INSTALLATION RESTORATION PROGRAM

PRELIMINARY ASSESSMENT/ SITE INSPECTION REPORT

VOLUME II APPENDICES A-I

143rd COMBAT COMMUNICATIONS SQUADRON
SEATTLE AIR NATIONAL GUARD STATION
WASHINGTON AIR NATIONAL GUARD
SEATTLE, WASHINGTON

MARCH 1995

AIR NATIONAL GUARD READINESS CENTER
ANDREWS AFB, MARYLAND

Tech 109-001

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Appendix A

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APPENDIX A

SOIL VAPOR SURVEY RESULTS

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TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

7110 38th Drive SE
Lacey, Washington 98503

Mobile Environmental Laboratories
Environmental Sampling Services

Telephone: 206-459-4670
Fax: 206-459-3432

Mr. Mike Giles
OPTECH
4100 N.W. Loop 410, Suite 230
San Antonio, TX 78229

July 9, 1994

Dear Mr. Giles:

Please find enclosed the data report for the analyses conducted on-site for samples from the Western Washington area Air National Guard Sites. There were 21 soil vapor samples from the Boeing Field site, 20 samples from the Bellingham site, and 40 samples from the Everett site. All samples were analyzed Volatile Aromatic Hydrocarbons (BTEX) by Modified EPA Method 8020 and for Total Volatile Hydrocarbons (TVH) by Modified EPA Method 8015.

The results of the analyses are summarized in the attached table. An invoice for this analytical work and the on-site analyses in March is also enclosed.

TEG Northwest appreciates the opportunity to have provided analytical services to OPTECH for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A. Korosec

Michael A. Korosec
(President)

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

AIR NATIONAL GUARD
Seattle, Washington
OPTECH
Project No: 1315-127

BTEX (Mod. EPA 8020) and Total Volatile Hydrocarbons in Soil Vapor

SAMPLE Number	DATE Analyzed	Benzen ppmv	Toluene ppmv	Eth Benz ppmv	Xylene ppmv	TVH ppmv
Meth. Blank	07/05/94	nd	nd	nd	nd	nd
BS1	07/05/94	nd	nd	nd	nd	5
BS2	07/05/94	nd	nd	nd	nd	6
BS3	07/05/94	nd	nd	nd	nd	4
BS4	07/05/94	nd	nd	nd	nd	3
BS5	07/05/94	nd	0.06	nd	nd	2
BS6	07/05/94	nd	nd	nd	nd	3
BS7	07/05/94	nd	nd	nd	nd	1
BS8	07/05/94	nd	nd	nd	nd	2
BS9	07/05/94	nd	nd	nd	nd	2
BS10	07/05/94	nd	nd	nd	nd	3
BS10 Dup	07/05/94	nd	nd	nd	nd	2
BS11	07/05/94	nd	nd	nd	nd	2
BS12	07/05/94	nd	nd	nd	nd	3
BS13	07/05/94	nd	nd	nd	nd	1
BS14	07/05/94	nd	nd	nd	nd	1
BS15	07/05/94	nd	nd	nd	nd	1
BS15 Dup	07/05/94	nd	nd	nd	nd	2
BS16	07/05/94	nd	nd	nd	nd	1
BS17	07/05/94	nd	nd	nd	nd	4
BS18	07/05/94	nd	nd	nd	nd	1
BS19	07/05/94	nd	nd	nd	nd	4
BS20	07/05/94	nd	nd	nd	nd	2
BS21	07/05/94	nd	nd	nd	nd	1
BS21 Dup	07/05/94	nd	nd	nd	nd	2
DETECTION LIMIT		0.01	0.01	0.01	0.01	1

"nd" Indicates NOT DETECTED at the Listed Detection Limits
"int" Indicates that INTERFERENCES prevent determination

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teg TRANSGLOBAL ENVIRONMENTAL GEOCHEMISTRY

CHAIN-OF-CUSTODY RECORD

P.O. #:

CLIENT: OPTECH

ADDRESS:

PHONE: FAX:

CLIENT PROJECT #: PROJECT MANAGER: KATHLEEN / MIKE GILES

DATE: 07.05.94 PAGE 1 OF 2

TEG PROJECT #: NW94-0705

LOCATION: ANG / SEATTLE

COLLECTOR: BTM / KV / KV DATE OF COLLECTION: 07059

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (g & d)	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TOTAL LEAD	pH	ASBESTOS						FIELD NOTES	Total Number Of Containers	Laboratory Note Number
MTH ELK	NA	0752	Vapor	20cc		✓				✓																1	
BS-1	5'	0744	Vapor	"		✓				✓																1	
BS-2	5'	0813	"	"		✓				✓																1	
BS-3	5'	0843	"	"		✓				✓																1	
BS-4	5'	0850	"	"		✓				✓																1	
BS-5	5'	0909	"	"		✓				✓																1	
BS-6	5'	0915	"	"		✓				✓																1	
BS-7		[illegible]	"	"		✓				✓																1	
BS-8	5'	0942	"	"		✓				✓																1	
BS-9	5'	0946	"	"		✓				✓																1	
BS-10	5'	1000	"	"		✓				✓																1	
BS-12	5'	1038	"			✓				✓																1	
BS-13	5	1121	"	"		✓				✓																1	
BS-14	5'	1220	"	"		✓				✓																1	
BS-15	5'	1232	"	"		✓				✓																1	
BS 16	5'	1233	"	"		✓				✓																1	
BS 17	5'	1245	"	"		✓				✓																1	
BS 18	5'	1257	"	"		✓				✓																1	

RELINQUISHED BY (Signature) DATE/TIME RECEIVED BY (Signature) DATE/TIME

RELINQUISHED BY (Signature) DATE/TIME RECEIVED BY (Signature) DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	18
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	Y
NOTES:	

LABORATORY NOTES:

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teg TRANSGLOBAL ENVIRONMENTAL GEOCHEMISTRY,

CHAIN-OF-CUSTODY RECORD

P.O. #:

CLIENT: Optech

ADDRESS:

PHONE: FAX:

CLIENT PROJECT #: PROJECT MANAGER: Kathleen / Mike Giles

DATE: 07-05-94 PAGE 2 OF 2

TEG PROJECT #: NW940705

LOCATION: ANG / Seattle

COLLECTOR: BIM / KU / KU DATE OF COLLECTION: 7-5-94

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (g & d)	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TOTAL LEAD	pH	ASBESTOS						FIELD NOTES	Total Number Of Containers	Laboratory Note Number
BS11	5'	1257	Vapor	2ucc		✓				✓																1	
BS19	5'	1316	"	"		✓				✓																1	
BS20	5'	1327	"	20"		✓				✓																1	
BS21	5'	1421	"	"		✓				✓																2	

RELINQUISHED BY (Signature) DATE/TIME RECEIVED BY (Signature) DATE/TIME

RELINQUISHED BY (Signature) DATE/TIME RECEIVED BY (Signature) DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	

LABORATORY NOTES:

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Appendix B

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APPENDIX B

BORING LOGS

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KEY TO BORING LOG SYMBOLS

UNIFIED SOIL CLASSIFICATION SYSTEM – ASTM D2487

MAJOR DIVISIONS			SYMBOL/ GRAPHIC	DESCRIPTIONS
COARSE-GRAINED SOILS (>50% Smaller Than #200 Sieve)	GRAVELS (More than 50% of coarse fraction is larger than the #4 sieve size.)	Clean gravels with little or no fines	GW	Well-Graded Gravels, Gravel – Sand Mixtures
			GP	Poorly Graded Gravels, Gravels – Sand Mixtures
		Gravels with over 12% fines	GM	Silty Gravels, Poorly Graded Gravel-Sand-Clay Mixtures
			GC	Clayey Gravels, Poorly Graded Gravel-Sand-Clay Mixtures
	SANDS (More than 50% of coarse fraction is smaller than the #4 sieve size.)	Clean sands with little or no fines	SW	Well-Graded Sands, Gravelly Sands
			SP	Poorly Graded Sands, Gravelly Sands
		Sands with over 12% fines	SM	Silty Sands, Poorly Graded Sand-Silt Mixtures
			SC	Clayey Sands, Poorly Graded Sand-Clay Mixtures
FINE-GRAINED SOILS (>50% Smaller Than #200 Sieve)	SILTS AND CLAYS (Liquid limit less than 50)		ML	Inorganic Silts and Very Fine Sands, Silty or Clayey Fine Sands
			CL	Inorganic Clays of Low to Medium Plasticity: Gravelly, Sandy or Silty Clays; Lean Clays
			OL	Organic Clays and Organic Silty Clays of Low Plasticity
	SILTS AND CLAYS (Liquid limit greater than 50)		MH	Inorganic Silts, Micaceous or Diatomacious Fine Sandy or Silty Soils, Elastic Silts
			CH	Inorganic Clays of High Plasticity Fat Clays
			OH	Organic Clays of Medium to High Plasticity, Organic Silts
HIGHLY ORGANIC SOILS			Pt	Peat and Other Highly Organic Soils

Shaded interval represents soil sample.
Blackened interval indicates portion of sample prepared for laboratory analysis.

Water Table Level

PID Photo-Ionization Detector readings (ppm)

	Asphaltic Concrete
	Portland Cement Concrete
	Cement Grout
	Boulders or Bedrock

FIGURE B.1

F:\FORMS\KEYLOG

KEY TO BORING LOG
143rd CCSQ, Seattle ANGS
Seattle, Washington

OPTECH
OPERATIONAL TECHNOLOGIES CORPORATION
1994

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WASHINGTON

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OPERATIONAL TECHNOLOGIES CORPORATION

LOG OF BORING BS-001BH

Project No.:	1315-127	**Sampling Method:**	Split Spoon
Logged By:	Kathleen Merino	**Depth Drilled:**	10 Ft.
Drilling Co.:	Cascade Driling Company	**Depth To Water:**	N/A
Driller:	Steve Butler	**Date Measured:**	N/A
Date Drilled:	07/14/94	**Surface Elevation:**	9.0 Ft.
Drilling Method:	Hollow Stem Auger		

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)
	14 17 13	66			Sand, silty; unconsolidated, brown.	1.5	7.0	5.0	0
	13 4 5	66			Clay; firm but fragile, dry to moist, brown with some red streaks.	0	4.7	9.0	0
5	10 6 7	70			Sand, silt; unconsolidated, reddish-brown.	1.5	7.5	3.0	0
	11 6 6	65			Sand, clayey; brown, some glass pieces.	1.9	6.9	0	0
	11 8 8	65			Sand, silty, dark brown, moist.	3.1	2.2	0	0
	4 3 3	35				0.1	7.9	0	0
10					Boring Terminated at 10 ft.				

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LOG OF BORING BS-002BH

Project No.:	1315-127	Sampling Method:	Split Spoon
Logged By:	Kathleen Merino	Depth Drilled:	10 Ft.
Drilling Co.:	Cascade Driling Company	Depth To Water:	N/A
Driller:	Steve Butler	Date Measured:	N/A
Date Drilled:	07/14/94	Surface Elevation:	9.41 Ft.
Drilling Method:	Hollow Stem Auger		

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)
	11 7 6	65			Silt, clayey; some sand, slightly moist; dark brown.	0	0	0	0
5	11 7 9	65			Sand, silty; brown, slightly moist.	0.5	0	3.0	0
	9 3 6	40				0.6	0	0	0
10					Boring Terminated at 10 ft.				

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OPERATIONAL TECHNOLOGIES CORPORATION

LOG OF BORING BS-003BH

Project No.:	**1315-127**	**Sampling Method:**	**Split Spoon**
Logged By:	**Kathleen Merino**	**Depth Drilled:**	**10 Ft.**
Drilling Co.:	**Cascade Driling Company**	**Depth To Water:**	**N/A**
Driller:	**Steve Butler**	**Date Measured:**	**N/A**
Date Drilled:	**07/14/94**	**Surface Elevation:**	**9.35 Ft.**
Drilling Method:	**Hollow Stem Auger**		

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)
					Fill material with fine gravel.				
	8 4 6	55			Sand, clayey; slightly moist, brown.	0.1	0	0	0
5	6 9 10	66			Sand, silty; fill material present (red rubber), moist, dark brown.	0	0	3.0	0
	15 15 17	100			- some clay.	1.4	0	62.0	0
10					Boring Terminated at 10 ft.				

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OPERATIONAL TECHNOLOGIES CORPORATION

LOG OF BORING BS-004PZ

Project No.:	1315-127	Sampling Method:	Split Spoon
Logged By:	Kathleen Merino	Depth Drilled:	20.5
Drilling Co.:	Cascade Drilling Company	Depth To Water:	9.45 Ft.
Driller:	Steve Butler	Date Measured:	07/21/94
Date Drilled:	07/14/94	Surface Elevation:	9.28 Ft.
Drilling Method:	Hollow Stem Auger	TOC Elevation:	8.99 Ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)	Piezometer Well
					Fill, gravel, sand.					
					Sand, silty; medium-grained, light brown, red staining.					
	9 7 6	80				0	0	17.0	0	
5										
	6 4 3	80				0	0	35.0	0	
10					Sand, medium-grained, brown to gray, wet.					
	2 2 8	100				0	0	80.0	0	
15										
	2 6 15	100				0	0	72.0	0	
20										
					Boring Terminated at 20.5 ft.					

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LOG OF BORING BS-005PZ

Project No.:	1315-127	**Sampling Method:**	Split Spoon
Logged By:	Kathleen Merino	**Depth Drilled:**	20.5
Drilling Co.:	Cascade Drilling Company	**Depth To Water:**	9.81 Ft.
Driller:	Steve Butler	**Date Measured:**	07/21/94
Date Drilled:	07/14/94	**Surface Elevation:**	9.08 Ft.
Drilling Method:	Hollow Stem Auger	**TOC Elevation:**	8.72 Ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)	Piezometer Well
					Fill, gravel, sand.					
					Sand, silty, unconsolidated, medium-grained to coarse-grained, moderately sorted, dry, light brown.					
5	13 26 10	60				0	0	52.0	0	
10	8 7 5	50				8.3	0	80.0	0	
					Sand, coarse-grained, unconsolidated, dry, light brown.					
15	2 3 5	75				0	0	64.0	0	
20	7 8 9	100				0	0	19.0	0	
					Boring Terminated at 20.5 ft.					

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WASHINGTON

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OPERATIONAL TECHNOLOGIES CORPORATION

LOG OF BORING BS-006PZ

Project No.:	1315-127	Sampling Method:	Split Spoon
Logged By:	Kathleen Merino	Depth Drilled:	20.5
Drilling Co.:	Cascade Drilling Company	Depth To Water:	9.78 Ft.
Driller:	Steve Butler	Date Measured:	07/21/94
Date Drilled:	07/14/94	Surface Elevation:	9.24 Ft.
Drilling Method:	Hollow Stem Auger	TOC Elevation:	8.91 Ft.

Depth (ft.)	Blows/6"	% Recovery	Samples	Graphic	DESCRIPTION OF MATERIALS	FIELD SCREENING PID (ppm)	ATHA (ppm)	BTEX (ppb)	Benzene (ppb)	Piezometer Well
					Fill, gravel, sand.					
					Sand, silty, a little clay; light brown, dry to slightly moist, medium-grained.					
5	10 8 8	100	X			0	0	8.0	2.0	
10	9 8 6	70	X		Sand; medium-grained, moist to wet, black to dark gray, brown striations.	0	0	5.0	1.0	
					Clay, sandy.					
					Sand, silty, some gravel; dry to moist.					
					Sand, coarse-grained, well sorted, wet, black, occasional clay lenses.					
15	Driller Cut Hnd	100	X			0	0	5.0	1.0	
20	3 5 12	100	X			0	0	5.0	1.0	
					Boring Terminated at 20.5 ft.					

Appendix C

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APPENDIX C

FIELD GC, PID, AND GEOPHYSICAL SCREENING RESULTS

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FIELD GC DATA

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Table C.1
GC Screening Results - Soil Water
143rd CCSQ, Seattle ANGS, Seattle, Washington

Boring	Sample Interval (ft. BLS)	Sample Mass (grams)	Volatile Concentrations Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	m,p-Xylene (ppb)	o-Xylenes (ppb)	Total BTEX (ppb)
BS01-BH	1.0 - 2.5	10	ND	ND	5	ND	ND	5
BS01-BH	2.5 - 4.0	10	ND	ND	9	ND	ND	9
BS01-BH	4.0 - 5.5	10	ND	3	ND	ND	ND	3
BS01-BH	6.5 - 7.0	10	ND	ND	ND	ND	ND	ND
BS01-BH	7.0 - 8.5	10	ND	ND	ND	ND	ND	ND
CALIBRATION	100 PPB BTEX	NA	111	102	97	195	110	615
AIR BLANK	AIR SAMPLE	NA	ND	ND	ND	ND	ND	ND
BS01-BH	8.5 - 10	10	ND	ND	ND	ND	ND	ND
BS02-BH	1.0 - 2.5	10	ND	ND	ND	ND	ND	ND
BS02-BH	5.5 - 7.0	10	ND	3	ND	ND	ND	3
BS02-BH	8.5 - 10.0	10	ND	ND	ND	ND	ND	ND
BS03-BH	2.0 - 3.5	10	ND	ND	ND	ND	ND	ND
CALIBRATION	100 PPB BTEX	NA	121	97	84	162	91	555
AIR BLANK	AIR SAMPLE	NA	ND	ND	ND	4	ND	4
AIR BLANK	AIR SAMPLE	NA	7	4	ND	ND	ND	11
BS03-BH	5.5 - 7.0	10	ND	3	ND	ND	ND	3
BS03-BH	8.5 - 10.0	10	ND	42	ND	15	5	62
BS03-BH	8.5 - 10.0	10	ND	3	ND	8	ND	11
BS04-PZ	3.5 - 5.0	10	ND	3	ND	14	ND	17
BS04-PZ	8.5 - 10.0	10	ND	8	ND	20	7	35

BLS - Below land surface
ppb - Parts per billion
ND - Non detect
BS - Burial Site

BH - Borehole
PZ - Piezometer
BTEX - Benzene, Toulene, Ethylbenzene & Xylenes
ANGS - Air National Guard Station

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Table C.1 (Concluded)
GC Screening Results - Soil Water
143rd CCSQ, Seattle ANGS, Seattle, Washington

Boring	Sample Interval (ft. BLS)	Sample Mass (grams)	Volatile Concentrations					
			Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	m,p-Xylene (ppb)	o-Xylenes (ppb)	Total BTEX (ppb)
CALIBRATION	100 PPB BTEX	NA	58	49	32	68	36	243
AIR BLANK	AIR SAMPLE	NA	ND	ND	ND	ND	ND	ND
BS04-PZ	13.5 - 15.0	10	ND	6	ND	58	16	80
BS04-PZ	19.0 - 20.5	10	ND	6	ND	51	15	72
BS05-PZ	3.5 - 5.0	10	ND	ND	ND	36	16	52
BS05-PZ	8.5 - 10.0	10	ND	6	ND	58	16	80
BS05-PZ	13.5 - 15.0	10	ND	6	ND	45	13	64
CALIBRATION	100 PPB BTEX	NA	117	117	129	254	154	537
AIR BLANK	AIR SAMPLE	NA	ND	ND	ND	ND	ND	ND
BS05-PZ	19.0 - 20.5	10	ND	ND	ND	19	ND	19
CALIBRATION	100 PPB BTEX	NA	7	15	11	32	12	77
CALIBRATION	100 PPB BTEX	NA	100	100	100	200	100	600
BS06-PZ	3.5 - 5.0	10	2	3	1	1	1	8
BS06-PZ	8.5 - 10.0	10	1	1	1	1	1	5
BS06-PZ	13.5- 15.0	10	1	1	1	1	1	5
BS06-PZ	19.0 - 20.5	10	1	1	1	1	1	5
CALIBRATION	100 PPB BTEX	NA	100	100	100	200	100	600
AIR BLANK	AIR SAMPLE	NA	ND	ND	ND	ND	ND	ND
BS04-PZ	WATER	10	ND	ND	ND	ND	ND	ND
BS05-PZ	WATER	10	ND	ND	ND	ND	ND	ND
BS06-PZ	WATER	10	ND	ND	ND	ND	ND	ND

BLS - Below land surface
ppb - Parts per billion
ND - Non detect
BS - Burial Site

BH - Borehole
PZ - Piezometer
BTEX - Benzene, Toulene, Ethylbenzene & Xylenes
ANGS - Air National Guard Station

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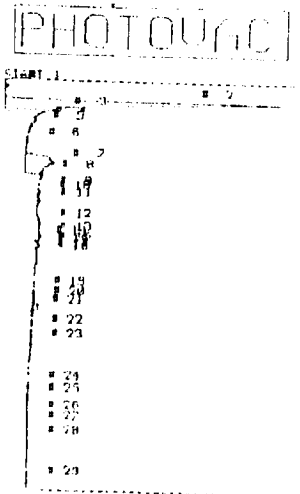
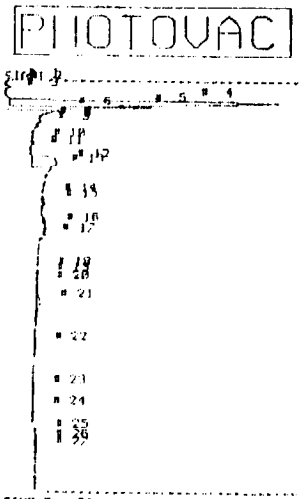
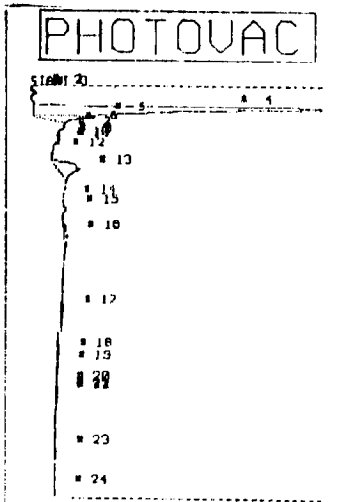
BS01-BH 1-1.5'



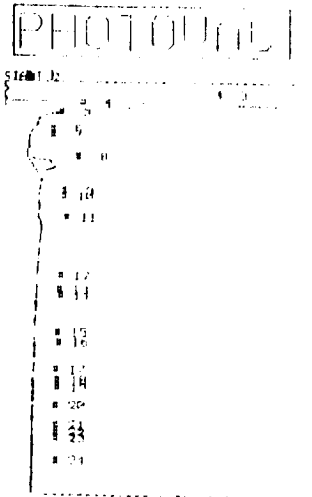
BS01BH 2.5-4'



BS01-BH 4-5.5'



BS01-BH 6.5-7'



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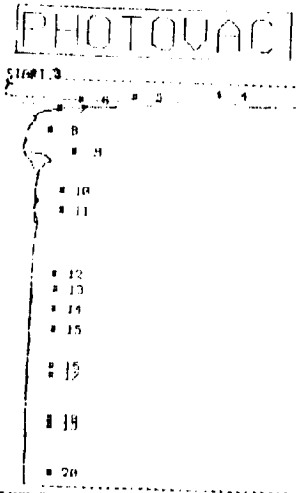
SEA405136

BS01-BH 7-8.5'

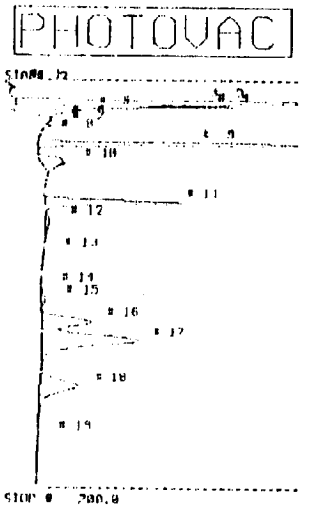


STOP # 700.0
SAMPLE LIBRARY 1 JUL 14 1994 14:42
ANALYSIS # 15 IRIS ARREDONDO
INTERNAL TEMP 25 SEATTLE ANGS
GAIN 50 BS01-BH 7.0-8.5

OFFSET 17.0 pV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 pV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 pVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 700.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	4	39.5	2.5 VS
UNKNOWN	5	47.8	2.1 VS
UNKNOWN	6	55.8	1.1 VS
UNKNOWN	9	146.7	1.5 VS
UNKNOWN	11	248.9	149.0 mVS
UNKNOWN	13	303.7	104.1 mVS

CALIBRATION

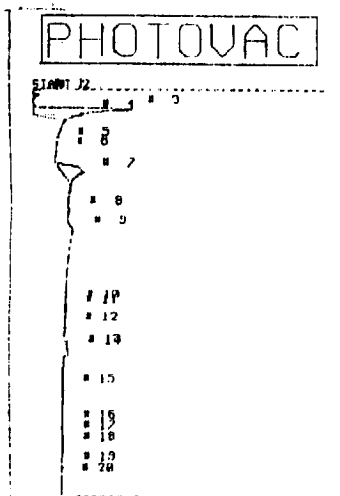


STOP # 700.0
SAMPLE LIBRARY 1 JUL 14 1994 14:56
ANALYSIS # 20 IRIS ARREDONDO
INTERNAL TEMP 25 SEATTLE ANGS
GAIN 50 100 PPB BTEX

OFFSET 17.0 pV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 pV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 pVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 700.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	1	38.9	5.8 VS
UNKNOWN	4	48.6	3.7 VS
UNKNOWN	5	50.2	1.3 VS
BENZENE	9	111.6	111.2 PPB
UNKNOWN	10	146.7	1.5 VS
TOLUENE	11	213.1	101.5 PPB
UNKNOWN	12	245.3	286.2 mVS
UNKNOWN	15	389.3	222.8 mVS
ETHYLBENZENE	16	421.7	97.44 PPB
MP-XYLENE	17	453.3	155.1 PPB
O-XYLENE	18	534.3	110.1 PPB

AIR BLANK

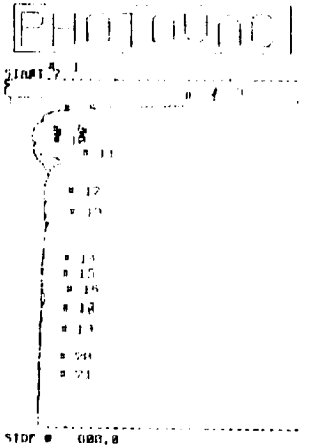


STOP # 700.0
SAMPLE LIBRARY 1 JUL 14 1994 15:13
ANALYSIS # 21 IRIS ARREDONDO
INTERNAL TEMP 25 SEATTLE ANGS
GAIN 50 AIR BLANK

OFFSET 17.0 pV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 pV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 pVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 700.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	38.3	2.7 VS
UNKNOWN	4	47.3	511.7 mVS
UNKNOWN	7	146.7	1.5 VS

BS01-BH 8.5-10



STOP # 600.0
SAMPLE LIBRARY 1 JUL 14 1994 15:26
ANALYSIS # 22 IRIS ARREDONDO
INTERNAL TEMP 26 SEATTLE ANGS
GAIN 50 BS01-BH 8.5-10.0

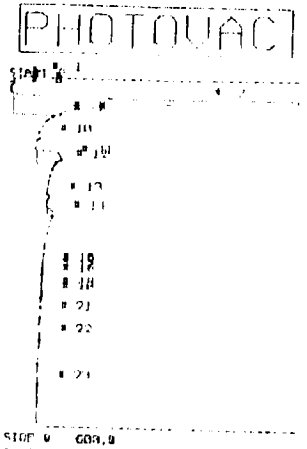
OFFSET 17.0 pV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 pV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 pVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	33.4	5.2 VS
UNKNOWN	4	42.8	3.2 VS
UNKNOWN	11	146.7	1.4 VS
UNKNOWN	12	249.3	204.2 mVS
UNKNOWN	16	382.9	228.5 mVS

KCSlip4 38607

SEA405137

BS02-BH 1-2.5'

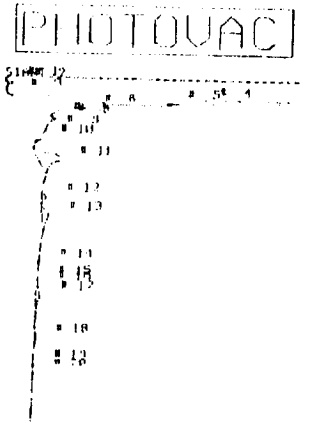


STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 15:48
ANALYSIS # 23 IRIS ARREDONDO
INTERNAL TEMP 26 SEATTLE ANOS
GAIN 50 BS02-BH 1.0-2.5

OFFSET 12.0 uV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	20.6	18.5 uS
UNKNOWN	8	69.2	288.1 uVS
UNKNOWN	11	146.2	1.6 uS
UNKNOWN	12	154.1	470.2 uVS
UNKNOWN	14	242.3	251.3 uVS

BS02-BH 5.5-7'

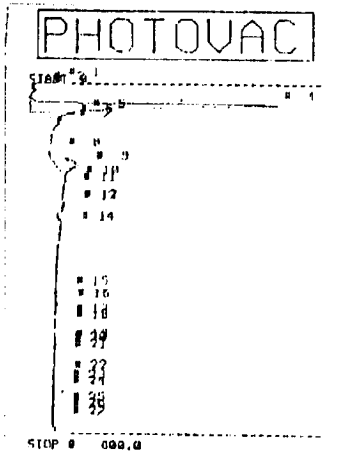


STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 15:52
ANALYSIS # 24 IRIS ARREDONDO
INTERNAL TEMP 26 SEATTLE ANOS
GAIN 50 BS02-BH 5.5-7.0

OFFSET 12.0 uV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	33.3	12.5 uS
UNKNOWN	5	47.0	3.3 uS
UNKNOWN	6	55.0	1.8 uS
UNKNOWN	11	146.2	1.6 uS
TOLUENE	12	211.9	2,226 PPB
UNKNOWN	13	242.5	102.8 uVS
UNKNOWN	17	380.9	107.2 uVS

BS02-BH 8.5-10'

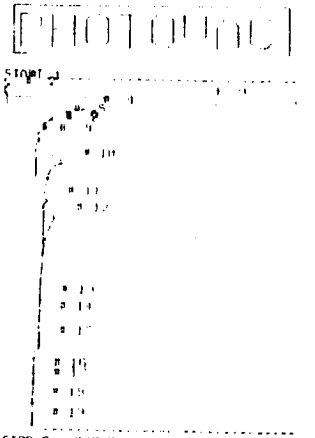


STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 16:15
ANALYSIS # 25 IRIS ARREDONDO
INTERNAL TEMP 26 SEATTLE ANOS
GAIN 50 BS02-BH 8.5-10.0

OFFSET 12.0 uV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	33.2	7.2 uS
UNKNOWN	5	55.5	1.2 uS
UNKNOWN	6	65.0	186.6 uVS
UNKNOWN	9	146.2	1.4 uS

BS03-BH 2-3.5'



STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 16:12
ANALYSIS # 26 IRIS ARREDONDO
INTERNAL TEMP 26 SEATTLE ANOS
GAIN 50 BS03-BH 2.0-3.5

OFFSET 12.0 uV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

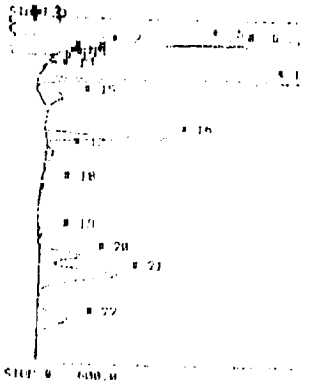
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	48.0	15.1 uS
UNKNOWN	4	55.8	1.9 uS
UNKNOWN	10	146.2	2.4 uS
UNKNOWN	12	243.8	1.1 uS

KCSlip4 38608

SEA405138

CALIBRATION

PHOTOVAC



STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 16:25
ANALYSIS # 27 JR15 ARREDONDO
INTERNAL TEMP 26 SEATTLE ANOS
GAIN 50 100 PPB BTEX

OFFSET 12.0 uV
CHART SPEED 0.5 cm/min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	14.1	120.2 uVS
UNKNOWN	5	40.5	11.9 US
UNKNOWN	6	48.2	4.4 US
UNKNOWN	7	56.1	2.2 US
UNKNOWN	8	68.3	184.4 uVS
UNKNOWN	11	82.2	108.0 uVS
BENZENE	14	111.2	121.1 PPB
UNKNOWN	15	146.2	1.6 US
TOLUENE	16	213.1	92.15 PPB
UNKNOWN	17	241.2	653.8 uVS
UNKNOWN	19	292.9	205.3 uVS
ETHYLBENZENE	20	421.3	83.78 PPB
MP-XYLENE	21	452.9	182.8 PPB
O-XYLENE	22	533.3	91.12 PPB

CALIBRATION

PHOTOVAC

CALIBRATED FROM 14.BENZENE

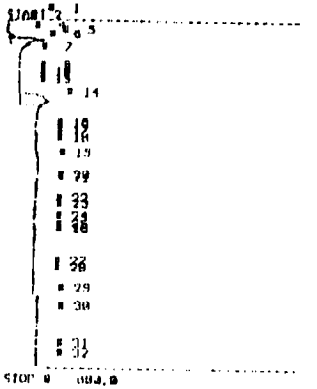
SAMPLE LIBRARY 1 JUL 14 1994 16:42
ANALYSIS # 27 JR15 ARREDONDO
INTERNAL TEMP 26 SEATTLE ANOS
GAIN 50 100 PPB BTEX

OFFSET 12.0 uV
CHART SPEED 0.5 cm/min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0. min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	14.1	120.2 uVS
UNKNOWN	5	40.5	11.9 US
UNKNOWN	6	48.2	4.4 US
UNKNOWN	7	56.1	2.2 US
UNKNOWN	8	68.3	184.4 uVS
UNKNOWN	11	82.2	108.0 uVS
BENZENE	14	111.2	100.0 PPB
UNKNOWN	15	146.2	1.6 US
TOLUENE	16	213.1	100.0 PPB
UNKNOWN	17	241.2	653.8 uVS
UNKNOWN	19	292.9	205.3 uVS
ETHYLBENZENE	20	421.3	100.0 PPB
MP-XYLENE	21	452.9	200.0 PPB
O-XYLENE	22	533.3	100.0 PPB

AIR BLANK

PHOTOVAC



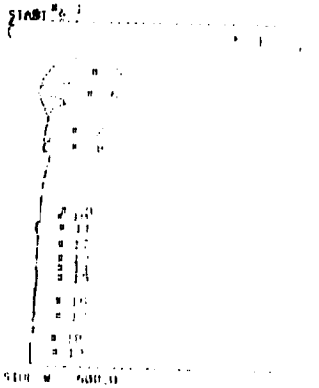
STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 16:55
ANALYSIS # 28 JR15 ARREDONDO
INTERNAL TEMP 26 SEATTLE ANOS
GAIN 50 AIR BLANK

OFFSET 12.0 uV
CHART SPEED 0.5 cm/min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	4	31.6	140.0 uVS
UNKNOWN	5	37.9	328.5 uVS
UNKNOWN	6	47.0	207.1 uVS
UNKNOWN	14	146.2	1.7 US
MP-XYLENE	29	488.3	4.230 PPB

AIR BLANK

PHOTOVAC



STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 17:10
ANALYSIS # 29 JR15 ARREDONDO
INTERNAL TEMP 26 SEATTLE ANOS
GAIN 50 AIR BLANK

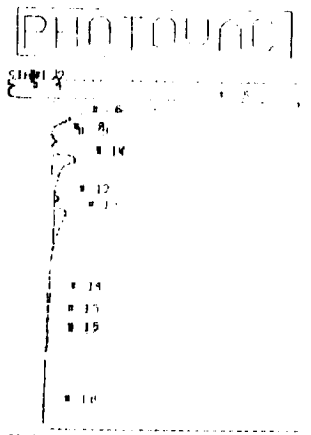
OFFSET 12.0 uV
CHART SPEED 0.5 cm/min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	4	31.2	[illegible] US
BENZENE	5	104.2	2.493 PPB
UNKNOWN	6	146.2	1.8 US
TOLUENE	7	213.2	1.184 PPB
UNKNOWN	9	[illegible]	[illegible]

KCSlip4 38609

SEA405139

BS03-BH 5.5-7

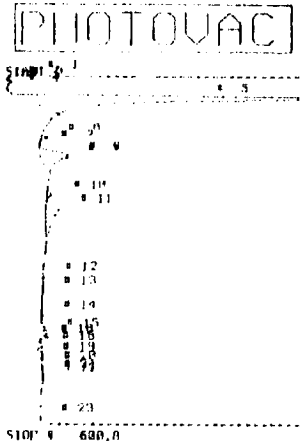


SAMPLE LIBRARY 1 JUL 14 1994 12:23
ANALYSIS # 38 IRIS ARREDONDO
INTERNAL TEMP 22 SEATTLE ANGS
GAIN 50 BS03-BH 5.5-7.0

OFFSET 12.0 mV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 mV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	5	40.7	16.6 VS
UNKNOWN	10	142.3	359.6 mVS
UNKNOWN	11	146.2	1.1 VS
TOLUENE	12	211.5	3.268 PPB
UNKNOWN	13	[illegible]	[illegible]
UNKNOWN	14	328.1	103.0 mVS

BSO3-BH 8.5-10

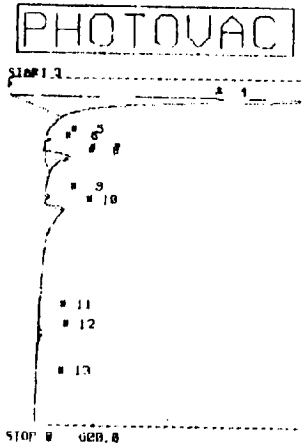


SAMPLE LIBRARY 1 JUL 14 1994 12:36
ANALYSIS # 31 IRIS ARREDONDO
INTERNAL TEMP 22 SEATTLE ANGS
GAIN 50 BS03-BH 8.5-10.0

OFFSET 18.0
CHART SPEED 0.5 µV
SLOPE SENS. 2 2cM/Min
WINDOW +/- 10 mV/Sec
MINIMUM AREA 100 Percent
TIMER DELAY 0.0 mVSec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Sec
Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	5	39.4	14.1 VS
UNKNOWN	8	141.3	1.0 VS
UNKNOWN	9	146.2	931.9 mVS
TOLUENE	10	210.9	3.360 PPB
TOLUENE	11	236.3	38.42 PPB
MP-XYLENE	15	449.3	2.831 PPB
MP-XYLENE	19	489.8	2.480 PPB
P-XYLENE	20	504.8	4.674 PPB

BS03-BH 8.5-10

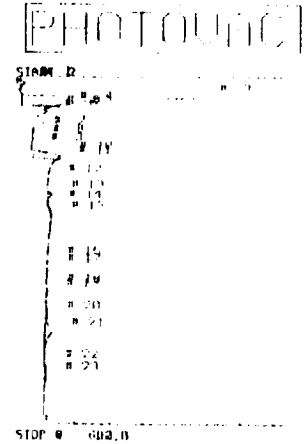


SAMPLE LIBRARY 1 JUL 14 1994 12:48
ANALYSIS # 32 IRIS ARREDONDO
INTERNAL TEMP 28 SEATTLE ANGS
GAIN 50 BS03-BH 8.5-10.0

OFFSET 18.0 mV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 mV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min.

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	4	39.8	14.2 VS
UNKNOWN	7	141.7	936.6 mVS
UNKNOWN	8	146.2	249.9 mVS
TOLUENE	9	211.7	2.980 PPB
MP-XYLENE	12	449.5	2.542 PPB

BS04-PZ 3.5-5



SAMPLE LIBRARY 1 JUL 14 1994 13:24
ANALYSIS # 33 IRIS ARREDONDO
INTERNAL TEMP 26 SEATTLE ANGS
GAIN 50 BS04-PZ 3.5-5.0

OFFSET 12.0 mV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 mV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

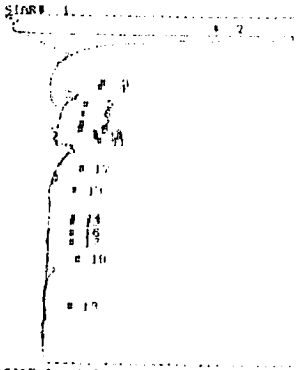
COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	2	13.5	143.4 mVS
UNKNOWN	3	39.0	5.3 VS
UNKNOWN	4	52.2	133.0 mVS
UNKNOWN	10	140.2	1.0 VS
UNKNOWN	11	146.5	214.4 mVS
TOLUENE	12	[illegible]	[illegible]
MP-XYLENE	21	446.9	[illegible]

KCSlip4 38610

SEA405140

BS04-PZ 8.5-10'

PHOTOVAC



STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 15:35
ANALYSIS # 34 JRJS ARREDONDO
INTERNAL TEMP 26 SEATTLE ANDS
GAIN 50 BS04-PZ 8.5-10.0

OFFSET 12.0 µV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 µV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 µVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	1	13.0	150.1 µVS
UNKNOWN	2	38.5	14.8 VS
UNKNOWN	3	140.1	1.0 VS
UNKNOWN	4	146.5	1.0 VS
TOLUENE	5	220.0	5.455 PPB
TOLUENE	10	320.8	3.455 PPB
UNKNOWN	12	285.2	114.4 µVS
MP-XYLENE	18	445.3	13.03 PPB
O-XYLENE	19	[illegible]	6.519 PPB

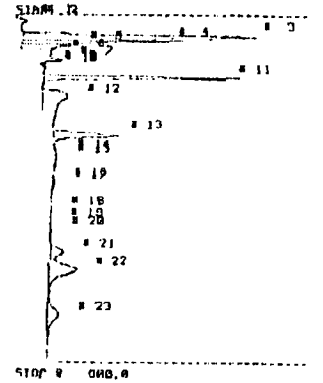
LIBRARY LISTING

PHOTOVAC

COMPOUND	ID #	R.T.	LIMIT
BENZENE	1	111.2	100.0 PPB
TOLUENE	2	217.1	100.0 PPB
ETHYL-BENZENE	3	421.3	100.0 PPB
MP-XYLENE	4	457.3	200.0 PPB
O-XYLENE	5	533.3	100.0 PPB

CALIBRATION

PHOTOVAC



STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 15:53
ANALYSIS # 35 JRJS ARREDONDO
INTERNAL TEMP 26 SEATTLE ANDS
GAIN 50 100 PPB BTEX

OFFSET 10.0 µV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 µV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 µVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	35.2	5.3 VS
UNKNOWN	4	47.7	2.7 VS
UNKNOWN	5	55.1	1.1 VS
UNKNOWN	7	81.2	215.5 µVS
BENZENE	11	110.0	52.67 PPB
UNKNOWN	12	146.5	2.4 VS
TOLUENE	13	218.3	49.28 PPB
ETHYL-BENZENE	21	416.1	32.42 PPB
MP-XYLENE	22	447.3	87.82 PPB
O-XYLENE	23	522.3	38.82 PPB

LIBRARY LISTING

PHOTOVAC

COMPOUND	ID #	R.T.	LIMIT
BENZENE	1	110.0	100.0 PPB
TOLUENE	2	210.3	100.0 PPB
ETHYL-BENZENE	3	416.1	100.0 PPB
MP-XYLENE	4	447.3	200.0 PPB
O-XYLENE	5	522.3	100.0 PPB

KCSlip4 38611

SEA405141

CALIBRATION

PHOTOVAC

CALIBRATED PEAK 11.CHLOROBENZENE

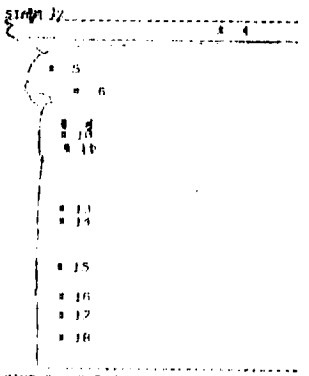
SAMPLE LIBRARY 1 JUL 14 1994 20: 6
ANALYSIS # 35 IRIS ARREDONDO
INTERNAL TEMP 25 SEATTLE ANGS
GAIN 50 100 PPB BTEX

OFFSET 12.0 mV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	33.2	5.5 uS
UNKNOWN	4	47.2	2.2 uS
UNKNOWN	5	55.1	1.1 uS
UNKNOWN	7	81.2	215.9 uVS
BENZENE	11	110.0	100.0 PPB
UNKNOWN	12	146.5	2.4 uS
TOLUENE	13	210.5	100.0 PPB
CHLOR.-BENZENE	21	416.1	100.0 PPB
MP-XYLENE	22	442.1	200.0 PPB
O-XYLENE	23	522.3	100.0 PPB

AIR BLANK

PHOTOVAC



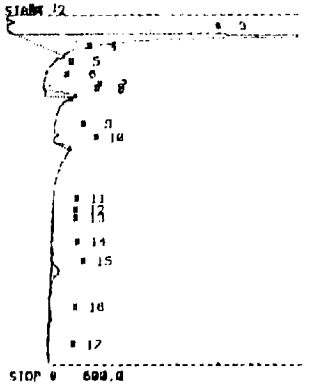
STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 20:19
ANALYSIS # 36 IRIS ARREDONDO
INTERNAL TEMP 25 SEATTLE ANGS
GAIN 50 AIR BLANK

OFFSET 12.0 mV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	4	38.5	8.6 uS
UNKNOWN	6	146.5	1.4 uS
UNKNOWN	11	215.3	100.0 uVS

BS04-PZ 13.5-15

PHOTOVAC



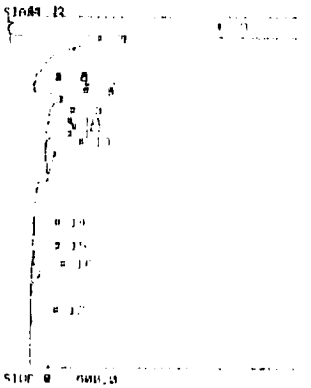
STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 20:34
ANALYSIS # 38 IRIS ARREDONDO
INTERNAL TEMP 26 SEATTLE ANGS
GAIN 50 BS04-PZ 13.5-15

OFFSET 12.0 mV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	38.0	13.2 uS
UNKNOWN	7	148.3	883.2 uVS
TOLUENE	9	209.2	5.994 PPB
MP-XYLENE	15	446.9	37.96 PPB
O-XYLENE	18	527.3	16.38 PPB

BS04-PZ 19-20.5

PHOTOVAC



STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 20:52
ANALYSIS # 39 IRIS ARREDONDO
INTERNAL TEMP 26 SEATTLE ANGS
GAIN 50 BS04-PZ 19-20.5

OFFSET 12.0 mV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	38.2	10.0 uS
UNKNOWN	4	52.0	1.2 uS
UNKNOWN	7	148.5	992.3 uVS
UNKNOWN	9	148.5	652.5 uVS
TOLUENE	11	209.2	6.486 PPB
UNKNOWN	13	296.2	1.0 uS
MP-XYLENE	16	446.3	51.32 PPB
O-XYLENE	17	529.0	14.22 PPB

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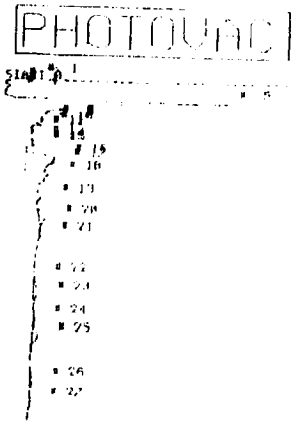
BS05-PZ 3.5-5

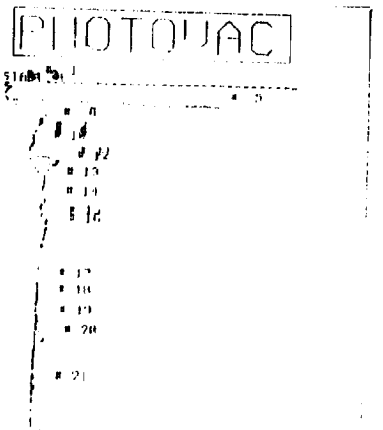


STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 21:14
ANALYSIS # 40 IRIS ARREDONDO
INTERNAL TEMP 28 SEATTLE ANOS
GAIN 50 BS05-PZ 3.5-5.0

OFFSET 12.0 uV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	38.6	5.5 uS
UNKNOWN	16	140.5	1.0 uS
UNKNOWN	17	146.5	1.3 uS
UNKNOWN	18	148.7	669.9 uVS
UNKNOWN	23	211.7	453.2 uVS
UNKNOWN	23	374.5	313.3 uVS
M-XYLENE	24	446.5	35.49 PPB
O-XYLENE	26	524.9	15.93 PPB

BS05-PZ 8.5-10

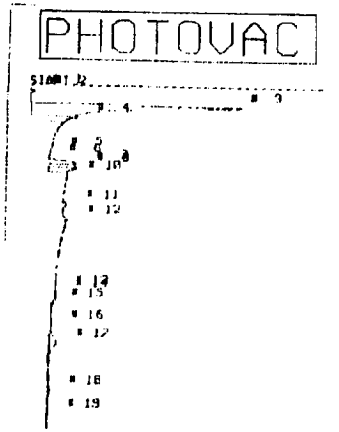


STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 21:15
ANALYSIS # 41 IRIS ARREDONDO
INTERNAL TEMP 25 SEATTLE ANOS
GAIN 50 BS05-PZ 8.5-10.0

OFFSET 12.0 uV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	5	38.3	6.5 uS
UNKNOWN	11	133.5	1.0 uS
UNKNOWN	12	146.5	950.3 uVS
TOLUENE	14	203.5	6.131 PPB
UNKNOWN	15	239.6	228.6 uVS
M-XYLENE	20	446.1	58.13 PPB
O-XYLENE	21	526.1	16.18 PPB

BS05-PZ 13.5-15



STOP @ 600.0
SAMPLE LIBRARY 1 JUL 14 1994 21:22
ANALYSIS # 42 IRIS ARREDONDO
INTERNAL TEMP 26 SEATTLE ANOS
GAIN 50 BS05-PZ 13.5-15

OFFSET 12.0 uV
CHART SPEED 0.5 cM/Min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	38.4	7.3 uS
UNKNOWN	4	57.0	269.4 uVS
UNKNOWN	7	139.5	669.2 uVS
UNKNOWN	8	143.5	308.1 uVS
UNKNOWN	9	146.5	834.7 uVS
TOLUENE	11	210.1	5.765 PPB
M-XYLENE	17	446.5	43.38 PPB
O-XYLENE	18	527.0	12.86 PPB

LIBRARY LISTING

COMPOUND	JU #	R.T.	[illegible]
BENZENE	1	110.0	100.0 PPB
TOLUENE	2	210.1	100.0 PPB
ETHYL-BENZENE	3	410.5	100.0 PPB
MP-XYLENE	4	442.7	200.0 PPB
O-XYLENE	5	527.5	100.0 PPB

KCSlip4 38613

SEA405143

CALIBRATION

PHOTOVAC

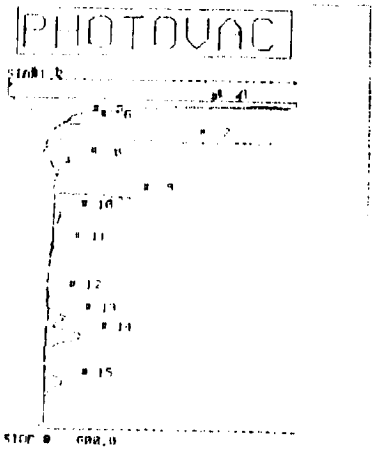
CALIBRATED PEAK 2,BENZENE

SAMPLE LIBRARY 1 JUL 14 1994 21:42
ANALYSIS # 43 IRIS ARREDONDO
INTERNAL TEMP 25 SEATTLE ANGS
GAIN 50 100 PPB BTEX

OFFSET 17.0 µV
CHART SPEED 0.5 cm/min
SLOPE SENS. 2 2 2 µV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 µVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB	
UNKNOWN	3	40.6	17.0	VS
UNKNOWN	4	47.2	2.2	VS
UNKNOWN	6	81.1	249.4	µVS
BENZENE	7	110.0	100.0	PPB
UNKNOWN	8	146.5	1.5	VS
TOLUENE	9	210.0	100.0	PPB
UNKNOWN	10	241.4	650.2	µVS
ETHYL-BENZENE	13	416.5	100.0	PPB
M+P-XYLENE	14	442.2	200.0	PPB
O-XYLENE	15	522.1	100.0	PPB

CALIBRATION

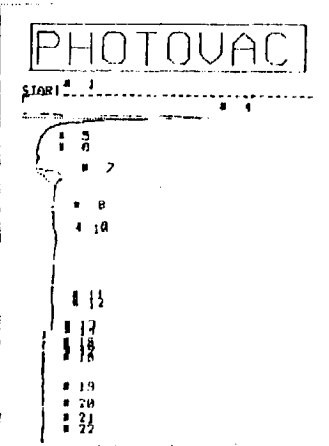


STOP # 600.0
SAMPLE LIBRARY 1 JUL 14 1994 21:08
ANALYSIS # 43 IRIS ARREDONDO
INTERNAL TEMP 25 SEATTLE ANGS
GAIN 50 100 PPB BTEX

OFFSET 17.0 µV
CHART SPEED 0.5 cm/min
SLOPE SENS. 2 2 2 µV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 µVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB	
UNKNOWN	3	40.6	17.0	VS
UNKNOWN	4	47.2	2.2	VS
UNKNOWN	6	81.1	240.4	µVS
BENZENE	7	110.0	117.1	PPB
UNKNOWN	8	146.5	1.5	VS
TOLUENE	9	210.0	117.4	PPB
UNKNOWN	10	241.4	650.2	µVS
ETHYL-BENZENE	13	416.5	129.0	PPB
M+P-XYLENE	14	442.2	250.0	PPB
O-XYLENE	15	522.1	154.1	PPB

AIR BLANK



STOP # 600.0
SAMPLE LIBRARY 1 JUL 14 1994 22:18
ANALYSIS # 44 IRIS ARREDONDO
INTERNAL TEMP 25 SEATTLE ANGS
GAIN 50 AIR BLANK

OFFSET 17.0 µV
CHART SPEED 0.5 cm/min
SLOPE SENS. 2 2 2 µV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 µVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB	
UNKNOWN	4	35.8	3.6	VS
UNKNOWN	7	146.5	1.2	VS

BS05-PZ 19-20.5

STOP # 600.0
SAMPLE LIBRARY 1 JUL 14 1994 22:02
ANALYSIS # 45 IRIS ARREDONDO
INTERNAL TEMP 25 SEATTLE ANGS
GAIN 50 BS05-PZ 19-20.5

OFFSET 16.9 µV
CHART SPEED 0.5 cm/min
SLOPE SENS. 2 2 2 µV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 µVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB	
UNKNOWN	3	40.6	32.4	VS
UNKNOWN	5	140.5	922.4	µVS
UNKNOWN	6	146.5	228.4	µVS
UNKNOWN	9	242.0	132.5	µVS
M+P-XYLENE	13	415.2	19.0	PPB

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CALIBRATION

PHOTOVAC ①

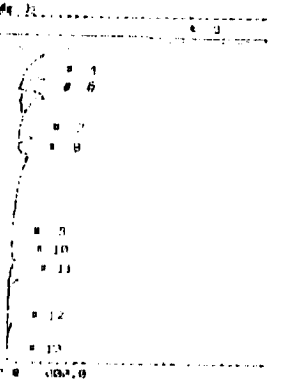
STOP @ 600.0
SAMPLE LIBRARY 1 JUL 15 1994 10:28
ANALYSIS # 16 IRIS ARREDONDO
INTERNAL TEMP 23 SEATTLE ANGS
GAIN 50 100 PPB BTEX

OFFSET 14.0 mV
CHART SPEED 0.5 cm/min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	5	41.5	33.8 uS
BENZENE	7	113.1	2,815 PPB
UNKNOWN	8	143.9	741.9 uVS
UNKNOWN	9	149.7	894.7 uVS
TOLUENE	12	218.1	14.00 PPB
UNKNOWN	13	238.5	3.4 uS
ETHYL-BENZENE	14	438.5	10.63 PPB
M-XYLENE	15	462.1	21.06 PPB
O-XYLENE	16	44.1	11.69 PPB

CALIBRATION

PHOTOVAC ②



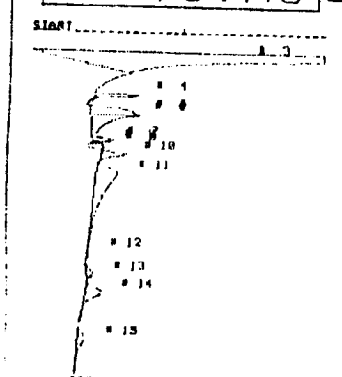
STOP @ 600.0
SAMPLE LIBRARY 1 JUL 15 1994 11:0
ANALYSIS # 17 IRIS ARREDONDO
INTERNAL TEMP 23 SEATTLE ANGS
GAIN 50 100 PPB BTEX

OFFSET 15.0 mV
CHART SPEED 0.5 cm/min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	39.8	16.4 uS
UNKNOWN	4	102.2	324.2 uVS
UNKNOWN	5	142.2	846.3 uVS
UNKNOWN	6	145.3	1.0 uS
UNKNOWN	7	214.2	4151.8 uVS
UNKNOWN	8	218.3	121.2 uVS
UNKNOWN	10	426.1	177.2 uVS
UNKNOWN	11	450.5	562.8 uVS
UNKNOWN	12	541.3	242.5 uVS

CALIBRATION

PHOTOVAC ③



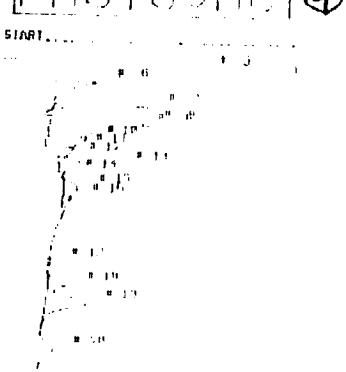
STOP @ 600.0
SAMPLE LIBRARY 1 JUL 15 1994 11:23
ANALYSIS # 18 IRIS ARREDONDO
INTERNAL TEMP 24 SEATTLE ANGS
GAIN 100 100 PPB BTEX

OFFSET 16.0 mV
CHART SPEED 0.5 cm/min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 10 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	1	12.7	158.0 uVS
UNKNOWN	2	41.0	37.2 uS
UNKNOWN	4	114.0	228.0 uVS
UNKNOWN	5	142.5	1.7 uS
UNKNOWN	6	146.2	2.7 uS
UNKNOWN	7	188.5	552.8 uVS
UNKNOWN	8	195.5	184.6 uVS
UNKNOWN	9	199.1	233.7 uVS
UNKNOWN	10	214.1	241.0 uVS
UNKNOWN	11	240.0	2.5 uS
UNKNOWN	13	425.3	313.3 uVS
UNKNOWN	14	457.3	1.1 uS
UNKNOWN	15	538.3	523.4 uVS

CALIBRATION

PHOTOVAC ④



STOP @ 600.0
SAMPLE LIBRARY 1 JUL 15 1994 11:43
ANALYSIS # 19 IRIS ARREDONDO
INTERNAL TEMP 24 SEATTLE ANGS
GAIN 200 100 PPB BTEX

OFFSET 17.0 mV
CHART SPEED 0.5 cm/min
SLOPE SENS. 2 2 2 uV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 200 uVSec
TIMER DELAY 0.0 Sec
ANALYSIS TIME 600.0 Sec
CYCLE TIME 0 min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	5	43.6	45.4 uS
UNKNOWN	6	49.3	212 uS
UNKNOWN	7	115.6	1.8 uS
UNKNOWN	8	143.3	3.6 uS
UNKNOWN	9	146.7	4.4 uS
UNKNOWN	10	170.1	2.9 uS
UNKNOWN	13	214.7	2.1 uS
UNKNOWN	15	255.8	1.5 uS
UNKNOWN	16	322.5	120.2 uVS
UNKNOWN	18	[illegible]	[illegible]
UNKNOWN	19	[illegible]	[illegible]

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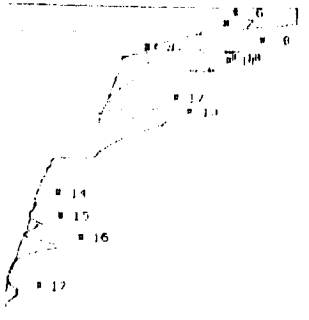
CALIBRATION

PHOTOVAC (5)



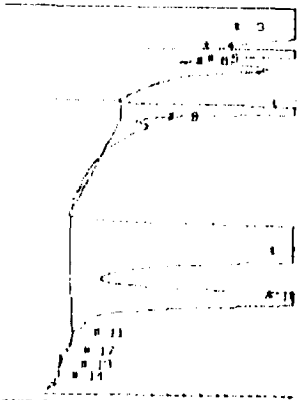
STOP @ 200.0
SAMPLE LIBRARY 1 JUL 15 1994 12:19
ANALYSIS # 51 IRIS ARREDONDO
INTERNAL TEMP 25 SEATTLE ANGS
GAIN 200 100 PPB BTEX

OFFSET	18.0 mV
CHART SPEED	0.5 cM/Min
SLOPE SENS.	2 2 2 mV/Sec
WINDOW +/-	10 Percent
MINIMUM AREA	13 mVSec
TIMER DELAY	0.0 Sec
ANALYSIS TIME	200.0 Sec
CYCLE TIME	0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	12.3	224.4 mVS
UNKNOWN	4	49.0	305.6 VS
UNKNOWN	7	61.1	11.0 VS
UNKNOWN	8	111.9	1.8 VS
UNKNOWN	10	142.7	3.3 VS
UNKNOWN	11	146.3	4.4 VS
UNKNOWN	12	213.9	1.6 VS
UNKNOWN	13	238.1	2.7 VS
UNKNOWN	15	428.5	202.2 mVS
UNKNOWN	16	458.9	2.2 VS
UNKNOWN	17	529.8	1.1 VS

CALIBRATION

PHOTOVAC

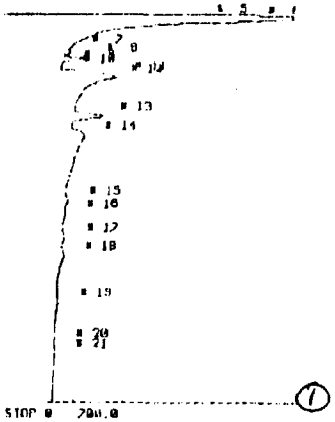


STOP @ 200.0
SAMPLE LIBRARY 1 JUL 15 1994 12:40
ANALYSIS # 52 IRIS ARREDONDO
INTERNAL TEMP 25 SEATTLE ANGS
GAIN 200 100 PPB BTEX

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	2	12.1	235.8 mVS
UNKNOWN	3	61.8	607.9 VS
UNKNOWN	4	114.1	38.2 VS
UNKNOWN	5	142.5	15.9 VS
UNKNOWN	6	146.7	45.2 VS
UNKNOWN	7	214.7	43.2 VS
UNKNOWN	8	245.0	2.1 VS
UNKNOWN	9	443.8	516.9 VS
UNKNOWN	10	532.4	75.3 VS
UNKNOWN	11	616.1	199.7 mVS
UNKNOWN	12	642.3	40.9 mVS

BS06-PZ 3.5-5

PHOTOVAC



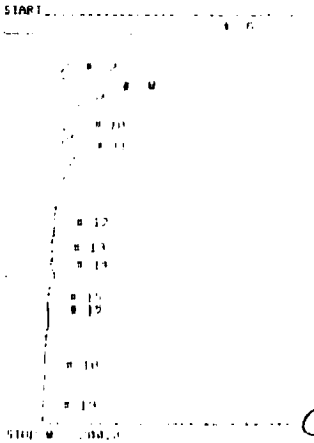
(1)

STOP @ 200.0
SAMPLE LIBRARY 1 JUL 15 1994 13:56 (24)
ANALYSIS # 54 IRIS ARREDONDO
INTERNAL TEMP 24 ~~BELLINGHAM ANGS~~ SEATTLE ANGS
GAIN 100 BS06-PZ 3.5-5.0

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	2	12.5	194.3 mVS
UNKNOWN	5	40.4	15.4 VS
UNKNOWN	6	47.0	7.7 VS
BENZENE	8	111.3	2.156 PPB
UNKNOWN	11	143.1	1.8 VS
UNKNOWN	12	146.7	2.9 VS
TOLUENE	13	213.1	2.939 PPB
UNKNOWN	14	248.0	682.8 mVS
UNKNOWN	15	359.7	85.7 mVS
UNKNOWN	16	382.1	14.7 mVS
ETHYLBENZENE	17	422.1	0.563 PPB
MP-XYLENE	18	454.1	0.514 PPB
O-XYLENE	19	532.3	0.554 PPB
UNKNOWN	21	619.1	46.2 mVS

BS06-PZ 8.5-10

PHOTOVAC



(2)

STOP @ 200.0
SAMPLE LIBRARY 1 JUL 15 1994 14:19
ANALYSIS # 55 IRIS ARREDONDO (24)
INTERNAL TEMP 24 ~~BELLINGHAM ANGS~~ SEATTLE ANGS
GAIN 100 BS06-PZ 8.5-10

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	2	12.4	150.5 mVS
UNKNOWN	6	38.9	13.6 VS
BENZENE	7	110.8	0.349 PPB
UNKNOWN	8	142.3	1.7 VS
UNKNOWN	9	146.7	2.3 VS
TOLUENE	10	212.5	1.025 PPB
UNKNOWN	11	246.8	2.0 VS
ETHYLBENZENE	13	422.1	0.240 PPB
MP-XYLENE	14	452.9	0.622 PPB
O-XYLENE	17	531.0	0.102 PPB
UNKNOWN	18	621.3	30.0 mVS

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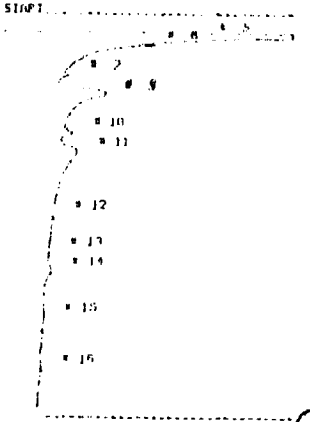
SEA405146

LIBRARY LISTING	BS06-PZ 13.5-15	BS06-PZ 19-20.5	

PHOTOVAC

COMPOUND	ID #	R.T.	UNIT
BENZENE	1	116.0	100.0 PPB
TOLUENE	2	218.4	100.0 PPB
ETHYLBENZENE	3	431.9	100.0 PPB
MP-XYLENE	4	463.0	200.0 PPB
O-XYLENE	5	548.8	100.0 PPB

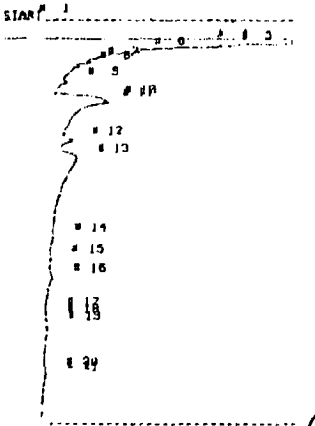
PHOTOVAC



STOP @ 200.0 (3)
SAMPLE LIBRARY 1 JUL 15 1994 14:24
ANALYSIS # 56 IRIS ARREDONDO (24)
INTERNAL TEMP 25 ~~BELLINGHAM-ANGS~~ Seattle Angs
GAIN 100 BS06-PZ 13.5-15

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	13.0	152.4 mVS
UNKNOWN	5	39.4	20.1 VS
BENZENE	7	110.9	0.401 PPB
UNKNOWN	8	142.7	117 VS
UNKNOWN	9	146.7	2.2 VS
TOLUENE	10	212.5	0.800 PPB
UNKNOWN	11	246.2	2.5 VS
ETHYLBENZENE	13	420.5	0.082 PPB
MP-XYLENE	14	453.3	0.249 PPB
O-XYLENE	15	533.3	0.394 PPB
UNKNOWN	16	621.9	120.8 mVS

PHOTOVAC



STOP @ 200.0 (4)
SAMPLE LIBRARY 1 JUL 15 1994 14:41
ANALYSIS # 57 IRIS ARREDONDO (24)
INTERNAL TEMP 25 ~~BELLINGHAM-ANGS~~ Seattle Angs
GAIN 100 BS06-PZ 19-20.5

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	3	12.8	128.7 mVS
UNKNOWN	4	39.7	21.2 VS
UNKNOWN	5	47.2	6.5 VS
UNKNOWN	6	58.0	2.5 VS
UNKNOWN	8	82.4	18.4 mVS
BENZENE	9	111.2	0.333 PPB
UNKNOWN	10	142.9	1.7 VS
UNKNOWN	11	146.7	2.0 VS
TOLUENE	12	213.3	0.501 PPB
UNKNOWN	13	246.2	2.5 VS
UNKNOWN	14	382.1	20.0 mVS
ETHYLBENZENE	15	420.5	0.090 PPB
MP-XYLENE	16	453.7	0.673 PPB
O-XYLENE	19	539.8	0.050 PPB

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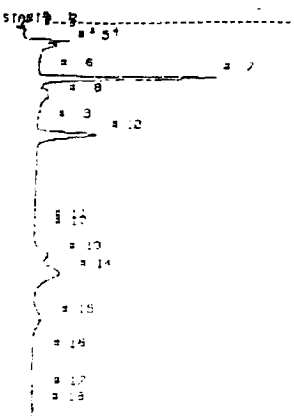
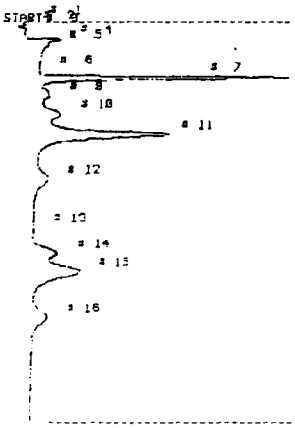
PHOTOVAC



STOP # 700.0
SAMPLE LIBRARY 1 AUG 1 1994 10:13
ANALYSIS # 2 IRIS ARRECONDO
INTERNAL TEMP 22 SEATTLE
GAIN 23 ~~[illegible]~~ BTEX 100 PPB

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	3.3	51.6 mVS
UNKNOWN	4	35.5	1.8 VS
UNKNOWN	5	44.2	575.2 mVS
UNKNOWN	7	121.3	3.5 VS
UNKNOWN	9	136.3	472.7 mVS
UNKNOWN	10	200.3	3.2 VS
UNKNOWN	13	414.1	1.3 VS
UNKNOWN	14	445.3	2.5 VS
UNKNOWN	15	526.9	671.3 mVS

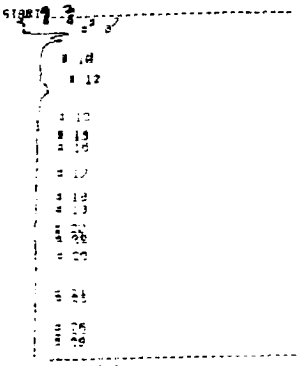
PHOTOVAC



STOP # 700.2
SAMPLE LIBRARY 1 AUG 1 1994 10:27
ANALYSIS # 5 IRIS ARRECONDO
INTERNAL TEMP 22 SEATTLE
GAIN 23 ~~[illegible]~~ BTEX 100 PPB

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	35.3	355.6 mVS
UNKNOWN	7	121.7	3.7 VS
UNKNOWN	10	142.1	537.5 mVS
UNKNOWN	11	121.3	3.7 VS
UNKNOWN	12	200.3	3.2 VS
UNKNOWN	13	411.7	1.3 VS
UNKNOWN	14	445.3	2.5 VS
UNKNOWN	15	526.9	671.3 mVS

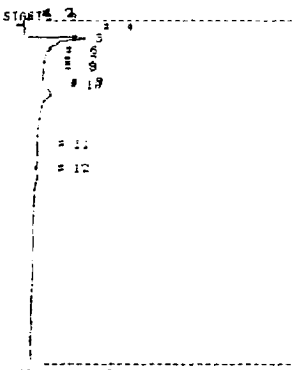
PHOTOVAC



STOP # 600.0
SAMPLE LIBRARY 1 AUG 1 1994 10:32
ANALYSIS # 6 IRIS ARRECONDO
INTERNAL TEMP 24 SEATTLE
GAIN 20 AIR BLANK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	7	34.4	[illegible]
UNKNOWN	8	43.4	348.3 mVS

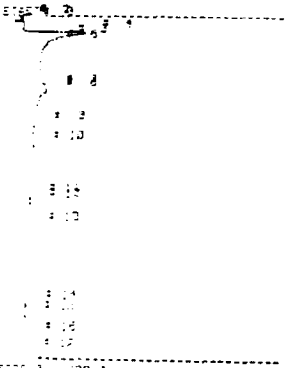
PHOTOVAC



STOP # 600.0
SAMPLE LIBRARY 1 AUG 1 1994 10:2
ANALYSIS # 7 IRIS ARRECONDO
INTERNAL TEMP 24 SEATTLE
GAIN 20 BS-84 P2 H2O

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	34.9	826.4 mVS
UNKNOWN	9	131.1	284.6 mVS
UNKNOWN	10	136.1	199.3 mVS

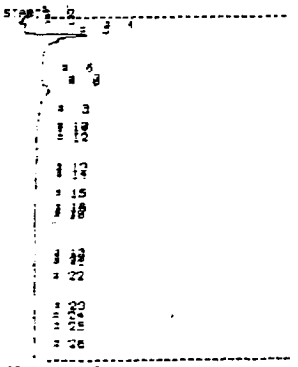
PHOTOVAC



STOP # 600.0
SAMPLE LIBRARY 1 AUG 1 1994 10:10
ANALYSIS # 3 IRIS ARRECONDO
INTERNAL TEMP 24 SEATTLE
GAIN 22 BS-85 P2 H2O

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	15.5	108.4 mVS
UNKNOWN	4	34.4	1.8 VS
UNKNOWN	5	43.3	555.9 mVS
UNKNOWN	7	132.3	247.1 mVS

PHOTOVAC



STOP # 600.0
SAMPLE LIBRARY 1 AUG 1 1994 10:26
ANALYSIS # 9 IRIS ARRECONDO
INTERNAL TEMP 24 SEATTLE
GAIN 22 BS-90 P2 H2O

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	34.2	1.7 VS
UNKNOWN	5	43.1	590.3 mVS
UNKNOWN	7	130.3	321.2 mVS
UNKNOWN	8	136.1	230.8 mVS

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PID AND ATHA DATA

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Table C.2
Field PID Results – Soil
143rd CCSQ, Seattle ANGS, Seattle, Washington

Boring	Sample Interval (ft BLS)	PID Reading* (ppm)	
		Upon Sample Retrieval	Ambient Temperature Headspace Analysis
BS-001BH	1.0 - 2.5	1.5	7.0
	2.5 - 4.0	0	4.7
	4.0 - 5.5	1.5	7.5
	5.5 - 7.0	1.9	6.9
	7.0 - 8.5	3.1	2.2
	8.5 - 10.0	0.1	7.9
BS-002BH	1.0 - 2.5	0	0
	5.5 - 7.0	0.5	0
	8.5 - 10.0	0.6	0
BS-003BH	2.0 - 3.5	0.1	0
	5.5 - 7.0	0	0
	8.5 - 10.0	1.4	0
BS-004PZ	3.5 - 5.0	0	0
	8.5 - 10.0	0	0
	13.5 - 15.0	0	0
	18.5 - 20.0	0	0
BS-005PZ	3.5 - 5.0	0	0
	8.5 - 10.0	8.3	0
	13.5 - 15.0	0	0
	19.0 - 20.5	0	0
BS-006PZ	3.5 - 5.0	0	0
	8.5 - 10.0	0	0
	13.5 - 15.0	0	0
	19.0 - 20.5	0	0

PID – Photoionization Detector.
ft BLS – feet Below Land Surface.
ppm – parts per million.
* – PID calibrated with 100 ppm isobutylene.

BS – Burial Site AOC.
BH – Borehole.
PZ – Piezometer.

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MAGNETOMETER DATA

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dobecki earth sciences, inc.

geophysics for engineering and the environment

REF: P.O. #2249

August 10, 1994

Dr. Matt Alexander
Operational Technologies Corporation
4100 N.W. Loop 410
Suite 230
San Antonio, TX 78229-4253

LETTER REPORT
REVIEW OF GEOPHYSICAL DATA SETS AND INTERPRETATIONS
WASHINGTON AIR NATIONAL GUARD SITES

Dear Matt:

This brief report reviews my findings and suggestions with respect to our meeting and working together at my office on August 9, 1994. At this meeting, we a) discussed the objectives of the geophysical surveys at the four Air National Guard Sites, b) reviewed the survey parameters at each site, c) analyzed the specific geophysical data at each site, and d) compared my interpretations of said data sets with those made by Operational Technologies Corporation (Optech). This review report will deal with each site and data set, individually, and will conclude with an overall summary of my impressions.

Site 1 Four Lakes (FAD and AUT areas)

This site contained two distinct areas (FAD and AUT), each have different survey targets (objectives).

At FAD, the target was to define the presence and location of a buried, concrete pit which, since time of its decommission, has been filled and covered with the current asphalt cover. Because the target was, largely, concrete with unknown reinforcing (steel) content and, because there were also concrete roadways buried beneath the present asphaltic cover, Optech chose to survey for the pit using ground penetrating radar (GPR). Upon review of the GPR results, this was a fortunate choice because the former concrete roadway surrounding the pit did contain reinforcing bars which would have caused difficulties for magnetometer or electromagnetic methods. The resulting GPR transect did, indeed, show

11111 Katy Freeway; Suite 610
Houston, Texas 77079
Phone: 713-467-0373 FAX: 713-465-0919

the areas of buried concrete roadway (typified by rebar signatures on the records) and the presence of the pit. The pit was typified by a) strong reflections from the concrete edges and b) a lack of concrete roadway signature above the pit. The survey objectives were satisfied using the method chosen, and the survey parameters were appropriate for the task. The only suggestions I have in conducting similar surveys in the future would be to extend the line lengths and to use a paper speed on the GPR system to provide an expanded record in order to look at the results in more detail.

At AUT, the objective was to survey a small parking area adjacent to a building to determine the presence and location of a buried underground storage tank (UST). The method used was magnetics - specifically magnetic gradiometry. I found that the data were contaminated on the south edge of the area because of the building but that the tank signature was still apparent of the data. Therefore, I do feel the survey objective was satisfied by the survey. I would recommend that in addition to plotting the map of contoured magnetic field gradient values that Optech also contour the magnetic field values from either the top or bottom magnetic sensor. This data is available and so this is not a difficult task. Also, I feel the way the data were acquired (in two passes with first an EW, tight spacing then with a NS tight spacing) is somewhat redundant and poses some problems in assembling the best data set for contouring. It would have been better to simply grid the entire area at a 5-ft data interval and acquire as a single data set. To contour with a uniform 5-ft sample now will require mixing the two data sets. This site would also have been an excellent candidate for using GPR, but the magnetics was appropriate and did resolve the tank.

Site 2 Spokane Site SM

This site is a swampy area in whose depression area there exists the possibility of dumping of trash or other materials. The large site (500 X 800 ft) was surveyed around its perimeter using GPR on three, concentric perimeter traverses (except where inaccessible due to slope and vegetation). The balance of the site was surveyed using magnetics.

The GPR was shown to be functioning in that it did respond well to known artifacts (a French drain structure). The traverse around the perimeter did not show any significant excavations or accumulations of buried trash. The only anomalous feature, aside from the French drain, was a buried depression near perimeter Station 12. The appearance of this, however, looks to be a natural depression (pre-fill surface drainage?) which has subsequently been leveled by filling.

The magnetic data set, again, should have the normal magnetic field as well as gradient contoured. The magnetic data are quite disturbed when near fence lines, buildings, and survey metal masses but, generally, are quite well-behaved within the central portion of the site (where the GPR was not possible). There appear to be a couple of areas of anomalously high magnetic field, and these were pointed out to you on the gradient maps we reviewed. These areas should also be reviewed on your final contour maps of gradient and field values. These have the appearance of possible metal concentrations although they are not suggestive of buried tanks or other large, concentrated metal masses.

Site 3 Paine Field Site ST

The target objectives on this site were to describe the position/size of a known tank (UST) situated near a water/oil separator unit and to search the area for other, possible UST's and piping (metals). To accomplish these, a combination of GPR and magnetics was again chosen. Generally, the GPR showed quite a bit of buried metals and, coupled with the large amount of surface metals (fences and buildings), all this interference meant that the magnetics was not very effective. The spacing of the magnetic grid (25 ft) was too large (coarse) in terms of the objectives sought (individual pipes and tanks) and should have been reduced to a 5 ft spacing. However, I do not feel this would have produced much better results because of the high noise level on this site. It turns out the GPR worked very well obviating the need for the magnetics anyway.

The GPR were acquired on a regular grid of transects as allowed by surface access. A program of follow-up, detail GPR transects was made in areas where significant anomalies were discovered using the 25 ft grid, and this was a very good, commendable idea which should be applied for any project of such nature. The GPR fully described the position and depth of the buried UST and found many other, linear features which could be followed across the site. These linear features are, most likely, gas and water lines and sewer lines. The presumed pipe-like features occur at two, general depths (very shallow and up to 8 ft) which is also likely for infrastructural (deeper sewers) and surficial (irrigation water lines) type of installations. The GPR, in itself, was able to satisfy the objectives of the survey.

Site 4 Seattle Site BS

This site is a (present day) flat, asphalt and grass parking area adjacent to a service area. Old site photos show several buildings which had been sited here, so there is concern that there may have been burial of materials or of existing tanks, etc. related to the former operations. A program of magnetics and GPR on a 15 ft grid of lines was employed to assess the site subsurface.

The magnetics showed a, largely, featureless behavior except near obvious sources such as light poles. Still, I suggest that the normal field data be plotted and contoured in addition to the magnetic gradient and reviewed for possible metal burial.

The GPR data for this site were extremely interesting. Other than a few discrete piping or utilities structures, the GPR did not show any large buried tank-like features which is consistent with the magnetometer results. There are, however, two areas of the site which show a very anomalous GPR signature behavior. These two areas, pointed out to you at our meeting, are along the eastern edge of the site and in the SW corner-Western half of the site. Both areas are characterized by an increase in the strength of the radar returns (very dark-looking records) over a laterally limited area. Typically, such low-attenuation affects are causes by a local change in the electrical resistivity of the subsurface materials to a, relatively, higher resistivity material (such as air/voids, sand versus clay, or

hydrocarbons versus water) or due to the presence of a very good reflector like a buried tank or pipe. The magnetics do not show large metals and the shape of the anomalous areas do not look like tanks, so the buried metal reflectors is not a probable interpretation. The depth of occurrence of each area is different - the eastern being closer to the ground surface. The cause of these two areas could be natural/geologic (e.g. sand channels), artificial (e.g. backhoed trenches filled with non-conductive materials) or both. In any sense, the GPR has located these features quite well but is inadequate, in and of itself, to define exactly what is the cause of these features. I'd recommend some follow-up drilling or careful review of other (e.g. soil gas) surveys to answer this question.

General Comments

The combination of two (or more) surveys is always recommended. While GPR seemed to be able to answer most of the objectives by itself, it must be remembered that GPR is also the most site dependent of the geophysical methods (e.g. what worked in Washington may not work in Alabama!), so an additional survey technique is always appropriate. You may consider that for many sites, an electromagnetic conductivity survey is a useful adjunct to either a GPR or a magnetic survey.

Care must be given to the grid spacing used on site for any geophysical survey. The grid spacing for magnetics at Site ST, for example, was probably too coarse for the objective of defining individual tanks while the spacing at Site SM was wholly appropriate for locating possible dumping sites which are large in area.

For each site, the objectives of the site-specific survey were satisfied by the geophysical survey as designed and applied. The results at Site BS, however, point to the strength as well as weakness of geophysics as a stand-alone tool in site investigation. Here, the location of an anomalous feature was described quite well, but the source of the anomaly remains in question. Geophysics should always be viewed as a guide for an effective drilling and sampling program.

Respectfully submitted,
Dobecki Earth Sciences, Inc.

Thomas L. Dobecki, Principal Geophysicist

MAGNETOMETER DATA FOR SEATTLE ANGS

FILE: burial.dat
DATE: 06/10/94

LINE	DATE	CLOCK	STAT #	X	Y	TOP	BOTTOM	GRAD
25	161	140516	0	0	0	58560.2	52972	-2157.61
25	161	140541	2	0	15	54949.4	54280.9	-258.108
25	161	140602	4	0	30	55471.4	54789.1	-263.437
25	161	140622	6	0	45	55487.9	54984.7	-194.287
25	161	140641	8	0	60	55046.8	54692.3	-136.873
25	161	140659	10	0	75	54863.7	54251.8	-236.254
25	161	140715	12	0	90	54725.7	54455	-104.517
25	161	140736	14	0	105	55161.6	54211.5	-366.835
25	161	140831	16	0	120	55182.9	33079	-8534.33
25	161	140848	18	0	135	55136.5	45972.3	-3538.3
25	161	140859	20	0	150	55188.5	38606.2	-6402.43
25	161	140909	22	0	165	55217.2	52524.9	-1039.5
115	161	141136	24	15	165	54501.6	54098.5	-155.638
115	161	141147	26	15	150	54502.3	54103.7	-153.9
115	161	141157	28	15	135	54504.4	54104	-154.596
115	161	141210	30	15	120	54501.6	54107.5	-152.163
115	161	141301	32	15	105	54640.8	54545.3	-36.873
115	161	141319	34	15	90	54704.7	54613.9	-35.057
115	161	141337	36	15	75	54820.8	54750.9	-26.988
115	161	141553	38	15	60	55010	54947.5	-24.131
115	161	141614	40	15	45	55447.3	55698.3	96.911
115	161	141635	42	15	30	55158.4	55277.7	46.061
115	161	141655	44	15	15	54066.2	53189.6	-338.455
115	161	141716	46	15	0	54408	54395	-5.019
215	161	141801	48	30	0	54607.1	54607.8	0.27
215	161	141819	50	30	15	54661.2	54569.3	-35.482
215	161	141839	52	30	30	54994.9	55009.3	5.559
215	161	141856	54	30	45	55062.1	55113.1	19.691
215	161	141913	56	30	60	54958.6	54897.1	-23.745
215	161	141932	58	30	75	54950.7	54805.7	-55.985
215	161	141950	60	30	90	54807.1	54394.6	-159.266
215	161	142032	62	30	105	54790	54906.6	45.02
215	161	142055	64	30	120	54637.8	54496	-54.749
215	161	142119	66	30	135	55555.4	53019.2	-979.229
215	161	142132	68	30	150	55595.3	53063.2	-977.645
215	161	142141	70	30	165	55557.8	53004	-986.023
315	161	142307	72	45	165	54841.2	53884.3	-369.459
315	161	142317	74	45	150	54840.2	53952.5	-342.741
315	161	142327	76	45	135	54834.5	53964.5	-335.907
315	161	142420	78	45	120	54708.1	54658.6	-19.112
315	161	142438	80	45	105	54840.3	54773.8	-25.676
315	161	142457	82	45	90	55266.7	55982.5	276.371
315	161	142518	84	45	75	54968	54936.2	-12.278
315	161	142542	86	45	60	54840.4	54595.2	-94.673
315	161	142559	88	45	45	54943.7	54881.8	-23.899
315	161	142617	90	45	30	55027.4	55103.5	29.381
315	161	142635	92	45	15	54985.4	55016.6	12.046
315	161	142659	94	45	0	54875	54938.4	24.48
415	161	142731	96	60	0	54953.1	54958	1.891
415	161	142752	98	60	15	55000.1	55000.7	0.231
415	161	142810	100	60	30	54907.2	54737.7	-65.444
415	161	142828	102	60	45	55005.1	55003.8	-0.502
415	161	142846	104	60	60	54971.4	54860.3	-42.896
415	161	142904	106	60	75	55150.3	55300	57.799
415	161	142923	108	60	90	55265.9	55542.9	106.95

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415	161	142941	110	60	105	54850.7	54793.4	-22.122
415	161	143002	112	60	120	54754.4	54837.3	32.007
415	161	143019	114	60	135	54731.6	54371.1	-139.189
415	161	143035	116	60	150	54735.5	54370.8	-140.811
415	161	143050	118	60	165	54733.4	54373	-139.151
515	161	143224	120	75	165	54889.9	54990.6	38.88
515	161	143234	122	75	150	54892.1	55027	52.084
515	161	143244	124	75	135	54891.9	55026.3	51.891
515	161	143305	126	75	120	54801.5	54769.8	-12.239
515	161	143328	128	75	105	54857.4	54905.8	18.687
515	161	143347	130	75	90	54876.7	54787.7	-34.363
515	161	143405	132	75	75	54979.1	55027.9	18.842
515	161	143423	134	75	60	55201.2	55429.3	88.07
515	161	143442	136	75	45	55086.3	55060.5	-9.962
515	161	143504	138	75	30	55015.3	55007.9	-2.857
515	161	143522	140	75	15	55015.1	55034.7	7.567
515	161	143544	142	75	0	55059.7	55230.5	65.946
615	161	143633	144	90	0	54919.4	54803.7	-44.673
615	161	143651	146	90	15	55009.6	54923.7	-33.167
615	161	143710	148	90	30	55061.7	55049.6	-4.671
615	161	143729	150	90	45	55198.3	55322.6	47.993
615	161	143747	152	90	60	55250.9	55244.2	-2.588
615	161	143812	154	90	75	54912	54659	-97.683
615	161	143829	156	90	90	54744.2	54447.7	-114.479
615	161	143847	158	90	105	54745.6	54687.5	-22.433
615	161	143904	160	90	120	54761	54767.4	2.472
615	161	143923	162	90	135	54791.6	54775	-6.41
615	161	143951	164	90	150	54945.9	53730.7	-469.19
615	161	144001	166	90	165	54945.7	53739.5	-465.714
715	161	144121	168	105	165	54728	54169.2	-215.753
715	161	144133	170	105	150	54734.7	54160	-221.892
715	161	144207	172	105	135	54720.4	54726.7	2.431
715	161	144226	174	105	120	54628.2	54393.6	-90.578
715	161	144245	176	105	105	54721.7	54119.8	-232.393
715	161	144304	178	105	90	55158.3	55526.6	142.201
715	161	144340	180	105	75	54976.5	54822.1	-59.613
715	161	144502	182	105	60	55335.9	55582.5	95.211
715	161	144536	184	105	45	55146.8	55156.5	3.745
715	161	144556	186	105	30	55073.5	55069.6	-1.505
715	161	144615	188	105	15	55217.9	55421.9	78.764
715	161	144633	190	105	0	56215.1	58509.1	885.714
815	161	144811	192	120	0	55078	55139.9	23.901
815	161	144832	194	120	15	55016.7	55022.8	2.356
815	161	144857	196	120	30	54967.4	54957.8	-3.707
815	161	144916	198	120	45	55031.4	55017.8	-5.252
815	161	144934	200	120	60	55049.2	55037	-4.71
815	161	144954	202	120	75	55011.5	55170.9	61.545
815	161	145015	204	120	90	54917.6	54807.9	-42.355
815	161	145036	206	120	105	55183.5	55526.6	132.472
815	161	145109	208	120	120	54856.4	54795.7	-23.438
815	161	145128	210	120	135	54768	54872	40.154
815	161	145149	212	120	150	54484	54319.9	-63.358
815	161	145159	214	120	165	54486.6	54318.3	-64.981
915	161	145257	216	135	165	57052.8	58521	566.872
915	161	145317	218	135	150	54541.8	54470	-27.722
915	161	145334	220	135	135	54746.6	54772.2	9.883
915	161	145354	222	135	120	54871.5	54869	-0.965
915	161	145411	224	135	105	54860.3	54811	-19.035
915	161	145433	226	135	90	54836.9	54761.4	-29.151
915	161	145452	228	135	75	55030.6	55151.8	46.795

915	161	145514	230	135	60	55071.8	55046.8	-9.653
915	161	145531	232	135	45	55025.9	55013.3	-4.865
915	161	145550	234	135	30	54845.7	54556.5	-111.66
915	161	145609	236	135	15	54963.6	54976.7	5.057
915	161	145628	238	135	0	55026.8	55153.6	48.958
15	161	145718	240	150	0	54907.7	54939.3	12.201
15	161	145737	242	150	15	54953.4	54985.3	12.316
15	161	145755	244	150	30	54992.9	54981.3	-4.479
15	161	145813	246	150	45	55267.2	55491.8	86.719
15	161	145832	248	150	60	55243.3	55492.3	96.139
15	161	145850	250	150	75	54881.9	54791.7	-34.827
15	161	145908	252	150	90	54916.4	55064.6	57.22
15	161	145926	254	150	105	54855.8	54912.9	22.047
15	161	145949	256	150	120	54777.4	54863.9	33.398
15	161	150012	258	150	135	54666.8	54762.4	36.912
15	161	150029	260	150	150	54531.1	54491	-15.483
15	161	150049	262	150	165	54827.9	53872.8	-368.765

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GPR DATA

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SEATTLE
ANGS
6/10/94

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HPF=10
LPF=50

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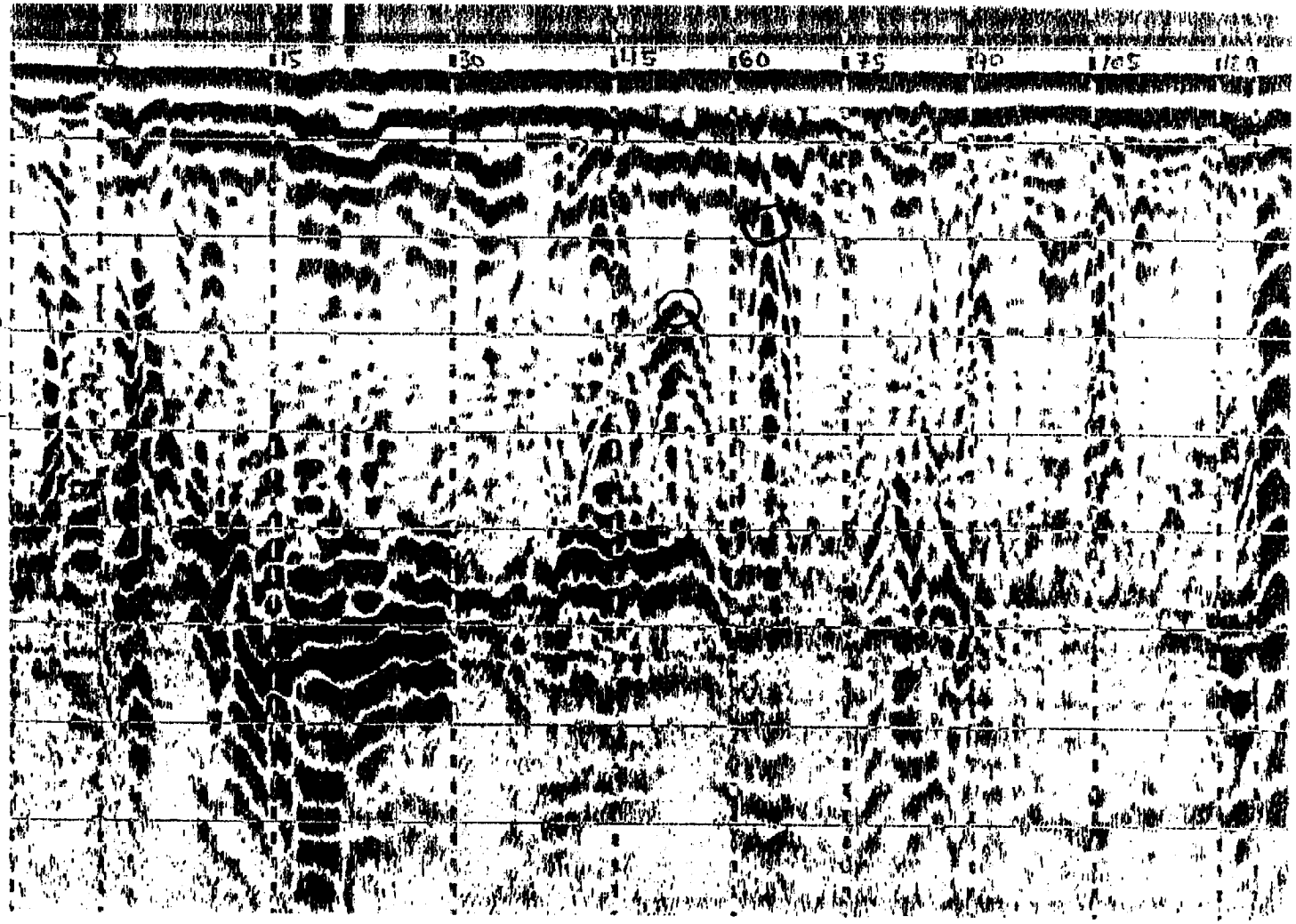
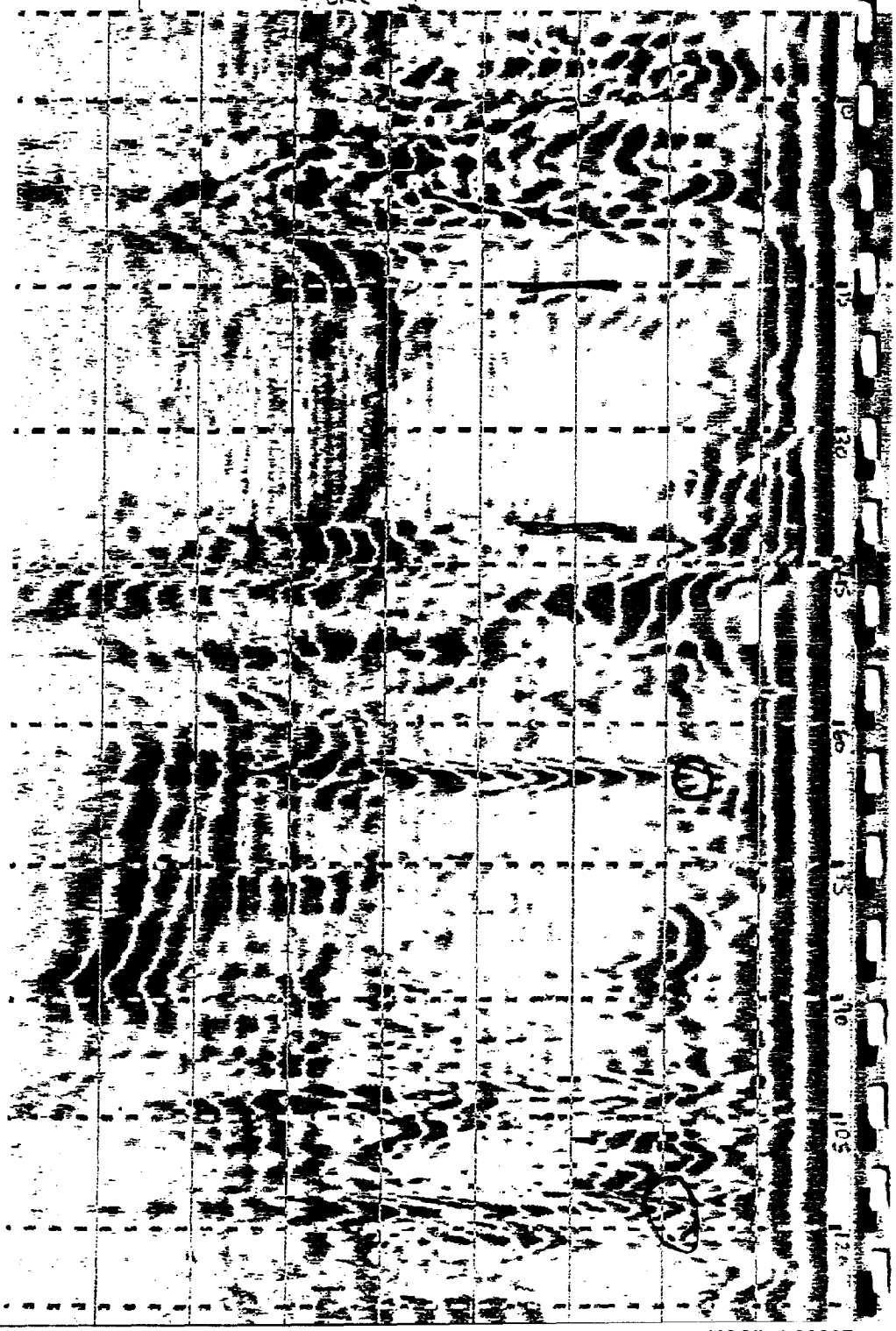
cycles/scan=16



KCSlip4 38636

SEA405166

FIGURE 7



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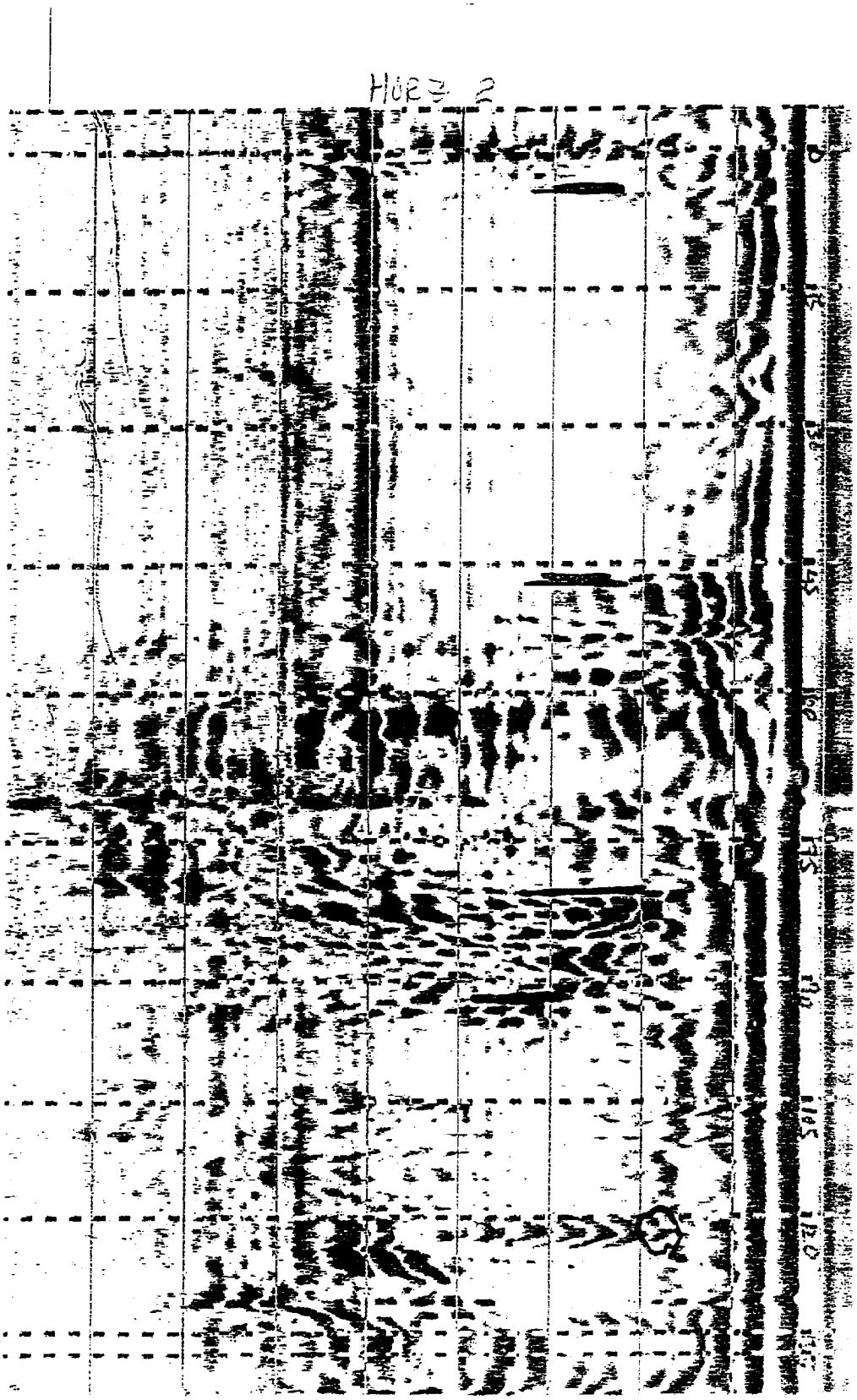

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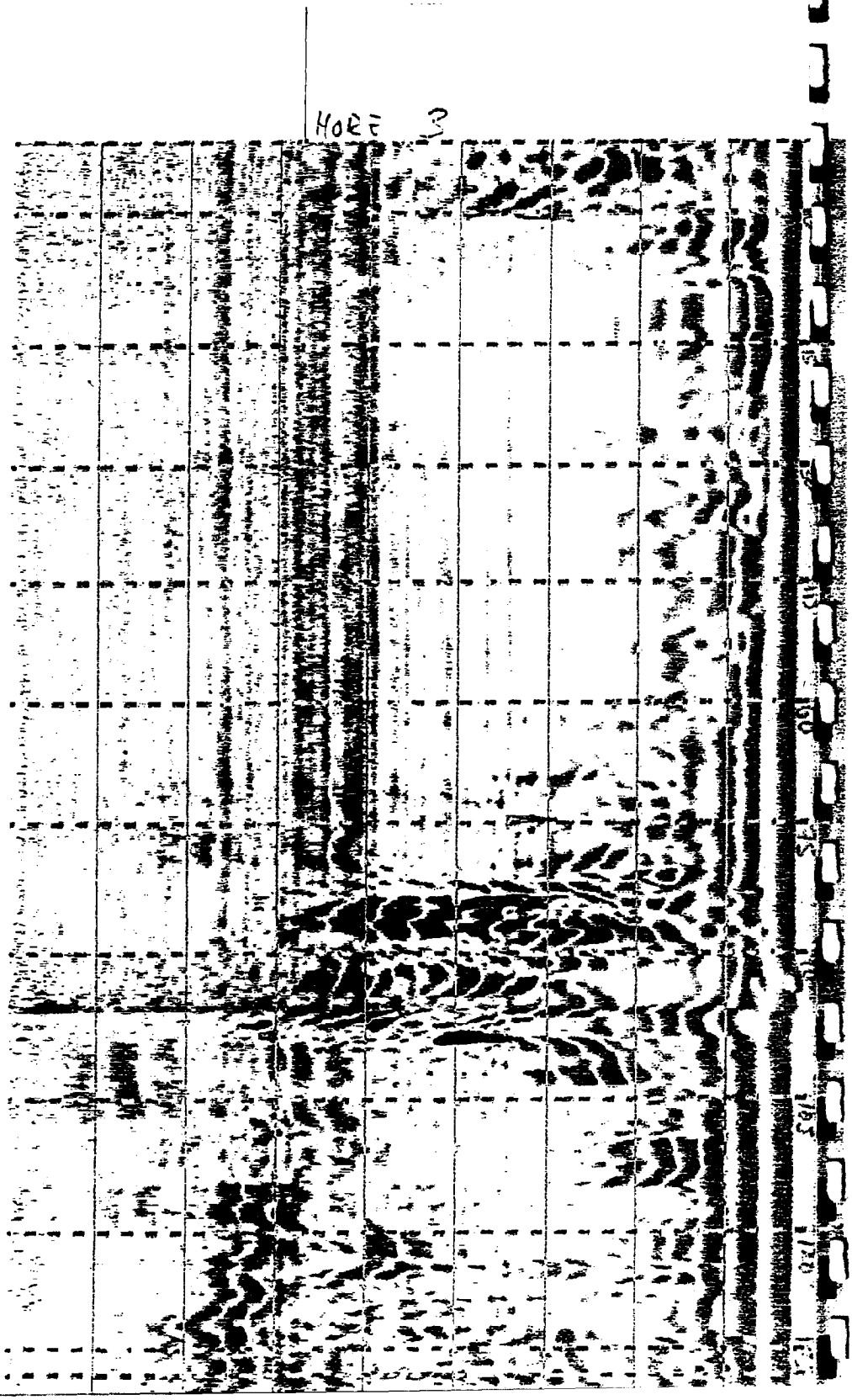
SEA405168



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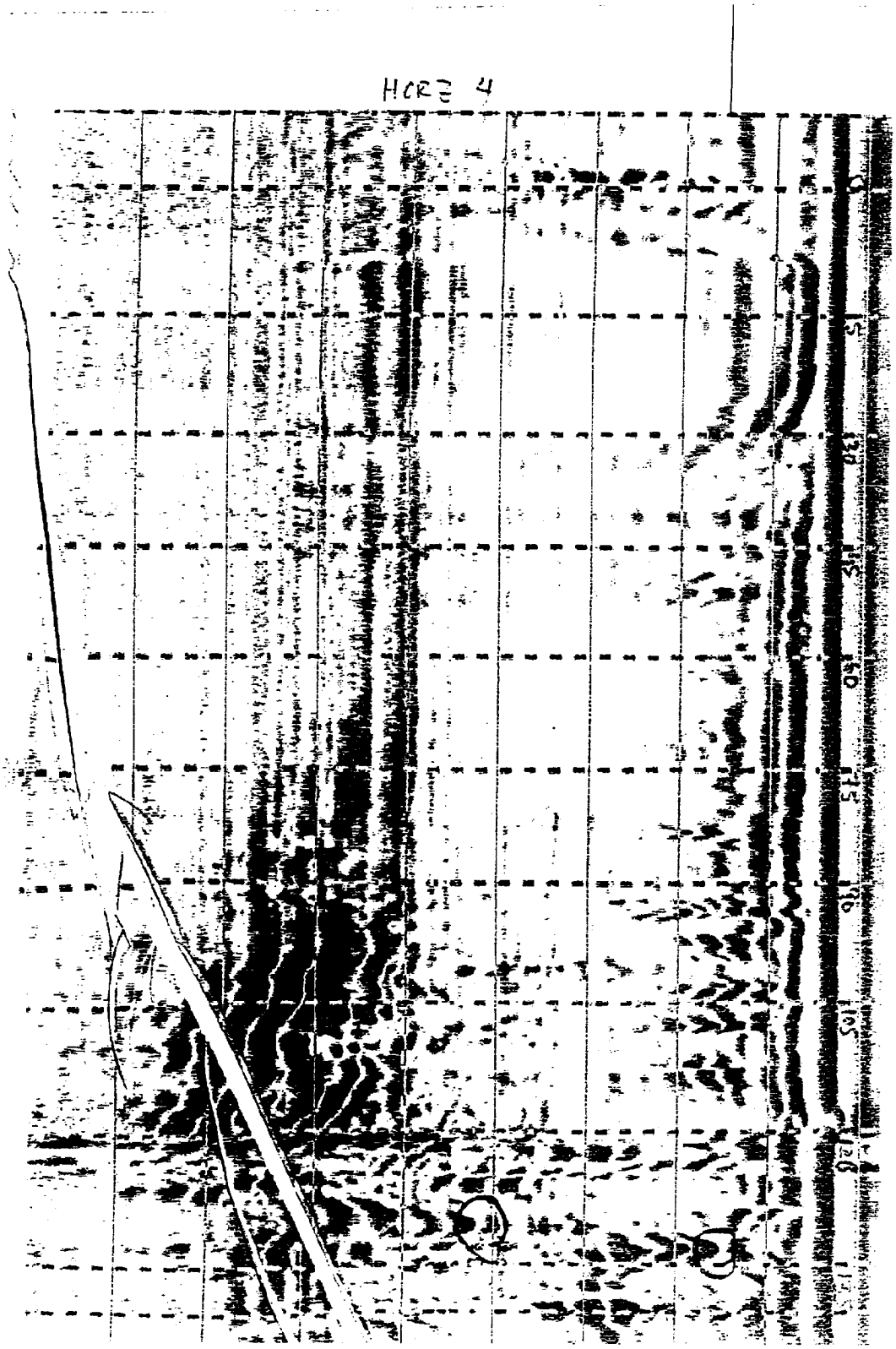

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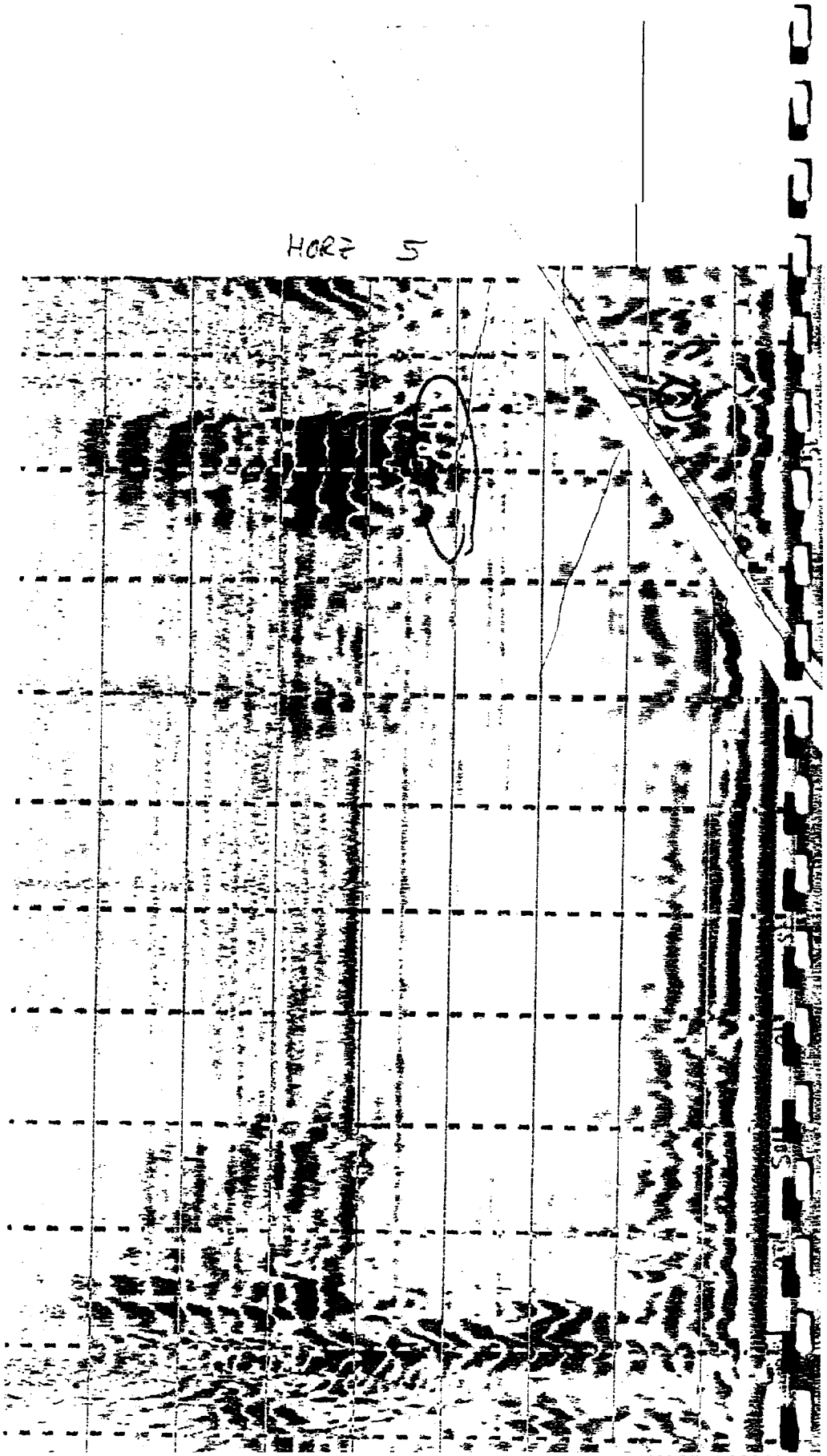
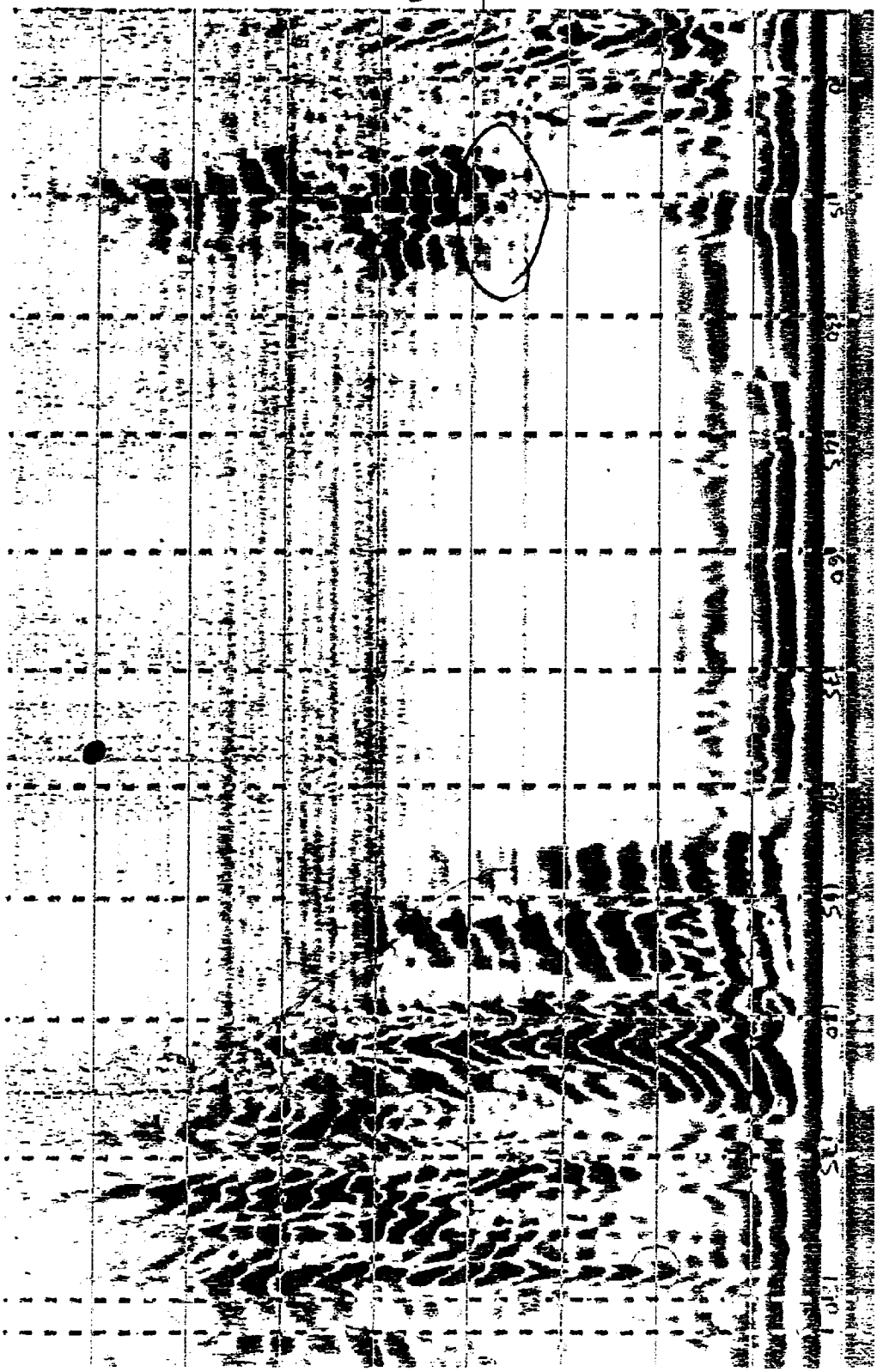
SEA405170



KCSlip4 38641

SEA405171

HOR E 6



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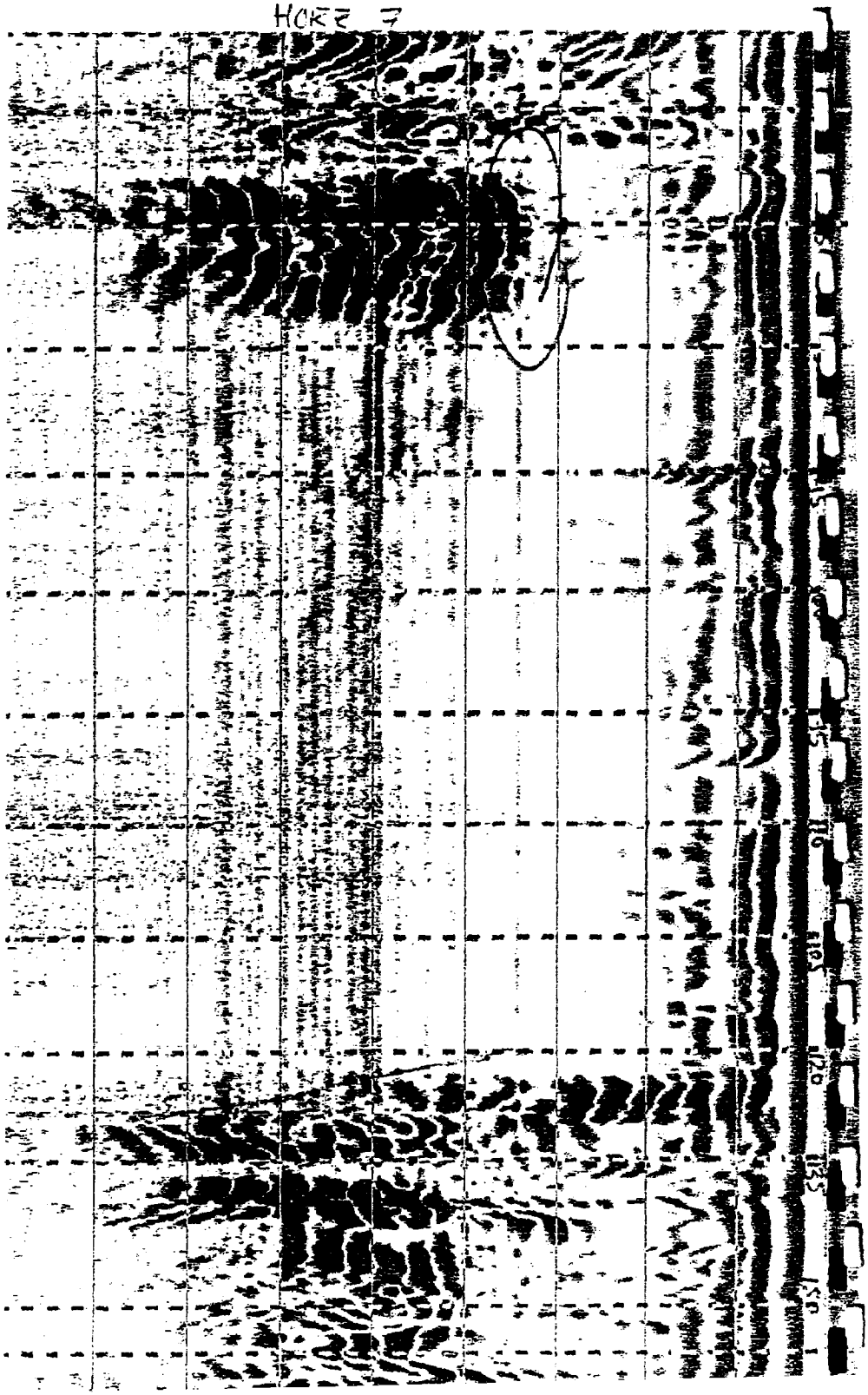

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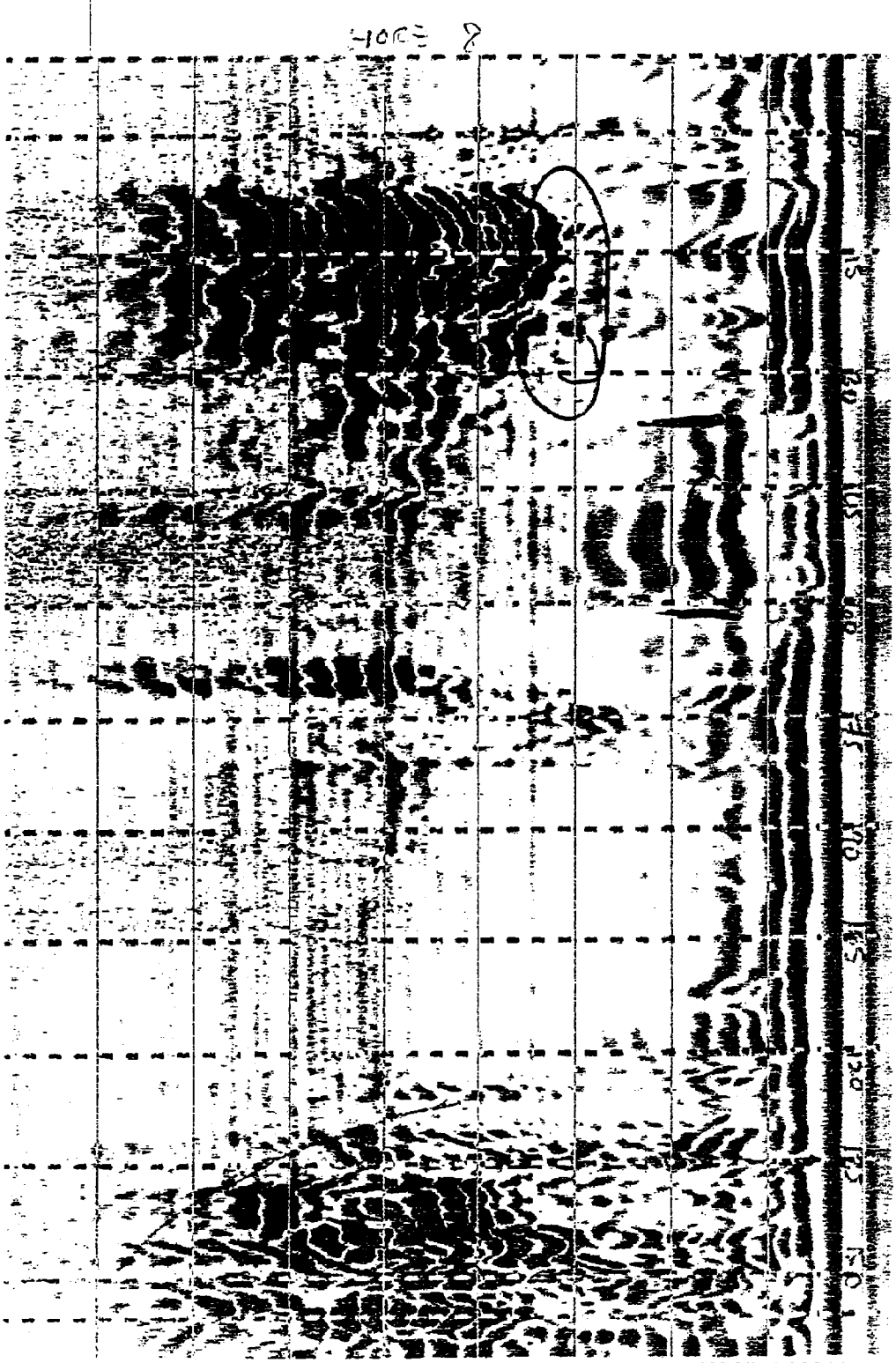

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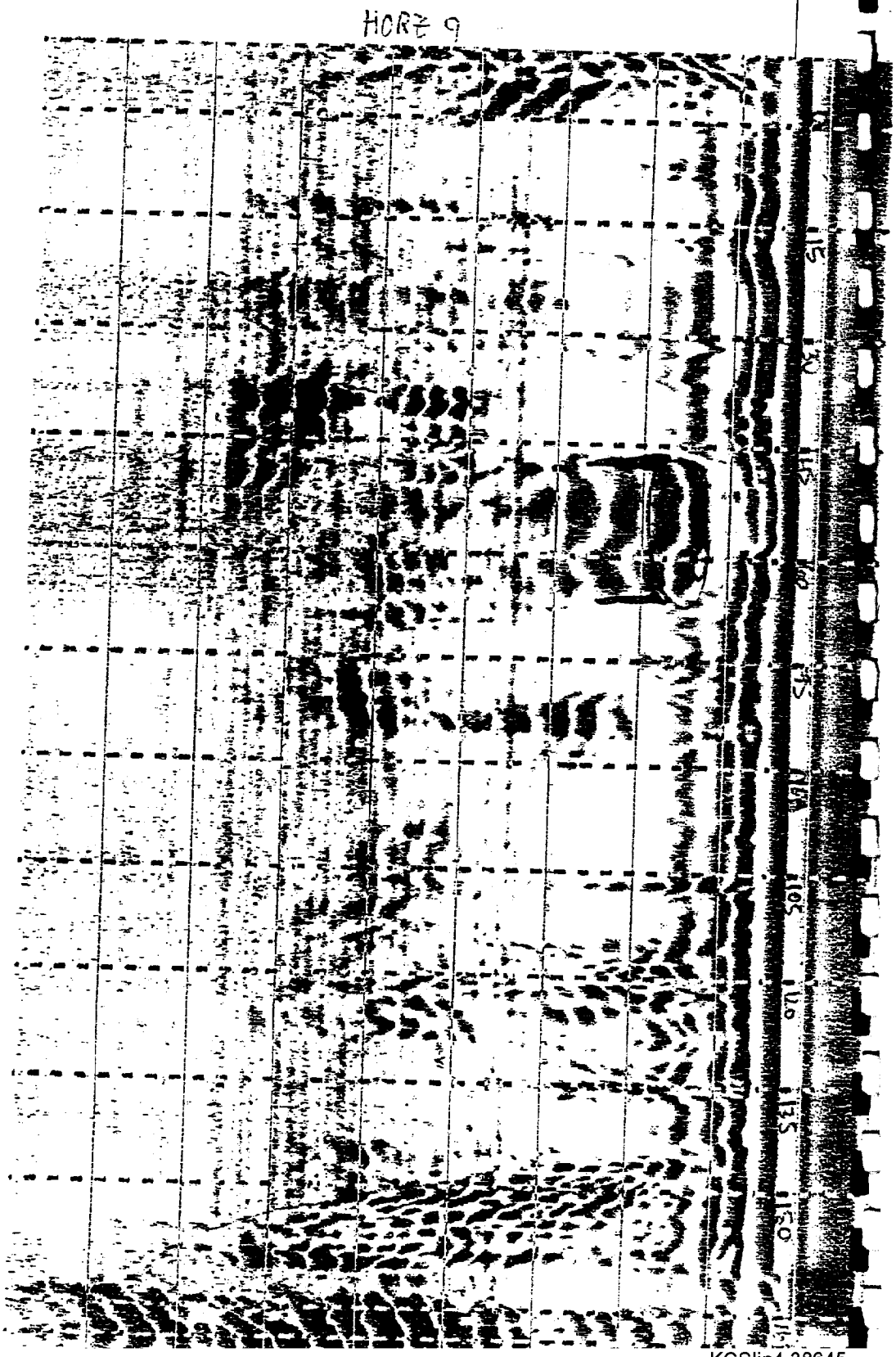

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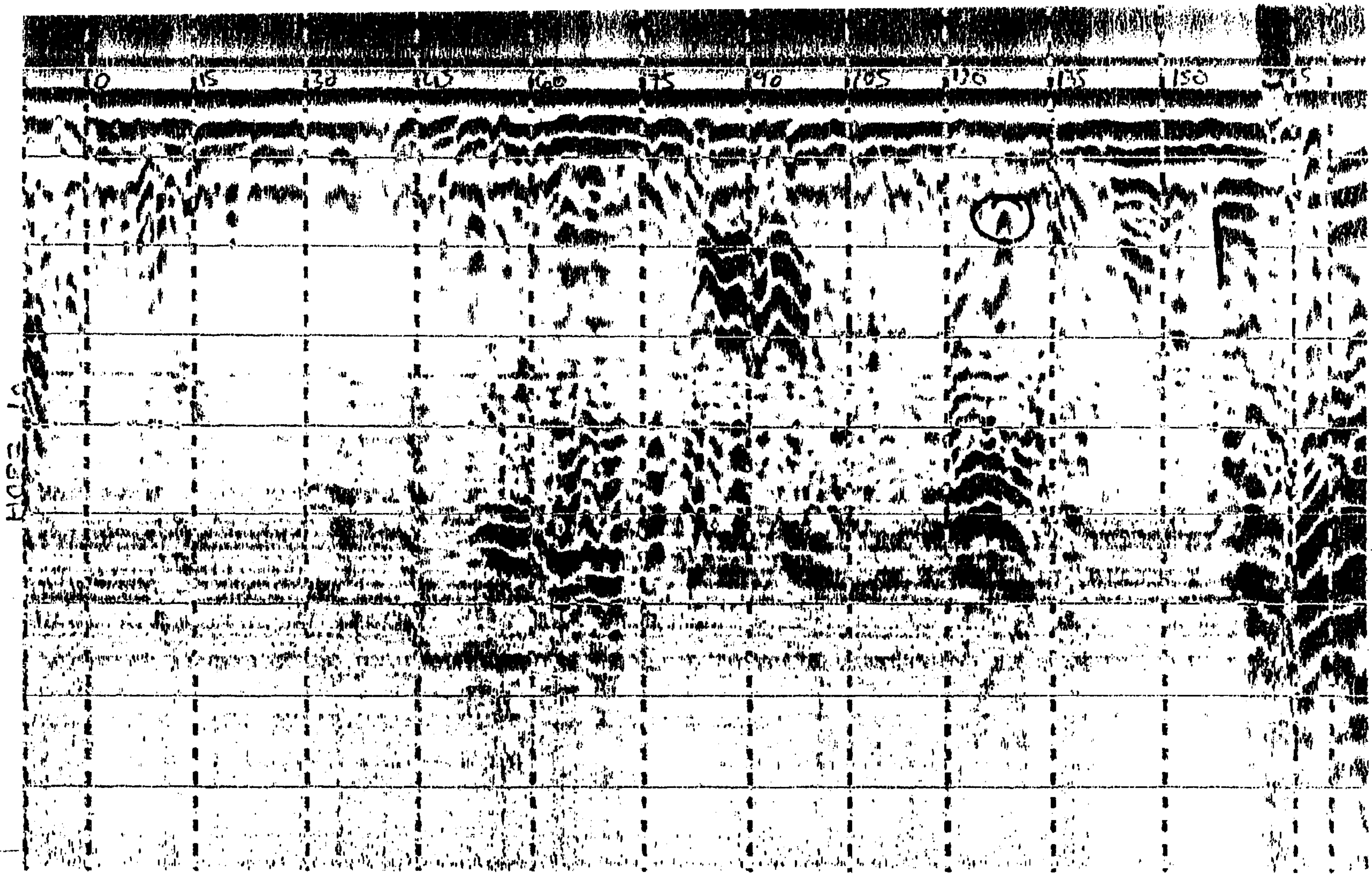

KCSlip4 38646
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VERTICAL LINES (N-S)

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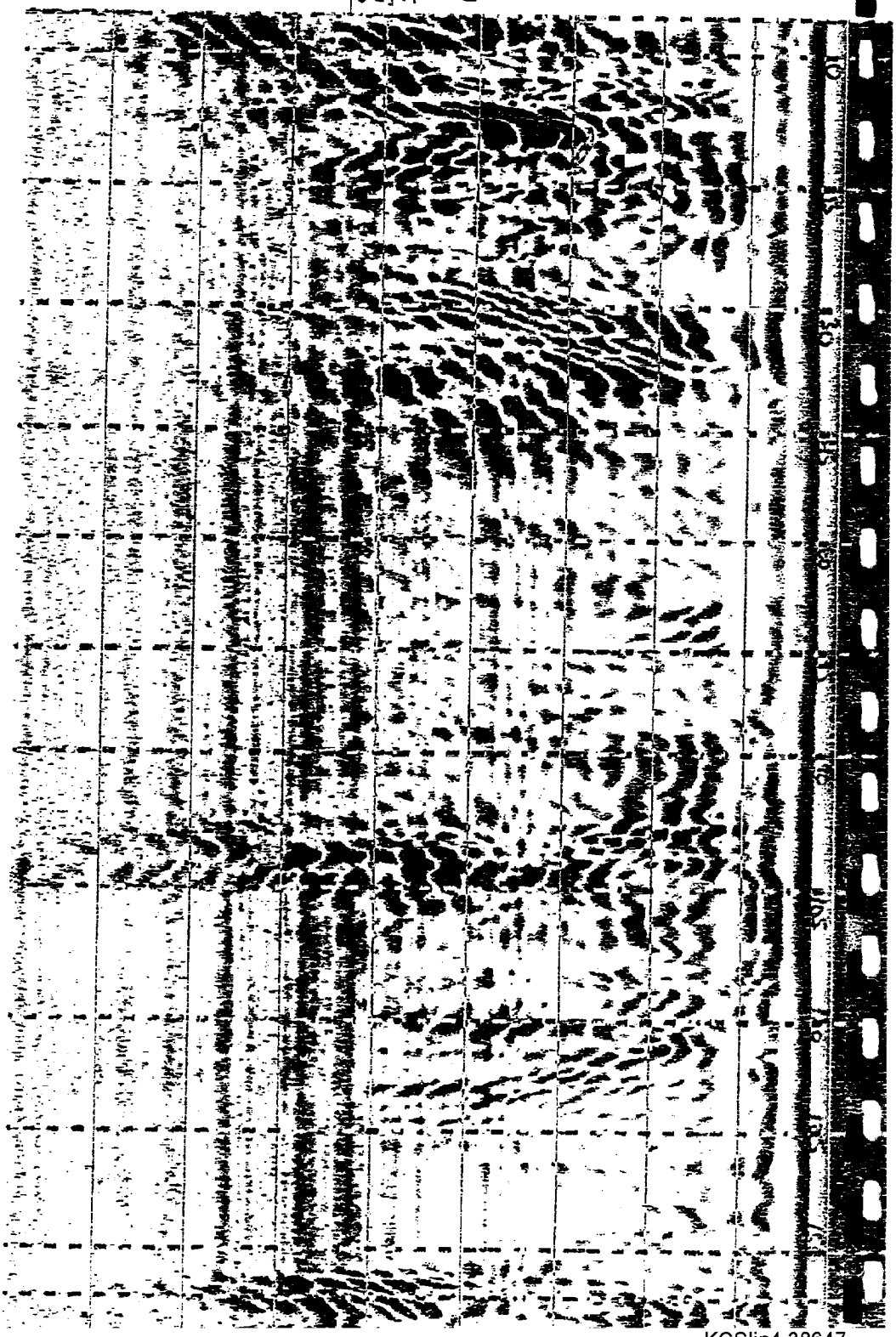

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SEA405177

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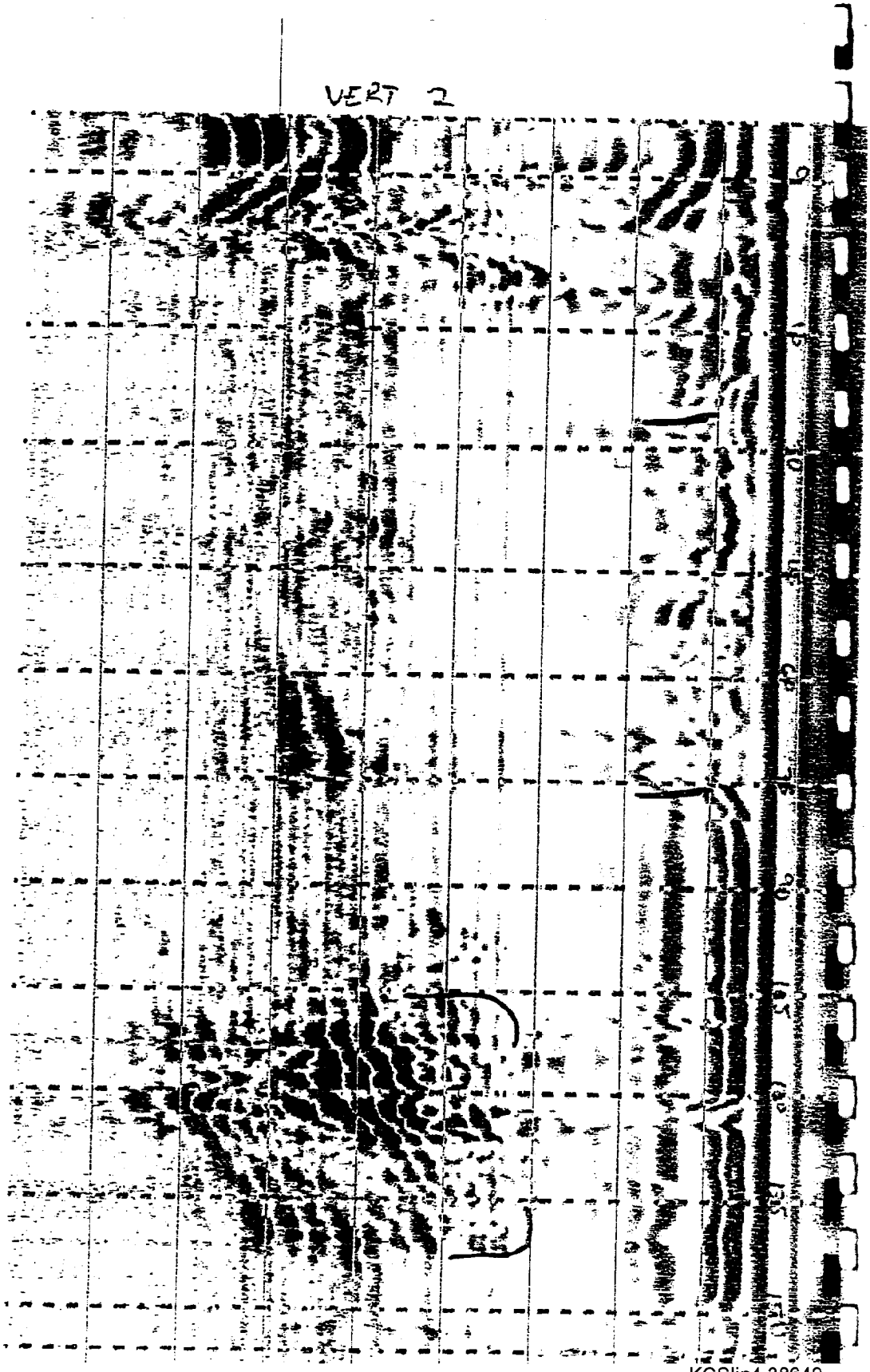
SEA405178



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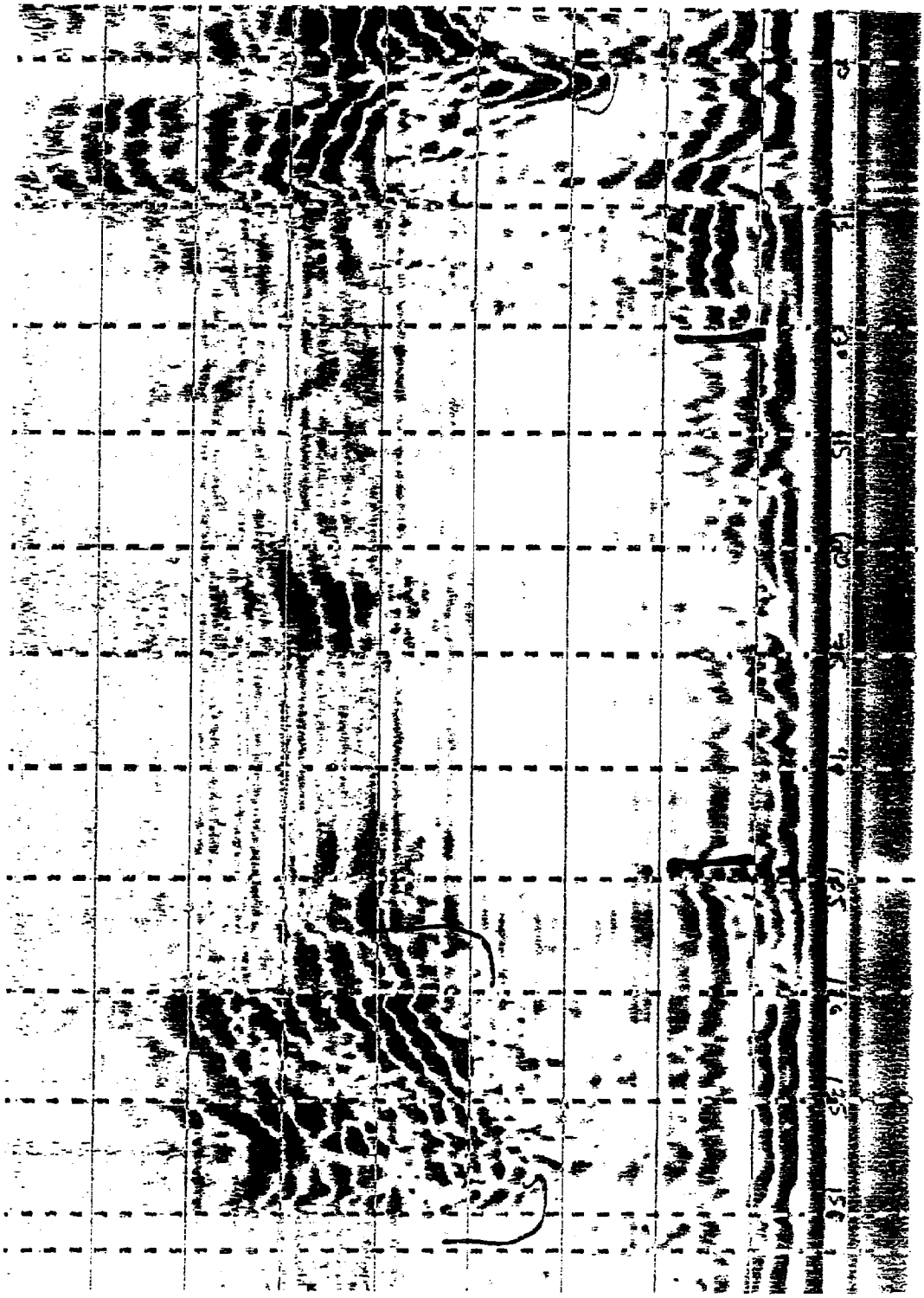

KCSlip4 38650

SEA405180

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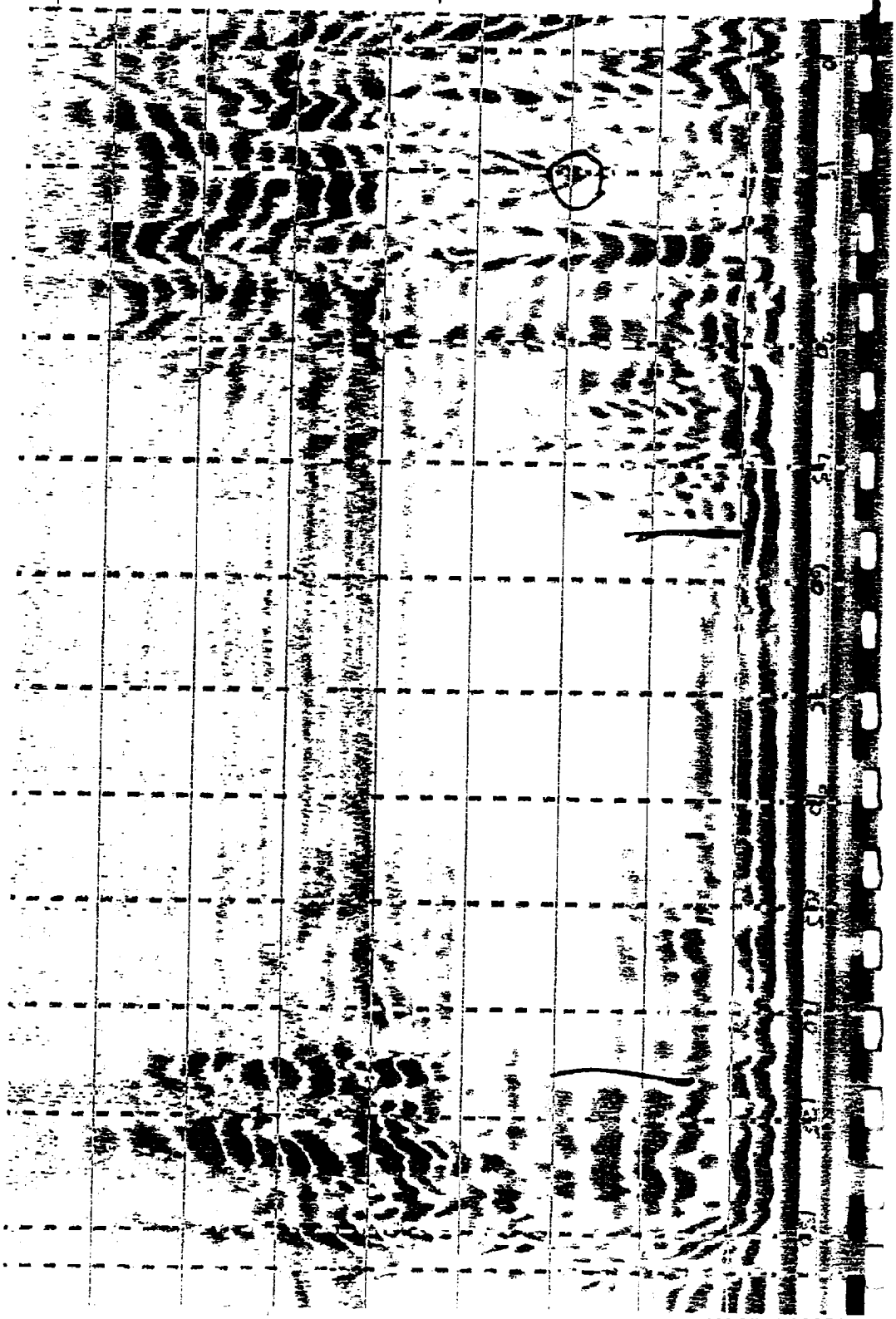

KCSlip4 38651

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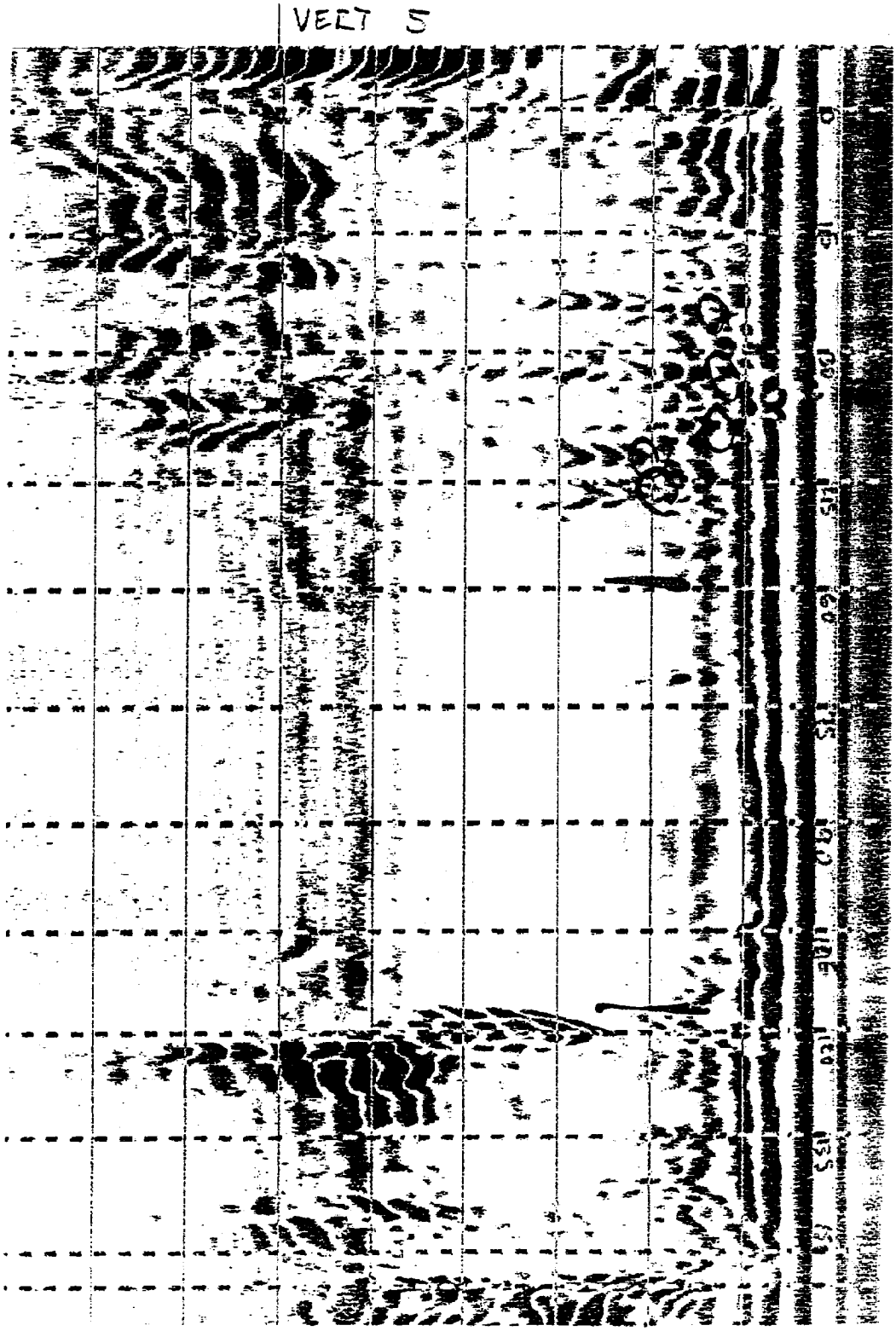

KCSlip4 38652

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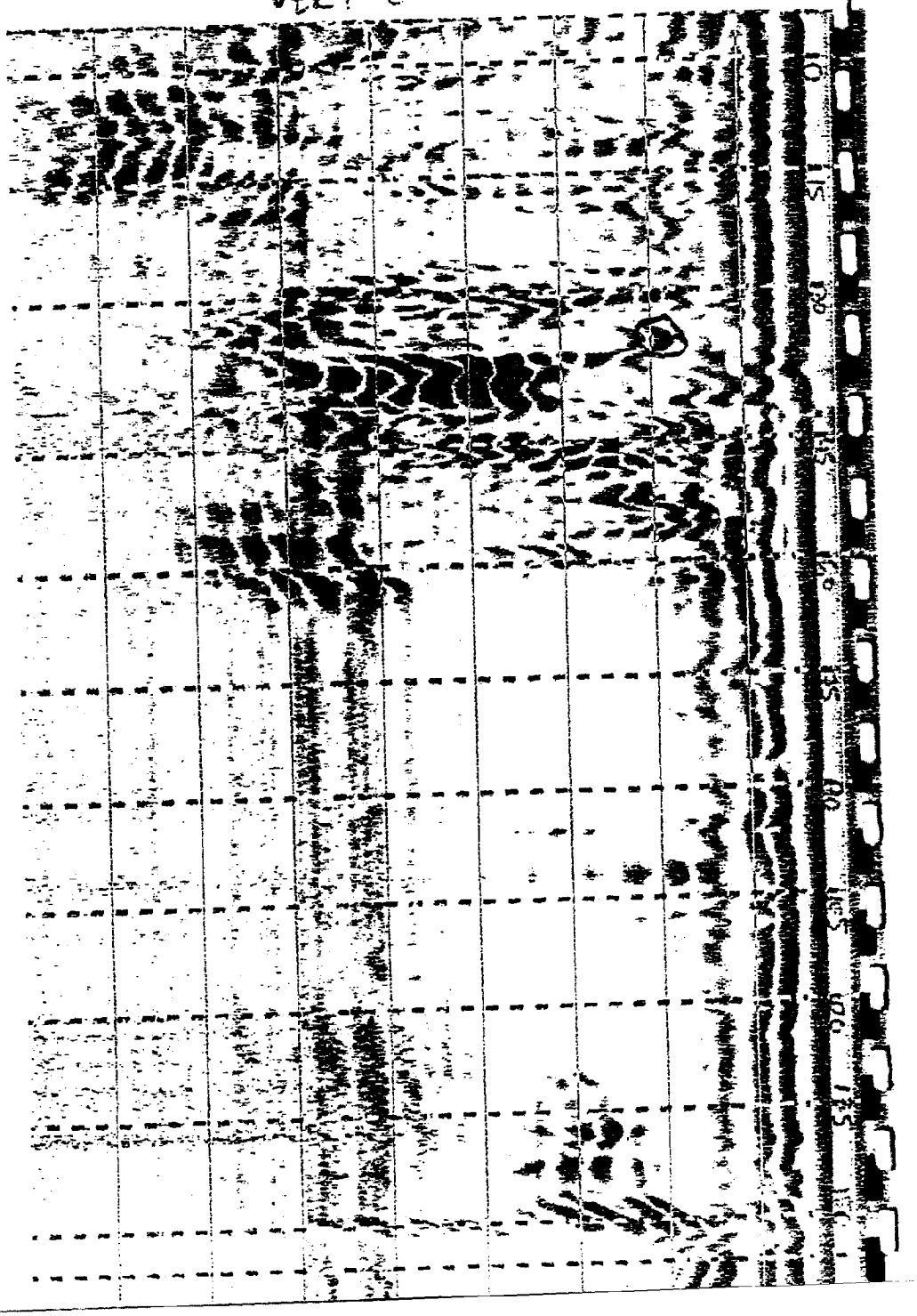

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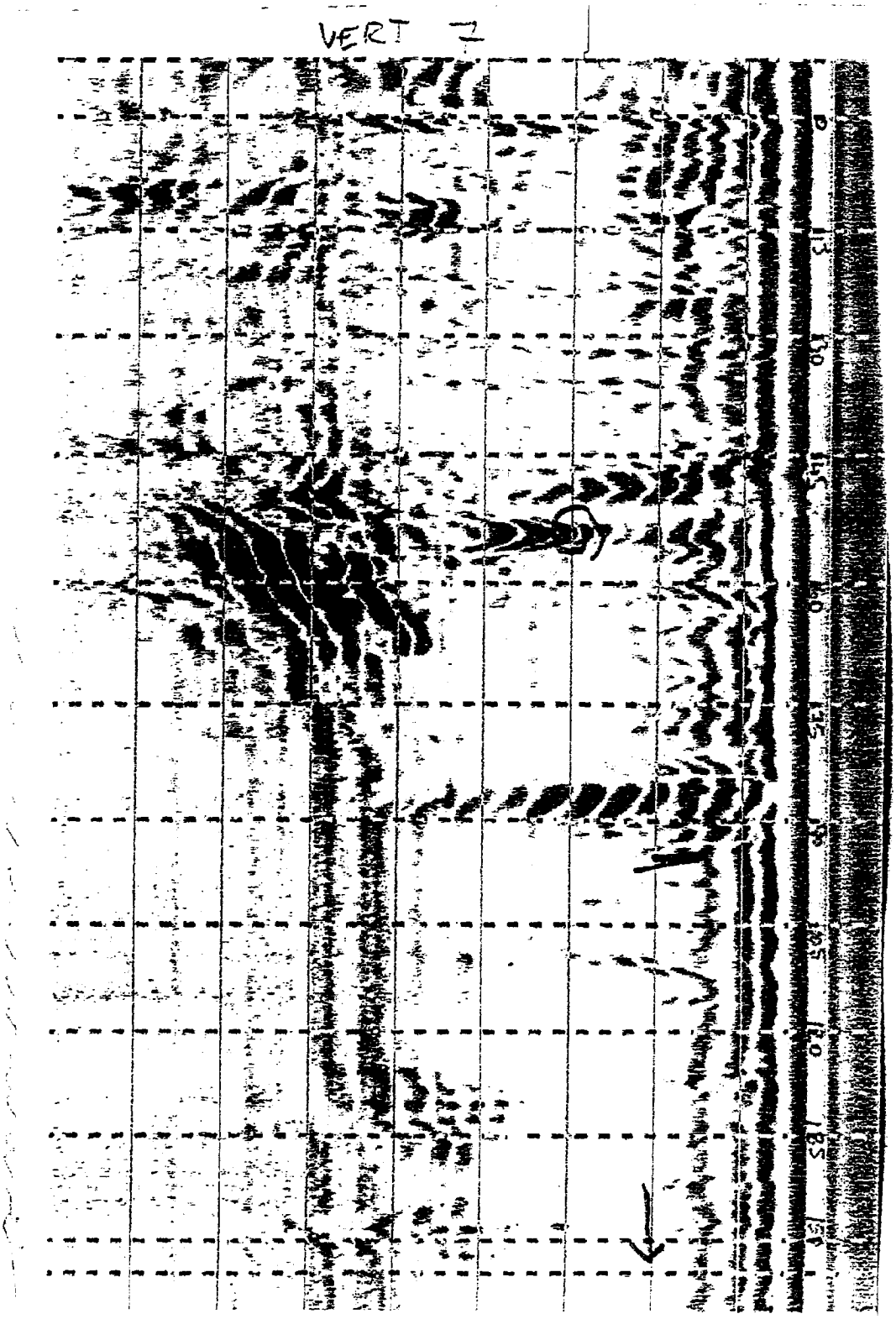

KCSlip4 38654

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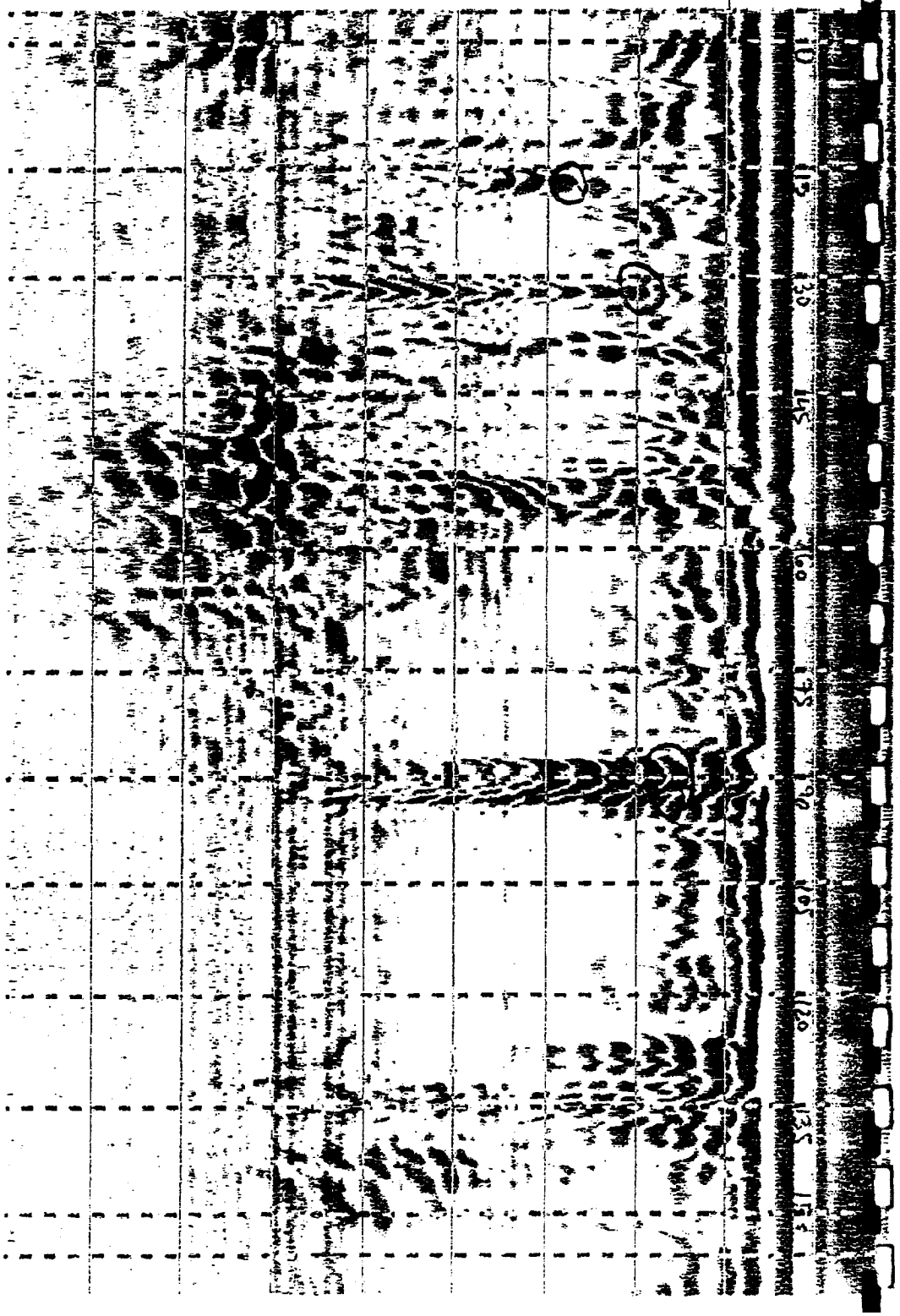

KCSlip4 38655

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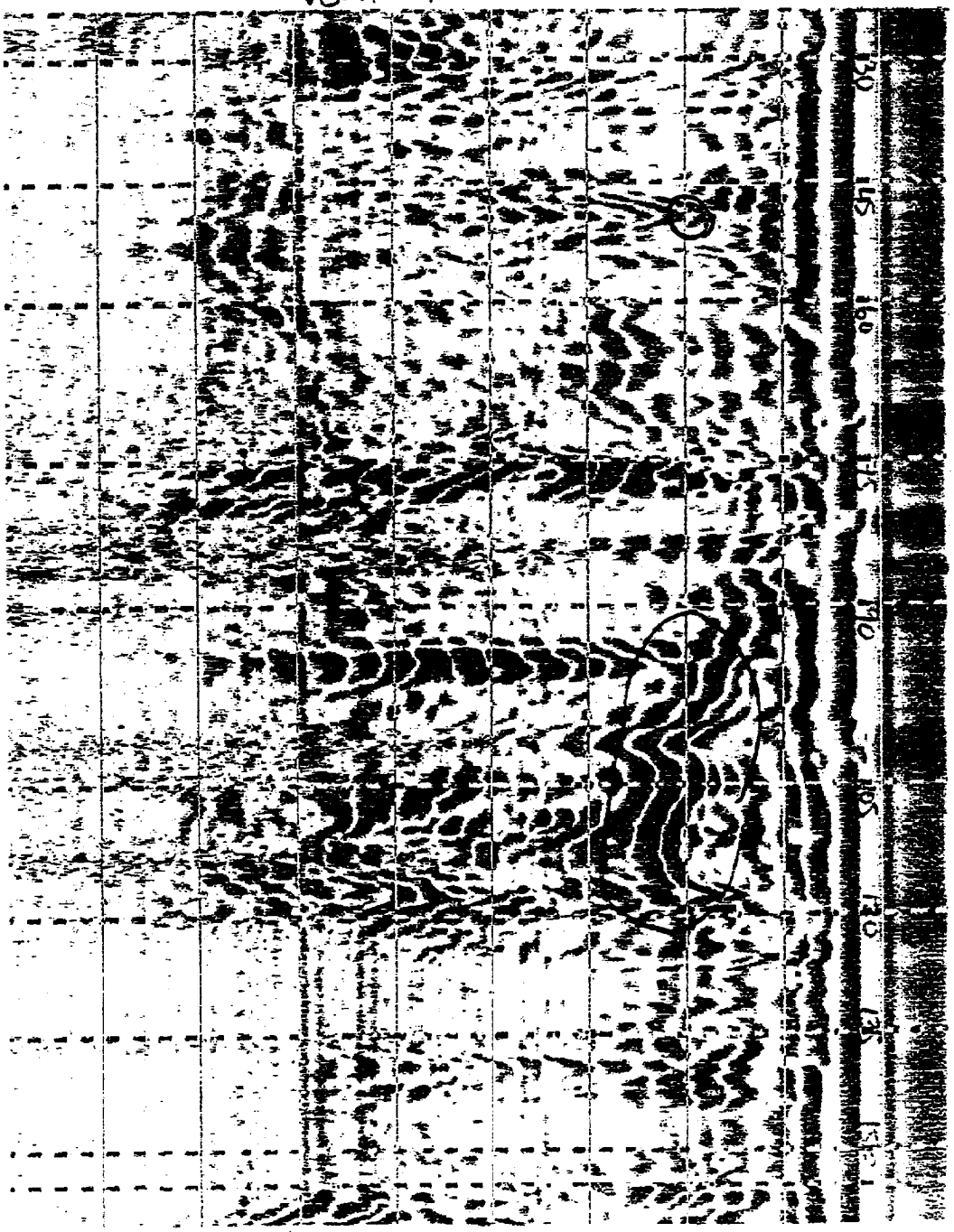

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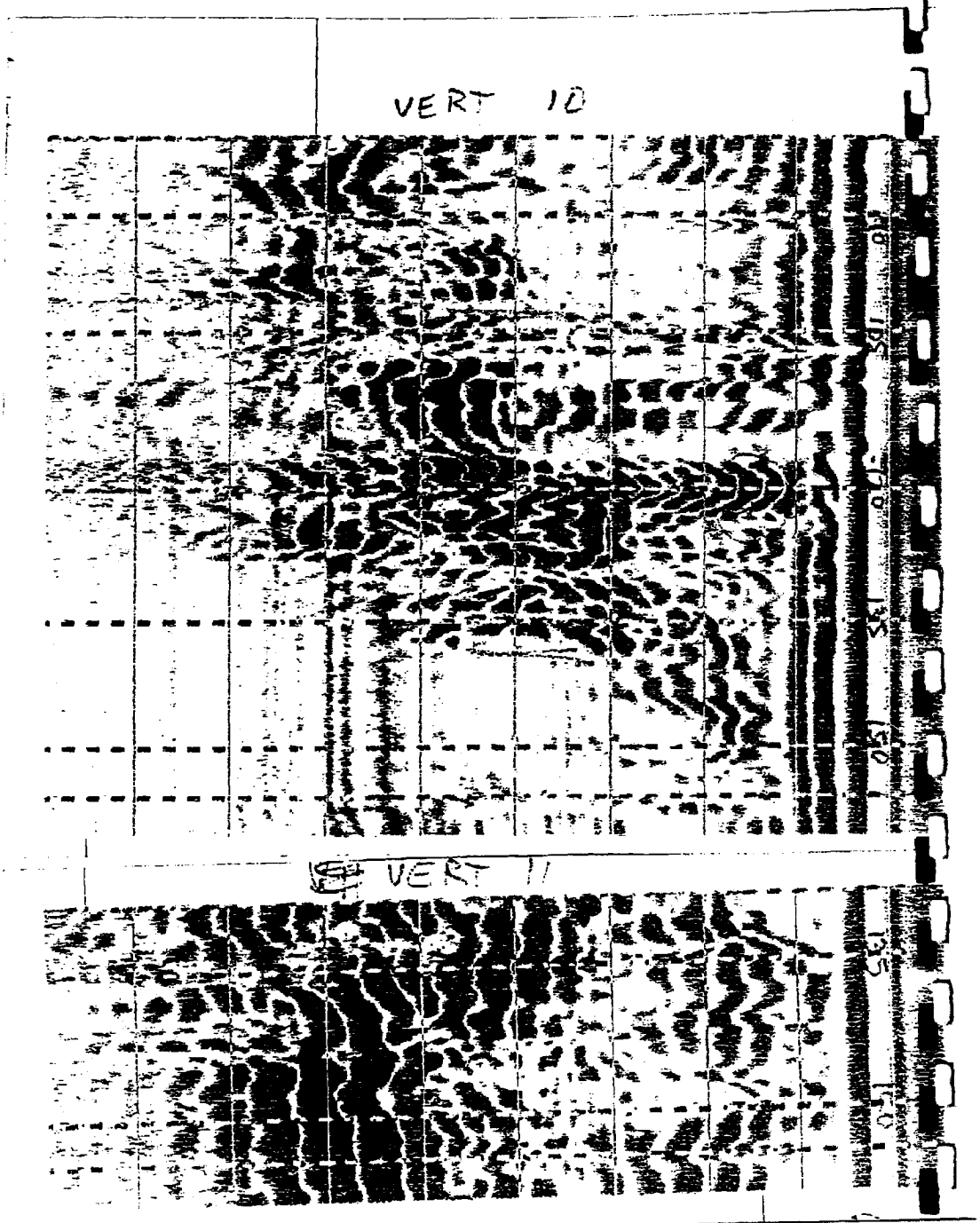

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Appendix D

KCSlip4 38658

SEA405188

APPENDIX D

PIEZOMETER CONSTRUCTION DIAGRAMS

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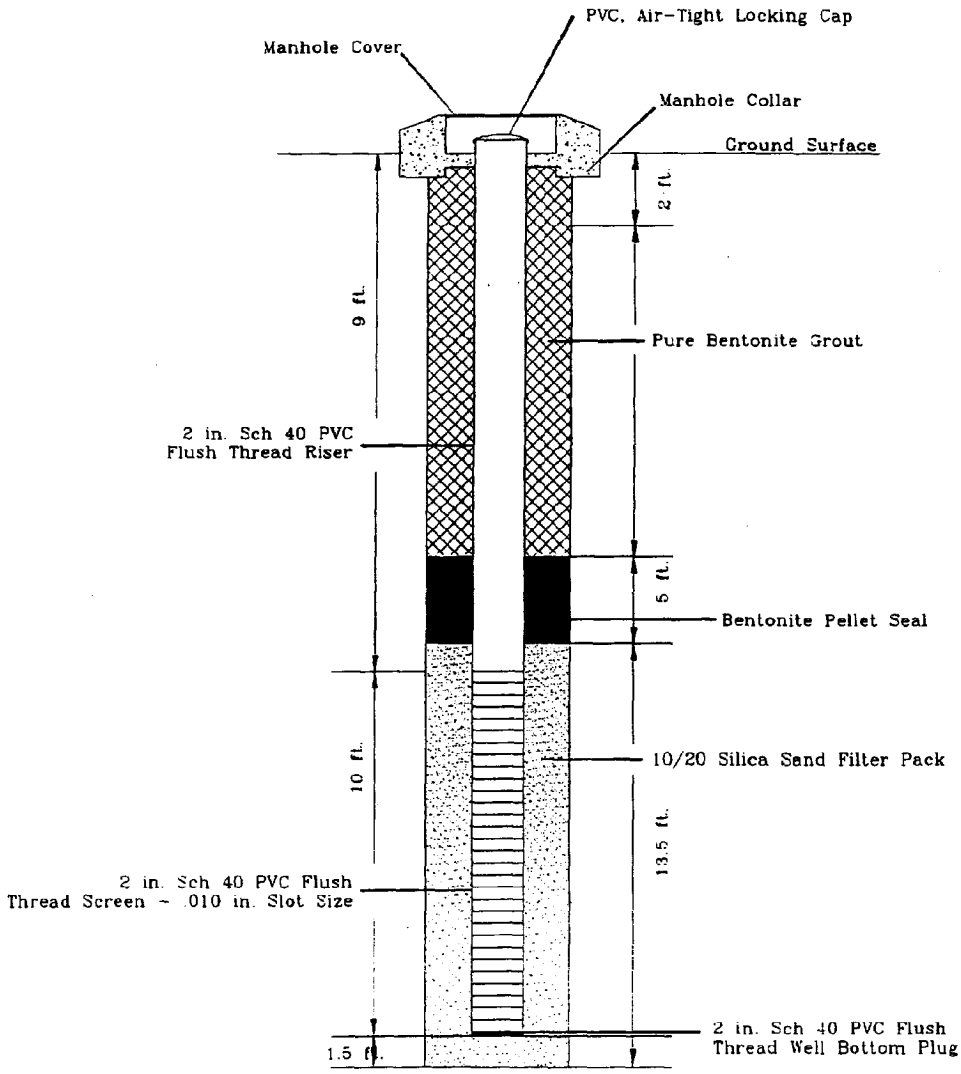
SEA405190

Project:	Seattle ANGS	Date Installed:	07/14/94
Town/City:	Seattle	Drilling Contractor:	Cascade
County:	King State: Washington	Drilling Method:	Hollow-Stem Auger
TOC Elev:	8.99 ft.	Borehole Diameter:	6.75 in.
Ground Elev.:	9.28 ft.	Development Technique:	Bailing
Water Level:	9.45 ft. TOC		
Total Well Depth:	20.5 ft.	Not To Scale	



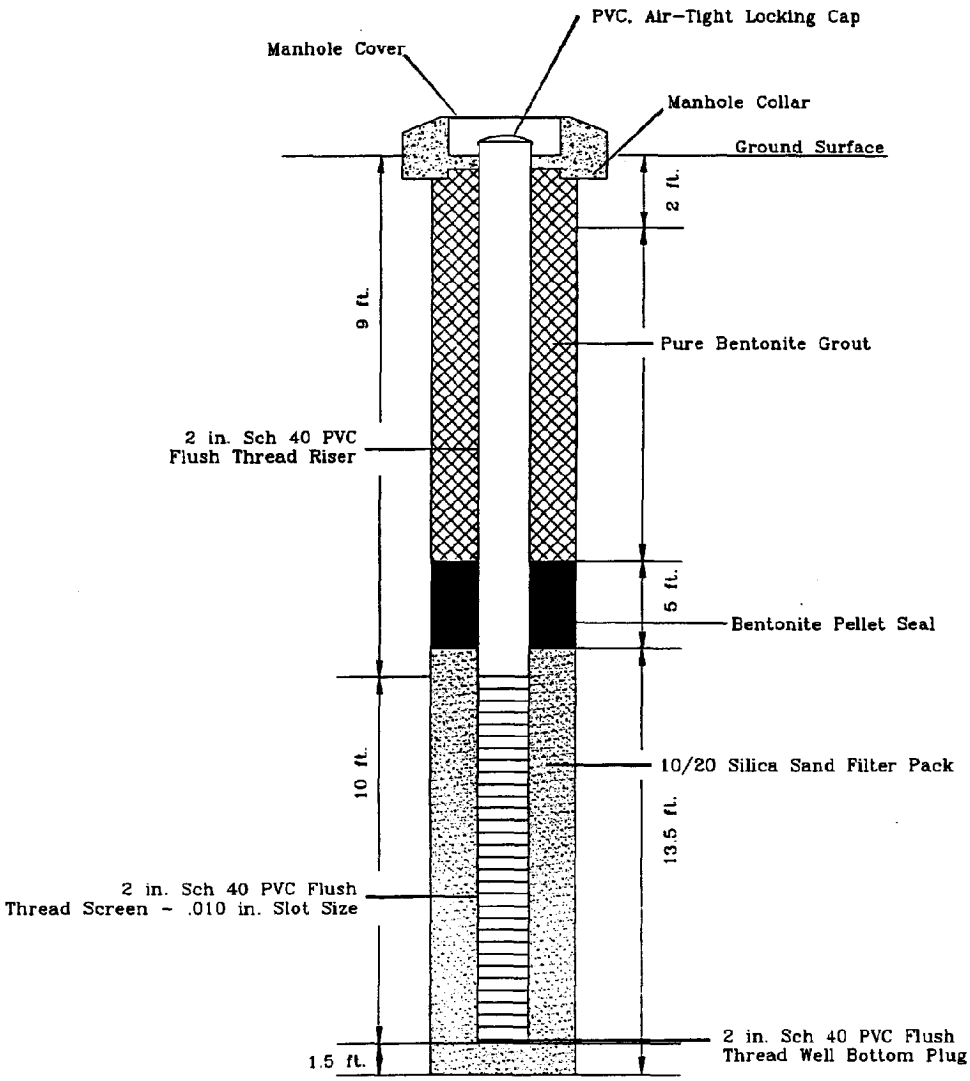
PIEZOMETER CONSTRUCTION LOG
Well No. BS-004PZ

OPTECH
OPERATIONAL TECHNOLOGIES CORPORATION
OCTOBER 1994 SEAT PIEZLOG1

KCSlip4 38661

SEA405191

Project:	Seattle ANGS	Date Installed:	07/14/94
Town/City:	Seattle	Drilling Contractor:	Cascade
County:	King State: Washington	Drilling Method:	Hollow-Stem Auger
TOC Elev:	8.72 ft.	Borehole Diameter:	6.75 in.
Ground Elev.:	9.08 ft.	Development Technique:	Bailing
Water Level:	9.81 ft. TOC		
Total Well Depth:	20.5 ft.		Not To Scale



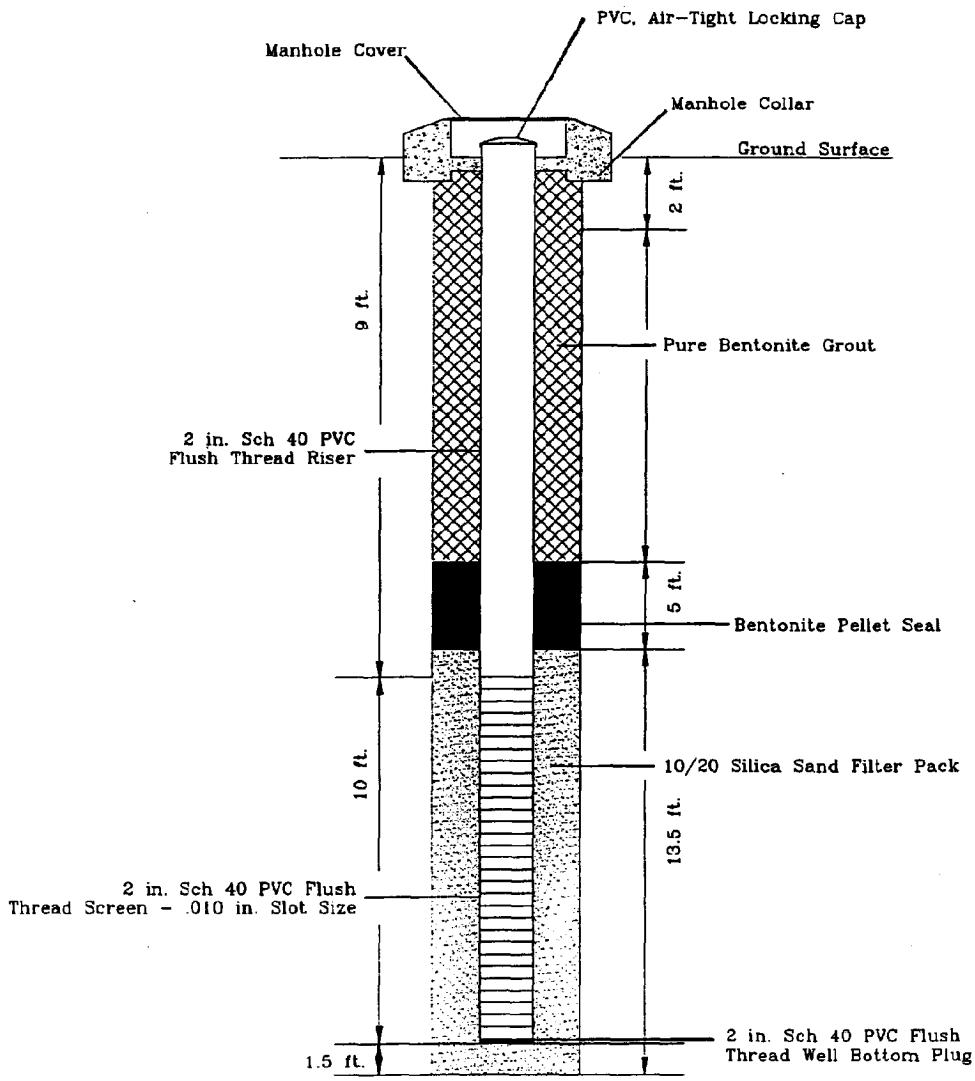
PIEZOMETER CONSTRUCTION LOG
Well No. BS-005PZ

OPTECH
OPERATIONAL TECHNOLOGIES CORPORATION
OCTOBER 1994 SEAT\PIEZLOG2

KCSlip4 38662

SEA405192

Project:	Seattle ANGS	Date Installed:	07/14/94
Town/City:	Seattle	Drilling Contractor:	Cascade
County:	King State: Washington	Drilling Method:	Hollow-Stem Auger
TOC Elev:	8.91 ft.	Borehole Diameter:	6.75 in.
Ground Elev.:	9.24 ft.	Development Technique:	Bailing
Water Level:	9.78 ft. TOC		
Total Well Depth:	20.5 ft.		Not To Scale



PIEZOMETER CONSTRUCTION LOG
Well No. BS-006PZ

OPTECH
OPERATIONAL TECHNOLOGIES CORPORATION
OCTOBER 1994 SEAT\PIEZLOG3

KCSlip4 38663

SEA405193

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Appendix E

KCSlip4 38665

SEA405195

APPENDIX E

ANALYTICAL REPORTS

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SEA405197

Appendix E
Summary of Volatile Organic Compounds Detected in Soil Samples
143rd CCSQ, Seattle ANGS, Seattle, WA
(Results in micrograms per kilogram unless otherwise noted.)

Location No.:	BS001 BH 1-2 1/2	BS001 BH 5 1/2-7	BS001 BH 8 1/2-10	BS002 BH 1-2 1/2	BS002 BH 5 1/2-7
Sample Date:	7/14/94	7/14/94	7/14/94	7/14/94	7/14/94
Lab Sample No.:	49837	49838	49839	49840	49841
Volatile Organics Matrix	Soil	Soil	Soil	Soil	Soil
1,1,1-Trichloroethane	25U	25U	25U	25U	25U
1,1,2,2-Tetrachloroethane	25U	25U	25U	25U	25U
1,1,2-Trichloroethane	25U	25U	25U	25U	25U
1,1-Dichloroethane	25U	25U	25U	25U	25U
1,1-Dichloroethene	25U	25U	25U	25U	25U
1,2 Dichlorobenzene	50U	50U	50U	50U	50U
1,2-Dichloroethane	25U	25U	25U	25U	25U
1,2-Dichloropropane	25U	25U	25U	25U	25U
1,3 Dichlorobenzene	50U	50U	50U	50U	50U
1,4 Dichlorobenzene	50U	50U	50U	50U	50U
2-Butanone (MEK)	500U	500U	500U	500U	500U
2-Hexanone	250U	250U	250U	250U	250U
4-Methyl-2-pentanone (MIBK)	250U	250U	250U	250U	250U
Acetone	500U	500U	500U	500U	500U
Benzene	25U	25U	25U	25U	25U
Bromodichloromethane	25U	25U	25U	25U	25U
Bromoform	25U	25U	25U	25U	25U
Bromomethane	50U	50U	50U	50U	50U
c-1,3-Dichloropropene	25U	25U	25U	25U	25U
Carbon disulfide	25U	25U	25U	25U	25U
Carbon tetrachloride	25U	25U	25U	25U	25U
Chlorobenzene	25U	25U	25U	25U	25U
Chloroethane	50U	50U	50U	50U	50U
Chloroform	25U	25U	25U	25U	25U
Chloromethane	50U	50U	50U	50U	50U
Dibromochloromethane	25U	25U	25U	25U	25U
Ethylbenzene	25U	25U	25U	25U	25U
m,p- Xylenes	25U	25U	25U	25U	25U
Methylene Chloride	25U	25U	25U	25U	25U
o- Xylenes	25U	25U	25U	25U	25U
Styrene	25U	25U	25U	25U	25U
t-1,2-Dichloroethene	25U	25U	25U	25U	25U
t-1,3-Dichloropropene	25U	25U	25U	25U	25U
Tetrachloroethene	25U	25U	25U	25U	25U
Toluene	25U	25U	25U	25U	25U
Trichloroethene	25U	25U	25U	25U	25U
Vinyl chloride	50U	50U	50U	50U	50U

U - Indicates compound analyzed for but not detected.

BG - Background
BH - Borehole

KCSlip4 38668
SEA405198

Appendix E

Summary of Volatile Organic Compounds Detected in Soil Samples

143rd CCSQ, Seattle ANGS, Seattle, WA

(Results in micrograms per kilogram unless otherwise noted.)

Location No.:	BS002 BH 8 1/2-10	BS003 BH 2-3 1/2	BS003 BH 5 1/2-7	BS003 BH 8 1/2-10	BS004 PZ 8 1/2-10
Sample Date:	7/14/94	7/14/94	7/14/94	7/14/94	7/14/94
Lab Sample No.:	49842	49843	49844	49845	49846
Volatile Organics Matrix	Soil	Soil	Soil	Soil	Soil
1,1,1-Trichloroethane	25U	25U	25U	25U	25U
1,1,2,2-Tetrachloroethane	25U	25U	25U	25U	25U
1,1,2-Trichloroethane	25U	25U	25U	25U	25U
1,1-Dichloroethane	25U	25U	25U	25U	25U
1,1-Dichloroethene	25U	25U	25U	25U	25U
1,2 Dichlorobenzene	50U	50U	50U	50U	50U
1,2-Dichloroethane	25U	25U	25U	25U	25U
1,2-Dichloropropane	25U	25U	25U	25U	25U
1,3 Dichlorobenzene	50U	50U	50U	50U	50U
1,4 Dichlorobenzene	50U	50U	50U	50U	50U
2-Butanone (MEK)	500U	500U	500U	500U	500U
2-Hexanone	250U	250U	250U	250U	250U
4-Methyl-2-pentanone (MIBK)	250U	250U	250U	250U	250U
Acetone	500U	500U	500U	500U	500U
Benzene	25U	25U	25U	25U	25U
Bromodichloromethane	25U	25U	25U	25U	25U
Bromoform	25U	25U	25U	25U	25U
Bromomethane	50U	50U	50U	50U	50U
c-1,3-Dichloropropene	25U	25U	25U	25U	25U
Carbon disulfide	25U	25U	25U	25U	25U
Carbon tetrachloride	25U	25U	25U	25U	25U
Chlorobenzene	25U	25U	25U	25U	25U
Chloroethane	50U	50U	50U	50U	50U
Chloroform	25U	25U	25U	25U	25U
Chloromethane	50U	50U	50U	50U	50U
Dibromochloromethane	25U	25U	25U	25U	25U
Ethylbenzene	25U	25U	25U	25U	25U
m,p- Xylenes	25U	25U	25U	25U	25U
Methylene Chloride	25U	25U	25U	25U	25U
o- Xylenes	25U	25U	25U	25U	25U
Styrene	25U	25U	25U	25U	25U
t-1,2-Dichloroethene	25U	25U	25U	25U	25U
t-1,3-Dichloropropene	25U	25U	25U	25U	25U
Tetrachloroethene	25U	25U	25U	25U	25U
Toluene	25U	25U	25U	25U	25U
Trichloroethene	25U	25U	25U	25U	25U
Vinyl chloride	50U	50U	50U	50U	50U

U - Indicates compound analyzed for but not detected.

BG - Background
BH - Borehole

KCSlip4 38669
SEA405199

Appendix E
Summary of Volatile Organic Compounds Detected in Water Samples
143rd CCSQ, Seattle ANGS, Seattle, WA
(Results in micrograms per liter unless otherwise noted.)

Location No.:	BS 004 PZ	BS 005 PZ	BS 006PZ	BS001 TB
Sample Date:	7/21/94	7/21/94	7/20/94	7/14/94
Lab Sample No.:	50098	50097	50072	49847
Volatile Organics Matrix:	Water	Water	Water	Water
1,1,1-Trichloroethane	5U	5U	5U	5U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U
1,2 Dichlorobenzene	10U	10U	10U	10U
1,2-Dichloroethane	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U
1,3 Dichlorobenzene	10U	10U	10U	10U
1,4 Dichlorobenzene	10U	10U	10U	10U
2-Butanone (MEK)	100U	100U	100U	100U
2-Hexanone	50U	50U	50U	50U
4-Methyl-2-pentanone (MIBK)	50U	50U	50U	50U
Acetone	100U	100U	100U	100U
Benzene	5U	5U	5U	5U
Bromodichloromethane	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U
c-1,3-Dichloropropene	5U	5U	5U	5U
Carbon disulfide	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U
Ethylbenzene	5U	5U	5U	5U
m,p- Xylenes	5U	5U	5U	5U
Methylene Chloride	5U	5U	5U	5U
o- Xylenes	5U	5U	5U	5U
Styrene	5U	5U	5U	5U
t-1,2-Dichloroethene	5U	5U	5U	5U
t-1,3-Dichloropropene	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U
Toluene	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U
Vinyl chloride	10U	10U	10U	10U

U - Indicates compound analyzed for but not detected.

BG - Background
BH - Borehole

KCSlip4 38670
SEA405200

Appendix E
Summary of Semivolatile Organic Compounds Detected in Soil Samples
143rd CCSQ, Seattle ANGS, Seattle, WA
(Results in micrograms per kilogram unless otherwise noted.)

Location No.:	BS001 BH 1-2 1/2	BS001 BH 5 1/2-7	BS001 BH 8 1/2-10	BS002 BH 1-2 1/2	BS002 BH 5 1/2-7
Sample Date:	7/14/94	7/14/94	7/14/94	7/14/94	7/14/94
Lab Sample No.:	49837	49838	49839	49840	49841
Semivolatile Organics — Matrix	Soil	Soil	Soil	Soil	Soil
1,2,4-Trichlorobenzene	400U	200U	200U	200U	200U
2,4,5-Trichlorophenol	400U	200U	200U	200U	200U
2,4,6-Trichlorophenol	400U	200U	200U	200U	200U
2,4-Dichlorophenol	400U	200U	200U	200U	200U
2,4-Dimethylphenol	400U	200U	200U	200U	200U
2,4-Dinitrophenol	2000U	1000U	1000U	1000U	1000U
2,4-Dinitrotoluene	400U	200U	200U	200U	200U
2,6-Dinitrotoluene	400U	200U	200U	200U	200U
2-Chloronaphthalene	400U	200U	200U	200U	200U
2-Chlorophenol	400U	200U	200U	200U	200U
2-Methylnaphthalene	400U	200U	200U	200U	200U
2-Methylphenol (o-Cresol)	400U	200U	200U	200U	200U
2-Nitroaniline	2000U	1000U	1000U	1000U	1000U
2-Nitrophenol	400U	200U	200U	200U	200U
3&4-Methylphenol (m&p-Cresol)	400U	200U	200U	200U	200U
3,3'-Dichlorobenzidine	800U	400U	400U	400U	400U
3-Nitroaniline	2000U	1000U	1000U	1000U	1000U
4,6-Dinitro-2-methylphenol	2000U	1000U	1000U	1000U	1000U
4-Bromophenyl phenyl ether	400U	200U	200U	200U	200U
4-Chloro-3-methylphenol	800U	400U	400U	400U	400U
4-Chloroaniline	800U	400U	400U	400U	400U
4-Chlorophenyl phenyl ether	400U	200U	200U	200U	200U
4-Nitroaniline	800U	400U	400U	400U	400U
4-Nitrophenol	2000U	1000U	1000U	1000U	1000U
Acenaphthene	400U	200U	200U	200U	200U
Acenaphthylene	400U	200U	200U	200U	200U
Anthracene	400U	200U	200U	200U	200U
Benzoic acid	2000U	1000U	1000U	1000U	1000U
Benzo(a)anthracene	400U	200U	200U	200U	200U
Benzo(a)pyrene	400U	200U	200U	200U	200U
Benzo(b)fluoranthene	400U	200U	200U	200U	200U

U - Indicates compound analyzed for but not detected

BG - Background

KCSlip4 38671
SEA405201

Appendix E
Summary of Semivolatile Organic Compounds Detected in Soil Samples
143rd CCSQ, Seattle ANGS, Seattle, WA
(Results in micrograms per kilogram unless otherwise noted.)

Location No.:	BS 001 BH 1-2 1/2	BS001 BH 5 1/2-7	BS001 BH 8 1/2-10	BS002 BH 1-2 1/2	BS002 BH 5 1/2-7
Sample Date:	7/14/94	7/14/94	7/14/94	7/14/94	7/14/94
Lab Sample No.:	49837	49838	49839	49840	49841
Semivolatile Organics Matrix	Soil	Soil	Soil	Soil	Soil
Benzo(g,h,i)perylene	400U	200U	200U	200U	200U
Benzo(j,k)fluoranthene	400U	200U	200U	200U	200U
Benzyl alcohol	800U	400U	400U	400U	400U
Bis(2-chloroethoxy)methane	400U	200U	200U	200U	200U
Bis(2-chloroethyl)ether	400U	200U	200U	200U	200U
Bis(2-chloroisopropyl)ether	400U	200U	200U	200U	200U
Bis(2-ethylhexyl) phthalate	400U	200U	200U	200U	200U
Butyl benzyl phthalate	400U	200U	200U	200U	200U
Chrysene	400U	200U	200U	200U	200U
Di-n-butyl phthalate	1750	1680	1590	1640	900
Di-n-octyl phthalate	400U	200U	200U	200U	200U
Dibenzofuran	400U	200U	200U	200U	200U
Dibenzo(a,h)anthracene	400U	200U	200U	200U	200U
Diethylphthalate	400U	200U	200U	200U	200U
Dimethylphthalate	400U	200U	200U	200U	200U
Fluoranthene	400U	200U	200U	200U	200U
Fluorene	400U	200U	200U	200U	200U
Hexachlorobenzene	400U	200U	200U	200U	200U
Hexachlorobutadiene	400U	200U	200U	200U	200U
Hexachlorocyclopentadiene	400U	200U	200U	200U	200U
Hexachloroethane	400U	200U	200U	200U	200U
Indeno(1,2,3-cd)pyrene	400U	200U	200U	200U	200U
Isophorone	400U	200U	200U	200U	200U
N-Nitrosodi-n-propylamine	400U	200U	200U	200U	200U
N-Nitrosodiphenylamine	400U	200U	200U	200U	200U
Naphthalene	400U	200U	200U	200U	200U
Nitrobenzene	400U	200U	200U	200U	200U
Pentachlorophenol	2000U	1000U	1000U	1000U	1000U
Phenanthrene	400U	200U	200U	200U	200U
Phenol	400U	200U	200U	200U	200U
Pyrene	400U	200U	200U	200U	200U

U - Indicates compound analyzed for but not detected

BG - Background

KCSlip4 38672
SEA405202

Appendix E

Summary of Semivolatile Organic Compounds Detected in Soil Samples

143rd CCSQ, Seattle ANGS, Seattle, WA

(Results in micrograms per kilogram unless otherwise noted.)

Location No.:	BS002 BH 8 1/2-10	BS003 BH 2-3 1/2	BS003 BH 5 1/2-7	BS003 BH 8 1/2-10	BS004 PZ 8 1/2-10
Sample Date:	7/14/94	7/14/94	7/14/94	7/14/94	7/14/94
Lab Sample No.:	49842	49843	49844	49845	49846
Semivolatile Organics Matrix	Soil	Soil	Soil	Soil	Soil
1,2,4-Trichlorobenzene	200U	400U	200U	200U	200U
2,4,5-Trichlorophenol	200U	400U	200U	200U	200U
2,4,6-Trichlorophenol	200U	400U	200U	200U	200U
2,4-Dichlorophenol	200U	400U	200U	200U	200U
2,4-Dimethylphenol	200U	400U	200U	200U	200U
2,4-Dinitrophenol	1000U	2000U	1000U	1000U	1000U
2,4-Dinitrotoluene	200U	400U	200U	200U	200U
2,6-Dinitrotoluene	200U	400U	200U	200U	200U
2-Chloronaphthalene	200U	400U	200U	200U	200U
2-Chlorophenol	200U	400U	200U	200U	200U
2-Methylnaphthalene	200U	400U	200U	200U	200U
2-Methylphenol (o-Cresol)	200U	400U	200U	200U	200U
2-Nitroaniline	1000U	2000U	1000U	1000U	1000U
2-Nitrophenol	200U	400U	200U	200U	200U
3&4-Methylphenol (m&p-Cresol)	200U	400U	200U	200U	200U
3,3'-Dichlorobenzidine	400U	800U	400U	400U	400U
3-Nitroaniline	1000U	2000U	1000U	1000U	1000U
4,6-Dinitro-2-methylphenol	1000U	2000U	1000U	1000U	1000U
4-Bromophenyl phenyl ether	200U	400U	200U	200U	200U
4-Chloro-3-methylphenol	400U	800U	400U	400U	400U
4-Chloroaniline	400U	800U	400U	400U	400U
4-Chlorophenyl phenyl ether	200U	400U	200U	200U	200U
4-Nitroaniline	400U	800U	400U	400U	400U
4-Nitrophenol	1000U	2000U	1000U	1000U	1000U
Acenaphthene	200U	400U	200U	200U	200U
Acenaphthylene	200U	400U	200U	200U	200U
Anthracene	200U	400U	200U	200U	200U
Benzoic acid	1000U	2000U	1000U	1000U	1000U
Benzo(a)anthracene	200U	400U	200U	200U	200U
Benzo(a)pyrene	200U	400U	200U	200U	200U
Benzo(b)fluoranthene	200U	400U	200U	200U	200U

U - Indicates compound analyzed for but not detected

KCSlip4 38673

SEA405203

Appendix E
Summary of Semivolatile Organic Compounds Detected in Soil Samples
143rd CCSQ, Seattle ANGS, Seattle, WA
(Results in micrograms per kilogram unless otherwise noted.)

Location No.:	BS002 BH 8 1/2-10	BS003 BH 2-3 1/2	BS003 BH 5 1/2-7	BS003 BH 8 1/2-10	BS004 PZ 8 1/2-10
Sample Date:	7/14/94	7/14/94	7/14/94	7/14/94	7/14/94
Lab Sample No.:	49842	49843	49844	49845	49846
Semivolatile Organics / Matrix	Soil	Soil	Soil	Soil	Soil
Benzo(g,h,i)perylene	200U	400U	200U	200U	200U
Benzo(j,k)fluoranthene	200U	400U	200U	200U	200U
Benzyl alcohol	400U	800U	400U	400U	400U
Bis(2-chloroethoxy)methane	200U	400U	200U	200U	200U
Bis(2-chloroethyl)ether	200U	400U	200U	200U	200U
Bis(2-chloroisopropyl)ether	200U	400U	200U	200U	200U
Bis(2-ethylhexyl) phthalate	200U	400U	200U	200U	200U
Butyl benzyl phthalate	200U	400U	200U	200U	200U
Chrysene	200U	400U	200U	200U	200U
Di-n-butyl phthalate	1960	400U	744	1750	2240
Di-n-octyl phthalate	200U	400U	200U	200U	200U
Dibenzofuran	200U	400U	200U	200U	200U
Dibenzo(a,h)anthracene	200U	400U	200U	200U	200U
Diethylphthalate	200U	400U	200U	200U	200U
Dimethylphthalate	200U	400U	200U	200U	200U
Fluoranthene	200U	400U	200U	200U	200U
Fluorene	200U	400U	200U	200U	200U
Hexachlorobenzene	200U	400U	200U	200U	200U
Hexachlorobutadiene	200U	400U	200U	200U	200U
Hexachlorocyclopentadiene	200U	400U	200U	200U	200U
Hexachloroethane	200U	400U	200U	200U	200U
Indeno(1,2,3-cd)pyrene	200U	400U	200U	200U	200U
Isophorone	200U	400U	200U	200U	200U
N-Nitrosodi-n-propylamine	200U	400U	200U	200U	200U
N-Nitrosodiphenylamine	200U	400U	200U	200U	200U
Naphthalene	200U	400U	200U	200U	200U
Nitrobenzene	200U	400U	200U	200U	200U
Pentachlorophenol	1000U	2000U	1000U	1000U	1000U
Phenanthrene	200U	400U	200U	200U	200U
Phenol	200U	400U	200U	200U	200U
Pyrene	200U	400U	200U	200U	200U

U - Indicates compound analyzed for but not detected.

BG - Background
BH - Borehole

KCSlip4 38674
SEA405204

Appendix E
Summary of Semivolatile Organic Compounds Detected in Water Samples
143rd CCSQ, Seattle ANGS, Seattle, WA
(Results in micrograms per liter unless otherwise noted.)

Location No.:	BS 004 PZ	BS 005 PZ	BS 006PZ
Sample Date:	7/21/94	7/21/94	7/20/94
Lab Sample No.:	50098	50097	50072
Semivolatile Organics Matrix:	Water	Water	Water
1,2,4-Trichlorobenzene	10U	10U	10U
2,4,5-Trichlorophenol	10U	10U	10U
2,4,6-Trichlorophenol	10U	10U	10U
2,4-Dichlorophenol	10U	10U	10U
2,4-Dimethylphenol	10U	10U	10U
2,4-Dinitrophenol	50U	50U	50U
2,4-Dinitrotoluene	10U	10U	10U
2,6-Dinitrotoluene	10U	10U	10U
2-Chloronaphthalene	10U	10U	10U
2-Chlorophenol	10U	10U	10U
2-Methylnaphthalene	10U	10U	10U
2-Methylphenol (o-Cresol)	10U	10U	10U
2-Nitroaniline	50U	50U	50U
2-Nitrophenol	10U	10U	10U
3&4-Methylphenol (m&p-Cresol)	10U	10U	10U
3,3'-Dichlorobenzidine	20U	20U	20U
3-Nitroaniline	50U	50U	50U
4,6-Dinitro-2-methylphenol	50U	50U	50U
4-Bromophenyl phenyl ether	10U	10U	10U
4-Chloro-3-methylphenol	20U	20U	20U
4-Chloroaniline	20U	20U	20U
4-Chlorophenyl phenyl ether	10U	10U	10U
4-Nitroaniline	20U	20U	20U
4-Nitrophenol	50U	50U	50U
Acenaphthene	10U	10U	10U
Acenaphthylene	10U	10U	10U
Anthracene	10U	10U	10U
Benzoic acid	50U	50U	50U
Benzo(a)anthracene	10U	10U	10U
Benzo(a)pyrene	10U	10U	10U
Benzo(b)fluoranthene	10U	10U	10U

KCSlip4 38675
SEA405205

Appendix E
Summary of Semivolatile Organic Compounds Detected in Water Samples
143rd CCSQ, Seattle ANGS, Seattle, WA
(Results in micrograms per liter unless otherwise noted.)

Location No.:	BS 004 PZ	BS 005 PZ	BS 006PZ
Sample Date:	7/21/94	7/21/94	7/20/94
Lab Sample No.:	50098	50097	50072
Semivolatile Organics Matrix	**Water**	**Water**	**Water**
Benzo(g,h,i)perylene	10U	10U	10U
Benzo(j,k)fluoranthene	10U	10U	10U
Benzyl alcohol	20U	20U	20U
Bis(2-chloroethoxy)methane	10U	10U	10U
Bis(2-chloroethyl)ether	10U	10U	10U
Bis(2-chloroisopropyl)ether	10U	10U	10U
Bis(2-ethylhexyl) phthalate	10U	10U	10U
Butyl benzyl phthalate	10U	10U	10U
Chrysene	10U	10U	10U
Di-n-butyl phthalate	10U	10U	10U
Di-n-octyl phthalate	10U	10U	10U
Dibenzofuran	10U	10U	10U
Dibenzo(a,h)anthracene	10U	10U	10U
Diethylphthalate	10U	10U	10U
Dimethylphthalate	10U	10U	10U
Fluoranthene	10U	10U	10U
Fluorene	10U	10U	10U
Hexachlorobenzene	10U	10U	10U
Hexachlorobutadiene	10U	10U	10U
Hexachlorocyclopentadiene	10U	10U	10U
Hexachloroethane	10U	10U	10U
Indeno(1,2,3-cd)pyrene	10U	10U	10U
Isophorone	10U	10U	10U
N-Nitrosodi-n-propylamine	10U	10U	10U
N-Nitrosodiphenylamine	10U	10U	10U
Naphthalene	10U	10U	10U
Nitrobenzene	10U	10U	10U
Pentachlorophenol	50U	50U	50U
Phenanthrene	10U	10U	10U
Phenol	10U	10U	10U
Pyrene	10U	10U	10U

U - Indicates compound analyzed for but not detected.

BG - Background
BH - Borehole

KCSlip4 38676
SEA405206

Appendix E
Summary of Metal/TPH/Oil & Grease Analytes Detected in Soil Samples
143rd CCSQ, Seattle ANGS, Seattle, WA
(Results in milligrams per kilogram unless otherwise noted.)

Location No.:	BS001 BH 1-2 1/2	BS001 BH 5 1/2-7	BS001 BH 8 1/2-10	BS002 BH 1-2 1/2	BS002 BH 5 1/2-7
Sample Date:	7/14/94	7/14/94	7/14/94	7/14/94	7/14/94
Lab Sample No:	49837	49838	49839	49840	49841
Metals / Matrix	Soil	Soil	Soil	Soil	Soil
Antimony (Sb)	0.06U	0.06U	0.06U	0.06U	0.06U
Arsenic (As)	0.33	1.6	0.033	2.7	1.1
Beryllium (Be)	1	0.82	0.29	0.87	0.49
Cadmium (Cd)	1.6	1.1	0.66	1.3	0.92
Chromium (Cr)	11	11	7.9	10	14
Copper (Cu)	130	16	9.3	23	23
Lead (Pb)	28	16	9.7	28	15
Mercury (Hg)	0.004U	0.004U	0.004U	0.004U	0.004U
Nickel (Ni)	14	5.8	5.6	9.3	6.2
Selenium (Se)	0.053	0.04U	0.04U	0.04U	0.04U
Silver (Ag)	0.18	0.04U	0.04U	0.04U	0.04U
Thallium (Tl)	0.038	0.03	0.02U	0.024	0.054
Zinc (Zn)	19	8.6	14	31	16

Lab Sample No.:	49837 (pCi/g)	49838 (pCi/g)	49839 (pCi/g)	49840 (pCi/g)	49841 (pCi/g)
Gross alpha	N/A	0 +/- 18	0 +/- 20	2 +/- 25	2 +/- 25
Gross beta	2 +/- 35	4 +/- 36	0 +/- 24	3 +/- 37	0 +/-36

Lab Sample No.:	49837	49838	49839	49840	49841
TPH by GC (as diesel)	50U	50U	50U	50U	50U
TPH by GC (as gasoline)	5U	5U	5U	5U	5U

U - Indicates compound analyzed for but not detected.
pCi/g - pico Curies/gram

BG - Background
BH - Borehole

KCSlip4 38677
SEA405207

Appendix E
Summary of Metal/TPH/Oil & Grease Analytes Detected in Soil Samples
143rd CCSQ, Seattle ANGS, Seattle, WA
(Results in milligrams per kilogram unless otherwise noted.)

Location No.:	BS002 BH 8 1/2-10	BS003 BH 2-3 1/2	BS003 BH 5 1/2-7	BS003 BH 8 1/2-10	BS004 PZ 8 1/2-10
Sample Date:	7/14/94	7/14/94	7/14/94	7/14/94	7/14/94
Lab Sample No:	49842	49843	49844	49845	49846
Metals / Matrix	Soil	Soil	Soil	Soil	Soil
Antimony (Sb)	0.06U	0.06U	0.06U	0.06U	0.06U
Arsenic (As)	0.63	4.1	20	3.7	2
Beryllium (Be)	0.34	1	1.1	0.58	1.2
Cadmium (Cd)	0.75	1.3	1.5	1	1.6
Chromium (Cr)	9.3	11	15	12	10
Copper (Cu)	7.5	20	33	14	40
Lead (Pb)	10	27	62	29	34
Mercury (Hg)	0.004U	0.004U	0.004U	0.004U	0.004U
Nickel (Ni)	7.2	8.6	14	8.3	13
Selenium (Se)	0.04U	0.04U	0.04U	0.11	0.04U
Silver (Ag)	0.04U	0.04U	0.042	0.04U	0.04U
Thallium (Tl)	0.02U	0.053	0.093	0.02U	0.056
Zinc (Zn)	20	19	40	20	25

Lab Sample No.:	49842 (pCi/g)	49843 (pCi/g)	49844 (pCi/g)	49845 (pCi/g)	49846 (pCi/g)
Gross alpha	2 +/- 25	2 +/- 20	0 +/- 21	0 +/- 21	0 +/- 17
Gross beta	0 +/- 34	2 +/- 30	0 +/- 34	0 +/- 34	0 +/- 32

Lab Sample No.:	49842	49843	49844	49845	49846
TPH by GC (as diesel)	50U	50U	50U	50U	50U
TPH by GC (as gasoline)	5U	5U	5U	5U	5U
TPH by IR (as lube oil)	N/A	780	160	N/A	N/A

U - Indicates compound analyzed for but not detected.
pCi/g - pico Curies/gram

BG - Background
BH - Borehole

KCSlip4 38678
SEA405208

Appendix E
Summary of Metal/TPH/Oil & Grease Analytes Detected in Water Samples
143rd CCSQ, Seattle ANGS, Seattle, WA
(Results in milligrams per liter unless otherwise noted.)

Location No.:	BS 004 PZ	BS 005 PZ	BS-006PZ
Sample Date:	7/21/94	7/21/94	7/20/94
Lab Sample No:	50098	50097	50072
Metals / Matrix	Water	Water	Water
Antimony (Sb)	0.003U	0.003U	0.003U
Arsenic (As)	0.038	0.028	0.027
Beryllium (Be)	0.013	0.54	0.82
Cadmium (Cd)	0.0006U	0.0006U	0.0006U
Chromium (Cr)	0.12	0.0052	0.097
Copper (Cu)	0.29	0.054	0.078
Lead (Pb)	0.033	0.022	0.026
Mercury (Hg)	0.0002U	0.0002U	0.0002U
Nickel (Ni)	0.16	0.031	0.06
Selenium (Se)	0.002U	0.002U	0.0031
Silver (Ag)	0.002U	0.002U	0.002U
Thallium (Tl)	0.0057	0.001U	0.001U
Zinc (Zn)	0.45	0.05U	0.05U

Lab Sample No.:	50098 (pCi/l)	50097 (pCi/l)	50072 (pCi/l)
Gross alpha	36 +/- 42	15 +/- 39	59 +/- 59
Gross beta	78 +/- 25	77 +/- 24	58 +/- 30

Lab Sample No.:	50098	50097	50072
TPH by GC (as diesel)	0.25U	0.25U	0.25U
TPH by GC (as gasoline)	N/A	N/A	N/A

U - Indicates compound analyzed for but not detected.

BG - Background

Appendix E
Summary of Pesticide/PCB Analytes Detected in Soil Samples
143rd CCSQ, Seattle ANGS, Seattle, WA
(Results in micrograms per kilogram unless otherwise noted.)

Location No.:	BS001 BH 1-2 1/2	BS001 BH 5 1/2-7	BS001 BH 8 1/2-10	BS002 BH 1-2 1/2	BS002 BH 5 1/2-7
Sample Date:	7/14/94	7/14/94	7/14/94	7/14/94	7/14/94
Lab Sample No.:	49837	49838	49839	49840	49841
Pesticides / Matrix	Soil	Soil	Soil	Soil	Soil
4,4'-DDD	3.2U	0.4U	0.4U	0.4U	0.4U
4,4'-DDE	3.2U	0.4U	0.4U	0.4U	0.4U
4,4'-DDT	3.2U	0.4U	0.4U	0.4U	0.4U
Aldrin	3.2U	0.4U	0.4U	0.4U	0.4U
alpha-BHC	3.2U	0.4U	0.4U	0.4U	0.4U
alpha-Chlordane	8U	1U	1U	1U	1U
beta-BHC	3.2U	0.4U	0.4U	0.4U	0.4U
beta-Chlordane	8U	1U	1U	1U	1U
delta-BHC	3.2U	0.4U	0.4U	0.4U	0.4U
Dieldrin	3.2U	0.4U	0.4U	0.4U	0.4U
Endosulfan I	8U	1U	1U	1U	1U
Endosulfan II	3.2U	0.4U	0.4U	0.4U	0.4U
Endosulfan sulfate	8U	1U	1U	1U	1U
Endrin	8U	1U	1U	1U	1U
Endrin aldehyde	8U	1U	1U	1U	1U
Heptachlor	3.2U	0.4U	0.4U	0.4U	0.4U
Heptachlor epoxide	8U	1U	1U	1U	1U
Lindane	3.2U	0.4U	0.4U	0.4U	0.4U
Methoxychlor	32U	4U	4U	4U	4U
PCB, total	32U	4U	4U	4U	4U
Toxaphene	80U	10U	10U	10U	10U

U - Indicates compound analyzed for but not detected.

BG - Background
BH - Borehole

KCSlip4 38680
SEA405210

Appendix E
Summary of Pesticide/PCB Analytes Detected in Soil Samples
143rd CCSQ, Seattle ANGS, Seattle, WA
(Results in micrograms per kilogram unless otherwise noted.)

Location No.:	BS002 BH 8 1/2-10	BS003 BH 2-3 1/2	BS003 BH 5 1/2-7	BS003 BH 8 1/2-10	BS004 PZ 8 1/2-10
Sample Date:	7/14/94	7/14/94	7/14/94	7/14/94	7/14/94
Lab Sample No.:	49842	49843	49844	49845	49846
Pesticides Matrix	Soil	Soil	Soil	Soil	Soil
4,4'-DDD	0.4U	8U	0.4U	0.4U	2U
4,4'-DDE	0.4U	8U	0.4U	0.4U	2U
4,4'-DDT	0.4U	8U	0.4U	0.4U	2U
Aldrin	0.4U	8U	0.4U	0.4U	2U
alpha-BHC	0.4U	8U	0.4U	0.4U	2U
alpha-Chlordane	1U	20U	1U	1U	5U
beta-BHC	0.4U	8U	0.4U	0.4U	2U
beta-Chlordane	1U	20U	1U	1U	5U
delta-BHC	0.4U	8U	0.4U	0.4U	2U
Dieldrin	0.4U	8U	0.4U	0.4U	2U
Endosulfan I	1U	20U	1U	1U	5U
Endosulfan II	0.4U	8U	0.4U	0.4U	2U
Endosulfan sulfate	1U	20U	1U	1U	5U
Endrin	1U	20U	1U	1U	5U
Endrin aldehyde	1U	20U	1U	1U	5U
Heptachlor	0.4U	8U	0.4U	0.4U	2U
Heptachlor epoxide	1U	20U	1U	1U	5U
Lindane	0.4U	8U	0.4U	0.4U	2U
Methoxychlor	4U	80U	4U	4U	20U
PCB, total	4U	80U	4U	4U	20U
Toxaphene	10U	200U	10U	10U	50U

U - Indicates compound analyzed for but not detected.

BG - Background

BH - Borehole

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SEA405211

Appendix E
Summary of Pesticide/PCB Analytes Detected in Water Samples
143rd CCSQ, Seattle ANGS, Seattle, WA
(Results in micrograms per liter unless otherwise noted.)

Location No.:	BS 004 PZ	BS 005 PZ	BS 006PZ
Sample Date:	7/21/94	7/21/94	7/20/94
Lab Sample No.:	50098	50097	50072
Pesticides / **Matrix**	**Water**	**Water**	**Water**
4,4'-DDD	0.02U	0.02U	0.02U
4,4'-DDE	0.02U	0.02U	0.02U
4,4'-DDT	0.02U	0.02U	0.02U
Aldrin	0.02U	0.02U	0.02U
alpha-BHC	0.02U	0.02U	0.02U
alpha-Chlordane	0.05U	0.05U	0.05U
beta-BHC	0.02U	0.02U	0.02U
beta-Chlordane	0.05U	0.05U	0.05U
delta-BHC	0.02U	0.02U	0.02U
Dieldrin	0.02U	0.02U	0.02U
Endosulfan I	0.05U	0.05U	0.05U
Endosulfan II	0.02U	0.02U	0.02U
Endosulfan sulfate	0.05U	0.05U	0.05U
Endrin	0.05U	0.05U	0.05U
Endrin aldehyde	0.05U	0.05U	0.05U
Heptachlor	0.02U	0.02U	0.02U
Heptachlor epoxide	0.05U	0.05U	0.05U
Lindane	0.02U	0.02U	0.02U
Methoxychlor	0.2U	0.2U	0.2U
PCB, total	0.2U	0.2U	0.2U
Toxaphene	0.5U	0.5U	0.5U

U - Indicates compound analyzed for but not detected.
PCB - Polychloronated Biphenyls

BG - Background
BH - Borehole

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SEA405213

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September 9, 1994

Mr. Hopkins Haden
AnalySys Inc.
4221 Freidrich Lane, Suite 190
Austin, Texas 78744
(512) 444-5896 FAX: (512) 447-4766

Dear Mr. Haden,

The following is a brief summary of some issues questioned on the Seattle Air National Guard Project in Washington State completed a few weeks ago. Please review the following questions and feel free to contact me for any questions regarding the validation at (210) 731-0000 (ext. 188).

Sincerely,

Mark Escobar
Project Chemist

Enclosures: As stated

4100 N.W. Loop 410, Suite 230 • San Antonio, TX 78229-4253 • (210) 731-0000 • Fax (210) 731-0008

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CORPORATION

Questions Regarding Validation on Seattle Air National Guard Site Investigation Seattle, Washington 1315-127 AnalySys Laboratories, Austin Texas

Gross Alpha/Beta Radiation (SW9310)

1. **(Concerning all associated samples for this analysis)**
   Were there any surrogate recoveries to accompany all Gross α&β analyses? If so, we would like this information due to the fact that the Report Forms show no reported values of such results.

2. **(Concerning all associated samples for this analysis)**
   Were there any blanks analyzed with these samples? If they were run, please provide this information due to these values no being reported on any of the Report Forms.

3. **Samples BS-005PZ (Lab ID# 50079) and BS-004PZ (Lab ID# 50098)** show no date analyzed on the report form. If you could please provide this information to verify if the sample was analyzed within 5 days.

4. **Sample BS-001BH 1-2.5' (Lab ID#49837)** is missing the results for Gross Alpha. Please provide this information for validation purposes.

5. **Samples BS-001BH 1-2.5' (Lab ID# 49837)**
   BS-001BH 5.5-7' (Lab ID# 49838)
   BS-001BH 8.5-10' (Lab ID# 49839)
   BS-002BH 1-2.5' (Lab ID# 49840)
   BS-002BH 5.5-7' (Lab ID# 49841)
   BS-002BH 8.5-10' (Lab ID# 49842)
   BS-003BH 2-3.5' (Lab ID# 49843)
   BS-003BH 5.5-7' (Lab ID# 49844)
   BS-003BH 8.5-10' (Lab ID# 49845)
   BS-004PZ 8.5-10" (Lab ID# 49846)

   *These samples were not analyzed within five days of the sample collection date. The method states a five day analysis holding time.

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Total Petroleum Hydrocarbons (SW Mod 8015)

1. **Samples BS-003BH 2-3.5' (Lab ID# 49843) and BS-003BH 5.5-7' (Lab ID# 49844)** had TPH hits by method 418.1 instead of SW Mod 8015. What was the reason for this measure of analysis just for these two samples?

Semivolatiles (SW 8270)

1. **Sample BS-003BH 5.5-7 (Lab ID# 49844)** had three acid and two bases that were outside of QC Limits. No reanalysis or any note of corrective action was accompanied with the results.

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-476

OPTEC
4100 NW Loop Suite 230
San Antonio, Tx. 78229
Attn: Mark Escobar

In response to your questions regarding validation on the Seattle Air National Guard Site investigation, would like to address the issues item by item based on the fax I received on September 9, 1994.

Items 1 and 2 of the fax dealt with the question of surrogate recoveries and blanks being provided on Gross Alpha and Beta. This information is not provided to us by the laboratory we use. We can ask them to provide that information in the future.

Item 3 dealt with the report date not being identified for Gross Alpha and Beta on reports 50097 and 50098. The dates are now in the data base and a new report has been enclosed with this letter.

Item 4 dealt with Gross Alpha being absent on report 49837. the print flag was not put into the data base. The problem has been remedied and a new report has been issued.

Item 5 dealt with report numbers 49837-49846. At issue is the question of holding times for Gross Alpha and Beta. When preserved with HNO3 the holding time is 6 months.

Samples 49843 and 49844 were run for TPH 418.1 consistent with the requirements of the Washington HDIC TPH by GC method.

Sample 49844 had low surrogate recoveries due to matrix interferences. The sample was extracted and analyzed twice with low surrogate recoveries both times. All of the calibration standards and end of run checks were within range, which indicates that the instrumentation was working properly.

If I can be of any further assistance to you, please feel free to call me at (512) 444-5896.

Sincerely,

Hopkins Haden

KCSlip4 38687

SEA405217

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-4766

Attn: Matt Alexander,

Analysys, Inc. was instructed to run TPH by HCID on the following report numbers:

49730 - 49738
49766 - 49777(excluding 49776)
49797 - 49798
49837 - 49846
49916 - 49917
49920 - 49925
49927 - 49929

Since TPH HCID is a screening method and is designed to tell which TPH by GC method is to be run, AnalySys, Inc. ran both TPH by GC methods since there were already so many other OPTEC samples in house requiring them. OPTEC will only be billed for the HCID run and not both GC runs unless one was specifically requested.

In addition to the TPH by GC as gasoline and diesel there were some samples that had hits that we suspected to be heavy end hydrocarbons which, had we run the HCID method, would have resulted in a 418.1 TPH run 'being required. Due to this fact, AnalySys, Inc. ran 418.1.

The rest of the data was normal and should not present any problems which need to be addressed in this letter. If you have any further questions please feel free to call me at (512) 444-5896.

Sincerely,

Hopkins Haden

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-4[illegible]

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49837
Report Date: 8/22/94

Project Description: Seattle ANGS 1315-127
Sample Name: BS001 BH 1-2 1/2
Matrix: Soil
Date/Time Taken: 7/14/94
Date/Time Received: 7/15/94 4:20:00

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis-General Parameters

Report #: 49837

Sample Name: BS001 BH 1-2 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
A/BN Extraction-8080/PCB	—				7/19/94	3540
A/BN Extraction-8270	—				7/19/94	3540
Gross Alpha	4 +/- 27	pCi/g			7/21/94	DOE ESM4103
Gross Beta	2 +/- 35	pCi/g			7/21/94	DOE ESM4103
Metals dig.-Hg	—				7/20/94	7471
Metals dig.-HNO3	—				7/20/94	3051
TPH by GC (as diesel)	<50	mg/Kg	50	<50	8/2/94	8015 mod.
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	7/26/94	8015 mod.
TPH by HCID	See letter					
Antimony/GFAA	<0.06	mg/Kg	0.06	<0.06	7/22/94	204.2&7041
Arsenic/GFAA	0.33	mg/Kg	0.02	<0.02	7/21/94	206.2&7060
Beryllium/ICP	1	mg/Kg	0.1	<0.1	7/29/94	6010 & 200.7
Cadmium/GFAA	1.6	mg/Kg	0.2	<0.2	7/29/94	7131&213.2
Chromium/GFAA	11	mg/Kg	0.5	<0.5	7/29/94	7191&218.2
Copper/ICP	130	mg/Kg	1	<1	8/4/94	6010 & 200.7
Lead/GFAA	28	mg/Kg	1.5	<1.5	7/29/94	7421&239.2
Mercury/CVAA	<0.004	mg/Kg	0.004	<0.004	7/20/94	245.5&7471
Nickel/ICP	14	mg/Kg	1	<1	7/29/94	6010 & 200.7
Selenium/GFAA	0.053	mg/Kg	0.04	<0.04	7/21/94	270.2&7740
Silver/GFAA	0.18	mg/Kg	0.04	<0.04	7/21/94	272.2&7761
Thallium/GFAA	0.038	mg/Kg	0.02	<0.02	7/22/94	279.2&7841
Zinc/ICP	19	mg/Kg	0.2	<0.2	7/29/94	6010 & 200.7

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

Report of Analysis-Volatile Organics (GC/MS)

Report #: 49837

Sample Name: BS001 BH 1-2 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Meth
Volatile organics-8240	—				7/19/94	8240
1,1,1-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2,2-tetrachloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,2-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichloropropane	<25	µg/Kg	25	<25	7/19/94	8240
1,3-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,4-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
2-butanone (MEK)	<500	µg/Kg	500	<500	7/19/94	8240
2-hexanone	<250	µg/Kg	250	<250	7/19/94	8240
4-methyl-2-pentanone (MIBK)	<250	µg/Kg	250	<250	7/19/94	8240
Acetone	<500	µg/Kg	500	<500	7/19/94	8240
Benzene	<25	µg/Kg	25	<25	7/19/94	8240
Bromodichloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Bromoform	<25	µg/Kg	25	<25	7/19/94	8240
Bromomethane	<50	µg/Kg	50	<50	7/19/94	8240
c-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Carbon disulfide	<25	µg/Kg	25	<25	7/19/94	8240
Carbon tetrachloride	<25	µg/Kg	25	<25	7/19/94	8240
Chlorobenzene	<25	µg/Kg	25	<25	7/19/94	8240
Chloroethane	<50	µg/Kg	50	<50	7/19/94	8240
Chloroform	<25	µg/Kg	25	<25	7/19/94	8240
Chloromethane	<50	µg/Kg	50	<50	7/19/94	8240
Dibromochloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Ethylbenzene	<25	µg/Kg	25	<25	7/19/94	8240
m,p-Xylenes	<25	µg/Kg	25	<25	7/19/94	8240
Methylene chloride	<25	µg/Kg	25	<25	7/19/94	8240
o-Xylene	<25	µg/Kg	25	<25	7/19/94	8240
Styrene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,2-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Tetrachloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Toluene	<25	µg/Kg	25	<25	7/19/94	8240
Trichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Vinyl chloride	<50	µg/Kg	50	<50	7/19/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 1

Report #: 49837

Sample Name: BS001 BH 1-2 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8270	—				7/26/94	625&8270
1,2,4-Trichlorobenzene	<400	µg/Kg	400	<400	7/26/94	625&8270
2,4,5-Trichloropenol	<400	µg/Kg	400	<400	7/26/94	625&8270
2,4,6-Trichlorophenol	<400	µg/Kg	400	<400	7/26/94	625&8270
2,4-Dichlorophenol	<400	µg/Kg	400	<400	7/26/94	625&8270
2,4-Dimethylphenol	<400	µg/Kg	400	<400	7/26/94	625&8270
2,4-Dinitrophenol	<2000	µg/Kg	2000	<2000	7/26/94	625&8270
2,4-Dinitrotoluene	<400	µg/Kg	400	<400	7/26/94	625&8270
2,6-Dinitrotoluene	<400	µg/Kg	400	<400	7/26/94	625&8270
2-Chloronaphthalene	<400	µg/Kg	400	<400	7/26/94	625&8270
2-Chlorophenol	<400	µg/Kg	400	<400	7/26/94	625&8270
2-Methylnaphthalene	<400	µg/Kg	400	<400	7/26/94	625&8270
2-Methylphenol (o-Cresol)	<400	µg/Kg	400	<400	7/26/94	625&8270
2-Nitroaniline	<2000	µg/Kg	2000	<2000	7/26/94	625&8270
2-Nitrophenol	<400	µg/Kg	400	<400	7/26/94	625&8270
3&4 Methylphenol (m&p-Cresol)	<400	µg/Kg	400	<400	7/26/94	625&8270
3,3'-Dichlorobenzidine	<800	µg/Kg	800	<800	7/26/94	625&8270
3-Nitroaniline	<2000	µg/Kg	2000	<2000	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 2

Report #: 49837

Sample Name: BS001 BH 1-2 1/2

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Methc
4,6-Dinitro-2-methylphenol	<2000	µg/Kg	2000	<2000	7/26/94	625&8270
4-Bromophenyl phenyl ether	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chloro-3-methylphenol(p-Chloro-m-cres	<800	µg/Kg	800	<800	7/26/94	625&8270
4-Chloroaniline (p-Chloroaniline)	<800	µg/Kg	800	<800	7/26/94	625&8270
4-Chlorophenyl phenyl ether	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Nitroaniline	<800	µg/Kg	800	<800	7/26/94	625&8270
4-Nitrophenol	<2000	µg/Kg	2000	<2000	7/26/94	625&8270
Acenaphthene	<400	µg/Kg	400	<400	7/26/94	625&8270
Acenaphthylene	<400	µg/Kg	400	<400	7/26/94	625&8270
Anthracene	<400	µg/Kg	400	<400	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics b

Report of Analysis-Extractable Organics (GC/MS)-page 3

Report #: 49837

Sample Name: BS001 BH 1-2 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Benzoic acid	<2000	µg/Kg	2000	<2000	7/26/94	625&8270
Benzo[a]anthracene	<400	µg/Kg	400	<400	7/26/94	625&8270
Benzo[a]pyrene	<400	µg/Kg	400	<400	7/26/94	625&8270
Benzo[b]fluoranthene	<400	µg/Kg	400	<400	7/26/94	625&8270
Benzo[g,h,i]perylene	<400	µg/Kg	400	<400	7/26/94	625&8270
Benzo[j,k]fluoranthene	<400	µg/Kg	400	<400	7/26/94	625&8270
Benzyl alcohol	<800	µg/Kg	800	<800	7/26/94	625&8270
bis(2-Chloroethoxy)methane	<400	µg/Kg	400	<400	7/26/94	625&8270
bis(2-Chloroethyl)ether	<400	µg/Kg	400	<400	7/26/94	625&8270
bis(2-chloroisopropyl)ether	<400	µg/Kg	400	<400	7/26/94	625&8270
bis(2-Ethylhexyl)phthalate	<400	µg/Kg	400	<400	7/26/94	625&8270
Butyl benzyl phthalate	<400	µg/Kg	400	<400	7/26/94	625&8270
Chrysene	<400	µg/Kg	400	<400	7/26/94	625&8270
Di-n-butyl phthalate (Dibutyl phthalate	1750	µg/Kg	400	<400	7/26/94	625&8270
Di-n-octylphthalate (Dioctyl phthalate)	<400	µg/Kg	400	<400	7/26/94	625&8270
Dibenzofuran	<400	µg/Kg	400	<400	7/26/94	625&8270
Dibenz[a,h]anthracene	<400	µg/Kg	400	<400	7/26/94	625&8270
Diethylphthalate	<400	µg/Kg	400	<400	7/26/94	625&8270
Dimethylphthalate	<400	µg/Kg	400	<400	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 4

Report #: 49837

Sample Name: BS001 BH 1-2 1/2

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Fluoranthene	<400	µg/Kg	400	<400	7/26/94	625&8270
Fluorene	<400	µg/Kg	400	<400	7/26/94	625&8270
Hexachlorobenzene	<400	µg/Kg	400	<400	7/26/94	625&8270
Hexachlorobutadiene	<400	µg/Kg	400	<400	7/26/94	625&8270
Hexachlorocyclopentadiene	<400	µg/Kg	400	<400	7/26/94	625&8270
Hexachloroethane	<400	µg/Kg	400	<400	7/26/94	625&8270
Indeno[1,2,3-cd]pyrene	<400	µg/Kg	400	<400	7/26/94	625&8270
Isophorone	<400	µg/Kg	400	<400	7/26/94	625&8270
N-Nitrosodi-n-propylamine	<400	µg/Kg	400	<400	7/26/94	625&8270
n-Nitrosodiphenylamine	<400	µg/Kg	400	<400	7/26/94	625&8270
Naphthalene	<400	µg/Kg	400	<400	7/26/94	625&8270
Nitrobenzene	<400	µg/Kg	400	<400	7/26/94	625&8270
Pentachlorophenol	<2000	µg/Kg	2000	<2000	7/26/94	625&8270
Phenanthrene	<400	µg/Kg	400	<400	7/26/94	625&8270
Phenol	<400	µg/Kg	400	<400	7/26/94	625&8270
Pyrene	<400	µg/Kg	400	<400	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Organics (GC & LC)

Report #: 49837

Sample Name: BS001 BH 1-2 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8080/PCB	—				7/27/94	
4,4'-DDD	<3.2	µg/Kg	3.2	<3.2	7/27/94	8080
4,4'-DDE	<3.2	µg/Kg	3.2	<3.2	7/27/94	8080
4,4'-DDT	<3.2	µg/Kg	3.2	<3.2	7/27/94	8080
Aldrin	<3.2	µg/Kg	3.2	<3.2	7/27/94	8080
alpha-BHC	<3.2	µg/Kg	3.2	<3.2	7/27/94	8080
alpha-Chlordane	<8	µg/Kg	8	<8	7/27/94	8080
beta-BHC	<3.2	µg/Kg	3.2	<3.2	7/27/94	8080
beta-Chlordane	<8	µg/Kg	8	<8	7/27/94	8080
delta-BHC	<3.2	µg/Kg	3.2	<3.2	7/27/94	8080
Dieldrin	<3.2	µg/Kg	3.2	<3.2	7/27/94	8080
Endosulfan I	<8	µg/Kg	8	<8	7/27/94	8080
Endosulfan II	<3.2	µg/Kg	3.2	<3.2	7/27/94	8080
Endosulfan sulfate	<8	µg/Kg	8	<8	7/27/94	8080
Endrin	<8	µg/Kg	8	<8	7/27/94	8080
Endrin aldehyde	<8	µg/Kg	8	<8	7/27/94	8080
Heptachlor	<3.2	µg/Kg	3.2	<3.2	7/27/94	8080
Heptachlor epoxide	<8	µg/Kg	8	<8	7/27/94	8080
Lindane	<3.2	µg/Kg	3.2	<3.2	7/27/94	8080
Methoxychlor	<32	µg/Kg	32	<32	7/27/94	8080
PCB, total	<32	µg/Kg	32	<32	7/27/94	8080
Toxaphene	<80	µg/Kg	80	<80	7/27/94	8080

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

AnalySys inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-4[illegible]6

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49838
Report Date: 8/22/94

Project Description: Seattle ANGS 1315-127
Sample Name: BS001 BH 5 1/2-7 **Matrix:** Soil
Date/Time Taken: 7/14/94 **Date/Time Received:** 7/15/94 4:20:00

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis-General Parameters

Report #: 49838

Sample Name: BS001 BH 5 1/2-7

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
A/BN Extraction-8080/PCB	—				7/19/94	3540
A/BN Extraction-8270	—				7/19/94	3540
Gross Alpha	0 +/- 18	pCi/g			7/21/94	DOE ESM4103
Gross Beta	4 +/- 36	pCi/g			7/21/94	DOE ESM4103
Metals dig.-Hg	—				7/20/94	7471
Metals dig.-HNO3	—				7/20/94	3051
TPH by GC (as diesel)	<50	mg/Kg	50	<50	8/2/94	8015 mod.
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	7/26/94	8015 mod.
TPH by HCID	See letter					
Antimony/GFAA	<0.06	mg/Kg	0.06	<0.06	7/22/94	204.2&7041
Arsenic/GFAA	1.6	mg/Kg	0.02	<0.02	7/21/94	206.2&7060
Beryllium/ICP	0.82	mg/Kg	0.1	<0.1	7/29/94	6010 & 200.7
Cadmium/GFAA	1.1	mg/Kg	0.2	<0.2	7/29/94	7131&213.2
Chromium/GFAA	11	mg/Kg	0.5	<0.5	7/29/94	7191&218.2
Copper/ICP	16	mg/Kg	1	<1	8/4/94	6010 & 200.7
Lead/GFAA	16	mg/Kg	1.5	<1.5	7/29/94	7421&239.2
Mercury/CVAA	<0.004	mg/Kg	0.004	<0.004	7/20/94	245.5&7471
Nickel/ICP	5.8	mg/Kg	1	<1	7/29/94	6010 & 200.7
Selenium/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	270.2&7740
Silver/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	272.2&7761
Thallium/GFAA	0.03	mg/Kg	0.02	<0.02	7/22/94	279.2&7841
Zinc/ICP	8.6	mg/Kg	0.2	<0.2	7/29/94	6010 & 200.7

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

Report of Analysis-Volatile Organics (GC/MS)

Report #: 49838

Sample Name: BS001 BH 5 1/2-7

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Meth
Volatile organics-8240	—				7/19/94	8240
1,1,1-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2,2-tetrachloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,2-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichloropropane	<25	µg/Kg	25	<25	7/19/94	8240
1,3-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,4-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
2-butanone (MEK)	<500	µg/Kg	500	<500	7/19/94	8240
2-hexanone	<250	µg/Kg	250	<250	7/19/94	8240
4-methyl-2-pentanone (MIBK)	<250	µg/Kg	250	<250	7/19/94	8240
Acetone	<500	µg/Kg	500	<500	7/19/94	8240
Benzene	<25	µg/Kg	25	<25	7/19/94	8240
Bromodichloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Bromoform	<25	µg/Kg	25	<25	7/19/94	8240
Bromomethane	<50	µg/Kg	50	<50	7/19/94	8240
c-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Carbon disulfide	<25	µg/Kg	25	<25	7/19/94	8240
Carbon tetrachloride	<25	µg/Kg	25	<25	7/19/94	8240
Chlorobenzene	<25	µg/Kg	25	<25	7/19/94	8240
Chloroethane	<50	µg/Kg	50	<50	7/19/94	8240
Chloroform	<25	µg/Kg	25	<25	7/19/94	8240
Chloromethane	<50	µg/Kg	50	<50	7/19/94	8240
Dibromochloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Ethylbenzene	<25	µg/Kg	25	<25	7/19/94	8240
m,p-Xylenes	<25	µg/Kg	25	<25	7/19/94	8240
Methylene chloride	<25	µg/Kg	25	<25	7/19/94	8240
o-Xylene	<25	µg/Kg	25	<25	7/19/94	8240
Styrene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,2-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Tetrachloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Toluene	<25	µg/Kg	25	<25	7/19/94	8240
Trichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Vinyl chloride	<50	µg/Kg	50	<50	7/19/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 1

Report #: 49838

Sample Name: BS001 BH 5 1/2-7

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8270	—				7/26/94	625&8270
1,2,4-Trichlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,5-Trichloropenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,6-Trichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dimethylphenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dinitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2,4-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,6-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chloronaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylnaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylphenol (o-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2-Nitrophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
3&4 Methylphenol (m&p-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
3,3'-Dichlorobenzidine	<400	µg/Kg	400	<400	7/26/94	625&8270
3-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 2

Report #: 49838

Sample Name: BS001 BH 5 1/2-7

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
4,6-Dinitro-2-methylphenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
4-Bromophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Chloro-3-methylphenol(p-Chloro-m-cres	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chloroaniline (p-Chloroaniline)	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chlorophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Nitroaniline	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Nitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Acenaphthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Acenaphthylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 3

Report #: 49838

Sample Name: BS001 BH 5 1/2-7

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Benzoic acid	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Benzo[a]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[a]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[b]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[g,h,i]perylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[j,k]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzyl alcohol	<400	µg/Kg	400	<400	7/26/94	625&8270
bis(2-Chloroethoxy)methane	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Chloroethyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-chloroisopropyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Ethylhexyl)phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Butyl benzyl phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Chrysene	<200	µg/Kg	200	<200	7/26/94	625&8270
Di-n-butyl phthalate (Dibutyl phthalate	1680	µg/Kg	200	<200	7/26/94	625&8270
Di-n-octylphthalate (Dioctyl phthalate)	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenzofuran	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenz[a,h]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Diethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Dimethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 4

Report #: 49838

Sample Name: BS001 BH 5 1/2-7

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Fluorene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobutadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorocyclopentadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachloroethane	<200	µg/Kg	200	<200	7/26/94	625&8270
Indeno[1,2,3-cd]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Isophorone	<200	µg/Kg	200	<200	7/26/94	625&8270
N-Nitrosodi-n-propylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
n-Nitrosodiphenylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
Naphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
Nitrobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Pentachlorophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Phenanthrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Phenol	<200	µg/Kg	200	<200	7/26/94	625&8270
Pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Organics (GC & LC)

Report #: 49838

Sample Name: BS001 BH 5 1/2-7

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8080/PCB	—				7/27/94	
4,4'-DDD	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
4,4'-DDE	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
4,4'-DDT	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Aldrin	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
alpha-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
alpha-Chlordane	<1	µg/Kg	1	<1	7/27/94	8080
beta-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
beta-Chlordane	<1	µg/Kg	1	<1	7/27/94	8080
delta-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Dieldrin	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Endosulfan I	<1	µg/Kg	1	<1	7/27/94	8080
Endosulfan II	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Endosulfan sulfate	<1	µg/Kg	1	<1	7/27/94	8080
Endrin	<1	µg/Kg	1	<1	7/27/94	8080
Endrin aldehyde	<1	µg/Kg	1	<1	7/27/94	8080
Heptachlor	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Heptachlor epoxide	<1	µg/Kg	1	<1	7/27/94	8080
Lindane	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Methoxychlor	<4	µg/Kg	4	<4	7/27/94	8080
PCB, total	<4	µg/Kg	4	<4	7/27/94	8080
Toxaphene	<10	µg/Kg	10	<10	7/27/94	8080

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-47

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49839
Report Date: 8/22/94

Project Description: Seattle ANGS 1315-127
Sample Name: BS001 BH 8 1/2-10 **Matrix:** Soil
Date/Time Taken: 7/14/94 **Date/Time Received:** 7/15/94 4:20:00

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis-General Parameters

Report #: 49839

Sample Name: BS001 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
A/BN Extraction-8080/PCB	—				7/19/94	3540
A/BN Extraction-8270	—				7/19/94	3540
Gross Alpha	0 +/- 20	pCi/g			7/21/94	DOE ESM4103
Gross Beta	0 +/- 24	pCi/g			7/21/94	DOE ESM4103
Metals dig.-Hg	—				7/20/94	7471
Metals dig.-HNO3	—				7/20/94	3051
TPH by GC (as diesel)	<50	mg/Kg	50	<50	8/2/94	8015 mod.
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	7/26/94	8015 mod.
TPH by HCID	See letter					
Antimony/GFAA	<0.06	mg/Kg	0.06	<0.06	7/22/94	204.2&7041
Arsenic/GFAA	0.033	mg/Kg	0.02	<0.02	7/21/94	206.2&7060
Beryllium/ICP	0.29	mg/Kg	0.1	<0.1	7/29/94	6010 & 200.7
Cadmium/GFAA	0.66	mg/Kg	0.2	<0.2	7/29/94	7131&213.2
Chromium/GFAA	7.9	mg/Kg	0.5	<0.5	7/29/94	7191&218.2
Copper/ICP	9.3	mg/Kg	1	<1	8/4/94	6010 & 200.7
Lead/GFAA	9.7	mg/Kg	1.5	<1.5	7/29/94	7421&239.2
Mercury/CVAA	<0.004	mg/Kg	0.004	<0.004	7/20/94	245.5&7471
Nickel/ICP	5.6	mg/Kg	1	<1	7/29/94	6010 & 200.7
Selenium/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	270.2&7740
Silver/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	272.2&7761
Thallium/GFAA	<0.02	mg/Kg	0.02	<0.02	7/22/94	279.2&7841
Zinc/ICP	14	mg/Kg	0.2	<0.2	7/29/94	6010 & 200.7

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

Report of Analysis-Volatile Organics (GC/MS)

Report #: 49839

Sample Name: BS001 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Metho
Volatile organics-8240	—				7/19/94	8240
1,1,1-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2,2-tetrachloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,2-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichloropropane	<25	µg/Kg	25	<25	7/19/94	8240
1,3-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,4-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
2-butanone (MEK)	<500	µg/Kg	500	<500	7/19/94	8240
2-hexanone	<250	µg/Kg	250	<250	7/19/94	8240
4-methyl-2-pentanone (MIBK)	<250	µg/Kg	250	<250	7/19/94	8240
Acetone	<500	µg/Kg	500	<500	7/19/94	8240
Benzene	<25	µg/Kg	25	<25	7/19/94	8240
Bromodichloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Bromoform	<25	µg/Kg	25	<25	7/19/94	8240
Bromomethane	<50	µg/Kg	50	<50	7/19/94	8240
c-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Carbon disulfide	<25	µg/Kg	25	<25	7/19/94	8240
Carbon tetrachloride	<25	µg/Kg	25	<25	7/19/94	8240
Chlorobenzene	<25	µg/Kg	25	<25	7/19/94	8240
Chloroethane	<50	µg/Kg	50	<50	7/19/94	8240
Chloroform	<25	µg/Kg	25	<25	7/19/94	8240
Chloromethane	<50	µg/Kg	50	<50	7/19/94	8240
Dibromochloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Ethylbenzene	<25	µg/Kg	25	<25	7/19/94	8240
m,p-Xylenes	<25	µg/Kg	25	<25	7/19/94	8240
Methylene chloride	<25	µg/Kg	25	<25	7/19/94	8240
o-Xylene	<25	µg/Kg	25	<25	7/19/94	8240
Styrene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,2-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Tetrachloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Toluene	<25	µg/Kg	25	<25	7/19/94	8240
Trichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Vinyl chloride	<50	µg/Kg	50	<50	7/19/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 1

Report #: 49839

Sample Name: BS001 BH 8 1/2-10

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8270	—				7/26/94	625&8270
1,2,4-Trichlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,5-Trichloropenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,6-Trichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dimethylphenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dinitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2,4-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,6-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chloronaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylnaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylphenol (o-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2-Nitrophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
3&4 Methylphenol (m&p-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
3,3'-Dichlorobenzidine	<400	µg/Kg	400	<400	7/26/94	625&8270
3-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 2

Report #: 49839

Sample Name: BS001 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
4,6-Dinitro-2-methylphenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
4-Bromophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Chloro-3-methylphenol(p-Chloro-m-cres	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chloroaniline (p-Chloroaniline)	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chlorophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Nitroaniline	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Nitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Acenaphthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Acenaphthylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 3

Report #: 49839

Sample Name: BS001 BH 8 1/2-10

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Benzoic acid	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Benzo[a]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[a]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[b]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[g,h,i]perylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[j,k]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzyl alcohol	<400	µg/Kg	400	<400	7/26/94	625&8270
bis(2-Chloroethoxy)methane	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Chloroethyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-chloroisopropyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Ethylhexyl)phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Butyl benzyl phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Chrysene	<200	µg/Kg	200	<200	7/26/94	625&8270
Di-n-butyl phthalate (Dibutyl phthalate	1590	µg/Kg	200	<200	7/26/94	625&8270
Di-n-octylphthalate (Dioctyl phthalate)	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenzofuran	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenz[a,h]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Diethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Dimethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 4

Report #: 49839

Sample Name: BS001 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Fluorene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobutadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorocyclopentadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachloroethane	<200	µg/Kg	200	<200	7/26/94	625&8270
Indeno[1,2,3-cd]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Isophorone	<200	µg/Kg	200	<200	7/26/94	625&8270
N-Nitrosodi-n-propylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
n-Nitrosodiphenylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
Naphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
Nitrobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Pentachlorophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Phenanthrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Phenol	<200	µg/Kg	200	<200	7/26/94	625&8270
Pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Organics (GC & LC)

Report #: 49839

Sample Name: BS001 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8080/PCB	—				7/27/94	
4,4'-DDD	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
4,4'-DDE	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
4,4'-DDT	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Aldrin	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
alpha-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
alpha-Chlordane	<1	µg/Kg	1	<1	7/27/94	8080
beta-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
beta-Chlordane	<1	µg/Kg	1	<1	7/27/94	8080
delta-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Dieldrin	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Endosulfan I	<1	µg/Kg	1	<1	7/27/94	8080
Endosulfan II	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Endosulfan sulfate	<1	µg/Kg	1	<1	7/27/94	8080
Endrin	<1	µg/Kg	1	<1	7/27/94	8080
Endrin aldehyde	<1	µg/Kg	1	<1	7/27/94	8080
Heptachlor	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Heptachlor epoxide	<1	µg/Kg	1	<1	7/27/94	8080
Lindane	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Methoxychlor	<4	µg/Kg	4	<4	7/27/94	8080
PCB, total	<4	µg/Kg	4	<4	7/27/94	8080
Toxaphene	<10	µg/Kg	10	<10	7/27/94	8080

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-47

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49840
Report Date: 8/22/94

Project Description: Seattle ANGS 1315-127
Sample Name: BS002 BH 1-2 1/2 **Matrix:** Soil
Date/Time Taken: 7/14/94 **Date/Time Received:** 7/15/94 4:20:00

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis-General Parameters

Report #: 49840

Sample Name: BS002 BH 1-2 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
A/BN Extraction-8080/PCB	—				7/19/94	3540
A/BN Extraction-8270	—				7/19/94	3540
Gross Alpha	2 +/- 25	pCi/g			7/21/94	DOE ESM4103
Gross Beta	3 +/- 37	pCi/g			7/21/94	DOE ESM4103
Metals dig.-Hg	—				7/20/94	7471
Metals dig.-HNO3	—				7/20/94	3051
TPH by GC (as diesel)	<50	mg/Kg	50	<50	8/2/94	8015 mod.
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	7/26/94	8015 mod.
TPH by HCID	See letter					
Antimony/GFAA	<0.06	mg/Kg	0.06	<0.06	7/22/94	204.2&7041
Arsenic/GFAA	2.7	mg/Kg	0.02	<0.02	7/21/94	206.2&7060
Beryllium/ICP	0.87	mg/Kg	0.1	<0.1	7/29/94	6010 & 200.7
Cadmium/GFAA	1.3	mg/Kg	0.2	<0.2	7/29/94	7131&213.2
Chromium/GFAA	10	mg/Kg	0.5	<0.5	7/29/94	7191&218.2
Copper/ICP	23	mg/Kg	1	<1	8/4/94	6010 & 200.7
Lead/GFAA	28	mg/Kg	1.5	<1.5	7/29/94	7421&239.2
Mercury/CVAA	<0.004	mg/Kg	0.004	<0.004	7/20/94	245.5&7471
Nickel/ICP	9.3	mg/Kg	1	<1	7/29/94	6010 & 200.7
Selenium/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	270.2&7740
Silver/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	272.2&7761
Thallium/GFAA	0.024	mg/Kg	0.02	<0.02	7/22/94	279.2&7841
Zinc/ICP	31	mg/Kg	0.2	<0.2	7/29/94	6010 & 200.7

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

Report of Analysis-Volatile Organics (GC/MS)

Report #: 49840

Sample Name: BS002 BH 1-2 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Volatile organics-8240	—				7/19/94	8240
1,1,1-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2,2-tetrachloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,2-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichloropropane	<25	µg/Kg	25	<25	7/19/94	8240
1,3-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,4-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
2-butanone (MEK)	<500	µg/Kg	500	<500	7/19/94	8240
2-hexanone	<250	µg/Kg	250	<250	7/19/94	8240
4-methyl-2-pentanone (MIBK)	<250	µg/Kg	250	<250	7/19/94	8240
Acetone	<500	µg/Kg	500	<500	7/19/94	8240
Benzene	<25	µg/Kg	25	<25	7/19/94	8240
Bromodichloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Bromoform	<25	µg/Kg	25	<25	7/19/94	8240
Bromomethane	<50	µg/Kg	50	<50	7/19/94	8240
c-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Carbon disulfide	<25	µg/Kg	25	<25	7/19/94	8240
Carbon tetrachloride	<25	µg/Kg	25	<25	7/19/94	8240
Chlorobenzene	<25	µg/Kg	25	<25	7/19/94	8240
Chloroethane	<50	µg/Kg	50	<50	7/19/94	8240
Chloroform	<25	µg/Kg	25	<25	7/19/94	8240
Chloromethane	<50	µg/Kg	50	<50	7/19/94	8240
Dibromochloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Ethylbenzene	<25	µg/Kg	25	<25	7/19/94	8240
m,p-Xylenes	<25	µg/Kg	25	<25	7/19/94	8240
Methylene chloride	<25	µg/Kg	25	<25	7/19/94	8240
o-Xylene	<25	µg/Kg	25	<25	7/19/94	8240
Styrene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,2-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Tetrachloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Toluene	<25	µg/Kg	25	<25	7/19/94	8240
Trichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Vinyl chloride	<50	µg/Kg	50	<50	7/19/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 1

Report #: 49840

Sample Name: BS002 BH 1-2 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8270	—				7/26/94	625&8270
1,2,4-Trichlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,5-Trichloropenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,6-Trichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dimethylphenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dinitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2,4-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,6-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chloronaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylnaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylphenol (o-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2-Nitrophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
3&4 Methylphenol (m&p-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
3,3'-Dichlorobenzidine	<400	µg/Kg	400	<400	7/26/94	625&8270
3-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 2

Report #: 49840

Sample Name: BS002 BH 1-2 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
4,6-Dinitro-2-methylphenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
4-Bromophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Chloro-3-methylphenol(p-Chloro-m-cres	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chloroaniline (p-Chloroaniline)	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chlorophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Nitroaniline	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Nitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Acenaphthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Acenaphthylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 3

Report #: 49840

Sample Name: BS002 BH 1-2 1/2

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Benzoic acid	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Benzo[a]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[a]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[b]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[g,h,i]perylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[j,k]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzyl alcohol	<400	µg/Kg	400	<400	7/26/94	625&8270
bis(2-Chloroethoxy)methane	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Chloroethyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-chloroisopropyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Ethylhexyl)phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Butyl benzyl phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Chrysene	<200	µg/Kg	200	<200	7/26/94	625&8270
Di-n-butyl phthalate (Dibutyl phthalate	1640	µg/Kg	200	<200	7/26/94	625&8270
Di-n-octylphthalate (Dioctyl phthalate)	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenzofuran	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenz[a,h]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Diethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Dimethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 4

Report #: 49840

Sample Name: BS002 BH 1-2 1/2

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Fluorene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobutadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorocyclopentadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachloroethane	<200	µg/Kg	200	<200	7/26/94	625&8270
Indeno[1,2,3-cd]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Isophorone	<200	µg/Kg	200	<200	7/26/94	625&8270
N-Nitrosodi-n-propylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
n-Niurosodiphenylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
Naphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
Nitrobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Pentachlorophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Phenanthrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Phenol	<200	µg/Kg	200	<200	7/26/94	625&8270
Pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Organics (GC & LC)

Report #: 49840

Sample Name: BS002 BH 1-2 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8080/PCB	—				7/27/94	
4,4'-DDD	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
4,4'-DDE	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
4,4'-DDT	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Aldrin	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
alpha-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
alpha-Chlordane	<1	µg/Kg	1	<1	7/27/94	8080
beta-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
beta-Chlordane	<1	µg/Kg	1	<1	7/27/94	8080
delta-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Dieldrin	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Endosulfan I	<1	µg/Kg	1	<1	7/27/94	8080
Endosulfan II	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Endosulfan sulfate	<1	µg/Kg	1	<1	7/27/94	8080
Endrin	<1	µg/Kg	1	<1	7/27/94	8080
Endrin aldehyde	<1	µg/Kg	1	<1	7/27/94	8080
Heptachlor	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Heptachlor epoxide	<1	µg/Kg	1	<1	7/27/94	8080
Lindane	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Methoxychlor	<4	µg/Kg	4	<4	7/27/94	8080
PCB, total	<4	µg/Kg	4	<4	7/27/94	8080
Toxaphene	<10	µg/Kg	10	<10	7/27/94	8080

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-476

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49841
Report Date: 8/22/94

Project Description: Seattle ANGS 1315-127
Sample Name: BS002 BH 5 1/2-7 **Matrix:** Soil
Date/Time Taken: 7/14/94 **Date/Time Received:** 7/15/94 4:20:00

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis-General Parameters

Report #: 49841

Sample Name: BS002 BH 5 1/2-7

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
A/BN Extraction-8080/PCB	—				7/19/94	3540
A/BN Extraction-8270	—				7/19/94	3540
Gross Alpha	2 +/- 25	pCi/g			7/21/94	DOE ESM4103
Gross Beta	0 +/- 36	pCi/g			7/21/94	DOE ESM4103
Metals dig.-Hg	—				7/20/94	7471
Metals dig.-HNO3	—				7/20/94	3051
TPH by GC (as diesel)	<50	mg/Kg	50	<50	8/2/94	8015 mod.
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	7/26/94	8015 mod.
TPH by HCID	See letter					
Antimony/GFAA	<0.06	mg/Kg	0.06	<0.06	7/22/94	204.2&7041
Arsenic/GFAA	1.1	mg/Kg	0.02	<0.02	7/21/94	206.2&7060
Beryllium/ICP	0.49	mg/Kg	0.1	<0.1	7/29/94	6010 & 200.7
Cadmium/GFAA	0.92	mg/Kg	0.2	<0.2	7/29/94	7131&213.2
Chromium/GFAA	14	mg/Kg	0.5	<0.5	7/29/94	7191&218.2
Copper/ICP	23	mg/Kg	1	<1	8/4/94	6010 & 200.7
Lead/GFAA	15	mg/Kg	1.5	<1.5	7/29/94	7421&239.2
Mercury/CVAA	<0.004	mg/Kg	0.004	<0.004	7/20/94	245.5&7471
Nickel/ICP	6.2	mg/Kg	1	<1	7/29/94	6010 & 200.7
Selenium/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	270.2&7740
Silver/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	272.2&7761
Thallium/GFAA	0.054	mg/Kg	0.02	<0.02	7/22/94	279.2&7841
Zinc/ICP	16	mg/Kg	0.2	<0.2	7/29/94	6010 & 200.7

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

Report of Analysis-Volatile Organics (GC/MS)

Report #: 49841

Sample Name: BS002 BH 5 1/2-7

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Volatile organics-8240	—				7/19/94	8240
1,1,1-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2,2-tetrachloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,2-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichloropropane	<25	µg/Kg	25	<25	7/19/94	8240
1,3-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,4-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
2-butanone (MEK)	<500	µg/Kg	500	<500	7/19/94	8240
2-hexanone	<250	µg/Kg	250	<250	7/19/94	8240
4-methyl-2-pentanone (MIBK)	<250	µg/Kg	250	<250	7/19/94	8240
Acetone	<500	µg/Kg	500	<500	7/19/94	8240
Benzene	<25	µg/Kg	25	<25	7/19/94	8240
Bromodichloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Bromoform	<25	µg/Kg	25	<25	7/19/94	8240
Bromomethane	<50	µg/Kg	50	<50	7/19/94	8240
c-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Carbon disulfide	<25	µg/Kg	25	<25	7/19/94	8240
Carbon tetrachloride	<25	µg/Kg	25	<25	7/19/94	8240
Chlorobenzene	<25	µg/Kg	25	<25	7/19/94	8240
Chloroethane	<50	µg/Kg	50	<50	7/19/94	8240
Chloroform	<25	µg/Kg	25	<25	7/19/94	8240
Chloromethane	<50	µg/Kg	50	<50	7/19/94	8240
Dibromochloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Ethylbenzene	<25	µg/Kg	25	<25	7/19/94	8240
m,p-Xylenes	<25	µg/Kg	25	<25	7/19/94	8240
Methylene chloride	<25	µg/Kg	25	<25	7/19/94	8240
o-Xylene	<25	µg/Kg	25	<25	7/19/94	8240
Styrene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,2-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Tetrachloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Toluene	<25	µg/Kg	25	<25	7/19/94	8240
Trichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Vinyl chloride	<50	µg/Kg	50	<50	7/19/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 1

Report #: 49841

Sample Name: BS002 BH 5 1/2-7

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8270	—				7/26/94	625&8270
1,2,4-Trichlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,5-Trichloropenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,6-Trichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dimethylphenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dinitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2,4-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,6-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chloronaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylnaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylphenol (o-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2-Nitrophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
3&4 Methylphenol (m&p-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
3,3'-Dichlorobenzidine	<400	µg/Kg	400	<400	7/26/94	625&8270
3-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 2

Report #: 49841

Sample Name: BS002 BH 5 1/2-7

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
4,6-Dinitro-2-methylphenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
4-Bromophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Chloro-3-methylphenol(p-Chloro-m-cres	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chloroaniline (p-Chloroaniline)	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chlorophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Nitroaniline	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Nitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Acenaphthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Acenaphthylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 3

Report #: 49841

Sample Name: BS002 BH 5 1/2-7

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Benzoic acid	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Benzo[a]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[a]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[b]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[g,h,i]perylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[j,k]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzyl alcohol	<400	µg/Kg	400	<400	7/26/94	625&8270
bis(2-Chloroethoxy)methane	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Chloroethyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-chloroisopropyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Ethylhexyl)phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Butyl benzyl phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Chrysene	<200	µg/Kg	200	<200	7/26/94	625&8270
Di-n-butyl phthalate (Dibutyl phthalate	900	µg/Kg	200	<200	7/26/94	625&8270
Di-n-octylphthalate (Dioctyl phthalate)	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenzofuran	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenz[a,h]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Diethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Dimethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 4

Report #: 49841

Sample Name: BS002 BH 5 1/2-7

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Fluorene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobutadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorocyclopentadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachloroethane	<200	µg/Kg	200	<200	7/26/94	625&8270
Indeno[1,2,3-cd]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Isophorone	<200	µg/Kg	200	<200	7/26/94	625&8270
N-Nitrosodi-n-propylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
n-Nitrosodiphenylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
Naphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
Nitrobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Pentachlorophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Phenanthrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Phenol	<200	µg/Kg	200	<200	7/26/94	625&8270
Pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Organics (GC & LC)

Report #: 49841

Sample Name: BS002 BH 5 1/2-7

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8080/PCB	—				7/27/94	
4,4'-DDD	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
4,4'-DDE	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
4,4'-DDT	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Aldrin	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
alpha-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
alpha-Chlordane	<1	µg/Kg	1	<1	7/27/94	8080
beta-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
beta-Chlordane	<1	µg/Kg	1	<1	7/27/94	8080
delta-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Dieldrin	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Endosulfan I	<1	µg/Kg	1	<1	7/27/94	8080
Endosulfan II	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Endosulfan sulfate	<1	µg/Kg	1	<1	7/27/94	8080
Endrin	<1	µg/Kg	1	<1	7/27/94	8080
Endrin aldehyde	<1	µg/Kg	1	<1	7/27/94	8080
Heptachlor	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Heptachlor epoxide	<1	µg/Kg	1	<1	7/27/94	8080
Lindane	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Methoxychlor	<4	µg/Kg	4	<4	7/27/94	8080
PCB, total	<4	µg/Kg	4	<4	7/27/94	8080
Toxaphene	<10	µg/Kg	10	<10	7/27/94	8080

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-476

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49842
Report Date: 8/22/94

Project Description: Seattle ANGS 1315-127
Sample Name: BS002 BH 8 1/2-10 **Matrix:** Soil
Date/Time Taken: 7/14/94 **Date/Time Received:** 7/15/94 4:20:00

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis-General Parameters

Report #: 49842

Sample Name: BS002 BH 8 1/2-10

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
A/BN Extraction-8080/PCB	—				7/19/94	3540
A/BN Extraction-8270	—				7/19/94	3540
Gross Alpha	2 +/- 25	pCi/g			7/21/94	DOE ESM4103
Gross Beta	0 +/- 34	pCi/g			7/21/94	DOE ESM4103
Metals dig.-Hg	—				7/20/94	7471
Metals dig.-HNO3	—				7/20/94	3051
TPH by GC (as diesel)	<50	mg/Kg	50	<50	8/2/94	8015 mod.
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	7/26/94	8015 mod.
TPH by HCID	See letter					
Antimony/GFAA	<0.06	mg/Kg	0.06	<0.06	7/22/94	204.2&7041
Arsenic/GFAA	0.63	mg/Kg	0.02	<0.02	7/21/94	206.2&7060
Beryllium/ICP	0.34	mg/Kg	0.1	<0.1	7/29/94	6010 & 200.7
Cadmium/GFAA	0.75	mg/Kg	0.2	<0.2	7/29/94	7131&213.2
Chromium/GFAA	9.3	mg/Kg	0.5	<0.5	7/29/94	7191&218.2
Copper/ICP	7.5	mg/Kg	1	<1	8/4/94	6010 & 200.7
Lead/GFAA	10	mg/Kg	1.5	<1.5	7/29/94	7421&239.2
Mercury/CVAA	<0.004	mg/Kg	0.004	<0.004	7/20/94	245.5&7471
Nickel/ICP	7.2	mg/Kg	1	<1	7/29/94	6010 & 200.7
Selenium/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	270.2&7740
Silver/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	272.2&7761
Thallium/GFAA	<0.02	mg/Kg	0.02	<0.02	7/22/94	279.2&7841
Zinc/ICP	20	mg/Kg	0.2	<0.2	7/29/94	6010 & 200.7

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

Report of Analysis-Volatile Organics (GC/MS)

Report #: 49842

Sample Name: BS002 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Volatile organics-8240	—				7/19/94	8240
1,1,1-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2,2-tetrachloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,2-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichloropropane	<25	µg/Kg	25	<25	7/19/94	8240
1,3-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,4-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
2-butanone (MEK)	<500	µg/Kg	500	<500	7/19/94	8240
2-hexanone	<250	µg/Kg	250	<250	7/19/94	8240
4-methyl-2-pentanone (MIBK)	<250	µg/Kg	250	<250	7/19/94	8240
Acetone	<500	µg/Kg	500	<500	7/19/94	8240
Benzene	<25	µg/Kg	25	<25	7/19/94	8240
Bromodichloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Bromoform	<25	µg/Kg	25	<25	7/19/94	8240
Bromomethane	<50	µg/Kg	50	<50	7/19/94	8240
c-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Carbon disulfide	<25	µg/Kg	25	<25	7/19/94	8240
Carbon tetrachloride	<25	µg/Kg	25	<25	7/19/94	8240
Chlorobenzene	<25	µg/Kg	25	<25	7/19/94	8240
Chloroethane	<50	µg/Kg	50	<50	7/19/94	8240
Chloroform	<25	µg/Kg	25	<25	7/19/94	8240
Chloromethane	<50	µg/Kg	50	<50	7/19/94	8240
Dibromochloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Ethylbenzene	<25	µg/Kg	25	<25	7/19/94	8240
m,p-Xylenes	<25	µg/Kg	25	<25	7/19/94	8240
Methylene chloride	<25	µg/Kg	25	<25	7/19/94	8240
o-Xylene	<25	µg/Kg	25	<25	7/19/94	8240
Styrene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,2-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Tetrachloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Toluene	<25	µg/Kg	25	<25	7/19/94	8240
Trichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Vinyl chloride	<50	µg/Kg	50	<50	7/19/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 1

Report #: 49842

Sample Name: BS002 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8270	—				7/26/94	625&8270
1,2,4-Trichlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,5-Trichloropenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,6-Trichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dimethylphenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dinitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2,4-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,6-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chloronaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylnaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylphenol (o-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2-Nitrophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
3&4 Methylphenol (m&p-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
3,3'-Dichlorobenzidine	<400	µg/Kg	400	<400	7/26/94	625&8270
3-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 2

Report #: 49842

Sample Name: BS002 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
4,6-Dinitro-2-methylphenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
4-Bromophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Chloro-3-methylphenol(p-Chloro-m-cres	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chloroaniline (p-Chloroaniline)	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chlorophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Nitroaniline	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Nitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Acenaphthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Acenaphthylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 3

Report #: 49842

Sample Name: BS002 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Benzoic acid	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Benzo[a]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[a]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[b]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[g,h,i]perylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[j,k]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzyl alcohol	<400	µg/Kg	400	<400	7/26/94	625&8270
bis(2-Chloroethoxy)methane	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Chloroethyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-chloroisopropyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Ethylhexyl)phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Butyl benzyl phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Chrysene	<200	µg/Kg	200	<200	7/26/94	625&8270
Di-n-butyl phthalate (Dibutyl phthalate	1960	µg/Kg	200	<200	7/26/94	625&8270
Di-n-octylphthalate (Dioctyl phthalate)	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenzofuran	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenz[a,h]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Diethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Dimethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 4

Report #: 49842

Sample Name: BS002 BH 8 1/2-10

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Fluorene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobutadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorocyclopentadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachloroethane	<200	µg/Kg	200	<200	7/26/94	625&8270
Indeno[1,2,3-cd]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Isophorone	<200	µg/Kg	200	<200	7/26/94	625&8270
N-Nitrosodi-n-propylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
n-Nitrosodiphenylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
Naphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
Nitrobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Pentachlorophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Phenanthrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Phenol	<200	µg/Kg	200	<200	7/26/94	625&8270
Pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Organics (GC & LC)

Report #: 49842

Sample Name: BS002 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8080/PCB	—				7/27/94	
4,4'-DDD	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
4,4'-DDE	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
4,4'-DDT	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Aldrin	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
alpha-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
alpha-Chlordane	<1	µg/Kg	1	<1	7/27/94	8080
beta-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
beta-Chlordane	<1	µg/Kg	1	<1	7/27/94	8080
delta-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Dieldrin	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Endosulfan I	<1	µg/Kg	1	<1	7/27/94	8080
Endosulfan II	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Endosulfan sulfate	<1	µg/Kg	1	<1	7/27/94	8080
Endrin	<1	µg/Kg	1	<1	7/27/94	8080
Endrin aldehyde	<1	µg/Kg	1	<1	7/27/94	8080
Heptachlor	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Heptachlor epoxide	<1	µg/Kg	1	<1	7/27/94	8080
Lindane	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Methoxychlor	<4	µg/Kg	4	<4	7/27/94	8080
PCB, total	<4	µg/Kg	4	<4	7/27/94	8080
Toxaphene	<10	µg/Kg	10	<10	7/27/94	8080

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-4766

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49843
Report Date: 8/22/94

Project Description: Seattle ANGS 1315-127
Sample Name: BS003 BH 2-3 1/2 **Matrix:** Soil
Date/Time Taken: 7/14/94 **Date/Time Received:** 7/15/94 4:20:00

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis-General Parameters

Report #: 49843

Sample Name: BS003 BH 2-3 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
A/BN Extraction-8080/PCB	—				7/19/94	3540
A/BN Extraction-8270	—				7/19/94	3540
Gross Alpha	2 +/- 20	pCi/g			7/21/94	DOE ESM4103
Gross Beta	2 +/- 30	pCi/g			7/21/94	DOE ESM4103
Metals dig.-Hg	—				7/20/94	7471
Metals dig.-HNO3	—				7/20/94	3051
Petroleum hydrocarbons	780	mg/Kg	10	<10	8/9/94	418.1
TPH by GC (as diesel)	<50	mg/Kg	50	<50	8/2/94	8015 mod.
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	7/26/94	8015 mod.
TPH by HCID	See letter					
Antimony/GFAA	<0.06	mg/Kg	0.06	<0.06	7/22/94	204.2&7041
Arsenic/GFAA	4.1	mg/Kg	0.02	<0.02	7/21/94	206.2&7060
Beryllium/ICP	1	mg/Kg	0.1	<0.1	7/29/94	6010 & 200.7
Cadmium/GFAA	1.3	mg/Kg	0.2	<0.2	7/29/94	7131&213.2
Chromium/GFAA	11	mg/Kg	0.5	<0.5	7/29/94	7191&218.2
Copper/ICP	20	mg/Kg	1	<1	8/4/94	6010 & 200.7
Lead/GFAA	27	mg/Kg	1.5	<1.5	7/29/94	7421&239.2
Mercury/CVAA	<0.004	mg/Kg	0.004	<0.004	7/20/94	245.5&7471
Nickel/ICP	8.6	mg/Kg	1	<1	7/29/94	6010 & 200.7
Selenium/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	270.2&7740
Silver/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	272.2&7761
Thallium/GFAA	0.053	mg/Kg	0.02	<0.02	7/22/94	279.2&7841
Zinc/ICP	19	mg/Kg	0.2	<0.2	7/29/94	6010 & 200.7

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

Report of Analysis-Volatile Organics (GC/MS)

Report #: 49843

Sample Name: BS003 BH 2-3 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Volatile organics-8240	—				7/19/94	8240
1,1,1-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2,2-tetrachloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1,2-trichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,1-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,2-dichloroethane	<25	µg/Kg	25	<25	7/19/94	8240
1,2-dichloropropane	<25	µg/Kg	25	<25	7/19/94	8240
1,3-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
1,4-dichlorobenzene	<50	µg/Kg	50	<50	7/19/94	8240
2-butanone (MEK)	<500	µg/Kg	500	<500	7/19/94	8240
2-hexanone	<250	µg/Kg	250	<250	7/19/94	8240
4-methyl-2-pentanone (MIBK)	<250	µg/Kg	250	<250	7/19/94	8240
Acetone	<500	µg/Kg	500	<500	7/19/94	8240
Benzene	<25	µg/Kg	25	<25	7/19/94	8240
Bromodichloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Bromoform	<25	µg/Kg	25	<25	7/19/94	8240
Bromomethane	<50	µg/Kg	50	<50	7/19/94	8240
c-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Carbon disulfide	<25	µg/Kg	25	<25	7/19/94	8240
Carbon tetrachloride	<25	µg/Kg	25	<25	7/19/94	8240
Chlorobenzene	<25	µg/Kg	25	<25	7/19/94	8240
Chloroethane	<50	µg/Kg	50	<50	7/19/94	8240
Chloroform	<25	µg/Kg	25	<25	7/19/94	8240
Chloromethane	<50	µg/Kg	50	<50	7/19/94	8240
Dibromochloromethane	<25	µg/Kg	25	<25	7/19/94	8240
Ethylbenzene	<25	µg/Kg	25	<25	7/19/94	8240
m,p-Xylenes	<25	µg/Kg	25	<25	7/19/94	8240
Methylene chloride	<25	µg/Kg	25	<25	7/19/94	8240
o-Xylene	<25	µg/Kg	25	<25	7/19/94	8240
Styrene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,2-dichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
t-1,3-dichloropropene	<25	µg/Kg	25	<25	7/19/94	8240
Tetrachloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Toluene	<25	µg/Kg	25	<25	7/19/94	8240
Trichloroethene	<25	µg/Kg	25	<25	7/19/94	8240
Vinyl chloride	<50	µg/Kg	50	<50	7/19/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 1

Report #: 49843

Sample Name: BS003 BH 2-3 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8270	—				7/27/94	625&8270
1,2,4-Trichlorobenzene	<400	µg/Kg	400	<400	7/27/94	625&8270
2,4,5-Trichloropenol	<400	µg/Kg	400	<400	7/27/94	625&8270
2,4,6-Trichlorophenol	<400	µg/Kg	400	<400	7/27/94	625&8270
2,4-Dichlorophenol	<400	µg/Kg	400	<400	7/27/94	625&8270
2,4-Dimethylphenol	<400	µg/Kg	400	<400	7/27/94	625&8270
2,4-Dinitrophenol	<2000	µg/Kg	2000	<2000	7/27/94	625&8270
2,4-Dinitrotoluene	<400	µg/Kg	400	<400	7/27/94	625&8270
2,6-Dinitrotoluene	<400	µg/Kg	400	<400	7/27/94	625&8270
2-Chloronaphthalene	<400	µg/Kg	400	<400	7/27/94	625&8270
2-Chlorophenol	<400	µg/Kg	400	<400	7/27/94	625&8270
2-Methylnaphthalene	<400	µg/Kg	400	<400	7/27/94	625&8270
2-Methylphenol (o-Cresol)	<400	µg/Kg	400	<400	7/27/94	625&8270
2-Nitroaniline	<2000	µg/Kg	2000	<2000	7/27/94	625&8270
2-Nitrophenol	<400	µg/Kg	400	<400	7/27/94	625&8270
3&4 Methylphenol (m&p-Cresol)	<400	µg/Kg	400	<400	7/27/94	625&8270
3,3'-Dichlorobenzidine	<800	µg/Kg	800	<800	7/27/94	625&8270
3-Nitroaniline	<2000	µg/Kg	2000	<2000	7/27/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 2

Report #: 49843

Sample Name: BS003 BH 2-3 1/2

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
4,6-Dinitro-2-methylphenol	<2000	µg/Kg	2000	<2000	7/27/94	625&8270
4-Bromophenyl phenyl ether	<400	µg/Kg	400	<400	7/27/94	625&8270
4-Chloro-3-methylphenol(p-Chloro-m-cres	<800	µg/Kg	800	<800	7/27/94	625&8270
4-Chloroaniline (p-Chloroaniline)	<800	µg/Kg	800	<800	7/27/94	625&8270
4-Chlorophenyl phenyl ether	<400	µg/Kg	400	<400	7/27/94	625&8270
4-Nitroaniline	<800	µg/Kg	800	<800	7/27/94	625&8270
4-Nitrophenol	<2000	µg/Kg	2000	<2000	7/27/94	625&8270
Acenaphthene	<400	µg/Kg	400	<400	7/27/94	625&8270
Acenaphthylene	<400	µg/Kg	400	<400	7/27/94	625&8270
Anthracene	<400	µg/Kg	400	<400	7/27/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 3

Report #: 49843

Sample Name: BS003 BH 2-3 1/2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Benzoic acid	<2000	µg/Kg	2000	<2000	7/27/94	625&8270
Benzo[a]anthracene	<400	µg/Kg	400	<400	7/27/94	625&8270
Benzo[a]pyrene	<400	µg/Kg	400	<400	7/27/94	625&8270
Benzo[b]fluoranthene	<400	µg/Kg	400	<400	7/27/94	625&8270
Benzo[g,h,i]perylene	<400	µg/Kg	400	<400	7/27/94	625&8270
Benzo[j,k]fluoranthene	<400	µg/Kg	400	<400	7/27/94	625&8270
Benzyl alcohol	<800	µg/Kg	800	<800	7/27/94	625&8270
bis(2-Chloroethoxy)methane	<400	µg/Kg	400	<400	7/27/94	625&8270
bis(2-Chloroethyl)ether	<400	µg/Kg	400	<400	7/27/94	625&8270
bis(2-chloroisopropyl)ether	<400	µg/Kg	400	<400	7/27/94	625&8270
bis(2-Ethylhexyl)phthalate	<400	µg/Kg	400	<400	7/27/94	625&8270
Butyl benzyl phthalate	<400	µg/Kg	400	<400	7/27/94	625&8270
Chrysene	<400	µg/Kg	400	<400	7/27/94	625&8270
Di-n-butyl phthalate (Dibutyl phthalate	<400	µg/Kg	400	<400	7/27/94	625&8270
Di-n-octylphthalate (Dioctyl phthalate)	<400	µg/Kg	400	<400	7/27/94	625&8270
Dibenzofuran	<400	µg/Kg	400	<400	7/27/94	625&8270
Dibenz[a,h]anthracene	<400	µg/Kg	400	<400	7/27/94	625&8270
Diethylphthalate	<400	µg/Kg	400	<400	7/27/94	625&8270
Dimethylphthalate	<400	µg/Kg	400	<400	7/27/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 4

Report #: 49843

Sample Name: BS003 BH 2-3 1/2

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Fluoranthene	<400	µg/Kg	400	<400	7/27/94	625&8270
Fluorene	<400	µg/Kg	400	<400	7/27/94	625&8270
Hexachlorobenzene	<400	µg/Kg	400	<400	7/27/94	625&8270
Hexachlorobutadiene	<400	µg/Kg	400	<400	7/27/94	625&8270
Hexachlorocyclopentadiene	<400	µg/Kg	400	<400	7/27/94	625&8270
Hexachloroethane	<400	µg/Kg	400	<400	7/27/94	625&8270
Indeno[1,2,3-cd]pyrene	<400	µg/Kg	400	<400	7/27/94	625&8270
Isophorone	<400	µg/Kg	400	<400	7/27/94	625&8270
N-Nitrosodi-n-propylamine	<400	µg/Kg	400	<400	7/27/94	625&8270
n-Nitrosodiphenylamine	<400	µg/Kg	400	<400	7/27/94	625&8270
Naphthalene	<400	µg/Kg	400	<400	7/27/94	625&8270
Nitrobenzene	<400	µg/Kg	400	<400	7/27/94	625&8270
Pentachlorophenol	<2000	µg/Kg	2000	<2000	7/27/94	625&8270
Phenanthrene	<400	µg/Kg	400	<400	7/27/94	625&8270
Phenol	<400	µg/Kg	400	<400	7/27/94	625&8270
Pyrene	<400	µg/Kg	400	<400	7/27/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Organics (GC & LC)

Report #: 49843

Sample Name: BS003 BH 2-3 1/2

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8080/PCB	—				7/28/94	
4,4'-DDD	<8	µg/Kg	8	<8	7/28/94	8080
4,4'-DDE	<8	µg/Kg	8	<8	7/28/94	8080
4,4'-DDT	<8	µg/Kg	8	<8	7/28/94	8080
Aldrin	<8	µg/Kg	8	<8	7/28/94	8080
alpha-BHC	<8	µg/Kg	8	<8	7/28/94	8080
alpha-Chlordane	<20	µg/Kg	20	<20	7/28/94	8080
beta-BHC	<8	µg/Kg	8	<8	7/28/94	8080
beta-Chlordane	<20	µg/Kg	20	<20	7/28/94	8080
delta-BHC	<8	µg/Kg	8	<8	7/28/94	8080
Dieldrin	<8	µg/Kg	8	<8	7/28/94	8080
Endosulfan I	<20	µg/Kg	20	<20	7/28/94	8080
Endosulfan II	<8	µg/Kg	8	<8	7/28/94	8080
Endosulfan sulfate	<20	µg/Kg	20	<20	7/28/94	8080
Endrin	<20	µg/Kg	20	<20	7/28/94	8080
Endrin aldehyde	<20	µg/Kg	20	<20	7/28/94	8080
Heptachlor	<8	µg/Kg	8	<8	7/28/94	8080
Heptachlor epoxide	<20	µg/Kg	20	<20	7/28/94	8080
Lindane	<8	µg/Kg	8	<8	7/28/94	8080
Methoxychlor	<80	µg/Kg	80	<80	7/28/94	8080
PCB, total	<80	µg/Kg	80	<80	7/28/94	8080
Toxaphene	<200	µg/Kg	200	<200	7/28/94	8080

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-476

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49844
Report Date: 8/22/94

Project Description: Seattle ANGS 1315-127
Sample Name: BS003 BH 5 1/2-7 **Matrix:** Soil
Date/Time Taken: 7/14/94 **Date/Time Received:** 7/15/94 4:20:00

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis-General Parameters

Report #: 49844

Sample Name: BS003 BH 5 1/2-7

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
A/BN Extraction-8080/PCB	—				7/19/94	3540
A/BN Extraction-8270	—				7/19/94	3540
Gross Alpha	0 +/- 21	pCi/g			7/21/94	DOE ESM4103
Gross Beta	0 +/- 34	pCi/g			7/21/94	DOE ESM4103
Metals dig.-Hg	—				7/20/94	7471
Metals dig.-HNO3	—				7/21/94	3051
Petroleum hydrocarbons	160	mg/Kg	10	<10	8/9/94	418.1
TPH by GC (as diesel)	<50	mg/Kg	50	<50	8/2/94	8015 mod.
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	7/26/94	8015 mod.
TPH by HCID	See letter					
Antimony/GFAA	<0.06	mg/Kg	0.06	<0.06	7/22/94	204.2&7041
Arsenic/GFAA	20	mg/Kg	0.02	<0.02	7/21/94	206.2&7060
Beryllium/ICP	1.1	mg/Kg	0.1	<0.1	7/29/94	6010 & 200.7
Cadmium/GFAA	1.5	mg/Kg	0.2	<0.2	7/29/94	7131&213.2
Chromium/GFAA	15	mg/Kg	0.5	<0.5	7/29/94	7191&218.2
Copper/ICP	33	mg/Kg	1	<1	8/4/94	6010 & 200.7
Lead/GFAA	62	mg/Kg	1.5	<1.5	7/29/94	7421&239.2
Mercury/CVAA	<0.004	mg/Kg	0.004	<0.004	7/20/94	245.5&7471
Nickel/ICP	14	mg/Kg	1	<1	7/29/94	6010 & 200.7
Selenium/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	270.2&7740
Silver/GFAA	0.042	mg/Kg	0.04	<0.04	7/21/94	272.2&7761
Thallium/GFAA	0.093	mg/Kg	0.02	<0.02	7/22/94	279.2&7841
Zinc/ICP	40	mg/Kg	0.2	<0.2	7/29/94	6010 & 200.7

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

Report of Analysis-Volatile Organics (GC/MS)

Report #: 49844

Sample Name: BS003 BH 5 1/2-7

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Volatile organics-8240	—				7/20/94	8240
1,1,1-trichloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,1,2,2-tetrachloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,1,2-trichloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,1-dichloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,1-dichloroethene	<25	µg/Kg	25	<25	7/20/94	8240
1,2-dichlorobenzene	<50	µg/Kg	50	<50	7/20/94	8240
1,2-dichloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,2-dichloropropane	<25	µg/Kg	25	<25	7/20/94	8240
1,3-dichlorobenzene	<50	µg/Kg	50	<50	7/20/94	8240
1,4-dichlorobenzene	<50	µg/Kg	50	<50	7/20/94	8240
2-butanone (MEK)	<500	µg/Kg	500	<500	7/20/94	8240
2-hexanone	<250	µg/Kg	250	<250	7/20/94	8240
4-methyl-2-pentanone (MIBK)	<250	µg/Kg	250	<250	7/20/94	8240
Acetone	<500	µg/Kg	500	<500	7/20/94	8240
Benzene	<25	µg/Kg	25	<25	7/20/94	8240
Bromodichloromethane	<25	µg/Kg	25	<25	7/20/94	8240
Bromoform	<25	µg/Kg	25	<25	7/20/94	8240
Bromomethane	<50	µg/Kg	50	<50	7/20/94	8240
c-1,3-dichloropropene	<25	µg/Kg	25	<25	7/20/94	8240
Carbon disulfide	<25	µg/Kg	25	<25	7/20/94	8240
Carbon tetrachloride	<25	µg/Kg	25	<25	7/20/94	8240
Chlorobenzene	<25	µg/Kg	25	<25	7/20/94	8240
Chloroethane	<50	µg/Kg	50	<50	7/20/94	8240
Chloroform	<25	µg/Kg	25	<25	7/20/94	8240
Chloromethane	<50	µg/Kg	50	<50	7/20/94	8240
Dibromochloromethane	<25	µg/Kg	25	<25	7/20/94	8240
Ethylbenzene	<25	µg/Kg	25	<25	7/20/94	8240
m,p-Xylenes	<25	µg/Kg	25	<25	7/20/94	8240
Methylene chloride	<25	µg/Kg	25	<25	7/20/94	8240
o-Xylene	<25	µg/Kg	25	<25	7/20/94	8240
Styrene	<25	µg/Kg	25	<25	7/20/94	8240
t-1,2-dichloroethene	<25	µg/Kg	25	<25	7/20/94	8240
t-1,3-dichloropropene	<25	µg/Kg	25	<25	7/20/94	8240
Tetrachloroethene	<25	µg/Kg	25	<25	7/20/94	8240
Toluene	<25	µg/Kg	25	<25	7/20/94	8240
Trichloroethene	<25	µg/Kg	25	<25	7/20/94	8240
Vinyl chloride	<50	µg/Kg	50	<50	7/20/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 1

Report #: 49844

Sample Name: BS003 BH 5 1/2-7

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8270	—				7/26/94	625&8270
1,2,4-Trichlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,5-Trichloropenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,6-Trichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dimethylphenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dinitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2,4-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,6-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chloronaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylnaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylphenol (o-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2-Nitrophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
3&4 Methylphenol (m&p-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
3,3'-Dichlorobenzidine	<400	µg/Kg	400	<400	7/26/94	625&8270
3-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 2

Report #: 49844

Sample Name: BS003 BH 5 1/2-7

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
4,6-Dinitro-2-methylphenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
4-Bromophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Chloro-3-methylphenol(p-Chloro-m-cres	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chloroaniline (p-Chloroaniline)	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chlorophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Nitroaniline	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Nitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Acenaphthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Acenaphthylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 3

Report #: 49844

Sample Name: BS003 BH 5 1/2-7

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Benzoic acid	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Benzo[a]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[a]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[b]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[g,h,i]perylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[j,k]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzyl alcohol	<400	µg/Kg	400	<400	7/26/94	625&8270
bis(2-Chloroethoxy)methane	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Chloroethyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-chloroisopropyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Ethylhexyl)phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Butyl benzyl phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Chrysene	<200	µg/Kg	200	<200	7/26/94	625&8270
Di-n-butyl phthalate (Dibutyl phthalate	744	µg/Kg	200	<200	7/26/94	625&8270
Di-n-octylphthalate (Dioctyl phthalate)	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenzofuran	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenz[a,h]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Diethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Dimethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 4

Report #: 49844

Sample Name: BS003 BH 5 1/2-7

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Fluorene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobutadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorocyclopentadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachloroethane	<200	µg/Kg	200	<200	7/26/94	625&8270
Indeno[1,2,3-cd]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Isophorone	<200	µg/Kg	200	<200	7/26/94	625&8270
N-Nitrosodi-n-propylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
n-Nitrosodiphenylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
Naphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
Nitrobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Pentachlorophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Phenanthrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Phenol	<200	µg/Kg	200	<200	7/26/94	625&8270
Pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Organics (GC & LC)

Report #: 49844

Sample Name: BS003 BH 5 1/2-7

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8080/PCB	—				7/27/94	
4,4'-DDD	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
4,4'-DDE	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
4,4'-DDT	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Aldrin	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
alpha-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
alpha-Chlordane	<1	µg/Kg	1	<1	7/27/94	8080
beta-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
beta-Chlordane	<1	µg/Kg	1	<1	7/27/94	8080
delta-BHC	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Dieldrin	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Endosulfan I	<1	µg/Kg	1	<1	7/27/94	8080
Endosulfan II	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Endosulfan sulfate	<1	µg/Kg	1	<1	7/27/94	8080
Endrin	<1	µg/Kg	1	<1	7/27/94	8080
Endrin aldehyde	<1	µg/Kg	1	<1	7/27/94	8080
Heptachlor	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Heptachlor epoxide	<1	µg/Kg	1	<1	7/27/94	8080
Lindane	<0.4	µg/Kg	0.4	<0.4	7/27/94	8080
Methoxychlor	<4	µg/Kg	4	<4	7/27/94	8080
PCB, total	<4	µg/Kg	4	<4	7/27/94	8080
Toxaphene	<10	µg/Kg	10	<10	7/27/94	8080

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-4766

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49845
Report Date: 8/22/94

Project Description: Seattle ANGS 1315-127
Sample Name: BS003 BH 8 1/2-10 **Matrix:** Soil
Date/Time Taken: 7/14/94 **Date/Time Received:** 7/15/94 4:20:00

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis-General Parameters

Report #: 49845

Sample Name: BS003 BH 8 1/2-10

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
A/BN Extraction-8080/PCB	—				7/19/94	3540
A/BN Extraction-8270	—				7/19/94	3540
Gross Alpha	0 +/- 21	pCi/g			7/21/94	DOE ESM4103
Gross Beta	0 +/- 34	pCi/g			7/21/94	DOE ESM4103
Metals dig.-Hg	—				7/20/94	7471
Metals dig.-HNO3	—				7/21/94	3051
TPH by GC (as diesel)	<50	mg/Kg	50	<50	8/2/94	8015 mod.
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	7/26/94	8015 mod.
TPH by HCID	See letter					
Antimony/GFAA	<0.06	mg/Kg	0.06	<0.06	7/22/94	204.2&7041
Arsenic/GFAA	3.7	mg/Kg	0.02	<0.02	7/21/94	206.2&7060
Beryllium/ICP	0.58	mg/Kg	0.1	<0.1	7/29/94	6010 & 200.7
Cadmium/GFAA	1	mg/Kg	0.2	<0.2	7/29/94	7131&213.2
Chromium/GFAA	12	mg/Kg	0.5	<0.5	7/29/94	7191&218.2
Copper/ICP	14	mg/Kg	1	<1	8/4/94	6010 & 200.7
Lead/GFAA	29	mg/Kg	1.5	<1.5	7/29/94	7421&239.2
Mercury/CVAA	<0.004	mg/Kg	0.004	<0.004	7/20/94	245.5&7471
Nickel/ICP	8.3	mg/Kg	1	<1	7/29/94	6010 & 200.7
Selenium/GFAA	0.11	mg/Kg	0.04	<0.04	7/21/94	270.2&7740
Silver/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	272.2&7761
Thallium/GFAA	<0.02	mg/Kg	0.02	<0.02	7/22/94	279.2&7841
Zinc/ICP	20	mg/Kg	0.2	<0.2	7/29/94	6010 & 200.7

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

Report of Analysis-Volatile Organics (GC/MS)

Report #: 49845

Sample Name: BS003 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Volatile organics-8240	—				7/20/94	8240
1,1,1-trichloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,1,2,2-tetrachloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,1,2-trichloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,1-dichloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,1-dichloroethene	<25	µg/Kg	25	<25	7/20/94	8240
1,2-dichlorobenzene	<50	µg/Kg	50	<50	7/20/94	8240
1,2-dichloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,2-dichloropropane	<25	µg/Kg	25	<25	7/20/94	8240
1,3-dichlorobenzene	<50	µg/Kg	50	<50	7/20/94	8240
1,4-dichlorobenzene	<50	µg/Kg	50	<50	7/20/94	8240
2-butanone (MEK)	<500	µg/Kg	500	<500	7/20/94	8240
2-hexanone	<250	µg/Kg	250	<250	7/20/94	8240
4-methyl-2-pentanone (MIBK)	<250	µg/Kg	250	<250	7/20/94	8240
Acetone	<500	µg/Kg	500	<500	7/20/94	8240
Benzene	<25	µg/Kg	25	<25	7/20/94	8240
Bromodichloromethane	<25	µg/Kg	25	<25	7/20/94	8240
Bromoform	<25	µg/Kg	25	<25	7/20/94	8240
Bromomethane	<50	µg/Kg	50	<50	7/20/94	8240
c-1,3-dichloropropene	<25	µg/Kg	25	<25	7/20/94	8240
Carbon disulfide	<25	µg/Kg	25	<25	7/20/94	8240
Carbon tetrachloride	<25	µg/Kg	25	<25	7/20/94	8240
Chlorobenzene	<25	µg/Kg	25	<25	7/20/94	8240
Chloroethane	<50	µg/Kg	50	<50	7/20/94	8240
Chloroform	<25	µg/Kg	25	<25	7/20/94	8240
Chloromethane	<50	µg/Kg	50	<50	7/20/94	8240
Dibromochloromethane	<25	µg/Kg	25	<25	7/20/94	8240
Ethylbenzene	<25	µg/Kg	25	<25	7/20/94	8240
m,p-Xylenes	<25	µg/Kg	25	<25	7/20/94	8240
Methylene chloride	<25	µg/Kg	25	<25	7/20/94	8240
o-Xylene	<25	µg/Kg	25	<25	7/20/94	8240
Styrene	<25	µg/Kg	25	<25	7/20/94	8240
t-1,2-dichloroethene	<25	µg/Kg	25	<25	7/20/94	8240
t-1,3-dichloropropene	<25	µg/Kg	25	<25	7/20/94	8240
Tetrachloroethene	<25	µg/Kg	25	<25	7/20/94	8240
Toluene	<25	µg/Kg	25	<25	7/20/94	8240
Trichloroethene	<25	µg/Kg	25	<25	7/20/94	8240
Vinyl chloride	<50	µg/Kg	50	<50	7/20/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 1

Report #: 49845

Sample Name: BS003 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8270	—				7/26/94	625&8270
1,2,4-Trichlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,5-Trichloropenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4,6-Trichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dichlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dimethylphenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2,4-Dinitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2,4-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2,6-Dinitrotoluene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chloronaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Chlorophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylnaphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Methylphenol (o-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
2-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
2-Nitrophenol	<200	µg/Kg	200	<200	7/26/94	625&8270
3&4 Methylphenol (m&p-Cresol)	<200	µg/Kg	200	<200	7/26/94	625&8270
3,3'-Dichlorobenzidine	<400	µg/Kg	400	<400	7/26/94	625&8270
3-Nitroaniline	<1000	µg/Kg	1000	<1000	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 2

Report #: 49845

Sample Name: BS003 BH 8 1/2-10

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
4,6-Dinitro-2-methylphenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
4-Bromophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Chloro-3-methylphenol(p-Chloro-m-cres	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chloroaniline (p-Chloroaniline)	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Chlorophenyl phenyl ether	<200	µg/Kg	200	<200	7/26/94	625&8270
4-Nitroaniline	<400	µg/Kg	400	<400	7/26/94	625&8270
4-Nitrophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Acenaphthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Acenaphthylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 3

Report #: 49845

Sample Name: BS003 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Benzoic acid	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Benzo[a]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[a]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[b]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[g,h,i]perylene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzo[j,k]fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Benzyl alcohol	<400	µg/Kg	400	<400	7/26/94	625&8270
bis(2-Chloroethoxy)methane	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Chloroethyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-chloroisopropyl)ether	<200	µg/Kg	200	<200	7/26/94	625&8270
bis(2-Ethylhexyl)phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Butyl benzyl phthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Chrysene	<200	µg/Kg	200	<200	7/26/94	625&8270
Di-n-butyl phthalate (Dibutyl phthalate	1750	µg/Kg	200	<200	7/26/94	625&8270
Di-n-octylphthalate (Dioctyl phthalate)	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenzofuran	<200	µg/Kg	200	<200	7/26/94	625&8270
Dibenz[a,h]anthracene	<200	µg/Kg	200	<200	7/26/94	625&8270
Diethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270
Dimethylphthalate	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 4

Report #: 49845

Sample Name: BS003 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Fluoranthene	<200	µg/Kg	200	<200	7/26/94	625&8270
Fluorene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorobutadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachlorocyclopentadiene	<200	µg/Kg	200	<200	7/26/94	625&8270
Hexachloroethane	<200	µg/Kg	200	<200	7/26/94	625&8270
Indeno[1,2,3-cd]pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Isophorone	<200	µg/Kg	200	<200	7/26/94	625&8270
N-Nitrosodi-n-propylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
n-Nitrosodiphenylamine	<200	µg/Kg	200	<200	7/26/94	625&8270
Naphthalene	<200	µg/Kg	200	<200	7/26/94	625&8270
Nitrobenzene	<200	µg/Kg	200	<200	7/26/94	625&8270
Pentachlorophenol	<1000	µg/Kg	1000	<1000	7/26/94	625&8270
Phenanthrene	<200	µg/Kg	200	<200	7/26/94	625&8270
Phenol	<200	µg/Kg	200	<200	7/26/94	625&8270
Pyrene	<200	µg/Kg	200	<200	7/26/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Organics (GC & LC)

Report #: 49845

Sample Name: BS003 BH 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8080/PCB	—				7/28/94	
4,4'-DDD	<0.4	µg/Kg	0.4	<0.4	7/28/94	8080
4,4'-DDE	<0.4	µg/Kg	0.4	<0.4	7/28/94	8080
4,4'-DDT	<0.4	µg/Kg	0.4	<0.4	7/28/94	8080
Aldrin	<0.4	µg/Kg	0.4	<0.4	7/28/94	8080
alpha-BHC	<0.4	µg/Kg	0.4	<0.4	7/28/94	8080
alpha-Chlordane	<1	µg/Kg	1	<1	7/28/94	8080
beta-BHC	<0.4	µg/Kg	0.4	<0.4	7/28/94	8080
beta-Chlordane	<1	µg/Kg	1	<1	7/28/94	8080
delta-BHC	<0.4	µg/Kg	0.4	<0.4	7/28/94	8080
Dieldrin	<0.4	µg/Kg	0.4	<0.4	7/28/94	8080
Endosulfan I	<1	µg/Kg	1	<1	7/28/94	8080
Endosulfan II	<0.4	µg/Kg	0.4	<0.4	7/28/94	8080
Endosulfan sulfate	<1	µg/Kg	1	<1	7/28/94	8080
Endrin	<1	µg/Kg	1	<1	7/28/94	8080
Endrin aldehyde	<1	µg/Kg	1	<1	7/28/94	8080
Heptachlor	<0.4	µg/Kg	0.4	<0.4	7/28/94	8080
Heptachlor epoxide	<1	µg/Kg	1	<1	7/28/94	8080
Lindane	<0.4	µg/Kg	0.4	<0.4	7/28/94	8080
Methoxychlor	<4	µg/Kg	4	<4	7/28/94	8080
PCB, total	<4	µg/Kg	4	<4	7/28/94	8080
Toxaphene	<10	µg/Kg	10	<10	7/28/94	8080

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-4[illegible]6

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49846
Report Date: 8/22/94

Project Description: Seattle ANGS 1315-127
Sample Name: BS004 P2 8 1/2-10 **Matrix:** Soil
Date/Time Taken: 7/14/94 **Date/Time Received:** 7/15/94 4:20:00

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis-General Parameters

Report #: 49846

Sample Name: BS004 P2 8 1/2-10

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
A/BN Extraction-8080/PCB	—				7/19/94	3540
A/BN Extraction-8270	—				7/19/94	3540
Gross Alpha	0 +/- 17	pCi/g			7/21/94	DOE ESM4103
Gross Beta	0 +/- 32	pCi/g			7/21/94	DOE ESM4103
Metals dig.-Hg	—				7/20/94	7471
Metals dig.-HNO3	—				7/21/94	3051
TPH by GC (as diesel)	<50	mg/Kg	50	<50	8/2/94	8015 mod.
TPH by GC (as gasoline)	<5	mg/Kg	5	<5	7/26/94	8015 mod.
TPH by HCID	See letter					
Antimony/GFAA	<0.06	mg/Kg	0.06	<0.06	7/22/94	204.2&7041
Arsenic/GFAA	2	mg/Kg	0.02	<0.02	7/21/94	206.2&7060
Beryllium/ICP	1.2	mg/Kg	0.1	<0.1	7/29/94	6010 & 200.7
Cadmium/GFAA	1.6	mg/Kg	0.2	<0.2	7/29/94	7131&213.2
Chromium/GFAA	10	mg/Kg	0.5	<0.5	7/29/94	7191&218.2
Copper/ICP	40	mg/Kg	1	<1	8/4/94	6010 & 200.7
Lead/GFAA	34	mg/Kg	1.5	<1.5	7/29/94	7421&239.2
Mercury/CVAA	<0.004	mg/Kg	0.004	<0.004	7/20/94	245.5&7471
Nickel/ICP	13	mg/Kg	1	<1	7/29/94	6010 & 200.7
Selenium/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	270.2&7740
Silver/GFAA	<0.04	mg/Kg	0.04	<0.04	7/21/94	272.2&7761
Thallium/GFAA	0.056	mg/Kg	0.02	<0.02	7/22/94	279.2&7841
Zinc/ICP	25	mg/Kg	0.2	<0.2	7/29/94	6010 & 200.7

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

Report of Analysis-Volatile Organics (GC/MS)

Report #: 49846

Sample Name: BS004 P2 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Volatile organics-8240	—				7/20/94	8240
1,1,1-trichloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,1,2,2-tetrachloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,1,2-trichloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,1-dichloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,1-dichloroethene	<25	µg/Kg	25	<25	7/20/94	8240
1,2-dichlorobenzene	<50	µg/Kg	50	<50	7/20/94	8240
1,2-dichloroethane	<25	µg/Kg	25	<25	7/20/94	8240
1,2-dichloropropane	<25	µg/Kg	25	<25	7/20/94	8240
1,3-dichlorobenzene	<50	µg/Kg	50	<50	7/20/94	8240
1,4-dichlorobenzene	<50	µg/Kg	50	<50	7/20/94	8240
2-butanone (MEK)	<500	µg/Kg	500	<500	7/20/94	8240
2-hexanone	<250	µg/Kg	250	<250	7/20/94	8240
4-methyl-2-pentanone (MIBK)	<250	µg/Kg	250	<250	7/20/94	8240
Acetone	<500	µg/Kg	500	<500	7/20/94	8240
Benzene	<25	µg/Kg	25	<25	7/20/94	8240
Bromodichloromethane	<25	µg/Kg	25	<25	7/20/94	8240
Bromoform	<25	µg/Kg	25	<25	7/20/94	8240
Bromomethane	<50	µg/Kg	50	<50	7/20/94	8240
c-1,3-dichloropropene	<25	µg/Kg	25	<25	7/20/94	8240
Carbon disulfide	<25	µg/Kg	25	<25	7/20/94	8240
Carbon tetrachloride	<25	µg/Kg	25	<25	7/20/94	8240
Chlorobenzene	<25	µg/Kg	25	<25	7/20/94	8240
Chloroethane	<50	µg/Kg	50	<50	7/20/94	8240
Chloroform	<25	µg/Kg	25	<25	7/20/94	8240
Chloromethane	<50	µg/Kg	50	<50	7/20/94	8240
Dibromochloromethane	<25	µg/Kg	25	<25	7/20/94	8240
Ethylbenzene	<25	µg/Kg	25	<25	7/20/94	8240
m,p-Xylenes	<25	µg/Kg	25	<25	7/20/94	8240
Methylene chloride	<25	µg/Kg	25	<25	7/20/94	8240
o-Xylene	<25	µg/Kg	25	<25	7/20/94	8240
Styrene	<25	µg/Kg	25	<25	7/20/94	8240
t-1,2-dichloroethene	<25	µg/Kg	25	<25	7/20/94	8240
t-1,3-dichloropropene	<25	µg/Kg	25	<25	7/20/94	8240
Tetrachloroethene	<25	µg/Kg	25	<25	7/20/94	8240
Toluene	<25	µg/Kg	25	<25	7/20/94	8240
Trichloroethene	<25	µg/Kg	25	<25	7/20/94	8240
Vinyl chloride	<50	µg/Kg	50	<50	7/20/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 1

Report #: 49846

Sample Name: BS004 P2 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8270	—				7/27/94	625&8270
1,2,4-Trichlorobenzene	<200	µg/Kg	200	<200	7/27/94	625&8270
2,4,5-Trichloropenol	<200	µg/Kg	200	<200	7/27/94	625&8270
2,4,6-Trichlorophenol	<200	µg/Kg	200	<200	7/27/94	625&8270
2,4-Dichlorophenol	<200	µg/Kg	200	<200	7/27/94	625&8270
2,4-Dimethylphenol	<200	µg/Kg	200	<200	7/27/94	625&8270
2,4-Dinitrophenol	<1000	µg/Kg	1000	<1000	7/27/94	625&8270
2,4-Dinitrotoluene	<200	µg/Kg	200	<200	7/27/94	625&8270
2,6-Dinitrotoluene	<200	µg/Kg	200	<200	7/27/94	625&8270
2-Chloronaphthalene	<200	µg/Kg	200	<200	7/27/94	625&8270
2-Chlorophenol	<200	µg/Kg	200	<200	7/27/94	625&8270
2-Methylnaphthalene	<200	µg/Kg	200	<200	7/27/94	625&8270
2-Methylphenol (o-Cresol)	<200	µg/Kg	200	<200	7/27/94	625&8270
2-Nitroaniline	<1000	µg/Kg	1000	<1000	7/27/94	625&8270
2-Nitrophenol	<200	µg/Kg	200	<200	7/27/94	625&8270
3&4 Methylphenol (m&p-Cresol)	<200	µg/Kg	200	<200	7/27/94	625&8270
3,3'-Dichlorobenzidine	<400	µg/Kg	400	<400	7/27/94	625&8270
3-Nitroaniline	<1000	µg/Kg	1000	<1000	7/27/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 2

Report #: 49846

Sample Name: BS004 P2 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
4,6-Dinitro-2-methylphenol	<1000	µg/Kg	1000	<1000	7/27/94	625&8270
4-Bromophenyl phenyl ether	<200	µg/Kg	200	<200	7/27/94	625&8270
4-Chloro-3-methylphenol(p-Chloro-m-cres	<400	µg/Kg	400	<400	7/27/94	625&8270
4-Chloroaniline (p-Chloroaniline)	<400	µg/Kg	400	<400	7/27/94	625&8270
4-Chlorophenyl phenyl ether	<200	µg/Kg	200	<200	7/27/94	625&8270
4-Nitroaniline	<400	µg/Kg	400	<400	7/27/94	625&8270
4-Nitrophenol	<1000	µg/Kg	1000	<1000	7/27/94	625&8270
Acenaphthene	<200	µg/Kg	200	<200	7/27/94	625&8270
Acenaphthylene	<200	µg/Kg	200	<200	7/27/94	625&8270
Anthracene	<200	µg/Kg	200	<200	7/27/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 3

Report #: 49846

Sample Name: BS004 P2 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Benzoic acid	<1000	µg/Kg	1000	<1000	7/27/94	625&8270
Benzo[a]anthracene	<200	µg/Kg	200	<200	7/27/94	625&8270
Benzo[a]pyrene	<200	µg/Kg	200	<200	7/27/94	625&8270
Benzo[b]fluoranthene	<200	µg/Kg	200	<200	7/27/94	625&8270
Benzo[g,h,i]perylene	<200	µg/Kg	200	<200	7/27/94	625&8270
Benzo[j,k]fluoranthene	<200	µg/Kg	200	<200	7/27/94	625&8270
Benzyl alcohol	<400	µg/Kg	400	<400	7/27/94	625&8270
bis(2-Chloroethoxy)methane	<200	µg/Kg	200	<200	7/27/94	625&8270
bis(2-Chloroethyl)ether	<200	µg/Kg	200	<200	7/27/94	625&8270
bis(2-chloroisopropyl)ether	<200	µg/Kg	200	<200	7/27/94	625&8270
bis(2-Ethylhexyl)phthalate	<200	µg/Kg	200	<200	7/27/94	625&8270
Butyl benzyl phthalate	<200	µg/Kg	200	<200	7/27/94	625&8270
Chrysene	<200	µg/Kg	200	<200	7/27/94	625&8270
Di-n-butyl phthalate (Dibutyl phthalate	2240	µg/Kg	200	<200	7/27/94	625&8270
Di-n-octylphthalate (Dioctyl phthalate)	<200	µg/Kg	200	<200	7/27/94	625&8270
Dibenzofuran	<200	µg/Kg	200	<200	7/27/94	625&8270
Dibenz[a,h]anthracene	<200	µg/Kg	200	<200	7/27/94	625&8270
Diethylphthalate	<200	µg/Kg	200	<200	7/27/94	625&8270
Dimethylphthalate	<200	µg/Kg	200	<200	7/27/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 4

Report #: 49846

Sample Name: BS004 P2 8 1/2-10

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Fluoranthene	<200	µg/Kg	200	<200	7/27/94	625&8270
Fluorene	<200	µg/Kg	200	<200	7/27/94	625&8270
Hexachlorobenzene	<200	µg/Kg	200	<200	7/27/94	625&8270
Hexachlorobutadiene	<200	µg/Kg	200	<200	7/27/94	625&8270
Hexachlorocyclopentadiene	<200	µg/Kg	200	<200	7/27/94	625&8270
Hexachloroethane	<200	µg/Kg	200	<200	7/27/94	625&8270
Indeno[1,2,3-cd]pyrene	<200	µg/Kg	200	<200	7/27/94	625&8270
Isophorone	<200	µg/Kg	200	<200	7/27/94	625&8270
N-Nitrosodi-n-propylamine	<200	µg/Kg	200	<200	7/27/94	625&8270
n-Nitrosodiphenylamine	<200	µg/Kg	200	<200	7/27/94	625&8270
Naphthalene	<200	µg/Kg	200	<200	7/27/94	625&8270
Nitrobenzene	<200	µg/Kg	200	<200	7/27/94	625&8270
Pentachlorophenol	<1000	µg/Kg	1000	<1000	7/27/94	625&8270
Phenanthrene	<200	µg/Kg	200	<200	7/27/94	625&8270
Phenol	<200	µg/Kg	200	<200	7/27/94	625&8270
Pyrene	<200	µg/Kg	200	<200	7/27/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Organics (GC & LC)

Report #: 49846

Sample Name: BS004 P2 8 1/2-10

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8080/PCB	—				7/28/94	
4,4'-DDD	<2	µg/Kg	2	<2	7/28/94	8080
4,4'-DDE	<2	µg/Kg	2	<2	7/28/94	8080
4,4'-DDT	<2	µg/Kg	2	<2	7/28/94	8080
Aldrin	<2	µg/Kg	2	<2	7/28/94	8080
alpha-BHC	<2	µg/Kg	2	<2	7/28/94	8080
alpha-Chlordane	<5	µg/Kg	5	<5	7/28/94	8080
beta-BHC	<2	µg/Kg	2	<2	7/28/94	8080
beta-Chlordane	<5	µg/Kg	5	<5	7/28/94	8080
delta-BHC	<2	µg/Kg	2	<2	7/28/94	8080
Dieldrin	<2	µg/Kg	2	<2	7/28/94	8080
Endosulfan I	<5	µg/Kg	5	<5	7/28/94	8080
Endosulfan II	<2	µg/Kg	2	<2	7/28/94	8080
Endosulfan sulfate	<5	µg/Kg	5	<5	7/28/94	8080
Endrin	<5	µg/Kg	5	<5	7/28/94	8080
Endrin aldehyde	<5	µg/Kg	5	<5	7/28/94	8080
Heptachlor	<2	µg/Kg	2	<2	7/28/94	8080
Heptachlor epoxide	<5	µg/Kg	5	<5	7/28/94	8080
Lindane	<2	µg/Kg	2	<2	7/28/94	8080
Methoxychlor	<20	µg/Kg	20	<20	7/28/94	8080
PCB, total	<20	µg/Kg	20	<20	7/28/94	8080
Toxaphene	<50	µg/Kg	50	<50	7/28/94	8080

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-4766

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49847 **Page** 1
Report Date: 8/22/94

Project Description: Seattle ANGS 1315-127
Sample Name: BS001 TB
Date/Time Taken: 7/14/94

Matrix: Water
Date/Time Received: 7/15/94 4:20:00

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis

Project Desc: Seattle ANGS 1315-127 Report #: 49847 Page 2

Sample Name: BS001 TB Report Date: 8/22/94

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Volatile organics-8240	—				7/20/94	8240
1,1,1-trichloroethane	<5	µg/L	5	<5	7/20/94	8240
1,1,2,2-tetrachloroethane	<5	µg/L	5	<5	7/20/94	8240
1,1,2-trichloroethane	<5	µg/L	5	<5	7/20/94	8240
1,1-dichloroethane	<5	µg/L	5	<5	7/20/94	8240
1,1-dichloroethene	<5	µg/L	5	<5	7/20/94	8240
1,2-dichlorobenzene	<10	µg/L	10	<10	7/20/94	8240
1,2-dichloroethane	<5	µg/L	5	<5	7/20/94	8240
1,2-dichloropropane	<5	µg/L	5	<5	7/20/94	8240
1,3-dichlorobenzene	<10	µg/L	10	<10	7/20/94	8240
1,4-dichlorobenzene	<10	µg/L	10	<10	7/20/94	8240
2-butanone (MEK)	<100	µg/L	100	<100	7/20/94	8240
2-hexanone	<50	µg/L	50	<50	7/20/94	8240
4-methyl-2-pentanone (MIBK)	<50	µg/L	50	<50	7/20/94	8240
Acetone	<100	µg/L	100	<100	7/20/94	8240
Benzene	<5	µg/L	5	<5	7/20/94	8240
Bromodichloromethane	<5	µg/L	5	<5	7/20/94	8240
Bromoform	<5	µg/L	5	<5	7/20/94	8240
Bromomethane	<10	µg/L	10	<10	7/20/94	8240
c-1,3-dichloropropene	<5	µg/L	5	<5	7/20/94	8240
Carbon disulfide	<5	µg/L	5	<5	7/20/94	8240
Carbon tetrachloride	<5	µg/L	5	<5	7/20/94	8240
Chlorobenzene	<5	µg/L	5	<5	7/20/94	8240
Chloroethane	<10	µg/L	10	<10	7/20/94	8240
Chloroform	<5	µg/L	5	<5	7/20/94	8240
Chloromethane	<10	µg/L	10	<10	7/20/94	8240
Dibromochloromethane	<5	µg/L	5	<5	7/20/94	8240
Ethylbenzene	<5	µg/L	5	<5	7/20/94	8240
m,p-Xylenes	<5	µg/L	5	<5	7/20/94	8240
Methylene chloride	<5	µg/L	5	<5	7/20/94	8240
o-Xylene	<5	µg/L	5	<5	7/20/94	8240
Styrene	<5	µg/L	5	<5	7/20/94	8240
t-1,2-dichloroethene	<5	µg/L	5	<5	7/20/94	8240
t-1,3-dichloropropene	<5	µg/L	5	<5	7/20/94	8240
Tetrachloroethene	<5	µg/L	5	<5	7/20/94	8240
Toluene	<5	µg/L	5	<5	7/20/94	8240
Trichloroethene	<5	µg/L	5	<5	7/20/94	8240
Vinyl chloride	<10	µg/L	10	<10	7/20/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

QUALITY ASSURANCE

KCSlip4 38771

SEA405301

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49837

Project Description: Seattle ANGS 1315-127
Sample Name: BS001 BH 1-2 1/2 **Matrix:** Soil
Date/Time Taken: 7/14/94 **Date/Time Received:** 7/15/94 4:20:00

Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]
TPH by GC (as diesel)	5.6	89.9
TPH by GC (as gasoline)	9.3	89.5
Antimony/GFAA	1.9	75.6
Arsenic/GFAA	1.1	65.2
Beryllium/ICP	3.2	92.8
Cadmium/GFAA	0.2	79
Chromium/GFAA	1.1	79.7
Copper/ICP	0.6	103
Lead/GFAA	0.3	80.1
Mercury/CVAA	9.1	105.6
Nickel/ICP	1.5	76
Selenium/GFAA	2.9	39.6
Silver/GFAA	10.1	40.6
Thallium/GFAA	8.6	88.8
Zinc/ICP	2.1	77.4
4,4'-DDD	13	76.1
4,4'-DDE	10.1	79.3
4,4'-DDT	13.6	78.2
Aldrin	10.8	101.7
alpha-BHC	22.5	99.1
alpha-Chlordane	13.7	85.4
beta-BHC	24.3	88.4
beta-Chlordane	14.3	89.5
delta-BHC	10.2	96.4
Dieldrin	13.4	82.4
Endosulfan I	10.3	75.7
Endosulfan II	9.3	79.6
Endosulfan sulfate	21.8	78.4
Endrin	2.2	73.6
Endrin aldehyde	14.1	75.9
Heptachlor	19.2	103.5
Heptachlor epoxide	20.8	83.6
Lindane	2.4	99.8
Methoxychlor	17.3	74.6

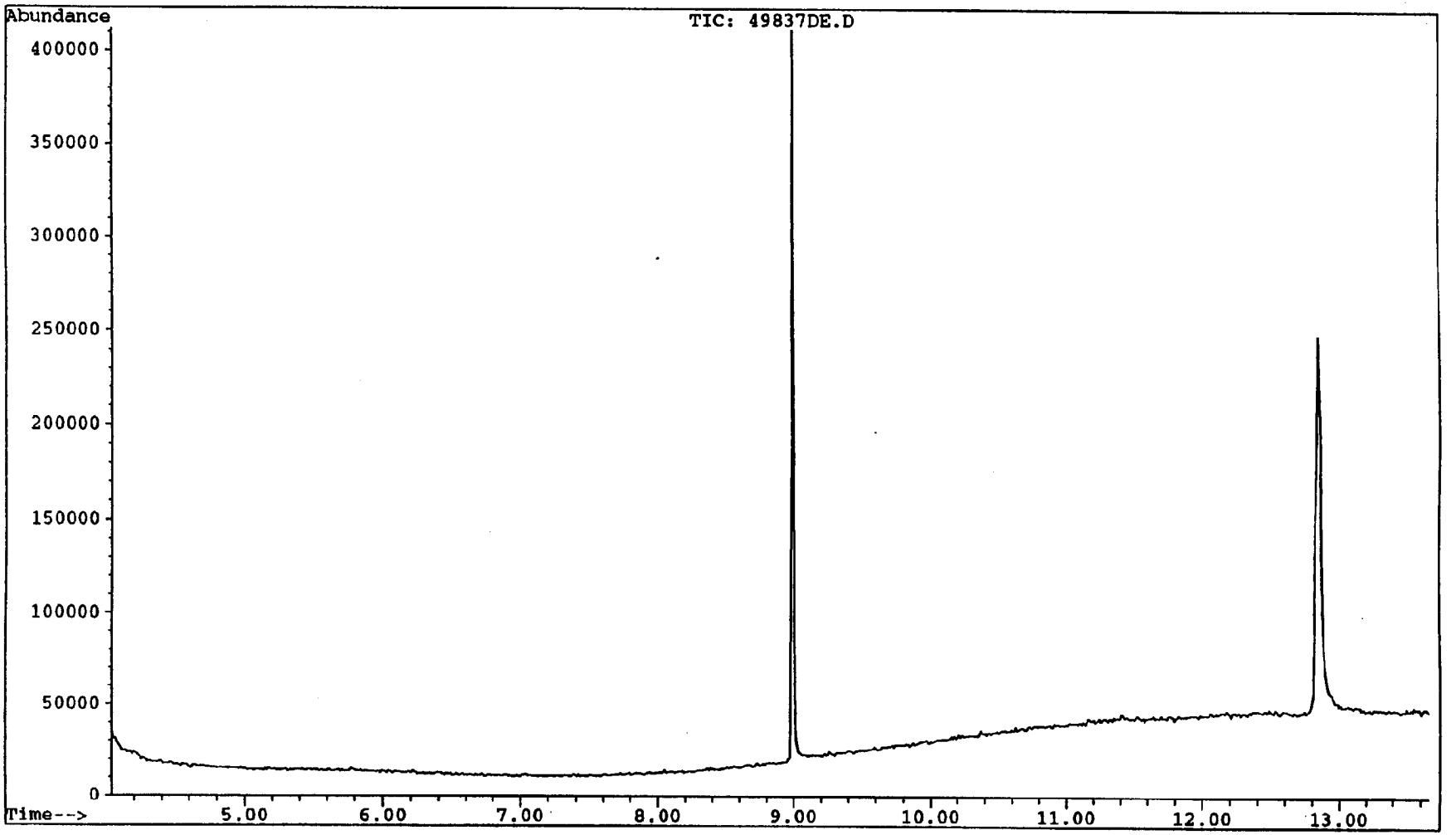
PCB, total	3.7	49.5
Toxaphene	12.5	91

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	8240	84
4-Bromofluorobenzene(surr)	8240	97
Toluene-d8(surr)	8240	115
2,4,6-Tribromophenol	625&8270	diluted
2-Fluorobiphenyl	625&8270	diluted
2-Fluorophenol	625&8270	diluted
Nitrobenzene-d5	625&8270	diluted
Phenol-d5	625&8270	diluted
Terphenyl-d14	625&8270	diluted
2,4,5,6-Tetrachloro-m-xylene	8080	Diluted
Dibutyl Chlorendate	8080	Diluted
p-Terphenyl	8015 mod.	81.2
Pentafluorobenzene(Surr)	8015 mod.	95.9

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

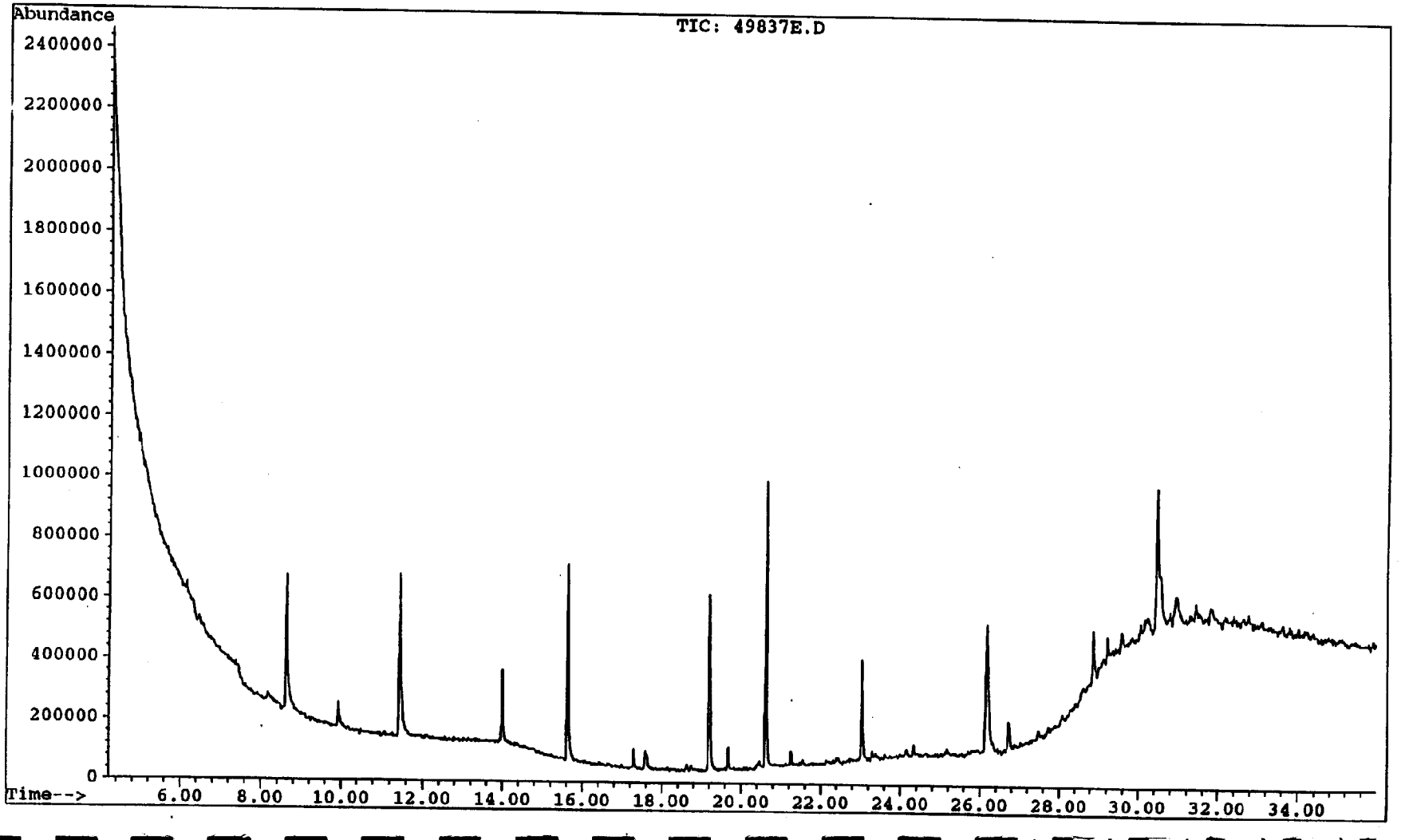
File : D:\4214FDSL\49837DE.D
Operator : TR
Acquired : 2 Aug 94 5:30 pm using AcqMethod TPHDEL.M
Instrument : 5971 - GC
Sample Name:
Misc Info :
Vial Number: 8



KCSlip4 38774

SEA405304

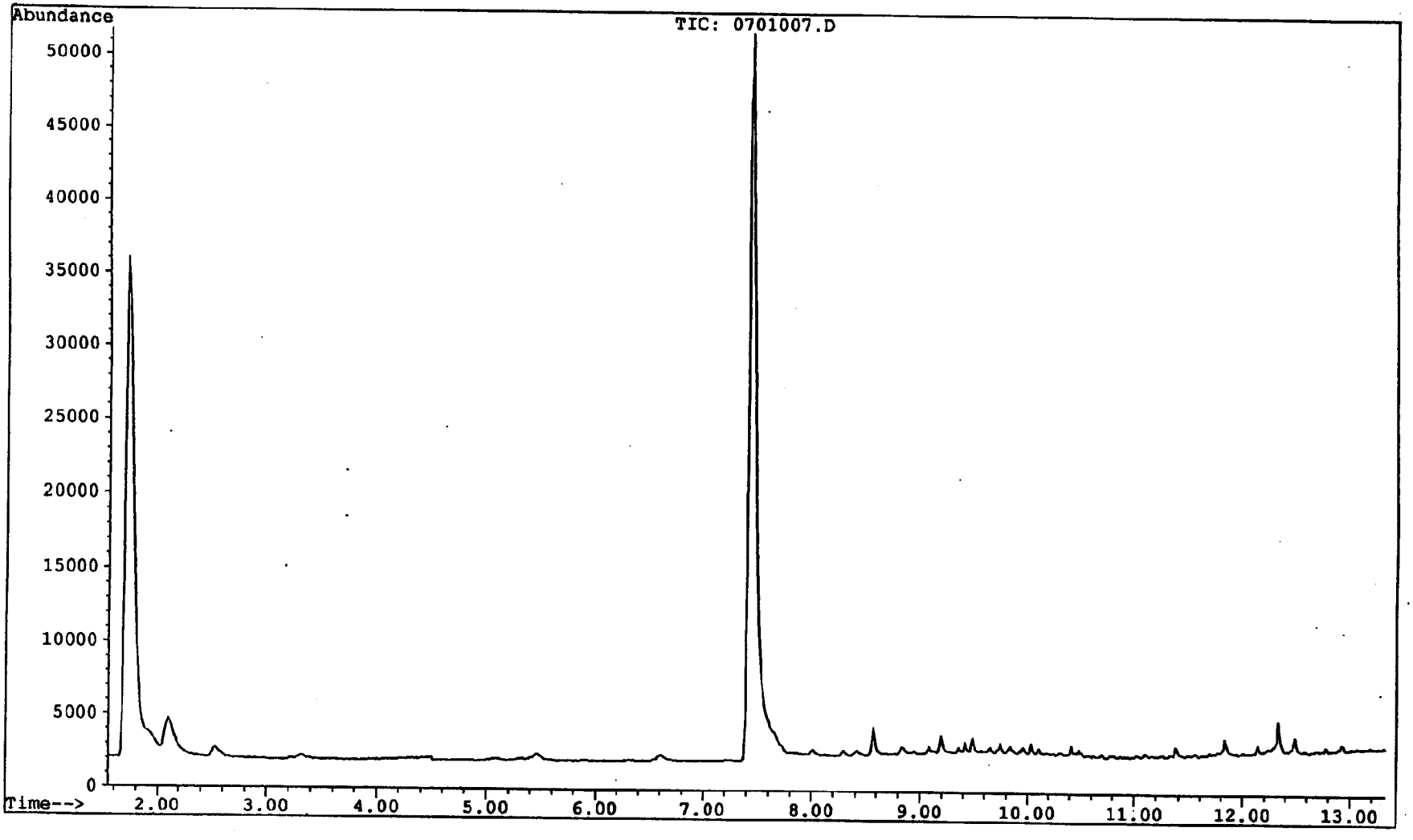
File : D:\4207FOPT\49837E.D
Operator : TR
Acquired : 26 Jul 94 8:06 pm using AcqMethod OPTECH.M
Instrument : 5971 - GC
Sample Name: SMPL9
Misc Info : S40
Vial Number: 13



KCSlip4 38775

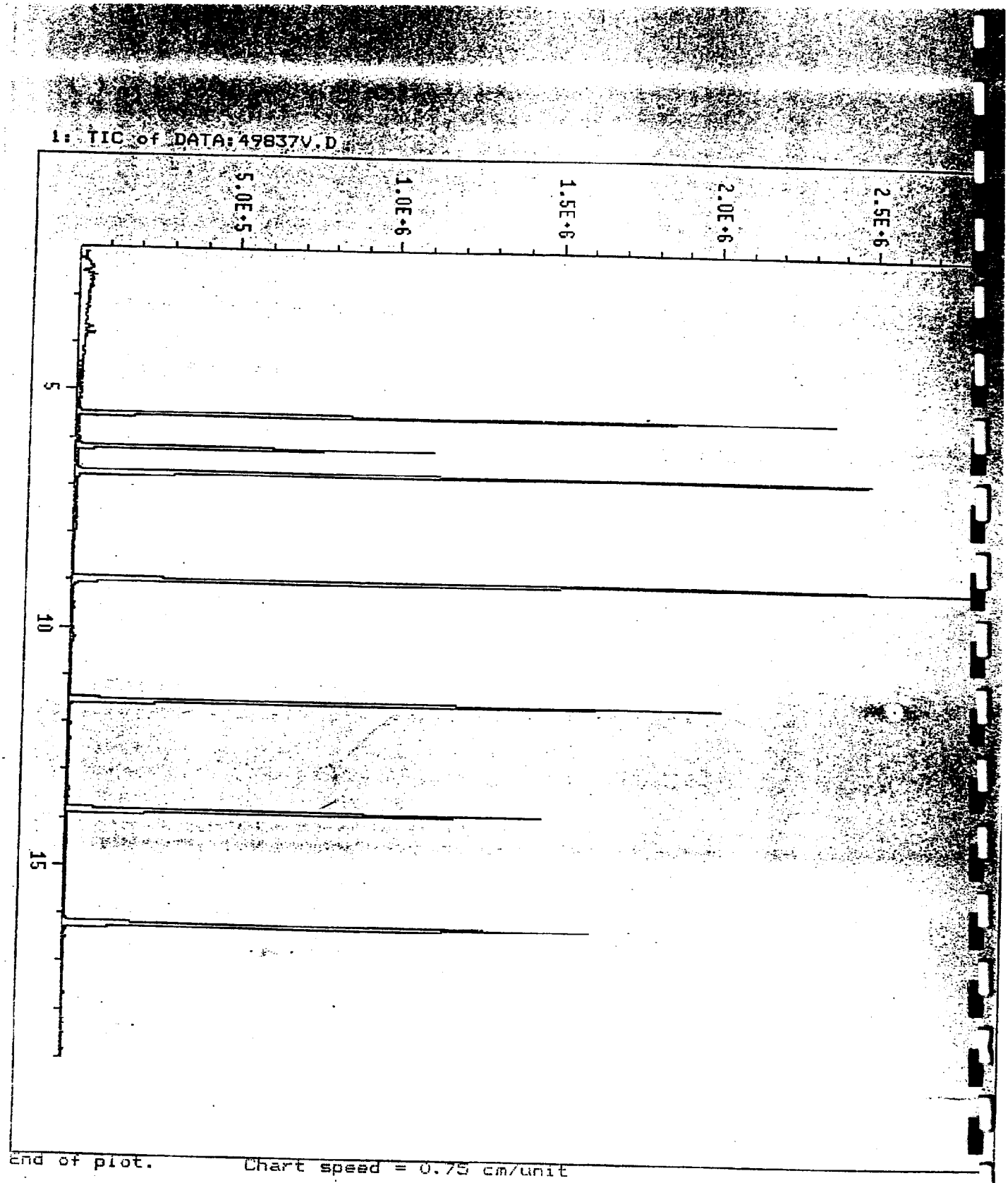
SEA405305

File : C:\HPCHEM\1\DATA\BTEXDATA\40726.1\0701007.D
Operator :
Acquired : 26 Jul 94 7:20 pm using AcqMethod TPH&BTEX.M
Instrument : H-P 5890/
Sample Name: 49837
Misc Info :
Vial Number: 7



KCSlip4 38776

SEA405306

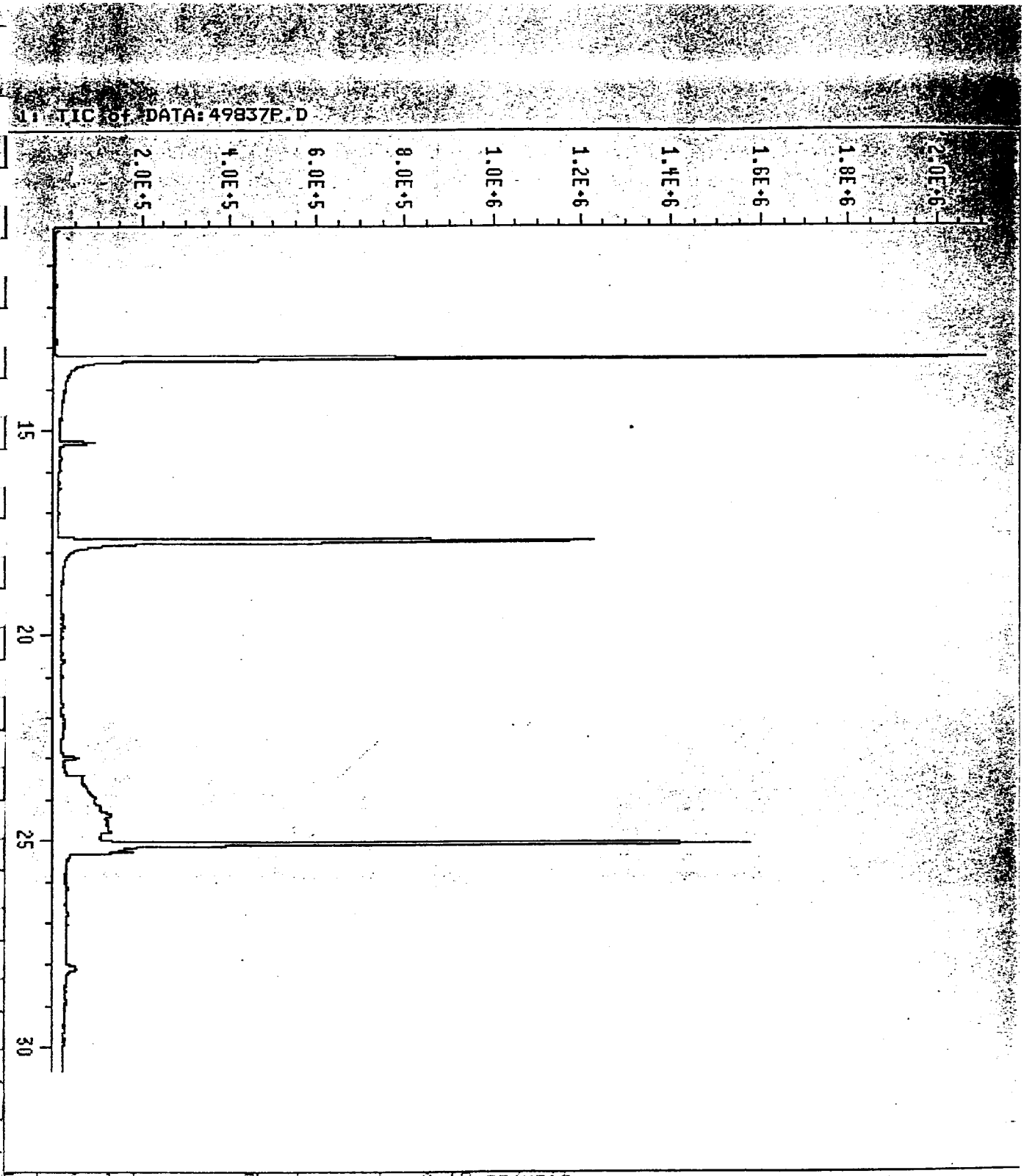


End of plot. Chart speed = 0.75 cm/unit

CHROMATOGRAM OF VOLATILE FRACTION FROM SAMPLE 49837V

KCSlip4 38777

SEA405307



End of plot. Chart speed = 0.62 cm/unit

CHROMATOGRAM OF SAMPLE 49837P

KCSlip4 38778

SEA405308

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49838

Project Description: Seattle ANGS 1315-127
Sample Name: BS001 BH 5 1/2-7
Date/Time Taken: 7/14/94

Matrix: Soil
Date/Time Received: 7/15/94 4:20:00

Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]
TPH by GC (as diesel)	5.6	89.9
TPH by GC (as gasoline)	9.3	89.5
Antimony/GFAA	1.9	75.6
Arsenic/GFAA	1.1	65.2
Beryllium/ICP	3.2	92.8
Cadmium/GFAA	0.2	79
Chromium/GFAA	1.1	79.7
Copper/ICP	0.6	103
Lead/GFAA	0.3	80.1
Mercury/CVAA	9.1	105.6
Nickel/ICP	1.5	76
Selenium/GFAA	2.9	39.6
Silver/GFAA	10.1	40.6
Thallium/GFAA	8.6	88.8
Zinc/ICP	2.1	77.4
4,4'-DDD	13	76.1
4,4'-DDE	10.1	79.3
4,4'-DDT	13.6	78.2
Aldrin	10.8	101.7
alpha-BHC	22.5	99.1
alpha-Chlordane	13.7	85.4
beta-BHC	24.3	88.4
beta-Chlordane	14.3	89.5
delta-BHC	10.2	96.4
Dieldrin	13.4	82.4
Endosulfan I	10.3	75.7
Endosulfan II	9.3	79.6
Endosulfan sulfate	21.8	78.4
Endrin	2.2	73.6
Endrin aldehyde	14.1	75.9
Heptachlor	19.2	103.5
Heptachlor epoxide	20.8	83.6
Lindane	2.4	99.8
Methoxychlor	17.3	74.6

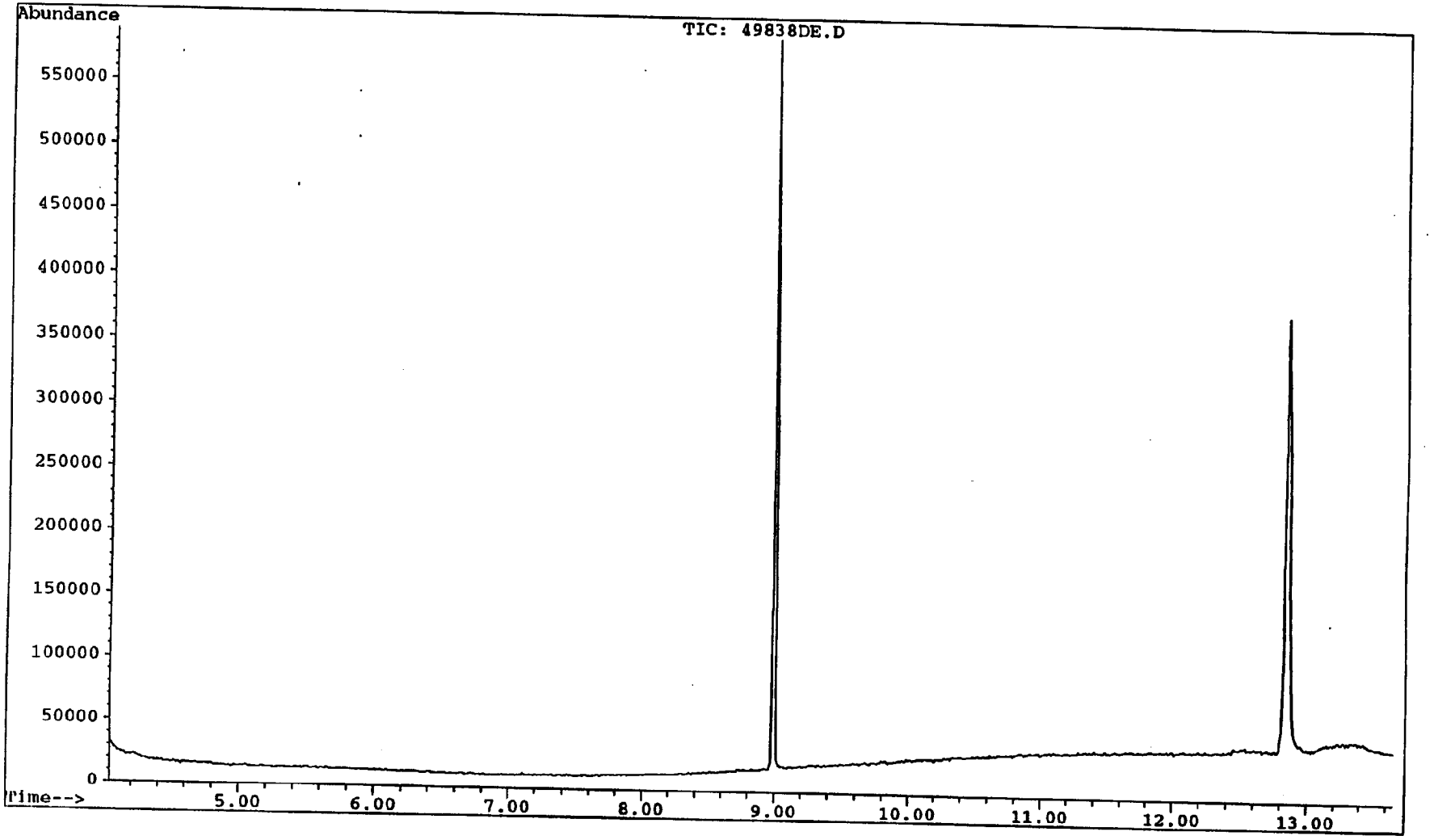
PCB, total	3.7	49.5
Toxaphene	12.5	91

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	8240	89
4-Bromofluorobenzene(surr)	8240	98
Toluene-d8(surr)	8240	112
2,4,6-Tribromophenol	625&8270	54
2-Fluorobiphenyl	625&8270	49.6
2-Fluorophenol	625&8270	43.2
Nitrobenzene-d5	625&8270	44.2
Phenol-d5	625&8270	50.2
Terphenyl-d14	625&8270	63.1
2,4,5,6-Tetrachloro-m-xylene	8080	50.7
Dibutyl Chlorendate	8080	62.9
p-Terphenyl	8015 mod.	75.3
Pentafluorobenzene(Surr)	8015 mod.	96.6

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

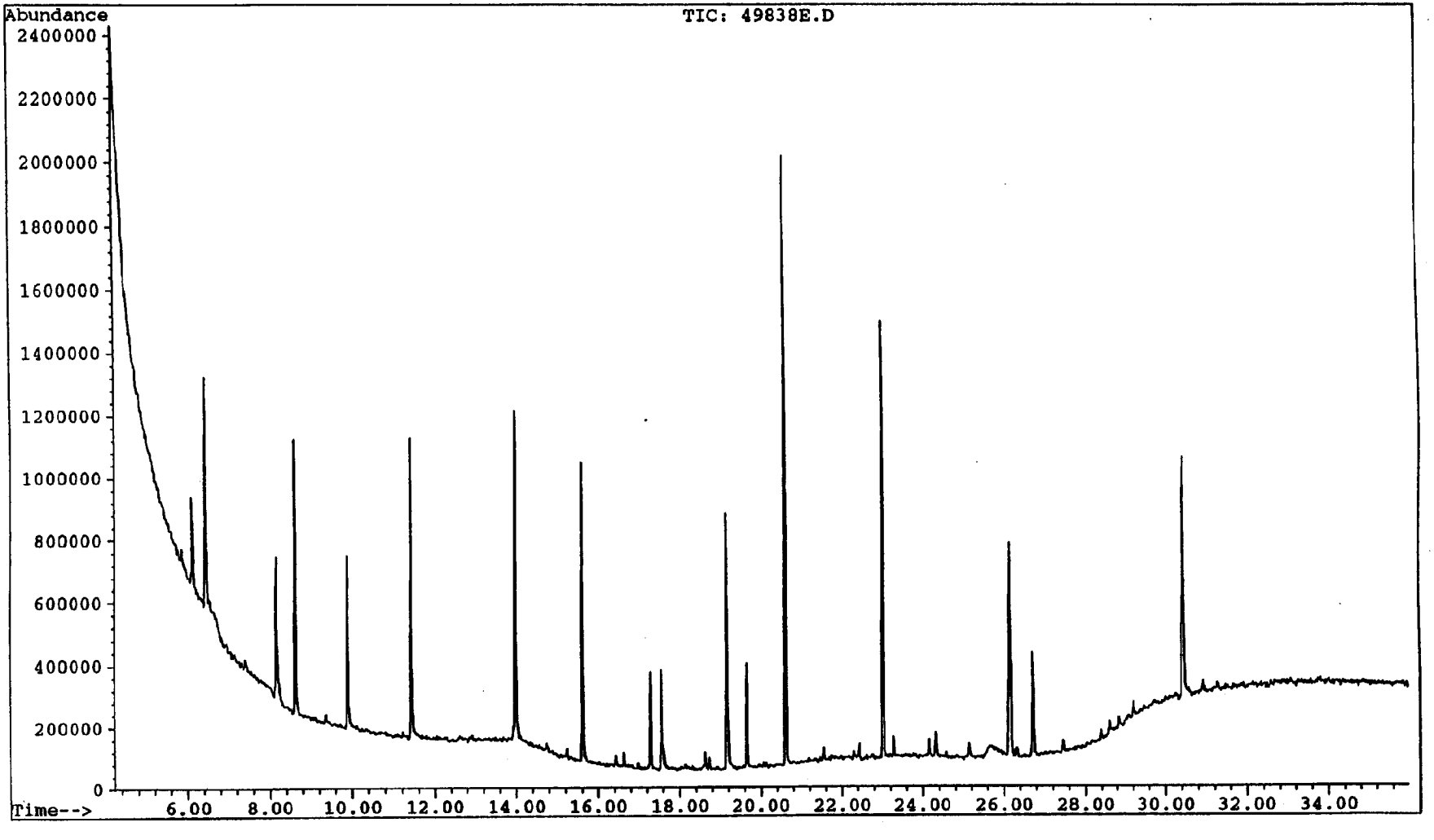
File : D:\4214FDSL\49838DE.D
Operator : TR
Acquired : 2 Aug 94 5:51 pm using AcqMethod TPHDEL.M
Instrument : 5971 - GC
Sample Name:
Misc Info :
Vial Number: 9



KCSlip4 38781

SEA405311

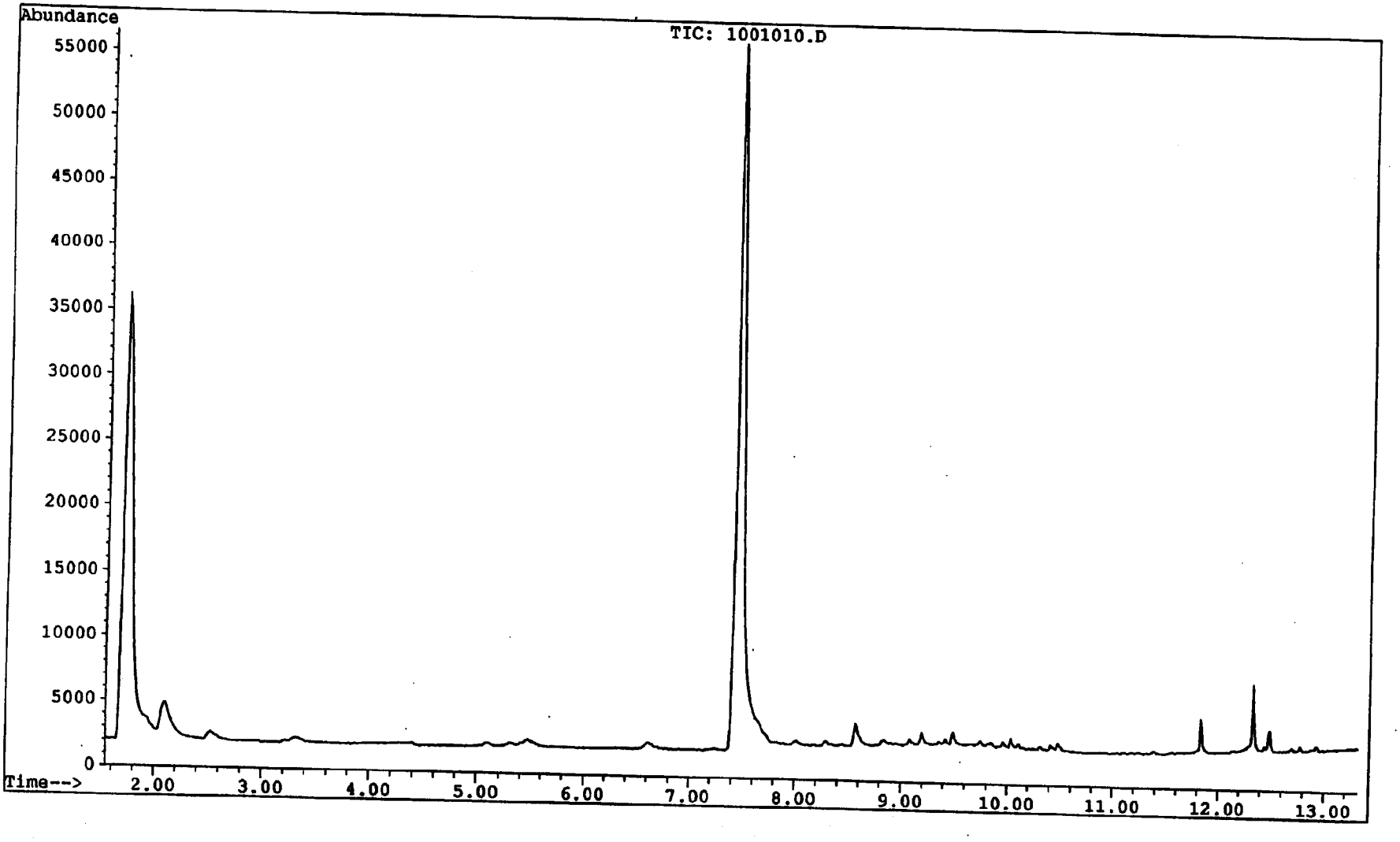
File : D:\4207FOPT\49838E.D
Operator : TR
Acquired : 26 Jul 94 3:25 pm using AcqMethod OPTECH.M
Instrument : 5971 - GC
Sample Name: SMPL3
Misc Info : S20
Vial Number: 7



KCSlip4 38782

SEA405312

File : C:\HPCHEM\1\DATA\BTEXDATA\40726.1\1001010.D
Operator :
Acquired : 26 Jul 94 8:21 pm using AcqMethod TPH&BTEX.M
Instrument : H-P 5890/
Sample Name: 49838
Misc Info :
Vial Number: 10



KCSlip4 38783

SEA405313

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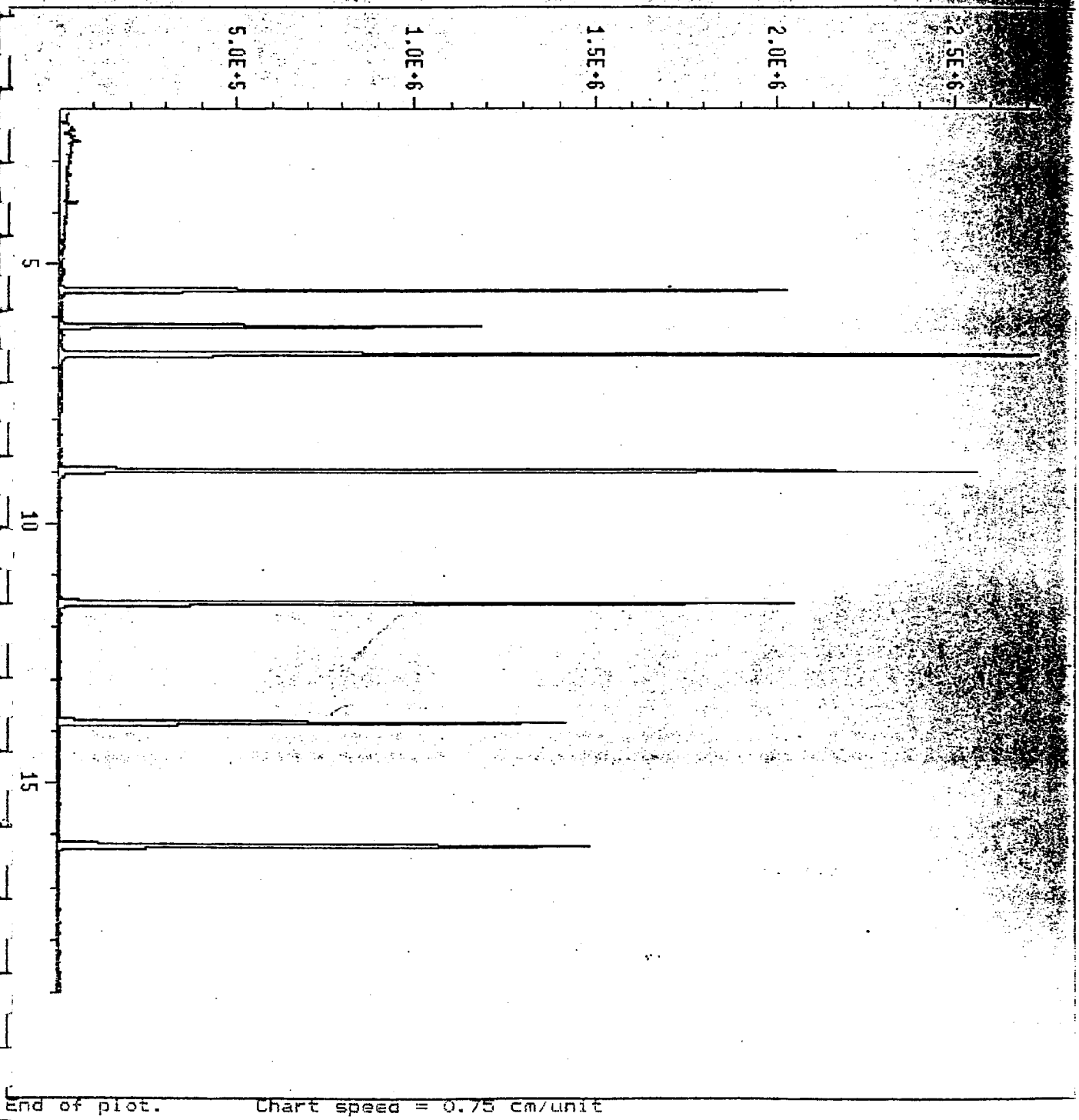
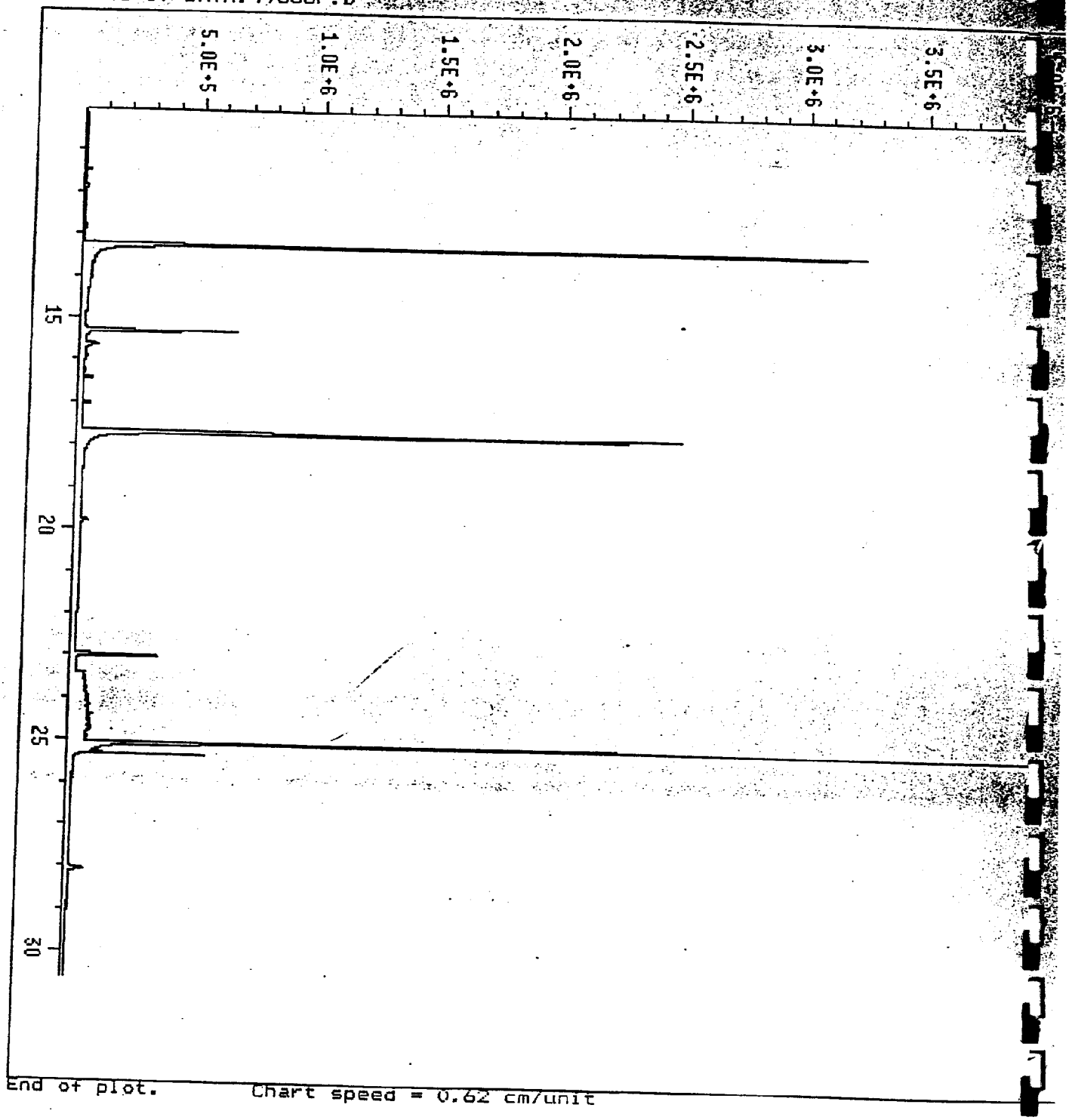


End of plot. Chart speed = 0.75 cm/unit

CHROMATOGRAM OF VOLATILE FRACTION FROM SAMPLE 49838V

KCSlip4 38784

SEA405314



End of plot. Chart speed = 0.62 cm/unit

CHROMATOGRAM OF SAMPLE 49838P

KCSlip4 38785

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49839

Project Description: Seattle ANGS 1315-127
Sample Name: BS001 BH 8 1/2-10 **Matrix:** Soil
Date/Time Taken: 7/14/94 **Date/Time Received:** 7/15/94 4:20:00

Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]
TPH by GC (as diesel)	5.6	89.9
TPH by GC (as gasoline)	9.3	89.5
Antimony/GFAA	1.9	75.6
Arsenic/GFAA	1.1	65.2
Beryllium/ICP	3.2	92.8
Cadmium/GFAA	0.2	79
Chromium/GFAA	1.1	79.7
Copper/ICP	0.6	103
Lead/GFAA	0.3	80.1
Mercury/CVAA	9.1	105.6
Nickel/ICP	1.5	76
Selenium/GFAA	2.9	39.6
Silver/GFAA	10.1	40.6
Thallium/GFAA	8.6	88.8
Zinc/ICP	2.1	77.4
4,4'-DDD	13	76.1
4,4'-DDE	10.1	79.3
4,4'-DDT	13.6	78.2
Aldrin	10.8	101.7
alpha-BHC	22.5	99.1
alpha-Chlordane	13.7	85.4
beta-BHC	24.3	88.4
beta-Chlordane	14.3	89.5
delta-BHC	10.2	96.4
Dieldrin	13.4	82.4
Endosulfan I	10.3	75.7
Endosulfan II	9.3	79.6
Endosulfan sulfate	21.8	78.4
Endrin	2.2	73.6
Endrin aldehyde	14.1	75.9
Heptachlor	19.2	103.5
Heptachlor epoxide	20.8	83.6
Lindane	2.4	99.8
Methoxychlor	17.3	74.6

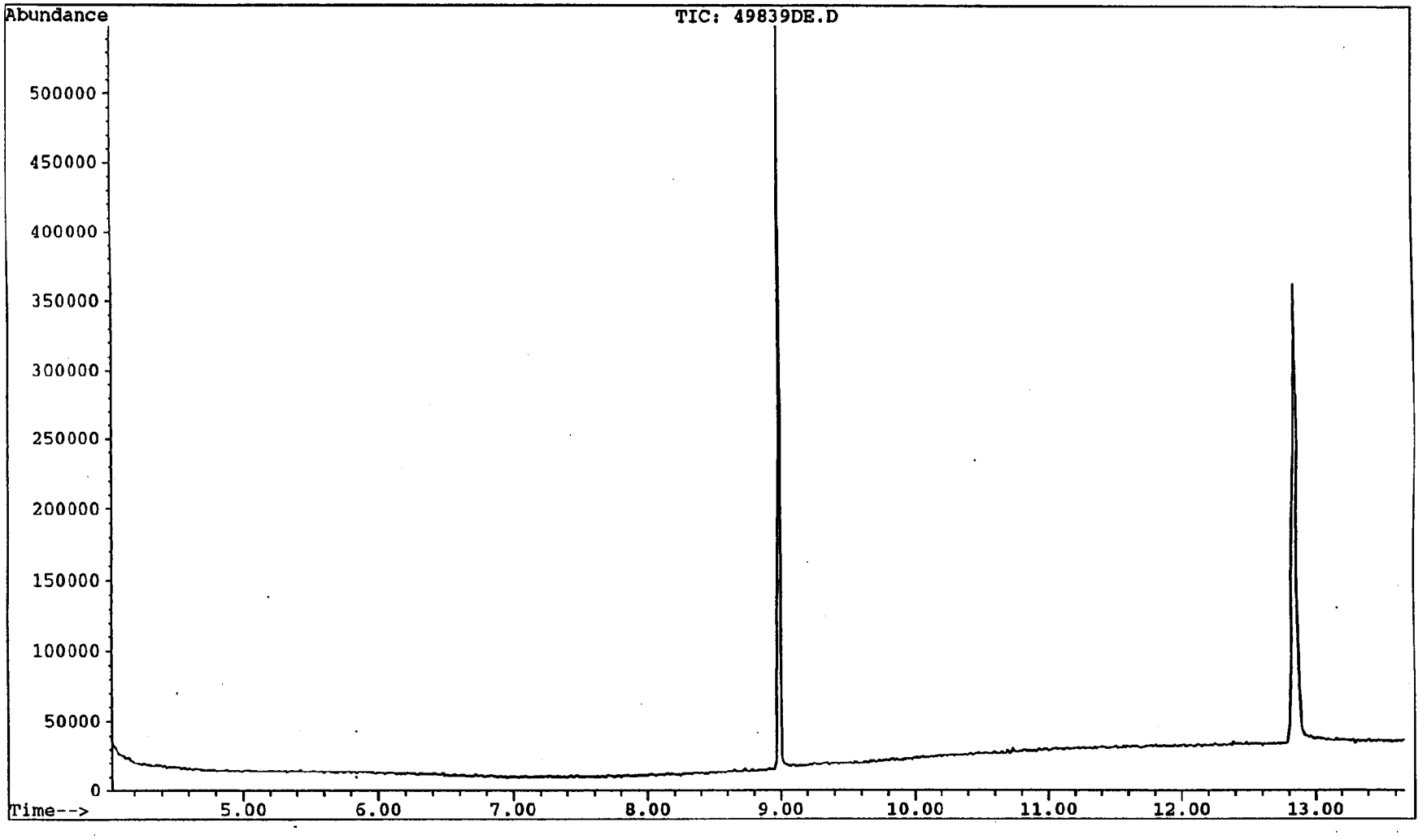
PCB, total	3.7	49.5
Toxaphene	12.5	91

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	8240	97
4-Bromofluorobenzene(surr)	8240	97
Toluene-d8(surr)	8240	109
2,4,6-Tribromophenol	625&8270	56.4
2-Fluorobiphenyl	625&8270	45.3
2-Fluorophenol	625&8270	37.5
Nitrobenzene-d5	625&8270	38
Phenol-d5	625&8270	44.9
Terphenyl-d14	625&8270	64.3
2,4,5,6-Tetrachloro-m-xylene	8080	50
Dibutyl Chlorendate	8080	63
p-Terphenyl	8015 mod.	70.4
Pentafluorobenzene(Surr)	8015 mod.	90.5

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

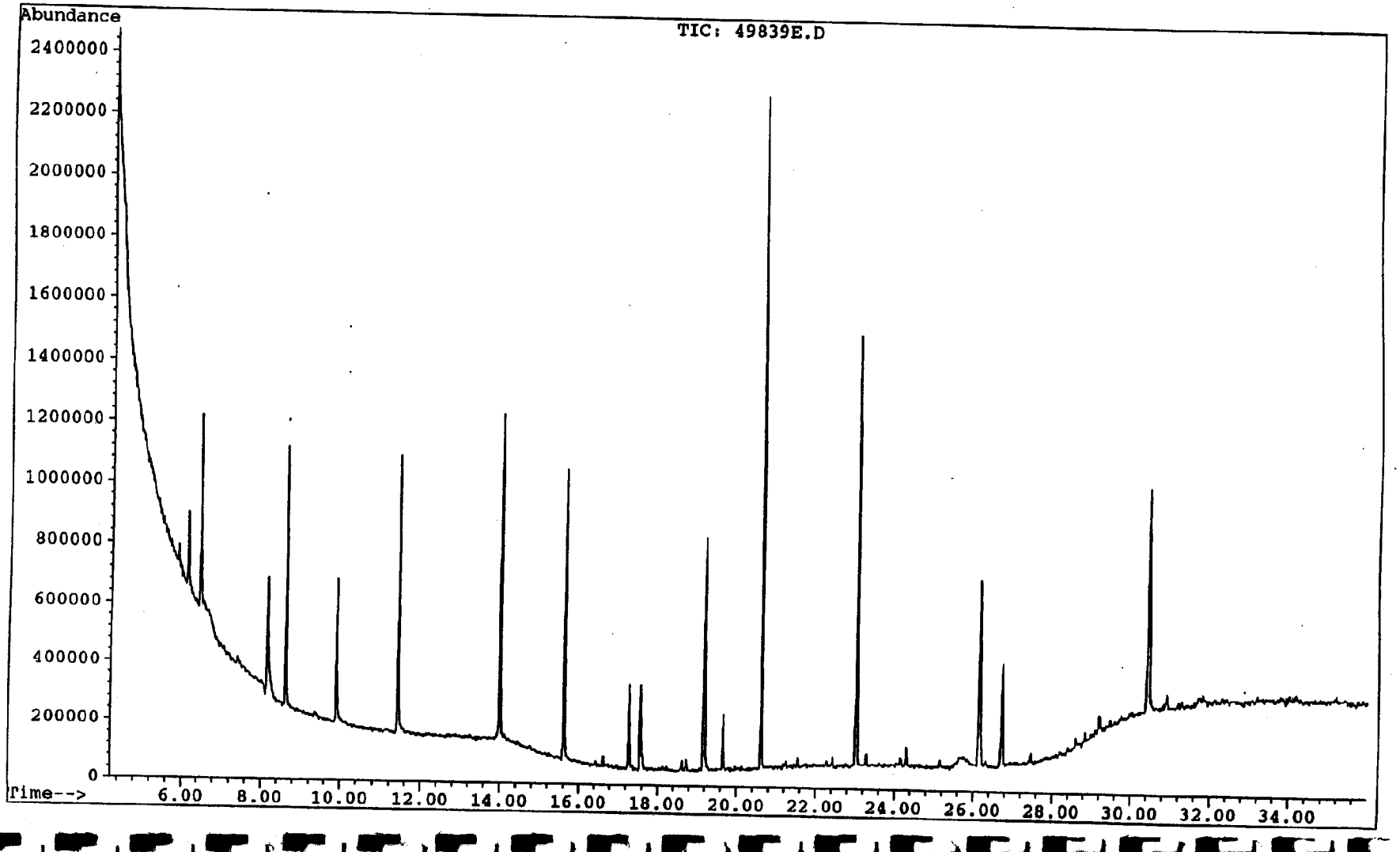
File : D:\4214FDSL\49839DE.D
Operator : TR
Acquired : 2 Aug 94 6:52 pm using AcqMethod TPHDEL.M
Instrument : 5971 - GC
Sample Name:
Misc Info :
Vial Number: 12



KCSlip4 38788

SEA405318

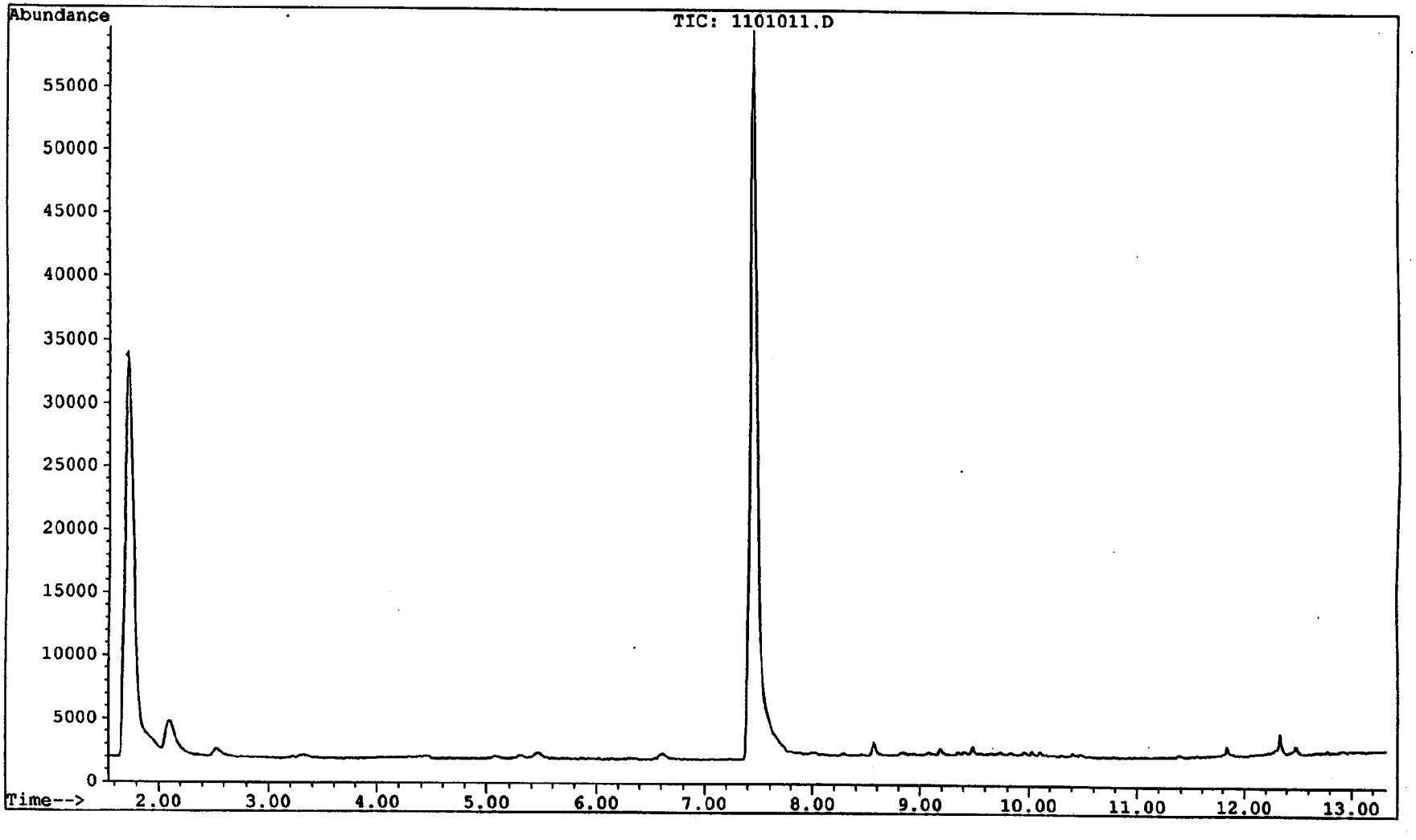
File : D:\4207FOPT\49839E.D
Operator : TR
Acquired : 26 Jul 94 4:12 pm using AcqMethod OPTECH.M
Instrument : 5971 - GC
Sample Name: SMPL4
Misc Info : S20
Vial Number: 8



KCSlip4 38789

SEA405319

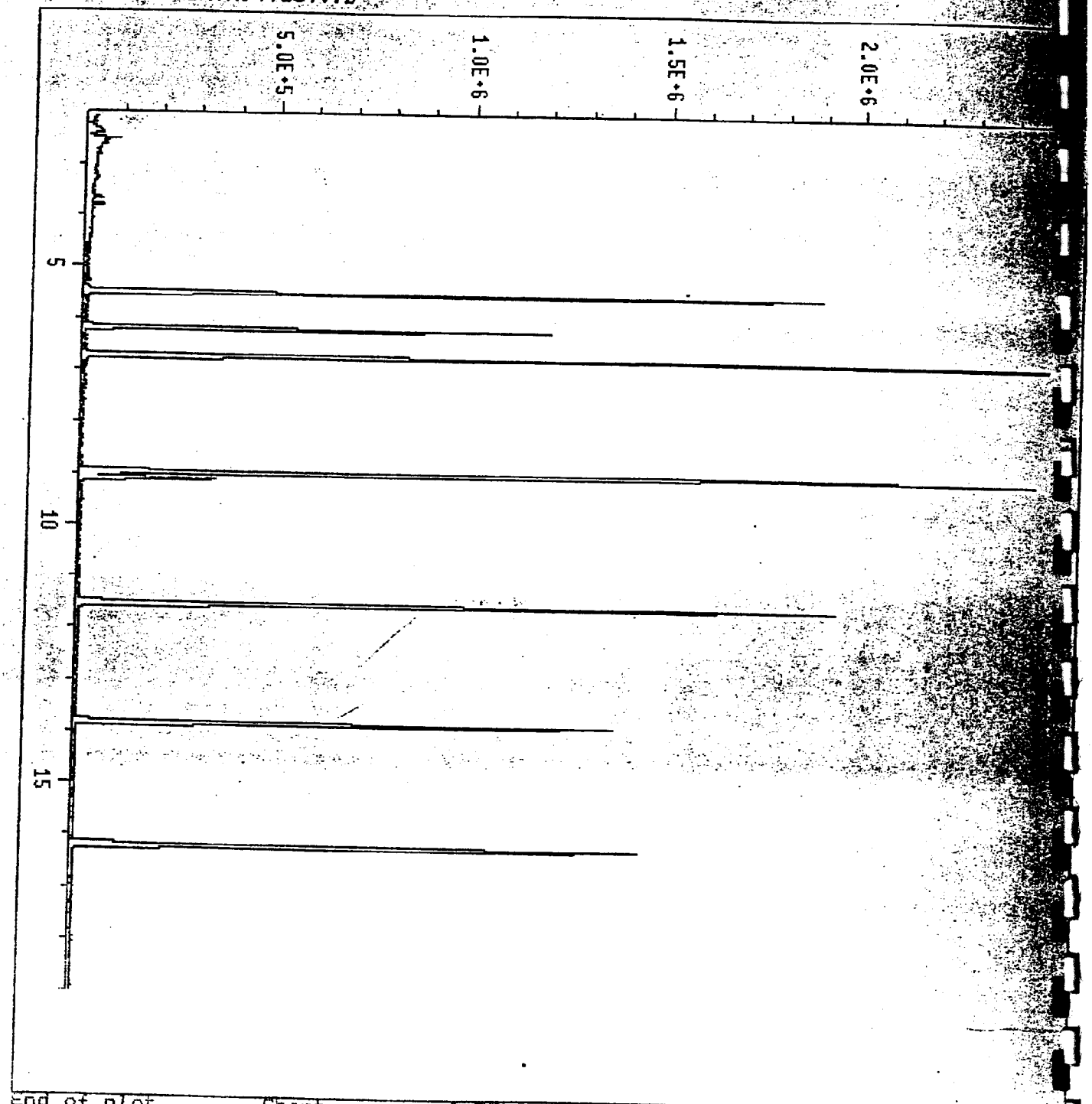
File : C:\HPCHEM\1\DATA\BTEXDATA\40726.1\1101011.D
Operator :
Acquired : 26 Jul 94 8:41 pm using AcqMethod TPH&BTEX.M
Instrument : H-P 5890/
Sample Name: 49839
Misc Info :
Vial Number: 11



KCSlip4 38790

SEA405320

1: TIC of DATA:49839V.D

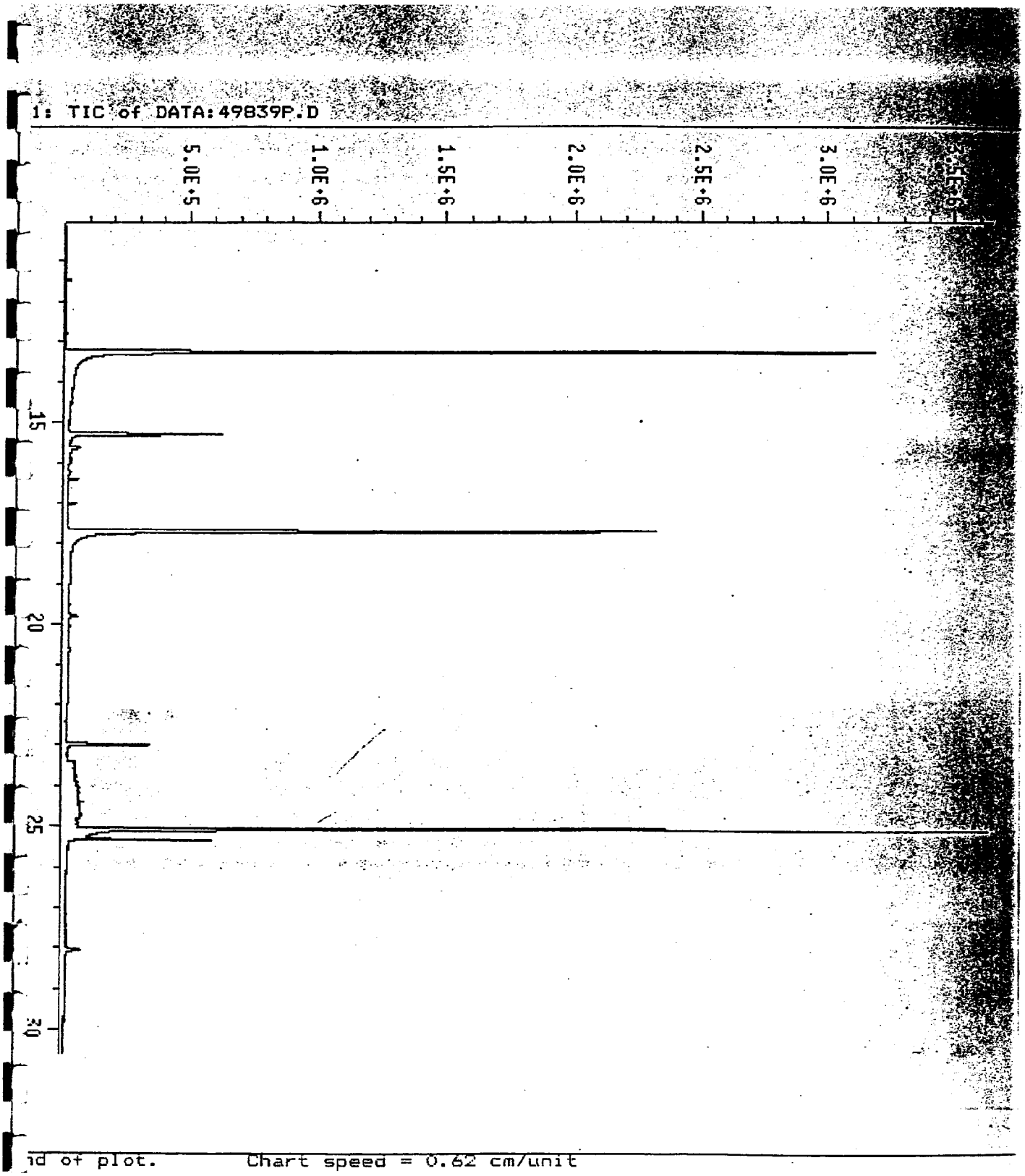


End of plot. Chart speed = 0.75 cm/unit

CHROMATOGRAM OF VOLATILE FRACTION FROM SAMPLE 49839V

KCSlip4 38791

SEA405321



nd of plot. Chart speed = 0.62 cm/unit

CHROMATOGRAM OF SAMPLE 49839P

KCSlip4 38792

SEA405322

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49840

Project Description: Seattle ANGS 1315-127
Sample Name: BS002 BH 1-2 1/2
Date/Time Taken: 7/14/94

Matrix: Soil
Date/Time Received: 7/15/94 4:20:00

Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]
TPH by GC (as diesel)	5.6	89.9
TPH by GC (as gasoline)	9.3	89.5
Antimony/GFAA	1.9	75.6
Arsenic/GFAA	1.1	65.2
Beryllium/ICP	3.2	92.8
Cadmium/GFAA	0.2	79
Chromium/GFAA	1.1	79.7
Copper/ICP	0.6	103
Lead/GFAA	0.3	80.1
Mercury/CVAA	9.1	105.6
Nickel/ICP	1.5	76
Selenium/GFAA	2.9	39.6
Silver/GFAA	10.1	40.6
Thallium/GFAA	8.6	88.8
Zinc/ICP	2.1	77.4
4,4'-DDD	13	76.1
4,4'-DDE	10.1	79.3
4,4'-DDT	13.6	78.2
Aldrin	10.8	101.7
alpha-BHC	22.5	99.1
alpha-Chlordane	13.7	85.4
beta-BHC	24.3	88.4
beta-Chlordane	14.3	89.5
delta-BHC	10.2	96.4
Dieldrin	13.4	82.4
Endosulfan I	10.3	75.7
Endosulfan II	9.3	79.6
Endosulfan sulfate	21.8	78.4
Endrin	2.2	73.6
Endrin aldehyde	14.1	75.9
Heptachlor	19.2	103.5
Heptachlor epoxide	20.8	83.6
Lindane	2.4	99.8
Methoxychlor	17.3	74.6

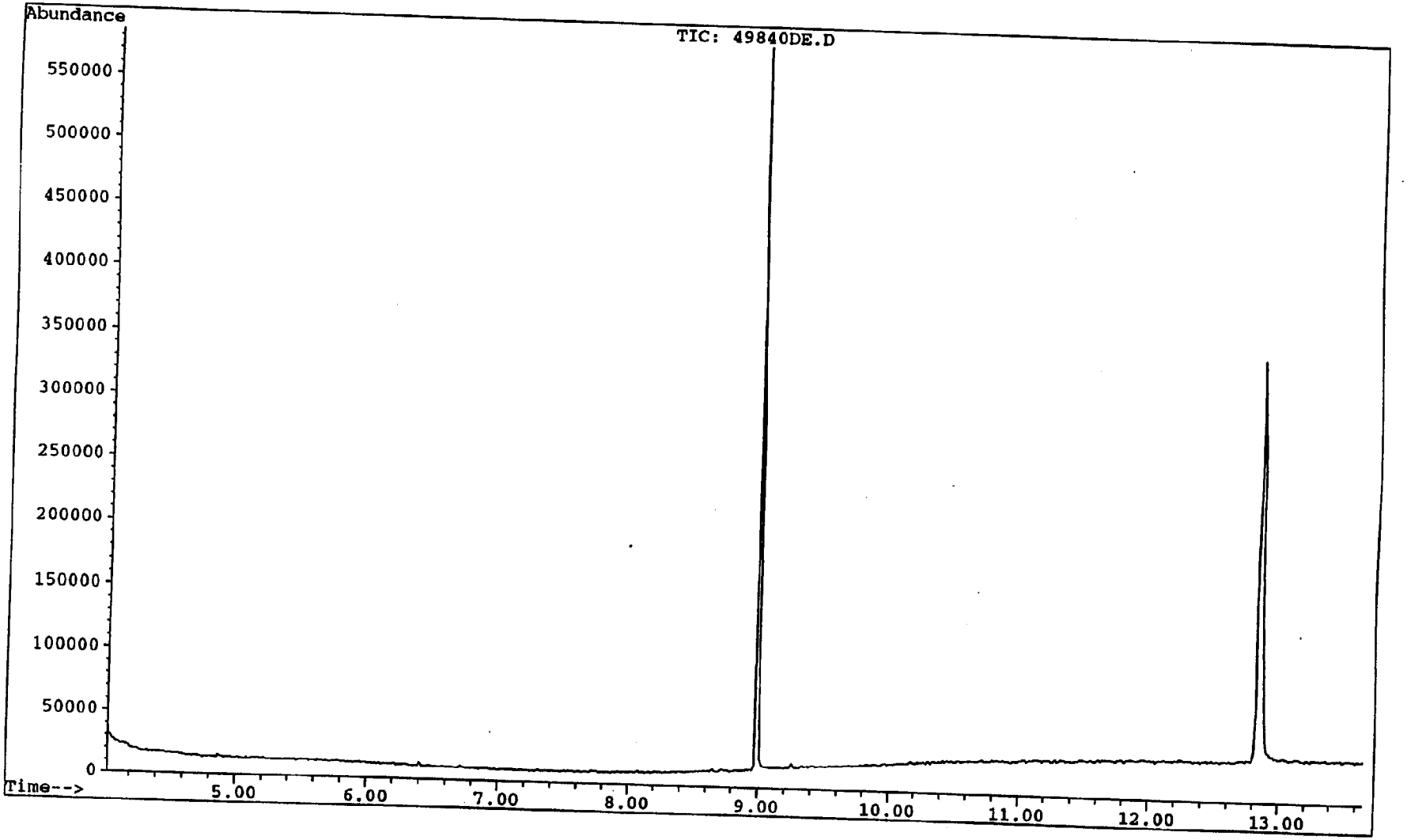
PCB, total	3.7	49.5
Toxaphene	12.5	91

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	8240	94
4-Bromofluorobenzene(surr)	8240	94
Toluene-d8(surr)	8240	107
2,4,6-Tribromophenol	625&8270	46.5
2-Fluorobiphenyl	625&8270	29.5
2-Fluorophenol	625&8270	29
Nitrobenzene-d5	625&8270	33.7
Phenol-d5	625&8270	35.4
Terphenyl-d14	625&8270	43.2
2,4,5,6-Tetrachloro-m-xylene	8080	37.3
Dibutyl Chlorendate	8080	43.4
p-Terphenyl	8015 mod.	76.3
Pentafluorobenzene(Surr)	8015 mod.	79.2

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

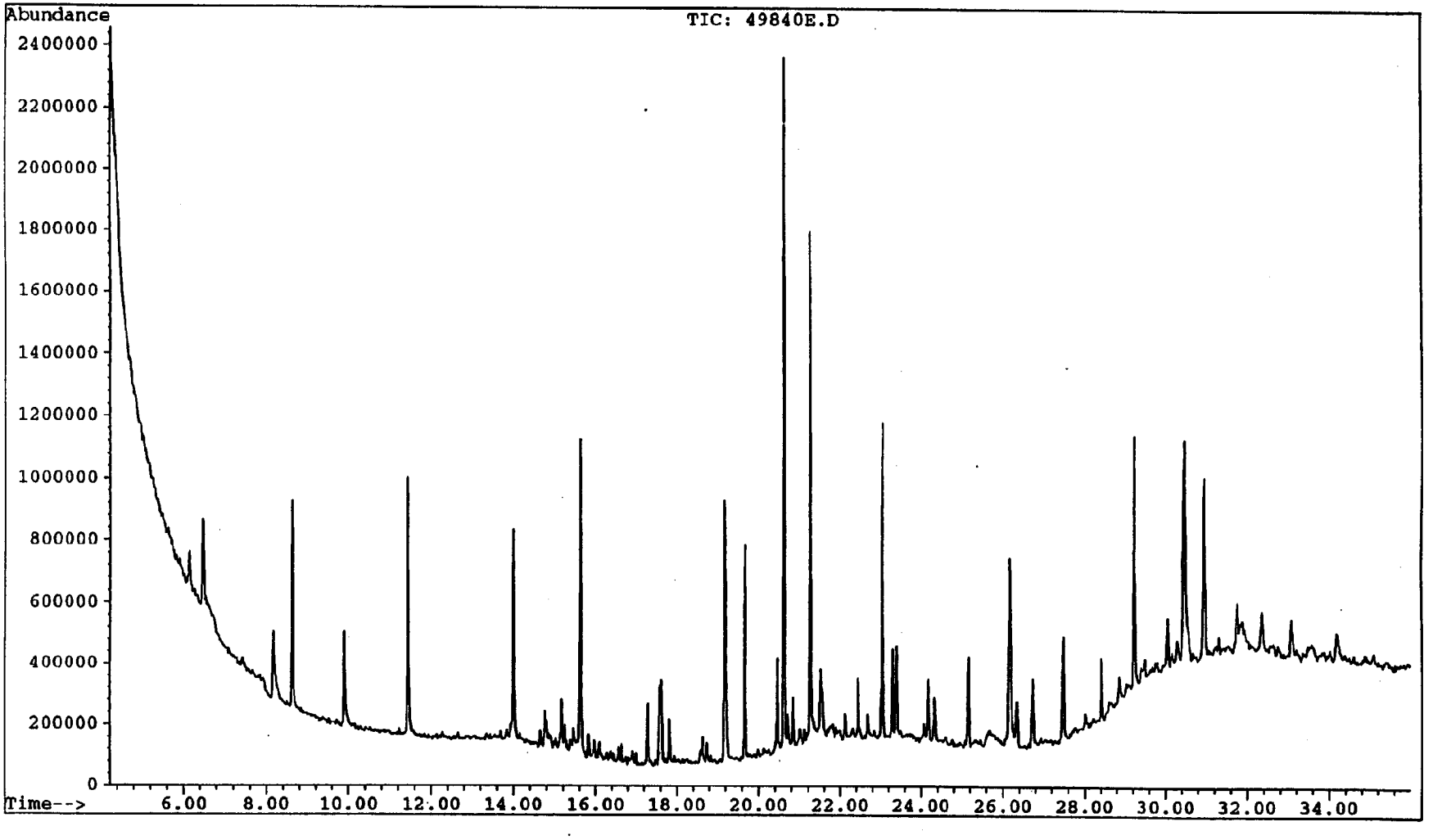
File : D:\4214FDSL\49840DE.D
Operator : TR
Acquired : 2 Aug 94 7:12 pm using AcqMethod TPHDEL.M
Instrument : 5971 - GC
Sample Name:
Misc Info :
Vial Number: 13



KCSlip4 38795

SEA405325

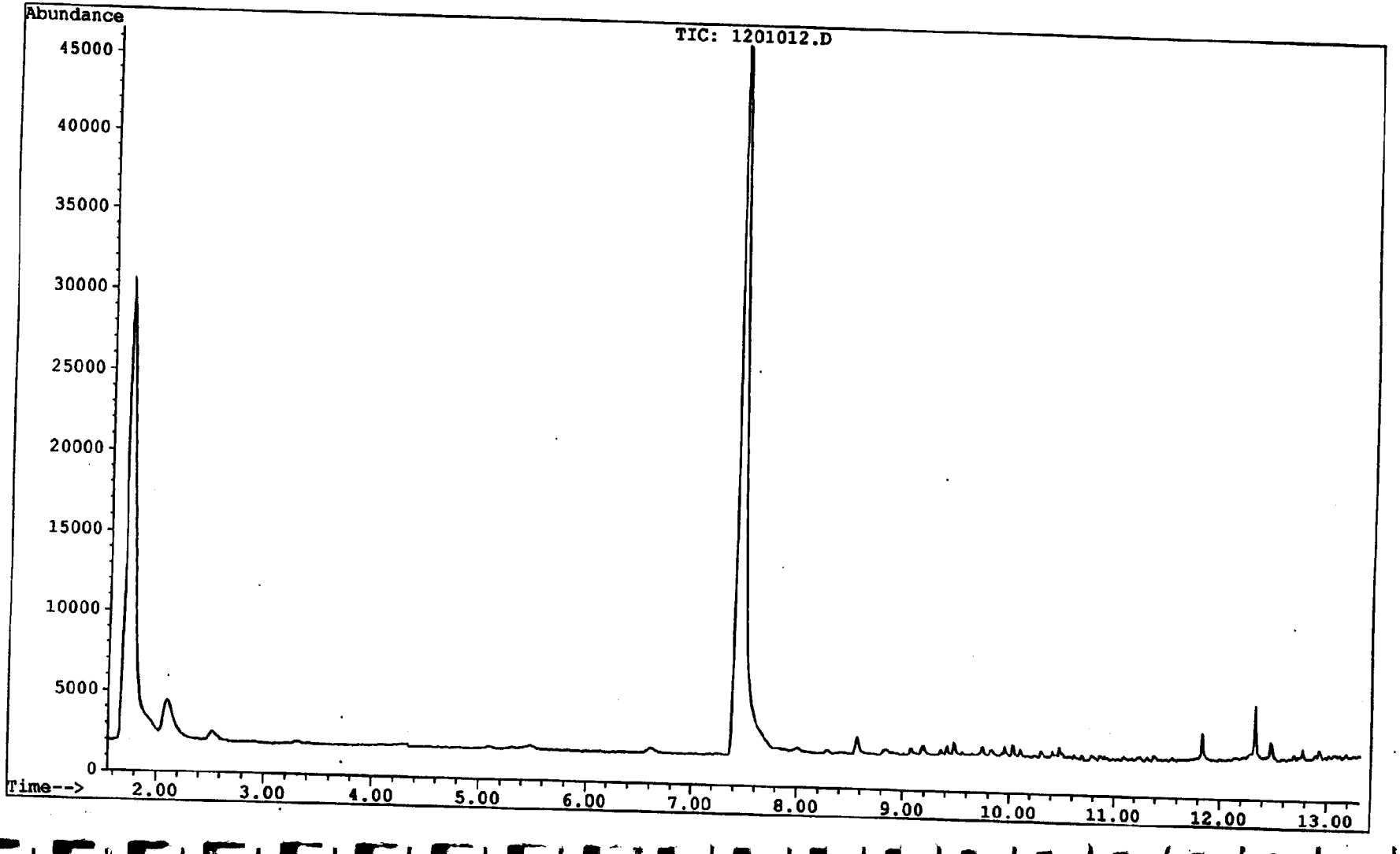
File : D:\4207FOPT\49840E.D
Operator : TR
Acquired : 26 Jul 94 4:59 pm using AcqMethod OPTECH.M
Instrument : 5971 - GC
Sample Name: SMPL5
Misc Info : S20
Vial Number: 9



KCSlip4 38796

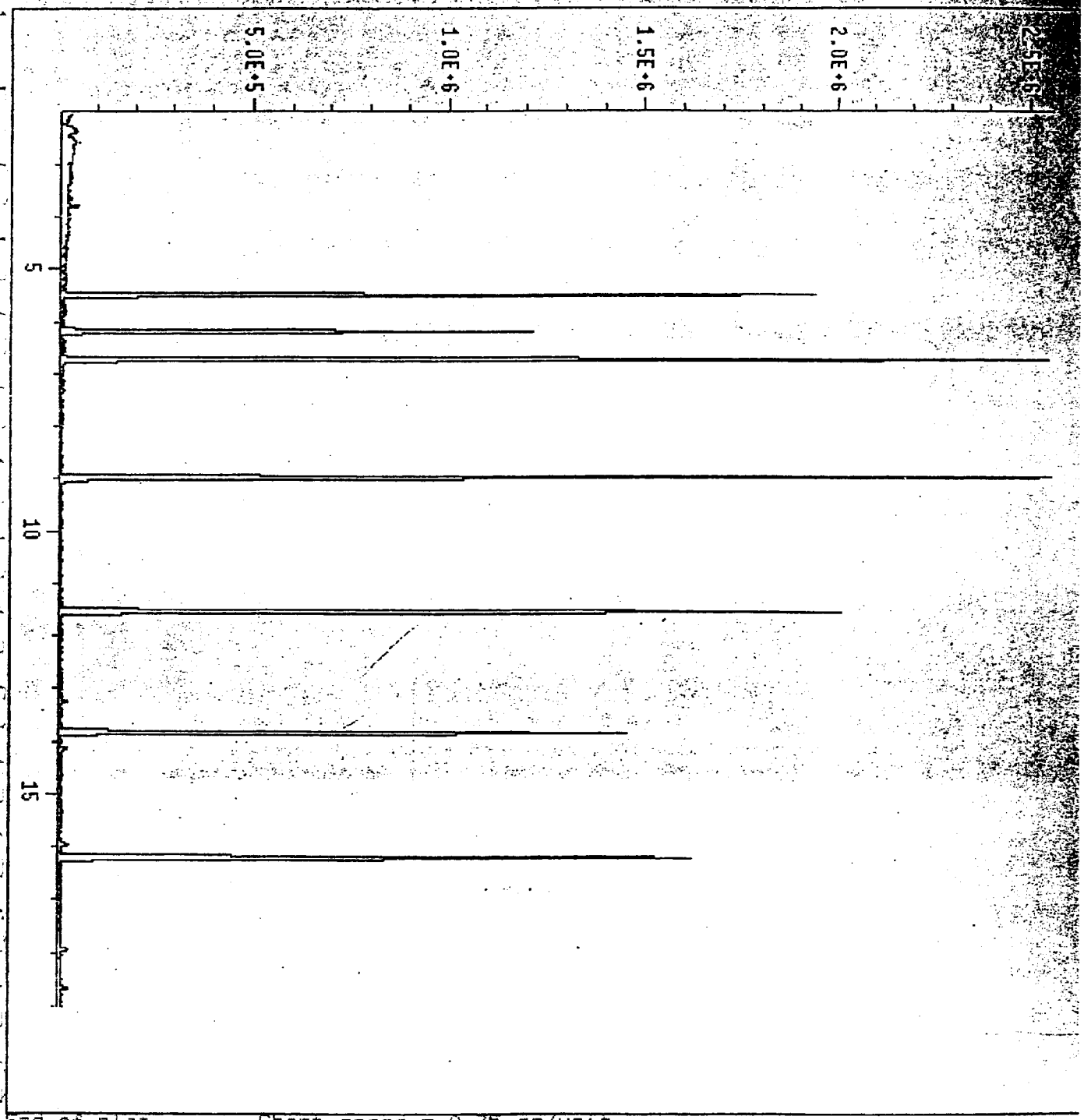
SEA405326

File : C:\HPCHEM\1\DATA\BTEXDATA\40726.1\1201012.D
Operator :
Acquired : 26 Jul 94 9:02 pm using AcqMethod TPH&BTEX.M
Instrument : H-P 5890/
Sample Name: 49840
Misc Info :
Vial Number: 12



KCSlip4 38797

SEA405327

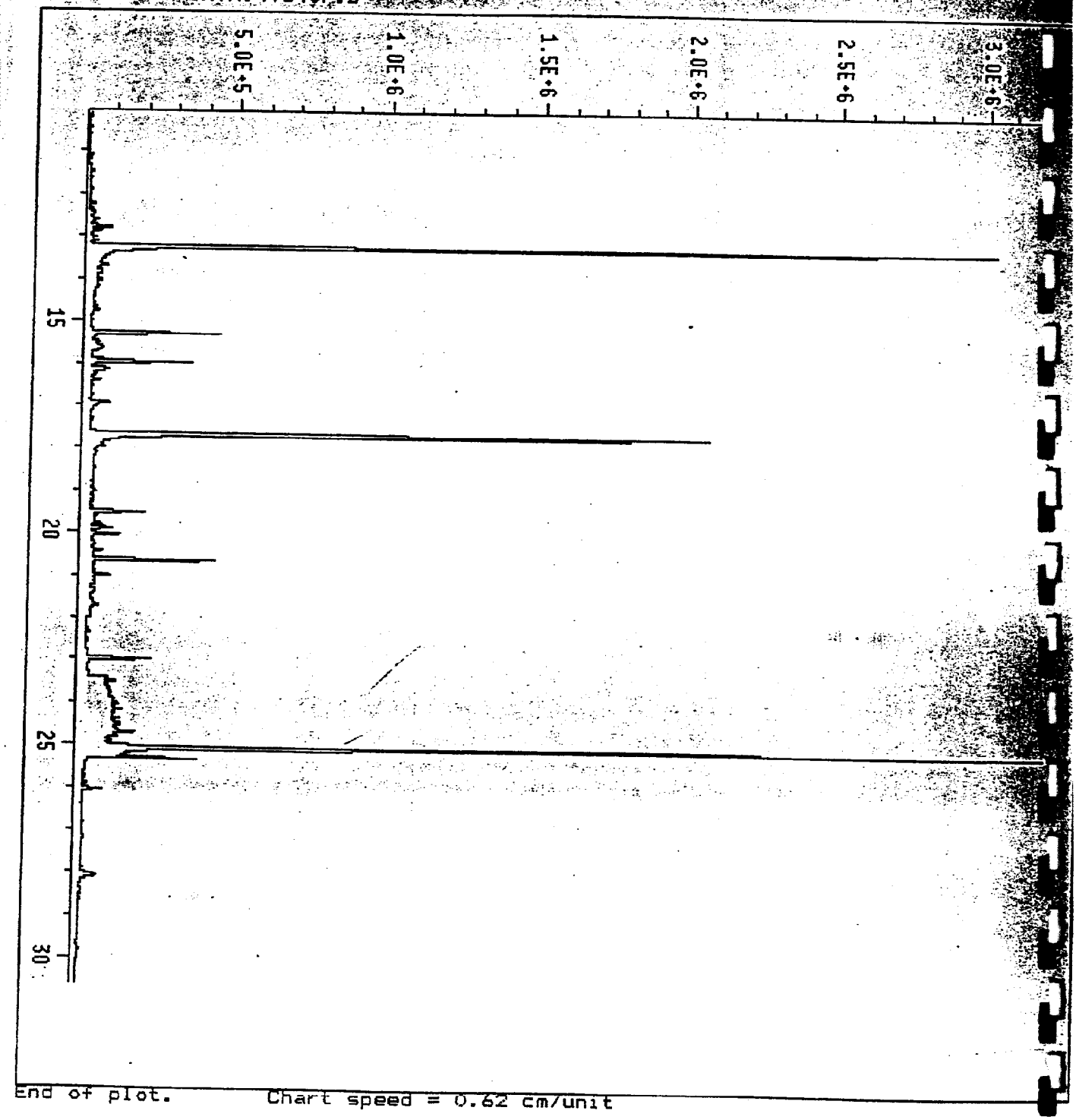


End of plot. Chart speed = 0.75 cm/unit

CHROMATOGRAM OF VOLATILE FRACTION FROM SAMPLE 49840V

KCSlip4 38798

SEA405328



End of plot. Chart speed = 0.62 cm/unit

CHROMATOGRAM OF SAMPLE 49840P

KCSlip4 38799

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49841

Project Description: Seattle ANGS 1315-127
Sample Name: BS002 BH 5 1/2-7
Date/Time Taken: 7/14/94

Matrix: Soil
Date/Time Received: 7/15/94 4:20:00

Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]
TPH by GC (as diesel)	5.6	89.9
TPH by GC (as gasoline)	9.3	89.5
Antimony/GFAA	1.9	75.6
Arsenic/GFAA	1.1	65.2
Beryllium/ICP	3.2	92.8
Cadmium/GFAA	0.2	79
Chromium/GFAA	1.1	79.7
Copper/ICP	0.6	103
Lead/GFAA	0.3	80.1
Mercury/CVAA	9.1	105.6
Nickel/ICP	1.5	76
Selenium/GFAA	2.9	39.6
Silver/GFAA	10.1	40.6
Thallium/GFAA	8.6	88.8
Zinc/ICP	2.1	77.4
4,4'-DDD	13	76.1
4,4'-DDE	10.1	79.3
4,4'-DDT	13.6	78.2
Aldrin	10.8	101.7
alpha-BHC	22.5	99.1
alpha-Chlordane	13.7	85.4
beta-BHC	24.3	88.4
beta-Chlordane	14.3	89.5
delta-BHC	10.2	96.4
Dieldrin	13.4	82.4
Endosulfan I	10.3	75.7
Endosulfan II	9.3	79.6
Endosulfan sulfate	21.8	78.4
Endrin	2.2	73.6
Endrin aldehyde	14.1	75.9
Heptachlor	19.2	103.5
Heptachlor epoxide	20.8	83.6
Lindane	2.4	99.8
Methoxychlor	17.3	74.6

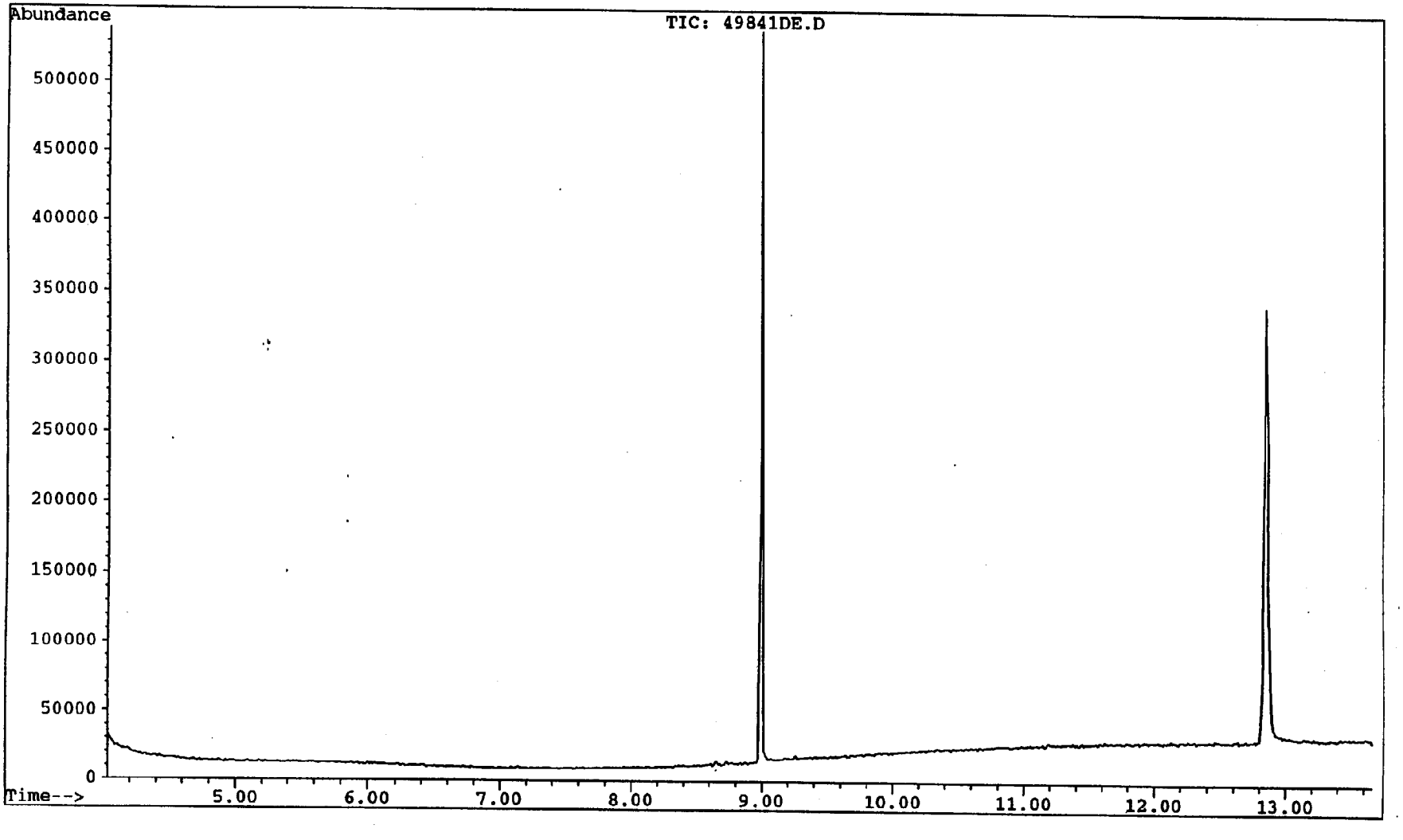
PCB, total	3.7	49.5
Toxaphene	12.5	91

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	8240	89
4-Bromofluorobenzene(surr)	8240	93
Toluene-d8(surr)	8240	111
2,4,6-Tribromophenol	625&8270	56.4
2-Fluorobiphenyl	625&8270	51.1
2-Fluorophenol	625&8270	8.8
Nitrobenzene-d5	625&8270	41.4
Phenol-d5	625&8270	52.4
Terphenyl-d14	625&8270	61.9
2,4,5,6-Tetrachloro-m-xylene	8080	55.6
Dibutyl Chlorendate	8080	63.1
p-Terphenyl	8015 mod.	71
Pentafluorobenzene(Surr)	8015 mod.	91.4

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

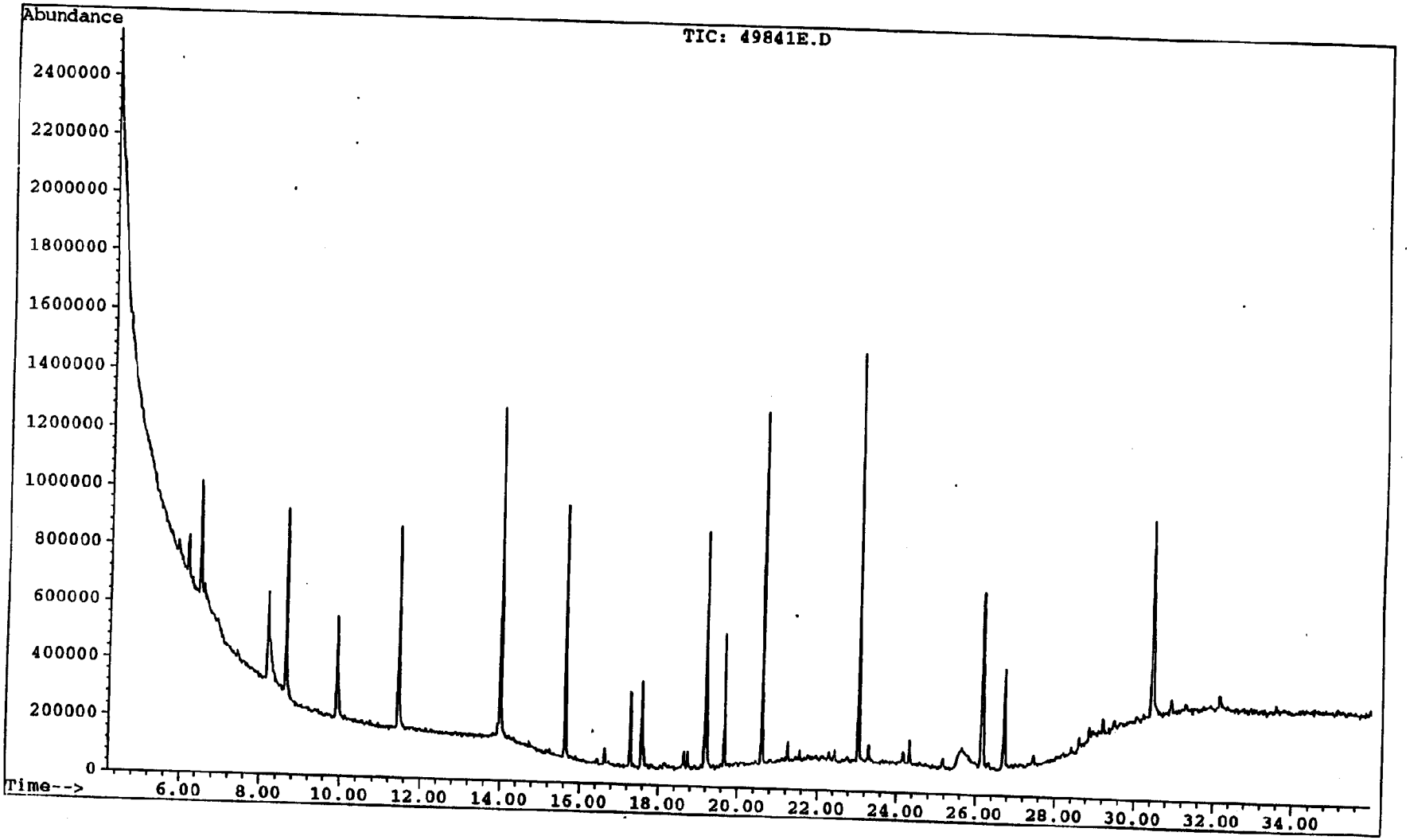
File : D:\4214FDSL\49841DE.D
Operator : TR
Acquired : 2 Aug 94 7:33 pm using AcqMethod TPHDEL.M
Instrument : 5971 - GC
Sample Name:
Misc Info :
Vial Number: 14



KCSlip4 38802

SEA405332

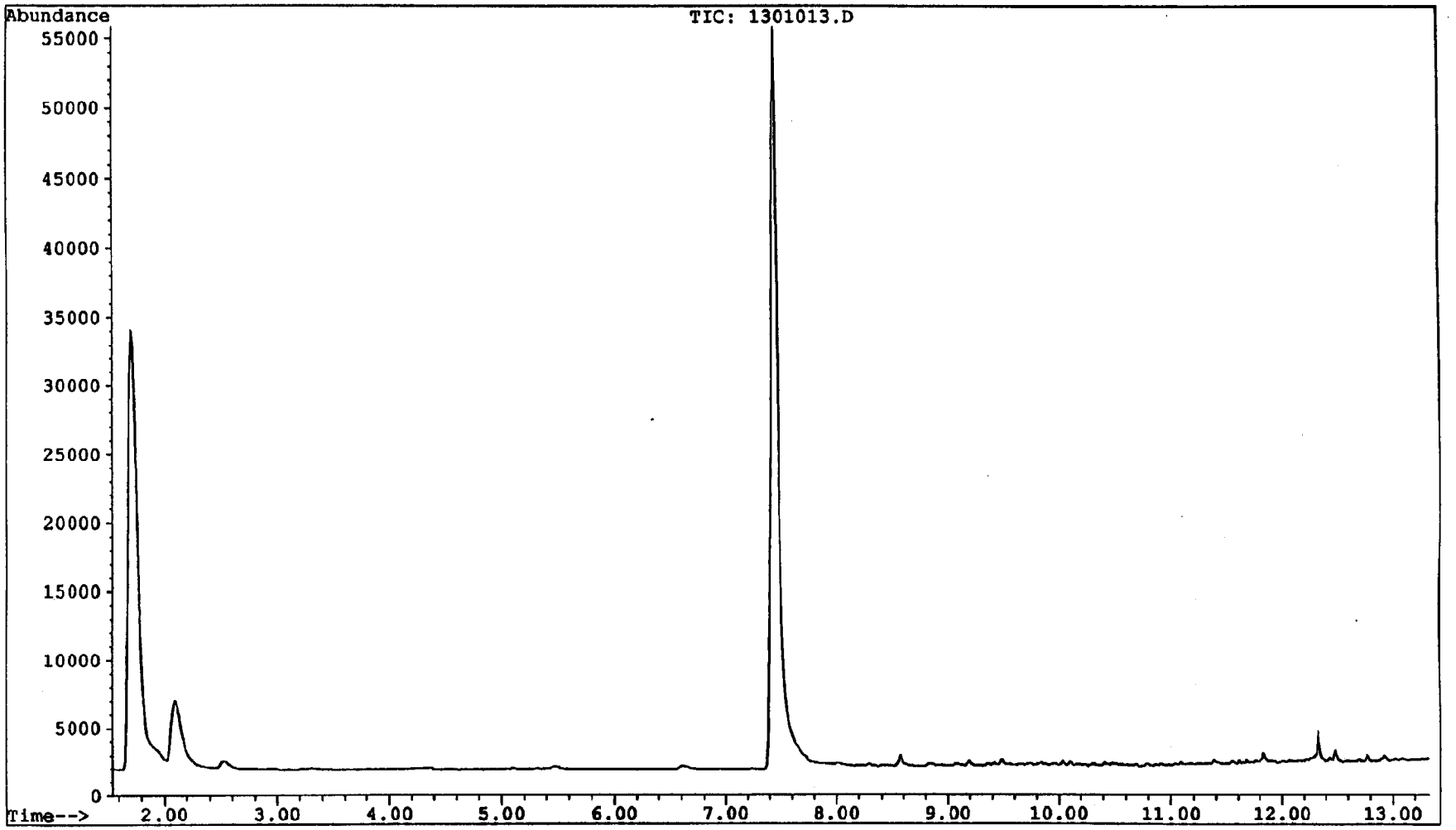
File : D:\4207FOPT\49841E.D
Operator : TR
Acquired : 26 Jul 94 5:46 pm using AcqMethod OPTECH.M
Instrument : 5971 - GC
Sample Name: SMPL6
Misc Info : S20
Vial Number: 10



KCSlip4 38803

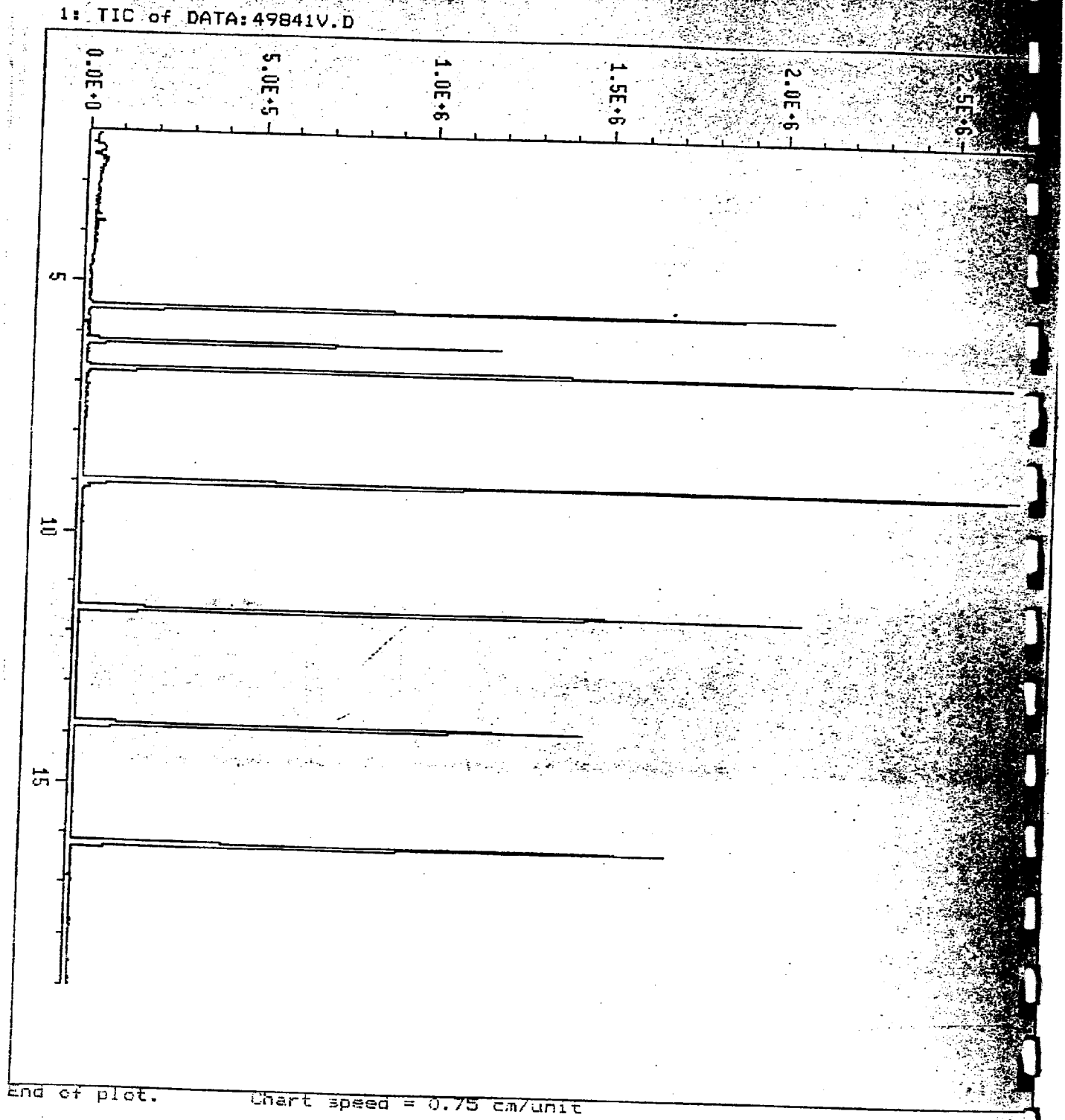
SEA405333

File : C:\HPCHEM\1\DATA\BTEXDATA\40726.1\1301013.D
Operator :
Acquired : 26 Jul 94 9:22 pm using AcqMethod TPH&BTEX.M
Instrument : H-P 5890/
Sample Name: 49841
Misc Info :
Vial Number: 13



KCSlip4 38804

SEA405334



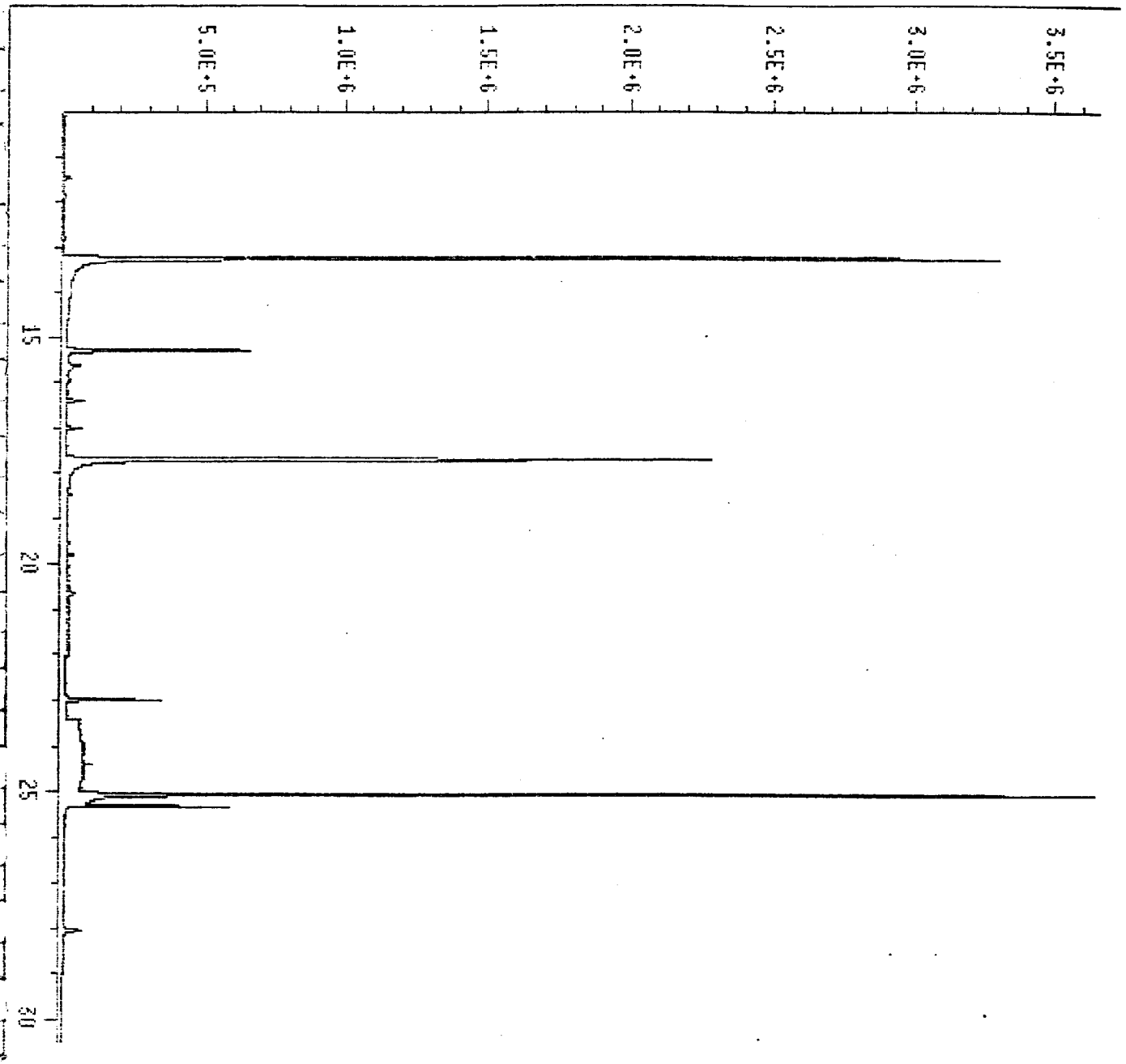
End of plot. Chart speed = 0.75 cm/unit

CHROMATOGRAM OF VOLATILE FRACTION FROM SAMPLE 49841V

KCSlip4 38805

SEA405335

1: TIC of DATA:49841P.D



End of plot. Chart speed = 0.02 cm/unit

CHROMATOGRAM OF SAMPLE 49841P

KCSlip4 38806

SEA405336

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49842

Project Description: Seattle ANGS 1315-127
Sample Name: BS002 BH 8 1/2-10 **Matrix:** Soil
Date/Time Taken: 7/14/94 **Date/Time Received:** 7/15/94 4:20:00

Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]
TPH by GC (as diesel)	5.6	89.9
TPH by GC (as gasoline)	9.3	89.5
Antimony/GFAA	1.9	75.6
Arsenic/GFAA	1.1	65.2
Beryllium/ICP	3.2	92.8
Cadmium/GFAA	0.2	79
Chromium/GFAA	1.1	79.7
Copper/ICP	0.6	103
Lead/GFAA	0.3	80.1
Mercury/CVAA	9.1	105.6
Nickel/ICP	1.5	76
Selenium/GFAA	2.9	39.6
Silver/GFAA	10.1	40.6
Thallium/GFAA	8.6	88.8
Zinc/ICP	2.1	77.4
4,4'-DDD	13	76.1
4,4'-DDE	10.1	79.3
4,4'-DDT	13.6	78.2
Aldrin	10.8	101.7
alpha-BHC	22.5	99.1
alpha-Chlordane	13.7	85.4
beta-BHC	24.3	88.4
beta-Chlordane	14.3	89.5
delta-BHC	10.2	96.4
Dieldrin	13.4	82.4
Endosulfan I	10.3	75.7
Endosulfan II	9.3	79.6
Endosulfan sulfate	21.8	78.4
Endrin	2.2	73.6
Endrin aldehyde	14.1	75.9
Heptachlor	19.2	103.5
Heptachlor epoxide	20.8	83.6
Lindane	2.4	99.8
Methoxychlor	17.3	74.6

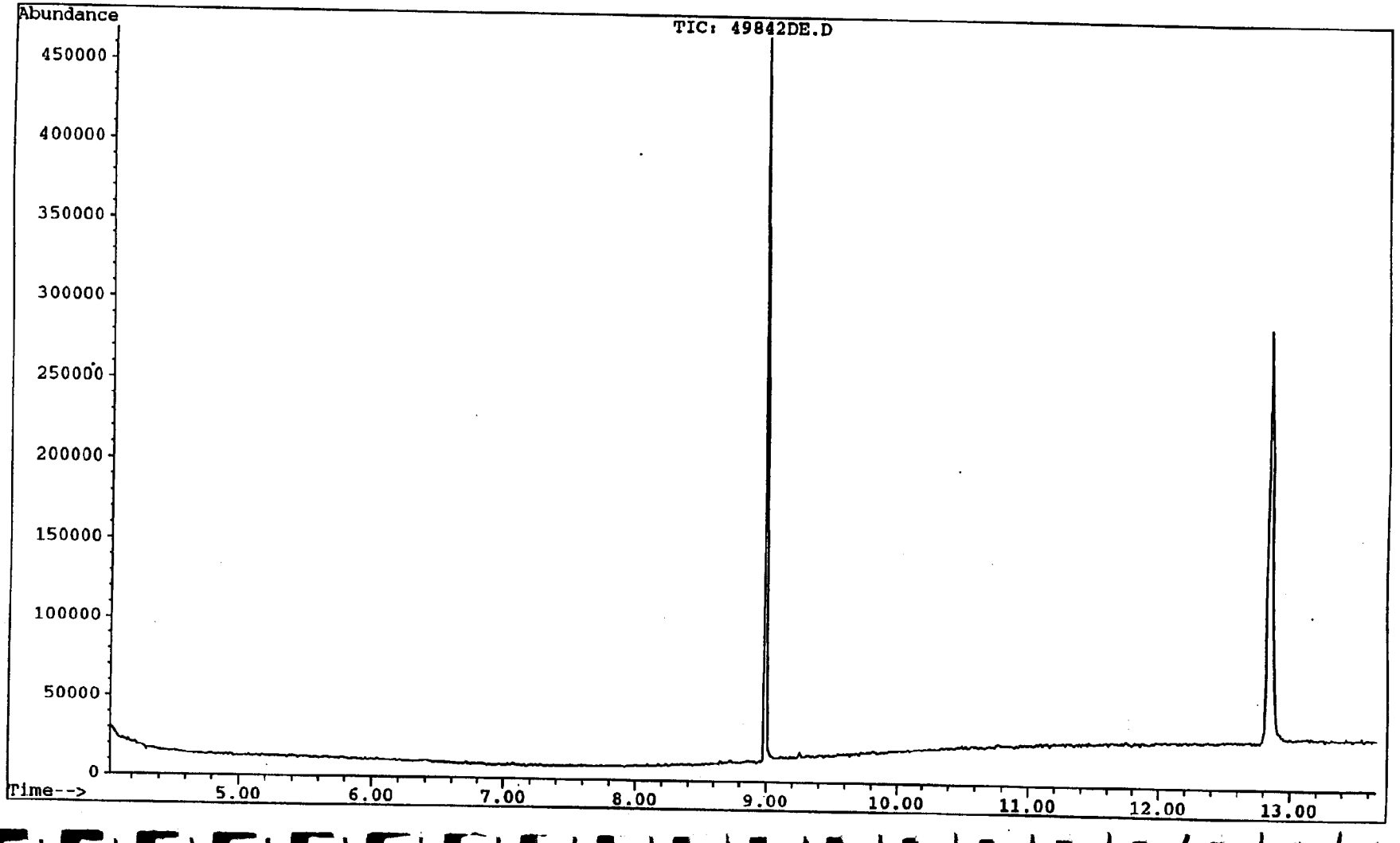
PCB, total	3.7	49.5
Toxaphene	12.5	91

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	8240	94
4-Bromofluorobenzene(surr)	8240	92
Toluene-d8(surr)	8240	110
2,4,6-Tribromophenol	625&8270	55
2-Fluorobiphenyl	625&8270	47
2-Fluorophenol	625&8270	35.1
Nitrobenzene-d5	625&8270	35
Phenol-d5	625&8270	41.2
Terphenyl-d14	625&8270	69.6
2,4,5,6-Tetrachloro-m-xylene	8080	52.4
Dibutyl Chlorendate	8080	70.1
p-Terphenyl	8015 mod.	73.7
Pentafluorobenzene(Surr)	8015 mod.	93.2

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

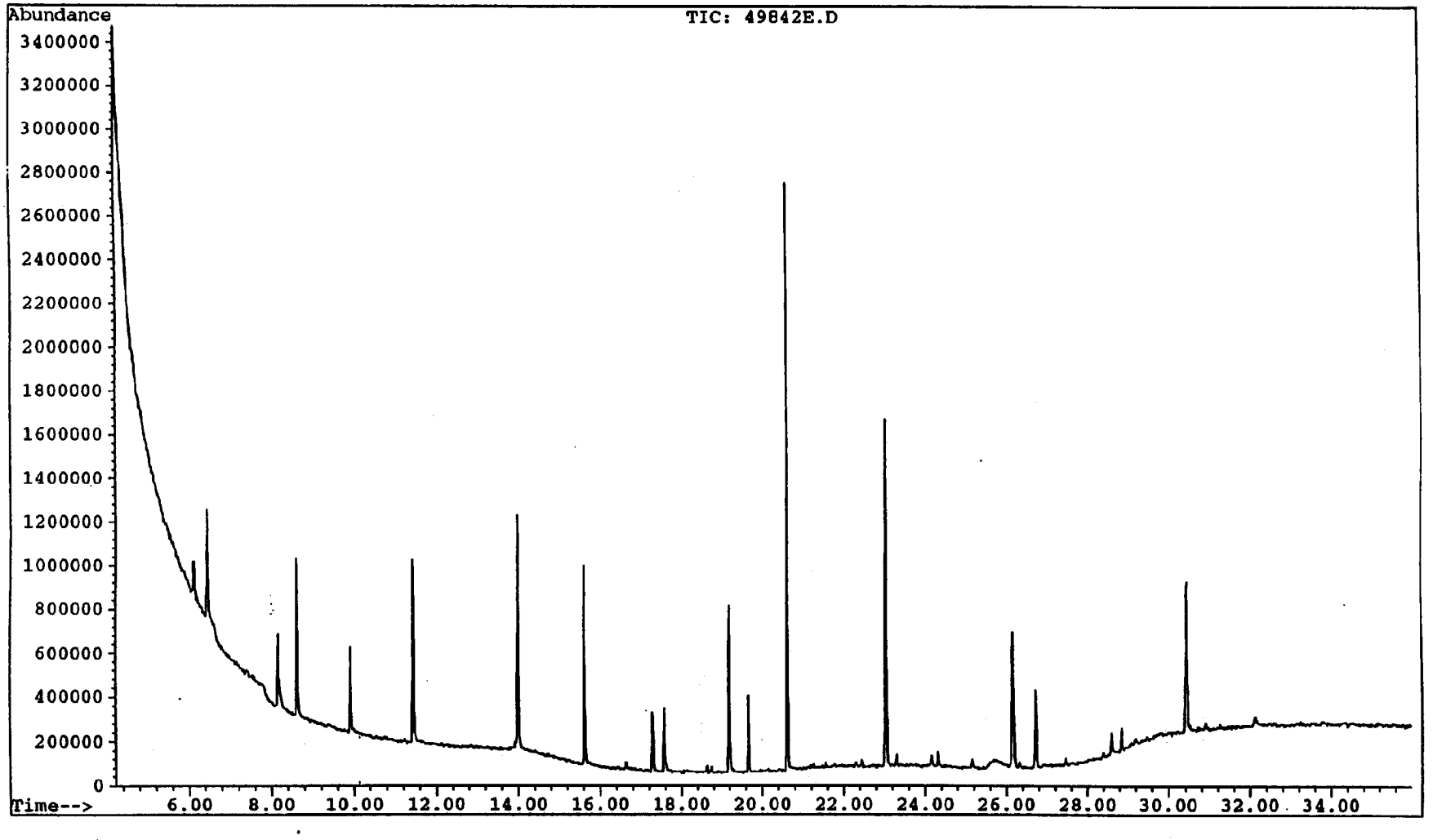
File : D:\4214FDSL\49842DE.D
Operator : TR
Acquired : 2 Aug 94 7:53 pm using AcqMethod TPHDEL.M
Instrument : 5971 - GC
Sample Name:
Misc Info :
Vial Number: 15



KCSlip4 38809

SEA405339

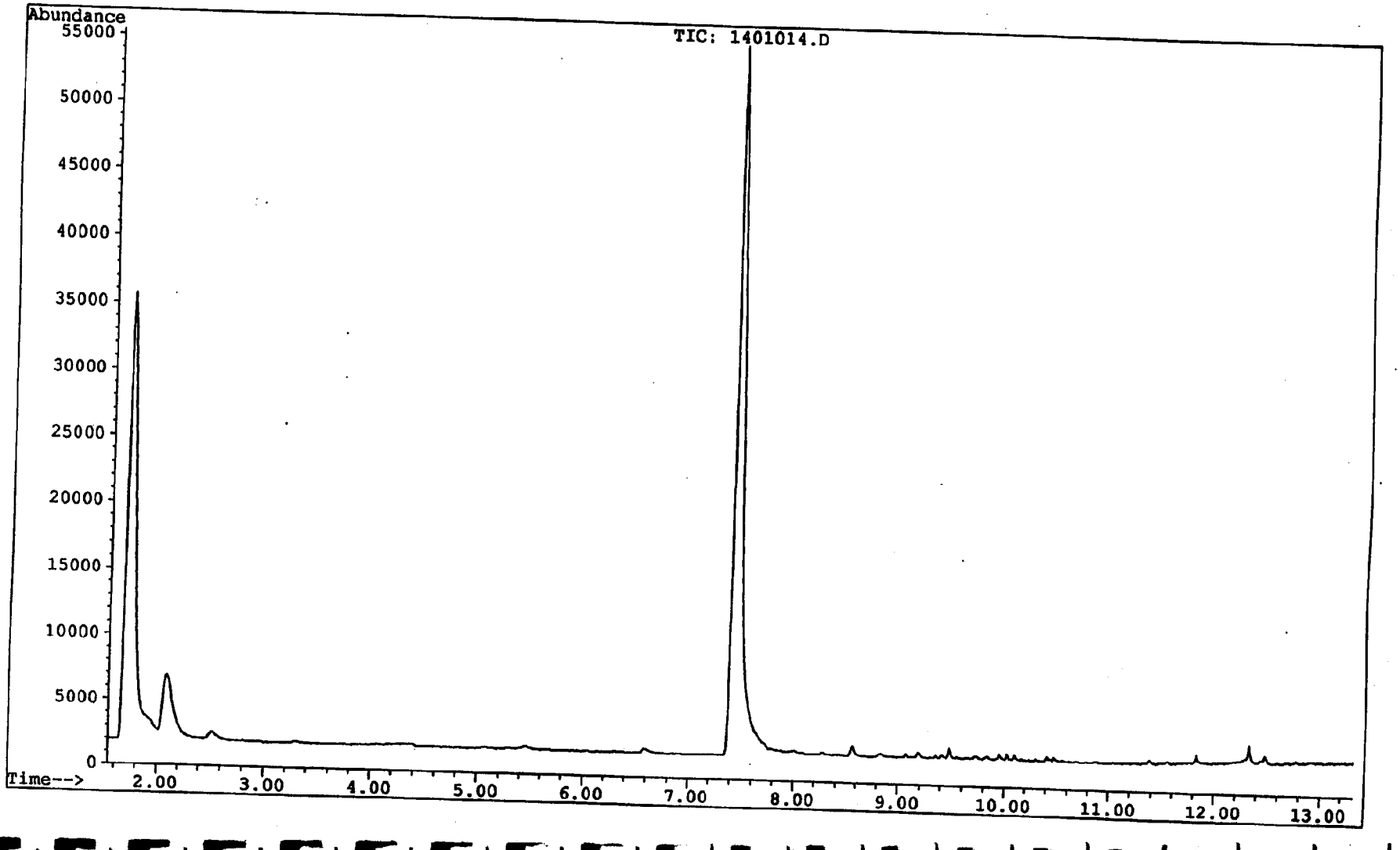
File : D:\4207FOPT\49842E.D
Operator : TR
Acquired : 26 Jul 94 6:32 pm using AcqMethod OPTECH.M
Instrument : 5971 - GC
Sample Name: SMPL7
Misc Info : S20
Vial Number: 11



KCSlip4 38810

SEA405340

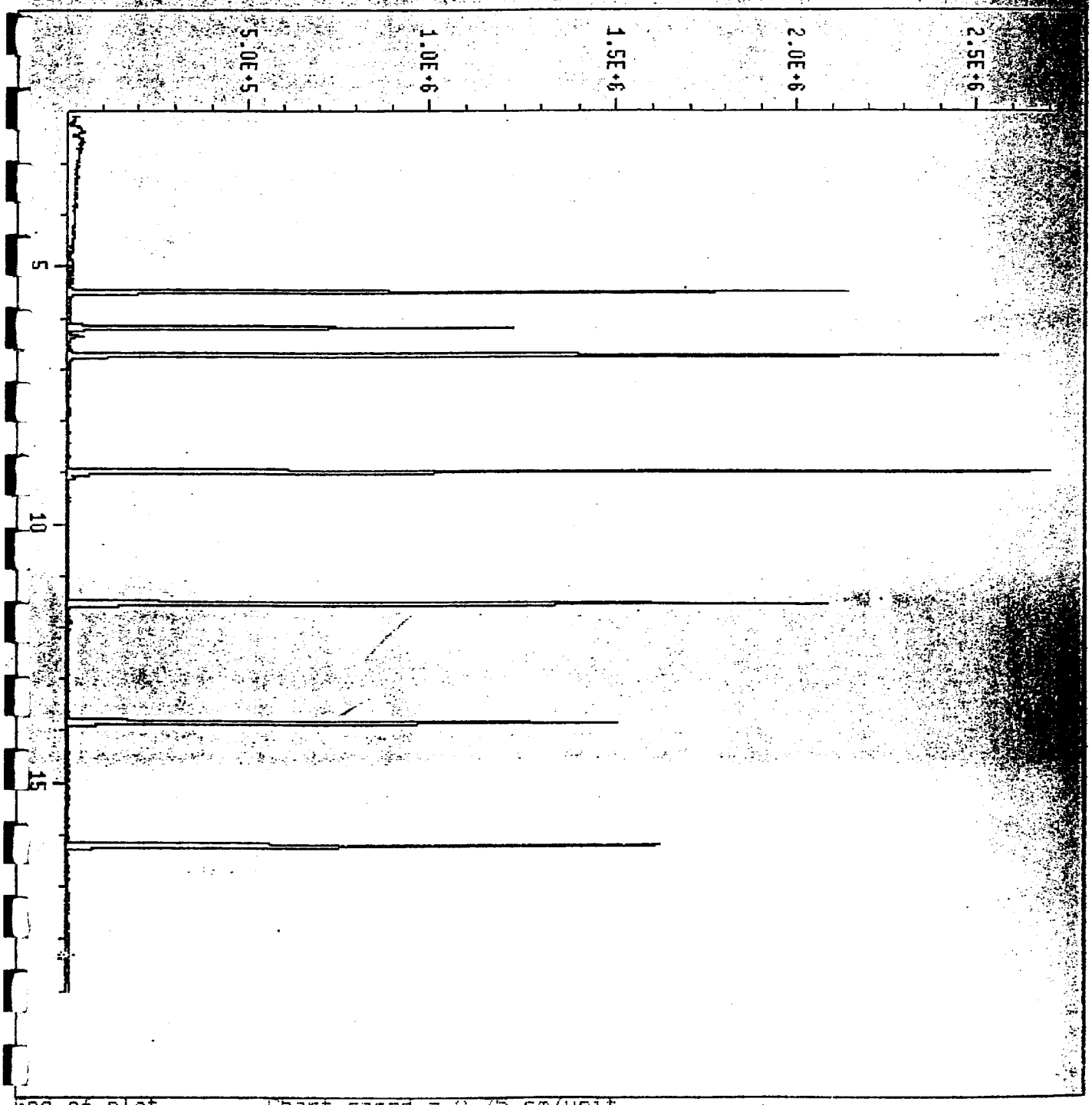
File : C:\HPCHEM\1\DATA\BTEXDATA\40726.1\1401014.D
Operator :
Acquired : 26 Jul 94 9:42 pm using AcqMethod TPH&BTEX.M
Instrument : H-P 5890/
Sample Name: 49842
Misc Info :
Vial Number: 14



KCSlip4 38811

SEA405341

1: TIC of DATA:49842V.D

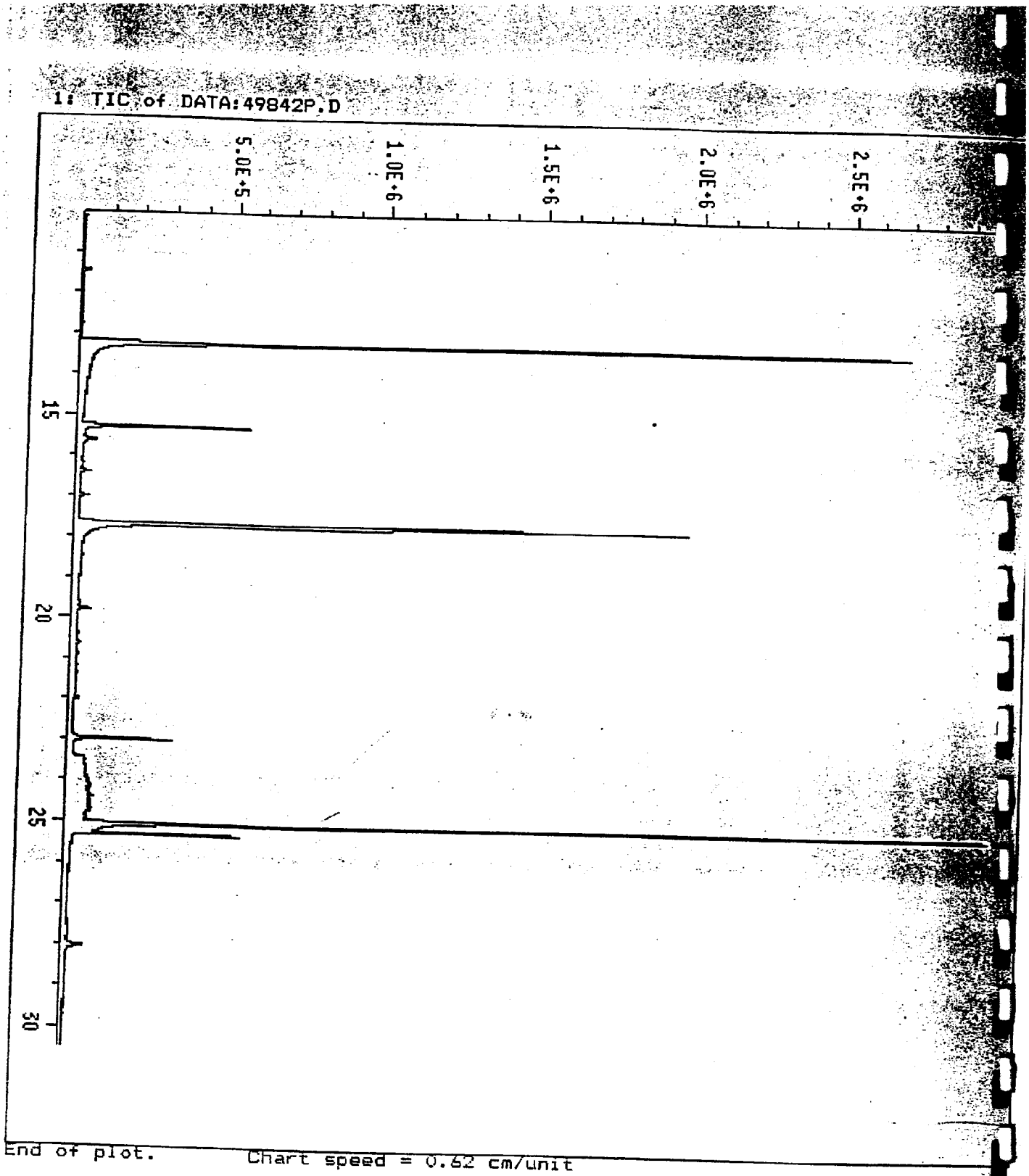


End of plot. Chart speed = 0.75 cm/unit

CHROMATOGRAM OF VOLATILE FRACTION FROM SAMPLE 49842V

KCSlip4 38812

SEA405342



End of plot. Chart speed = 0.62 cm/unit

CHROMATOGRAM OF SAMPLE 49842P

KCSlip4 38813

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49843

Project Description: Seattle ANGS 1315-127
Sample Name: BS003 BH 2-3 1/2
Matrix: Soil
Date/Time Taken: 7/14/94
Date/Time Received: 7/15/94 4:20:00

Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]
Petroleum hydrocarbons	10.8	100.9
TPH by GC (as diesel)	5.6	89.9
TPH by GC (as gasoline)	9.3	89.5
Antimony/GFAA	1.9	75.6
Arsenic/GFAA	1.1	65.2
Beryllium/ICP	3.2	92.8
Cadmium/GFAA	0.2	79
Chromium/GFAA	1.1	79.7
Copper/ICP	0.6	103
Lead/GFAA	0.3	80.1
Mercury/CVAA	9.1	105.6
Nickel/ICP	1.5	76
Selenium/GFAA	2.9	39.6
Silver/GFAA	10.1	40.6
Thallium/GFAA	8.6	88.8
Zinc/ICP	2.1	77.4
4,4'-DDD	5.6	53.6
4,4'-DDE	1.8	56.1
4,4'-DDT	8.3	56.5
Aldrin	11	49.6
alpha-BHC	0.2	52.4
alpha-Chlordane	2.3	58.2
beta-BHC	0.9	104.5
beta-Chlordane	2	60.2
delta-BHC	1	57.8
Dieldrin	2.7	53.3
Endosulfan I	6.9	59.9
Endosulfan II	1.2	51.6
Endosulfan sulfate	1.1	52.2
Endrin	11.4	68.8
Endrin aldehyde	5.5	62.6
Heptachlor	1.6	57.3
Heptachlor epoxide	3.1	56.3
Lindane	0.8	114.8

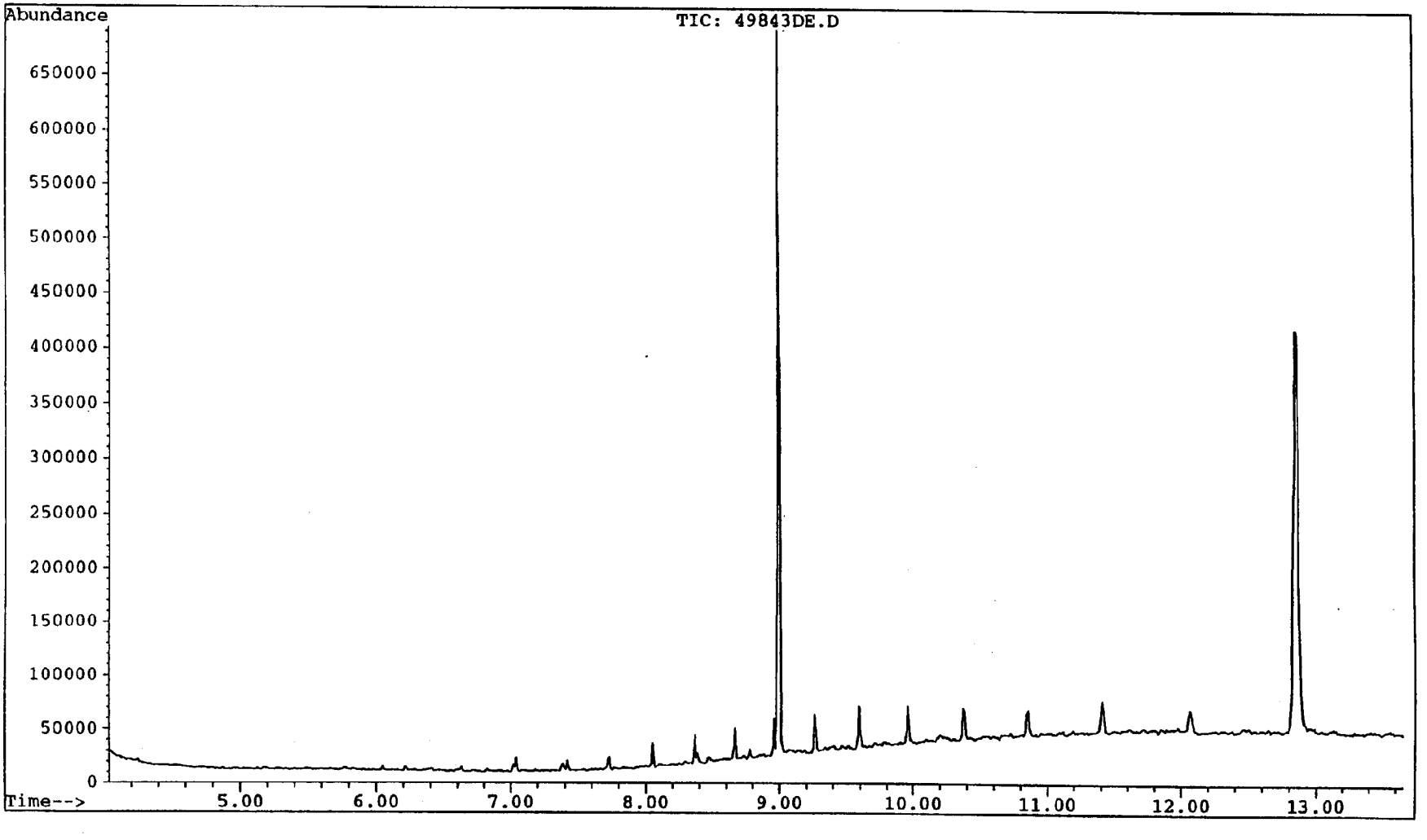
Methoxychlor	3.5	49.5
PCB, total	0.4	52
Toxaphene	4.1	64.1

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	8240	89
4-Bromofluorobenzene(surr)	8240	95
Toluene-d8(surr)	8240	110
2,4,6-Tribromophenol	625&8270	diluted
2-Fluorobiphenyl	625&8270	diluted
2-Fluorophenol	625&8270	diluted
Nitrobenzene-d5	625&8270	diluted
Phenol-d5	625&8270	diluted
Terphenyl-d14	625&8270	diluted
2,4,5,6-Tetrachloro-m-xylene	608 & 8080	Diluted
Dibutyl Chlorendate	608 & 8080	Diluted
p-Terphenyl	8015 mod.	67
Pentafluorobenzene(Surr)	8015 mod.	91.8

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

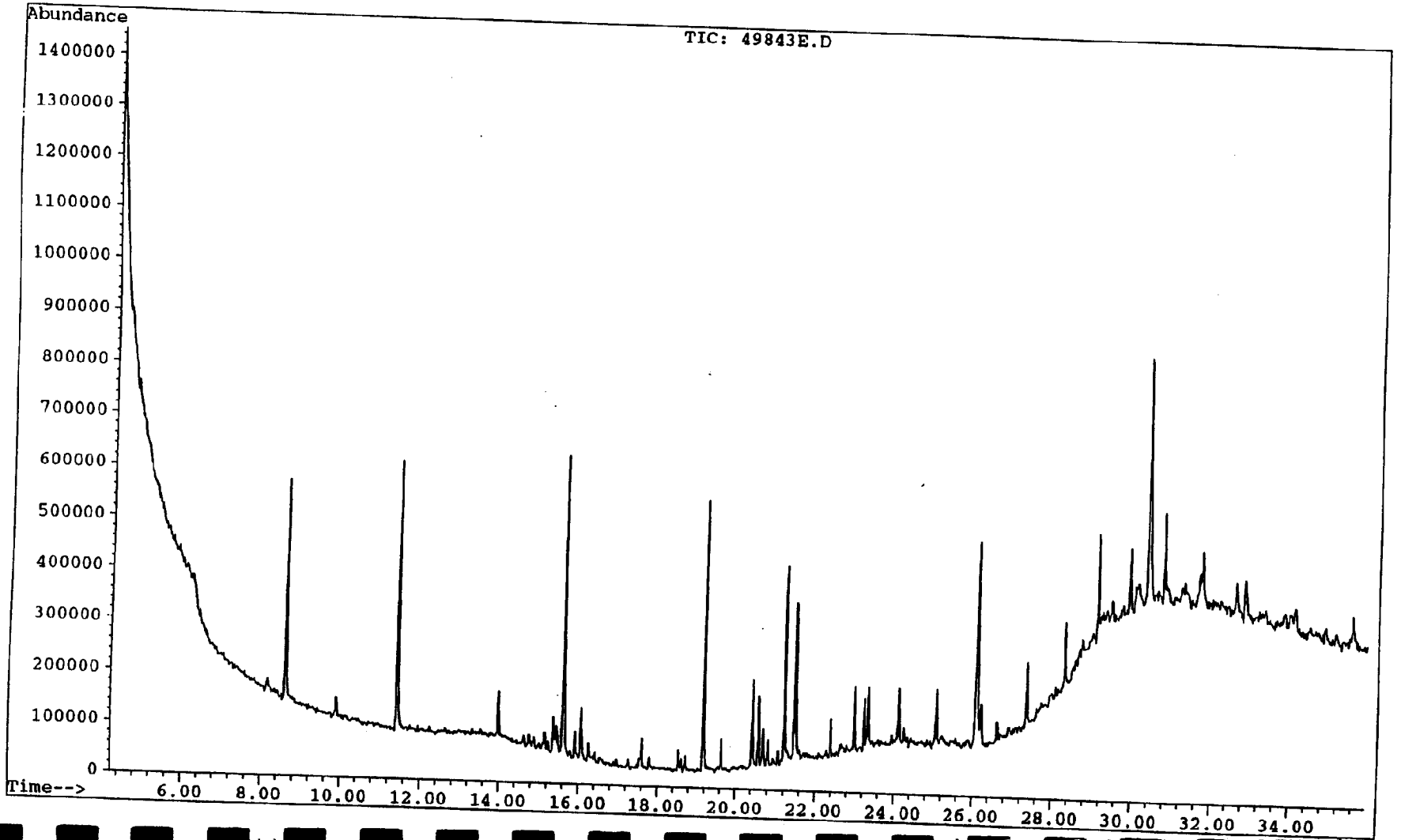
File : D:\4214FDSL\49843DE.D
Operator : TR
Acquired : 2 Aug 94 8:14 pm using AcqMethod TPHDEL.M
Instrument : 5971 - GC
Sample Name:
Misc Info :
Vial Number: 16



KCSlip4 38816

SEA405346

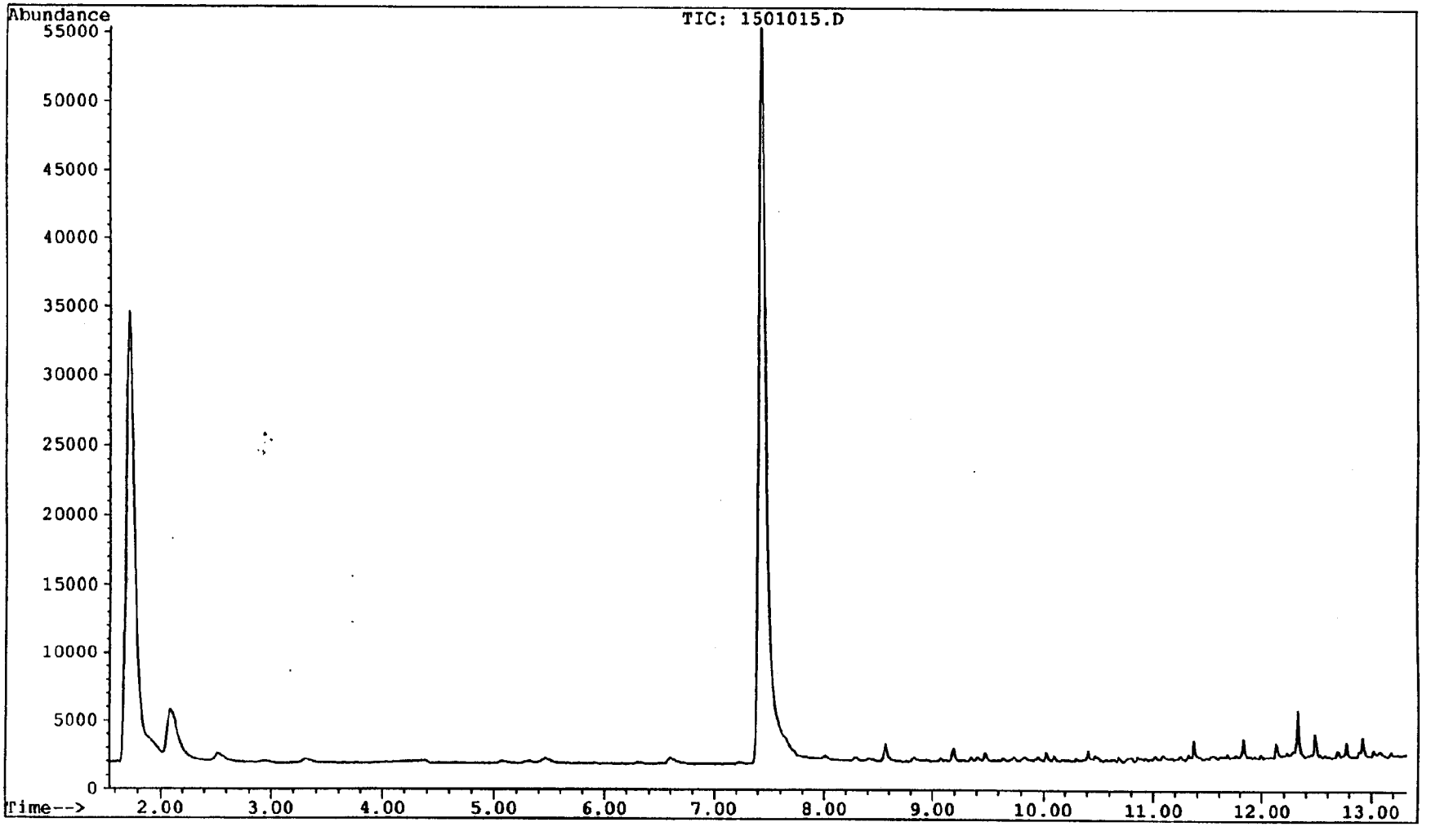
File : D:\4208FOPT\49843E.D
Operator : TR
Acquired : 27 Jul 94 7:36 pm using AcqMethod OPTECH.M
Instrument : 5971 - GC
Sample Name: SMPL9
Misc Info : S40
Vial Number: 13



KCSlip4 38817

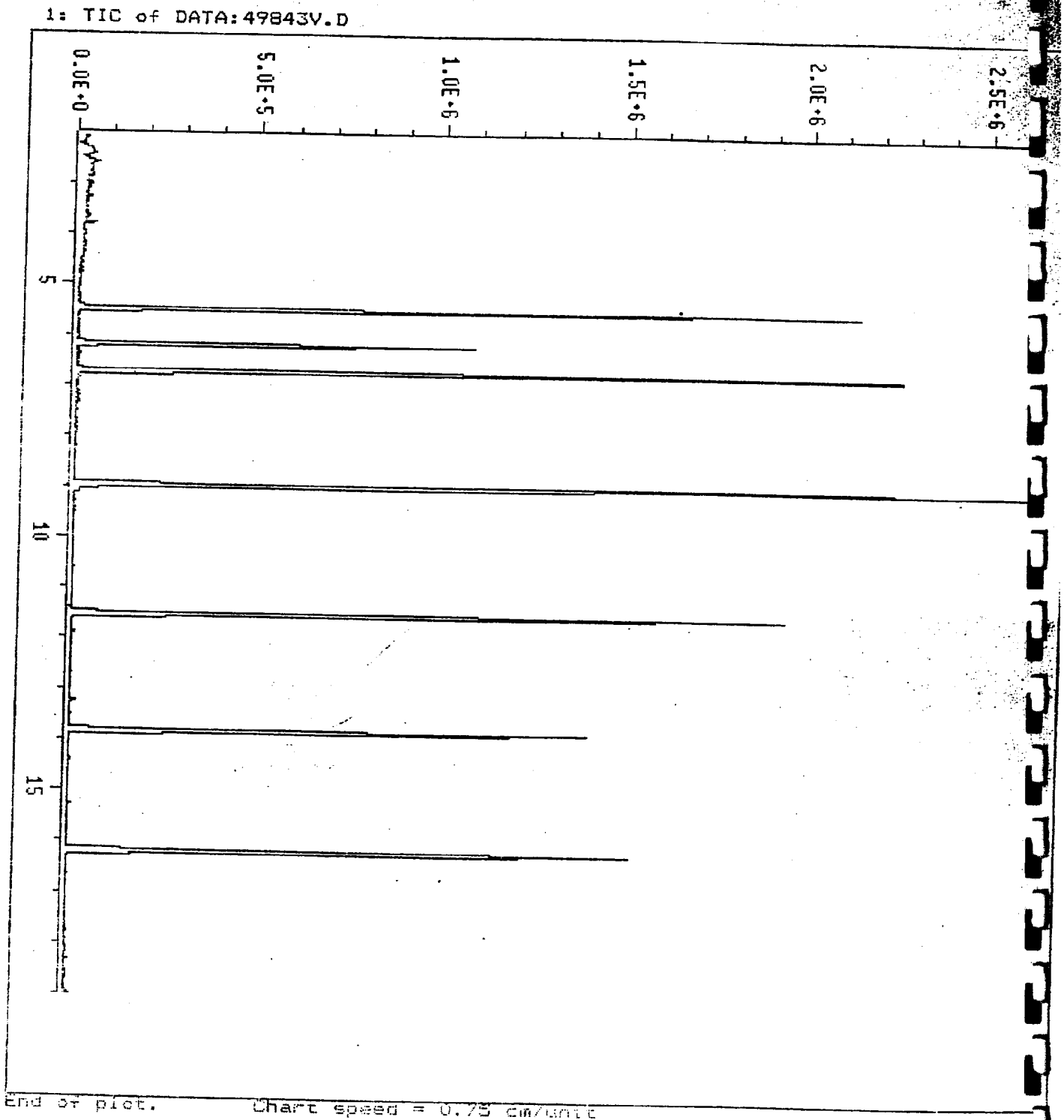
SEA405347

File : C:\HPCHEM\1\DATA\BTEXDATA\40726.1\1501015.D
Operator :
Acquired : 26 Jul 94 10:02 pm using AcqMethod TPH&BTEX.M
Instrument : H-P 5890/
Sample Name: 49843
Misc Info :
Vial Number: 15



KCSlip4 38818

SEA405348



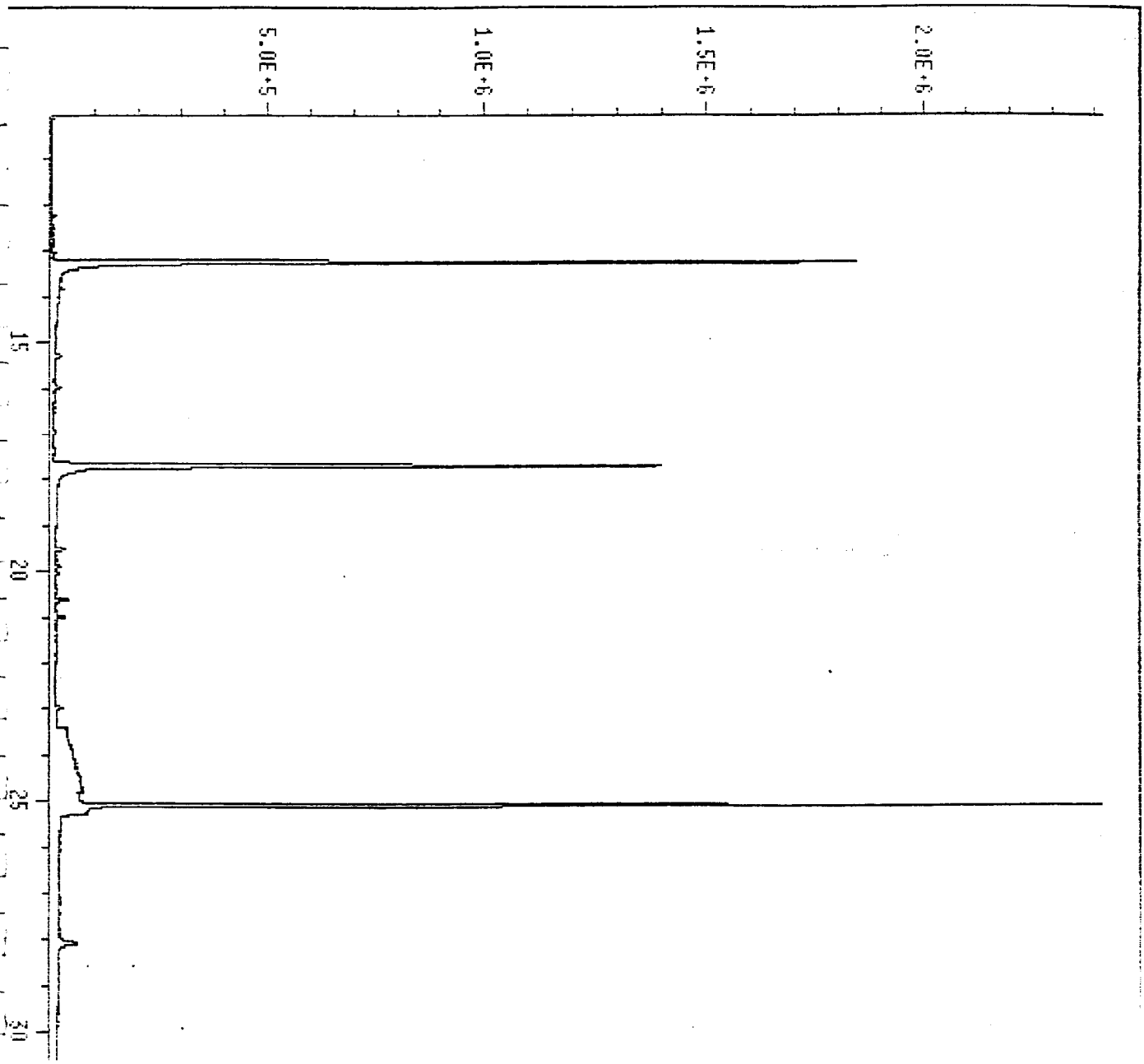
End of plot. Chart speed = 0.75 cm/unit

CHROMATOGRAM OF VOLATILE FRACTION FROM SAMPLE 49843V

KCSlip4 38819

SEA405349

1: TIC of DATA:49843P.D



nd of plot. Chart speed = 0.02 cm/unit

CHROMATOGRAM OF SAMPLE 49843P

KCSlip4 38820

SEA405350

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 42844

Project Description: Seattle ANGS 1315-127
Sample Name: BS003 BH 5 1/2-7
Date/Time Taken: 7/14/94

Matrix: Soil
Date/Time Received: 7/15/94 4:20:00

Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]
Petroleum hydrocarbons	10.8	100.9
TPH by GC (as diesel)	5.6	89.9
TPH by GC (as gasoline)	9.3	89.5
Antimony/GFAA	1.9	75.6
Arsenic/GFAA	1.1	65.2
Beryllium/ICP	3.2	92.8
Cadmium/GFAA	0.2	79
Chromium/GFAA	1.1	79.7
Copper/ICP	0.6	103
Lead/GFAA	0.3	80.1
Mercury/CVAA	9.1	105.6
Nickel/ICP	1.5	76
Selenium/GFAA	2.9	39.6
Silver/GFAA	10.1	40.6
Thallium/GFAA	8.6	88.8
Zinc/ICP	2.1	77.4
4,4'-DDD	13	76.1
4,4'-DDE	10.1	79.3
4,4'-DDT	13.6	78.2
Aldrin	10.8	101.7
alpha-BHC	22.5	99.1
alpha-Chlordane	13.7	85.4
beta-BHC	24.3	88.4
beta-Chlordane	14.3	89.5
delta-BHC	10.2	96.4
Dieldrin	13.4	82.4
Endosulfan I	10.3	75.7
Endosulfan II	9.3	79.6
Endosulfan sulfate	21.8	78.4
Endrin	2.2	73.6
Endrin aldehyde	14.1	75.9
Heptachlor	19.2	103.5
Heptachlor epoxide	20.8	83.6
Lindane	2.4	99.8

KCSlip4 38821

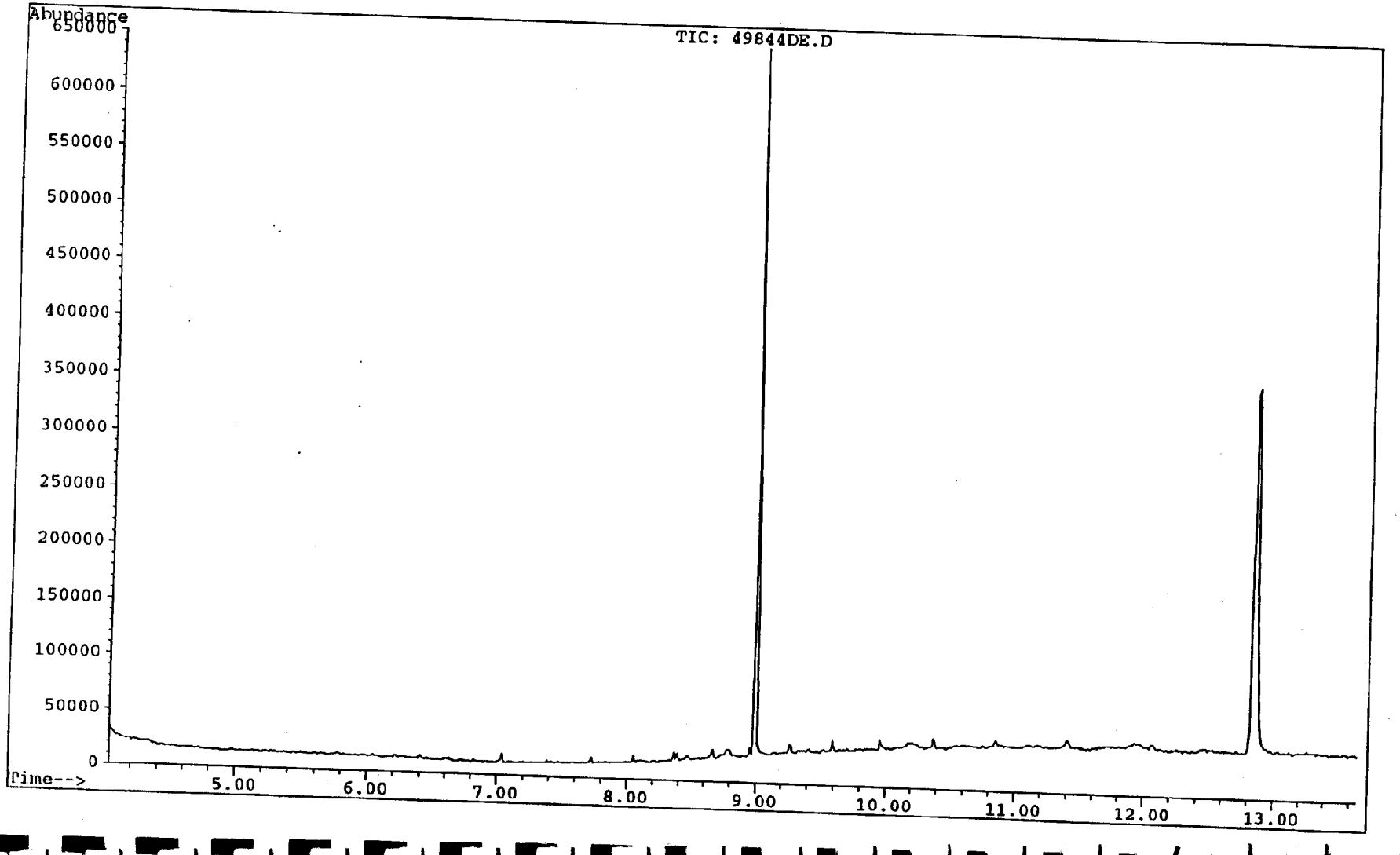
Methoxychlor	17.3	74.6
PCB, total	3.7	49.5
Toxaphene	12.5	91

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	8240	96
4-Bromofluorobenzene(surr)	8240	97
Toluene-d8(surr)	8240	116
2,4,6-Tribromophenol	625&8270	4.2
2-Fluorobiphenyl	625&8270	3.1
2-Fluorophenol	625&8270	1.4
Nitrobenzene-d5	625&8270	3
Phenol-d5	625&8270	2.7
Terphenyl-d14	625&8270	60.7
2,4,5,6-Tetrachloro-m-xylene	8080	4.9
Dibutyl Chlorendate	8080	54.3
p-Terphenyl	8015 mod.	73.7
Pentafluorobenzene(Surr)	8015 mod.	96.7

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

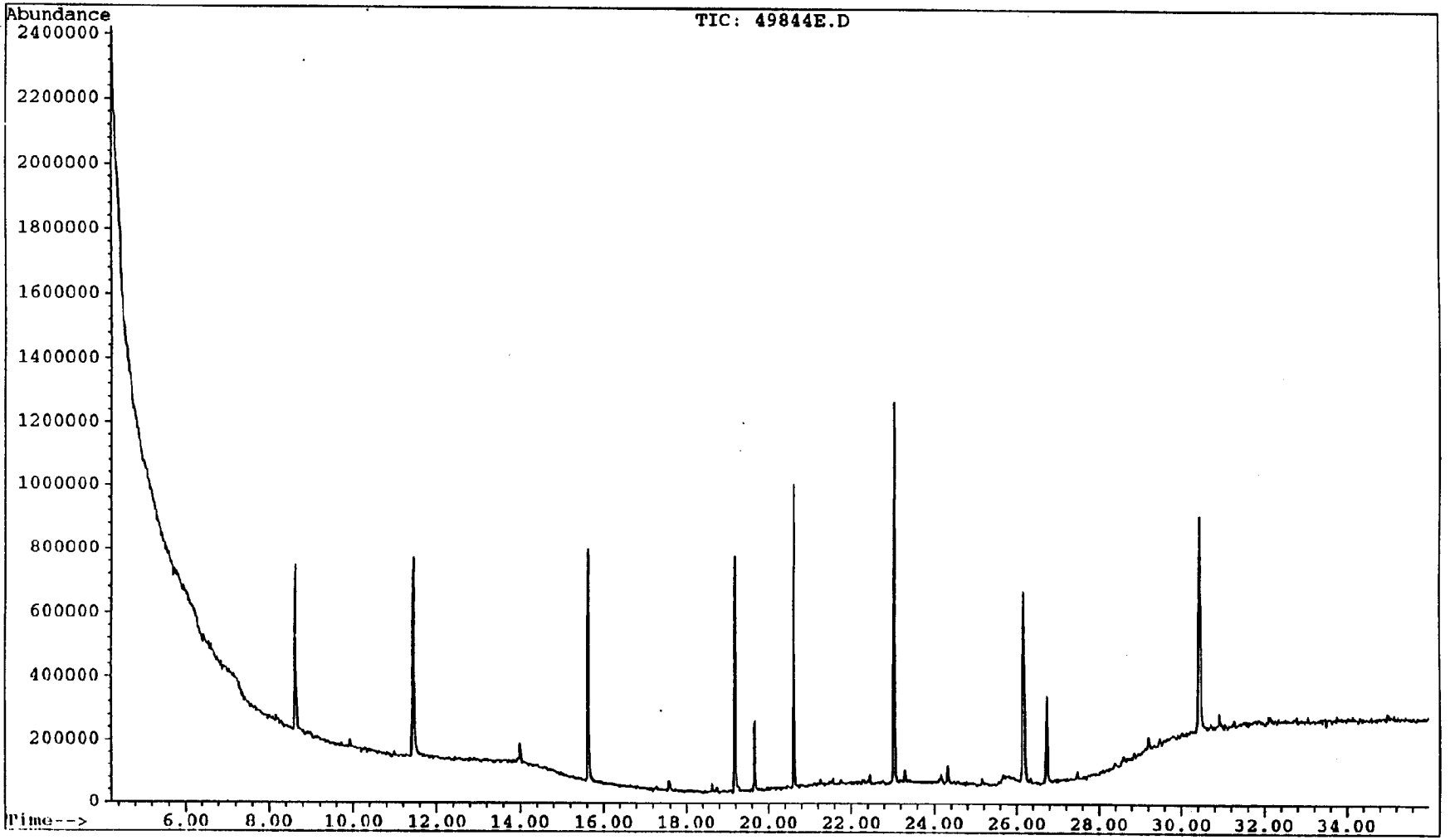
File : D:\4214FDSL\49844DE.D
Operator : TR
Acquired : 2 Aug 94 8:34 pm using AcqMethod TPHDEL.M
Instrument : 5971 - GC
Sample Name:
Misc Info :
Vial Number: 17



KCSlip4 38823

SEA405353

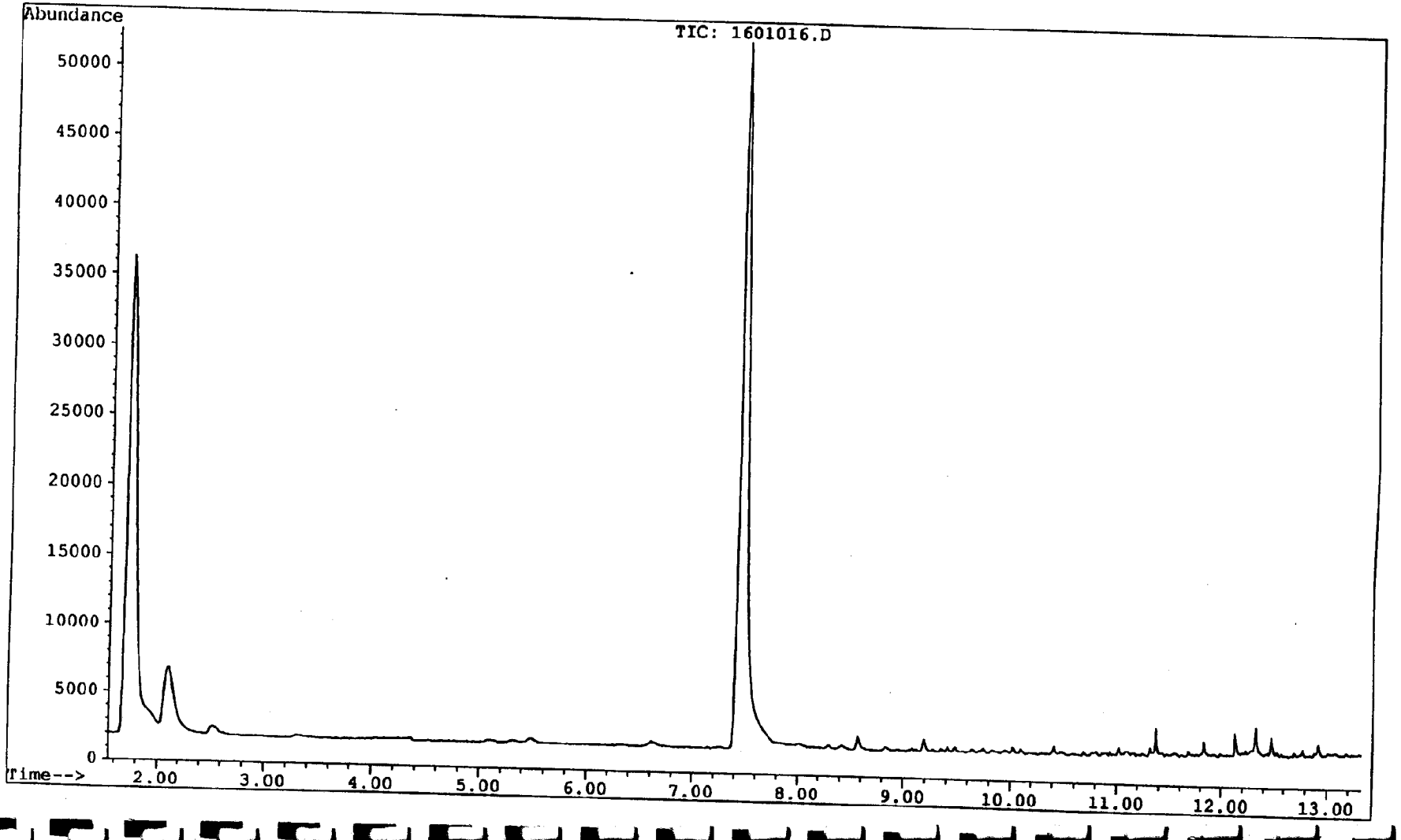
File : D:\4207FORT\49844E.D
Operator : TR
Acquired : 26 Jul 94 7:19 pm using AcqMethod OPTECH.M
Instrument : 5971 - GC
Sample Name: SMPL8
Misc Info : S20
Vial Number: 12



KCSlip4 38824

SEA405354

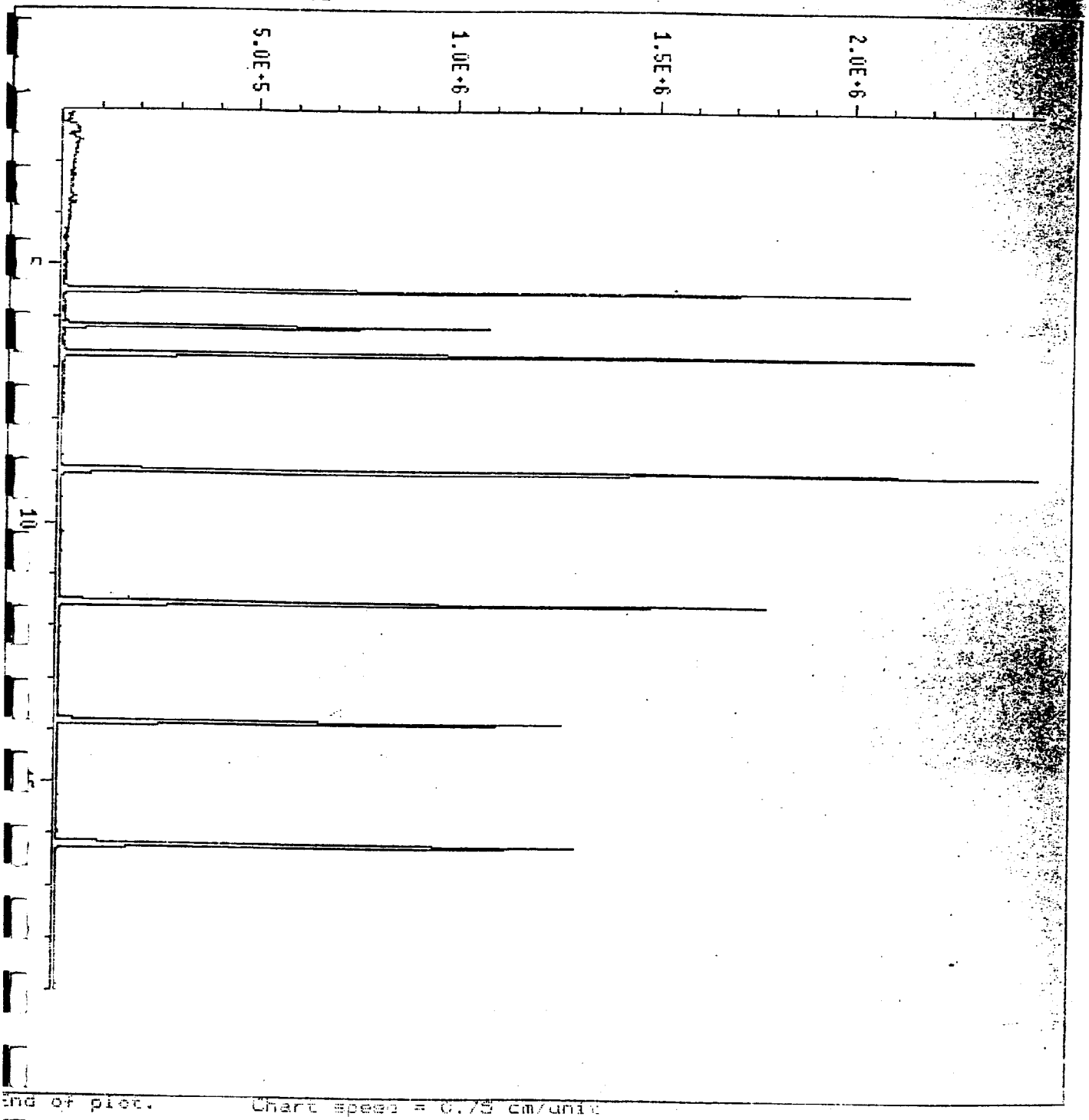
File : C:\HPCHEM\1\DATA\BTEXDATA\40726.1\1601016.D
Operator :
Acquired : 26 Jul 94 10:23 pm using AcqMethod TPH&BTEX.M
Instrument : H-P 5890/
Sample Name: 49844
Misc Info :
Vial Number: 16



KCSlip4 38825

SEA405355

1: TIC of DATA:49844V.D



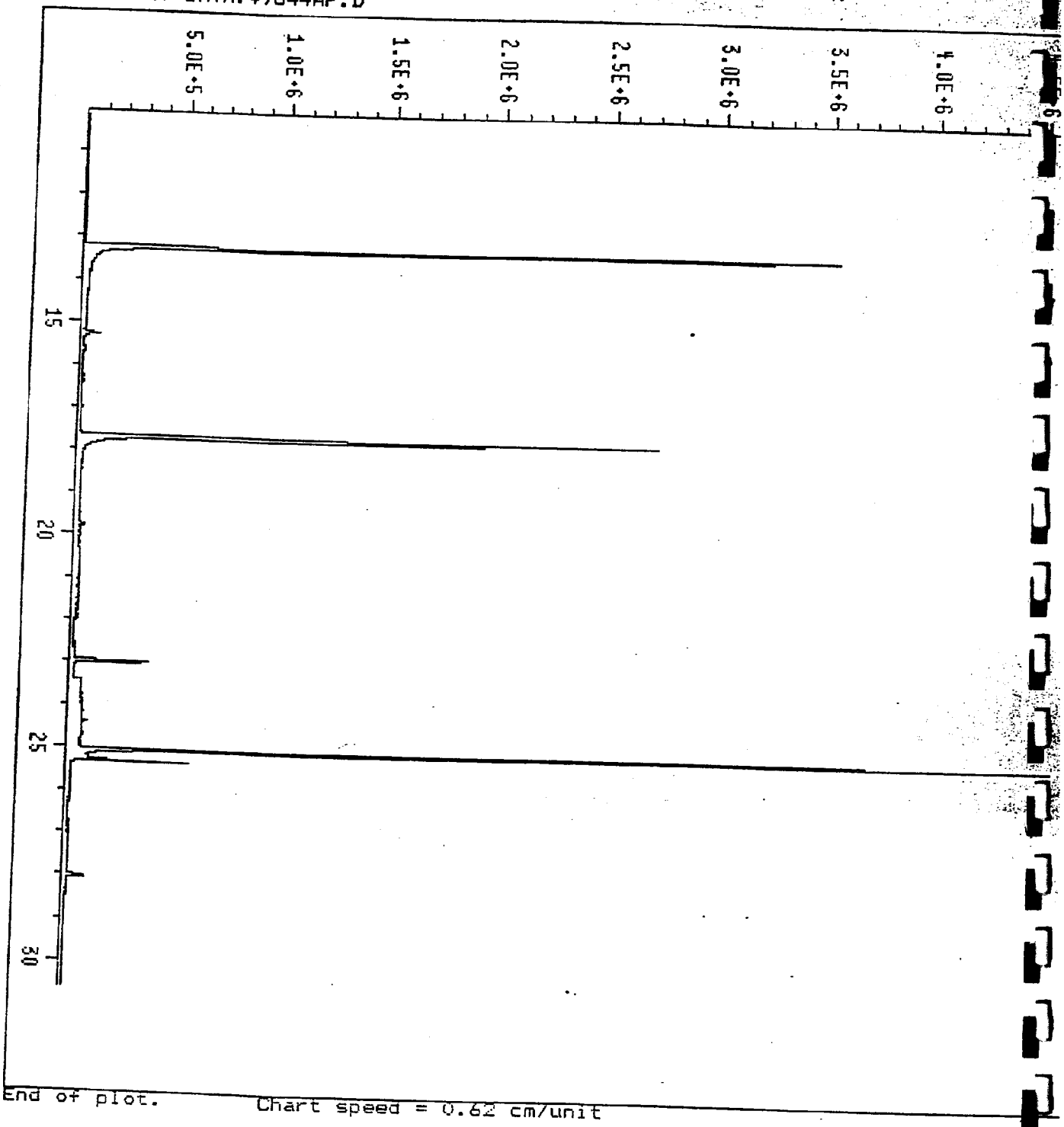
End of plot. Chart speed = 0.75 cm/unit

CHROMATOGRAM OF VOLATILE FRACTION FROM SAMPLE 49844V

KCSlip4 38826

SEA405356

1: TIC of DATA:49844AP.D



End of plot. Chart speed = 0.62 cm/unit

CHROMATOGRAM OF SAMPLE 49844AP

KCSlip4 38827

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49845

Project Description: Seattle ANGS 1315-127
Sample Name: BS003 BH 8 1/2-10 **Matrix:** Soil
Date/Time Taken: 7/14/94 **Date/Time Received:** 7/15/94 4:20:00

Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]
TPH by GC (as diesel)	5.6	89.9
TPH by GC (as gasoline)	9.3	89.5
Antimony/GFAA	1.9	75.6
Arsenic/GFAA	1.1	65.2
Beryllium/ICP	3.2	92.8
Cadmium/GFAA	0.2	79
Chromium/GFAA	1.1	79.7
Copper/ICP	0.6	103
Lead/GFAA	0.3	80.1
Mercury/CVAA	9.1	105.6
Nickel/ICP	1.5	76
Selenium/GFAA	2.9	39.6
Silver/GFAA	10.1	40.6
Thallium/GFAA	8.6	88.8
Zinc/ICP	2.1	77.4
4,4'-DDD	5.6	53.6
4,4'-DDE	1.8	56.1
4,4'-DDT	8.3	56.5
Aldrin	11	49.6
alpha-BHC	0.2	52.4
alpha-Chlordane	2.3	58.2
beta-BHC	0.9	104.5
beta-Chlordane	2	60.2
delta-BHC	1	57.8
Dieldrin	2.7	53.3
Endosulfan I	6.9	59.9
Endosulfan II	1.2	51.6
Endosulfan sulfate	1.1	52.2
Endrin	11.4	68.8
Endrin aldehyde	5.5	62.6
Heptachlor	1.6	57.3
Heptachlor epoxide	3.1	56.3
Lindane	0.8	114.8
Methoxychlor	3.5	49.5

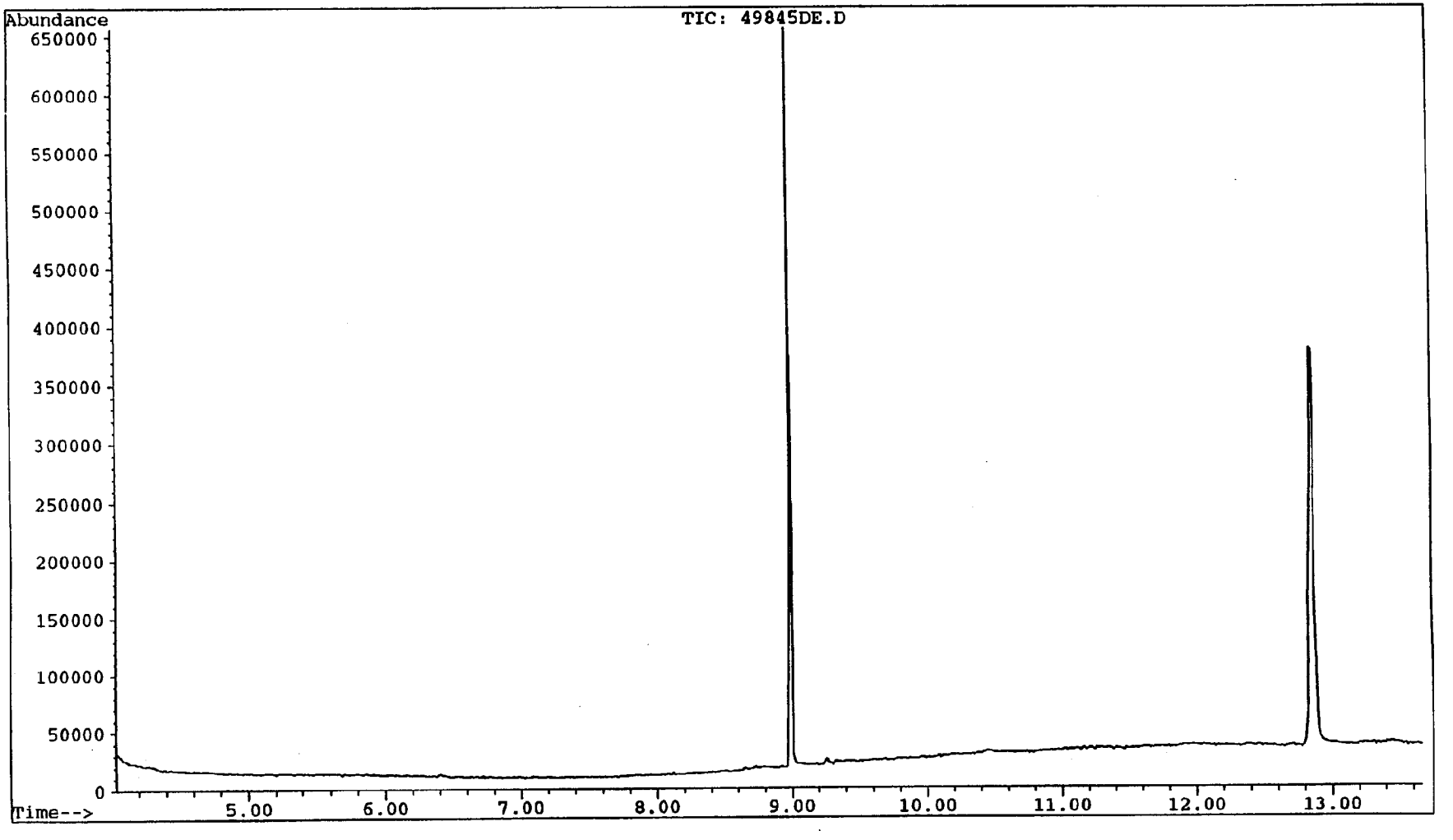
PCB, total	0.4	52
Toxaphene	4.1	64.1

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	8240	101
4-Bromofluorobenzene(surr)	8240	97
Toluene-d8(surr)	8240	112
2,4,6-Tribromophenol	625&8270	63.1
2-Fluorobiphenyl	625&8270	45.4
2-Fluorophenol	625&8270	36.8
Nitrobenzene-d5	625&8270	35.9
Phenol-d5	625&8270	44
Terphenyl-d14	625&8270	70.6
2,4,5,6-Tetrachloro-m-xylene	608 & 8080	49.4
Dibutyl Chlorendate	608 & 8080	0.5
p-Terphenyl	8015 mod.	69.3
Pentafluorobenzene(Surr)	8015 mod.	91.1

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

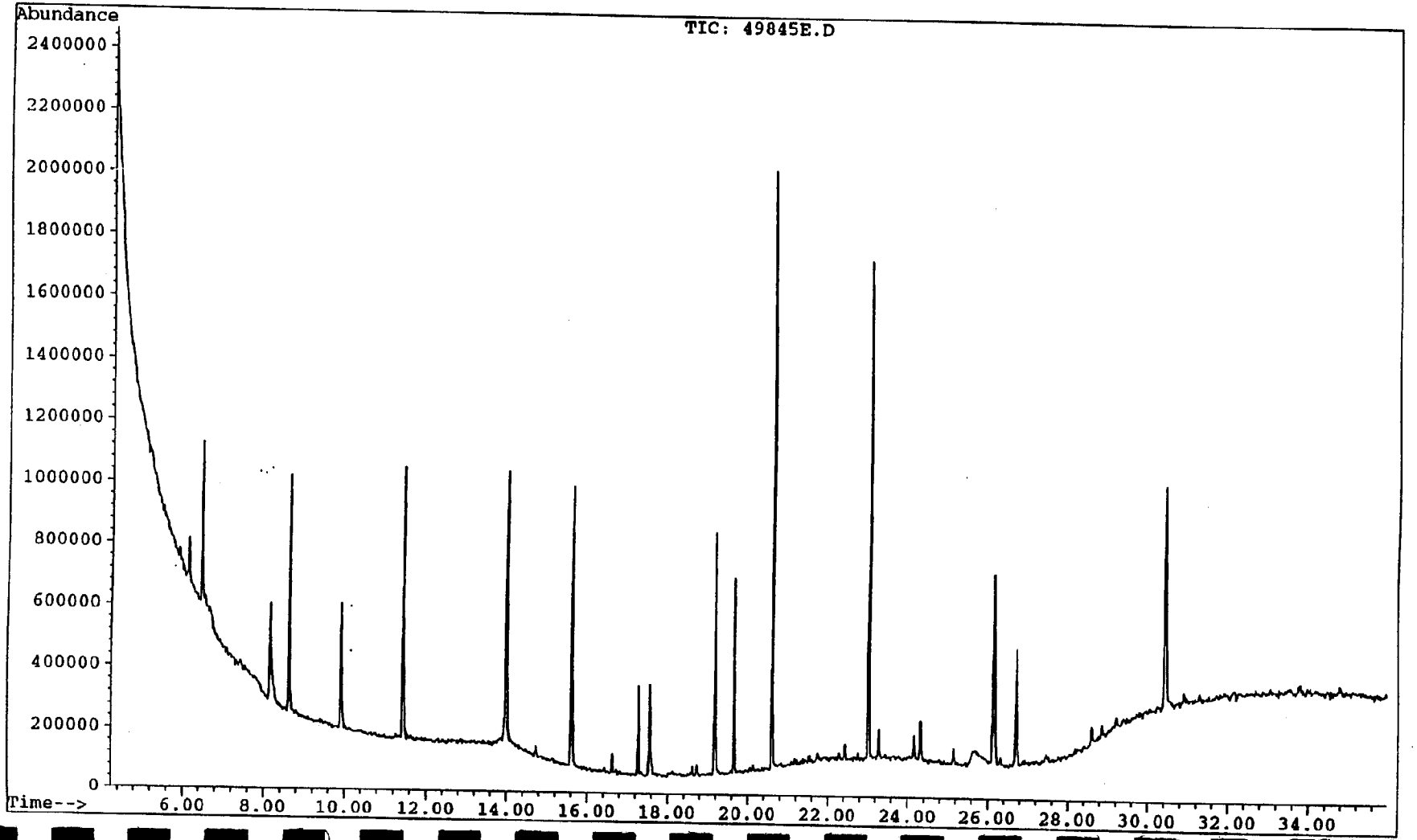
File : D:\4214FDSL\49845DE.D
Operator : TR
Acquired : 2 Aug 94 8:54 pm using AcqMethod TPHDEL.M
Instrument : 5971 - GC
Sample Name:
Misc Info :
Vial Number: 18



KCSlip4 38830

SEA405360

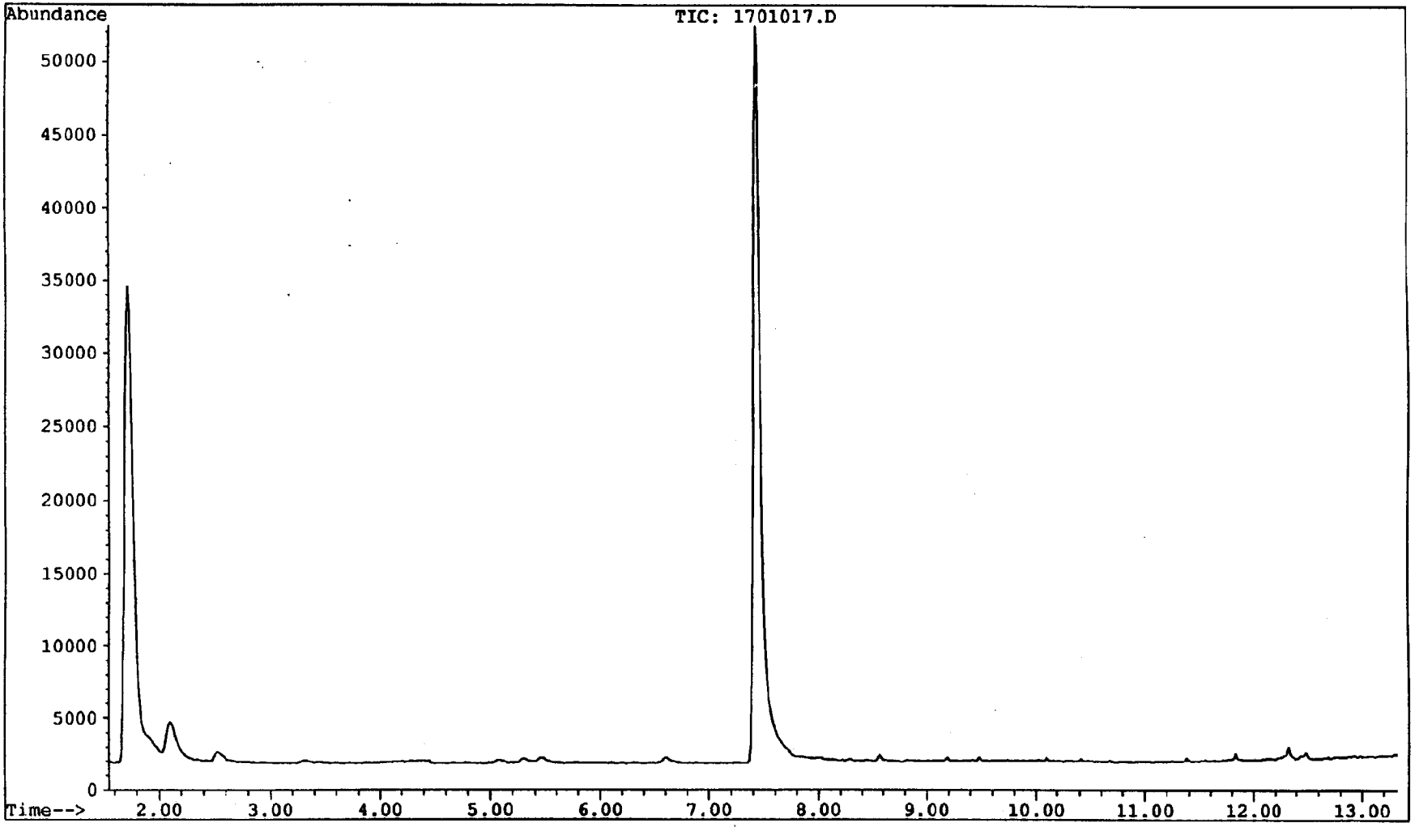
File : D:\4207FOPT\49845E.D
Operator : TR
Acquired : 26 Jul 94 1:51 pm using AcqMethod OPTECH.M
Instrument : 5971 - GC
Sample Name: SMPL1
Misc Info : S20
Vial Number: 5



KCSlip4 38831

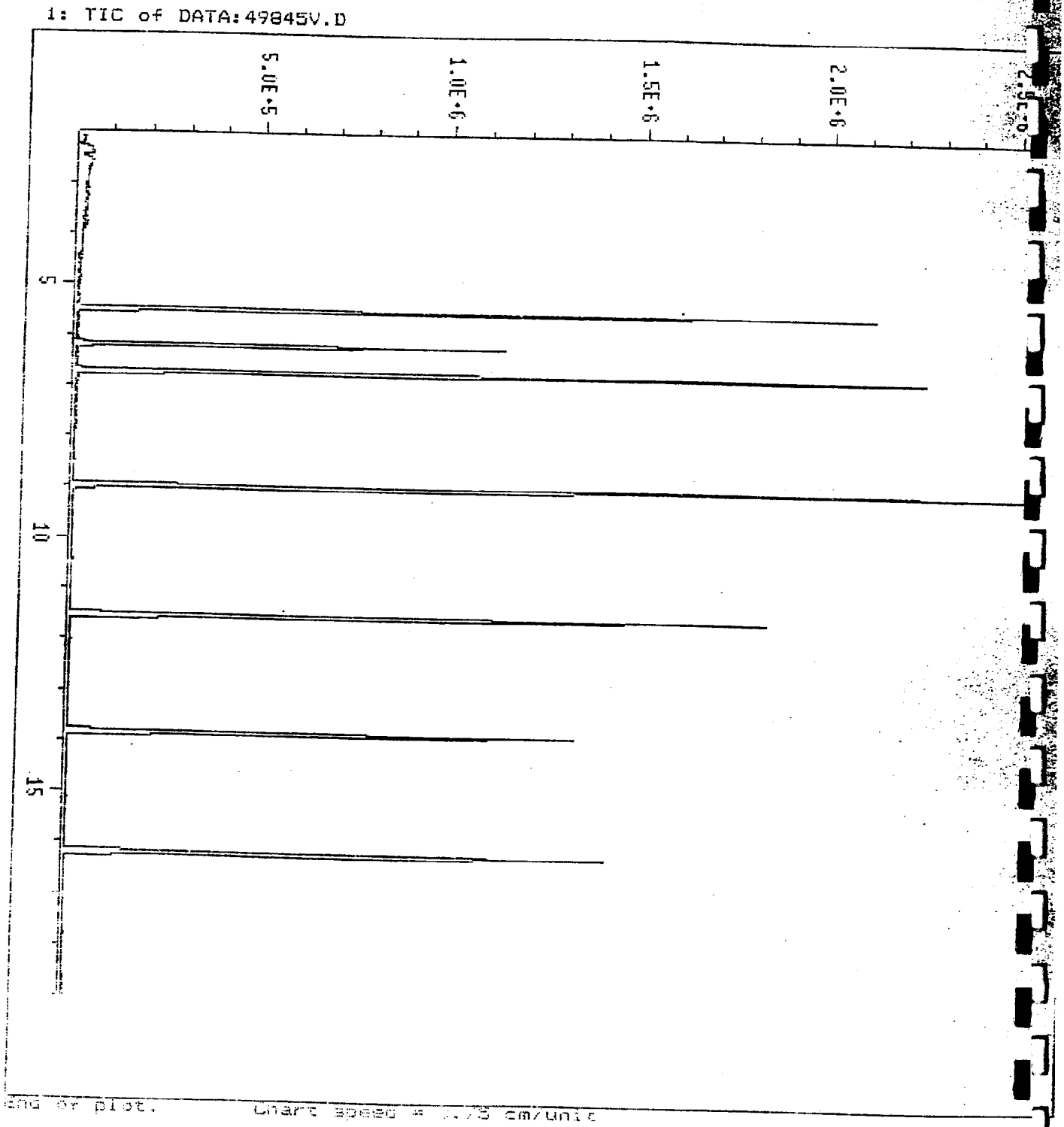
SEA405361

File : C:\HPCHEM\1\DATA\BTEXDATA\40726.1\1701017.D
Operator :
Acquired : 26 Jul 94 10:44 pm using AcqMethod TPH&BTEX.M
Instrument : H-P 5890/
Sample Name: 49845
Misc Info :
Vial Number: 17



KCSlip4 38832

SEA405362



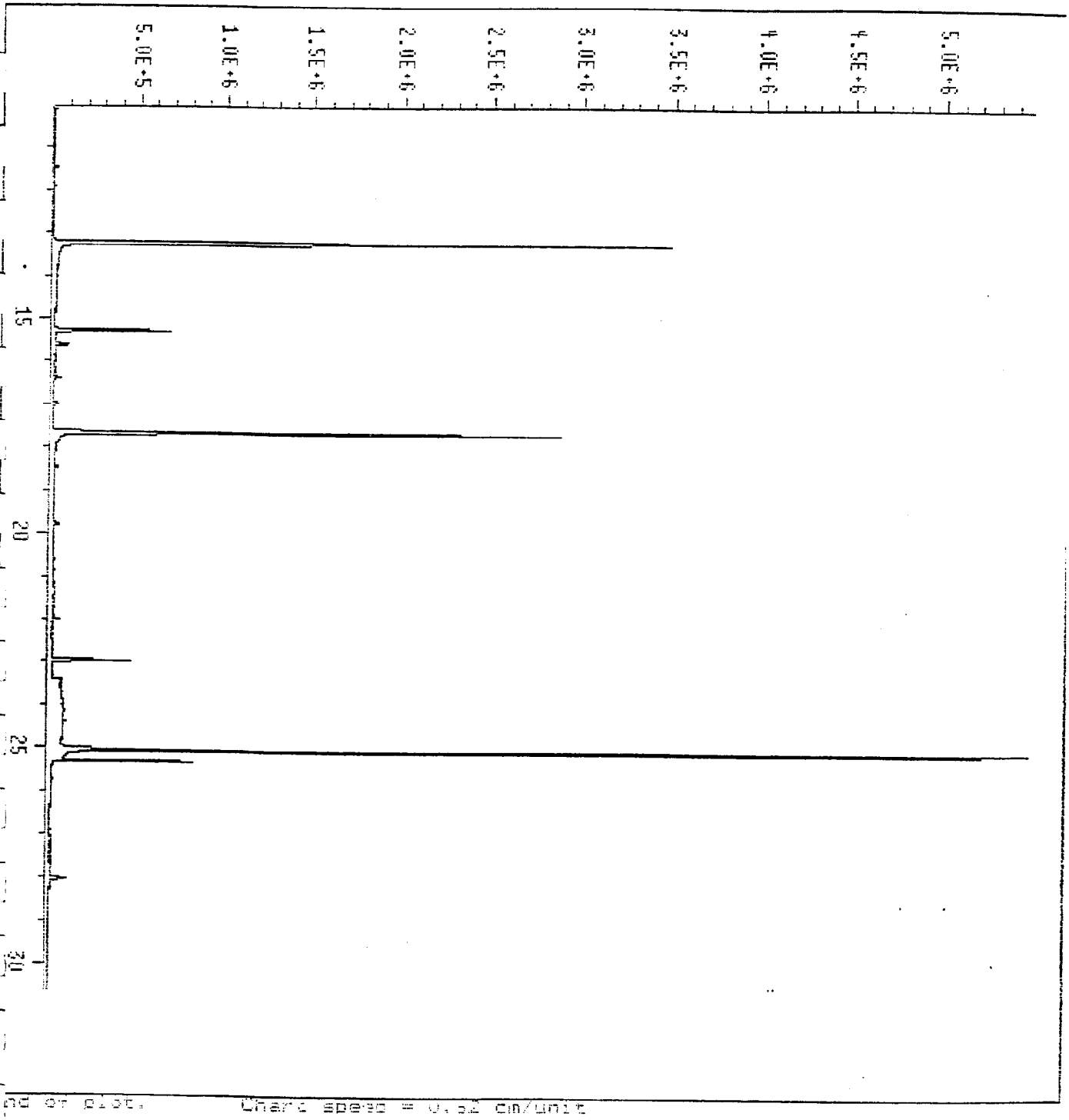
End of plot. Chart speed = 1.75 cm/min

CHROMATOGRAM OF VOLATILE FRACTION FROM SAMPLE 49845V

KCSlip4 38833

SEA405363

1: TIC of DATA:49845P.D



End of plot. Chart speed = 0.52 cm/unit

CHROMATOGRAM OF SAMPLE 49845P

KCSlip4 38834

SEA405364

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49846

Project Description: Seattle ANGS 1315-127
Sample Name: BS004 P2 8 1/2-10
Date/Time Taken: 7/14/94

Matrix: Soil
Date/Time Received: 7/15/94 4:20:00

Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]
TPH by GC (as diesel)	18	83.1
TPH by GC (as gasoline)	9.3	89.5
Antimony/GFAA	1.9	75.6
Arsenic/GFAA	1.1	65.2
Beryllium/ICP	3.2	92.8
Cadmium/GFAA	0.2	79
Chromium/GFAA	1.1	79.7
Copper/ICP	0.6	103
Lead/GFAA	0.3	80.1
Mercury/CVAA	9.1	105.6
Nickel/ICP	1.5	76
Selenium/GFAA	2.9	39.6
Silver/GFAA	10.1	40.6
Thallium/GFAA	8.6	88.8
Zinc/ICP	2.1	77.4
4,4'-DDD	5.6	53.6
4,4'-DDE	1.8	56.1
4,4'-DDT	8.3	56.5
Aldrin	11	49.6
alpha-BHC	0.2	52.4
alpha-Chlordane	2.3	58.2
beta-BHC	0.9	104.5
beta-Chlordane	2	60.2
delta-BHC	1	57.8
Dieldrin	2.7	53.3
Endosulfan I	6.9	59.9
Endosulfan II	1.2	51.6
Endosulfan sulfate	1.1	52.2
Endrin	11.4	68.8
Endrin aldehyde	5.5	62.6
Heptachlor	1.6	57.3
Heptachlor epoxide	3.1	56.3
Lindane	0.8	114.8
Methoxychlor	3.5	49.5

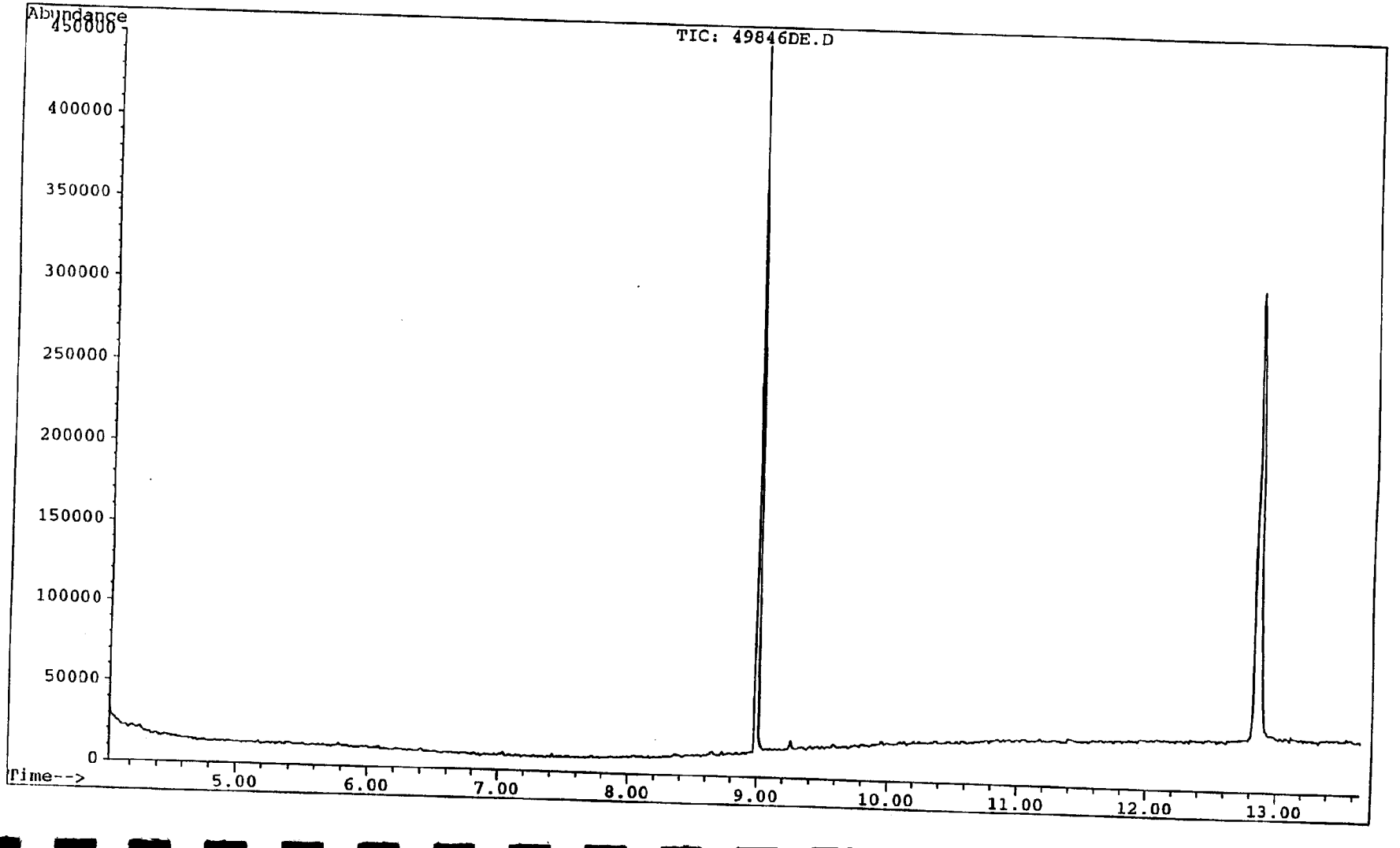
PCB, total	0.4	52
Toxaphene	4.1	64.1

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	8240	103
4-Bromofluorobenzene(surr)	8240	95
Toluene-d8(surr)	8240	110
2,4,6-Tribromophenol	625&8270	45.4
2-Fluorobiphenyl	625&8270	45.4
2-Fluorophenol	625&8270	26.9
Nitrobenzene-d5	625&8270	42.4
Phenol-d5	625&8270	37.3
Terphenyl-d14	625&8270	56.4
2,4,5,6-Tetrachloro-m-xylene	608 & 8080	Diluted
Dibutyl Chlorendate	608 & 8080	Diluted
p-Terphenyl	8015 mod.	61.3
Pentafluorobenzene(Surr)	8015 mod.	100.3

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

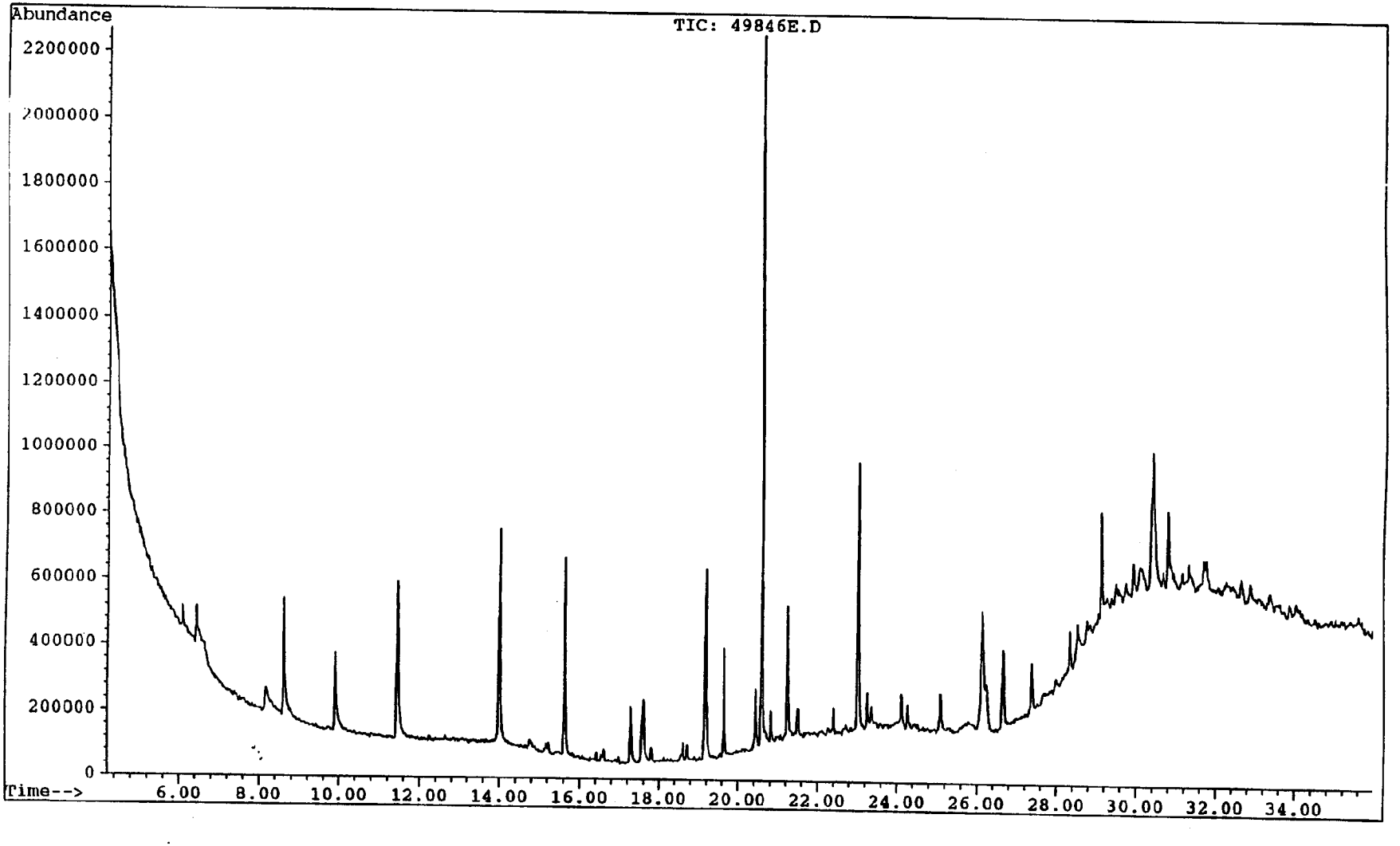
File : D:\4214FDSL\49846DE.D
Operator : TR
Acquired : 2 Aug 94 9:55 pm using AcqMethod TPHDEL.M
Instrument : 5971 - GC
Sample Name:
Misc Info :
Vial Number: 21



KCSlip4 38837

SEA405367

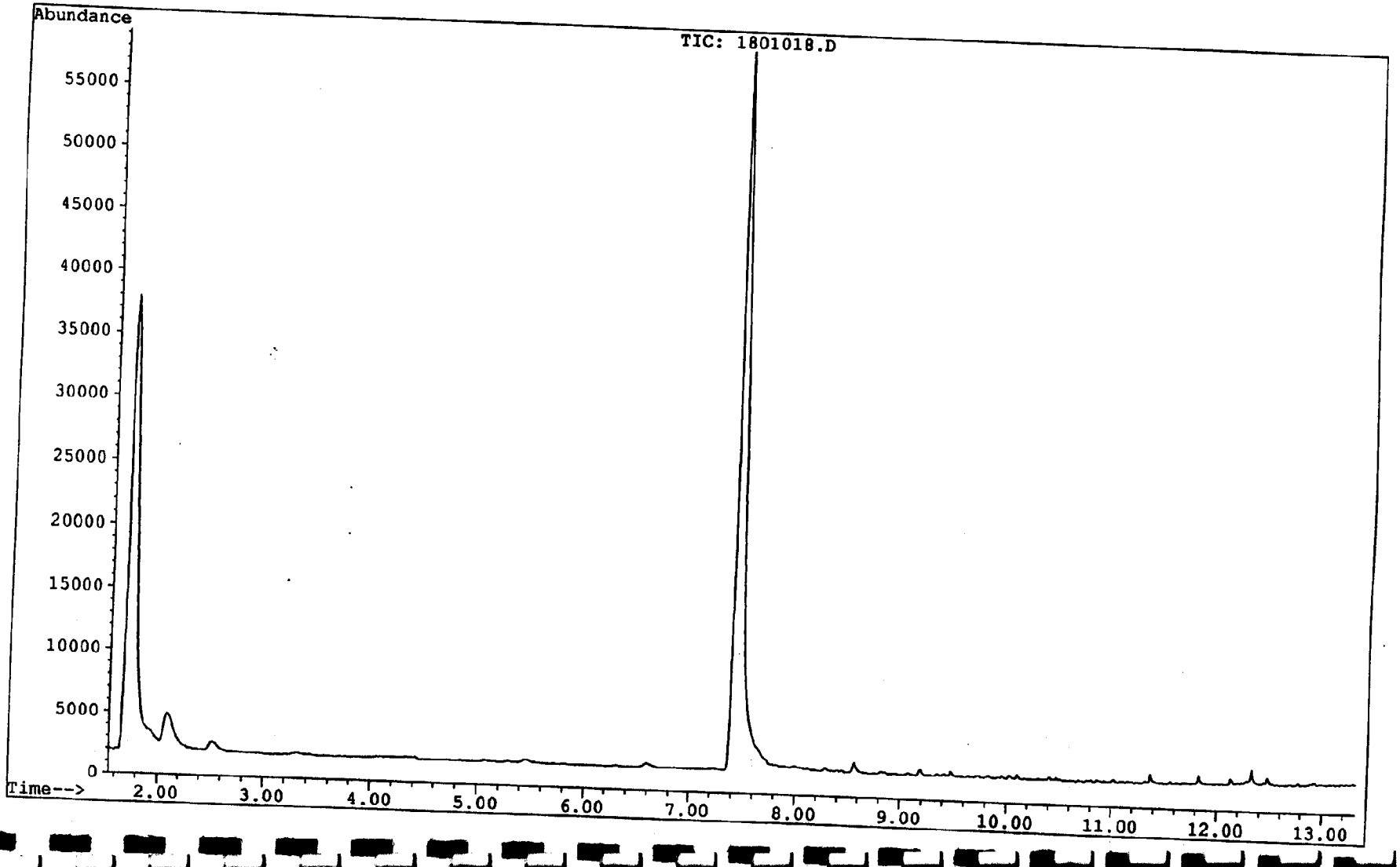
File : D:\4208FOPT\49846E.D
Operator : TR
Acquired : 27 Jul 94 8:23 pm using AcqMethod OPTECH.M
Instrument : 5971 - GC
Sample Name: SMPL10
Misc Info : S20
Vial Number: 14



KCSlip4 38838

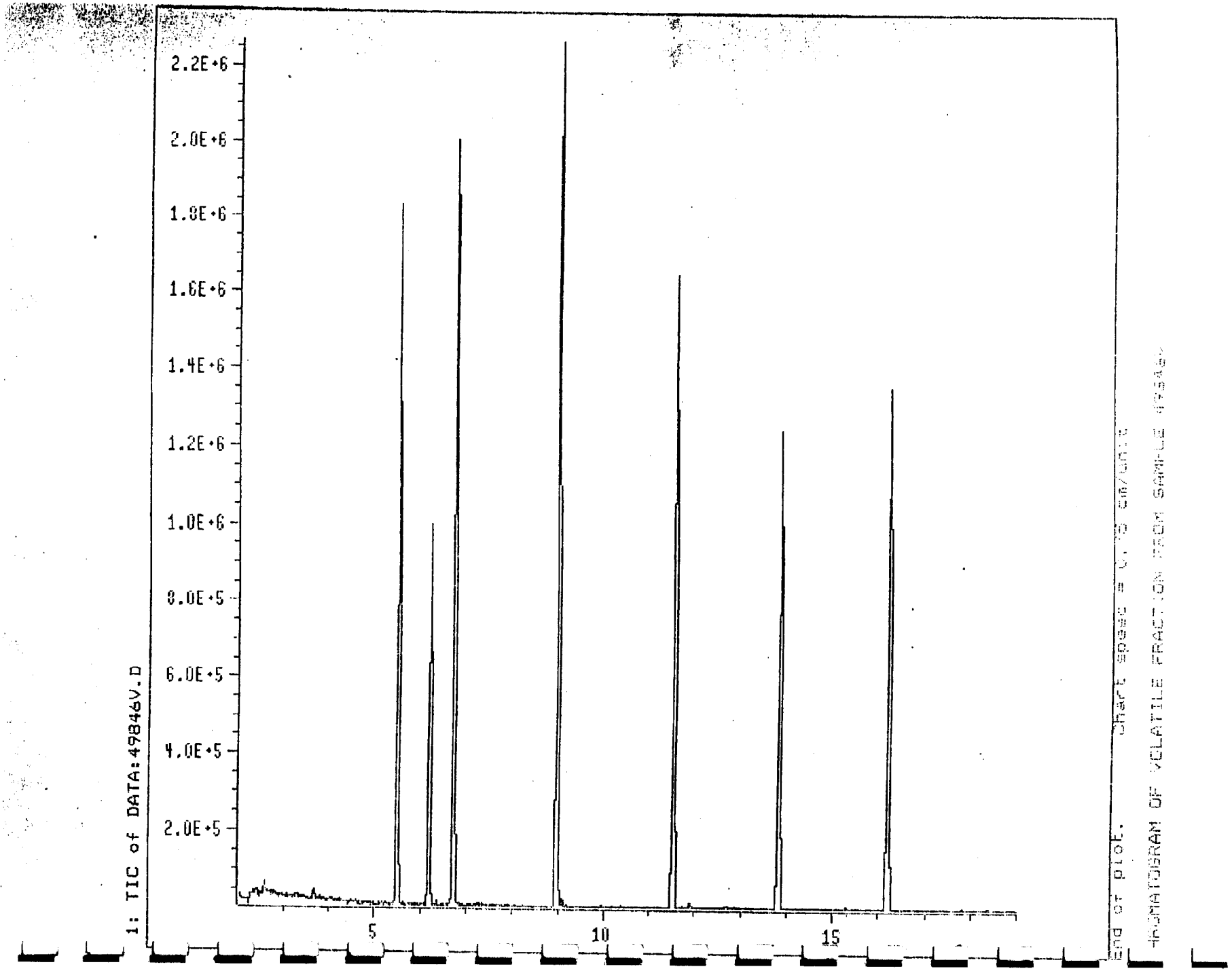
SEA405368

File : C:\HPCHEM\1\DATA\BTEXDATA\40726.1\1801018.D
Operator :
Acquired : 26 Jul 94 11:05 pm using AcqMethod TPH&BTEX.M
Instrument : H-P 5890/
Sample Name: 49846
Misc Info :
Vial Number: 18



KCSlip4 38839

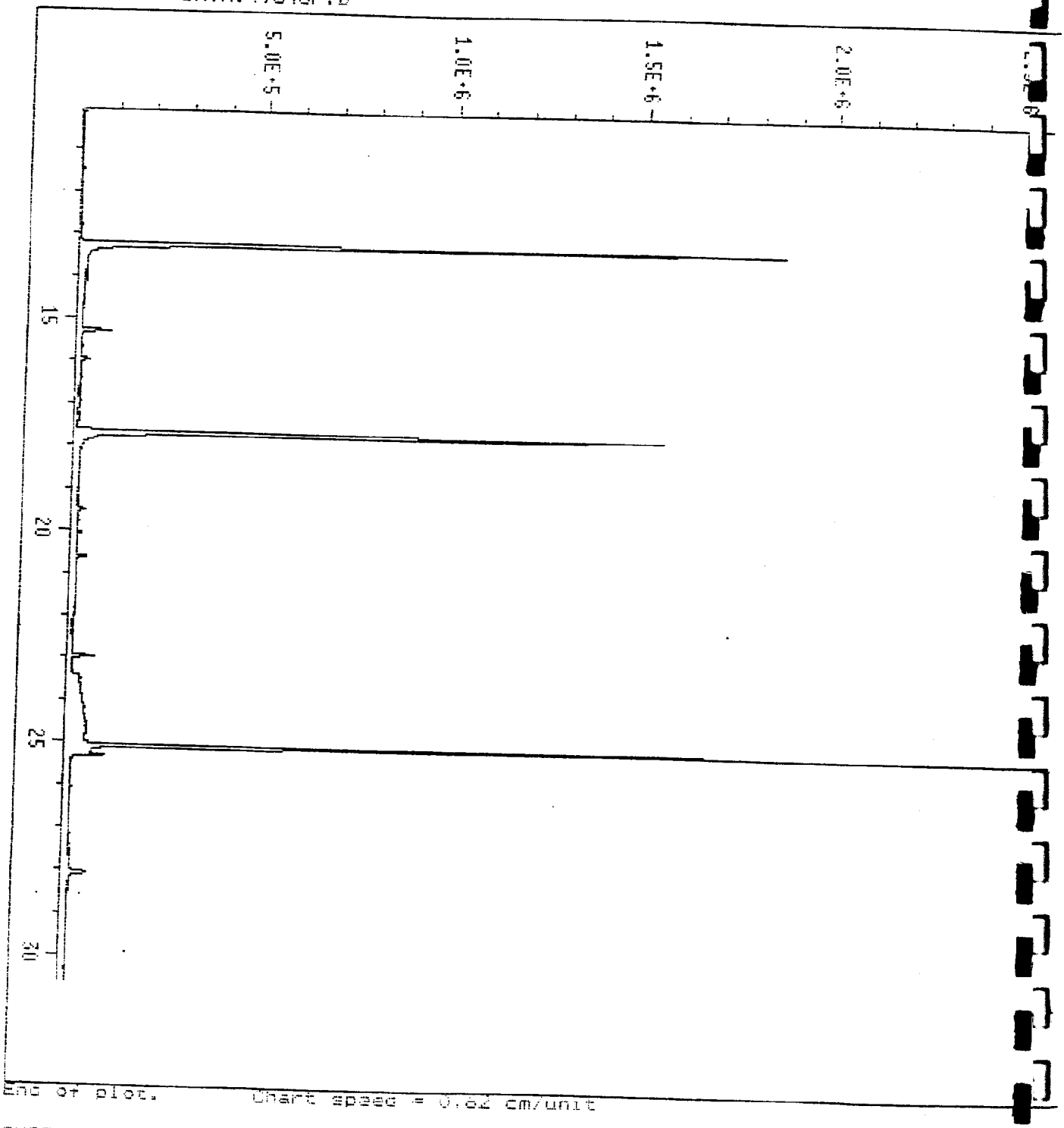
SEA405369



KCSlip4 38840

SEA405370

1: TIC of DATA:49846P.D



End of plot. Chart speed = 0.62 cm/unit

CHROMATOGRAM OF SAMPLE 49846P

KCSlip4 38841

SEA405371

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 49847

Project Description: Seattle ANGS 1315-127
Sample Name: BS001 TB
Matrix: Water
Date/Time Taken: 7/14/94
Date/Time Received: 7/15/94 4:20:00

Q.A. Data Report [1]

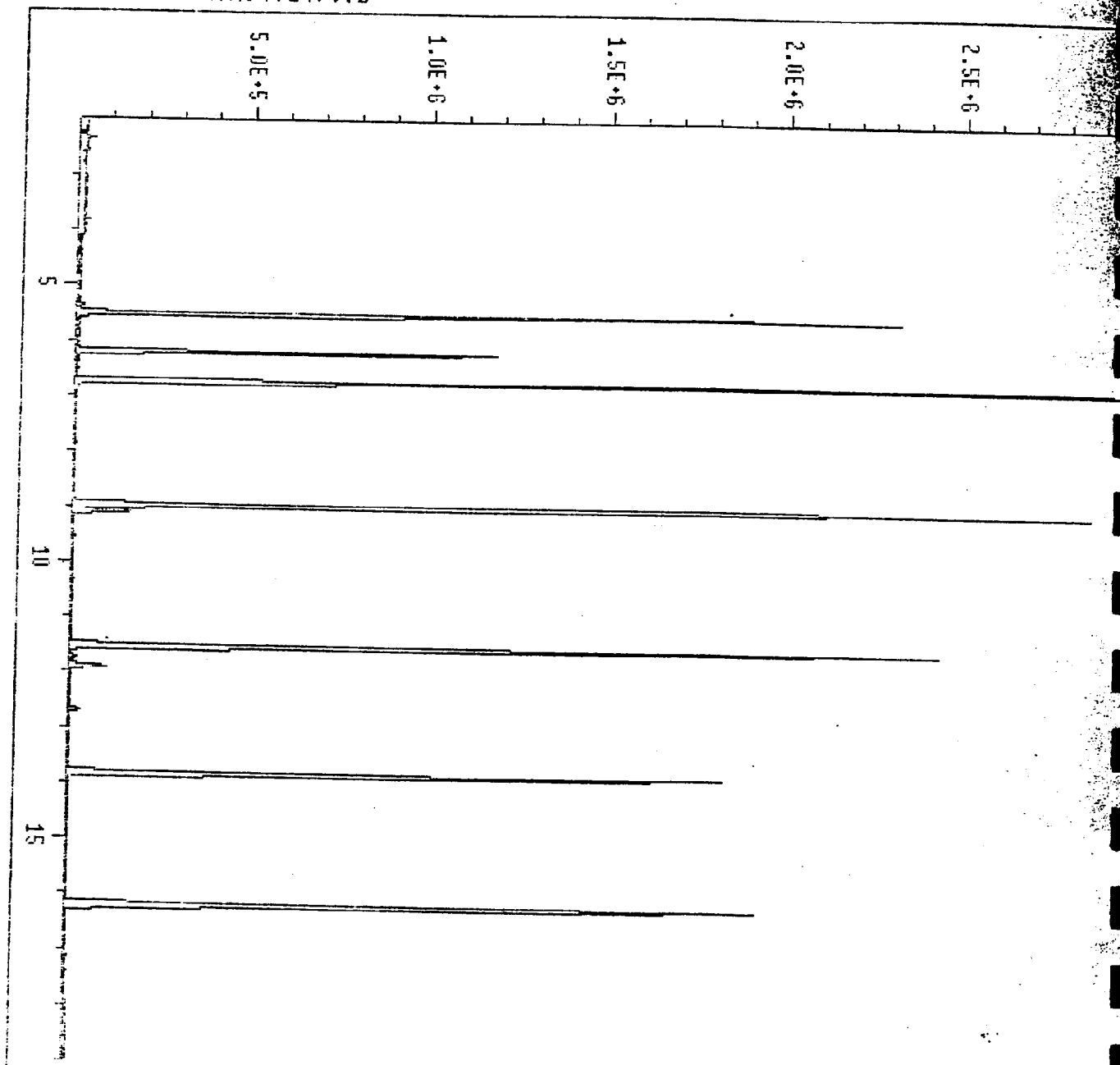
Parameter	Precision [2]	Recovery [3]

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	8240	100
4-Bromofluorobenzene(surr)	8240	98
Toluene-d8(surr)	8240	101

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

1: TIC of DATA:49847V.D



end of plot. chart speed = 0.73 cm/unit

CHROMATOGRAM OF VOLATILE FRACTION FROM SAMPLE 49847.

KCSlip4 38843

SEA405373

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-4766

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 50097
Report Date: 9/19/94

Project Description: Seattle 1315-127 / Bellingham 1315-131
Sample Name: BS 005 P2 **Matrix:** Water
Date/Time Taken: 7/21/94 **Date/Time Received:** 7/22/94 1:50:00

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis-General Parameters

Report #: 50097

Sample Name: BS 005 P2

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
A/BN Extraction-8080/PCB	—				7/28/94	3520
A/BN Extraction-8270	—				7/28/94	3520
Gross alpha	15 +/- 39	pCi/L			7/22/94	9310
Gross beta	77 +/- 24	pCi/L			7/22/94	9310
Metals dig.-Hg	—				7/26/94	7470
Metals dig.-HNO3	—				8/1/94	3015
TPH by GC (as diesel)	<0.25	mg/L	0.25	<0.25	8/12/94	8015 mod.
Antimony/GFAA	<0.003	mg/L	0.003	<0.003	8/3/94	204.2&7041
Arsenic/GFAA	0.028	mg/L	0.001	<0.001	8/3/94	206.2&7060
Beryllium/ICP	0.54	mg/L	0.005	<0.005	8/3/94	6010 & 200.7
Cadmium/GFAA	<0.0006	mg/L	6E-04	<0.0006	8/2/94	213.2&7131
Chromium/GFAA	0.0052	mg/L	0.001	<0.001	8/2/94	218.2&7191
Copper/ICP	0.054	mg/L	0.01	<0.01	8/4/94	6010&200.7
Lead/GFAA	0.022	mg/L	0.001	<0.001	8/3/94	239.2&7421
Mercury/CVAA	<0.0002	mg/L	2E-04	<0.0002	7/26/94	245.1&7470
Nickel/ICP	0.031	mg/L	0.01	<0.01	8/3/94	6010 & 200.7
Selenium/GFAA	0.002	mg/L	0.002	<0.002	8/2/94	270.2&7740
Silver/GFAA	<0.002	mg/L	0.002	<0.002	8/3/94	272.2&7761
Thallium/GFAA	<0.001	mg/L	0.001	<0.001	8/3/94	279.2&7841
Zinc/ICP	<0.05	mg/L	0.05	<0.05	8/3/94	6010 & 200.7

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

Report of Analysis-Volatile Organics (GC/MS)

Report #: 50097

Sample Name: BS 005 P2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Volatile organics-8240	—				7/26/94	8240
1,1,1-trichloroethane	<5	µg/L	5	<5	7/26/94	8240
1,1,2,2-tetrachloroethane	<5	µg/L	5	<5	7/26/94	8240
1,1,2-trichloroethane	<5	µg/L	5	<5	7/26/94	8240
1,1-dichloroethane	<5	µg/L	5	<5	7/26/94	8240
1,1-dichloroethene	<5	µg/L	5	<5	7/26/94	8240
1,2-dichlorobenzene	<10	µg/L	10	<10	7/26/94	8240
1,2-dichloroethane	<5	µg/L	5	<5	7/26/94	8240
1,2-dichloropropane	<5	µg/L	5	<5	7/26/94	8240
1,3-dichlorobenzene	<10	µg/L	10	<10	7/26/94	8240
1,4-dichlorobenzene	<10	µg/L	10	<10	7/26/94	8240
2-butanone (MEK)	<100	µg/L	100	<100	7/26/94	8240
2-hexanone	<50	µg/L	50	<50	7/26/94	8240
4-methyl-2-pentanone (MIBK)	<50	µg/L	50	<50	7/26/94	8240
Acetone	<100	µg/L	100	<100	7/26/94	8240
Benzene	<5	µg/L	5	<5	7/26/94	8240
Bromodichloromethane	<5	µg/L	5	<5	7/26/94	8240
Bromoform	<5	µg/L	5	<5	7/26/94	8240
Bromomethane	<10	µg/L	10	<10	7/26/94	8240
c-1,3-dichloropropene	<5	µg/L	5	<5	7/26/94	8240
Carbon disulfide	<5	µg/L	5	<5	7/26/94	8240
Carbon tetrachloride	<5	µg/L	5	<5	7/26/94	8240
Chlorobenzene	<5	µg/L	5	<5	7/26/94	8240
Chloroethane	<10	µg/L	10	<10	7/26/94	8240
Chloroform	<5	µg/L	5	<5	7/26/94	8240
Chloromethane	<10	µg/L	10	<10	7/26/94	8240
Dibromochloromethane	<5	µg/L	5	<5	7/26/94	8240
Ethylbenzene	<5	µg/L	5	<5	7/26/94	8240
m,p-Xylenes	<5	µg/L	5	<5	7/26/94	8240
Methylene chloride	<5	µg/L	5	<5	7/26/94	8240
o-Xylene	<5	µg/L	5	<5	7/26/94	8240
Styrene	<5	µg/L	5	<5	7/26/94	8240
t-1,2-dichloroethene	<5	µg/L	5	<5	7/26/94	8240
t-1,3-dichloropropene	<5	µg/L	5	<5	7/26/94	8240
Tetrachloroethene	<5	µg/L	5	<5	7/26/94	8240
Toluene	<5	µg/L	5	<5	7/26/94	8240
Trichloroethene	<5	µg/L	5	<5	7/26/94	8240
Vinyl chloride	<10	µg/L	10	<10	7/26/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 1

Report #: 50097

Sample Name: BS 005 P2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8270	—				8/9/94	625&8270
1,2,4-Trichlorobenzene	<10	µg/L	10	<10	8/9/94	625&8270
2,4,5-Trichloropenol	<10	µg/L	10	<10	8/9/94	625&8270
2,4,6-Trichlorophenol	<10	µg/L	10	<10	8/9/94	625&8270
2,4-Dichlorophenol	<10	µg/L	10	<10	8/9/94	625&8270
2,4-Dimethylphenol	<10	µg/L	10	<10	8/9/94	625&8270
2,4-Dinitrophenol	<50	µg/L	50	<50	8/9/94	625&8270
2,4-Dinitrotoluene	<10	µg/L	10	<10	8/9/94	625&8270
2,6-Dinitrotoluene	<10	µg/L	10	<10	8/9/94	625&8270
2-Chloronaphthalene	<10	µg/L	10	<10	8/9/94	625&8270
2-Chlorophenol	<10	µg/L	10	<10	8/9/94	625&8270
2-Methylnaphthalene	<10	µg/L	10	<10	8/9/94	625&8270
2-Methylphenol (o-Cresol)	<10	µg/L	10	<10	8/9/94	625&8270
2-Nitroaniline	<50	µg/L	50	<50	8/9/94	625&8270
2-Nitrophenol	<10	µg/L	10	<10	8/9/94	625&8270
3&4 Methylphenol (m&p-Cresol)	<10	µg/L	10	<10	8/9/94	625&8270
3,3'-Dichlorobenzidine	<20	µg/L	20	<20	8/9/94	625&8270
3-Nitroaniline	<50	µg/L	50	<50	8/9/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 2

Report #: 50097

Sample Name: BS 005 P2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
4,6-Dinitro-2-methylphenol	<50	µg/L	50	<50	8/9/94	625&8270
4-Bromophenyl phenyl ether	<10	µg/L	10	<10	8/9/94	625&8270
4-Chloro-3-methylphenol(p-Chloro-m-cres	<20	µg/L	20	<20	8/9/94	625&8270
4-Chloroaniline (p-Chloroaniline)	<20	µg/L	20	<20	8/9/94	625&8270
4-Chlorophenyl phenyl ether	<10	µg/L	10	<10	8/9/94	625&8270
4-Nitroaniline	<20	µg/L	20	<20	8/9/94	625&8270
4-Nitrophenol	<50	µg/L	50	<50	8/9/94	625&8270
Acenaphthene	<10	µg/L	10	<10	8/9/94	625&8270
Acenaphthylene	<10	µg/L	10	<10	8/9/94	625&8270
Anthracene	<10	µg/L	10	<10	8/9/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 3

Report #: 50097

Sample Name: BS 005 P2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Benzoic acid	<50	µg/L	50	<50	8/9/94	625&8270
Benzo[a]anthracene	<10	µg/L	10	<10	8/9/94	625&8270
Benzo[a]pyrene	<10	µg/L	10	<10	8/9/94	625&8270
Benzo[b]fluoranthene	<10	µg/L	10	<10	8/9/94	625&8270
Benzo[g,h,i]perylene	<10	µg/L	10	<10	8/9/94	625&8270
Benzo[j,k]fluoranthene	<10	µg/L	10	<10	8/9/94	625&8270
Benzyl alcohol	<20	µg/L	20	<20	8/9/94	625&8270
bis(2-Chloroethoxy)methane	<10	µg/L	10	<10	8/9/94	625&8270
bis(2-Chloroethyl)ether	<10	µg/L	10	<10	8/9/94	625&8270
bis(2-chloroisopropyl)ether	<10	µg/L	10	<10	8/9/94	625&8270
bis(2-Ethylhexyl)phthalate	<10	µg/L	10	<10	8/9/94	625&8270
Butyl benzyl phthalate	<10	µg/L	10	<10	8/9/94	625&8270
Chrysene	<10	µg/L	10	<10	8/9/94	625&8270
Di-n-butyl phthalate (Dibutyl phthalate	<10	µg/L	10	<10	8/9/94	625&8270
Di-n-octylphthalate (Dioctyl phthalate)	<10	µg/L	10	<10	8/9/94	625&8270
Dibenzofuran	<10	µg/L	10	<10	8/9/94	625&8270
Dibenz[a,h]anthracene	<10	µg/L	10	<10	8/9/94	625&8270
Diethylphthalate	<10	µg/L	10	<10	8/9/94	625&8270
Dimethylphthalate	<10	µg/L	10	<10	8/9/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 4

Report #: 50097

Sample Name: BS 005 P2

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Fluoranthene	<10	µg/L	10	<10	8/9/94	625&8270
Fluorene	<10	µg/L	10	<10	8/9/94	625&8270
Hexachlorobenzene	<10	µg/L	10	<10	8/9/94	625&8270
Hexachlorobutadiene	<10	µg/L	10	<10	8/9/94	625&8270
Hexachlorocyclopentadiene	<10	µg/L	10	<10	8/9/94	625&8270
Hexachloroethane	<10	µg/L	10	<10	8/9/94	625&8270
Indeno[1,2,3-cd]pyrene	<10	µg/L	10	<10	8/9/94	625&8270
Isophorone	<10	µg/L	10	<10	8/9/94	625&8270
N-Nitrosodi-n-propylamine	<10	µg/L	10	<10	8/9/94	625&8270
n-Nitrosodiphenylamine	<10	µg/L	10	<10	8/9/94	625&8270
Naphthalene	<10	µg/L	10	<10	8/9/94	625&8270
Nitrobenzene	<10	µg/L	10	<10	8/9/94	625&8270
Pentachlorophenol	<50	µg/L	50	<50	8/9/94	625&8270
Phenanthrene	<10	µg/L	10	<10	8/9/94	625&8270
Phenol	<10	µg/L	10	<10	8/9/94	625&8270
Pyrene	<10	µg/L	10	<10	8/9/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Organics (GC & LC)

Report #: 50097

Sample Name: BS 005 P2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8080/PCB	—				8/3/94	
4,4'-DDD	<0.02	µg/L	0.02	<0.02	8/3/94	8080
4,4'-DDE	<0.02	µg/L	0.02	<0.02	8/3/94	8080
4,4'-DDT	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Aldrin	<0.02	µg/L	0.02	<0.02	8/3/94	8080
alpha-BHC	<0.02	µg/L	0.02	<0.02	8/3/94	8080
alpha-Chlordane	<0.05	µg/L	0.05	<0.05	8/3/94	8080
beta-BHC	<0.02	µg/L	0.02	<0.02	8/3/94	8080
beta-Chlordane	<0.05	µg/L	0.05	<0.05	8/3/94	8080
delta-BHC	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Dieldrin	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Endosulfan I	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Endosulfan II	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Endosulfan sulfate	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Endrin	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Endrin aldehyde	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Heptachlor	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Heptachlor epoxide	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Lindane	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Methoxychlor	<0.2	µg/L	0.2	<0.2	8/3/94	8080
PCB, total	<0.2	µg/L	0.2	<0.2	8/3/94	8080
Toxaphene	<0.5	µg/L	0.5	<0.5	8/3/94	8080

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

AnalySys inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-4766

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 50098
Report Date: 9/19/94

Project Description: Seattle 1315-127 / Bellingham 1315-131
Sample Name: BS 004 P2
Date/Time Taken: 7/21/94

Matrix: Water
Date/Time Received: 7/22/94 1:50:00

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis-General Parameters

Report #: 50098

Sample Name: BS 004 P2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
A/BN Extraction-8080/PCB	—				7/28/94	3520
A/BN Extraction-8270	—				7/28/94	3520
Gross alpha	36 +/- 42	pCi/L				
Gross beta	78 +/- 25	pCi/L				
Metals dig.-Hg	—				7/26/94	7470
Metals dig.-HNO3	—				8/1/94	3015
TPH by GC (as diesel)	<0.25	mg/L	0.25	<0.25	8/12/94	8015 mod.
Antimony/GFAA	<0.003	mg/L	0.003	<0.003	8/3/94	204.2&7041
Arsenic/GFAA	0.038	mg/L	0.001	<0.001	8/3/94	206.2&7060
Beryllium/ICP	0.013	mg/L	0.005	<0.005	8/3/94	6010 & 200.7
Cadmium/GFAA	0.0006	mg/L	6E-04	<0.0006	8/2/94	213.2&7131
Chromium/GFAA	0.12	mg/L	0.001	<0.001	8/2/94	218.2&7191
Copper/ICP	0.29	mg/L	0.01	<0.01	8/3/94	6010 & 200.7
Lead/GFAA	0.033	mg/L	0.001	<0.001	8/3/94	239.2&7421
Mercury/CVAA	<0.0002	mg/L	2E-04	<0.0002	7/26/94	245.1&7470
Nickel/ICP	0.16	mg/L	0.01	<0.01	8/3/94	6010 & 200.7
Selenium/GFAA	<0.002	mg/L	0.002	<0.002	8/2/94	270.2&7740
Silver/GFAA	<0.002	mg/L	0.002	<0.002	8/3/94	272.2&7761
Thallium/GFAA	0.0057	mg/L	0.001	<0.001	8/3/94	279.2&7841
Zinc/ICP	0.45	mg/L	0.05	<0.05	8/3/94	6010 & 200.7

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

Report of Analysis-Volatile Organics (GC/MS)

Report #: 50098

Sample Name: BS 004 P2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Volatile organics-8240	—				7/26/94	8240
1,1,1-trichloroethane	<5	µg/L	5	<5	7/26/94	8240
1,1,2,2-tetrachloroethane	<5	µg/L	5	<5	7/26/94	8240
1,1,2-trichloroethane	<5	µg/L	5	<5	7/26/94	8240
1,1-dichloroethane	<5	µg/L	5	<5	7/26/94	8240
1,1-dichloroethene	<5	µg/L	5	<5	7/26/94	8240
1,2-dichlorobenzene	<10	µg/L	10	<10	7/26/94	8240
1,2-dichloroethane	<5	µg/L	5	<5	7/26/94	8240
1,2-dichloropropane	<5	µg/L	5	<5	7/26/94	8240
1,3-dichlorobenzene	<10	µg/L	10	<10	7/26/94	8240
1,4-dichlorobenzene	<10	µg/L	10	<10	7/26/94	8240
2-butanone (MEK)	<100	µg/L	100	<100	7/26/94	8240
2-hexanone	<50	µg/L	50	<50	7/26/94	8240
4-methyl-2-pentanone (MIBK)	<50	µg/L	50	<50	7/26/94	8240
Acetone	<100	µg/L	100	<100	7/26/94	8240
Benzene	<5	µg/L	5	<5	7/26/94	8240
Bromodichloromethane	<5	µg/L	5	<5	7/26/94	8240
Bromoform	<5	µg/L	5	<5	7/26/94	8240
Bromomethane	<10	µg/L	10	<10	7/26/94	8240
c-1,3-dichloropropene	<5	µg/L	5	<5	7/26/94	8240
Carbon disulfide	<5	µg/L	5	<5	7/26/94	8240
Carbon tetrachloride	<5	µg/L	5	<5	7/26/94	8240
Chlorobenzene	<5	µg/L	5	<5	7/26/94	8240
Chloroethane	<10	µg/L	10	<10	7/26/94	8240
Chloroform	<5	µg/L	5	<5	7/26/94	8240
Chloromethane	<10	µg/L	10	<10	7/26/94	8240
Dibromochloromethane	<5	µg/L	5	<5	7/26/94	8240
Ethylbenzene	<5	µg/L	5	<5	7/26/94	8240
m,p-Xylenes	<5	µg/L	5	<5	7/26/94	8240
Methylene chloride	<5	µg/L	5	<5	7/26/94	8240
o-Xylene	<5	µg/L	5	<5	7/26/94	8240
Styrene	<5	µg/L	5	<5	7/26/94	8240
t-1,2-dichloroethene	<5	µg/L	5	<5	7/26/94	8240
t-1,3-dichloropropene	<5	µg/L	5	<5	7/26/94	8240
Tetrachloroethene	<5	µg/L	5	<5	7/26/94	8240
Toluene	<5	µg/L	5	<5	7/26/94	8240
Trichloroethene	<5	µg/L	5	<5	7/26/94	8240
Vinyl chloride	<10	µg/L	10	<10	7/26/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 1

Report #: 50098

Sample Name: BS 004 P2

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8270	—				8/9/94	625&8270
1,2,4-Trichlorobenzene	<10	µg/L	10	<10	8/9/94	625&8270
2,4,5-Trichloropenol	<10	µg/L	10	<10	8/9/94	625&8270
2,4,6-Trichlorophenol	<10	µg/L	10	<10	8/9/94	625&8270
2,4-Dichlorophenol	<10	µg/L	10	<10	8/9/94	625&8270
2,4-Dimethylphenol	<10	µg/L	10	<10	8/9/94	625&8270
2,4-Dinitrophenol	<50	µg/L	50	<50	8/9/94	625&8270
2,4-Dinitrotoluene	<10	µg/L	10	<10	8/9/94	625&8270
2,6-Dinitrotoluene	<10	µg/L	10	<10	8/9/94	625&8270
2-Chloronaphthalene	<10	µg/L	10	<10	8/9/94	625&8270
2-Chlorophenol	<10	µg/L	10	<10	8/9/94	625&8270
2-Methylnaphthalene	<10	µg/L	10	<10	8/9/94	625&8270
2-Methylphenol (o-Cresol)	<10	µg/L	10	<10	8/9/94	625&8270
2-Nitroaniline	<50	µg/L	50	<50	8/9/94	625&8270
2-Nitrophenol	<10	µg/L	10	<10	8/9/94	625&8270
3&4 Methylphenol (m&p-Cresol)	<10	µg/L	10	<10	8/9/94	625&8270
3,3'-Dichlorobenzidine	<20	µg/L	20	<20	8/9/94	625&8270
3-Nitroaniline	<50	µg/L	50	<50	8/9/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 2

Report #: 50098

Sample Name: BS 004 P2

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
4,6-Dinitro-2-methylphenol	<50	µg/L	50	<50	8/9/94	625&8270
4-Bromophenyl phenyl ether	<10	µg/L	10	<10	8/9/94	625&8270
4-Chloro-3-methylphenol(p-Chloro-m-cres	<20	µg/L	20	<20	8/9/94	625&8270
4-Chloroaniline (p-Chloroaniline)	<20	µg/L	20	<20	8/9/94	625&8270
4-Chlorophenyl phenyl ether	<10	µg/L	10	<10	8/9/94	625&8270
4-Nitroaniline	<20	µg/L	20	<20	8/9/94	625&8270
4-Nitrophenol	<50	µg/L	50	<50	8/9/94	625&8270
Acenaphthene	<10	µg/L	10	<10	8/9/94	625&8270
Acenaphthylene	<10	µg/L	10	<10	8/9/94	625&8270
Anthracene	<10	µg/L	10	<10	8/9/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 3

Report #: 50098

Sample Name: BS 004 P2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Benzoic acid	<50	µg/L	50	<50	8/9/94	625&8270
Benzo[a]anthracene	<10	µg/L	10	<10	8/9/94	625&8270
Benzo[a]pyrene	<10	µg/L	10	<10	8/9/94	625&8270
Benzo[b]fluoranthene	<10	µg/L	10	<10	8/9/94	625&8270
Benzo[g,h,i]perylene	<10	µg/L	10	<10	8/9/94	625&8270
Benzo[j,k]fluoranthene	<10	µg/L	10	<10	8/9/94	625&8270
Benzyl alcohol	<20	µg/L	20	<20	8/9/94	625&8270
bis(2-Chloroethoxy)methane	<10	µg/L	10	<10	8/9/94	625&8270
bis(2-Chloroethyl)ether	<10	µg/L	10	<10	8/9/94	625&8270
bis(2-chloroisopropyl)ether	<10	µg/L	10	<10	8/9/94	625&8270
bis(2-Ethylhexyl)phthalate	<10	µg/L	10	<10	8/9/94	625&8270
Butyl benzyl phthalate	<10	µg/L	10	<10	8/9/94	625&8270
Chrysene	<10	µg/L	10	<10	8/9/94	625&8270
Di-n-butyl phthalate (Dibutyl phthalate	<10	µg/L	10	<10	8/9/94	625&8270
Di-n-octylphthalate (Dioctyl phthalate)	<10	µg/L	10	<10	8/9/94	625&8270
Dibenzofuran	<10	µg/L	10	<10	8/9/94	625&8270
Dibenz[a,h]anthracene	<10	µg/L	10	<10	8/9/94	625&8270
Diethylphthalate	<10	µg/L	10	<10	8/9/94	625&8270
Dimethylphthalate	<10	µg/L	10	<10	8/9/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 4

Report #: 50098

Sample Name: BS 004 P2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Fluoranthene	<10	µg/L	10	<10	8/9/94	625&8270
Fluorene	<10	µg/L	10	<10	8/9/94	625&8270
Hexachlorobenzene	<10	µg/L	10	<10	8/9/94	625&8270
Hexachlorobutadiene	<10	µg/L	10	<10	8/9/94	625&8270
Hexachlorocyclopentadiene	<10	µg/L	10	<10	8/9/94	625&8270
Hexachloroethane	<10	µg/L	10	<10	8/9/94	625&8270
Indeno[1,2,3-cd]pyrene	<10	µg/L	10	<10	8/9/94	625&8270
Isophorone	<10	µg/L	10	<10	8/9/94	625&8270
N-Nitrosodi-n-propylamine	<10	µg/L	10	<10	8/9/94	625&8270
n-Nitrosodiphenylamine	<10	µg/L	10	<10	8/9/94	625&8270
Naphthalene	<10	µg/L	10	<10	8/9/94	625&8270
Nitrobenzene	<10	µg/L	10	<10	8/9/94	625&8270
Pentachlorophenol	<50	µg/L	50	<50	8/9/94	625&8270
Phenanthrene	<10	µg/L	10	<10	8/9/94	625&8270
Phenol	<10	µg/L	10	<10	8/9/94	625&8270
Pyrene	<10	µg/L	10	<10	8/9/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Organics (GC & LC)

Report #: 50098

Sample Name: BS 004 P2

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8080/PCB	—				8/3/94	
4,4'-DDD	<0.02	µg/L	0.02	<0.02	8/3/94	8080
4,4'-DDE	<0.02	µg/L	0.02	<0.02	8/3/94	8080
4,4'-DDT	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Aldrin	<0.02	µg/L	0.02	<0.02	8/3/94	8080
alpha-BHC	<0.02	µg/L	0.02	<0.02	8/3/94	8080
alpha-Chlordane	<0.05	µg/L	0.05	<0.05	8/3/94	8080
beta-BHC	<0.02	µg/L	0.02	<0.02	8/3/94	8080
beta-Chlordane	<0.05	µg/L	0.05	<0.05	8/3/94	8080
delta-BHC	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Dieldrin	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Endosulfan I	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Endosulfan II	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Endosulfan sulfate	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Endrin	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Endrin aldehyde	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Heptachlor	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Heptachlor epoxide	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Lindane	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Methoxychlor	<0.2	µg/L	0.2	<0.2	8/3/94	8080
PCB, total	<0.2	µg/L	0.2	<0.2	8/3/94	8080
Toxaphene	<0.5	µg/L	0.5	<0.5	8/3/94	8080

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

QUALITY ASSURANCE

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 50097

Project Description: Seattle 1315-127 / Bellingham 1315-131
Sample Name: BS 005 P2
Date/Time Taken: 7/21/94

Matrix: Water
Date/Time Received: 7/22/94 1:50:00

Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]
TPH by GC (as diesel)	15.3	94.5
Antimony/GFAA	6.6	111.8
Arsenic/GFAA	2.5	86
Beryllium/ICP	0.8	95.5
Cadmium/GFAA	2.1	88.2
Chromium/GFAA	6.3	131.9
Copper/ICP	0.4	101.2
Lead/GFAA	3.8	69.3
Mercury/CVAA	2.5	98.8
Nickel/ICP	0.2	88.8
Selenium/GFAA	2.1	79.8
Silver/GFAA	1.7	60.3
Thallium/GFAA	0.5	121.4
Zinc/ICP	0.3	88.4
4,4'-DDD	2.2	52.1
4,4'-DDE	1.5	52.2
4,4'-DDT	1.3	56.4
Aldrin	7.5	56.7
alpha-BHC	7.1	53.1
alpha-Chlordane	1.4	56.4
beta-BHC	5.6	58.9
beta-Chlordane	1.6	57.7
delta-BHC	5.7	58.7
Dieldrin	1.7	52.9
Endosulfan I	2.8	56.4
Endosulfan II	0.6	51.5
Endosulfan sulfate	5.5	48.4
Endrin	0.3	56.3
Endrin aldehyde	3	64.2
Heptachlor	7.5	58.8
Heptachlor epoxide	4.3	55.8
Lindane	7	51.8
Methoxychlor	2	59.4
PCB, total	4.6	55.2

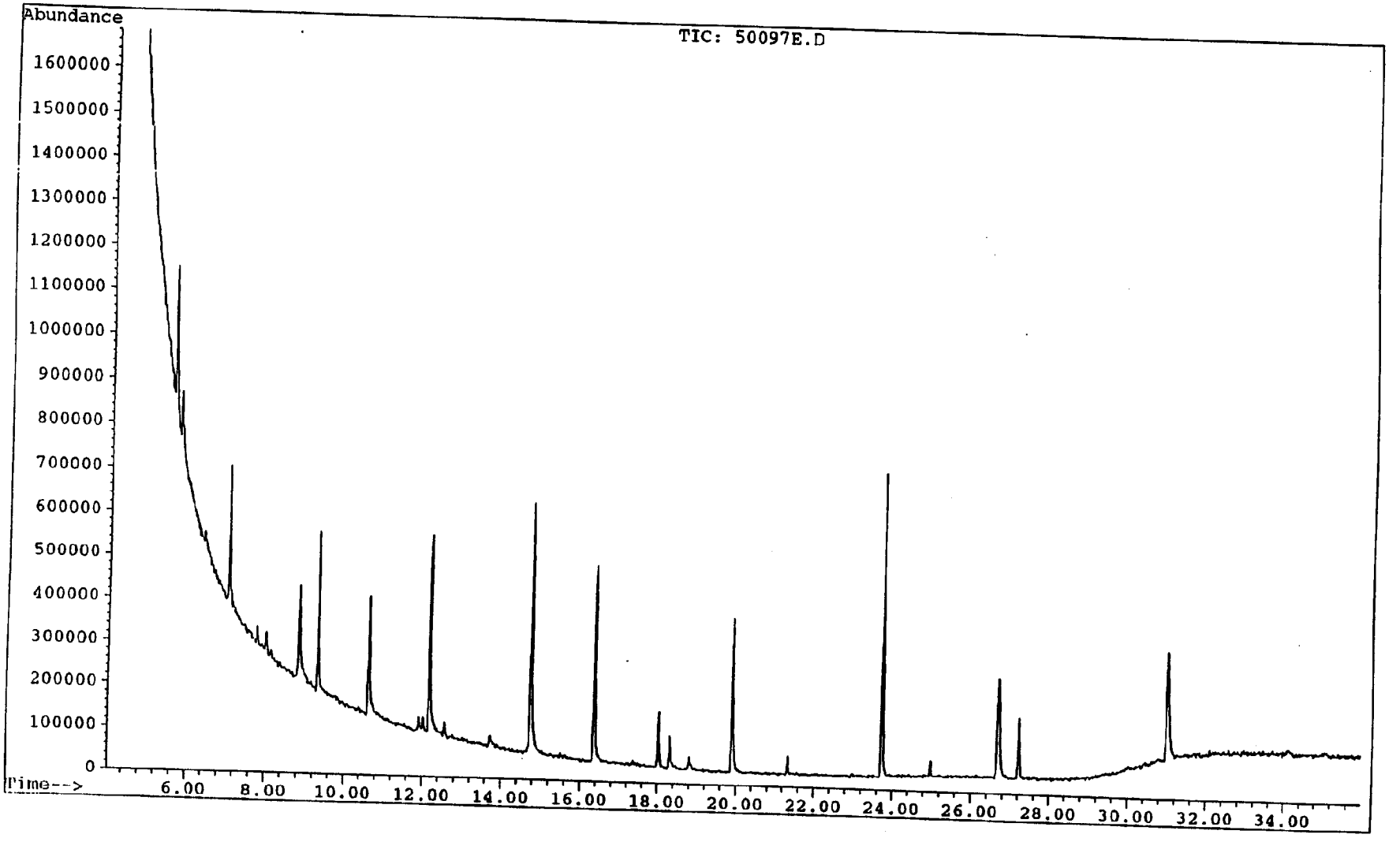
Toxaphene	1.6	62.8

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	624&8260	101
4-Bromofluorobenzene(surr)	624&8260	96
Toluene-d8(surr)	624&8260	98
2,4,6-Tribromophenol	625&8270	45.5
2-Fluorobiphenyl	625&8270	56.3
2-Fluorophenol	625&8270	44.2
Nitrobenzene-d5	625&8270	49.5
Phenol-d5	625&8270	52.3
Terphenyl-d14	625&8270	80.9
2,4,5,6-Tetrachloro-m-xylene	8080	52.9
Dibutyl Chlorendate	8080	127.4
p-Terphenyl	8015 mod.	71.8

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

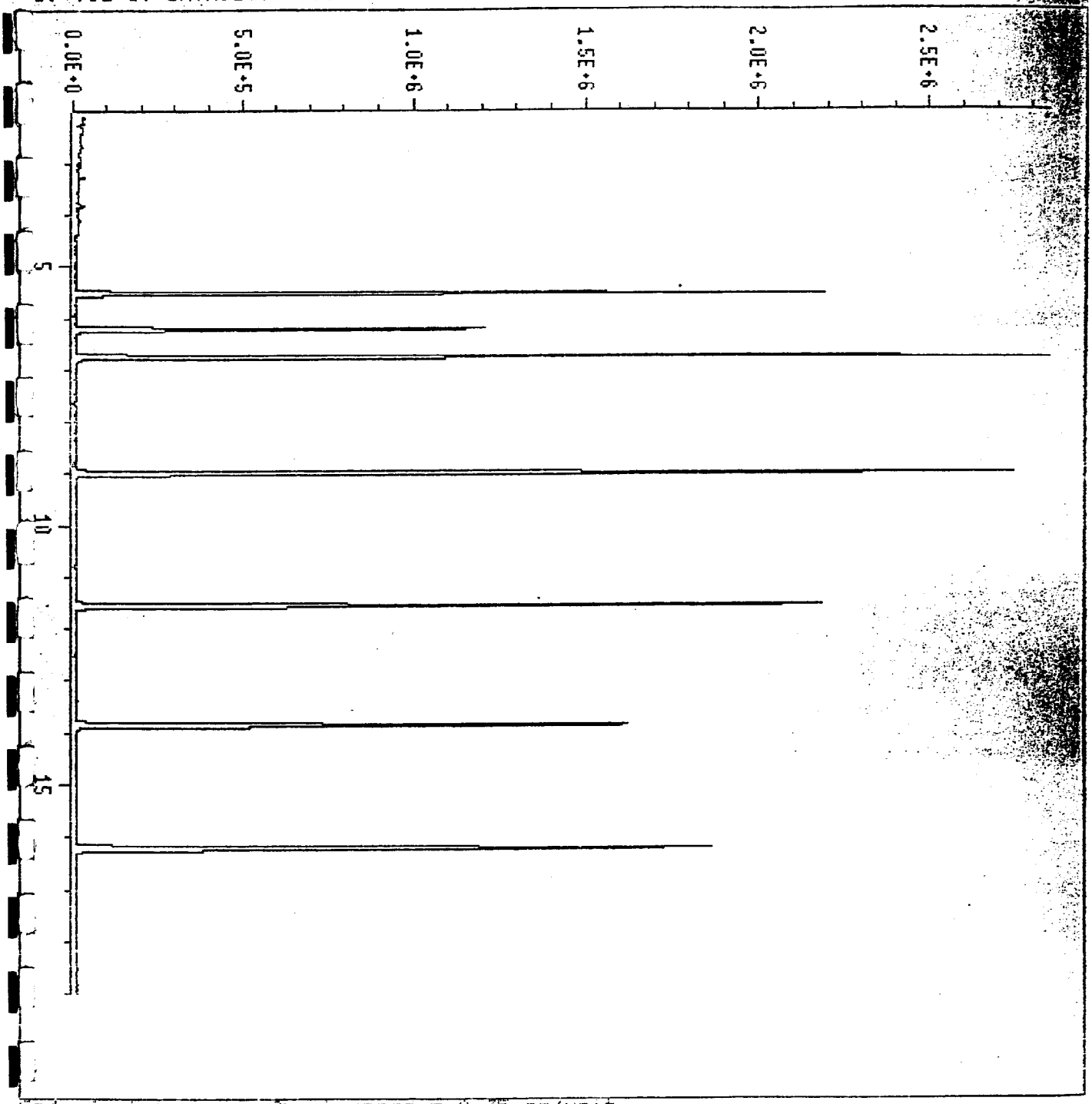
File : D:\4221FOPT\50097E.D
Operator : TR
Acquired : 9 Aug 94 3:49 pm using AcqMethod OPTECH.M
Instrument : 5971 - GC
Sample Name: SMPL1
Misc Info : W1
Vial Number: 5



KCSlip4 38863

SEA405393

1: TIC of DATA:50097V.D

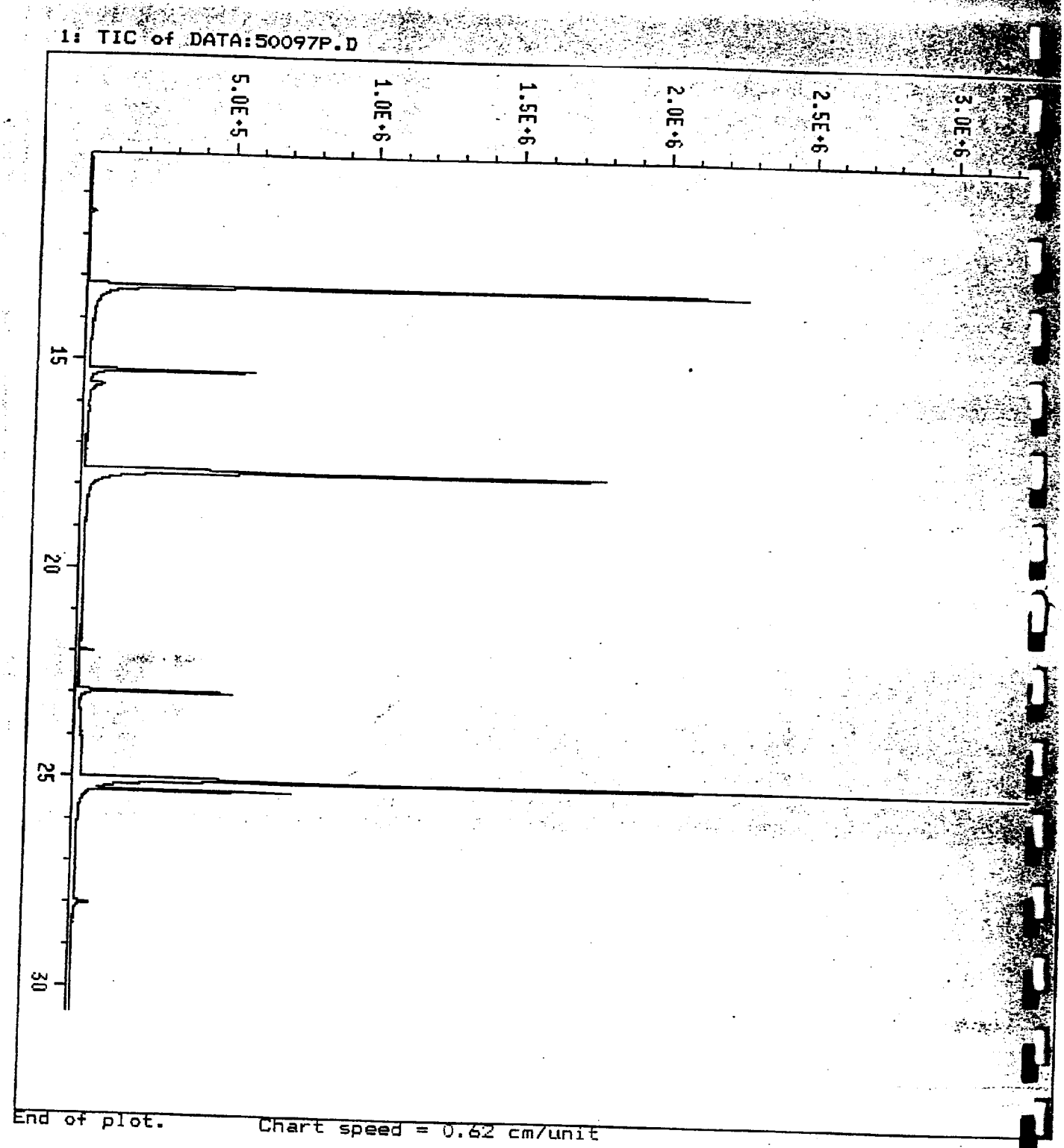


End of plot. Chart speed = 0.75 cm/unit

CHROMATOGRAM OF VOLATILE FRACTION FROM SAMPLE 50097V

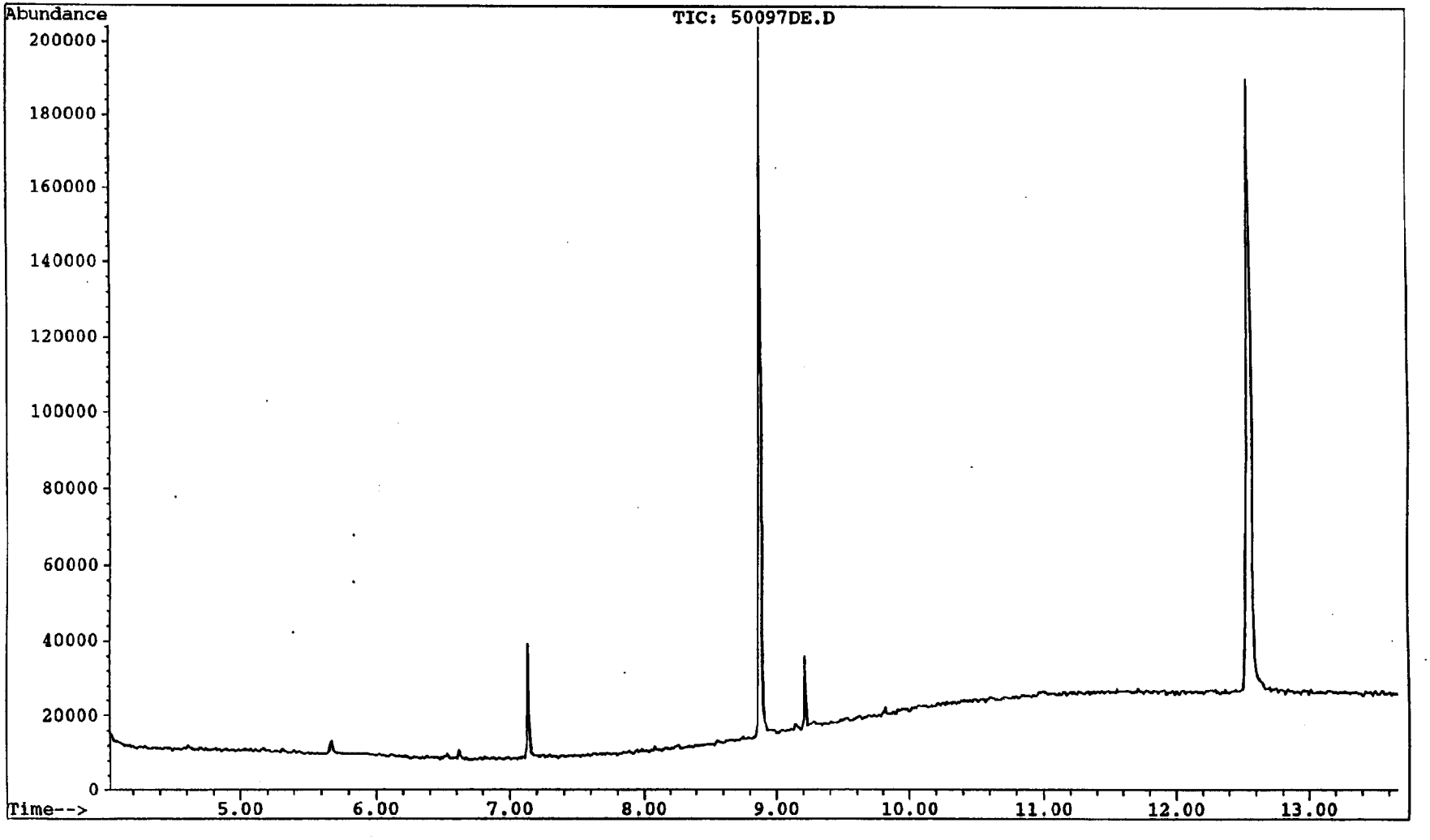
KCSlip4 38864

SEA405394



CHROMATOGRAM OF SAMPLE 50097P

File : D:\4224FORM\50097DE.D
Operator : TR
Acquired : 12 Aug 94 12:49 pm using AcqMethod TPHDEL.M
Instrument : 5971 - GC
Sample Name:
Misc Info :
Vial Number: 14



KCSlip4 38866

SEA405396

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 50098

Project Description: Seattle 1315-127 / Bellingham 1315-131
Sample Name: BS 004 P2
Date/Time Taken: 7/21/94

Matrix: Water
Date/Time Received: 7/22/94 1:50:00

Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]
TPH by GC (as diesel)	15.3	94.5
Antimony/GFAA	6.6	111.8
Arsenic/GFAA	3.5	105.8
Beryllium/ICP	0.8	95.5
Cadmium/GFAA	2.1	88.2
Chromium/GFAA	6.3	131.9
Copper/ICP	0.4	96.8
Lead/GFAA	10.9	108.5
Mercury/CVAA	2.5	98.8
Nickel/ICP	0.2	88.8
Selenium/GFAA	1	94.2
Silver/GFAA	1.7	60.3
Thallium/GFAA	0.5	121.4
Zinc/ICP	0.3	88.4
4,4'-DDD	2.2	52.1
4,4'-DDE	1.5	52.2
4,4'-DDT	1.3	56.4
Aldrin	7.5	56.7
alpha-BHC	7.1	53.1
alpha-Chlordane	1.4	56.4
beta-BHC	5.6	58.9
beta-Chlordane	1.6	57.7
delta-BHC	5.7	58.7
Dieldrin	1.7	52.9
Endosulfan I	2.8	56.4
Endosulfan II	0.6	51.5
Endosulfan sulfate	5.5	48.4
Endrin	0.3	56.3
Endrin aldehyde	3	64.2
Heptachlor	7.5	58.8
Heptachlor epoxide	4.3	55.8
Lindane	7	51.8
Methoxychlor	2	59.4
PCB, total	4.6	55.2

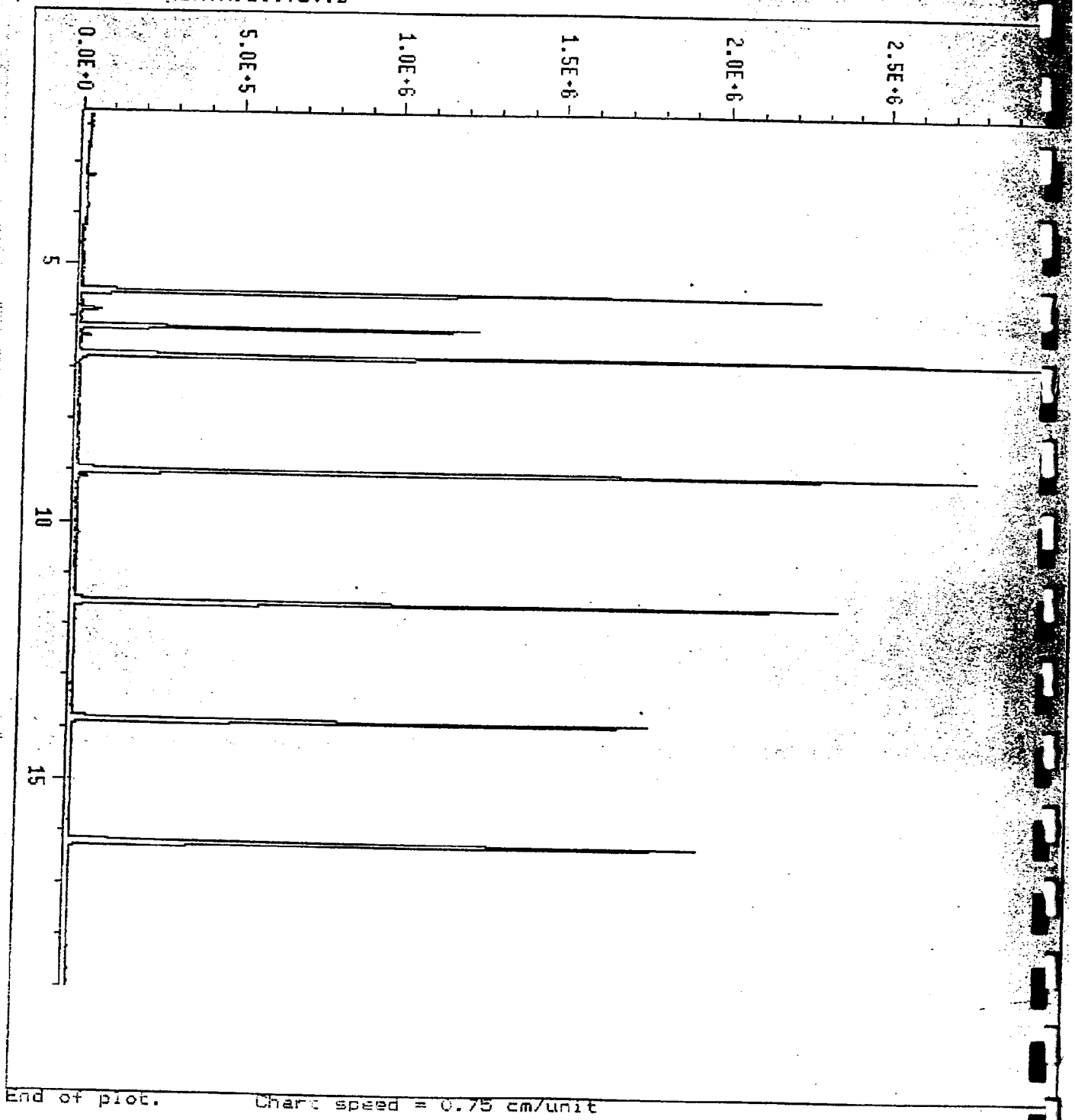
Toxaphene	1.6	62.8

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	624&8260	98
4-Bromofluorobenzene(surr)	624&8260	96
Toluene-d8(surr)	624&8260	98
2,4,6-Tribromophenol	625&8270	12.2
2-Fluorobiphenyl	625&8270	47.8
2-Fluorophenol	625&8270	36.1
Nitrobenzene-d5	625&8270	37.3
Phenol-d5	625&8270	31
Terphenyl-d14	625&8270	79.2
2,4,5,6-Tetrachloro-m-xylene	8080	48.6
Dibutyl Chlorendate	8080	0
p-Terphenyl	8015 mod.	77.7

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

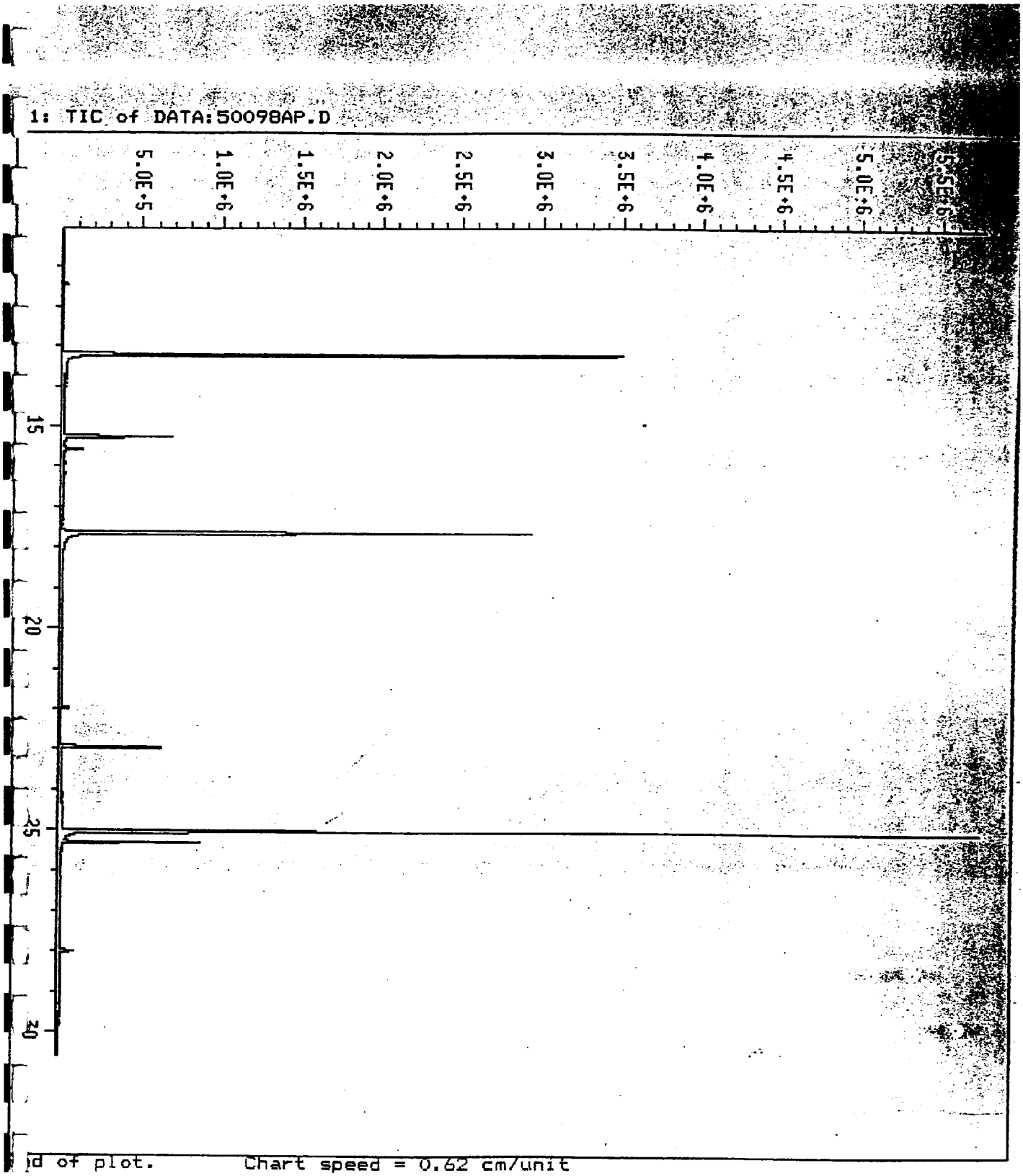
1: TIC of DATA:50098V.D



End of plot. Chart speed = 0.75 cm/unit

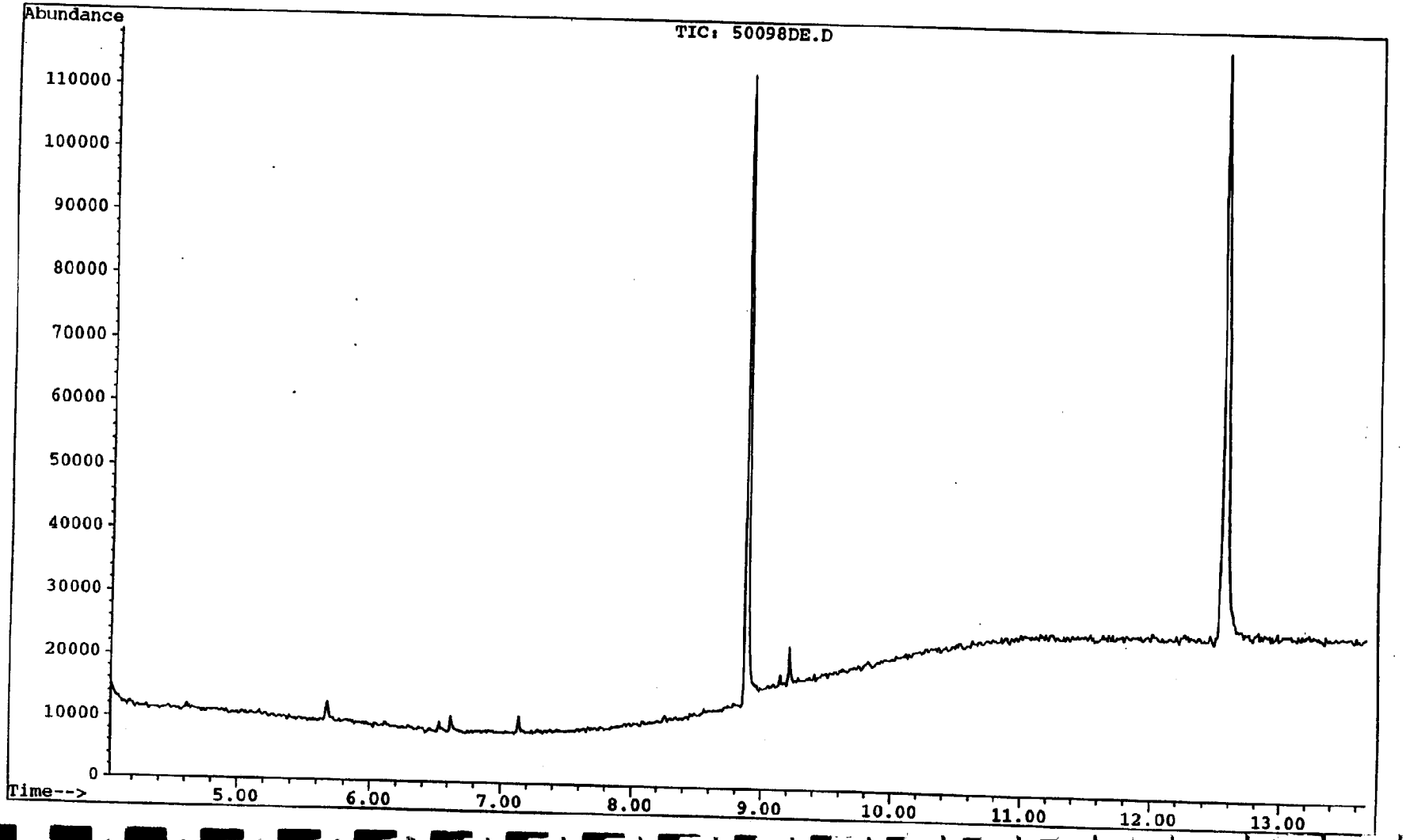
KCSlip4 38869

SEA405399



CHROMATOGRAM OF SAMPLE 50098AP

File : D:\4224FORM\50098DE.D
Operator : TR
Acquired : 12 Aug 94 1:09 pm using AcqMethod TPHDEL.M
Instrument : 5971 - GC
Sample Name:
Misc Info :
Vial Number: 15



KCSlip4 38871

SEA405401

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 50099

Project Description: Seattle 1315-127 / Bellingham 1315-131
Sample Name: BS 002 TB **Matrix:** Water
Date/Time Taken: 7/21/94 **Date/Time Received:** 7/22/94 1:50:00

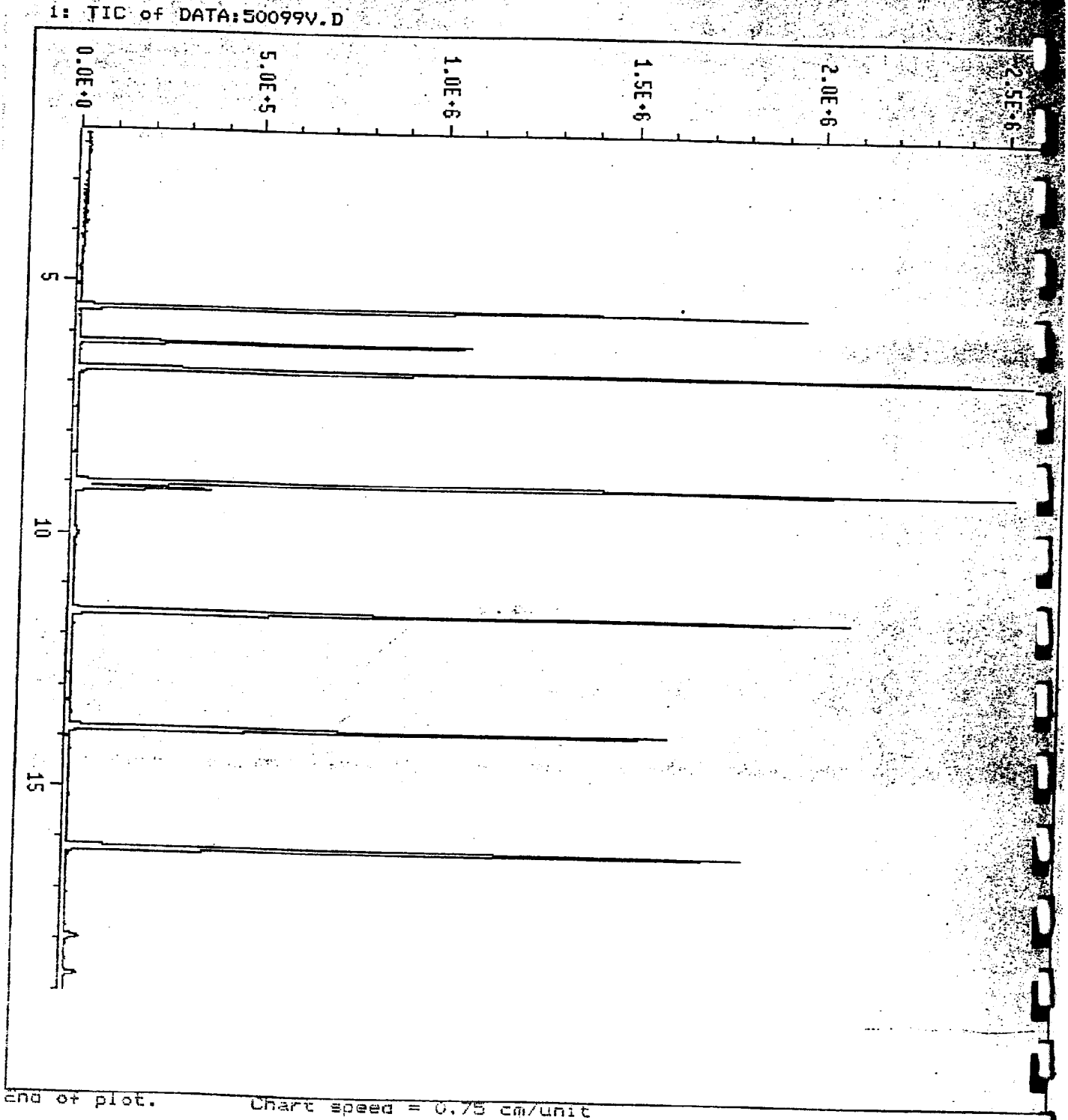
Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	8240	105
4-Bromofluorobenzene(surr)	8240	94
Toluene-d8(surr)	8240	96

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.



end of plot. Chart speed = 0.75 cm/unit

CHROMATOGRAM OF VOLATILE FRACTION FROM SAMPLE 50099V

KCSlip4 38873

SEA405403

AnalySys Inc.
4221 Freidrich Lane, Suite 190, Austin, Texas 78744-1044 ☐ (512) 444-5896 FAX: (512) 447-4766

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 50072
Report Date: 8/22/94

Project Description: Seattle 1315-127 / Paine Field Panel 129
Sample Name: BS-006PZ
Date/Time Taken: 7/20/94 2:22:00 **Date/Time Received:** 7/21/94 2:00:00 **Matrix:** Water

Report of Analysis

see attached

Respectfully submitted,

Hopkins Haden

All method numbers denote USEPA procedures unless otherwise stated.
"Less than" values reflect the nominal detection limit of the method employed.

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Report of Analysis-General Parameters

Report #: 50072

Sample Name: BS-006PZ

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
A/BN Extraction-8080/PCB	—				7/26/94	3520
A/BN Extraction-8270	—				7/26/94	3520
Gross alpha	59 +/- 59	pCi/l			7/22/94	EPA 9310
Gross beta	58 +/- 30	pCi/l			7/22/94	EPA 9310
Metals dig.-Hg	—				7/26/94	7470
Metals dig.-HNO3	—				8/1/94	3015
TPH by GC (as diesel)	<0.25	mg/L	0.25	<0.25	8/12/94	8015 mod.
Antimony/GFAA	<0.003	mg/L	0.003	<0.003	8/3/94	204.2&7041
Arsenic/GFAA	0.027	mg/L	0.001	<0.001	8/3/94	206.2&7060
Beryllium/ICP	0.82	mg/L	0.005	<0.005	8/3/94	6010 & 200.7
Cadmium/GFAA	<0.0006	mg/L	6E-04	<0.0006	8/2/94	213.2&7131
Chromium/GFAA	0.097	mg/L	0.001	<0.001	8/2/94	218.2&7191
Copper/ICP	0.078	mg/L	0.01	<0.01	8/4/94	6010&200.7
Lead/GFAA	0.026	mg/L	0.001	<0.001	8/3/94	239.2&7421
Mercury/CVAA	<0.0002	mg/L	2E-04	<0.0002	7/26/94	245.1&7470
Nickel/ICP	0.06	mg/L	0.01	<0.01	8/3/94	6010 & 200.7
Selenium/GFAA	0.0031	mg/L	0.002	<0.002	8/2/94	270.2&7740
Silver/GFAA	<0.002	mg/L	0.002	<0.002	8/3/94	272.2&7761
Thallium/GFAA	<0.001	mg/L	0.001	<0.001	8/3/94	279.2&7841
Zinc/ICP	<0.05	mg/L	0.05	<0.05	8/3/94	6010 & 200.7

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by GC or GC/MS.

Report of Analysis-Volatile Organics (GC/MS)

Report #: 50072

Sample Name: BS-006PZ

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Volatile organics-8240	—				7/26/94	8240
1,1,1-trichloroethane	<5	µg/L	5	<5	7/26/94	8240
1,1,2,2-tetrachloroethane	<5	µg/L	5	<5	7/26/94	8240
1,1,2-trichloroethane	<5	µg/L	5	<5	7/26/94	8240
1,1-dichloroethane	<5	µg/L	5	<5	7/26/94	8240
1,1-dichloroethene	<5	µg/L	5	<5	7/26/94	8240
1,2-dichlorobenzene	<10	µg/L	10	<10	7/26/94	8240
1,2-dichloroethane	<5	µg/L	5	<5	7/26/94	8240
1,2-dichloropropane	<5	µg/L	5	<5	7/26/94	8240
1,3-dichlorobenzene	<10	µg/L	10	<10	7/26/94	8240
1,4-dichlorobenzene	<10	µg/L	10	<10	7/26/94	8240
2-butanone (MEK)	<100	µg/L	100	<100	7/26/94	8240
2-hexanone	<50	µg/L	50	<50	7/26/94	8240
4-methyl-2-pentanone (MIBK)	<50	µg/L	50	<50	7/26/94	8240
Acetone	<100	µg/L	100	<100	7/26/94	8240
Benzene	<5	µg/L	5	<5	7/26/94	8240
Bromodichloromethane	<5	µg/L	5	<5	7/26/94	8240
Bromoform	<5	µg/L	5	<5.	7/26/94	8240
Bromomethane	<10	µg/L	10	<10	7/26/94	8240
c-1,3-dichloropropene	<5	µg/L	5	<5	7/26/94	8240
Carbon disulfide	<5	µg/L	5	<5	7/26/94	8240
Carbon tetrachloride	<5	µg/L	5	<5	7/26/94	8240
Chlorobenzene	<5	µg/L	5	<5	7/26/94	8240
Chloroethane	<10	µg/L	10	<10	7/26/94	8240
Chloroform	<5	µg/L	5	<5	7/26/94	8240
Chloromethane	<10	µg/L	10	<10	7/26/94	8240
Dibromochloromethane	<5	µg/L	5	<5	7/26/94	8240
Ethylbenzene	<5	µg/L	5	<5	7/26/94	8240
m,p-Xylenes	<5	µg/L	5	<5	7/26/94	8240
Methylene chloride	<5	µg/L	5	<5	7/26/94	8240
o-Xylene	<5	µg/L	5	<5	7/26/94	8240
Styrene	<5	µg/L	5	<5	7/26/94	8240
t-1,2-dichloroethene	<5	µg/L	5	<5	7/26/94	8240
t-1,3-dichloropropene	<5	µg/L	5	<5	7/26/94	8240
Tetrachloroethene	<5	µg/L	5	<5	7/26/94	8240
Toluene	<5	µg/L	5	<5	7/26/94	8240
Trichloroethene	<5	µg/L	5	<5	7/26/94	8240
Vinyl chloride	<10	µg/L	10	<10	7/26/94	8240

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 1

Report #: 50072

Sample Name: BS-006PZ

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8270	—				8/9/94	625&8270
1,2,4-Trichlorobenzene	<10	µg/L	10	<10	8/9/94	625&8270
2,4,5-Trichloropenol	<10	µg/L	10	<10	8/9/94	625&8270
2,4,6-Trichlorophenol	<10	µg/L	10	<10	8/9/94	625&8270
2,4-Dichlorophenol	<10	µg/L	10	<10	8/9/94	625&8270
2,4-Dimethylphenol	<10	µg/L	10	<10	8/9/94	625&8270
2,4-Dinitrophenol	<50	µg/L	50	<50	8/9/94	625&8270
2,4-Dinitrotoluene	<10	µg/L	10	<10	8/9/94	625&8270
2,6-Dinitrotoluene	<10	µg/L	10	<10	8/9/94	625&8270
2-Chloronaphthalene	<10	µg/L	10	<10	8/9/94	625&8270
2-Chlorophenol	<10	µg/L	10	<10	8/9/94	625&8270
2-Methylnaphthalene	<10	µg/L	10	<10	8/9/94	625&8270
2-Methylphenol (o-Cresol)	<10	µg/L	10	<10	8/9/94	625&8270
2-Nitroaniline	<50	µg/L	50	<50	8/9/94	625&8270
2-Nitrophenol	<10	µg/L	10	<10	8/9/94	625&8270
3&4 Methylphenol (m&p-Cresol)	<10	µg/L	10	<10	8/9/94	625&8270
3,3'-Dichlorobenzidine	<20	µg/L	20	<20	8/9/94	625&8270
3-Nitroaniline	<50	µg/L	50	<50	8/9/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 2

Report #: 50072

Sample Name: BS-006PZ

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
4,6-Dinitro-2-methylphenol	<50	µg/L	50	<50	8/9/94	625&8270
4-Bromophenyl phenyl ether	<10	µg/L	10	<10	8/9/94	625&8270
4-Chloro-3-methylphenol(p-Chloro-m-cres	<20	µg/L	20	<20	8/9/94	625&8270
4-Chloroaniline (p-Chloroaniline)	<20	µg/L	20	<20	8/9/94	625&8270
4-Chlorophenyl phenyl ether	<10	µg/L	10	<10	8/9/94	625&8270
4-Nitroaniline	<20	µg/L	20	<20	8/9/94	625&8270
4-Nitrophenol	<50	µg/L	50	<50	8/9/94	625&8270
Acenaphthene	<10	µg/L	10	<10	8/9/94	625&8270
Acenaphthylene	<10	µg/L	10	<10	8/9/94	625&8270
Anthracene	<10	µg/L	10	<10	8/9/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 3

Report #: 50072

Sample Name: BS-006PZ

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Benzoic acid	<50	µg/L	50	<50	8/9/94	625&8270
Benzo[a]anthracene	<10	µg/L	10	<10	8/9/94	625&8270
Benzo[a]pyrene	<10	µg/L	10	<10	8/9/94	625&8270
Benzo[b]fluoranthene	<10	µg/L	10	<10	8/9/94	625&8270
Benzo[g,h,i]perylene	<10	µg/L	10	<10	8/9/94	625&8270
Benzo[j,k]fluoranthene	<10	µg/L	10	<10	8/9/94	625&8270
Benzyl alcohol	<20	µg/L	20	<20	8/9/94	625&8270
bis(2-Chloroethoxy)methane	<10	µg/L	10	<10	8/9/94	625&8270
bis(2-Chloroethyl)ether	<10	µg/L	10	<10	8/9/94	625&8270
bis(2-chloroisopropyl)ether	<10	µg/L	10	<10	8/9/94	625&8270
bis(2-Ethylhexyl)phthalate	<10	µg/L	10	<10	8/9/94	625&8270
Butyl benzyl phthalate	<10	µg/L	10	<10	8/9/94	625&8270
Chrysene	<10	µg/L	10	<10	8/9/94	625&8270
Di-n-butyl phthalate (Dibutyl phthalate	<10	µg/L	10	<10	8/9/94	625&8270
Di-n-octylphthalate (Dioctyl phthalate)	<10	µg/L	10	<10	8/9/94	625&8270
Dibenzofuran	<10	µg/L	10	<10	8/9/94	625&8270
Dibenz[a,h]anthracene	<10	µg/L	10	<10	8/9/94	625&8270
Diethylphthalate	<10	µg/L	10	<10	8/9/94	625&8270
Dimethylphthalate	<10	µg/L	10	<10	8/9/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Extractable Organics (GC/MS)-page 4

Report #: 50072

Sample Name: BS-006PZ

Parameter	Result	Units	MDL/POL(1)	Blank	Date Analyzed	Test Method
Fluoranthene	<10	µg/L	10	<10	8/9/94	625&8270
Fluorene	<10	µg/L	10	<10	8/9/94	625&8270
Hexachlorobenzene	<10	µg/L	10	<10	8/9/94	625&8270
Hexachlorobutadiene	<10	µg/L	10	<10	8/9/94	625&8270
Hexachlorocyclopentadiene	<10	µg/L	10	<10	8/9/94	625&8270
Hexachloroethane	<10	µg/L	10	<10	8/9/94	625&8270
Indeno[1,2,3-cd]pyrene	<10	µg/L	10	<10	8/9/94	625&8270
Isophorone	<10	µg/L	10	<10	8/9/94	625&8270
N-Nitrosodi-n-propylamine	<10	µg/L	10	<10	8/9/94	625&8270
n-Nitrosodiphenylamine	<10	µg/L	10	<10	8/9/94	625&8270
Naphthalene	<10	µg/L	10	<10	8/9/94	625&8270
Nitrobenzene	<10	µg/L	10	<10	8/9/94	625&8270
Pentachlorophenol	<50	µg/L	50	<50	8/9/94	625&8270
Phenanthrene	<10	µg/L	10	<10	8/9/94	625&8270
Phenol	<10	µg/L	10	<10	8/9/94	625&8270
Pyrene	<10	µg/L	10	<10	8/9/94	625&8270

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

Report of Analysis-Organics (GC & LC)

Report #: 50072

Sample Name: BS-006PZ

Parameter	Result	Units	MDL/PQL(1)	Blank	Date Analyzed	Test Method
Extractable organics-8080/PCB	—				8/3/94	
4,4'-DDD	<0.02	µg/L	0.02	<0.02	8/3/94	8080
4,4'-DDE	<0.02	µg/L	0.02	<0.02	8/3/94	8080
4,4'-DDT	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Aldrin	<0.02	µg/L	0.02	<0.02	8/3/94	8080
alpha-BHC	<0.02	µg/L	0.02	<0.02	8/3/94	8080
alpha-Chlordane	<0.05	µg/L	0.05	<0.05	8/3/94	8080
beta-BHC	<0.02	µg/L	0.02	<0.02	8/3/94	8080
beta-Chlordane	<0.05	µg/L	0.05	<0.05	8/3/94	8080
delta-BHC	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Dieldrin	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Endosulfan I	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Endosulfan II	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Endosulfan sulfate	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Endrin	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Endrin aldehyde	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Heptachlor	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Heptachlor epoxide	<0.05	µg/L	0.05	<0.05	8/3/94	8080
Lindane	<0.02	µg/L	0.02	<0.02	8/3/94	8080
Methoxychlor	<0.2	µg/L	0.2	<0.2	8/3/94	8080
PCB, total	<0.2	µg/L	0.2	<0.2	8/3/94	8080
Toxaphene	<0.5	µg/L	0.5	<0.5	8/3/94	8080

1. Method Detection Limit (MDL), principally for inorganics, or Practical Quantitation Limit (PQL), principally for organics by

QUALITY ASSURANCE

Client: OpTech
4100 NW Loop 410 Suite 230
San Antonio, TX 78229
Attn: Matt Alexander (210) 731-0000

Report #: 50072

Project Description: Seattle 1315-127 / Paine Field Panel 129
Sample Name: BS-006PZ
Date/Time Taken: 7/20/94 2:22:00 **Date/Time Received:** 7/21/94 2:00:00 **Matrix:** Water

Q.A. Data Report [1]

Parameter	Precision [2]	Recovery [3]
TPH by GC (as diesel)	15.3	94.5
Antimony/GFAA	6.6	111.8
Arsenic/GFAA	2.5	86
Beryllium/ICP	0.8	95.5
Cadmium/GFAA	2.1	88.2
Chromium/GFAA	6.3	131.9
Copper/ICP	0.4	101.2
Lead/GFAA	3.8	69.3
Mercury/CVAA	2.5	98.8
Nickel/ICP	0.2	88.8
Selenium/GFAA	2.1	79.8
Silver/GFAA	1.7	60.3
Thallium/GFAA	0.5	121.4
Zinc/ICP	0.3	88.4
4,4'-DDD	2.2	52.1
4,4'-DDE	1.5	52.2
4,4'-DDT	1.3	56.4
Aldrin	7.5	56.7
alpha-BHC	7.1	53.1
alpha-Chlordane	1.4	56.4
beta-BHC	5.6	58.9
beta-Chlordane	1.6	57.7
delta-BHC	5.7	58.7
Dieldrin	1.7	52.9
Endosulfan I	2.8	56.4
Endosulfan II	0.6	51.5
Endosulfan sulfate	5.5	48.4
Endrin	0.3	56.3
Endrin aldehyde	3	64.2
Heptachlor	7.5	58.8
Heptachlor epoxide	4.3	55.8
Lindane	7	51.8
Methoxychlor	2	59.4
PCB, total	4.6	55.2

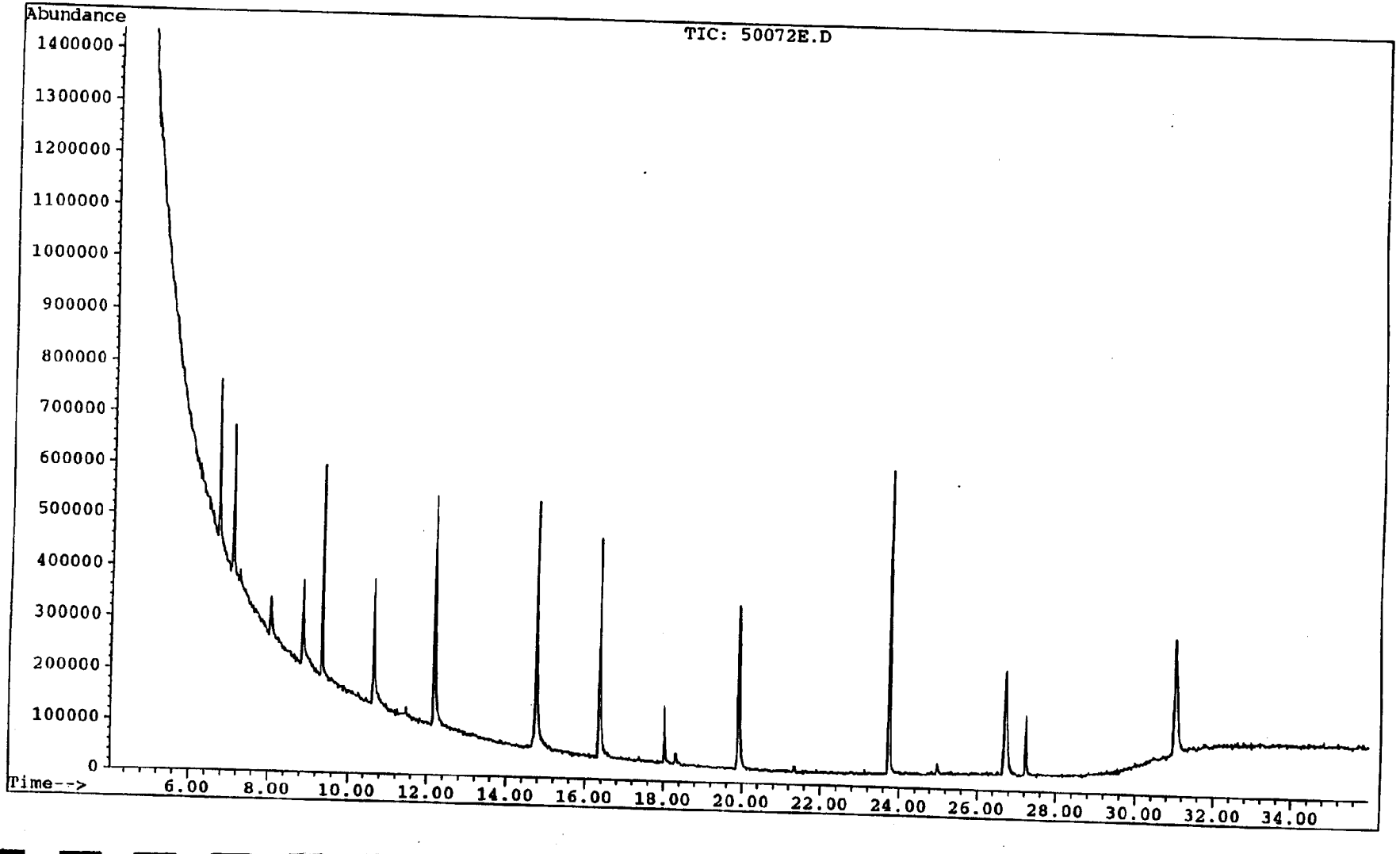
Toxaphene	1.6	62.8

Surrogate Recoveries

Surrogate Compound	Method	Recovery [3]
1,2-Dichloroethane-d2(surr)	8240	108
4-Bromofluorobenzene(surr)	8240	97
Toluene-d8(surr)	8240	95
2,4,6-Tribromophenol	625&8270	17.9
2-Fluorobiphenyl	625&8270	58.7
2-Fluorophenol	625&8270	45.6
Nitrobenzene-d5	625&8270	52.2
Phenol-d5	625&8270	47.9
Terphenyl-d14	625&8270	77.9
2,4,5,6-Tetrachloro-m-xylene	8080	52.6
Dibutyl Chlorendate	8080	0
p-Terphenyl	8015 mod.	146.5

1. QA data reported is for the lot analyzed which included this sample.
2. Precision is the absolute value of the percent difference between duplicate measurements.
3. Recovery is the percent of analyte recovered from spiked samples.

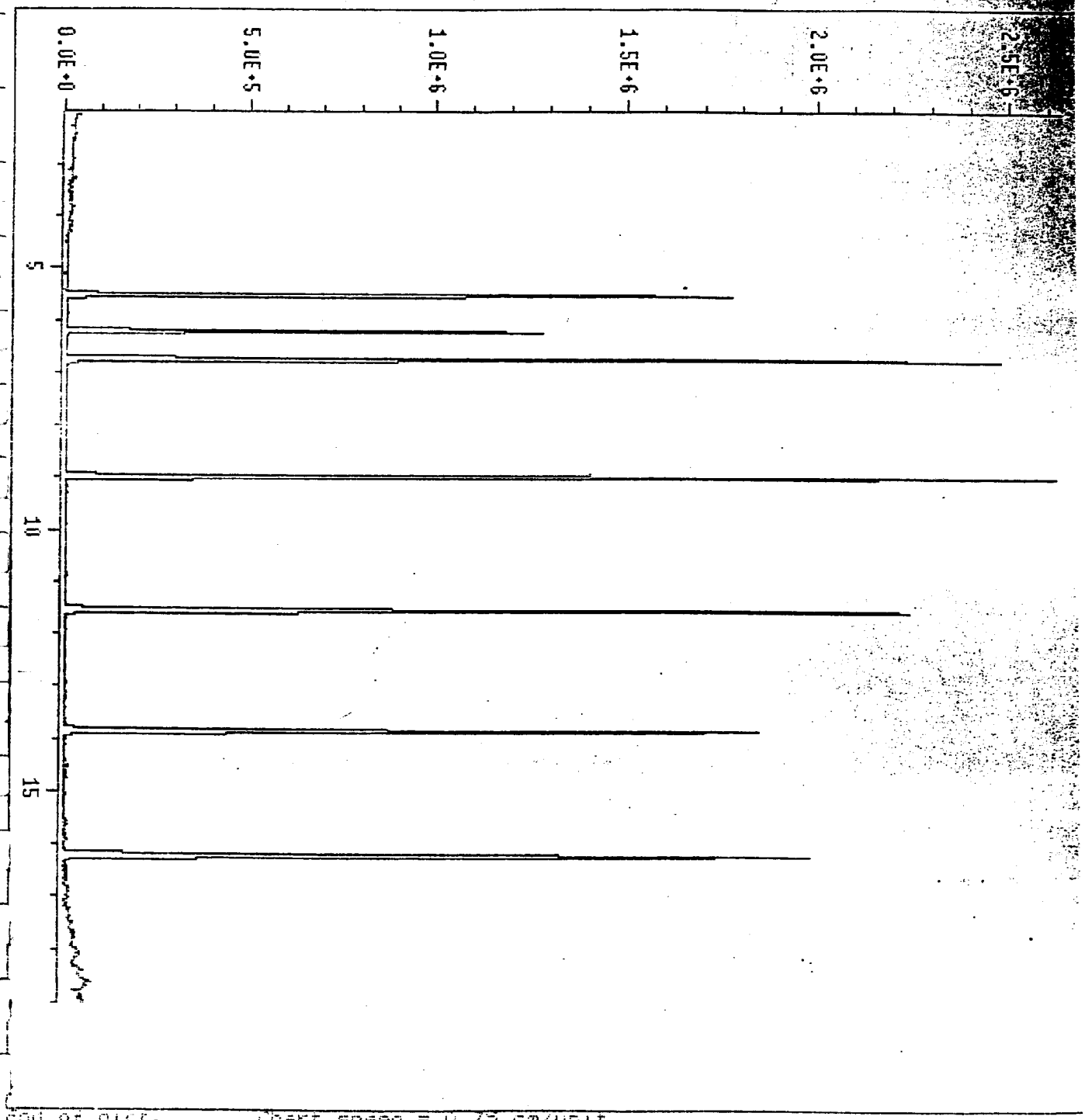
File : D:\4221FOPT\50072E.D
Operator : TR
Acquired : 9 Aug 94 6:10 pm using AcqMethod OPTECH.M
Instrument : 5971 - GC
Sample Name: SMPL4
Misc Info : W1
Vial Number: 8



KCSlip4 38885

SEA405415

1: TIC of DATA:50072V.D

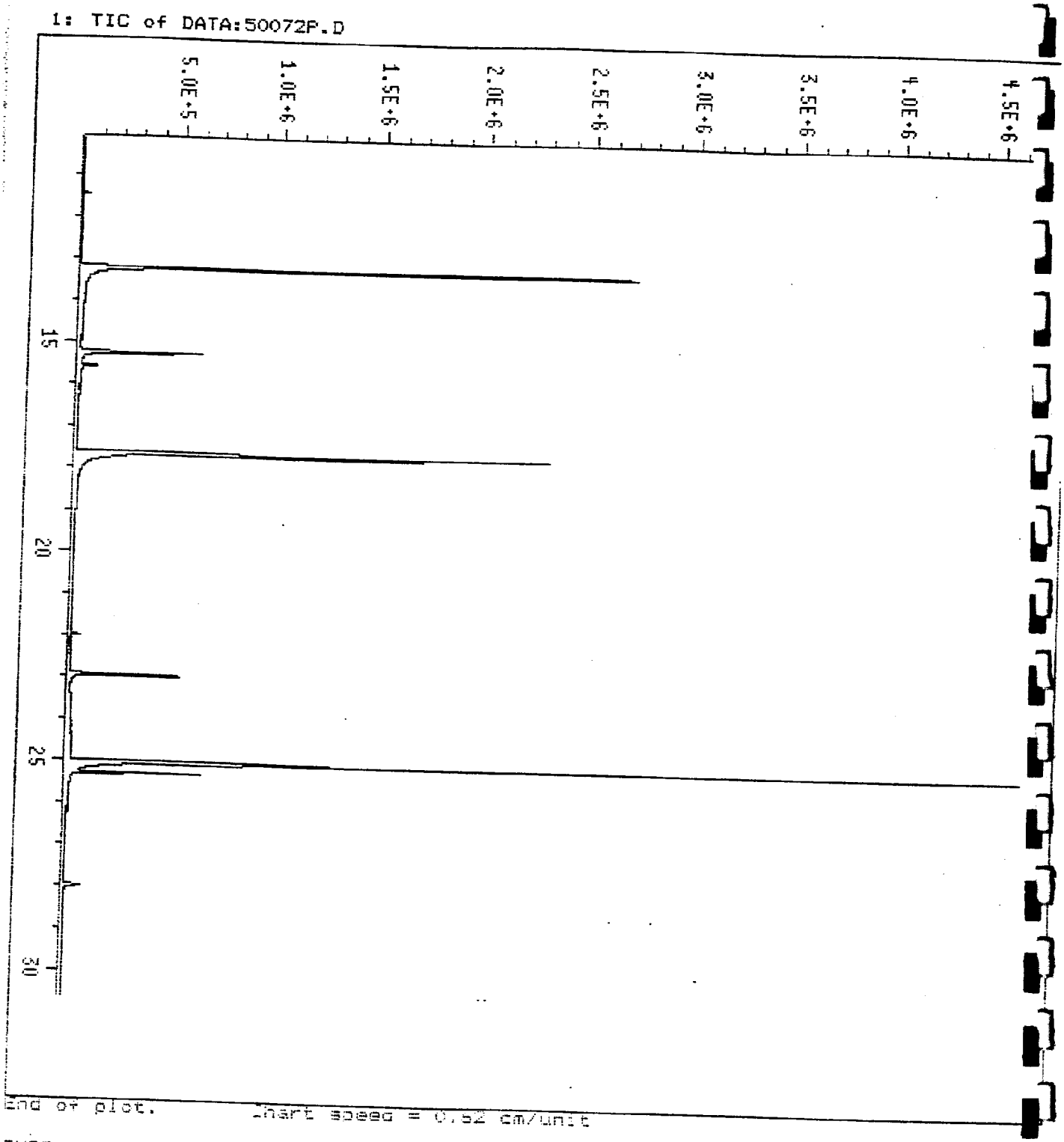


end of plot. Chart speed = 0.73 cm/unit

CHROMATOGRAM OF VOLATILE FRACTION FROM SAMPLE 50072V

KCSlip4 38886

SEA405416



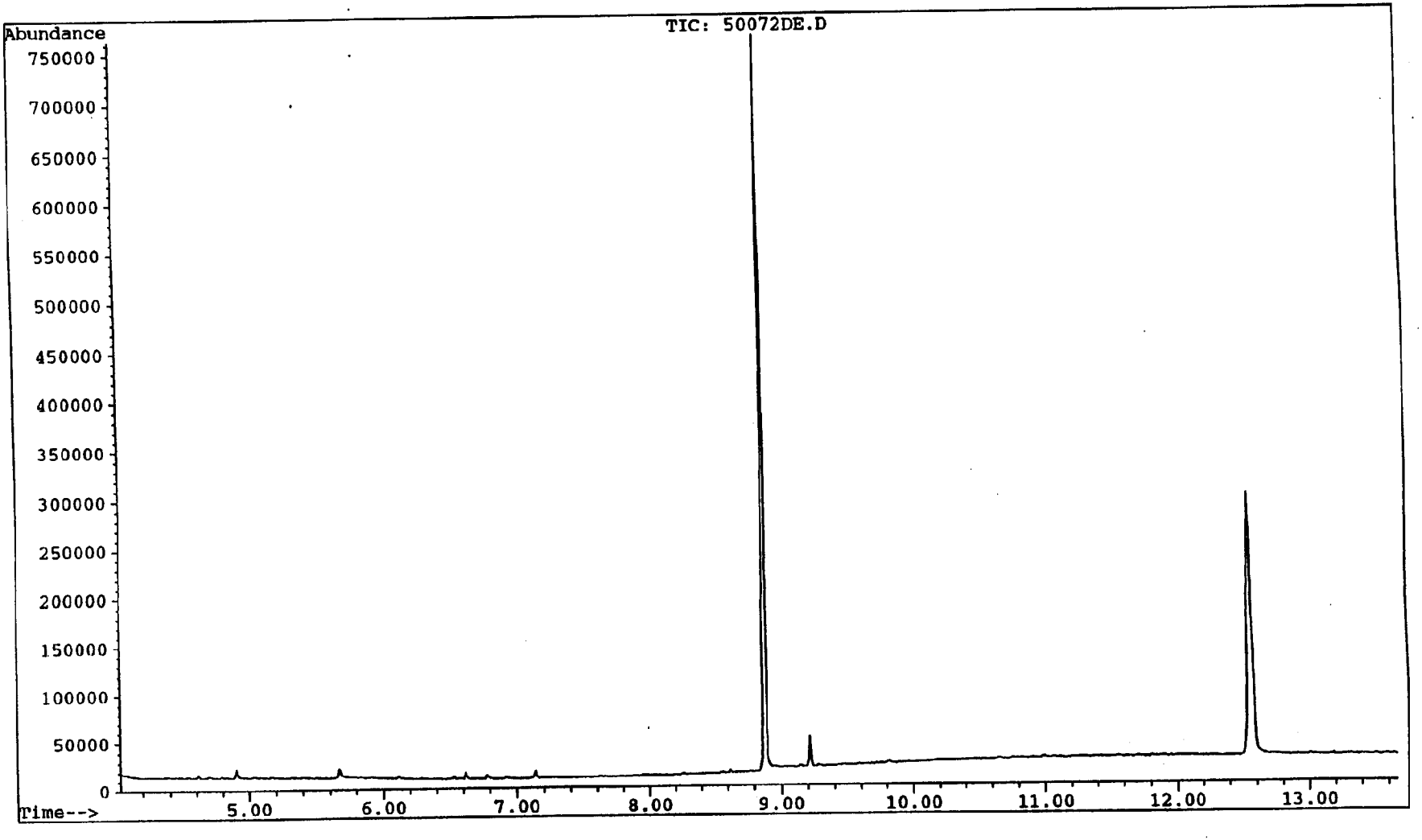
End of plot. Chart speed = 0.52 cm/unit

CHROMATOGRAM OF SAMPLE 50072F

KCSlip4 38887

SEA405417

File : D:\4224FORM\50072DE.D
Operator : TR
Acquired : 12 Aug 94 12:29 pm using AcqMethod TPHDEL.M
Instrument : 5971 - GC
Sample Name:
Misc Info :
Vial Number: 13



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Appendix F

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SEA405420

APPENDIX F

FIELD NOTES AND SURVEY REPORT

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FIELD NOTES

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OpTech

DAILY FIELD REPORT

Project Name: Seattle ANG

Date 7 / 5 / 94 Page 1 of 1

1. Project Number: 1315-125 P.
2. Site Manager: M. Gib
3. Site Telephone Numbers: _____ (Station/Base)
   (206) 745-2555 (Hotel)
   _____ (Cellular)
4. OpTech Team:
   Kathleen Merino Iris Arrodono
5. Work Completed:
   SOV survey - 21 point
6. Deviations From Work Plan:
   Move points 5, 6, 11, 21, due to [illegible]
7. Site Visitors:
   Stephen Purrum, Kent Dixon

KCSlip4 38895

SEA405425

OpTech

DAILY FIELD REPORT

Project Name: Seattle

Date 7 / 14 / 94

Page 1 of 1

1. Project Number: 1315 - 127

2. Site Manager: Giles

3. Site Telephone Numbers: _____ (Station/Base)
(206) 745 - 2555 (Hotel)
_____ (Cellular)

4. OpTech Team:

M. Giles K Merino I Arredondo M Henson

5. Work Completed:

BS-001BH - 10'
BS-002 BH - 10'
BS-003BH - 10'
BS-004PZ - 20'
BS-005PZ - 20'
BS-005PZ - 20

6. Deviations From Work Plan:

None

7. Site Visitors:

M. Greiner, Ruth Lodder

KCSlip4 38896

SEA405426

OpTech

DAILY FIELD REPORT

Project Name: Seattle

Date 7 / 18 / 94 Page 1 of __

1. Project Number: 1315 - 127

2. Site Manager: Giles

3. Site Telephone Numbers: _____ (Station/Base)
(206) 745-2555 (Hotel)
_____ (Cellular)

4. OpTech Team:

Giles Merlo Iris A

5. Work Completed:

Developed BS-006PZ

6. Deviations From Work Plan:

7. Site Visitors:

KCSlip4 38897

SEA405427

OpTech

DAILY FIELD REPORT

Project Name: Seattle

Date 7 / 19 / 94

Page 1 of __

1. Project Number: 1315 - 127
2. Site Manager: Gikes
3. Site Telephone Numbers:
   - ____ (Station/Base)
   - (206) 745-2555 (Hotel)
   - ____ (Cellular)
4. OpTech Team:

   Gikes, Merio, Iris A.

5. Work Completed:

   Developed BS-004PZ and BS-005PZ

6. Deviations From Work Plan:

7. Site Visitors:

   Bill Hidberg (Hazwrap)

KCSlip4 38898

SEA405428

OpTech

DAILY FIELD REPORT

Project Name: Seattle

Date 7 / 20 / 94 **Page** 1 **of** 1

1. **Project Number:** 1315 - 127

2. **Site Manager:** Giles

3. **Site Telephone Numbers:** _____ (Station/Base)
   (206) 745-2550 (Hotel)
   _____ (Cellular)

4. **OpTech Team:**

   Giles Merio

5. **Work Completed:**

   Sampled BS-006 PZ

6. **Deviations From Work Plan:**

7. **Site Visitors:**

   Bill Headberg (Hazwrap) Tim Ingraham (Surveyor)

KCSlip4 38899

SEA405429

OpTech

DAILY FIELD REPORT

Project Name: Seattle

Date 7 / 21 / 94

Page 1 of 1

1. Project Number: 1315 - 127

2. Site Manager: Gikes

3. Site Telephone Numbers:
   - _____ (Station/Base)
   - (206) 745-2555 (Hotel)
   - _____ (Cellular)

4. OpTech Team:

   Gikes, Merio

5. Work Completed:

   Sampled BS-004PZ and BS-005PZ

6. Deviations From Work Plan:

7. Site Visitors:

KCSlip4 38900

SEA405430

[illegible] STAKES FOR CROSS-SECTIONING

[illegible] of any Width. Side Slopes 1½ to 1.

[illegible] below, opposite 7 under "Cut or Fill" and under .3 [illegible] the distance out from the side stake at left. Also, [illegible] under "Cut or Fill" and under .1 read 16.7, the [illegible] from the side stake at right.

[illegible]	[illegible]	.5 [illegible]	.6	.7	.8	.9	Cut or Fill
Cut from Side or Shoulder Stake							
[illegible]	[illegible]	0.8	0.9	1.1	1.2	1.4	0
[illegible]	[illegible]	2.3	2.4	2.6	2.7	2.9	1
[illegible]	[illegible]	3.8	3.9	4.1	4.2	4.4	2
[illegible]	[illegible]	5.3	5.4	5.6	5.7	5.9	3
[illegible]	[illegible]	6.8	6.9	7.1	7.2	7.4	4
[illegible]	[illegible]	8.3	8.4	8.6	8.7	8.9	5
[illegible]	[illegible]	9.8	9.9	10.1	10.2	10.4	6
[illegible]	[illegible]	11.3	11.4	11.6	11.7	11.9	7
[illegible]	[illegible]	12.8	12.9	13.1	13.2	13.4	8
[illegible]	[illegible]	14.3	14.4	14.6	14.7	14.9	9
[illegible]	[illegible]	15.8	15.9	16.1	16.2	16.4	10
[illegible]	[illegible]	17.3	17.4	17.6	17.7	17.9	11
[illegible]	[illegible]	18.8	18.9	19.1	19.2	19.4	12
[illegible]	[illegible]	20.3	20.4	20.6	20.7	20.9	13
[illegible]	[illegible]	21.8	21.9	22.1	22.2	22.4	14
[illegible]	[illegible]	23.3	23.4	23.6	23.7	23.9	15
[illegible]	[illegible]	24.8	24.9	25.1	25.2	25.4	16
[illegible]	[illegible]	26.3	26.4	26.6	26.7	26.9	17
[illegible]	[illegible]	27.8	27.9	28.1	28.2	28.4	18
[illegible]	[illegible]	29.3	29.4	29.6	29.7	29.9	19
[illegible]	[illegible]	30.8	30.9	31.1	31.2	31.4	20
[illegible]	[illegible]	32.3	32.4	32.6	32.7	32.9	21
[illegible]	[illegible]	33.8	33.9	34.1	34.2	34.4	22
[illegible]	[illegible]	35.3	35.4	35.6	35.7	35.9	23
[illegible]	[illegible]	36.8	36.9	37.1	37.2	37.4	24
[illegible]	[illegible]	38.3	38.4	38.6	38.7	38.9	25
[illegible]	[illegible]	39.8	39.9	40.1	40.2	40.4	26
[illegible]	[illegible]	41.3	41.4	41.6	41.7	41.9	27
[illegible]	[illegible]	42.8	42.9	43.1	43.2	43.4	28
[illegible]	[illegible]	44.3	44.4	44.6	44.7	44.9	29
[illegible]	[illegible]	45.8	45.9	46.1	46.2	46.4	30
[illegible]	[illegible]	47.3	47.4	47.6	47.7	47.9	31
[illegible]	[illegible]	48.8	48.9	49.1	49.2	49.4	32
[illegible]	[illegible]	50.3	50.4	50.6	50.7	50.9	33
[illegible]	[illegible]	51.8	51.9	52.1	52.2	52.4	34
[illegible]	[illegible]	53.3	53.4	53.6	53.7	53.9	35
[illegible]	[illegible]	54.8	54.9	55.1	55.2	55.4	36
[illegible]	[illegible]	56.3	56.4	56.6	56.7	56.9	37
[illegible]	[illegible]	57.8	57.9	58.1	58.2	58.4	38
[illegible]	[illegible]	59.3	59.4	59.6	59.7	59.9	39
[illegible]	[illegible]	60.8	60.9	61.1	61.2	61.4	40

"Rite in the Rain"
ALL-WEATHER WRITING PAPER

Name Matt Alexander

Address Cavanaughs RIVER INN

Phone

Project SPOKANE 4 4 LAKES
6/1/94 to

"Rite In the Rain"—a unique all-weather writing surface created to shed water and to enhance the written image. Makes it possible to write sharp, legible field data in any kind of weather.

a product of

J. L. DARLING CORPORATION
TACOMA, WA 98421-3696 USA

KCSlip4 38901

SEA405431

(38) Now long GPR runs (175')

H3: 0 - 175'
H4: 0 - 175'
H5: 0 - 175' outside fence

Two add'l horizontal lines (short) made to identify waste oil tank @ OWS.

HORZ 6: 25-50' ~~[illegible]~~
@ 15 North of H4
H 7: 25-50'
@ 20 North of H4

1615 Tank very well defined by these two H6 + H7.

There are a number of lines running through the AOC as shown by GPR. I will quickly look over data to ~~[illegible]~~ locations on map shown of geophysical

Leave site @ 1700 hrs.

6/9/94

(39)

6/10/94 SEATTLE ANGS

Arrive 0730 and see G Sprague. They have cleared all of site from trucks and misc. other material. G Sprague will get up ramps to go over curbs with GPR & truck.

0800 Start unload equipment and set up grid. Grid interval is 15'

0940 Grid is complete. There are 10 intervals or 11 lines going N-S and there are 11 intervals, 12 lines going E-W. the 10, 11, + 12 lines get off E edge run into diagonal fence before reaching N boundary.

Will run GPR first + MAG 2nd. MAG lines will be W to east, Start 0,0 @ NW corner

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SEA405432

1015

GPR setting up & doing test runs

GPR – 300 MHz antenna
pulse width = 3 ns

Soil material -- sand and silt, probably saturated at shallow depths
Use saturated silt, because water table is shallow

$S_2 = 6$

Target depth of 10 feet

∴ Range = 6·10·1.5 = 90 ns

Cycles/scan = 90/3 = 30

∴ HPF < 15 → use 10
LPF > 30 → use 50

Lines/hr = 100
Scans/sec = 16

Met Sgt. McRae of veh. Maint. discussed truck parking

Start @ 1030 hrs

HORIZONTAL LINES
H0: 0 to 120'
H1: 0 to 120'
H2: 0 to 135'
H3: 0 to 135'
H4: 0 to 135'
H5: 0 to 135'
H6: 0 to 150'
H7: 0 to 150'
H8: 0 to 150'
H9: 0 to 165'
1130 H10: 0 to 165' one direction complete

1150
~~1130~~ VERTICAL LINES
V0: 0 to 150'
V1: 0 to 150'
V2: 0 to 150'
V3: 0 to 150'
V4: 0 to 150'
V5: 0 to 150'
V6: 0 to 150'
V7: 0 to 150'
V8: 0 to 150'
V9: 30 to 150'
V10: 90 to 150'
V11: 135 to 150'

Completed @ 1246

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Left for Lunch @ 1300 hrs and back @ 1330. Start setup for magnetometer

Rodeen setup MAG while I called OTC.

Start MAG @ 1400 hrs.

MAG lines are HORIZ. lines running E-W.
Pt. 0,0 is in NW corner

Each line has 12 data/line, 11 lines → 132 Stations and thus 264 total readings

Ghost data in NE corner

Run lines ALTERNATE DIRECTION

Line code – ~~035, 125, 225 ...~~
~~925, 025~~ ... mA
015, 115, 215, ... 915, 015

START 1400 hrs

LINE 0: pts 9, 10, & 11 taken @ 0,8
LINE 1: pts 11, 10, & 9 taken @ 1,8
LINE 2: pt 2,5 near GND & light pole
pt 2,6 near L pole & water spigot
pts 10 & 11 taken @ 2,9
LINE 3: pts 11 & 10 taken @ 3,9
LINE 4: pts 10 & 11 taken @ 4,9
LINE 5: pts. 11 & 10 taken @ 5,9
LINE 6: pt #11 taken @ 6,10
LINE 7: pt #11 taken @ 7,10
beeps on numerous pts on line 7 when no known metal visible --- could it be an E line between two light poles?
Light pole @ pt 7,0
LINE 8: pt #11 taken @ 8,10
LINE 9: complete set
LINE 10: complete set

FINISH 1500 hrs.
AM data downloaded OK @ 1520 hrs.
1530 – look over GPR data
Talked briefly w/ Gordon Sprague --- he will send me a copy of as-built drawing showing how Electrical conn to 3 light poles in BS AOC

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(44)

1545 Leave Station --- will have to look closer @ GPR later

Also today @ the Station, we met Sgt. Jim Munster (met him briefly during kickoff, as well as Sgt. McRae of Vehicle Maint.

They described the situation to us about truck parking @ ES AOC @ Seattle. They moved all of the trucks from the parking area for our use. Apparently (I don't understand), it is a big effort for them to move all of these trucks. They are not going to move them back before we come back for rest of field work. -- it is not worth it to them when we will be back in 4-6 weeks. They say they are busy now preparing for inspections.

Someone also asked (and Steve Purvine reiterated yesterday (on 6/9)) that Seattle ANGS would like to know whether part of AOC area could be yielded back to their use based on geophysical results.

I showed them that SAV would be over the whole area also, and so this was not possible. They seemed OK with that answer.

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[illegible] CONVERSIONS

MULTIPLY	TO FIND
[illegible]	centimeters
[illegible]	centimeters
[illegible]	meters
[illegible]	kilometers
[illegible]	inches
[illegible]	inches
[illegible]	feet
[illegible]	yards
[illegible]	miles
[illegible]	grams
0.0353	kilograms
0.035	ounces
[illegible]	pounds
[illegible]	milliliters
[illegible]	liters
[illegible]	liters
[illegible]	liters
[illegible]	fluid ounces
[illegible]	quarts
[illegible]	gallons (U.S.)
[illegible]	
[illegible]	

Decimal of foot	Millimeters
.0062	1.5875
.0104	3.1750
.0156	4.7625
.0208	6.3500
.0260	7.9350
.0312	9.5250
.0417	12.700
.0521	15.875
.0625	19.050
.0729	22.225
.0833	25.400
.1667	50.800
.2500	76.200
.3333	101.60
.4167	127.00
.5000	152.40
.5833	177.80
.6667	203.20
.7500	228.60
.8333	254.00
.9167	279.40
1.0000	304.80

A. Kathleen Merino
Operational Technologies
4100 N.W. Loop 410, Suite 230
San Antonio, TX 78229-4253
(210) 731-0000 1-800-677-8012
Fax (210) 731-0008

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5 July 94

Soil Gas Survey Seattle ANG

TEG soil gas contractor

Sherry Chillcutt
Brad
Karin
Kevin

Site: Burial Site AOC

21 points taken, each at 5'.

The following points where move to avoid potential subsurface hazards:

BS-5' ~10 feet
BS-6 ~5 feet
BS-11 ~2 feet
BS-21 ~5 feet

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SEA405437

SAMPLE GRID

FENCE LINE

BS-1 BS-2 BS-3 BS-4

BS-5

BS-8 BS-7 BS-6

BS-9 BS-10 BS-11 BS-12

BS-16 BS-15 BS-14 BS-13

BS-17 BS-18 BS-19 BS-20 BS-21

Using Mod. EPA 8021 (BTEX)
Mod. EPA 8015 (TVH

Results:

All results for Benezene, Eth Benzene & Xylene were non-detects (nd)

	TVH (ppmv)	Tolaene (ppmv)	Dup TVH
BS-1	5	nd	
BS-2	6	nd	
BS-3	4	nd	
BS-4	3	nd	
BS-5	2	.06	
BS-6	3	nd	
BS-7	1	nd	
BS-8	2	nd	
BS-9	2	nd	
BS-10	3	nd	2
BS-11	2	nd	
BS-12	3	nd	
BS-13	1	nd	
BS-14	1	nd	
BS-15	1	nd	2
BS-16	1	nd	
BS-17	4	nd	
BS-18	1	nd	
BS-19	4	nd	
BS-20	2	nd	
BS-21	1	nd	2
method blank	nd	nd	

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SEA405438

14 July 94

Seattle

0715 Arrive at Seattle

0730 Drillers Arrive, walk site w/ Drillers

0755 Begin Drilling

BS 001 BH P=1.5 R=66

0800 1-2½ 14/17/13

Silty sand, unconsolid. AP=7.0
Brown

~~BS 100~~ P=0.0 R=66

0803 2½-4 13/4/5

Clay, dry → moist AP=~~0.0~~ akm 4.7

Brown, firm, but fragile
some red

0806 4-5½ P=1.5 R=70
10/6/7
Sand w/ silt AP=~~0.0~~ akm 7.5
red-brown

0811 5½-7 P=1.9 R=65
11/6/6
Glass pieces, AP=~~0.0~~ akm 6.9
sand, w/ clay

0815 7-8½ P=3.1 R=65
11/8/8
AP=~~[illegible]~~ akm ~~0.5~~ akm 2.2
Sand and some silt
dark brown, moist

0820 8½-10 P=0.1 R=35
4/3/3
sand, w/ some silt AP=7.9
dark brown

TD=10

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SEA405439

BS-002 BH

0840 Begin drilling

1-2½ P=0.0 R=65

11/7/6

Silt w/clay, some sand slightly moist Dark brown

AP = 0.5 akm ~~5.0~~ akm 0.0

0844

5½-7 11/7/9

Sand w/silt Brown Slightly moist P=0.5 R=65

AP= ~~5.2~~ akm 0.0

0850

8½-10 P=0.6 R=40

Sand w/silt dark brown moist 9/3/6

AP=0.0

TD=10

BS 003 BH

Note: At 1' driller hit layer that felt "rubberish"

0934 P=0.1 R=55

~~2-3½~~ Akm

~~2½-4~~ km 8/4/6

2-3½ AP=0.0

2½ upward fill mat. fine grain gravel (~1/2")

Lower sand w/clay, slightly moist Brown

0939 P=0.0 R=66 AP=0.0

5½-7 6/9/10

Fill material red rubber, sand, silt, moist dark brown loose 5.7 lithology Δ clay upper sand lower

0943 P=1.9 R=100 AP=0

8½-10 15/15/17

Red rubber sand, silt & clay moist

TD=10

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SEA405440

1003 Weather Cloudy, cool

1005 Began drilling
BS 006 PZ

015 P= 0.0 R=
3½-5 10/8/8

3½-5 - Sand, unconsolid. AP= 0.0
silt, little clay, Light Brown
dry → slightly moist med size
sand.

1020
8½-10' P= 0.0 R= 70
9/8/6

8.5-9.2 Med-course sand AP= 0.0
Brown stritions. Moist → Wet
Black to dark gray sand
9.2-9.3 Clay w/ sand

9.3-10 Gravel in sand & silt
matrix. Dry → Moist

13½-10 P= 0.0 R= 100
Course → med sand,
wet, black
NO blow count
(drilled out hand)
and Purged)
AP= 0.0

19-20.5 P= 0.0 R= 100
3/5/12
Same as above
w/ interbedded
clay lense
3-6" apart
AP = 0.0

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SEA405441

1035 Began well ~~decon~~ construction

Well Constr. BS-006 PZ

9'-19' screen interval

7'-20.5' filter pack

0'-2' concrete

0'-7' Bentonite.

Begun

1110 Preparing BS005 PZ for drilling

1130 Driller cleaned rig from last hole's heaving sand

1147 P = 0.0 R = 60

3'/5 - 5 13/26/0

Med → course sand AP = 0.0

dry. light brown

Unconsolidated

1150 P = 8.3 R = 50

8'/2 - 10 8/7/5

~~Med~~ same as above, but wet & black

AP = 0.0

1154 P = 0.0 R = 75

13'/2 - 15 2/3/5

Same as above

AP = 0.0

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SEA405442

1205 P=0.0 R=100

19 - 2.05 7/8/9

AP=0.0

Same as above TD 20.5

Well Const.

0-2 concrete

2-7 bentonite

7-20.5 filter pack

9-19 Screen Interval

BS 004 P2 (Background)

1250 Began drilling

1300 3½-5 P=0.0 R=80

9/7/6

Med-course sand w/ silt. Light brown some red staining. Dry AP=0.0

1311 P=0.0 R=100

8½-10 6/4/3

same as above, but wet AP=0.0

1315 P=0.0 R=100

13½-15 2/2/8

Same as above AP=0.0

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SEA405443

1323 P = 0.0 R = ∞

19-20.5 2/6/15

AP = 0.0

19.0[illegible].am

19-20 same as above

20-20.5 sand, course grained
well sorted. WET

Well Const. Info

0-2 Concrete

2-7 Bentonite

7-20.5 Filter Pack

9-19 Screen

3- Empty 55-gl drums
10- Full 55 gal drums

1645 Took GC to Fed EX

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SEA405444

7/19/94

0645 BS-006PZ

TD = 19.24

∇ = 9.8

0645 Calibrated pH meter

0700 Start develop

0706	2gal	60.1	305	7.49
0716	4gal	58.8	294	6.8
0723	6gal	58.6	305	6.53
0730	8gal	58.4	312	6.42
0740	10gal	58.4	321	6.38
0744	12gal	58.5	322	6.37
0755	14gal	58.4	326	6.35
0804	16gal	58.5	328	6.33

0830 Surveyors

0840 ~~BB~~/BS-004PZ

Depth to water = 9.4'

TD = 18.90

0849	2gals	65.3°	247	6.88
0854	4gals	64.0	252	6.44
0859	6gal	62.8	237	6.37
0904	8gal	61.3	224	6.43
0909	10gal	61.0	229	6.48
0916	12gals	60.4	221	6.30
0921	14gals	60.0	227	6.28

∇ 9.43

0945 take # and record drawing

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SEA405445

ST-004PZ

1057	2gls	65.8	523	7.74
1106	4gls	61.2	520	7.19
1116	6gls	60.5	531	7.06
1125	8gls	61.6	540	7.14
1135	10gls	59.8	529	6.99

1145 Sample ST-004PZ

1230 Lunar Pain Field

1336 Arrive @ Seattle

BS-006PZ ∇ = 9.77

1348	2gal	68.7	422	8.38
1356	4gal	64.4	439	7.35
1402	6gal	65.3	398	7.00

1408	8gal	66°F	412	6.83
1414	10gal	64.7°F	407	6.74

~~1442~~
1422 Sample BS-006PZ

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SEA405446

21 July 94

BS 004 P2

Depth to water = 9.42' BLS

0706 Started bailing

	Vol	Temp°F	Cond	pH
0713	2gls	63.8	272	6.85
0721	4gls	62.0	254	6.67
0729	6gls	60.7	232	6.21
0737	8gls	60.5	231	6.19

BS 005 P2

0810 Started Bailing

Depth to water = 9.81' BLS

Depth to water for BS006 P2 = 9.78' BLS

	Vol	Temp°F	Cond	pH
0817	2gls	65.7	330	6.22
0824	4gls	60.9	328	6.09
0831	6gls	60.5	325	6.08

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SEA405447

July ~~15~~ 14, 1994

0645 Leave hotel.

0715 Arrive @ Seattle, calibrate

0730 Drillers arrive, walk site w/ drillers

0755 Set up over BS-001BH, KM will collect drilling data.

0820 TD @ 10'

0840 Set up over BS-002BH

0850 TD @ 10'

0930 Set up over BS-003BH

0945 TD @ 10'

1006 Set up over BS-006PZ

1030 TD = 20½
screen ~~sand~~ 9-19
sand 7-20½
bentonite 2-7

1115 Set up over BS-005PZ

1130 Clean hammer from sand

1205 TD = 20½
screen 9-19
sand 7-20½
bentonite 2-7

1250 BS-004PZ

1325 TD = 20½
screen ~~sand~~ 9-19
sand 7-20½
bentonite 2-7

1615 Leave for Fedex

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SEA405448

1330 Leave for Seattle

1415 Arrive @ Seattle

1125 Set up over BS-006PZ
$\underline{\nabla}$ in BS-006PZ = 9.78
TD " " = 19.25

KM still keeping notes

Weather Sunny mild to Hot (60-90's)
no wind

July 19, 1994

Arrive @ Seattle 0630

0645 Set up over BS-006 PZ

$\underline{\nabla}$ in BS-006PZ = 9.8
TD " " = 19.24

0648 Calibrate pH meter

0700 Start developing KM keeping notes

0830 Surveyor arrives, show him the Site.

0840 Set up over BS-004PZ
$\underline{\nabla}$ in BS-004PZ = 9.4
TD " " = 18.9

0945 # and record drums

1000 Leave for Bellingham

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SEA405449

1015 Sample ST-005PZ

1035 Set up @ ST-004PZ

1057 Start purging

1145 Sample ST-004PZ

1230 Leave Paine Field

1340 Arrive @ Seattle, set up @ BS-006PZ

$\bar{\bar{\nabla}}$ in BS-006PZ = 9.77

1422 Sample BS-006PZ

1450 Drop off samples @ Fedex

Weather: Sunny, mild to warm, 50's - 80's, light wind

~~July 21, 1994~~ July 20, 1994

~~0~~ Debrief with Bill Hedberg

① Calibrating Log Book - CYA

② Plastic under drum brackets

③ Bucket method overspray

④ Secure drums better

⑤ Pid the well boring

⑥ Litus paper to test for pH preserving

⑦ Leave VOA vials in open.

⑧ Sample up-gradient well first

⑨ Label time and date

⑩ Triplicate C of C, one per ice chest

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SEA405450

MEASUREMENT CONVERSION

[illegible]	[illegible]	[illegible]
LENGTH		
inches	[illegible]	[illegible]
feet	[illegible]	[illegible]
yards	0.914	meters
miles	[illegible]	[illegible]
millimeters	[illegible]	inches
centimeters	[illegible]	inches
meters	[illegible]	feet
meters	[illegible]	yards
kilometers	[illegible]	miles
WEIGHT		
ounces	28.[illegible]	grams
pounds	0.45[illegible]	kilograms
grams	0.0[illegible]	ounces
kilograms	2.20[illegible]	pounds
VOLUME		
fluid ounces	29.573	milliliters
pints	0.473	liters
quarts	0.946	liters
gallons (U.S.)	3.785	liters
milliliters	0.033	fluid ounces
liters	1.0[illegible]	quarts
liters	0.25[illegible]	gallons (U.S.)

TEMPERATURE

°C = (°F − 32) × .555
°F = (°C × 1.8) + 32

Inches	Decimals of foot	Millimeters
1/16	.0052	1.5875
1/8	.0104	3.1750
3/16	.0156	4.7625
1/4	.0208	6.3500
5/16	.0260	7.9350
3/8	.0313	9.5250
1/2	.0417	12.700
5/8	.0521	15.875
3/4	.0625	19.050
7/8	.0729	22.225
1"	.0833	25.400
2"	.1667	50.800
3"	.2500	76.200
4"	.3333	101.60
5"	.4167	127.00
6"	.5000	152.40
7"	.5833	177.80
8"	.6667	203.20
9"	.7500	228.60
10"	.8333	254.00
11"	.9167	279.40
1 foot	1.0000	304.80

ALL WEATHER WRITING PAPER

Name IRIS ARREDONDO

Address (OPERATIONAL Technologies)
SAN ANTONIO, TX

Phone (210) 731-0000 (1-800-677-8072)
(210) 731-0008 FAX *CALL!*

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✓ Paine Field 1315-127
✓ SEATTLE 1315-127
} Project #'s

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SEA405451

0900 Set up at MARK Henson's hotel room to run G.C. + train on it.

1000 Began set up procedure for standarization technique used on G.C.

1030 Ran field test samples on bore hole drills.

2130 Stopped running samples + call it a day End-of-day (15 hs).

Iris Anedondo

SAMPLES RAN:
ST0003 BH = 5 samples
ST0004 PZ = 6 samples
SD0005 PZ = 7 samples
+ (standards + air blanks)

Iris Anedondo

July 14, 1994 SEATTLE ANGS

0630: Begin set up procedure for G.C.

0700: Prepare standard solutions from stock solutions.

0730 Begin to identify peaks on chromatograph for BTEX standard.

0800: Ran samples for SEATTLE ANGS:
BS0001 BH = 6 samples
BS0002 BH = 3 samples
BS0003 BH = 4 samples
BS0004 PZ = 4 samples
BS0005 PZ = 4 samples

Plus, standards and air blanks

2000: End-of-day — (13 hs)

Iris Anedondo

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SEA405452

SURVEY REPORT

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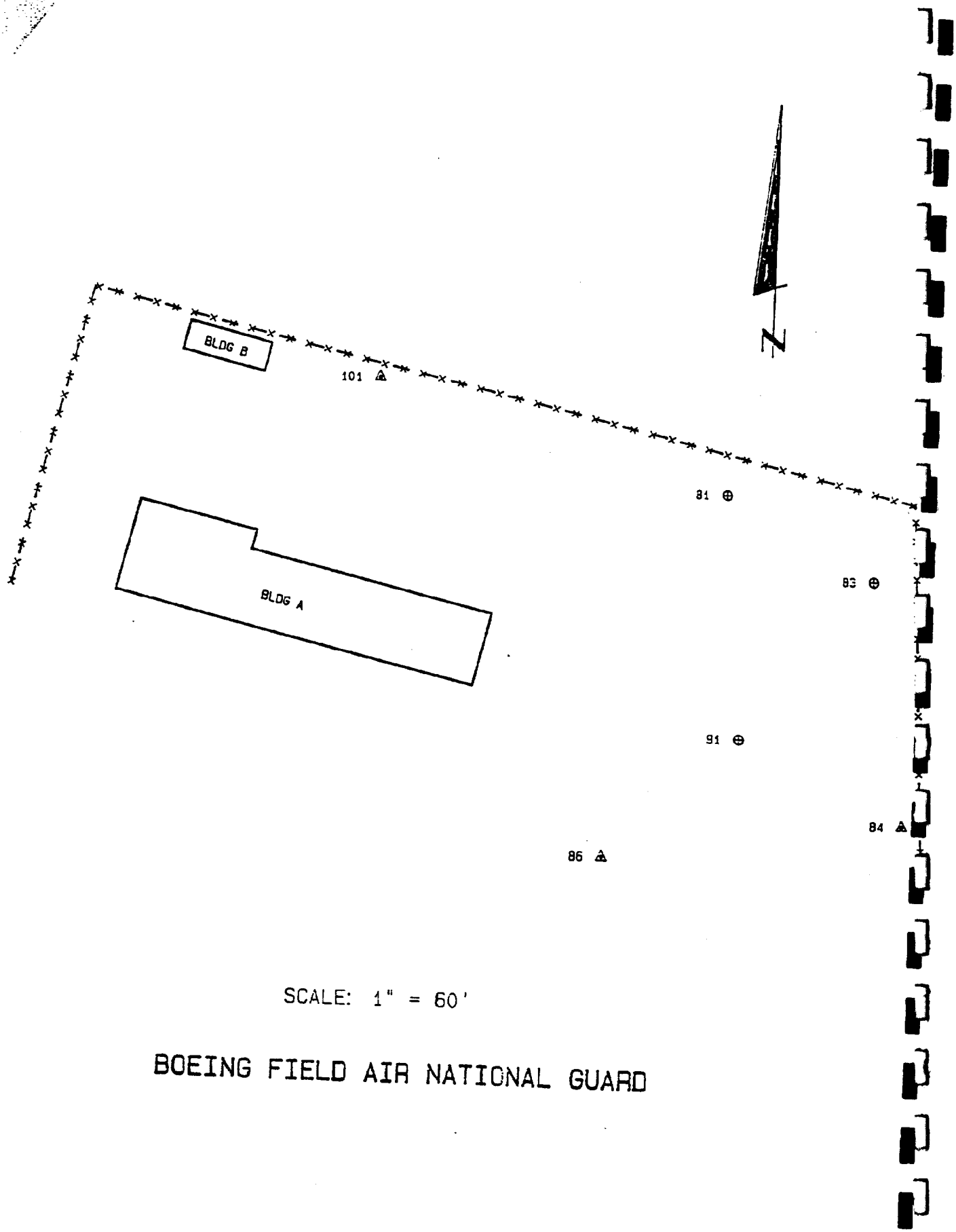
EING FIELD ANG MONITORING WELLS AND BORE HOLE LOCATIONS

3-19-94

ST COORDINATES

	PT#	NORTH	EAST	ELEV
BS 002 BH	81	201569.836	1273811.678	9.41
BS 001 BH	83	201526.835	1273889.582	9.00
	84	201401.418	1273908.326	9.24
	ABN 618 006 PZ (ELEV. OF MARK 8.91')			
	86	201381.097	1273753.398	9.08
	ABN 619 005 PZ (ELEV. OF MARK 8.72')			
BS 003 BH	91	201443.776	1273821.585	9.35
	101	201624.497	1273633.725	9.28
	ABN 620 004 PZ (ELEV. OF MARK 8.99,)			



SCALE: 1" = 60'

BOEING FIELD AIR NATIONAL GUARD

KCSlip4 38926

SEA405456

Appendix G

KCSlip4 38927

SEA405457

APPENDIX G

DATA REQUIREMENTS FOR FEDERAL FACILITY DOCKET SITES

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SEA405459

PA/SI DATA REQUIREMENTS FOR FEDERAL FACILITY DOCKET SITES
Seattle ANGS, Seattle, Washington

1. **Supply copies of all sampling data, on-site and off-site, including location map, detection limits (see definitions below), raw data sheets, QA/QC documents, date(s) sampled, analytical method(s) used, well or boring logs, and sampling technique(s).**

   Sampling data, detection limits, raw data sheets, QA/QC documents, dates sampled, and analytical methods used can be found in Appendix E. Well or boring logs can be found in Appendix B.

2. **Locate and identify on a map all known or suspected sources (see definition below). Supply all information about source(s) such as: dates of operation, use, or spillage; amounts of material deposited, stored, or spilled; dimensions of source(s); known or suspected hazardous substances (see definition below), etc.**

   The above information can be found in Section 4.0 of the PA/SI Report.

3. **Provide a description of all aquifers beneath the site, including description of overlying materials, depth first encountered, thickness, and composition.**

   The above information can be found in Section 3.0 of the PA/SI Report.

4. **For each source, choose one description from Table 1 that describes the groundwater containment. Provide complete documentation (i.e., engineering diagrams, photographs [originals]) as to why the source meets that description and not any other in the Table.**

   The best description for this site is: All sources: evidence of hazardous substance migration from source area.

5. **Provide the location of all drinking water wells in all aquifers beneath the site within a 4-mile radius from the site (property boundary) by HRS distance ring and locate the wells within a one-mile radius on a 7.5 minute topographic map. Provide information on depth of well(s), screening interval(s), depth of aquifer(s)**

encountered, population served for multiple wells (i.e., municipal system), provide the number of wells, location of all wells (regardless of 4-mile limit), average annual pumpage of each well (regardless of 4-mile limit), and total population served by the system. Include information on all standby wells.

The Seattle Water Department indicated that no municipal wells are within four miles of the Station. There are approximately 35 wells within a 4-mile radius from the site. Copies of these well logs have been included. (Source: Section 3.0 of the PA/SI Report and State of Washington Department of Ecology)

6. **Provide information and location (on 7.5 minute topographic map) of wells within 4 miles that are used to irrigate five or more acres of commercial food or forage crops, or watering of commercial livestock, or ingredient in commercial food preparation, or supply for aquaculture, or supply for a major or designated water recreation area, excluding drinking water use.**

The records obtained from the Washington Department of Ecology (DOE) Water Resources Department revealed no private drinking water wells within a 1-mile radius from the Station. However, there are approximately 35 wells within a 4-mile radius from the site. Copies of these well logs have been included. (Source: Section 3.0 of the PA/SI Report and State of Washington Department of Ecology)

7. **Provide the average number of persons per residence for county (or counties) that site is located in per the U. S. Census Bureau.**

The average number of persons per residence for King County is approximately 2.03. (Source: Washington State Library- 1990 Census)

8. **Identify and locate all surface water bodies within two miles of the site marking off the drainage routes (shown on a 7.5 minute topographic map) from each source to applicable surface water bodies. Provide the average annual cubic feet per second flow for each surface water body within 15 miles downriver or radius from the point of probable entry into surface water. For lakes, provide information on inflow and outflow.**

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SEA405461

Figure G shows all surface water bodies that are located within two miles of the site. The only body of water for this area is the Duwamish Waterway. Information on cubic feet per second flow was not available. (Source: City of Seattle Engineering)

9. **For each source, choose one description from Table 2 that describes the surface water containment. Provide complete documentation (i.e., engineering diagrams, photographs [originals]) as to why the source meets that description and not any other in the Table.**

The best description from Table 2 for this site is: No evidence of hazardous substance migration from source area and no maintained engineered cover or run-on control or run-off management system.

10. **Provide the number of acres in each drainage basin.**

The number of acres in the Duwamish drainage basin is 450 square miles.

11. **From Table 3, choose the predominant soil group (surface soil) which comprises the largest total area within each drainage area.**

The best soil description for this site is: Moderately fine-textured soils with low infiltration rates (for example: sandy silt)

12. **Provide the two year, 24-hour rainfall.**

The two year, 24-hour rainfall is 1.87". (Source: PA/SI Report)

13. **From Table 4, choose the floodplain category for each source (supply Federal Emergency Management Agency floodplain map) and determine if each source meets the criteria from Table 5 (engineer's certification).**

This site is not within the 100 year floodplain. (Source: PA/SI Report)

14. **Provide the location of all drinking water intakes within 15 downstream miles (rivers) or 15-mile radius (lakes, bays, etc.). Provide information on population**

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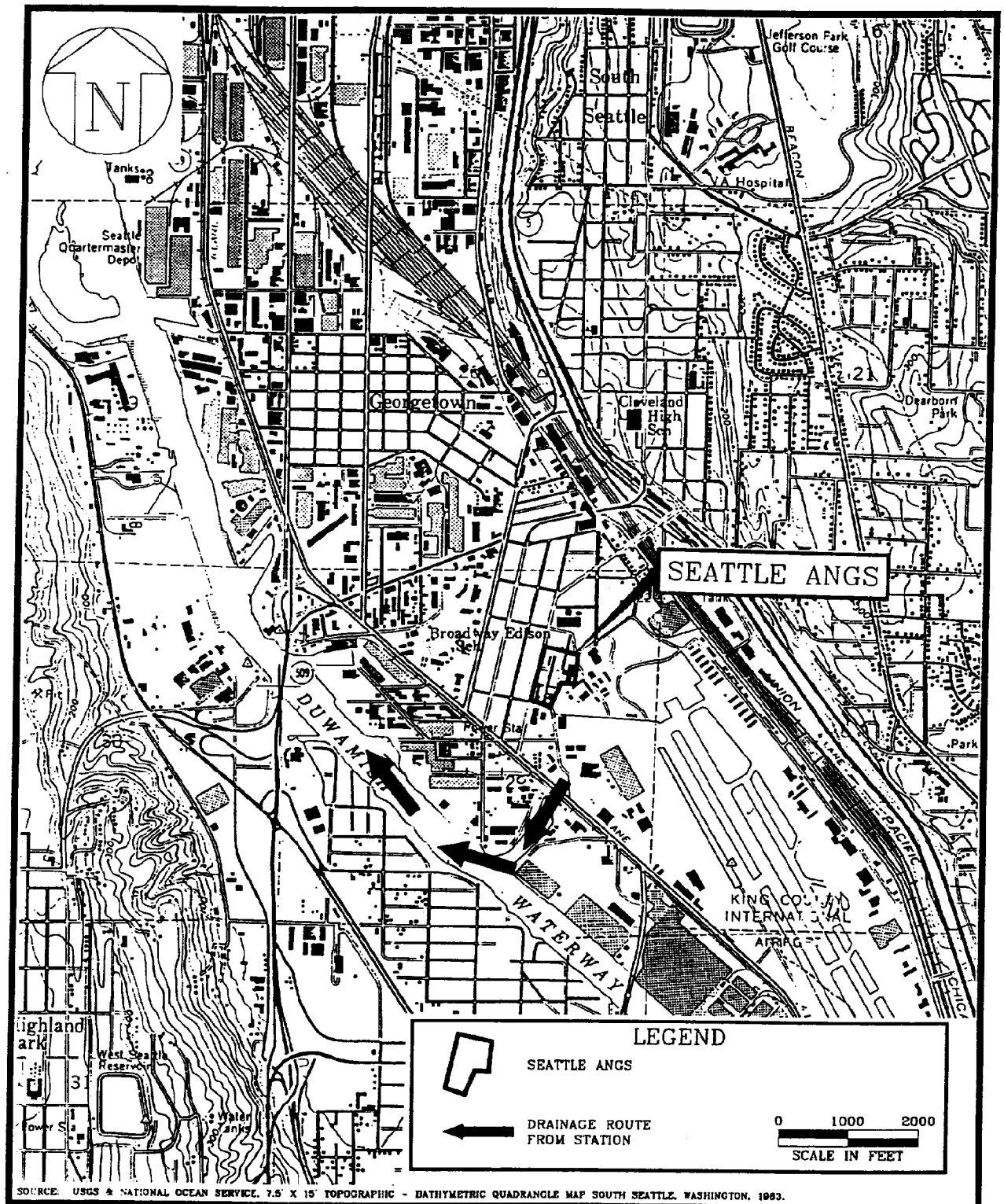

SOURCE: USGS & NATIONAL OCEAN SERVICE, 7.5' X 15' TOPOGRAPHIC - BATHYMETRIC QUADRANGLE MAP SOUTH SEATTLE, WASHINGTON, 1983.

FIGURE G

SEATTLE SEA4-1LO

DRAINAGE PATTERN IN VICINTY OF SEATTLE ANGS
143rd CCSQ, Seattle ANGS
Seattle, Washington

OPTECH
OPERATIONAL TECHNOLOGIES CORPORATION

MARCH 1995

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served. For multiple intakes (i.e., municipal system), provide information on the number of intakes, location of all intakes (regardless of 15-mile limit), and total population served by system. Include information on all standby intakes.

There are no drinking water intakes 15 downstream miles form the site. (Source: City of Seattle Engineering Department)

15. **Provide information and location of intakes within 15 miles downriver (radius in lake or bay) that are used to irrigate five or more acres of commercial food or forage crops, or watering of commercial livestock, or ingredient in commercial food preparation, or supply for aquaculture, or supply for a major or designated water recreation area, excluding drinking water use.**

    There are no water intakes 15 downstream miles form the site. (Source: City of Seattle Engineering Department)

16. **Provide any surface water body 15 miles downriver (radius in lakes or bay) used for drinking water.**

    There is no surface water body used for drinking water purposes 15 miles downriver. (Source: PA/SI Report)

17. **Provide the average human food chain production (pounds per year) for each surface water body 15 miles downriver or 15-mile radius in lake.**

    This information has not yet been made available.

18. **Within a 4-mile radius from the site and 15 miles downriver, or radius in lake, identify all sensitive environments that exist. Provide original documentation (USF&W, Natural Heritage Database, State agencies, NOAA, etc.). Note that there could be multiple sensitive environments within a sensitive environment.**

    There are no sensitive environments within a 4-mile radius from the site. (Source: PA Report)

19. **What is the linear frontage of all wetlands 15 miles downriver or 15-mile radius in lake?**

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The linear frontage of all wetlands 15 miles downriver is approximately less than 1 mile. (Source: U. S. Department of the Interior Fish and Wildlife Wetlands Map)

20. **Provide the location and number of persons residing, working, attending school, or day care within 200 feet. This includes both the Air and Army Guard.**

The number of persons working within 200 feet is 24 during normal workdays. During Unit Training Assembly (UTA) weekends, there are 158 persons. (Source: PA/SI Report)

21. **Identify all terrestrial sensitive environments that exist on-site. Provide original documentation (USF&W, natural Heritage Database, State Agencies, NOAA, etc.) and locate each on a 7.5 minute topographic map. Note that there could be multiple sensitive environments within a sensitive environment.**

There are no sensitive environments that exist on site. (Source: PA Report)

22. **For each source, choose one description from Table 8 that describes the accessibility to a human population. Provide complete documentation (i.e., engineering diagrams, photographs [originals]) as to why the source meets that description and not any other in the Table.**

The best description for this site is: Surrounded by maintained fence.

23. **Provide the total number of people in following distance rings from source(s)?**

- **0-1/4 mile** = 1 person
- **1/4-1/2 mile** = 449 persons
- **1/2-1 mile** = 4,480 persons
- **1-2 miles** = 24,664 persons
- **2-3 miles** = 36,145 persons
- **3-4 miles** = 40,741 persons

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Use 1990 Census data and/or actual house counts. Document how calculated.

Source: 1990 Census (block group level population aggregates)
Prepared by: GEOQUEST Information Technologies, Inc.

24. **For each source, choose one description from Table 9 that describes the gaseous containment. Provide complete documentation (i.e., engineering diagrams, photographs [originals]), as to why the source meets that description and not any other in the Table. From Table 10, choose the appropriate description for each source type. For each source, choose one description from Table 11 that describes the particulate containment. Provide complete documentation (i.e., engineering diagrams, photographs [originals]) as to why the source meets that description and not any other in the Table.**

Table 9:	All situations except those specifically listed below.
Table 10:	Contaminated soil (excluding land treatment).
Table 11:	All situations except those specifically listed below.

25. **Provide the location and area (in acres) of all wetlands within 4 miles of the site.**

There are approximately 75 acres of wetlands within 4 miles of the site. (Source: U. S. Department of the Interior Fish and Wildlife Wetlands Map)

26. **Contact EPA Regional Office immediately if any radionuclides are present or suspected at the site and supply all radiological information known to date.**

See Subsections 6.3.2, 6.4.2.6, 6.4.3.2.6, and Appendix E of the PA/SI Report for all gross alpha and gross beta radiation results for soil and groundwater samples.

27. **For all of the above information, use primary data source and supply two copies or specify where copies may be obtained.**

28. **Provide any removals or remedial actions taken place at the site.**

No removals or remedial actions have taken place at the site.

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29. **If information relevant to a question already has been provided to the EPA, your answer may precisely cite the previous submittal by title, date, page, and paragraph number rather than resubmitting the information.**

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DEFINITIONS

Detection Limit (DL)	Lowest amount that can be distinguished from the normal random "noise" of an analytical instrument or method. For this submission, the detection limit used is the method detection limit (MDL), or, for real-time instruments, the detection limit of the instrument as used in the field.
Hazardous Substance	CERCLA hazardous substances, pollutants, and contaminant as defined in CERCLA sections 101(14) and 101(33).
Method Detection Limit (MDL)	Lowest concentration of an analyte that a method can detect reliably in either a sample or blank.
Sample Quantitation Limit (SQL)	Quantity of a substance that can reasonably be quantified given the methods of analysis and sample characteristics that may affect quantification (for example, dilution, concentration).
	Site: Area(s) where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located. Such areas may include multiple sources and may include areas between sources.
	Source: Any area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance. Sources do not include those volumes of air, groundwater, surface water, or surface water sediments that have become contaminated by migration, except: in the case of either a groundwater plume with no identified source, or contaminated surface water sediments with no identified source, the plume may be considered a source.

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Table 1

All Sources (Except Surface Impoundments, Land Treatment, Containers, and Tanks)

Evidence of hazardous substance migration from source area (i.e., source area includes source and any associated containment structures).

No liner.

No evidence of hazardous substance migration from source area, a liner, and:

(a) None of the following present: (1) maintained engineered cover, (2) functioning and maintained run-on control system and runoff management system, or (3) functioning leachate collection and removal system immediately above liner.

(b) Any one of the three items in (a) present.

(c) Any two of the items in (a) present.

(d) All three items in (a) present plus a functioning groundwater monitoring system.

(e) All items in (d) present plus no bulk or non-containerized liquids nor materials containing free liquids deposited in source area.

No evidence of hazardous substance migration from source area, double liner with functioning leachate collection and removal system above and between liners, functioning groundwater monitoring system, and:

(f) Only one of the following deficiencies present in containment: (1) bulk or noncontainerized liquids or materials containing free liquids deposited in source area, or (2) no or nonfunctioning or nonmaintained run-on control system and runoff management system, or (3) no or nonmaintained engineered cover.

(g) None of the deficiencies in (f) present.

Source area inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate is generated, liquid or materials containing free liquids not deposited in source area, and functioning and maintained run-on control present.

Surface Impoundment

Evidence of hazardous substance migration from surface impoundment.

No liner.

Free liquids present with either no diking, unsound diking, or diking that is not regularly inspected and maintained.

No evidence of hazardous substance migration from surface impoundment, free liquids present, sound diking that is regularly inspected and maintained, adequate freeboard, and:

(a) Liner.

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(b) Liner with functioning leachate collection and removal system below liner, and functioning groundwater monitoring system.

(c) Double liner with functioning leachate collection and removal system between liners, and functioning groundwater monitoring system.

No evidence of hazardous substance migration from surface impoundment and all free liquids eliminated at closure (either by removal of liquids or solidification of remaining wastes and waste residues).

Land Treatment

Evidence of hazardous substance migration from land treatment zone.

No functioning, maintained, run-on control and runoff management system.

No evidence of hazardous substance migration from land treatment zone and:

(a) Functioning and maintained run-on control and runoff management system.

(b) Functioning and maintained run-on control and runoff management system, and vegetative cover established over entire land treatment area.

(c) Land treatment area maintained in compliance with 40 CFR 264.280.

Containers

All containers buried.

Evidence of hazardous substance migration from container area (i.e., container area includes containers and any associated containment structures).

No liner (or no essentially impervious base) under container area.

No diking (or no similar structure) surrounding container area.

Diking surrounding container area unsound or not regularly inspected and maintained.

No evidence of hazardous substance migration from container area, container area surrounded by sound diking that is regularly inspected and maintained, and:

(a) Liner (or essentially impervious base) under container area.

(b) Essentially impervious base under container area with liquids collection and removal system.

(c) Containment system includes essentially impervious base, liquids collection system, sufficient contain 10 percent of volume of all containers, and functioning and maintained run-on control; plus functioning groundwater monitoring system, and spilled or leaked hazardous substances and accumulated precipitation removed

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in timely manner to prevent overflow of collection system, at least weekly inspection of containers, hazardous substances in leaking or deteriorating containers transferred to containers in good condition, and containers sealed except when waste is added or removed.

(d) Free liquids present containment system has sufficient capacity to hold total volume of all containers and to provide adequate freeboard, single liner under container area with functioning leachate collection and removal system below liner, and functioning groundwater monitoring system.

(e) Same as (d) except: double liner under container area with functioning leachate collection and removal system between liners.

Containers inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate would be generated from any unsealed or ruptured containers, liquids or materials containing free liquids not deposited in any container, and functioning and maintained runoff control present.

No evidence of hazardous substance migration from container area, containers leaking, and all free liquids eliminated at closure (either by removal of liquid or solidification of remaining wastes and waste residues).

Tank

Belowground tank.

Evidence of hazardous substance migration from tank area (i.e., tank area includes tank, ancillary equipment such as piping, and any associated containment structures).

Tank and ancillary equipment not provided with secondary containment, (e.g., liner under tank area, vault system, double wall).

No diking (or no similar structure) surrounding tank and ancillary equipment

Diking surrounding tank and ancillary equipment unsound or not regularly inspected and maintained.

No evidence of hazardous substance migration from tank area, tank and ancillary equipment surrounded by sound diking that is regularly inspected and maintained, <u>and:</u>

(a) Tank and ancillary equipment provided with secondary containment.

(b) Tank and ancillary equipment provided with secondary containment with leak detection and collection system.

(c) Tank and ancillary equipment provided with secondary containment system that detects and collects spilled or leaked hazardous substances and accumulated precipitation and has sufficient capacity to contain 110 percent of volume of

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largest tank within containment area, spilled or leaked hazardous substances and accumulated precipitation removed in timely manner, at least weekly inspection of tank and secondary containment system, all leaking or unfit-for-use tank systems promptly responded to, and functioning groundwater monitoring system.

(d) Containment system has sufficient capacity to hold volume of all tanks within tank containment area and to provide adequate freeboard, single liner under that containment area with functioning leachate collection and removal system below liner, and functioning groundwater monitoring system.

(e) Same as (d) except double liner under tank containment area with functioning leachate collection and removal system between liners.

Tank is aboveground, and inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate would be generated from any material released from tank, liquids or materials containing free liquids not deposited in any tank, and functioning and maintained run-on control present.

Table 2

All Sources (Except Surface Impoundments, Land Treatment, Containers, and Tanks)

Evidence of hazardous substance migration from source area (i.e., source area includes source and any associated containment structures).

No evidence of hazardous substance migration from source areas and:

(a) Neither of the following present: (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system.

(b) Any one of the two items in (a) present.

(c) Any two of the following present: (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system, or (3) liner with functioning leachate collection and removal system immediately above liner.

(d) All items in (c) present.

(e) All items in (c) present, plus no bulk or non-containerized liquids nor materials containing free liquids deposited in source area.

No evidence of hazardous substance migration from source area, double liner with functioning leachate collection and removal system above and between liners, and:

(f) Only one of the following deficiencies present in containment: (1) bulk or noncontainerized liquids or materials containing free liquids deposited in source

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area, or (2) no or nonfunctioning or nonmaintained run-on control system and runoff management system, or (3) no or nonmaintained engineered cover.

(g) None of the deficiencies in (f) present.

Source area inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate is generated, liquids or materials containing free liquids not deposited in source area, and functioning and maintained run-on control present.

Surface Impoundment

Evidence of hazardous substance migration from surface impoundment.

Free liquids present with either no diking, unsound diking, or diking that is not regularly inspected and maintained.

No evidence of hazardous substance migration from surface impoundment, free liquids present, sound diking that is regularly inspected and maintained, adequate freeboard, <u>and:</u>

(a) No liner.

(b) Liner.

(c) Liner with functioning leachate collection and removal system below liner.

(d) Double liner with functioning leachate collection and removal system between liners.

No evidence of hazardous substance migration from surface impoundment and all free liquids eliminated at closure (either by removal of liquids or solidification of remaining wastes and waste residues).

Land Treatment

Evidence of hazardous substance migration from land treatment zone.

No functioning and maintained run-on control and runoff management system.

No evidence of hazardous substance migration from land treatment zone <u>and:</u>

(a) Functioning and maintained and maintained run-on control and runoff management system.

(b) Functioning and maintained run-on control and runoff management system, and vegetative cover established over entire land treatment area.

(c) Land treatment area maintained in compliance with 40 CFR 264.280.

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Containers

All containers buried.

Evidence of hazardous substance migration from container area (i.e., container area includes containers and any associated containment structures).

No diking (or no similar structure) surrounding container area.

Diking surrounding container area unsound or not regularly inspected and maintained.

No evidence of hazardous substance migration from container area and container area surrounded by sound diking that is regularly inspected and maintained.

No evidence of hazardous substance migration from container area, container area surrounded by sound diking that is regularly inspected and maintained, <u>and:</u>

(a) Essentially impervious base under container area with liquids collection and removal system.

(b) Containment system includes essentially impervious base, liquids collection system, sufficient capacity to contain 10 percent of volume of all containers, and functioning and maintained run-on control; and spilled or leaked hazardous substances and accumulated precipitation removed in timely manner to prevent overflow of collection system, at least weekly inspection of containers, hazardous substances in leaking or deteriorating containers transferred to containers in good condition, and containers sealed except when waste is added or removed.

(c) Free liquids present containment system has sufficient capacity to hold total volume of all containers and to provide adequate freeboard, and single liner under container area with functioning leachate collection and removal system below liner.

(d) Same as (c) except: double liner under container area with functioning leachate collection and removal system between liners. Containers inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate would be generated from any unsealed or ruptured containers, liquids or materials containing free liquids not deposited in any container, and functioning and maintained run-on control present.

No evidence of hazardous substance migration from container area, containers leaking, and all free liquids eliminated at closure (either by removal of liquids or solidification of remaining wastes and waste residues).

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Tank

Belowground tank.

Evidence of hazardous substance migration from tank area (i.e., tank area includes tank, ancillary equipment such as piping, and any associated containment structures).

No diking (or no similar structure) surrounding tank and ancillary equipment.

Diking surrounding tank and ancillary equipment unsound or not regularly inspected and maintained.

No evidence of hazardous substance migration from tank area and tank and ancillary equipment surrounded by sound diking that is regularly inspected and maintained.

No evidence of hazardous substance migration from tank area, tank and ancillary equipment surrounded by sound diking that is regularly inspected and maintained, <u>and:</u>

(a) Tank and ancillary equipment provided with secondary containment (e.g., liner under tank area, vault system, double wall) with leak detection and collection system.

(b) Tank and ancillary equipment provided with secondary containment system that detects and collects spiked or leaked hazardous substances and accumulated precipitation and has sufficient capacity to contain 110 percent of volume of largest tank within containment area, spilled or leaked hazardous substances and accumulated precipitation removed in a timely manner, at least weekly inspection of tank and secondary containment system, and all leaking or unfit-for-use tank systems promptly responded to.

(c) Containment system has sufficient capacity to hold total volume of all tanks within the tank containment area and to provide adequate freeboard, and single liner under tank containment area with functioning leachate collection and removal system below liner.

(d) Same as (c) except double liner under tank containment area with functioning leachate collection and removal system between liners.

Tank is aboveground, and inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate would be generated from any material released from tank, liquids or materials containing free liquids not deposited in any tank, and functioning and maintained run-on control present.

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Table 3
Surface Soil Description

Coarse-textured soils with high infiltration rates (for example, sands, loamy sands).
Medium-textured soils with moderate infiltration rates (for example, sandy loams, loams).
Moderately fine-textured soils with low infiltration rates (for example, silty loams, silts, sandy clay loams).
Fine-textured soils with very low infiltration rates (for example, clays, sandy clays, silty clay loams, clay loams, silty clays); or impermeable surfaces (for example, pavement).

Table 4
Floodplain Categories

Source floods annually.
Source in 10-year floodplain.
Source in 100-year floodplain.
Source in 500-year floodplain.
None of the above.

Table 5
Flood Containment

Documentation that containment at the source is designed, constructed, operated, and maintained to prevent a washout of hazardous substances by the flood being evaluated (see floodplain category).

Table 6
Sensitive Environments

Critical habitat[a] for Federal designated endangered or threatened species.
Marine Sanctuary.
National Park.
Designated Federal Wilderness Area.
Areas identified under Coastal Zone Management Act[b].

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Sensitive areas identified under National Estuary Program[c] or Near Coastal Waters Program[d].
Critical areas identified under the Clean Lakes Program[e].
National Monument[f].
National Seashore Recreational Area.
National Lakeshore Recreational Area.
Habitat known to be used by Federal designated or proposed endangered or threatened species.
National Preserve.
National or State Wildlife Refuge.
Unit of Coastal Barrier Resources System.
Coastal Barrier (undeveloped).
Federal land designated for protection of natural ecosystems.
Administratively Proposed Federal Wilderness Area.
Spawning areas critical[g] for the maintenance of fish/shellfish species within river, lake, or coastal tidal waters.
Migratory pathways and feeding areas critical for maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time.
Terrestrial areas utilized for breeding by large or dense aggregations of animals[h].
National river reach designated as Recreational.
Habitat known to be used by State designated endangered or threatened species.
Habitat known to be used by species under review as to its Federal endangered or threatened status.
Coastal Barrier (partially developed).
Federal designated Scenic or Wild River.
State land designated for wildlife or game management.
State designated Scenic or Wild River.
State designated Natural Areas.
Particular areas, relatively small in size, important to maintenance of unique biotic communities.
State designated areas for projection or maintenance of aquatic life[i].

---

[a]Critical habitat as defined in 50 CFR 424.02.
[b]Areas identified in State Coastal Zone Management plans as requiring protection because of ecological value.
[c]National Estuary Program study areas (Subareas within subareas) identified in Comprehensive Conservation and Management Plans as requiring protection because they support critical life stages of key estuarine species (Section 320 of Clean Water Act, as amended).
[d]Near Coastal Waters as defined in Sections 104(b)(3), 304(1), 319, and 320 of Clean Water Act, as amended.
[e]Clean Lakes Program critical areas (subareas within lakes, or in some cases entire small lakes) identified by State Clean Lake Plans as critical habitats (Section 314 of Clean Water Act, as amended).
[f]Use only for air migration pathway.
[g]Limit to areas described as being used for intense or concentrated spawning by a given species.

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[h]For the air migration pathway, limit to terrestrial vertebrate species. For the surface water migration pathway, limit to terrestrial vertebrate species aquatic or semiaquatic foraging habits.
[i]Areas designated under Section 305(a) of Clean Water Act, as amended.

Table 7
Terrestrial Sensitive Environments

Terrestrial critical habitat[a] for Federal designated endangered or threatened species.
National Park.
Designated Federal Wilderness Area.
National Monument.
Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species.
National Preserve (terrestrial).
National or State Terrestrial Wildlife Refuge.
Federal land designated for protection of natural ecosystems.
Administratively proposed Federal Wilderness Area.
Terrestrial areas utilized for breeding by large or dense aggregations of animals[b].
Terrestrial habitat known to be used by State designated endangered or threatened species.
Terrestrial habitat known to be used by species under review as to its Federal designated endangered or threatened status.
State lands designated for wildlife or game management.
State designated Natural Areas.
Particular area, relatively small in size, important to maintenance of unique biotic communities.

[a]Critical habitat as defined in 50 CFR 42.
[b]Limit to vertebrate species.

Table 8
Area of Observed Contamination

Designated recreational area.
Regularly used for public recreation (for example, fishing, hiking, softball).
Accessible and unique recreational area (for example, vacant lots in urban area).
Moderately accessible (may have some access improvements – for example, gravel road), with some public recreation use.

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Slightly accessible (for example, extremely rural area with no road improvement), with some public recreation use.
Accessible, with no public recreation use.
Surrounded by maintained fence or combination of maintained fence and natural barriers.
Physically inaccessible to public, with no evidence of public recreation use.

Table 9

Gas Containment Description

All situations except those specifically listed below.
Evidence of biogas release.
Active fire within source.
Gas collection/treatment system functioning, regularly inspected, maintained, and completely covering source.
Source substantially surrounded by engineering windbreak and no other containment specifically described in this table applies.
Source covered with essentially impermeable, regularly inspected, maintained cover.
Uncontaminated soil cover >3 feet:
- Source substantially vegetated with little exposed soil.
- Source lightly vegetated with much exposed soil.
- Source substantially devoid of vegetation.

Uncontaminated soil cover ≥ 1 foot and ≤3 feet:
- Source heavily vegetated with essentially no exposed soil.
- Cover soil resistant to gas migration[a].
- Cover soil type not resistant to gas migration[a] or unknown.
- Source substantially vegetated with little exposed soil and cover soil type resistant to gas migration[a].
- Other.

Uncontaminated soil cover <1 foot:
- Source heavily vegetated with essentially no exposed soil and cover soil type resistant to gas migration[a].
- Other.

Totally or partially enclosed within structurally intact building and no other containment specifically described in this table applies.
Source consists solely of intact, sealed containers:

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Totally protected from weather by regularly inspected, maintained cover.
Other.

---

[a]Consider moist fine-grained and saturated coarse-grained soils resistant to gas migration; consider all other soils nonresistant.

Table 10
Source Type

Active fire area.
Burn pit.
Containers or tanks (buried/belowground):
- Evidence of biogas release.
- No evidence of biogas release.

Containers or tanks, not elsewhere specified.
Contaminated soil (excluding land treatment).
Landfarm/land treatment.
Landfill:
- Evidence of biogas release.
- No evidence of biogas release.

Pile:
- Tailings pile.
- Scrap metal or junk pile.
- Trash pile.
- Chemical waste pile.
- Other waste piles.

Surface impoundments (buried/backfilled):
- Evidence of biogas release.
- No evidence of biogas release.

Surface impoundment (not buried/backfilled):
- Dry.
- Other.

Other types of sources, not elsewhere specified.

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Table 11

Particulate Containment Description

All situations except those specifically listed below.

Source contains only particulate hazardous substances totally covered by liquids.

Source substantially surrounded by engineered windbreak and no other containment specifically described in this table applies.

Source covered with essentially impermeable, regularly inspected, maintained cover.

Uncontaminated soil cover >3 feet:

- Source substantially vegetated with little or no exposed soil.
- Source lightly vegetated with much exposed soil.
- Source substantially devoid of vegetation.

Uncontaminated soil cover ≥1 foot and ≤3 feet:

- Source heavily vegetated with essentially no exposed soil:
  - Cover soil type resistant to gas migration[a].
  - Cover soil type not resistant to gas migration[a].
- Source substantially vegetated with little exposed soil and cover soil type resistant to gas migration[a].
- Other.

Uncontaminated soil cover <1 foot:

- Source heavily vegetated with essentially no exposed soil and cover soil type resistant to gas migration[a].
- Other.

Totally or partially enclosed within structurally intact building and no other containment specifically described in this table applies.

Source consists solely of containers:

- All containers contain only liquids.
- All containers intact, sealed, and totally protected from weather by regularly inspected, maintained cover.
- All containers intact and sealed.
- Other.

---

[a]Consider moist fine-grained and saturated coarse-grained soils resistant to gas migration; consider all other soils nonresistant.

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Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 4572

Water Right Permit No. _____

(1) OWNER: Name City of Tukwila Address 6200 So. Center Blvd Tukwila

(2) LOCATION OF WELL: County King

(2a) STREET ADDDRESS OF WELL (or nearest address) _____ SW ¼ SW ¼ Sec. 1 T 23 N., R 4 W

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

(4) TYPE OF WORK: Owner's number of well (if more than one) _____

Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☒ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 12" 8" inches.
Drilled 134 feet. Depth of completed well 61 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 12" Diam. from +2 ft. to 134 ft.
Welded ☒ 8" Diam. from +2 ft. to 37 ft.
Liner installed ☒
Threaded ☐ " Diam. from _____ ft. to _____ ft.

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

Screens: Yes ☒ No ☐
Manufacturer's Name UOP Johnson
Type Stainless I Model No. 304
Diam. 8" Slot size .3" from 37 ft. to 57 ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☒ No ☐ Size of gravel Aqua #8
Gravel placed from 61 ft. to 41 ft.

Surface seal: Yes ☒ No ☐ To what depth? 20' ft.
Material used in seal Cement Grout
Did any strata contain unusable water? Yes ☒ No ☐
Type of water? Salt Depth of strata 86-134
Method of sealing strata off Cement Grout 98-0065

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

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 15 ft. below top of well Date 1-20-88
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? Dustman
Yield: 75 gal./min. with 29 ft. drawdown after 4 hrs.
" " " "
" " " "

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

Time	Water Level	Time	Water Level	Time	Water Level
	Taken by Energy				

Date of test _____

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
Fill	0	3
Sand-Gravel - Wood	3	11
Blue Silty Sand	11	3
Fine to med Black silty Sand Water	30	5[illegible]
Silty Clay. Small Layer Silty Sand	56	100
Black Fine to Med Sand Water. Sea shells	100	13[illegible]
Sandstone.	130	13[illegible]
Seven set 1" at 100-130 Water very high in sand Pulled 12" casing back to 61 while installing screen. Tool Reinstalled 8" Screen set 58 to 37 Black Fine Sand Pulled 12" to 20 while Packing with Medium Aqua #8 Seal To surface. Pulled 12" Complete well 8" Dia		
Small Dia old well drilled approx 20. Abandon with Test Approx. Cement Grout. 12" to 106 Casing Pulled.		

Work started 12-5- 19[illegible] Completed 2-8- 19[illegible]

WELL CONSTRUCTOR CERTIFICATION:

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

NAME Armstrong Drilling Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 10915 66 Ave East Puy-Wa

(Signed) [signature] (WELL DRILLER) License No. 0012

Contractor's Registration No. ARMSFDI 134NC Date 2-3- 19[illegible]

(USE ADDITIONAL SHEETS IF NECESSARY)

RECEIVED MAR 3 1988 DEPARTMENT OF ECOLOGY

Y 050-1-20 (10-87) -1329- 3

KCSlip4 38953

SEA405483

The Original and First Copy with Department of Ecology
Second Copy—Owner's Copy
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WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 23/4/30

Water Right Permit No. _____

(1) OWNER: Name Boeing Address Boeing Renton

(2) LOCATION OF WELL: County King NW ¼ NW ¼ Sec. 2 T. 23 N., R. 4 W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) _____

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

(4) TYPE OF WORK: Owner's number of well (if more than one) _____

Abandoned ☐ New well ☑ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted ☑

(5) DIMENSIONS: Diameter of well 1 1/2 x inches.

Drilled 23 feet. Depth of completed well _____ ft.

(6) CONSTRUCTION DETAILS:

[illegible] Diam. from _____ ft. to _____ ft.

Welded ☐ _____ " Diam. from _____ ft. to _____ ft.
Liner installed ☐
Threaded ☐ _____ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☑ No ☐

Type of perforator used Mach Slots

SIZE of perforations .020 in. by 1 1/2" in.

_____ perforations from 2 ft. to 23 ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☐

Manufacturer's Name _____

Type _____ Model No. _____

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

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

Gravel packed: Yes ☑ No ☐ Size of gravel 4 x 8 [illegible]

Gravel placed from 0 ft. to 23 ft.

Surface seal: Yes ☑ No ☐ To what depth? 12" ft.

Material used in seal [illegible]

Did any strata contain unusable water? Yes ☐ No ☐

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

(7) PUMP: Manufacturer's Name [illegible] Dewatering

Type: _____ H.P. [illegible]

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level _____ ft. below top of well Date _____

Artesian pressure _____ lbs. per square inch Date _____

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

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

Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

" " " "

" " " "

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal. min with _____ ft. drawdown after _____ hrs.

Airtest _____ gal. min. with stem set at _____ ft. for _____ hrs.

Artesian flow _____ g.p.m. Date _____

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
Temp Dewatering Abandonment	0	23
Sealed Well [illegible]		
[illegible] Grout and Removed Wellpoint		

RECEIVED
MAR 09 1993
DEPT. OF ECOLOGY

Work started _____, 19__ Completed _____, 19__

WELL CONSTRUCTOR CERTIFICATION:

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

NAME [illegible] (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address [illegible]

(Signed) _____ (WELL DRILLER) License No. _____

Contractor's Registration No. [illegible] Date [illegible], 19__

(USE ADDITIONAL SHEETS IF NECESSARY)

CY 060-1-20 (10-67) 1329

KCSlip4 38954

SEA405484

The Original and Final Copy with Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. ——

23/4E/3

Water Right Permit No. ______

(1) OWNER: Name BOEING Address BOEING RENTON

(2) LOCATION OF WELL: County KING NW ¼ NE ¼ Sec 3 T 23 N., R 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address)

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

(4) TYPE OF WORK: Owner's number of well (if more than one) 160 EACH
Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted ☒

(5) DIMENSIONS: Diameter of well 1 1/2 X 8" inches.
Drilled 23 feet. Depth of completed well 23 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 1 1/2 " Diam. from 0 ft. to 20 ft.
Welded ☐ Liner installed ☐ Threaded ☐ ______ " Diam. from ______ ft. to ______ ft.
______ " Diam. from ______ ft. to ______ ft.

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

Screens: Yes ☒ No ☐
Manufacturer's Name HYDROPAC AARDVARK
Type PVC Model No. ______
Diam. 1 1/2" Slot size .020" from 20 ft. to 23 ft.
Diam. ______ Slot size ______ from ______ ft. to ______ ft.

Gravel packed: Yes ☒ No ☐ Size of gravel COARSE WASHED SAND
Gravel placed from 23 ft. to 0 ft.

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

(7) PUMP: Manufacturer's Name ANDERSON DEWATERING
Type: VACUUM WELLPOINT H.P. 40

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

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
FILL, SANDY GRAVEL	0'	8'
SAND, GREY-BLACK SOME SILTY LAYERS BLUEGRAY TRACE GRAVEL	8'	23'

RECEIVED
FEB 23 1983
DEPT. OF ECOLOGY

INSTALLED 160 EACH TEMPORARY DEWATERING VACUUM WELLPOINTS INSIDE A SHEETED HOLE.

Work started 12-29-82, 19__ Completed 2-23, 1983

WELL CONSTRUCTOR CERTIFICATION:

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

NAME ANDERSON DEWATERING (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address P BOX 3093 FEDERAL WAY WA
(Signed) [signature] (WELL DRILLER) License No. 1522
Contractor's Registration No. ANDERDD 099 Date 2-25, 1983

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20 (10/87) 1309

KCSlip4 38955

SEA405485

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

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 041667

Water Right Permit No. 23/4E/3F

(1) OWNER: Name HYSTER Address 9892 40th AVE S. SEATTLE

(2) LOCATION OF WELL: County KING SE ¼ NW ¼ Sec. 3 T. 23 N., R. 4E W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) SAME

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

(4) TYPE OF WORK: Owner's number of well (if more than one)

Abandoned ☒ New well ☐ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 2" inches.
Drilled ____ feet. Depth of completed well APPROX 15 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: ____ " Diam. from ____ ft. to ____ ft.
Welded ☐ Liner installed ☐
PVC Threaded ☒ 2" " Diam. from 0 ft. to 5 ft.

Perforations: Yes ☐ No ☐
Type of perforator used ~~TOTO~~
SIZE of perforations ~~DIO~~ in. by ____ in.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.

Screens: Yes ☒ No ☐
Manufacturer's Name ____
Type ____ Model No. ____
Diam. ____ Slot size .010 from 5 ft. to 15' ft.
Diam. ____ Slot size ____ from ____ ft. to ____ ft.

Gravel packed: Yes ☒ No ☐ Size of gravel ____
Gravel placed from 15 ft. to 4 ft.

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

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

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

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
WELL ABANDONMENT —		
REMOVAL WITH BACKHOE		
IN AREA OF SOILS		
EXCAVATION DURING		
CLEANUP		

RECEIVED DEC 16 1991 DEPT. OF ECOLOGY

RECEIVED DEC 17 1991 DEPT. OF ECOLOGY

Work started 10/18 1991 Completed 10/18 1991

WELL CONSTRUCTOR CERTIFICATION:

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

NAME TACOMA PUMP & DRILL (KELLEY)
(PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 30316 MOUNTAIN HWY GRAHAM, WA 98

(Signed) [signature] (WELL DRILLER) License No. 1880

Contractor's Registration No. 278039649 Date 12/13/91 19

USE ADDITIONAL SHEETS IF NECESSARY.

KCSlip4 38956

SEA405486

23/4 E

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

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 2730

Water Right Permit No. NA

(1) OWNER: Name BOEING Address 9725 E MARGINAL WAY S. SEATTLE

(2) LOCATION OF WELL: County KING NW ¼ NE ¼ Sec 4 T 23 N., R.

(2a) STREET ADDDRESS OF WELL (or nearest address) 9725 E MARGINAL WAY S. SEATTLE WA 98108

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

(4) TYPE OF WORK: Owner's number of well (if more than one) DC9-101-8A

Abandoned ☒ New well ☐ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 2 inches.
Drilled ≈ 20 feet. Depth of completed well ≈ 20 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: ____ " Diam. from ____ ft. to ____ ft.
Welded ☐ ____ " Diam. from ____ ft. to ____ ft.
Liner installed ☐ ____ " Diam. from ____ ft. to ____ ft.
Threaded ☐

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

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

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

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

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

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

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) ~~WELL LOG~~ or ABANDONMENT PROCEDURE DESCRIPT

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

(1) WE REMOVED FLUSH MOUNTED SURF PROTECTIVE MONUMENT BY CORING CONCRETE.	
(2) WE BROKE A HOLE IN THE BOT CAP OF THE FIBERGLASS WELL SCREE USING 25 FT OF 5/8 in REB	
(3) WE MIXED A THICK BENTONITE SLURRY AND FILLED THE WELL CASING TO THE TOP.	
(4) WE PULLED THE CASING OUT OF THE GROUND WITH A CHAIN AND BACKHOE. WE KEPT ADDING BENTONITE INTO CASING TO MAN PRESSURE HEAD ON GROUT. IN ALL, WE USED ABOUT 15 of GROUT.	

Work started 21 Dec 89, 19. Completed 21 Dec 89

WELL CONSTRUCTOR CERTIFICATION:

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

NAME JOHN LAMANNA - LANDAU ASSO (PERSON, FIRM, OR CORPORATION) (TYPE OR P

Address PO BOX 1024 EDMONDS, WA 9807

(Signed) [signature] (WELL DRILLER) License No. 1486

Contractor's Registration No. (NONE) Date (NA), 19

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20 (10/87) -1329

KCSlip4 38957

SEA405487

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

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 2730

Water Right Permit No. NA

WELL ABANDONMENT

(1) OWNER: Name BOEING COMPANY Address 9725 E. MARGINAL WAY S. TUKWILA

(2) LOCATION OF WELL: County KING NW ¼ NE ¼ Sec 4 T 23 N. R 4E W.M

(2a) STREET ADDDRESS OF WELL (or nearest address) 9725 E. MARGINAL WAY SOUTH TUKWILA 98108

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

(4) TYPE OF WORK: Owner's number of well (if more than one) BDC-05-1

Abandoned ☒ New well ☐ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

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

(6) CONSTRUCTION DETAILS:

Casing installed: _____ " Diam. from _____ ft. to _____ ft.
Welded ☐ _____ " Diam. from _____ ft. to _____ ft.
Liner installed ☐
Threaded ☐ _____ " Diam. from _____ ft. to _____ ft.

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

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

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

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

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

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

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) ~~WELL CONSTRUCTION~~ ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
WELL WAS ABANDONED ON 2 JAN 90 BY FOLLOWING PROCEDURE:		
(1) SURFACE FLUSH MOUNT PROTECTIVE MONUMENT REMOVED.		
(2) PIPE FILLED WITH BENTONITE SLURRY		
(3) CASING PULLED OUT OF GROUND WITH CHAIN AND BACKHOE		
(4) BENTONITE SLURRY: POURED INTO HOLE IN SOIL. TOTAL SLURRY USED ABOUT 20 GALLONS.		

RECEIVED
JAN 05 1990
DEPARTMENT OF ECOLOGY
NORTHWEST REGION

Work started 2 JAN, 19 90 Completed 2 JAN, 19 90

WELL CONSTRUCTOR CERTIFICATION:

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

NAME JOHN LAMANNA LANDAU ASSOC. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address PO BOX 1029, EDMONDS WA 98020-9

(Signed) [signature] (WELL DRILLER) License No. 1486

Contractor's Registration No. NA Date 3 JAN, 19 90

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20 (10/87) -1329-

KCSlip4 38958

SEA405488

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

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. A 07253

UNIQUE WELL I.D.

Water Right Permit No. 23/4E/4B

(1) OWNER: Name BOEING Address

(2) LOCATION OF WELL: County KING - NW 1/4 NE 1/4 Sec 4 T. 23 N. R. 4 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 9725 E. MARGINAL WAY SEATTLE

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

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

(5) DIMENSIONS: Diameter of well 2" inches.
Drilled feet. Depth of completed well ft.

(6) CONSTRUCTION DETAILS:

Casing installed: " Diam. from ft. to ft.
Welded ☐ " Diam. from ft. to ft.
Liner installed ☐ " Diam. from ft. to ft.
Threaded ☐

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

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

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

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

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

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

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
ABANDONED 2 WELLS		
#7A WAS 40½' SCREEN TO 30½' - 8" OVER DRILLED & PULLED SCREEN & RISER PIPE - PUMPED CEMENT BENT SLURRY		
& 2" WAS 20½ SCREEN TO 10½' OVER DRILLED & PULLED WELL CASING - PUMPED CEMENT & BENT SLURRY		
THESE WELLS WERE 5' A PART		

RECEIVED
NOV 29 1993
DEPT. OF ECOLOGY

Work Started 11/19, 19 93 Completed 11/19, 19

WELL CONSTRUCTOR CERTIFICATION:

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

NAME SOIL SAMPLING SERVICE (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 1415 MERIDIAN E PUYALLUP

(Signed) [signature] (WELL DRILLER) License No. 1611

Contractor's Registration No. SOILSS*34440 Date 11/20, 19 93

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38959

SEA405489

23/04E/04—

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

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 2730

WELL ABANDONMENT

Water Right Permit No. NA

(1) OWNER: Name BOEING COMPANY Address 9725 E. MARGINAL WAY SOUTH TUKWILA 98108

(2) LOCATION OF WELL: County KING NW ¼ NE ¼ Sec. 4 T. 23 N., R. 4E W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) 9725 E MARGINAL WAY SOUTH TUKWILA 98108

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

(4) TYPE OF WORK: Owner's number of well (if more than one) DC-953-1

Abandoned ☒ New well ☐ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

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

(6) CONSTRUCTION DETAILS:

Casing installed: _____" Diam. from _____ ft. to _____ ft.
Welded ☐ _____" Diam. from _____ ft. to _____ ft.
Liner installed ☐ _____" Diam. from _____ ft. to _____ ft.
Threaded ☐

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

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

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

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

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

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

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) ~~WELL LOG or~~ ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
WELL WAS ABANDONED ON 2 JAN 90 WITH FOLLOWING PROCEDURE		
(1) SURFACE FLUSH MOUNT PROTECTIVE CASING REMOVED.		
(2) BOTTOM OF PVC SCREEN BROKEN OUT WITH 30 FT LONG PIECE OF 5/8 IN REBAR.		
(3) PVC FILLED WITH BENTONITE SLURRY		
(4) CASING PULLED OUT OF GROUND WITH CHAIN AND BACKHOE.		
(5) BENTONITE SLURRY POURED INTO HOLE IN SOIL. TOTAL SLURRY USED ≈ 25 GAL		

RECEIVED
JAN 05 1990
DEPARTMENT OF ECOLOGY
NORTHWEST REGION

Work started 2 JAN 90, 19. Completed 2 JAN, 19 90

WELL CONSTRUCTOR CERTIFICATION:

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

NAME JOHN LAMANNA, LANDAU ASSOC (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address PO BOX 1029 EDMONDS WA 98020-912

(Signed) [signature] (WELL DRILLER) License No. 1436

Contractor's Registration No. NA Date 3 JAN, 19 90

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20 (10/87) -1329- 3

KCSlip4 38960

SEA405490

23-04-04

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

ANDERSON DEWATERING
WATER WELL REPORT
STATE OF WASHINGTON

Application No. ____
Permit No. ____

(1) OWNER: Name BVL SEITZ CONST Address 13810 PACHWMS SEATTLE WA

(2) LOCATION OF WELL: County KING — ¼ ¼ Sec. 4 T. 23 N., R. 4E

Bearing and distance from section or subdivision corner 112th & SR 99 SEATTLE WA

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

(4) TYPE OF WORK: Owner's number of well (if more than one) 3
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 36 inches.
Drilled 39 ft. Depth of completed well 30 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 12 " Diam. from 0 ft. to 10 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☐ " Diam. from ft. to ft.

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

Screens: Yes ☒ No ☐ Manufacturer's Name APPLEGATE HYDROPHILIC
Type PVC Model No.
Diam. 12 Slot size 060 from 10 ft. to 30 ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☒ No ☐ Size of gravel: PEA 3/8 –
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 6 ft.
Material used in seal BENTONITE GRANULES LOB
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name PROSSER ENPO
Type: DEWATERING SUBMERSIBLE H.P. 5

(8) WATER LEVELS: Land-surface elevation above mean sea level
Static level 9 ft. below top of well Date 12-7-88
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

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

MATERIAL	FROM	TO
BROWN SANDY SILT	0	3
GRAY SILTY SAND & SILT	3	9
GRAY SAND & SILT	9	30

3 TEMPORARY DEWATERING WELLS ON APPROX 50' CENTERS WITH NO SIGNIFICANT CHANGES IN STRATIFICATION OR SOIL TYPE

RECEIVED JAN 11 1989 DEPARTMENT OF ECOLOGY NORTHWEST REGION

Work started DEC 7, 1988 Completed DEC 9, 1988

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

NAME ANDERSON DEWATERING (Person, firm, or corporation) (Type or print)
Address PO BOX 3093
[Signed] William H Anderson (Well Driller)
License No. 1522 Date DEC 30, 1988

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38961

SEA405491

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

WATER WELL REPORT

STATE OF WASHINGTON

Water Right Permit No. 27N/4E/7m

(1) OWNER: Name BOEING COMPANY Address RENTON MUNICIPAL AIRPORT

(2) LOCATION OF WELL: County KING NW ¼ SW ¼ Sec. 7 T. 23N, R. 4E W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address)

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

(4) TYPE OF WORK: Owner's number of well (if more than one) 6

Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☒ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 30" inches.
Drilled 38 feet. Depth of completed well 36 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: PVC 12" Diam. from 0 ft. to 36 ft.
Welded ☐ Liner installed ☐ Threaded ☐ " Diam. from ft. to ft.

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

Screens: Yes ☒ No ☐
Manufacturer's Name
Type Model No.
Diam. 12 Slot size .050 from 16 ft. to 36 ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☒ No ☐ Size of gravel 1/4"
Gravel placed from 3 ft. to 38 ft.

Surface seal: Yes ☐ No ☒ To what depth? ft.
Material used in seal WILL BE EXCAVATED TO 20 FT
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? Depth of strata
Method of sealing strata off
GROUND WELL

(7) PUMP: Manufacturer's Name PROSSER
Type SUB H.P. .5

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 12 ft. below top of well Date 4-16-93
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: 20 gal./min. with 35 ft. drawdown after 1 hrs.
" " " "
" " " "

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
EXCAVATED	0	3
BROWN CLAY	3	20
BLACK SAND FINE	20	22
BROWN CLAY	22	35
BLACK SAND	35	38

RECEIVED
APR 20 1993
DEPT. OF ECOLOGY

Work started 4-12 1993 Completed 4-15 1993

WELL CONSTRUCTOR CERTIFICATION:

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

NAME Richard Lewis (PERSON, FIRM, OR CORPORATION) RICHARD LEWIS (TYPE OR PRINT)
ANDERSON DEWATERING

Address 5412-95th Ave Puyallup WA

(Signed) Richard Lewis (WELL DRILLER) License No. 0721

Contractor's Registration No. ANDRE N 411OPP Date 4-16-93, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20 (10/87) 1329

KCSlip4 38962

SEA405492

23/4E/7M
START CARD

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

ANDERSON DEWATERING
WATER WELL REPORT
STATE OF WASHINGTON

Application No. 202-9
Permit No.

(1) OWNER: Name Boeing Address Renton Boeing Airpark

(2) LOCATION OF WELL: County KING NW ¼ SW ¼ Sec. 7 T. 23 N., R. 4 E. M

Bearing and distance from section or subdivision corner

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

(4) TYPE OF WORK: Owner's number of well (if more than one) 6
New well ☐ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

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

(6) CONSTRUCTION DETAILS:

Casing installed: ..... " Diam. from ..... ft. to ..... ft.
Threaded ☐ ..... " Diam. from ..... ft. to ..... ft.
Welded ☐ ..... " Diam. from ..... ft. to ..... ft.

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

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

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

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

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

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

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) WELL LOG:

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

MATERIAL	FROM	TO
ABANDONMENT OF TEMP DEWATERING WELLS	0	35
Filled Casing With Bentonite & Concrete mix TO Surface of Casings		

RECEIVED
MAY 28 1993
DEPT. OF ECOLOGY

Work started 5-26, 1993 Completed 5-26, 1993

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME ANDERSON DEWATERING (Person, firm, or corporation) (Type or print)
Address PO BOX 3093 - FEDERAL WA 98063
[Signed] Leona F. Anderson (Well Driller)
License No. 2145 Date 5-26, 1993

KCSlip4 38963

SEA405493

23/04-9

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

ANDERSON DEWATERING
WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name HOS BROS Address 18120 NE 76th REDMOND WA 98052

(2) LOCATION OF WELL: County KING ¼ ¼ Sec. 9 T. 23 N., R. 4E W.M.

Bearing and distance from section or subdivision corner WESTERLY MARGIN OF STATE RD #1 11201 PACHWY S

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

(4) TYPE OF WORK: Owner's number of well (if more than one) 3 EA
New well ☒ Deepened ☐ Reconditioned ☐
Method: Dug ☐ Cable ☐ Rotary ☒ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 36 inches.
Drilled 32 ft. Depth of completed well 30 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 14" Diam. from 0 ft. to 30 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☐ " Diam. from ft. to ft.

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

Screens: Yes ☒ No ☐
Manufacturer's Name UNKNOWN
Type STEEL Model No.
Diam. 14 Slot size 3/16" from 10 ft. to 30 ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☒ No ☐ Size of gravel: 3/8 - PEA
Gravel placed from 3 ft. to 30 ft.

Surface seal: Yes ☒ No ☐ To what depth? 3 ft.
Material used in seal BENTONITE POWDER
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? — Depth of strata 10-?
Method of sealing strata off B

(7) PUMP: Manufacturer's Name FLYGT
Type: SUBMERSIBLE DEWATERING H.P. 5

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 12 ft. below top of well Date 4-7
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) WELL LOG:

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

MATERIAL	FROM	TO
FILL, RIP RAP & COBBLES	0	4
BROWN SILT CLAY	4	10
MOIST SILTY SAND BROWN WITH GRAY SANDY LAYERS TO	10	
GRAY SILTY SAND		18
BLACK SAND SEMI COARSE	18	
WITH SOME SMALL GRAVEL NEAR BOTTOM OF WELL APPROX 29'		32
LOG PERTAINS TO THREE EACH TEMPORARY DEWATERING WELLS ON 70' CENTERS WITH NO SIGNIFICANT CHANGES IN DEPTH OF SOILS OR AQUIFER		

Work started APRIL 7, 1988 Completed APRIL 7, 1988

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME ANDERSON DEWATERING (Person, firm, or corporation) (Type or print)

Address 2931 SW 314th FEDERAL WAY WA

[Signed] William H Anderson (Well Driller)

License No. 1522 Date APRIL 8, 1988

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38964

SEA405494

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

WATER WELL REPORT
STATE OF WASHINGTON

Application No. 6555
Permit No.

(1) OWNER: Name (b) (6) Address Rainier Golf Course

(2) LOCATION OF WELL: County King — NW¼ NW¼, Sec. 9 T. 23N., R. 4

Bearing and distance from section or subdivision corner

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

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

(5) DIMENSIONS: Diameter of well 12 inches.
Drilled 50 ft. Depth of completed well 50 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 12" Diam. from +2 ft. to 21'-6" ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

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

Screens: Yes ☒ No ☐
Manufacturer's Name Johnson
Type 304 Model No. SS
Diam. 10 Slot size 40 from 21'-6" ft. to 45'-6" ft.
Diam. Slot size from ft. to ft.

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

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Cement
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? Depth of strata
Method of sealing strata off

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

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 5' ft. below top of well Date
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom?
Yield: 275 gal./min. with 25 ft. drawdown after 12 hrs.
" " " "
" " " "

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

Time	Water Level	Time	Water Level	Time	Water Level

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

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

MATERIAL	FROM	TO
Topsoil	0	2
Sand + clay layers	2	18
Heaving sand	18	47
Clay	47	50

RECEIVED
JUN 21 1991
DEPT. OF ECOLOGY

RECEIVED
JUN 11 1991
DEPT. OF ECOLOGY

Work started 5-10 19 91 Completed 6-10

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

NAME Holt Drilling Inc (Person, firm, or corporation) (Type or print)
Address 10621 Tolt Rd E
[Signed] (Well Driller)
License No. 1099 Date 19

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38965

SEA405495

Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

STATE OF WASHINGTON

Water Right Permit No. 23/4E/10

(1) OWNER: Name BOEING Address PO BOX 3707 MAIL STOP 61-97 SEATT

(2) LOCATION OF WELL: County KING LOT 15 NW Sec 10 T 23 N., R 4E W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) 3717 120th PL S. TUKWILA

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

(4) TYPE OF WORK: Owner's number of well (if more than one) 3 EA

Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☒ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 30 inches.
Drilled 30 feet. Depth of completed well 30 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 12" Diam. from 0 ft. to 10 ft.
Welded ☐ Liner installed ☐ Threaded ☐ " Diam. from ft. to ft.

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

Screens: Yes ☒ No ☐
Manufacturer's Name WESTERN WELLSCREEN
Type PVC Model No.
Diam 12" Slot size .050" from 10 ft. to 30 ft.
Diam Slot size from ft. to ft.

Gravel packed: Yes ☒ No ☐ Size of gravel GRANULAR
Gravel placed from 30 ft. to 3 ft.

Surface seal: Yes ☒ No ☐ To what depth? 3 ft.
Material used in seal BENTONITE #8
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name PROSSER
Type SUBMERSIBLE DEWATERING H.P. 5

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 6 ft. below top of well Date
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
FILL (PIT RUN)	0	3
PEAT WOOD CHIPS (FILL?)	3	5
GRAY SILT	5	10
GRAY BLACK SILTY SAND	10	30

RECEIVED
SEP 03 1993
DEPT. OF ECOLOGY

Work started 7-8 19. Completed 7-15 1993

WELL CONSTRUCTOR CERTIFICATION:

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

NAME ANDERSON DEWATERING (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address PO BOX 3093 FEDERAL WAY W

(Signed) William Anderson (WELL DRILLER) License No 1522

Contractor's Registration No ANDERIID*PP Date AUG 30 1993

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38966

SEA405496

Second Copy—Owner's Copy
Third Copy—Driller's Copy

STATE OF WASHINGTON

Water Right Permit No. 23/4E/10

(1) OWNER: Name BOEING Address PO 3707 MAILSTOP 61-97 SEATTLE

(2) LOCATION OF WELL: County KING LOT 15 NW ¼ Sec. 10 T. 23 N., R. 4E

(2a) STREET ADDDRESS OF WELL (or nearest address) 3411 126th PL. S. TUKWILA

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

(4) TYPE OF WORK: Owner's number of well (if more than one) 3 EA

Abandoned ☒ New well ☐ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 30 inches. Drilled 30 feet. Depth of completed well 30 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: ____ " Diam. from ____ ft. to ____ ft.
Welded ☐ Liner installed ☐ Threaded ☐ ____ " Diam. from ____ ft. to ____ ft.
____ " Diam. from ____ ft. to ____ ft.

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

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

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

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

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

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

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
ABANDONED 3 EACH TEMPORARY		
DEWATERING WELLS		
USING LEAN MIX		
CEMENT + WITHDRAWING SCREEN		

RECEIVED
SEP 03 1993
DEPT. OF ECOLOGY

Work started 8-20, 19 Completed 8-20, 19

WELL CONSTRUCTOR CERTIFICATION:

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

NAME ANDERSON DEWATERING (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address P O BOX 3093 FEDERAL WAY
(Signed) William H Anderson (WELL DRILLER) License No 1522
Contractor's Registration No ANDERDI1DXPP Date AUG 30, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38967

SEA405497

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

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. A22201

UNIQUE WELL I.D. #

Water Right Permit No. 23/4/10R

(1) OWNER: Name (b) (6) [redacted] Address (b) (6) [redacted]

(2) LOCATION OF WELL: County King SE 1/4 SE 1/4 Sec 10 T. 23 N., R. 4 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 12246 - 46th Ave. S., Tukwila

(3) PROPOSED USE: [X] Domestic [ ] Irrigation [ ] DeWater Industrial [ ] Test Well [ ] Municipal [ ] Other [ ]

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

(5) DIMENSIONS: Diameter of well 2 inches.
Drilled 18 feet. Depth of completed well 18 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 2" Diam. from Ø ft. to 15 ft.
Welded [ ] " Diam. from ft. to ft.
Liner installed [ ] " Diam. from ft. to ft.
Threaded [ ]

Perforations: Yes [ ] No [X]
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes [X] No [ ]
Manufacturer's Name UNKNOWN (WELL POINT)
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes [ ] No [X] Size of gravel
Gravel placed from ft. to ft.

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

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

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 8 ft. below top of well Date 5-18-94
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

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

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Artesian gal./min. with stem set at ft. for hrs.
Artesian flow g.p.m. Date
Was a chemical analysis [illegible] [ ]

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
BENTONITE SLURRY	Ø	18
CASING & SCREEN REMOVED		

RECEIVED
MAY 25 1994
DEPT. OF ECOLOGY

Work Started 5-18, 19. Completed 5-18, 1994

WELL CONSTRUCTOR CERTIFICATION:

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

NAME S R STALEY DRILLING (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address P.O. BOX 687 STANWOOD WA.

(Signed) [signature] (WELL DRILLER) License No. 1904

Contractor's Registration No. STEVER172PF Date 5-21, 1994

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38968

SEA405498

Startlan 01722
23/24E-11

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

ANDERSON DEWATERING
WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name PANETTA BROS CONST Address 5212TH ST KENT

(2) LOCATION OF WELL: County KING — NW ¼ NE ¼ Sec 11 T 23 N., R 4 E

Bearing and distance from section or subdivision corner

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

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

(5) DIMENSIONS: Diameter of well 12" inches.
Drilled 30 ft. Depth of completed well 30 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 12" Diam. from 0 ft. to 30 ft.
Threaded ☐ ....." Diam. from ..... ft. to ..... ft.
Welded ☐ ....." Diam. from ..... ft. to ..... ft.

Perforations: Yes ☒ No ☐
Type of perforator used SLOTTED
SIZE of perforations 1/8 X 2 1/2 in. by ..... in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

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

Gravel packed: Yes ☒ No ☐ Size of gravel: 3/16 +/-
Gravel placed from 3 ft. to 30' ft.

Surface seal: Yes ☒ No ☐ To what depth? 3 ft.
Material used in seal HOLE PLUGE
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name PROSSER
Type: Subm H.P. 3 1/2

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 8 ft. below top of well Date 2-2-90
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? AD
Yield: 30 gal./min. with 30 ft. drawdown after 10 MIN hrs.
" " " "
" " " "

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) WELL LOG:

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

MATERIAL	FROM	TO
TEMP DEWATERING WELL		
FILL MATERIAL SAND	0	18
GREY FINE SILTY SAND	18	30

Work started 2-1 1990 Completed 2-2 1990

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME JOHN E ANDERSON DEWATERING (Person, firm, or corporation) (Type or print)

Address 2931-SW 314TH FEDERAL WAY WA

[Signed] [signature] (Well Driller)

License No 0721 Date 2-3, 1990

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38969

SEA405499

Second Copy—Owner's Copy
Third Copy—Driller's Copy

STATE OF WASHINGTON

Water Right Permit No. 23/4E/11G

(1) OWNER: Name ALDARRA CORP PARK Address 212th + 64th S

(2) LOCATION OF WELL: County KING SW ¼ NE ¼ Sec 11 T 23 N., R 4E W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) 212th + 64 S KENT WA

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

(4) TYPE OF WORK: Owner's number of well (if more than one)

Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted ☒

(5) DIMENSIONS: Diameter of well 1½" inches.

Drilled 23 feet. Depth of completed well 23 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 1½" Diam. from 0 ft. to 20 ft.

Welded ☐ " Diam. from ft. to ft.

Liner installed ☐ " Diam. from ft. to ft.

Threaded ☐

Perforations: Yes ☐ No ☐

Type of perforator used

SIZE of perforations in. by in.

perforations from ft. to ft.

perforations from ft. to ft.

perforations from ft. to ft.

Screens: Yes ☒ No ☐

Manufacturer's Name AARDVARK

Type PVC Model No.

Diam. 1½" Slot size .020 from 20 ft. to 23 ft.

Diam. Slot size from ft. to ft.

Gravel packed: Yes ☒ No ☐ Size of gravel COARSE WASHED SAND

Gravel placed from 2 ft. to 23 ft.

Surface seal: Yes ☒ No ☐ To what depth? 2 ft.

Material used in seal BENTONITE #8

Did any strata contain unusable water? Yes ☐ No ☒

Type of water? Depth of strata

Method of sealing strata off

(7) PUMP: Manufacturer's Name ANDERSON DEWATERING

Type: VACUUM WELLPOINT DEWATERING HP 40

(8) WATER LEVELS: Land-surface elevation above mean sea level ft

Static level 8 ft. below top of well Date

Artesian pressure lbs. per square inch Date

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

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

Was a pump test made? Yes ☐ No ☒ If yes, by whom?

Yield gal./min with ft. drawdown after hrs.

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test

Bailer test gal./min with ft. drawdown after hrs.

Airtest gal./min with stem set at ft. for hrs.

Artesian flow g.p.m. Date

Temperature of water Was a chemical analysis made? Yes No

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
FILL - GRAVEL SAND	0	2
SILT BROWN DENSE	2	5
SANDY SILT GRAY BROWN	5	8
SAND GRAY BLACK	8	23

INSTALLED 163 EACH TEMPORARY DEWATERING WELLPOINTS ALONG CONTRACTOR'S TRENCH LINE WITH NO SIGNIFICANT CHANGE IN SOIL FORMATION

Rcvd 8-4-93

Work started MAR 30, 19. Completed JULY 20, 1993

WELL CONSTRUCTOR CERTIFICATION:

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

NAME ANDERSON DEWATERING (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address PO BOX 3093 FEDERAL WAY

(Signed) William H Anders (WELL DRILLER) License No. 1522

Contractor's Registration No. ANDERDW[illegible] Date JULY 31, 1993

(USE ADDITIONAL SHEETS IF NECESSARY)

838-7448

KCSlip4 38970

SEA405500

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

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 202295

Water Right Permit No. 23/4E/11-G

(1) OWNER: Name ALDARRA CORP. PARK FERGUSON CONSTRUCTION Address 212th & 64th AVE KENT

(2) LOCATION OF WELL: County KING SW ¼ NE ¼ Sec. 11 T. 23 N., R. 4E W.

(2a) STREET ADDDRESS OF WELL (or nearest address) 212th & 64th AVE KENT WA

(3) PROPOSED USE: [ ] Domestic [ ] Irrigation [X] DeWater Industrial [ ] Test Well [ ] Municipal [ ] Other [ ]

(4) TYPE OF WORK: Owner's number of well (if more than one) 80 EACH

Abandoned [ ] New well [X] Deepened [ ] Reconditioned [ ] Method: Dug [ ] Cable [ ] Rotary [ ] Bored [ ] Driven [ ] Jetted [X]

(5) DIMENSIONS: Diameter of well 1 1/2" x 8 inches.
Drilled 23 feet. Depth of completed well 23 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 1 1/2" Diam. from 0 ft. to 20 ft.
Welded [ ] ____" Diam. from ____ ft. to ____ ft.
Liner installed [ ] ____" Diam. from ____ ft. to ____ ft.
Threaded [ ] ____" Diam. from ____ ft. to ____ ft.

Perforations: Yes [ ] No [X]
Type of perforator used ____
SIZE of perforations ____ in. by ____ in.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.

Screens: Yes [X] No [ ]
Manufacturer's Name AARDVARK HYDROPHYLIC
Type PVC Model No. ____
Diam. 1 1/2" Slot size .030" from 20 ft. to 23 ft.
Diam. ____ Slot size ____ from ____ ft. to ____ ft.

Gravel packed: Yes [X] No [ ] Size of gravel 20-40 SILICA AND COARSE CONCRETE SAND
Gravel placed from 25 ft. to ____ ft.

Surface seal: Yes [X] No [ ] To what depth? 2 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes [X] No [ ]
Type of water? HEAVY IRON Depth of strata 7
Method of sealing strata off ____

(7) PUMP: Manufacturer's Name ANDERSON DEWATERING
Type: VACUUM WELLPOINT DEWATERING H.P. 40 Hp

(8) WATER LEVELS: Land-surface elevation above mean sea level 31 ft.
Static level 3 ft. below top of well Date 4-2-93
Artesian pressure ____ lbs. per square inch Date ____
Artesian water is controlled by ____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [X] No [ ] If yes, by whom? ANDERSON
Yield: 60 gal./min with 16 ft. drawdown after 200 hrs.
" " " "
" " " "

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
SOFT TO MEDIUM STIFF BROWN SILT WITH SOME FINE SAND (MOIST)	0	3
LOOSE BROWN TO GRAY FINE SAND WITH A TRACE OF SILT (WET)	3	12
VERY SOFT GRAY SILT (WET)	12	1[illegible]
VERY LOOSE TO LOOSE BLACK SAND (WET)	13	18
SOFT TO MEDIUM STIFF GRAY SILT (WET)	18	20
LOOSE GRAY SILTY FINE SAND (WET)	20	2[illegible]

RECEIVED
APR 20 1993
DEPT. OF ECOLOGY

Work started MAR 22, 19__. Completed ____, 19__.

WELL CONSTRUCTOR CERTIFICATION:

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

NAME ANDERSON DEWATERING (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address PO BOX 3093 FEDERAL WAY WA
(Signed) William F. Anderson (WELL DRILLER) License No. 1522
Contractor's Registration No. ANDERDIDFP Date APRIL 16, 1993

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38971

SEA405501

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

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 213427

Water Right Permit No. 24/3E/13

(1) OWNER: Name SALMON BAY STEEL Address 2424 SW ANDOVER SEATTLE, WASH.

(2) LOCATION OF WELL: County KING SW ¼ NW ¼ Sec 13 T 24 N., R 3E W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) 2424 SW. ANDOVER

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

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

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 511 feet. Depth of completed well 504.5 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 16" Diam. from 0 ft. to 54 ft.
Welded ☒ 12" Diam. from 0 ft. to 456 ft.
Liner installed ☐ Threaded ☐ 8" Diam. from +2 ft. to 453.5 ft.

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

Screens: Yes ☒ No ☐
Manufacturer's Name COOK
Type 304 STAINLESS Model No.
Diam. 6" PIPE 040 Slot size .010 from 456.5 ft. to 456.5 ft.
Diam. 6" PIPE Slot size .060 from 457.5 ft. to 500.5 ft.

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

Surface seal: Yes ☒ No ☐ To what depth? 54 ft.
Material used in seal GROUT
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

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

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level +OR -5 ft. below top of well Date 3-15-93
Artesian pressure lbs. per square inch Date
Artesian water is controlled by CAP WELDED (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? HOLT TESTING
Yield: 500 gal./min. with 97 ft. drawdown after 24 hrs.
" " " "
" " " "

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
FILL CONCRETE, BRICK, SAND + GRVLS	0	5
GRAY SANDY SILT SOME CLAY	5	16
GRAY SAND + GRVL. WITH SOME SILT	16	20
GRAY SILT BOUND GRVLS.	20	49
GRAY SILT SOME GRVLS.	49	65
GRAY SILT GRVL. INCREASING WITH DEPTH	65	72
GRAY SAND SOME GRVL. WATER BEARING	72	81
GRAY CLAY HARD STICKY WITH GRVL. AND COBBLES	81	93
GRAY SAND FINE WITH TRACES OF SILT + WOOD WATER BEARING	93	98
GRAY SILT HARD	98	105
GRAY SILTY CLAY HARD + STICKY	105	128
GRAY SILTY CLAY WITH SOME GRVL STICKY	128	137
GRAY SAND + SILT INNER BEDDED WITH GRAY CLAY	137	151
GRAY SILTY SAND SOME GRVL. WET	151	165
GRAY SILT + GRVL. HARD	165	172
GRAY SILT + SAND	172	192
GRAY CLAY WITH GRVL. HARD STICKY	192	213
GRAY CLAY SOME GRVL. + ROCK SOFT	213	262
GRAY CLAY WITH GRVL. + ROCK STICKY	262	301
GRAY SILTY CLAY	301	331
GRAY CLAY WITH SOME SAND	331	340
GRAY CLAY WITH SAND	340	408
GRAY CLAY	408	428
GRAY CLAY WITH GRVLS.	428	435
GRAY SILT BOUND SAND WATER BEARING	435	443
GRAY SAND + GRVLS. FINE-MED. WATER BEARING	443	460
GRAY + BLACK SAND COARSE WATER BEARING	460	474
GRAY SANDY SILT	474	480

Work started 12-15, 19 92 Completed 3-22, 19 93

RECEIVED APR 20 1993 DEPT. OF ECOLOGY

WELL CONSTRUCTOR CERTIFICATION:

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

NAME HOLT TESTING INC. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 10621 TODD RD. EAST PUYALLUP, WA.

(Signed) [signature] (WELL DRILLER) License No. 1691

Contractor's Registration No. HOLTTI*DE703 Date 3-24, 1993

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 060-1 20 (10 87) 1329

KCSlip4 38972

SEA405502

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

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 41342 1

Water Right Permit No. 24/3E/13

(1) OWNER: Name Salmon Bay Steel Address 2424 SW Andover Seattle, WA

(2) LOCATION OF WELL: County King SW ¼ NW ¼ Sec 13 T. 24 N., R. 3E W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) 2424 SW Andover

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

(4) TYPE OF WORK: Owner's number of well (if more than one)

Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☒ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.

Drilled 571 feet. Depth of completed well 504.5 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 16" Diam. from 0 ft. to 54 ft.

Welded ☒ 12" Diam. from 0 ft. to 356 ft.

Liner installed ☐ Threaded ☐ 8" Diam. from +2 ft. to 453.5 ft.

Perforations: Yes ☐ No ☒

Type of perforator used

SIZE of perforations in. by in.

perforations from ft. to ft.

perforations from ft. to ft.

perforations from ft. to ft.

Screens: Yes ☒ No ☐

Manufacturer's Name Cook

Type 304 Stainless Model No.

Diam 6" Pipe Slot size .040 from 456.5 ft. to 459.5 ft.

Diam 6" Pipe Slot size .060 from 459.5 ft. to 500.5 ft.

Gravel packed: Yes ☐ No ☒ Size of gravel

Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 54 ft.

Material used in seal Grout

Did any strata contain unusable water? Yes ☐ No ☒

Type of water? Depth of strata

Method of sealing strata off

(7) PUMP: Manufacturer's Name

Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.

Static level +2 or -5 ft. below top of well Date 3-15-93

Artesian pressure lbs. per square inch Date

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

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

Was a pump test made? Yes ☒ No ☐ If yes, by whom? Holt Testing

Yield: 500 gal./min. with 99 ft. drawdown after 24 hrs.

" " " "

" " " "

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test

Bailer test gal./min. with ft. drawdown after hrs.

Airlift gal./min. with stem set at ft. for hrs.

Artesian flow g.p.m. Date

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
FILL CONCRETE, BRICK, SAND + GRVLS	0	5
GRAY SANDY SILT SOME CLAY	5	16
GRAY SAND + GRVL. WITH SOME SILT	16	20
GRAY SILT BOUND GRVLS.	20	49
GRAY SILT SOME GRVLS.	49	65
GRAY SILT GRVL INCREASING WITH DEPTH	65	72
GRAY SAND SOME GRVL. WATER BEARING	72	81
GRAY CLAY HARD STICKY WITH GRVL. AND COBBLES	81	93
GRAY SAND FINE WITH TRACES OF SILT + WOOD WATER BEARING	93	97
GRAY SILT HARD	97	105
GRAY SILTY CLAY HARD + STICKY	105	128
GRAY SILTY CLAY WITH SOME GRVL STICKY	128	137
GRAY SAND + SILT INNER BEDDED WITH GRAY CLAY	137	151
GRAY SILTY SAND SOME GRVL. WET	151	165
GRAY SILT + GRVL. HARD	165	172
GRAY SILT + SAND	172	192
GRAY CLAY WITH GRVL. HARD STICKY	192	213
GRAY CLAY SOME GRVL. + ROCK SOFT	213	262
GRAY CLAY WITH GRVL. + ROCK STICKY	262	301
GRAY SILTY CLAY	301	331
GRAY CLAY WITH SOME SILT	331	340
GRAY CLAY WITH SAND	340	407
GRAY CLAY	407	428
GRAY CLAY WITH GRVLS.	428	435
GRAY SILT BOUND SAND + GRVL. WATER BEARING	435	443
GRAY SAND + GRVLS. FINE-MED. WATER BEARING	443	460
GRAY + BLACK SAND COARSE WATER BEARING	460	474
GRAY SANDY SILT	474	485

Work started 12-15, 19 92 Completed 3-22, 19 93

RECEIVED APR 20 1993 DEPT. OF ECOLOGY

WELL CONSTRUCTOR CERTIFICATION:

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

NAME Holt Testing Inc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 10621 Todd Rd East Puyallup, WA.

(Signed) [signature] (WELL DRILLER) License No. 1691

Contractor's Registration No. HOLTT2*08703 Date 3-24, 19 93

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20 (10/87) 1329

KCSlip4 38973

SEA405503

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...ent of Ecology
...d Copy—Owner's Copy
...d Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 213427

Water Right Permit No. 24/3E/13E

(1) OWNER: Name SALMON BAY STEEL Address

(2) LOCATION OF WELL: County ____ ¼ ____ ¼ Sec ____ T ____ N., R ____ W.M.

(2a) STREET ADDRESS OF WELL (or nearest address)

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

(4) TYPE OF WORK: Owner's number of well (if more than one)

Abandoned ☐ New well ☐ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well ____ inches.

Drilled ____ feet. Depth of completed well ____ ft.

(6) CONSTRUCTION DETAILS:

Casing installed: ____ " Diam. from ____ ft. to ____ ft.

Welded ☐ ____ " Diam. from ____ ft. to ____ ft.

Liner installed ☐

Threaded ☐ ____ " Diam. from ____ ft. to ____ ft.

Perforations: Yes ☐ No ☐

Type of perforator used

SIZE of perforations ____ in. by ____ in.

____ perforations from ____ ft. to ____ ft.

____ perforations from ____ ft. to ____ ft.

____ perforations from ____ ft. to ____ ft.

Screens: Yes ☐ No ☐

Manufacturer's Name

Type ____ Model No.

Diam. ____ Slot size ____ from ____ ft. to ____ ft.

Diam. ____ Slot size ____ from ____ ft. to ____ ft.

Gravel packed: Yes ☐ No ☐ Size of gravel

Gravel placed from ____ ft. to ____ ft.

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

Material used in seal

Did any strata contain unusable water? Yes ☐ No ☐

Type of water? ____ Depth of strata

Method of sealing strata off

(7) PUMP: Manufacturer's Name

Type: ____ H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ____ ft.

Static level ____ ft. below top of well Date

Artesian pressure ____ lbs. per square inch Date

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

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

Was a pump test made? Yes ☐ No ☐ If yes, by whom?

Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.

" " " "

" " " "

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test

Bailer test ____ gal./min. with ____ ft. drawdown after ____ hrs.

Artest ____ gal./min. with stem set at ____ ft. for ____ hrs.

Artesian flow ____ g.p.m. Date

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
GRAY & BLACK COARSE SAND & GRVLS	480	487
SILT BINDER WATER BEARING		
GRAY & BLACK SAND & GRVLS. WITH	487	502
COBBLES WATER BEARIN		
GRAY SAND SILTY FINE	502	511

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APR 20 1993
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Work started 12-15-92, 19. Completed 3-22, 1993

WELL CONSTRUCTOR CERTIFICATION:

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

NAME HOLT TESTING INC. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 10621 TODD RD EAST PUYALLUP, WA.

(Signed) [signature] (WELL DRILLER) License No. 1691

Contractor's Registration No. HOLTTE#08703 Date 3-24, 1993

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38974

SEA405504

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

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 24/4E/5 E

Water Right Permit No.

(1) OWNER: Name Metro Address Exchange Bldg, 821 2nd Ave, Seattle W

(2) LOCATION OF WELL: County King NW¼ SW¼ NW¼ Sec 5 T 24 N. R 4 E

(2a) STREET ADDDRESS OF WELL (or nearest address) South Main St., between 4th and 5th Avenues, Seattle

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

(4) TYPE OF WORK: Owner's number of well (if more than one) DW-1

Abandoned ☑ New well ☐ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 12" casing, 24" borehole inches.
Drilled Approx. 70 feet. Depth of completed well ~ 70 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 12" Diam. from 0 ft. to ~50 ft.
Welded ☐ ____" Diam. from ____ ft. to ____ ft.
Liner installed ☐ ____" Diam. from ____ ft. to ____ ft.
Threaded ☐

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

Screens: Yes ☑ No ☐
Manufacturer's Name
Type PVC Model No.
Diam. 12" Slot size ____ from ~50 ft. to ~70 ft.
Diam. ____ Slot size ____ from ____ ft. to ____ ft.

Gravel packed: Yes ☑ No ☐ Size of gravel
Gravel placed from 0 ft. to ~70 ft.

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

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

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

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

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

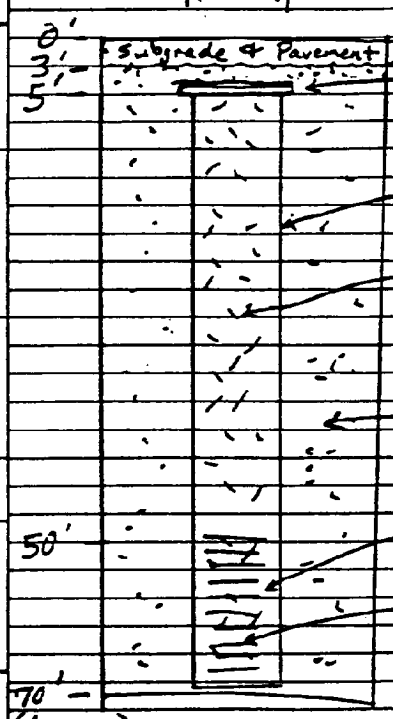
Time	Water Level	Time	Water Level	Time	Water Level

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
Upper 5' of casing were cut off during abandonment.		



Not to scale.

Work started Feb. 5, 19. Completed Approximately Feb. 5, 19

WELL CONSTRUCTOR CERTIFICATION:

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

Constructed 1986 by Hokkaido Drilling & Developing Corp.

NAME Abandoned by Frank Coluccio Construction (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 9600 ML King Way So. Seattle, WA. 98118

(Signed) [signature] License No. FR-AN-[illegible]

Contractor's Registration No. ____ Date Nov. 9, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

[illegible] For abandonment granted by [illegible]

KCSlip4 38975

SEA405505

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MAY 0 6 1991
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Carb
W-5610-01

SHANNON & WILSON, INC.
Geotechnical Consultants
Engineering and Applied Geosciences

Over 35 Years of Excellence

400 North 34th Street, Suite 100 • P.O. Box C-30313 • Seattle, WA 98103 • (206) 632-8020 • Fax: (206) 633-6777

May 2, 1991

Mr. Herman H. Higgins, Section Supervisor
Department of Ecology
Northwest Regional Office
4350 150th Avenue N.E.
Redmond, Washington 98052

RE: ABANDONMENT OF DEWATERING WELL DW-1, METRO BUS TUNNEL PROJECT, SOUTH PORTAL AREA

Dear Mr. Higgins:

Please find enclosed a Water Well Report for the dewatering well DW-1, as requested in your letter dated October 22, 1990. We recently received the report signed by Frank Collucio Construction Company, who did the abandonment and are forwarding it to you for your records. We trust this completes all the items necessary to finalize the abandonment of this well.

If you have any questions, please contact me at your convenience.

Sincerely,

SHANNON & WILSON, INC.

C. David Tonkin, P.E.
Senior Project Manager

CBT/tlm

Enclosure: As noted

cc: Paul Miller, METRO

W-5610-01.LT2/CDT-lkd/tlm

Seattle • Everett • Fairbanks • Anchorage • St. Louis

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CONSULTANT William L. Shannon P.E.

KCSlip4 38976

SEA405506

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Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. [redacted] 24/4/5L

Water Right Permit No. _____

1) OWNER: Name Texaco Address 511 Dearborn Seattle

2) LOCATION OF WELL: County 511 Dearborn Seattle NE ¼ SW ¼ Sec 5 T 24 N, R 4 E W.M.

2a) STREET ADDDRESS OF WELL (or nearest address) 511 Dearborn

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

4) TYPE OF WORK: Owner's number of well (if more than one) _____

Abandoned ☐ New well ☑ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☑ Driven ☐ Jetted ☐

5) DIMENSIONS: Diameter of well 6" inches.

Drilled 25 feet. Depth of completed well 25 ft.

6) CONSTRUCTION DETAILS:

Casing installed: PVC Diam. from 0 ft. to 25 ft.

Welded ☐ Liner installed ☐ Threaded ☑ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☐

Type of perforator used _____

SIZE of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☑ No ☐

Manufacturer's Name Johnson

Type PVC Model No. _____

Diam. 6" Slot size .020 from 10 ft. to 25 ft.

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

Gravel packed: Yes ☑ No ☐ Size of gravel 8/12 sand

Gravel placed from 8 ft. to 25 ft.

Surface seal: Yes ☑ No ☐ To what depth? 8 ft.

Material used in seal Bentonite chips

Did any strata contain unusable water? Yes ☐ No ☐

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level _____ ft. below top of well Date _____

Artesian pressure _____ lbs. per square inch Date _____

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

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

Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

" " " "

" " " "

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

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

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

Artesian flow _____ g.p.m. Date _____

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
Fill	0	13
Sands & silts Light Gray	13	25

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JUN 12 1992
DEPT. OF ECOLOGY

Work started 6-10, 19. Completed 6-10, 1992

WELL CONSTRUCTOR CERTIFICATION:

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

NAME Cascade Drilling INC (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address P.O Box 1184 Woodinville

(Signed) Michael Gilbert (WELL DRILLER) License No. 1890

Contractor's Registration No. CASCADEIOBBEK Date 6-11, 1992

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38977

SEA405507

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

WATER WELL REPORT

STATE OF WASHINGTON

24/4/5L

RECEIVED

JUN 26 1992

DEPT. OF ECOLOGY

Water Right Permit No. _____

(1) OWNER: Name Texaco Address 511 Dearborn

(2) LOCATION OF WELL: County King N.E. ¼ SW ¼ Sec. 5 T 24 N., R 4E W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) _____

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

(4) TYPE OF WORK: Owner's number of well (if more than one) 1

Abandoned ☐ New well ☑ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 4" inches.

Drilled _____ feet. Depth of completed well _____ ft.

(6) CONSTRUCTION DETAILS:

Casing installed: P.V.C. Diam. from 0 ft. to 20' ft.

Welded ☐ Diam. from _____ ft. to _____ ft.

Liner installed ☑ Threaded ☐ Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☐

Type of perforator used _____

SIZE of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☑ No ☐

Manufacturer's Name Johnson

Type .020 Model No. _____

Diam. 4" Slot size .020 from 5 ft. to 20 ft.

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

Gravel packed: Yes ☑ No ☐ Size of gravel 8/12 Sand

Gravel placed from 4 ft. to 20 ft.

Surface seal: Yes ☑ No ☐ To what depth? 0-3' ft.

Material used in seal Bentonite chips

Did any strata contain unusable water? Yes ☐ No ☑

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level _____ ft. below top of well Date _____

Artesian pressure _____ lbs. per square inch Date _____

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

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

Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____

Yield _____ gal./min. with _____ ft. drawdown after _____ hrs.

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

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

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

Artesian flow _____ g.p.m. Date _____

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
Top soil	0'	15
Sand & gravel light brown	15	20'

Work started 6-24, 19. Completed 6-24, 1992

WELL CONSTRUCTOR CERTIFICATION:

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

NAME Cascade Drilling INC (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 20140 136TH ave NE

(Signed) [signature] (WELL DRILLER) License No. 1890

Contractor's Registration No. CASCADI 088KK Date 6-24-92, 1992

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38978

SEA405508

Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 24/4E/7

Water Right Permit No.

(1) OWNER: Name Kipper & Sons Engineers Inc. Address 3215 13th Ave. S.W., Seattle, WA

(2) LOCATION OF WELL: County King County ¼ SW ¼ Sec 7 T 24 N., R 4E W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) 3215 13th Ave. S. W.

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

(4) TYPE OF WORK: Owner's number of well (if more than one) 1

Abandoned ☐ New well ☐ Deepened ☐ Reconditioned ☐ Method: Dug ☒ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 24" I.D. inches.
Drilled XXXX feet. Depth of completed well 4'6" ft.

(6) CONSTRUCTION DETAILS: 2" thick cement tile

Casing installed: ____ " Diam. from ____ ft. to ____ ft.
Welded ☐ ____ " Diam. from ____ ft. to ____ ft.
Liner installed ☐ ____ " Diam. from ____ ft. to ____ ft.
Threaded ☐

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

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

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

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

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

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

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

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
Catch basin or dry well installed several years ago to accommodate standing water. No longer used - covered with steel plate.		

RECEIVED
FEB 18 1999
DEPARTMENT OF ECOLOGY
NORTHWEST REGION

Work started, 19. Completed, 19

WELL CONSTRUCTOR CERTIFICATION:

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

NAME (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address

(Signed) (WELL DRILLER) License No.

Contractor's Registration No. Date, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38979

SEA405509

KIPPER & SONS ENGINEERS INC.
POWER PLANT DESIGN AND CONSTRUCTION
3215 · 13TH AVENUE S.W. / SEATTLE, WASHINGTON 98134-1033 / PHONE (206) 622-4545
CONTRACTORS REGISTRATION NO. KI-PP-ES-E288BC

February 12, 1990

RECEIVED
FEB 13 1990
DEPARTMENT OF ECOLOGY
NORTHWEST REGION

Department of Ecology
4350 150th Ave. N.E.
Redmond, WA 98052-5301

Attention: Barbara Trejo
Elliott Bay Action Team

Re: Letter dated 2-9-90 - Verification Inspection

Dear Ms. Trejo:

An on site inspection of the property located at 3215 13th Ave. S.W., Seattle, Wa, has revealed two (2) holes in the ground. The holes are cased with concrete pipe with dirt bottoms.

Your letter of November 8, 1989 classified these holes as Class IV wells and gave us the option to register them or abandon same in accordance with Chapter 173-160 WAC, Undergound Injection Control.

We have elected to register the wells. Locations are noted on the enclosed drawing. Water well reports are enclosed.

Very truly yours,

KIPPER & SONS ENGINEERS INC.

Dave Bucy

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

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Seattle water Dept. Address 821 Second Ave Seattle

(2) LOCATION OF WELL: County King ¼ SE ¼ Sec. 8 T. 24 N., R. 4 E.
Bearing and distance from section or subdivision corner water Dept. operations center Airport way

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

(4) TYPE OF WORK: Owner's number of well (if more than one) 5
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 300 ft. Depth of completed well 300 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 8 " Diam. from +1 ft. to 300 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

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

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

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

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

(7) PUMP: Manufacturer's Name
Type: N/A H.P.

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

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

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

MATERIAL	FROM	TO
Dark Brown sand gravel clay	0	3
Dark Brown sand clay Rocks	3	10
Brown sandy clay gravel water	10	35
Brown course sand clay Rocks	35	80
light gray sand clay gravel H2O	80	106
gray sand clay gravel Hard.	106	126
gray silt sand gravel Rocks H2O	126	160
gray sand silt, clay gravel H2O	160	300

RECEIVED
AUG 29 1983
DEPT. OF ECOLOGY

Work started May 4, 1983. Completed May 26, 1983

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

NAME B & J Drilling Co
(Person, firm, or corporation) (Type or print)
Address 9026 38th Ave SW, Seattle
[Signed] Donald Cannon by [illegible]
(Well Driller)
License No. 0924 Date 8/28, 1983

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38981

SEA405511

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

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Seattle water Dept. Address 821 Second Ave Seattle

(2) LOCATION OF WELL: County King — ¼ NW ¼ Sec 16 T 24 N., R 4E W.M.

Bearing and distance from section or subdivision corner Beacon Hill Cedar River pipeline @ Beacon

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

(4) TYPE OF WORK: Owner's number of well (if more than one) 3
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 305 ft. Depth of completed well 305 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 8" Diam. from +1 ft. to 304 ft.
Threaded ☐ ..... " Diam. from ..... ft. to ..... ft.
Welded ☒ ..... " Diam. from ..... ft. to ..... ft.

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

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

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

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

(7) PUMP: Manufacturer's Name N/A
Type: ..... H.P.

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

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) WELL LOG:

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

MATERIAL	FROM	TO
Dark top soil	0	3
Dark Brown sand clay gravel	3	14
light. Brown clay sand streaks	14	28
Dark Brown w/ gray sand clay	28	44
gray silty clay	44	120
gray clay str. & sand GR. water	120	140
gray Clay Fine sand water	140	160
gray Clay silt. Fine sand water	160	191
gray clay silt. Gravel Rocks	191	206
gray Clay stickie silt. Trace [illegible]	206	298
gray Coarse sand gravel Heaving	298	300
Drove pipe ahead to stop	300	304
Heaving Drill out To 300'		
stopped with plug in pipe		

RECEIVED
AUG 29 1983
DEPT. OF ECOLOGY

Work started April 19, 1983 Completed May 3, 1983

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report true to the best of my knowledge and belief.

NAME B & J Drilling Co (Person, firm, or corporation) (Type or print)

Address 9026 38th Ave SW.

[Signed] T. L. Cannon & Donald [illegible] (Well Driller)

License No. 0071-0924 Date 5/20, 1983

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38982

SEA405512

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

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....

Permit No. .....

(1) OWNER: Name City of Seattle, Seattle City Light Address 1015 3rd Ave, Seattle, WA. 98104

(2) LOCATION OF WELL: County King — NW ¼ SW ¼ Sec. 17 T. 24 N., R. 4 E W.M.

Bearing and distance from section or subdivision corner Seattle City Light Pole Yard, southeast corner

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

(4) TYPE OF WORK: Owner's number of well (if more than one) PW-1

New well ☒ Deepened ☐ Reconditioned ☐

Method: Dug ☐ Cable ☒ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 4 inches.

Drilled 20.5 ft. Depth of completed well 19.5 ft.

(6) CONSTRUCTION DETAILS: single piece

Casing installed: 4" Diam. from +2 ft. to -3 ft.

Threaded ☐ ..." Diam. from ... ft. to ... ft.

Welded ☐ ..." Diam. from ... ft. to ... ft.

Perforations: Yes ☐ No ☒

Type of perforator used .....

SIZE of perforations ... in. by ... in.

... perforations from ... ft. to ... ft.

... perforations from ... ft. to ... ft.

... perforations from ... ft. to ... ft.

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Screens: Yes ☒ No ☐

Manufacturer's Name .....

Type slotted stainless Model No. .....

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

Diam. 4" Slot size .01" from 14 ft. to 19.5 ft.

DEPARTMENT OF ECOLOGY NORTHWEST REGION

Gravel packed: Yes ☒ No ☐ Size of gravel: .....

Gravel placed from 10.5 ft. to 20 ft.

Surface seal: Yes ☒ No ☐ To what depth? 3.5 & 10.5 ft.

Material used in seal Concrete & Bentonite

Did any strata contain unusable water? Yes ☐ No ☐

N/A Type of water? ..... Depth of strata .....

Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....

N/A Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level ~10.5 ft.

Static level 12.052 ft. below top of well Date 30 Dec

Artesian pressure ... lbs. per square inch Date .....

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

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

Was a pump test made? Yes ☐ No ☒ If yes, by whom? .....

Yield: ... gal./min. with ... ft. drawdown after ... hrs.

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test 15 Dec

Bailer test 3.9 gal./min. with 0 ft. drawdown after 0.1 hrs.

Artesian flow ... g.p.m. Date .....

Temperature of water 15.35 °C Was a chemical analysis made? Yes ☒ No ☐

(10) WELL LOG: Monitor Well

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

MATERIAL	FROM	TO
ASPHALT	0"	3"
SILT: Dark gray, sandy, gritty (to 3mm) silt; little or no clay; sand and grit is multi colored.	3"	8'
SAND: Green-gray, gritty, gravelly sand with grains up to 10mm and angular to subrounded; some large (100mm) fragments of brick, concrete, and small pieces of glass.	8'	14'
SILT: Very dark gray, clayey silt, with common, brown, woody fragments, and angular to rounded rock fragments up to 30mm. This unit is moist.	14'	19'
SAND: Green-gray, silty, clean sand. This unit is saturated.	19'	20.5

AQUIFERS:

Moist: from 14' to 19'

Saturated: below 19'

Note: all units below asphalt are unconsolidated.

Work started 12-11, 19 86 Completed 12-15, 19 86

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Holt Drilling Co (Person, firm, or corporation) (Type or print)

Address Puyallup WA

[Signed] (Jack) (Well Driller)

License No. ..... Date .....

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38983

SEA405513

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

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name City of Seattle Seattle City Light Address 1015 3rd Ave, Seattle, WA. 98104

(2) LOCATION OF WELL: County King NW ¼ SW ¼ Sec 17 T. 24 N., R. 4 E. W.M.

Bearing and distance from section or subdivision corner Seattle City Light Pole Yard, Southwest corner

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

(4) TYPE OF WORK: Owner's number of well (if more than one) PW-2

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 4 inches.
Drilled 25.5 ft. Depth of completed well 23.5 ft.

(6) CONSTRUCTION DETAILS: single piece

Casing installed: 4" Diam. from +1.2 ft. to -3.8 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☐ " Diam. from ft. to ft.

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

Screens: Yes ☒ No ☐
Manufacturer's Name
Type Slotted stainless Model No.
Diam. 4" Slot size .01" from 18 ft. to 23.5 ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☒ No ☐ Size of gravel:
Gravel placed from 16 ft. to 25 ft.

Surface seal: Yes ☒ No ☐ To what depth? 3.5 & 16 ft.
Material used in seal Concrete & bentonite
Did any strata contain unusable water? Yes ☐ No ☐
N/A Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
N/A Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ~10.0 ft.
Static level 11.69 ft. below top of well Date 30 Dec.
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

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

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test 15 Dec
Bailer test 3.9 gal./min. with 0 ft. drawdown after 0.1 hrs.
Artesian flow g.p.m. Date
Temperature of water 13.59°C Was a chemical analysis made? Yes ☒ No ☐

(10) WELL LOG: Monitor Well

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

MATERIAL	FROM	TO
SAND: Green-gray, gravelly, slightly silty sand. Rounded gravel up to 40mm.	0'	6'
GRAVEL: Sandy gravel with wood fragments. Gravel is angular and up to 25 mm. Black petroliferous coating on all material.	6'	12'
SAND: Gravelly, silty sand with woody fragments. Black, oily material is common. This unit is moist & oily.	12'	14'
GRAVEL & HARDWARE: Sandy gravel with ~3-30mm angular pebbles. Nails, screws, strip metal, wire, etc. are abundant. This unit is slightly oily (brn-gray) and becoming wetter with depth.	14'	19'
SAND: Green-gray, clean sand, with very minor gravel and woody fibers. This unit is saturated.	19'	25.5'
AQUIFERS: Moist: from 12' to 19' Saturated: below 19'		
Note: all units are unconsolidated.		

Work started 12-12, 1986 Completed 12-15, 1986

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Holt Drilling Co (Person, firm, or corporation) (Type or print)

Address Puyallup WA

[Signed] (Jack) (Well Driller)

License No. Date, 19

USE ADDITIONAL SHEETS IF NECESSARY

KCSlip4 38984

SEA405514

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

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....

Permit No. .....

(1) OWNER: Name City of Seattle, Seattle City Light Address 1015 3rd Ave, Seattle, WA 98104

(2) LOCATION OF WELL: County King — NW ¼ SW ¼ Sec 17 T. 24 N., R. 4 W.

Bearing and distance from section or subdivision corner Seattle City Light Pole Yard, northwest corner

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

(4) TYPE OF WORK: Owner's number of well (if more than one) PW-3

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 4 inches.
Drilled 25 ft. Depth of completed well 20 ft.

(6) CONSTRUCTION DETAILS: single piece

Casing installed: 4" Diam. from +2.6 ft. to -2.4 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☐ " Diam. from ft. to ft.

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

Screens: Yes ☒ No ☐
Manufacturer's Name
Type Slotted Stainless Model No.
Diam. 4" Slot size .01" from 14.5 ft. to 20 ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☒ No ☐ Size of gravel:
Gravel placed from 12.5 ft. to 21.5 ft.

Surface seal: Yes ☒ No ☐ To what depth? 2 & 12.5 ft.
Material used in seal Concrete & bentonite
Did any strata contain unusable water? Yes ☐ No ☐
N/A Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
N/A Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ~10.5 ft.
Static level 12.50 ft. below top of well Date 30 Dec
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

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

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test 15 Dec
Bailer test 3.9 gal./min. with 0 ft. drawdown after 0.1 hrs.
Artesian flow g.p.m. Date
Temperature of water 13.37°C Was a chemical analysis made? Yes ☒ No ☐

(10) WELL LOG:

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

MATERIAL	FROM	TO
ASPHALT	0"	
SAND: Fairly clean, slightly silty and gritty, green-gray sand. Grains are multicolored and angular, up to 4mm. Below 10' is moist.	3"	
SILT and SAND: Sandy, clayey silt, with minor concrete fragments, grading down to cleaner, silty sand. This unit is moist.	13'	
SAND: green-gray, clean, slightly silty sand. This unit is saturated.	19'	

AQUIFERS:

Moist: From 10' to 19'
Saturated: Below 19'

Note: All units below asphalt are unconsolidated.

RECEIVED

DEPARTMENT OF ECOLOGY
NORTHWEST REGION

Work started 12-12 19 86 Completed 12-15 19

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Holt Drilling Co (Person, firm, or corporation) (Type or print)

Address Puyallup WA

[Signed] (Jack) (Well Driller)

License No. Date 19

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38985

SEA405515

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

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....

Permit No. .....

(1) OWNER: Name City of Seattle, Seattle City Light. Address 1015 3rd Ave, Seattle, WA. 98104

(2) LOCATION OF WELL: County King — NW ¼ SW ¼ Sec. 17 T. 24 N., R. 4E

Bearing and distance from section or subdivision corner Seattle City Light Pole Yard, northeast corner

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

(4) TYPE OF WORK: Owner's number of well (if more than one) .....

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well ~~8~~ 4 inches.
Drilled 24.5 ft. Depth of completed well 14 ft.

(6) CONSTRUCTION DETAILS: single piece

Casing installed: ~~8~~ 4" Diam. from +2 ft. to -3 ft.
Threaded ☐ ..." Diam. from ... ft. to ... ft.
Welded ☐ ..." Diam. from ... ft. to ... ft.

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

Screens: Yes ☒ No ☐
Manufacturer's Name .....
Type Slotted stainless Model No. .....
Diam. 4" Slot size .01" from 8.5 ft. to 14 ft.
Diam. ... Slot size ... from ... ft. to ... ft.

Gravel packed: Yes ☒ No ☐ Size of gravel: .....
Gravel placed from 16 ft. to 7 ft.

Surface seal: Yes ☒ No ☐ To what depth? 3 & 7 ft.
Material used in seal concrete & bentonite
Did any strata contain unusable water? Yes ☐ No ☐
N/A Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
N/A Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level ~11.0 ft.
Static level 11.42 ft. below top of well Date 30 Dec
Artesian pressure ... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

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

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test 15 Dec
Bailer test 3.9 gal./min. with 0 ft. drawdown after 0.1 hrs.
Artesian flow ... g.p.m. Date .....
Temperature of water 44.0°C Was a chemical analysis made? Yes ☒ No ☐

(10) WELL LOG: Monitor Well

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

MATERIAL	FROM	TO
ASPHALT.	0"	3"
SAND: green-gray, clean, slightly silty sand. This unit is saturated below 10'.	3"	14
SILT: Gray, sandy, clayey silt with woody fibers. Some organic-rich, gray to black horizons. This unit is generally moist.	14'	18'
SAND: Green-gray, clean, somewhat silty sand. This unit is moist.	18'	24.5

AQUIFERS:

Saturated: 10' to 14'
Moist: below 14'

Note: All units below asphalt are unconsolidated.

RECEIVED

Work started 12-13 19 86 Completed 12-15 19 8

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Holt Drilling Co (Person, firm, or corporation) (Type or print)

Address Puyallup WA

[Signed] (Jack) (Well Driller)

License No. ..... Date ..... 19..

(USE ADDITIONAL SHEETS IF NECESSARY)

KCSlip4 38986

SEA405516

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

WATER WELL REPORT

STATE OF WASHINGTON

24/4E11 Start Card No. 0[illegible]55

Water Right Permit No. _____

(1) OWNER: Name SCOTTY'S GENERAL CONST Address 20405 SE 344th AUBURN

(2) LOCATION OF WELL: County KING NW ¼ SW ¼ Sec 17 T 2[illegible] N, R 4E W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) 4501 6th AVE S SEATTLE WA

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

(4) TYPE OF WORK: Owner's number of well (if more than one) 2

Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☒ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 36 inches.
Drilled 30 feet. Depth of completed well 30 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 12" Diam. from 0 ft. to 10 ft.
Welded ☐ _____" Diam. from _____ ft. to _____ ft.
Liner installed ☐ _____" Diam. from _____ ft. to _____ ft.
Threaded ☐

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

Screens: Yes ☒ No ☐
Manufacturer's Name WESTERN WELLSCREEN
Type PVC Model No. _____
Diam. 12" Slot size .051 from 10 ft. to 30 ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☒ No ☐ Size of gravel 4X8" PEA
Gravel placed from 30 ft. to 3 ft.

Surface seal: Yes ☒ No ☐ To what depth? 3 ft.
Material used in seal ENVIROPLUG #8
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name PROSSER/ENDO
Type: SUBMERSIBLE DEWATERING H.P. 5

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 8 ft. below top of well Date SEPT 9, 91
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? _____
Yield: 350 gal./min. with 20 ft. drawdown after 1 hrs.
" 350 " 27 " 48 "
" " " "

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
BROWN SANDY FILL WITH LARGE CHUNKS OF CONCRETE & GRAVEL	0	6
GRAY BLACK SAND, SILTY SAND FINE TO MED	6	3[illegible]

RECEIVED
SEP 16 1991
DEPT. OF ECOLOGY

Work started SEPT 6, 19. Completed SEPT 6, 19[illegible]

WELL CONSTRUCTOR CERTIFICATION:

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

NAME ANDERSON DEWATERING (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address PO BOX 3093 FEDERAL WAY
(Signed) William H Anderson (WELL DRILLER) License No. 1522
Contractor's Registration No. ANDERD*110PP Date SEPT 10, 19[illegible]

(USE ADDITIONAL SHEETS IF NECESSARY)

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Appendix H

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SEA405518

APPENDIX H

INSPECTION DERIVED WASTE MANAGEMENT

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SEA405520

OPTECH

OPERATIONAL TECHNOLOGIES
CORPORATION

October 24, 1994

Steve Purvine
241st CES/DEV
104 Air Defense Lane
Tacoma, WA 98430-5022

Dear Mr. Purvine:

I am writing you concerning the contents of thirteen drums of Site Inspection-derived waste which was generated during the recent Site Inspection (SI) at the 143rd Combat Communications Squadron, Seattle ANGS. Six of these drums contain soil cuttings, three contain decontamination water, three contain piezometer purge and development water, and one contains brass sleeves from soil sampling, as shown in the attached Investigation Derived Waste Log. The attached Table 1 is a summary of the recommended disposition for each of these drums. These recommendations are based on guidance provided by personnel from the Dangerous Waste Division of the Washington Department of Ecology (DOE). Also included with this letter are Tables 2 through 10. There is one table for each drum which contains material representative of one or more samples submitted to the laboratory for confirmation or submitted for field screening for this SI. These tables provide the maximum analyte concentrations detected in soil samples representative of borehole cuttings or groundwater contained in that drum, along with their comparison to action levels. For comparison of metals in soils, values which are 20 times the TCLP regulatory level are used, which represents an estimate of the minimum concentration of the metal which would have to be present in the soil for a TCLP analysis to lead to a positive result.

The analytes detected in drums 1, 2, and 10 are present at concentrations less than 20 times the applicable TCLP regulatory levels. Therefore, the contents of these drums should not be considered a hazardous waste, and can be disposed of as a solid waste.

Drum 3 contains cuttings from boring BS-003BH, in which TPH was detected at a high level. There is no TCLP regulatory level for TPH; the TPH level detected significantly exceeds the Washington DOE cleanup level of 200 mg/kg for TPH in soil. The contents of this drum should be disposed of in a landfill which accepts TPH-contaminated soil or should be sent to a soil recycler.

No laboratory analyses were performed on piezometer soil cuttings present in drums 4 and 6; field screening results detected low levels of volatile contaminants in these soils. Therefore, samples should be taken from these drums and analyzed for TPH to determine whether any contamination exists which would require special waste handling.

4100 NW. Loop 410, Suite 230 • San Antonio, TX 78229-4253 • 210 731-0000 • Fax (210) 731-0005

The contents of drums 5, 8, and 9, which contain decontamination wastewater, were in contact with all of the sampling equipment employed for the Site Inspection. These waters should be analyzed for TPH and gross alpha and gross beta radiation (the contaminants of concern for this Site Inspection which significantly exceeded action levels) to determine whether any contamination exists which would require special handling for disposal.

Three drums, 11, 12, and 13, contain development and purge water from piezometers. The only analytes which exceed state and Federal action levels are gross alpha and gross beta radiation. If these radiation levels are below the pretreatment standard of the Station's sewer permit, then approval should be obtained from the City of Seattle Sewer Department for disposal of this groundwater in the Station sewer system.

I am sending you this information so that you can proceed in disposal of the contents of these drums. As the generator, the Station is responsible for determining whether the contents of each drum should be designated as a hazardous waste. The Washington DOE does not require notification of whether these materials are disposed of as hazardous waste or solid waste. If you have any questions regarding this information, please do not hesitate to contact me at (210) 731-0000. Thank you for your time.

Sincerely,

Matthew Alexander

Matthew Alexander, Ph.D.
Manager of Environmental Technology Development

Enclosures: as stated

cc: Mike Grimm, ANGRC/CEVR
Air National Guard file

INVESTIGATION DERIVED WASTE LOG

Drum	Contents (Water/Soil Cuttings/Borehole/MW/Decon)	% Full
1	BS-002BH Soil	
2	BS-001BH Soil	
3	BS-003BH Soil	
4	BS-006PZ Soil	
5	BS-AOC Decon Water	
6	BS-005PZ Soil	
7	BS-AOC Brass Sleeves	1/10
8	BS-AOC Decon Water	
9	BS-AOC Decon Water	
10	BS-004PZ Soil	

Location of Drums: On Site

Date Stored: 7-21-94

Site Manager: Michael A. [illegible]

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SEA405523

INVESTIGATION DERIVED WASTE LOG

Drum	Contents (Water/Soil Cuttings/Borehole/MW/Decon)	% Full
11	BS-006 PZ Water	1/2
12	BS-005 PZ Water	1/2
13	BS-004 PZ Water	1/2

Location of Drums: On-Site

Date Stored: 7-21-94

Site Manager: [signature]

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SEA405524

Table H.1
Recommended Disposition of Inspection Derived Waste
143rd CCSQ, Seattle ANGS, Seattle, Washington

Drum Number/ Material	Origin	Recommended Disposition	Rationale
1/Soil	BS-002BH	Dispose as a solid waste.	No analytes exceeded estimated TCLP regulatory levels.* Concentrations of analytes for which TCLP regulatory levels do not exist were equal to or less than site-specific background concentrations.
2/Soil	BS-001BH	Dispose as a solid waste.	No analytes exceeded estimated TCLP regulatory levels.* Concentrations of analytes for which TCLP regulatory levels do not exist were equal to or less than site-specific background concentrations.
3/Soil	BS-003BH	Dispose of in a landfill which accepts TPH contaminated soil or send to a soil recycler.	Analytical results show TPH significantly exceeds State action level.
4/Soil	BS-006PZ	Perform TPH analysis to determine whether TPH contamination is present.	Field GC screening of soils on-site indicated possible volatile contamination.
5/Water	Decontamination Water	Perform TPH and gross alpha radiation analysis to determine whether TPH and gross alpha contamination is present.	Potential contaminants contacted sampling equipment; TPH in soil samples and gross alpha in groundwater are the only contaminants which significantly exceed applicable action levels.
6/Soil	BS-005PZ	Perform TPH analysis to determine whether TPH contamination is present.	Field GC screening of soils on-site indicated possible volatile contamination.
7/Brass Sleeves	All Samples	Dispose of in a landfill which accepts TPH contaminated soil or send to a soil recycler.	Some brass sleeves were taken from soil samples whose results show TPH levels which significantly exceed State action levels.
8/Water	Decontamination Water	Perform TPH and gross alpha radiation analysis to determine whether TPH and gross alpha contamination is present.	Potential contaminants contacted sampling equipment; TPH in soil samples and gross alpha in groundwater are the only contaminants which significantly exceed applicable action levels.
9/Water	Decontamination Water	Perform TPH and gross alpha radiation analysis to determine whether TPH and gross alpha contamination is present.	Potential contaminants contacted sampling equipment; TPH in soil samples and gross alpha in groundwater are the only contaminants which significantly exceed applicable action levels.

Table H.1 (Concluded)
Recommended Disposition of Inspection Derived Waste
143rd CCSQ, Seattle ANGS, Seattle, Washington

Drum Number/ Material	Origin	Recommended Disposition	Rationale
10/Soil	BS-004PZ	Dispose as a solid waste.	No analytes exceeded estimated TCLP regulatory levels.* Concentrations of analytes for which TCLP regulatory levels do not exist were equal to or less than site-specific background concentrations.
11/Water	BS-006PZ Develop & Purge	Determine whether the City of Seattle Wastewater Management will allow gross alpha- and gross beta-contaminated water to be disposed of in the sewer system.	Analytical results show gross alpha and gross beta radiation exceed State and Federal action levels.
12/Water	BS-005PZ Develop & Purge	Determine whether the City of Seattle Wastewater Management will allow gross beta-contaminated water to be disposed of in the sewer system.	Analytical results show gross beta radiation exceeds Federal action level.
13/Water	BS-004PZ Develop & Purge	Determine whether the City of Seattle Wastewater Management will allow gross alpha- and gross beta-contaminated water to be disposed of in the sewer system.	Analytical results show gross alpha and gross beta radiation exceed State and Federal action levels.

BG – Background.
BS – Burial Site AOC.
TPH – Total Petroleum Hydrocarbons.
TCLP – Toxicity Characteristic Leaching Procedure.
BH – Borehole.
GC – Gas Chromatograph.
PID – Photoionization Detector.
* – Estimated TCLP regulatory levels – analyte concentrations are compared to 20 times the TCLP regulatory level, which represents an estimate of the minimum concentration of the analyte which would have to be present in the soil for a TCLP analysis to lead to a positive result.

Table H.2
Site Inspection Derived Waste – Drum 1 Containing Soil Cuttings from BS-002BH
143rd CCSQ, Seattle ANGS, Seattle, Washington

Analyte	Maximum Concentration in Soil Cuttings	Action Level Concentration	Standard Used
SVOC			
Di-n-butyl phthalate	1,960 μg/kg	NA	–
Metal			
Arsenic	2.7 mg/kg	100 mg/kg	TCLP 20
Beryllium	0.87 mg/kg	NA	–
Cadmium	1.3 mg/kg	20 mg/kg	TCLP 20
Chromium	14 mg/kg	100 mg/kg	TCLP 20
Copper	23 mg/kg	NA	–
Lead	28 mg/kg	100 mg/kg	TCLP 20
Nickel	9.3 mg/kg	NA	–
Thallium	0.054 mg/kg	NA	–
Zinc	31 mg/kg	NA	–
Radiation			
Gross alpha	2 ± 25 pCi/g	NA	–
Gross beta	3 ± 37 pCi/g	NA	–

BS – Burial Site AOC.
BH – Borehole.
SVOC – Semivolatile Organic Compound.
μg/kg – micrograms per kilogram.
NA – No TCLP regulatory level exists.
mg/kg – milligrams per kilogram.
TCLP – Toxicity Characteristic Leaching Procedure.
TCLP 20 – Twenty times TCLP regulatory level, expressed in mg/kg.
pCi/g – picoCuries per gram.

Table H.3
Site Inspection Derived Waste – Drum 2 Containing Soil Cuttings from BS-001BH
143rd CCSQ, Seattle ANGS, Seattle, Washington

Analyte	Maximum Concentration in Soil Cuttings	Action Level Concentration	Standard Used
SVOC			
Di-n-butyl phthalate	1,750 μg/kg	NA	–
Metal			
Arsenic	1.6 mg/kg	100 mg/kg	TCLP 20
Beryllium	1 mg/kg	NA	–
Cadmium	1.6 mg/kg	20 mg/kg	TCLP 20
Chromium	11 mg/kg	100 mg/kg	TCLP 20
Copper	130 mg/kg	NA	–
Lead	28 mg/kg	100 mg/kg	TCLP 20
Nickel	14 mg/kg	NA	–
Selenium	0.053 mg/kg	20 mg/kg	TCLP 20
Silver	0.18 mg/kg	100 mg/kg	TCLP 20
Thallium	0.038 mg/kg	NA	–
Zinc	19 mg/kg	NA	–
Radiation			
Gross alpha	0 ± 20 pCi/g	NA	–
Gross beta	4 ± pCi/g	NA	–

BS – Burial Site AOC.
BH – Borehole.
SVOC – Semivolatile Organic Compound.
μg/kg – micrograms per kilogram.
NA – No TCLP regulatory level exists.
mg/kg – milligrams per kilogram.
TCLP – Toxicity Characteristic Leaching Procedure.
TCLP 20 – Twenty times the TCLP regulatory level, expressed in mg/kg.
pCi/g – picoCuries per gram.

Table H.4
Site Inspection Derived Waste – Drum 3 Containing Soil Cuttings from BS-003BH
143rd CCSQ, Seattle ANGS, Seattle, Washington

Analyte	Maximum Concentration in Soil Cuttings	Action Level Concentration	Standard Used
SVOC			
Di-n-butyl phthalate	1,750 µg/kg	NA	–
Metal			
Arsenic	20 mg/kg	100 mg/kg	TCLP 20
Beryllium	1.1 mg/kg	NA	–
Cadmium	1.5 mg/kg	20 mg/kg	TCLP 20
Chromium	15 mg/kg	100 mg/kg	TCLP 20
Copper	33 mg/kg	NA	–
Lead	62 mg/kg	100 mg/kg	TCLP 20
Nickel	14 mg/kg	NA	–
Selenium	0.11 mg/kg	20 mg/kg	TCLP 20
Silver	0.042 mg/kg	100 mg/kg	TCLP 20
Thallium	0.093 mg/kg	NA	–
Zinc	40 mg/kg	NA	–
TPH			
Petroleum hydrocarbons	780 mg/kg	200 mg/kg	MTCA A
Radiation			
Gross alpha	2 ± 20 pCi/g	NA	–
Gross beta	2 ± 30 pCi/g	NA	–

BS – Burial Site AOC.
BH – Borehole.
SVOC – Semivolatile Organic Compound.
mg/kg – milligrams per kilogram.
NA – No TCLP regulatory level exists.
µg/kg – micrograms per kilogram.
TCLP – Toxicity Characteristic Leaching Procedure.
TCLP 20 – Twenty times TCLP regulatory level, expressed in mg/kg.
TPH – Total Petroleum Hydrocarbons.
MTCA A – Model Toxics Control Act Method A.
pCi/g – picoCuries per gram.

Table H.5
Site Inspection Derived Waste – Drum 4 Containing Soil Cuttings from BS-006PZ
143rd CCSQ, Seattle ANGS, Seattle, Washington

Analyte	Maximum Concentration in Soil Screening
Benzene	2 ppb
Toluene	3 ppb
Ethylbenzene	1 ppb
m,p-Xylene	1 ppb
o-Xylenes	1 ppb
PID Volatiles	0 ppm

BS – Burial Site AOC.
PZ – Piezometer.
PID – Photoionization detector.
ppm – parts per million.
ppb – parts per billion.

Table H.6
Site Inspection Derived Waste – Drum 6 Containing Soil Cuttings from BS-005PZ
143rd CCSQ, Seattle ANGS, Seattle, Washington

Analyte	Maximum Concentration in Soil Screening
Benzene	ND
Toluene	6 ppb
Ethylbenzene	ND
m,p-Xylene	58 ppb
o-Xylenes	16 ppb
PID Volatiles	8.3 ppm

BS – Burial Site AOC.
PZ – Piezometer.
PID – Photoionization detector.
ppm – parts per million.
ppb – parts per billion.
ND – Non detect.

Table H.7
Site Inspection Derived Waste – Drum 10 Containing Soil Cuttings from BS-004PZ
143rd CCSQ, Seattle ANGS, Seattle, Washington

Analyte	Maximum Concentration in Soil Cuttings	Action Level Concentration	Standard Used
SVOC			
Di-n-butyl phthalate	2,240 μg/kg	NA	–
Metal			
Arsenic	2 mg/kg	100 mg/kg	TCLP 20
Beryllium	1.2 mg/kg	NA	–
Cadmium	1.6 mg/kg	20 mg/kg	TCLP 20
Chromium	10 mg/kg	100 mg/kg	TCLP 20
Copper	40 mg/kg	NA	–
Lead	34 mg/kg	100 mg/kg	TCLP 20
Nickel	13 mg/kg	NA	–
Thallium	0.056 mg/kg	NA	–
Zinc	25 mg/kg	NA	–

BS – Burial Site AOC.
BH – Borehole.
SVOC – Semivolatile Organic Compound.
mg/kg – milligrams per kilogram.
NA – No TCLP regulatory level exists.
μg/kg – micrograms per kilogram.
TCLP – Toxicity Characteristic Leaching Procedure.
TCLP 20 – Twenty times TCLP regulatory level, expressed in mg/kg.

Table H.8
Site Inspection Derived Waste – Drum 11 Containing Groundwater from BS-006PZ
143rd CCSQ, Seattle ANGS, Seattle, Washington

Analyte	Maximum Concentration in Groundwater	Action Level Concentration	Standard Used
Metal			
Arsenic	0.027 mg/L	5.0 mg/L	TCLP
Beryllium	0.82 mg/L	NA	–
Chromium	0.097 mg/L	5.0 mg/L	TCLP
Copper	0.078 mg/L	NA	–
Lead	0.026 mg/L	5.0 mg/L	TCLP
Nickel	0.06 mg/L	NA	–
Selenium	0.0031 mg/L	1.0 mg/L	TCLP
Radiation			
Gross alpha	59 ± 59 pCi/L	15.0 pCi/L	MTCA A
Gross beta	58 ± 30 pCi/L	50 pCi/L	SDWA MCL

BS – Burial Site AOC.
PZ – Piezometer.
mg/L – milligrams per liter.
NA – No TCLP regulatory level exists.
TCLP – Toxicity Characteristic Leaching Procedure.
MTCA A – Model Toxics Control Act Method A.
SDWA MCL – Safe Drinking Water Act Maximum Contaminant Level.
pCi/L – picoCuries per liter.

Table H.9
Site Inspection Derived Waste – Drum 12 Containing Groundwater from BS-005PZ
143rd CCSQ, Seattle ANGS, Seattle, Washington

Analyte	Maximum Concentration in Groundwater	Action Level Concentration	Standard Used
Metal			
Arsenic	0.028 mg/L	5.0 mg/L	TCLP
Beryllium	0.54 mg/L	NA	–
Chromium	0.0052 mg/L	5.0 mg/L	TCLP
Copper	0.0054 mg/L	NA	–
Lead	0.022 mg/L	5.0 mg/L	TCLP
Nickel	0.031 mg/L	NA	–
Selenium	0.002 mg/L	1.0 mg/L	TCLP
Radiation			
Gross alpha	15 ± 39 pCi/L	15.0 pCi/L	MTCA A
Gross beta	77 ± 24 pCi/L	50 pCi/L	SDWA MCL

BS – Burial Site AOC.
PZ – Piezometer.
mg/L – milligrams per liter.
TPH – Total Petroleum Hydrocarbons.
NA – No TCLP regulatory level exists.

TCLP – Toxicity Characteristic Leaching Procedure.
MTCA A – Model Toxics Control Act Method A.
SDWA MCL – Safe Drinking Water Act Maximum Contaminant Level.
pCi/L – picoCuries per liter.

Table H.10
Site Inspection Derived Waste – Drum 13 Containing Groundwater from BS-004PZ
143rd CCSQ, Seattle ANGS, Seattle, Washington

Analyte	Maximum Concentration in Groundwater	Action Level Concentration	Standard Used
Metal			
Arsenic	0.038 mg/L	5.0 mg/L	TCLP
Beryllium	0.013 mg/L	NA	–
Cadmium	0.0006 mg/L	1.0 mg/L	TCLP
Chromium	0.12 mg/L	5.0 mg/L	TCLP
Copper	0.29 mg/L	NA	–
Lead	0.033 mg/L	5.0 mg/L	TCLP
Nickel	0.16 mg/L	NA	–
Thallium	0.0057 mg/L	NA	–
Zinc	0.45 mg/L	NA	–
Radiation			
Gross alpha	36 ± 42 pCi/L	15.0 pCi/L	MTCA A
Gross beta	78 ± 25 pCi/L	50 pCi/L	SDWA MCL

BS – Burial Site AOC.
PZ – Piezometer.
mg/L – milligrams per liter.
NA – No TCLP regulatory level exists.

TCLP – Toxicity Characteristic Leaching Procedure.
MTCA A – Model Toxics Control Act Method A.
SDWA MCL – Safe Drinking Water Act Maximum Contaminant Level.
pCi/L – picoCuries per liter.

Appendix I

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SEA405533

APPENDIX I

CHAIN OF CUSTODY FORMS

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KCSlip4 39005

SEA405535

CHAIN-OF-CUSTODY

AnalySys, Inc.
4221 Freidrich Lane, Suite 190, Austin, TX 78744

Send Reports To:
Company Name: Operational Techologies
Address: 4100 NW Loop 410, Suite 230
City: San Antonio State: TX Zip: 78229
ATTN: Mike Giles
Phone: (210) 731-0000 Fax: (210) 731-0008

Bill to (if different):
Company Name
Address
City State Zip
ATTN:
Phone Fax

Project Name/PO#: Seattle ANGS (1316-121) Sampler: K. Merino

Analyses Requested (1)
Please attach explanatory information as required

Client Sample No. Description/Identification	Date Sampled	Time Sampled	No. of Containers	Soil	Water	Waste	Lab I.D. # (Lab only)	SW 8240	SW 8270	SW 6010 *	SW 8082	Metals-Hold SW 8141-D	SW 9310			Comments
BS 001 BH 1-2½	14 Jul 94		2	✓			49837	✓	✓	✓	✓	✓	✓			* All solids except Arsenic SW 7060 Cadmium SW 7131 Chromium SW 7196 Lead SW 7421 Mercury SW 7470 Selenium SW 7740 Thallium SW 7841
5½-7			2	✓			49838	✓	✓	✓	✓	✓	✓			
8½-10			2	✓			49839	✓	✓	✓	✓	✓	✓			
BS 002 BH 1½-2½			2				49840	✓	✓	✓	✓	✓	✓			
5½-7			2				49841	✓	✓	✓	✓	✓	✓			
8½-10			2				49842	✓	✓	✓	✓	✓	✓			
BS 003 BH 2-3½			2				49843	✓	✓	✓	✓	✓	✓			
5½-7			2				49844	✓	✓	✓	✓	✓	✓			
8½-10	↓		2				49845	✓	✓	✓	✓	✓	✓			

(Unless specifically requested otherwise on this Chain-of-custody and/or attached documentation, all analyses will be conducted using ASI's method of choice and all data will be reported to ASI's normal reporting limits (MDL/PQL).

Special billing instructions (see back) YES NO (to be completed by AnalySys, Inc. personnel only)

Sample Relinquished By				Sample Recieved By			
Name	Affiliation	Date	Time	Name	Affiliation	Date	Time
				[illegible]	AnalySys Inc	7-15-94	16:20

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CHAIN-OF-CUSTODY

AnalySys, Inc.
4221 Freidrich Lane, Suite 190, Austin, TX 78744

Send Reports To:
Company Name Operational Technologies
Address 4100 N.W. Loop 410, Suite 230
City San Antonio State TX Zip 78229
ATTN: Mike Giles
Phone (210) 731-0000 Fax (210) 731-0008

Bill to (if different):
Company Name
Address
City State Zip
ATTN:
Phone Fax

1315-127
Project Name/PO#: Seattle ANGS Sampler: K. Herino

Analyses Requested (1)
Please attach explanatory information as required

Client Sample No. Description/Identification	Date Sampled	Time Sampled	No. of Containers	Soil	Water	Waste	Lab I.D. # (Lab only)	VOCs SW8240	SW 8270	SW 6010 *	SW 8080	TPH-HCID w/TPH-D	SW 9310			Comments
BS 004 P2 6½-10	145/94		2	✓			19846	✓	✓	✓	✓	✓	✓			* All except Arsenic Cadmium Chromium Lead Mercury Selenium Thallium
BS 001 TB	145/94		2		✓		19847	✓								

Unless specifically requested otherwise on this Chain-of-custody and/or attached documentation, all analyses will be conducted using ASI's method of choice and all data will be reported to ASI's normal reporting limits (MDL/PQL).

Special billing instructions (see back) YES NO (to be completed by AnalySys, Inc. personnel only)

Sample Relinquished By				Sample Recieved By			
Name	Affiliation	Date	Time	Name	Affiliation	Date	Time
				[illegible]	AnalySys Inc	7-15-94	1630

Transmittal of above described samples to AnalySys, Inc. for analytical testing constitutes

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