Engineers
Planners
Economists
Scientists

January 24, 1996

117482.7C.08

Mr. Art McEwen
Yakima County Health District
104 North First
Yakima, Washington 98901

Dear Mr. McEwen:

Subject: Interstate 82 Gateway Project
Disposal of Landfill Refuse

Thank you for taking the time to speak with me by telephone on January 18 regarding the landfill refuse recently encountered at the Interstate 82 Gateway Project. As we discussed, some of this refuse will need to be excavated to install a new drainage pipe. In turn, this material will need to be disposed of at an off-site landfill. Additional information about the refuse is summarized below.

As you are aware from your attendance at the January 11 meeting with the Department of Ecology (Ecology) on this issue, the "TAR" off-ramp is being constructed as part of the Interstate 82 Gateway project. The TAR off-ramp will provide access to the new Yakima Gateway shopping area from the south-bound lanes of Interstate 82. The off-ramp crosses the extreme eastern edge of a former landfill that reportedly accepted municipal solid waste from about 1963 to 1970. In our meeting with Ecology, the project team (City of Yakima, Washington Department of Transportation, and CH2M HILL) proposed that the off-ramp be built over the landfill, leaving the refuse undisturbed. Although Ecology staff said that they could not "approve" such a plan, they indicated that they did not see any fatal flaws with the approach. As such, construction of the off-ramp embankment is proceeding as proposed.

As we discussed during our telephone call last week, however, refuse will be excavated during installation of a buried 42-inch-diameter drainage pipe. This pipe will be installed along the west side of the TAR off-ramp embankment. We estimate that roughly 2,000 cubic yards of refuse may be encountered and require off-site disposal. As presented in the meeting with Ecology, characterization data from four samples indicate that the refuse contains petroleum hydrocarbons at concentrations ranging from 3,800 to 10,800 mg/kg (predominately heavy hydrocarbons in the diesel and motor oil range). TCLP metals analyses indicate that the refuse is not a dangerous waste under WAC 173-303-090. I

recently received the final laboratory reports for these analyses and have attached copies for your review.

Based on our January 18 telephone conversation, it is my understanding that the refuse from the Gateway project can be disposed of at the Terrace Heights Landfill on the condition that it does not contain free liquid. On January 19, I contacted Ron Pepper of the Yakima County Department of Solid Waste to inform him of our conversation. Ron indicated that he would like to explore the possibility of using the refuse as daily cover material at the Cheyne Landfill and said he would discuss this issue with you directly.

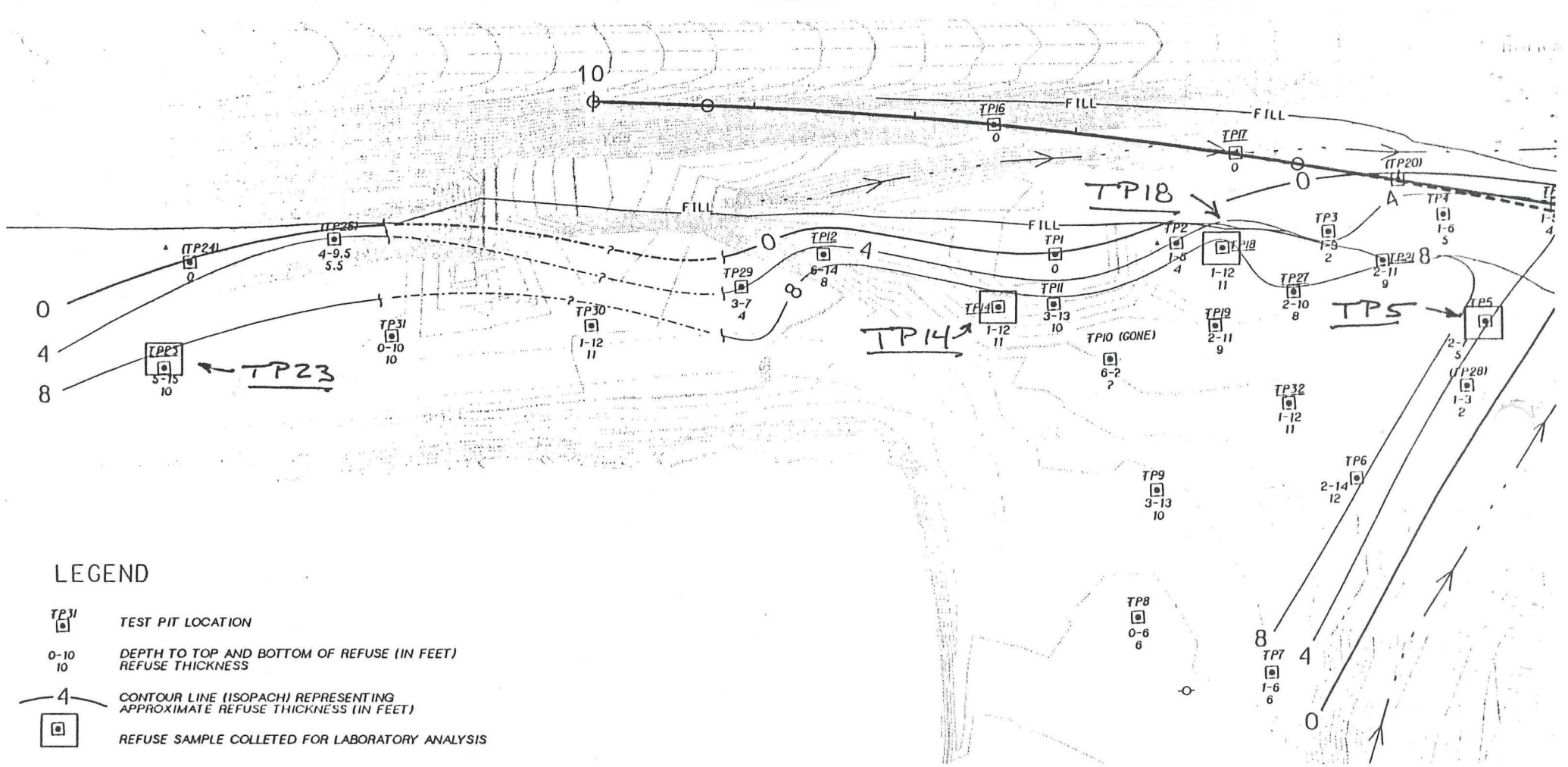
I will keep you and Ron informed of the excavation schedule. If you have any concerns about disposing the refuse at either the Terrace Heights or Cheyne landfills, please contact me immediately at 206-453-5000.

Sincerely,

CH2M HILL

Douglas B. Holsten
Hydrogeologist

c: Ron Pepper/Yakima County Department of Solid Waste
Mike Stephens/Washington DOT (w/o attachments)
Eilert Bjorge/Washington DOT (w/o attachments)
Dick Zias/City of Yakima (w/o attachments)
Denny Covell/City of Yakima (w/o attachments)
Brad Stein/CH2M HILL



LEGEND

TP31	TEST PIT LOCATION
0-10 10	DEPTH TO TOP AND BOTTOM OF REFUSE (IN FEET) REFUSE THICKNESS
4	CONTOUR LINE (ISOPACH) REPRESENTING APPROXIMATE REFUSE THICKNESS (IN FEET)
	REFUSE SAMPLE COLLETED FOR LABORATORY ANALYSIS

Analytical Resources, Incorporated
Analytical Chemists and Consultants

5 January 1996

Doug Holsten
CH2M Hill
777 18th Avenue NE
Bellevue, WA 98004

RE: Client Project: 117482.7C.08 Yakima I-82;
ARI Project: #M713

Dear Mr. Holsten,

Please find enclosed the original Chain of Custody record (COC) and analytical results for samples from the project referenced above. Four soil samples were received in good condition on 12/29/95, with no discrepancies between the COC and sample container labels. They were logged into the laboratory without incident of note. These results were faxed to you as soon as they became available.

Sample analyses for hydrocarbons and TCLP metals were routine, however note that the tph samples all required reanalyses at dilutions due to the high hydrocarbon concentrations present. All valid results are included on the report. Also included are the GC chromatograms to assist with your evaluation of the results.

Sample **TP14** was used as a QC sample for the TCLP metals; RPD and recovery results are reported as documentation. A Laboratory Control Sample was extracted and analyzed with the tph samples, and recoveries are reported as QC for this parameter.

A copy of this package, with all raw data and benchsheets, will be kept on file at ARI, should you require additional information or copies of any documentation. Please feel free to call me at any time if you find problems with these reports or have any questions.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator
206-340-2866, ext. 117

Enclosures
cc: file #M713

Chain of Custody Record & Laboratory Analysis Request

Date: 12/29/95
Page 1 of 1
Number of coolers: 1
Cooler Temp: 10.0 °C
Rad. Survey: Background

Analytical Resources, Incorporated
Analytical Chemist and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
(206) 621-6490
(206) 621-7523 (Fax)

ARI Client: CH2M Hill Phone#: 453-5000
Client Contact: Doug Houlsten (117482.TC.08)
Client Project ID: Yakima I-82
Samplers: Tim O'Connor

	Sample ID	Date	Time	Matx	No Cont	Lab ID	Extended WTPH-D	TCLP Metals	(Hg + other 7470/6010)					Notes/Comments
1	TP14-12/27/95-CH	12/27/95	13:10	Soil	3		X	X						95-21928 to 95-21931
2	TP 23-12/27/95-CH	12/27/95	15:25	↓	3		X	X						RUSH
3	TP 18-12/27/95-CH	12/27/95	12:15	↓	3		X	X						↓
4	TP 5-12/29/95-CH	12/27/95	14:30	↓	3		X	X						
5														
6														
7														

ARI Project No: M713
Comments/Special Instructions:

Relinquished by: (Signature)	Relinquished by: (Signature)	Relinquished by: (Signature)
Printed Name: Tim O'Connor	Printed Name:	Printed Name:
Company: CH2M Hill	Company:	Company:
Date: 12/29/95 Time: 8:15	Date: Time:	Date: Time:
Received by: (Signature) Erin Johnson	**Received by: (Signature)**	**Received by: (Signature)**
Printed Name: Erin Johnson	Printed Name:	Printed Name:
Company: ARI	Company:	Company:
Date: 12/29/95 Time: 08:15	Date: Time:	Date: Time:

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Seattle, WA 98109-5187
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INORGANICS ANALYSIS DATA SHEET Sample No: TP14-12/27/95-CH
TCLP METALS

Lab Sample ID: M713A
LIMS ID: 95-21928
Matrix: Soil

QC Report No: M713-CH2M Hill
Project: Yakima I-82
117482.7C.08
Date Sampled: 12/27/95
Date Received: 12/29/95

Data Release Authorized:
Reported: 01/03/96

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	Result
1311	12/29/95	6010	01/02/96	7440-38-2	Arsenic	0.05	0.05 U
1311	12/29/95	6010	01/02/96	**7440-39-3**	**Barium**	0.001	**0.546**
1311	12/29/95	6010	01/02/96	**7440-43-9**	**Cadmium**	0.002	**0.010**
1311	12/29/95	6010	01/02/96	7440-47-3	Chromium	0.005	0.005 U
1311	12/29/95	6010	01/02/96	**7439-92-1**	**Lead**	0.02	**0.09**
1311	12/29/95	7470	01/02/96	7439-97-6	Mercury	0.0001	0.0001 U
1311	12/29/95	6010	01/02/96	7782-49-2	Selenium	0.05	0.05 U
1311	12/29/95	6010	01/02/96	7440-22-4	Silver	0.003	0.003 U

Values reported in mg/L (ppm)

U Analyte undetected at given RL

RL Limit of Detection

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INORGANICS ANALYSIS DATA SHEET
TCLP METALS

Sample No: TP14-12/27/95-CH
Lab Sample ID: M713A
QC Report No: M713-CH2M Hill
LIMS ID: 95-21928
Project: Yakima I-82
Matrix: Soil
117482.7C.08
Date Received: 12/29/95

Data Release Authorized:
Reported: 01/03/96

MATRIX SPIKE RECOVERY

ANALYTE	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	Q
Arsenic	0.05 U	5.31	5.00	106%	
Barium	0.546	5.32	5.00	95.5%	
Cadmium	0.010	0.988	1.00	97.8%	
Chromium	0.005 U	4.79	5.00	95.8%	
Lead	0.09	4.93	5.00	96.8%	
Mercury	0.0001 U	0.0011	0.0010	110%	
Selenium	0.05 U	1.13	1.00	113%	
Silver	0.003 U	0.923	1.00	92.3%	

Reported in mg/L

'Q' codes:
N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Percent Recovery Control Limits: 75-125
RPD Control Limits: +/-20

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INORGANICS ANALYSIS DATA SHEET
TCLP METALS

Lab Sample ID: M713A
LIMS ID: 95-21928
Matrix: Soil

Sample No: TP14-12/27/95-CH
QC Report No: M713-CH2M Hill
Project: Yakima I-82
117482.7C.08
Date Received: 12/29/95

Data Release Authorized:
Reported: 01/03/96

MATRIX DUPLICATE QUALITY CONTROL REPORT

CONSTITUENT	ORIGINAL SAMPLE	MATRIX DUPLICATE	RPD	CONTROL LIMIT	Q
Arsenic	0.05 U	0.05 U	0.0%	+/- 0.05	L
Barium	0.546	0.550	0.7%	+/- 20 %	
Cadmium	0.010	0.011	9.5%	+/- 0.002	L
Chromium	0.005 U	0.005 U	0.0%	+/- 0.005	L
Lead	0.09	0.08	11.8%	+/- 0.02	L
Mercury	0.0001 U	0.0001 U	0.0%	+/- 0.0001	L
Selenium	0.05 U	0.05 U	0.0%	+/- 0.05	L
Silver	0.003 U	0.003 U	0.0%	+/- 0.003	L

'Q' codes: * = control limit not met
L = RPD not valid, alternate limit = detection limit

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INORGANICS ANALYSIS DATA SHEET Sample No: TP23-12/27/95-CH
TCLP METALS

Lab Sample ID: M713B
LIMS ID: 95-21929
Matrix: Soil

QC Report No: M713-CH2M Hill
Project: Yakima I-82
117482.7C.08
Date Sampled: 12/27/95
Date Received: 12/29/95

Data Release Authorized:
Reported: 01/03/96

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	Result
1311	12/29/95	6010	01/02/96	7440-38-2	Arsenic	0.05	0.05 U
1311	12/29/95	6010	01/02/96	**7440-39-3**	**Barium**	0.001	**0.687**
1311	12/29/95	6010	01/02/96	**7440-43-9**	**Cadmium**	0.002	**0.010**
1311	12/29/95	6010	01/02/96	7440-47-3	Chromium	0.005	0.005 U
1311	12/29/95	6010	01/02/96	**7439-92-1**	**Lead**	0.02	**0.85**
1311	12/29/95	7470	01/02/96	7439-97-6	Mercury	0.0001	0.0001 U
1311	12/29/95	6010	01/02/96	7782-49-2	Selenium	0.05	0.05 U
1311	12/29/95	6010	01/02/96	7440-22-4	Silver	0.003	0.003 U

Values reported in mg/L (ppm)

U Analyte undetected at given RL

RL Limit of Detection

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INORGANICS ANALYSIS DATA SHEET Sample No: TP18-12/27/95-CH
TCLP METALS

Lab Sample ID: M713C
LIMS ID: 95-21930
Matrix: Soil

QC Report No: M713-CH2M Hill
Project: Yakima I-82
117482.7C.08
Date Sampled: 12/27/95
Date Received: 12/29/95

Data Release Authorized:
Reported: 01/03/96

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	Result
1311	12/29/95	6010	01/02/96	7440-38-2	Arsenic	0.05	0.05 U
1311	12/29/95	6010	01/02/96	**7440-39-3**	**Barium**	0.001	**0.574**
1311	12/29/95	6010	01/02/96	7440-43-9	Cadmium	0.002	0.002 U
1311	12/29/95	6010	01/02/96	7440-47-3	Chromium	0.005	0.005 U
1311	12/29/95	6010	01/02/96	**7439-92-1**	**Lead**	0.02	**0.25**
1311	12/29/95	7470	01/02/96	7439-97-6	Mercury	0.0001	0.0001 U
1311	12/29/95	6010	01/02/96	7782-49-2	Selenium	0.05	0.05 U
1311	12/29/95	6010	01/02/96	7440-22-4	Silver	0.003	0.003 U

Values reported in mg/L (ppm)

U Analyte undetected at given RL

RL Limit of Detection

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INORGANICS ANALYSIS DATA SHEET Sample No: TP5-12/27/95-CH
TCLP METALS

Lab Sample ID: M713D
LIMS ID: 95-21931
Matrix: Soil

QC Report No: M713-CH2M Hill
Project: Yakima I-82
117482.7C.08
Date Sampled: 12/27/95
Date Received: 12/29/95

Data Release Authorized:
Reported: 01/03/96

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	Result
1311	12/29/95	6010	01/02/96	7440-38-2	Arsenic	0.05	0.05 U
1311	12/29/95	6010	01/02/96	**7440-39-3**	**Barium**	0.001	**0.578**
1311	12/29/95	6010	01/02/96	**7440-43-9**	**Cadmium**	0.002	**0.010**
1311	12/29/95	6010	01/02/96	7440-47-3	Chromium	0.005	0.005 U
1311	12/29/95	6010	01/02/96	**7439-92-1**	**Lead**	0.02	**0.11**
1311	12/29/95	7470	01/02/96	7439-97-6	Mercury	0.0001	0.0001 U
1311	12/29/95	6010	01/02/96	7782-49-2	Selenium	0.05	0.05 U
1311	12/29/95	6010	01/02/96	7440-22-4	Silver	0.003	0.003 U

Values reported in mg/L (ppm)

U Analyte undetected at given RL

RL Limit of Detection

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INORGANICS ANALYSIS DATA SHEET Sample No: Method Blank
TCLP METALS

Lab Sample ID: M713MB
LIMS ID: 95-21928
Matrix: Soil

QC Report No: M713-CH2M Hill
Project: Yakima I-82
117482.7C.08
Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 01/03/96

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	Result
1311	12/29/95	6010	01/02/96	7440-38-2	Arsenic	0.05	0.05 U
1311	12/29/95	6010	01/02/96	**7440-39-3**	**Barium**	0.001	**0.016**
1311	12/29/95	6010	01/02/96	7440-43-9	Cadmium	0.002	0.002 U
1311	12/29/95	6010	01/02/96	7440-47-3	Chromium	0.005	0.005 U
1311	12/29/95	6010	01/02/96	7439-92-1	Lead	0.02	0.02 U
1311	12/29/95	7470	01/02/96	**7439-97-6**	**Mercury**	0.0001	**0.0001**
1311	12/29/95	6010	01/02/96	7782-49-2	Selenium	0.05	0.05 U
1311	12/29/95	6010	01/02/96	7440-22-4	Silver	0.003	0.003 U

Values reported in mg/L (ppm)

U Analyte undetected at given RL

RL Limit of Detection

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TOTAL DIESEL RANGE HYDROCARBONS
WA TPHd Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 95-21928
Matrix: Soil

QC Report No: M713-CH2M Hill
Project: Yakima I-82
117482.7C.08

Data Release Authorized:
Reported: 01/05/96

Date Received: 12/29/95

Lab ID	Sample ID	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
M713MB	Method Blank	12/29/95	1:1	5.0 U	---	10 U	71.7%
M713A	**TP14-12/27/95-CH**	12/30/95	1:1	**1,300**	NO	**2,600 E**	41.9%
M713A	**TP14-12/27/95-CH**	12/30/95	1:10	**1,200**	NO	**2,700**	47.9%
M713B	**TP23-12/27/95-CH**	12/30/95	1:1	**1,100**	NO	**3,900 E**	52.4%
M713B	**TP23-12/27/95-CH**	12/30/95	1:10	**1,000**	NO	**3,800**	44.5%
M713C	**TP18-12/27/95-CH**	12/30/95	1:1	**980**	NO	**3,200 E**	50.8%
M713C	**TP18-12/27/95-CH**	12/30/95	1:10	**860**	NO	**3,300**	46.4%
M713D	**TP5-12/27/95-CH**	12/30/95	1:1	**1,700 E**	NO	**8,600 E**	64.3%
M713D	**TP5-12/27/95-CH**	12/30/95	1:10	**1,800**	NO	**9,000**	46.5%

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Values reported in ppm (mg/kg) on a dry weight basis.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C32.

Data Qualifiers

U	Compound not detected at the given detection limit.
E	Value detected above linear range of instrument. Dilution required.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.

FORM-1 WA TPHD

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TOTAL DIESEL RANGE HYDROCARBONS
WA TPHd Range C12 to C24 by GC/FID

Lab Sample ID: M713SB
LIMS ID: 95-21928
Matrix: Soil

QC Report No: M713-CH2M Hill
Project: Yakima I-82
117482.7C.08

Data Release Authorized:
Reported: 01/05/96

LABORATORY CONTROL SAMPLE RECOVERY REPORT

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	127	100	127%

TPHd Surrogate Recovery

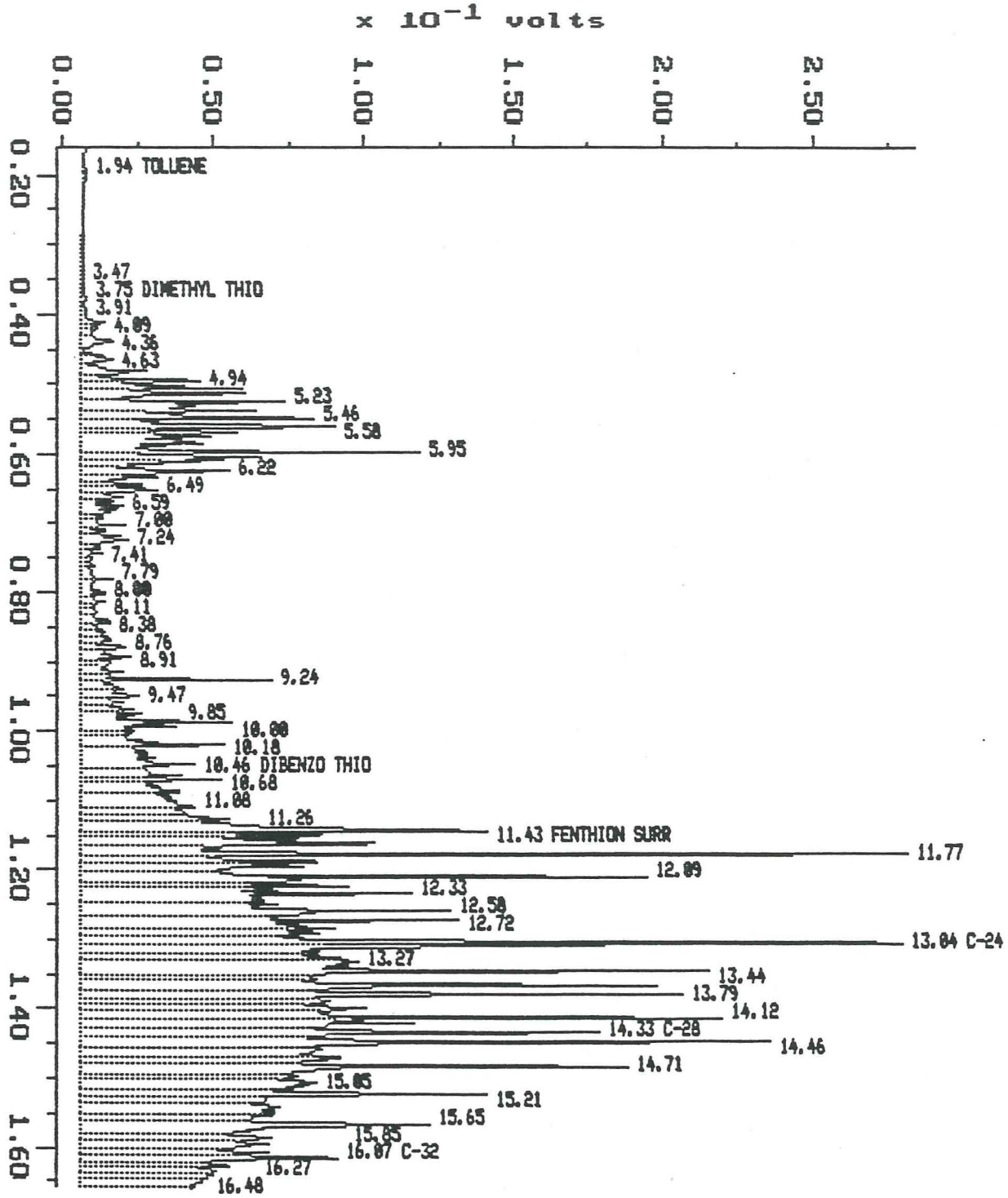
Methylarachidate 69.7%

Values reported in parts per million (mg/kg)

Sample: M713A
Acquired: 30-DEC-95 5:30

Channel: FID 2-DB5 .32
Method: C:\MAX\HCIDMTH\DEC26-3

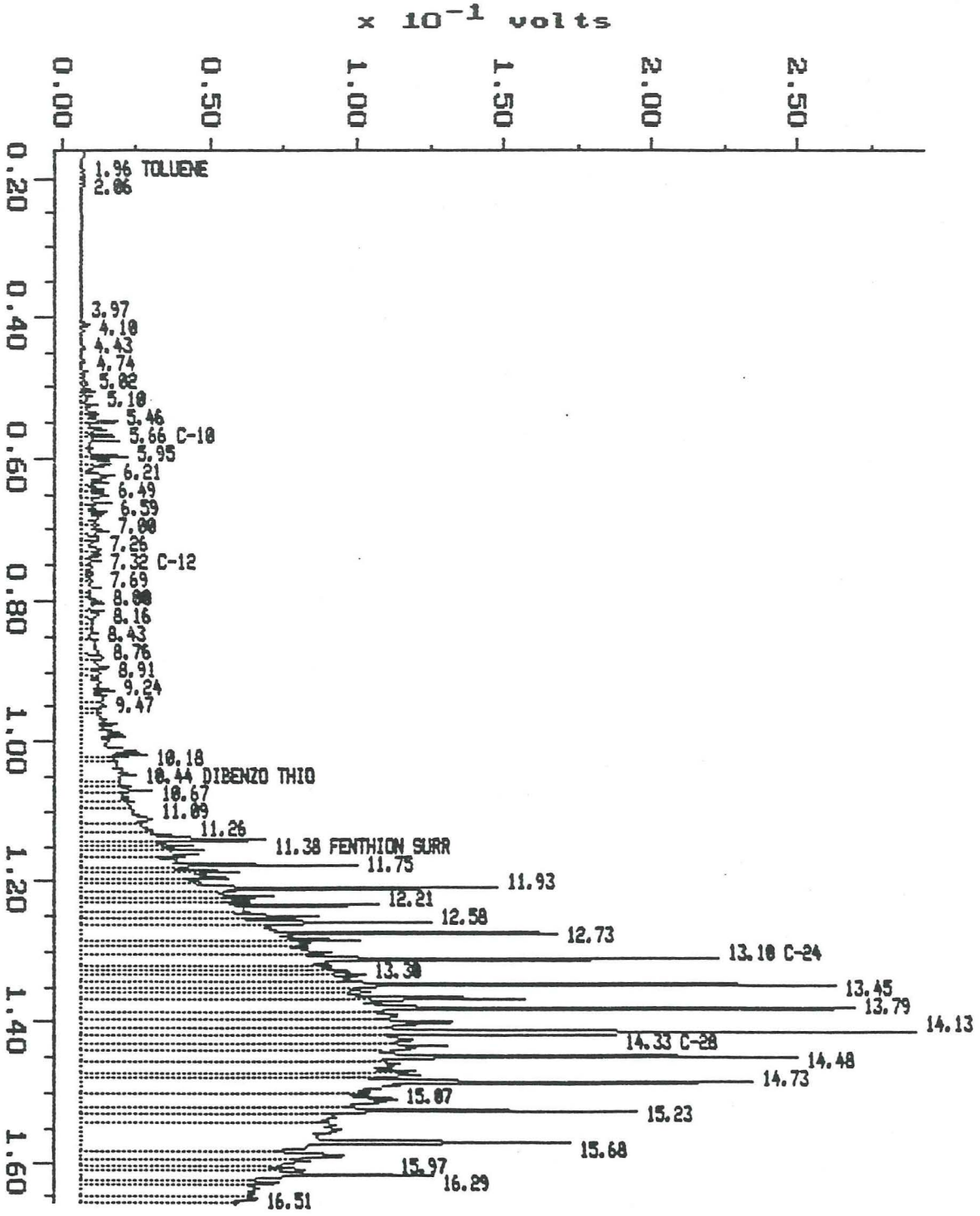
Filename: 1226122
Operator: BC



Sample: M713B
Acquired: 30-DEC-95 6:52

Channel: FID 2-DB5 .32
Method: C:\MAX\HCIDMTH\DEC26-3

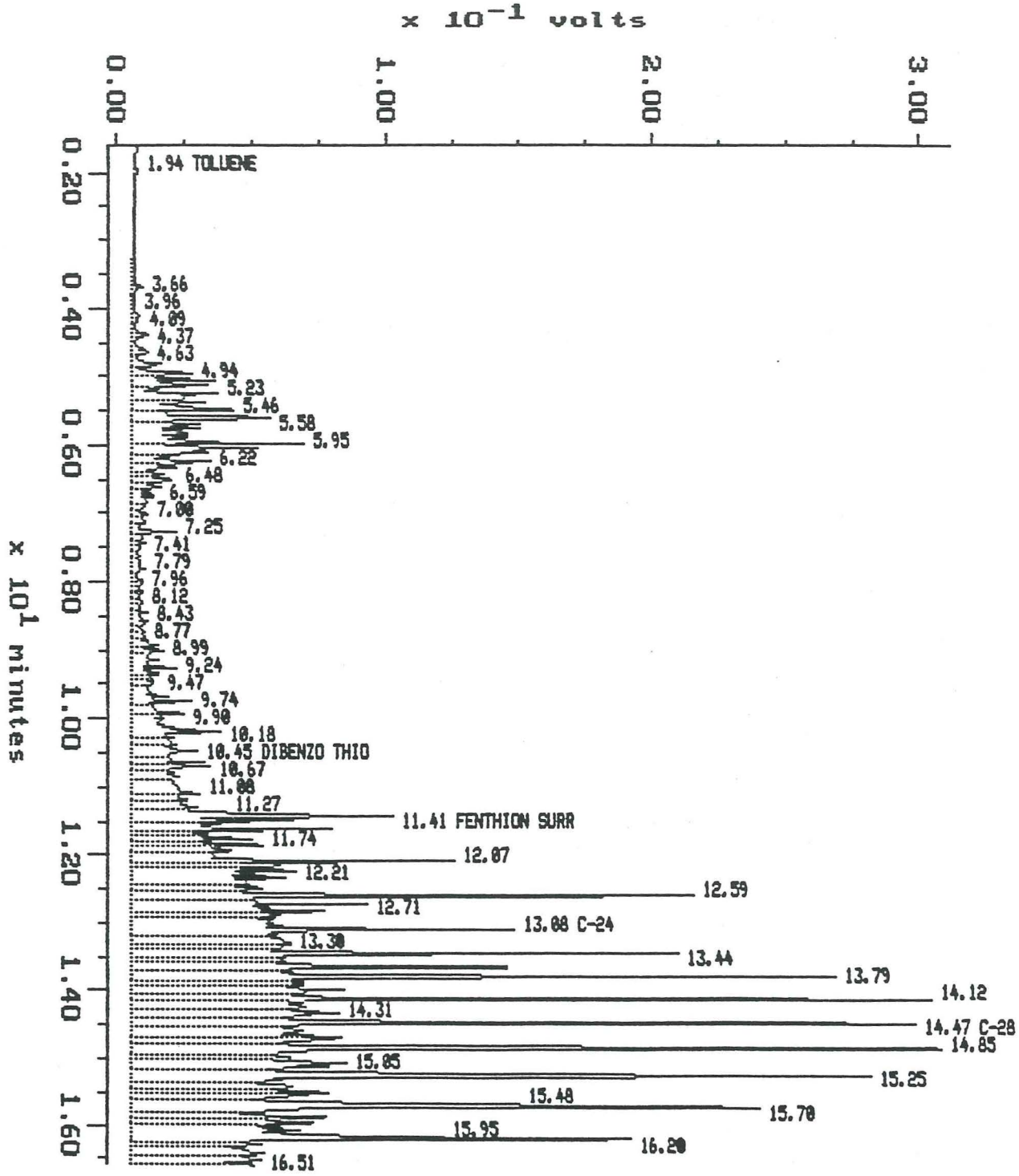
Filename: 1226124
Operator: BC



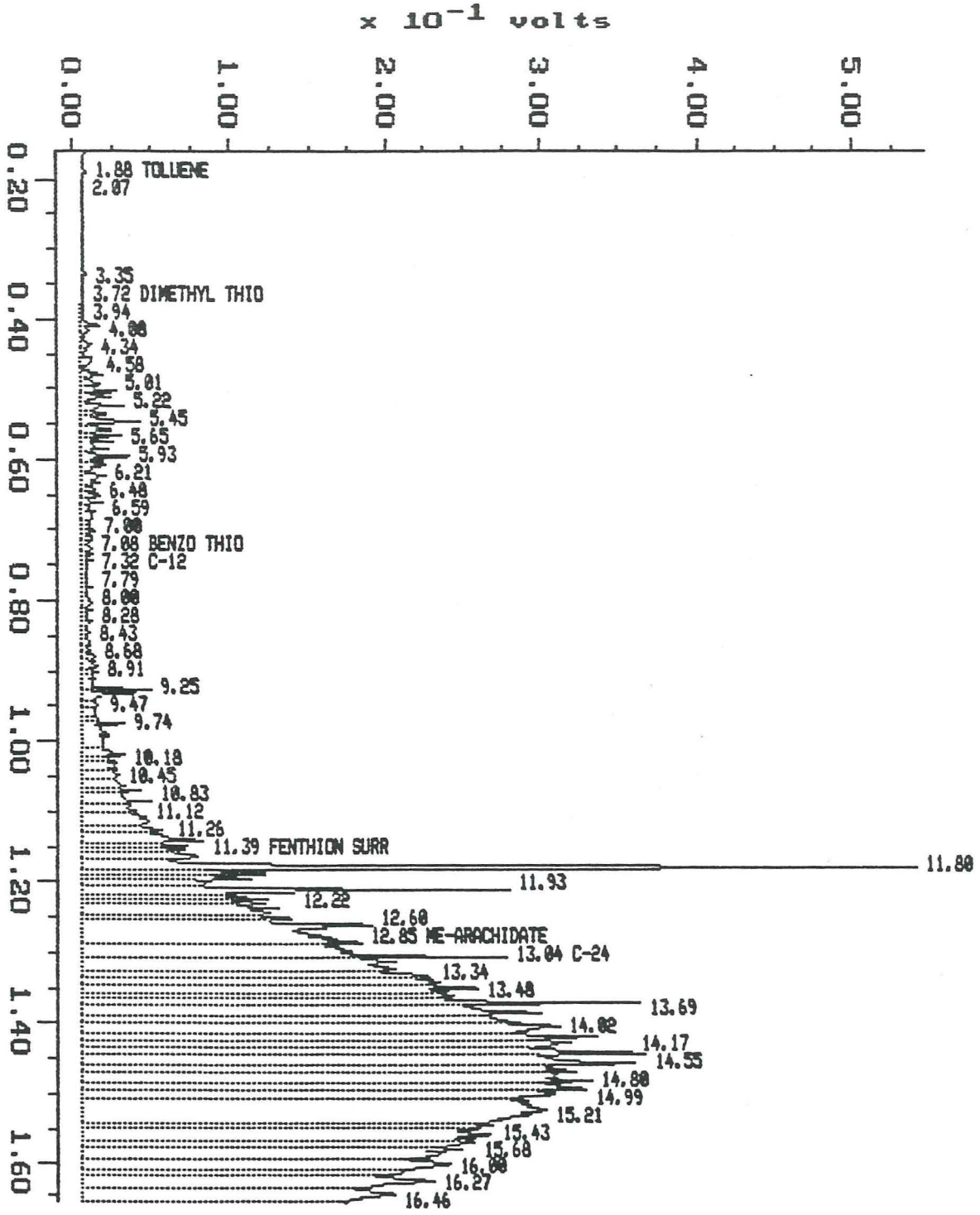
Sample: M713C
Acquired: 30-DEC-95 7:33

Channel: FID 2-DB5 .32
Method: C:\MAX\HCIDMTH\DEC26-3

Filename: 1226125
Operator: BC



Sample: M713D
Acquired: 30-DEC-95 9:31
Channel: FID 2-DB5 .32
Method: C:\MAX\HCIDMTH\DEC26-3
Filename: 1226128
Operator: BC



Analytical Resources, Incorporated
Analytical Chemists and Consultants

9 January 1996

Doug Holsten
CH2M Hill
777 18th Avenue NE
Bellevue, WA 98004

RE: Client Project: 117482.7C.08 Yakima I-82;
ARI Project: #M753

Dear Mr. Holsten,

Please find enclosed the additional analytical results for a sample from the project referenced above. Four soil samples were received in good condition on 12/29/95, the data for which was faxed to you, then submitted to you in final form on 1/5. At your faxed request on 1/4, sample T18 was relogged into the laboratory. These results were faxed to you earlier today.

The sample, a matrix spike, and a matrix spike duplicate were analyzed for diesel and motor oil range tphs by GC/FID. The analyses were routine, however note that the sample required reanalysis at dilution due to the high motor oil range hydrocarbon concentrations present. Both sets of results are included on the report. The sample extract was also analyzed by GC/MS, along with a standard alkane mix, to verify the presence of specific alkanes. All the sample chromatograms are included to assist with your evaluation of the results, which indicate that the hydrocarbons are truly those of a petroleum product.

QC documentation consists of a method blank report as well as the MS/MSD and Laboratory Control Sample recovery reports.

A copy of this package, with all raw data and benchsheets, will be kept on file at ARI, should you require additional information or copies of any documentation. Please feel free to call me at any time if you find problems with these reports or have any questions.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kate Stegemoeller
Project Coordinator
206-340-2866, ext. 117

Enclosures
cc: file #M753

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(206) 621-6490
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TOTAL DIESEL RANGE HYDROCARBONS
WA TPHd Range C12 to C24 by GC/FID
and Motor Oil

LIMS ID: 96-119
Matrix: Soil

Data Release Authorized:
Reported: 01/09/96

QC Report No: M753-CH2M Hill
Project: Yakima I-82
117482.7C.08
Date Received: 01/04/96

Lab ID	Sample ID	Date Analyzed	Dilution Factor	Diesel Range	*HC ID	Motor Oil Range	Surrogate Recovery
M753MB	Method Blank	01/05/95	1:1	5.0 U	---	10 U	117%
M753A	**TP18-12/27/95-CH**	01/05/96	1:1	**770**	NO	**2,300 E**	76.4%
M753A	**TP18-12/27/95-CH**	01/05/96	1:10	**780**	NO	**2,500**	75.0%

Surrogate is Methyl-Arachidate.

* ID indicates, in the opinion of the analyst, the petroleum product with the best pattern match. 'NO' indicates that there was not a good match for any of the requested products.
Values reported in ppm (mg/kg) on a dry weight basis.
Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the Motor Oil Standard range.

Data Qualifiers

U	Compound not detected at the given detection limit.
E	Value detected above linear range of instrument. Dilution required.
J	Indicates an estimated value below the calculated detection limit.
S	No value reported due to saturation of the detector. Dilution required.
D	Indicates the surrogate was not detected because of dilution of the extract.
E	Indicates a value above the linear range of the detector. Dilution required.
NR	Indicates no recovery due to matrix interference.

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL DIESEL RANGE HYDROCARBONS
WA TPHd Range C12 to C24 by GC/FID

Lab Sample ID: M753A
LIMS ID: 96-119
Matrix: Soil

Data Release Authorized:
Reported: 01/09/96

Sample No: TP18-12/27/95-CH
QC Report No: M753-CH2M Hill
Project: Yakima I-82
117482.7C.08
Date Received: 01/04/96

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Diesel Range Hydrocarbons	770	911	179	78.8%	
MATRIX SPIKE DUPLICATE					
Diesel Range Hydrocarbons	770	979	177	118%	39.9%

TPHd Surrogate Recovery

Matrix Spike	Methylarachidate	80.3%
MS Duplicate	Methylarachidate	75.7%

Values reported in parts per million (mg/kg)

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

TOTAL DIESEL RANGE HYDROCARBONS
WA TPHd Range C12 to C24 by GC/FID

Lab Sample ID: M753SB
LIMS ID: 96-119
Matrix: Soil

QC Report No: M753-CH2M Hill
Project: Yakima I-82
117482.7C.08

Data Release Authorized:
Reported: 01/09/96

LABORATORY CONTROL SAMPLE RECOVERY REPORT

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
Diesel Range Hydrocarbons	115	100	115%

TPHd Surrogate Recovery

Methylarachidate	117%

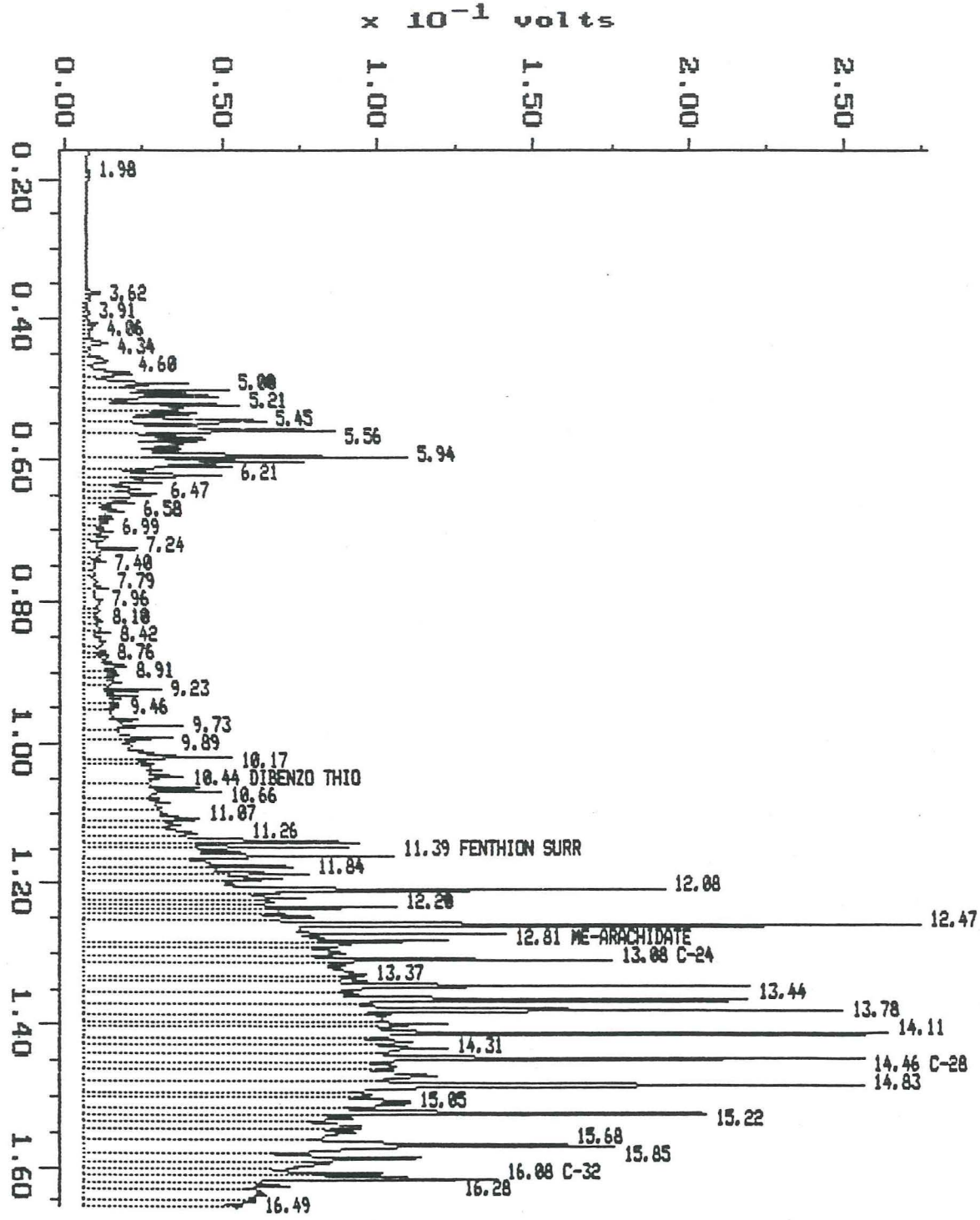
Values reported in parts per million (mg/kg)

7065

Sample: M753A
Acquired: 05-JAN-96 21:47

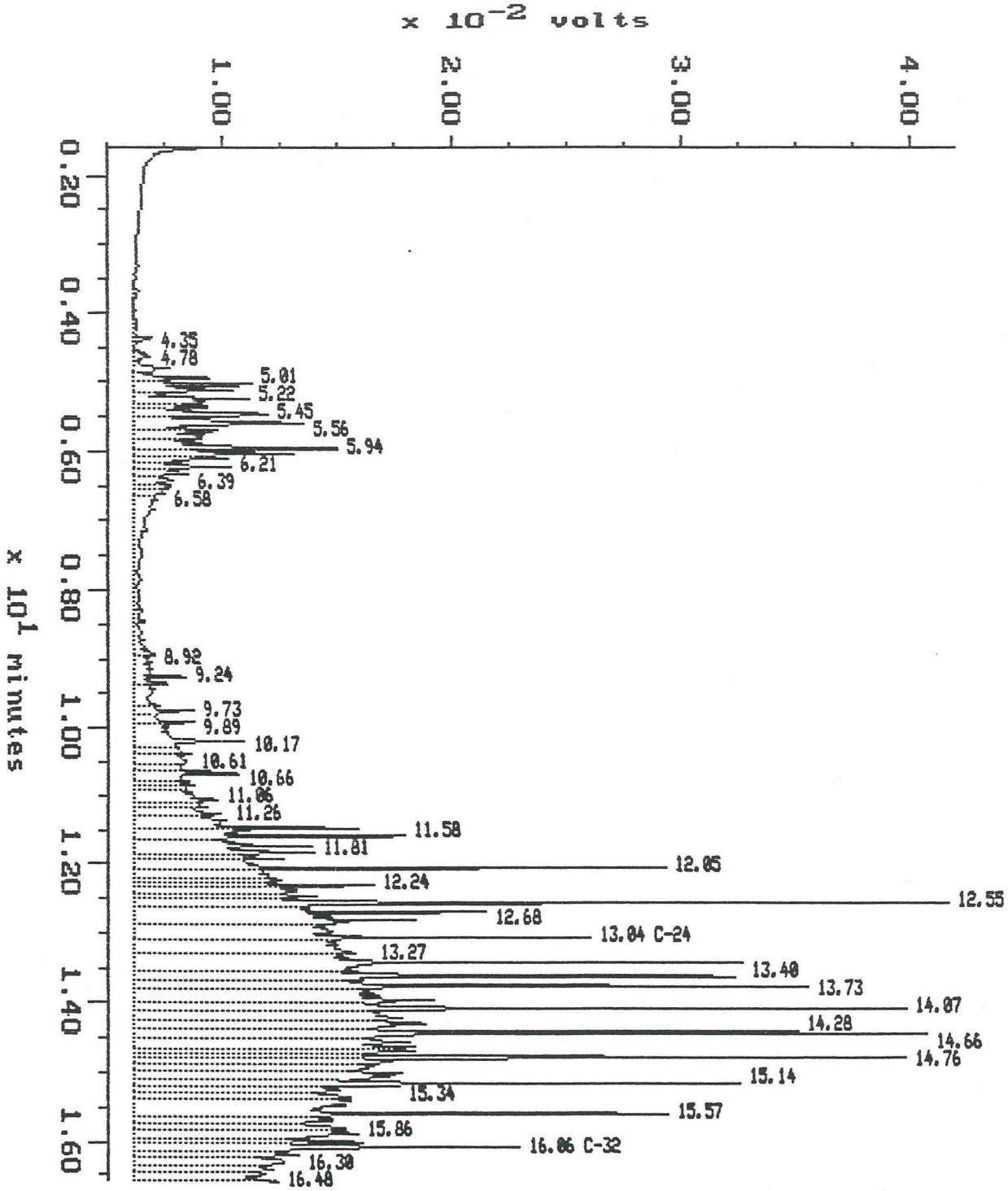
Channel: FID 2-DB5 .32
Method: C:\MAX\HCIDMTH\JAN02-2

Filename: 010287
Operator: BC



7215

Sample: M753A*10 Channel: FID 2-DB5 .32 Filename: 010283
Acquired: 05-JAN-96 19:10 Method: C:\MAX\HCIDMTH\JAN02-2 Operator: BC

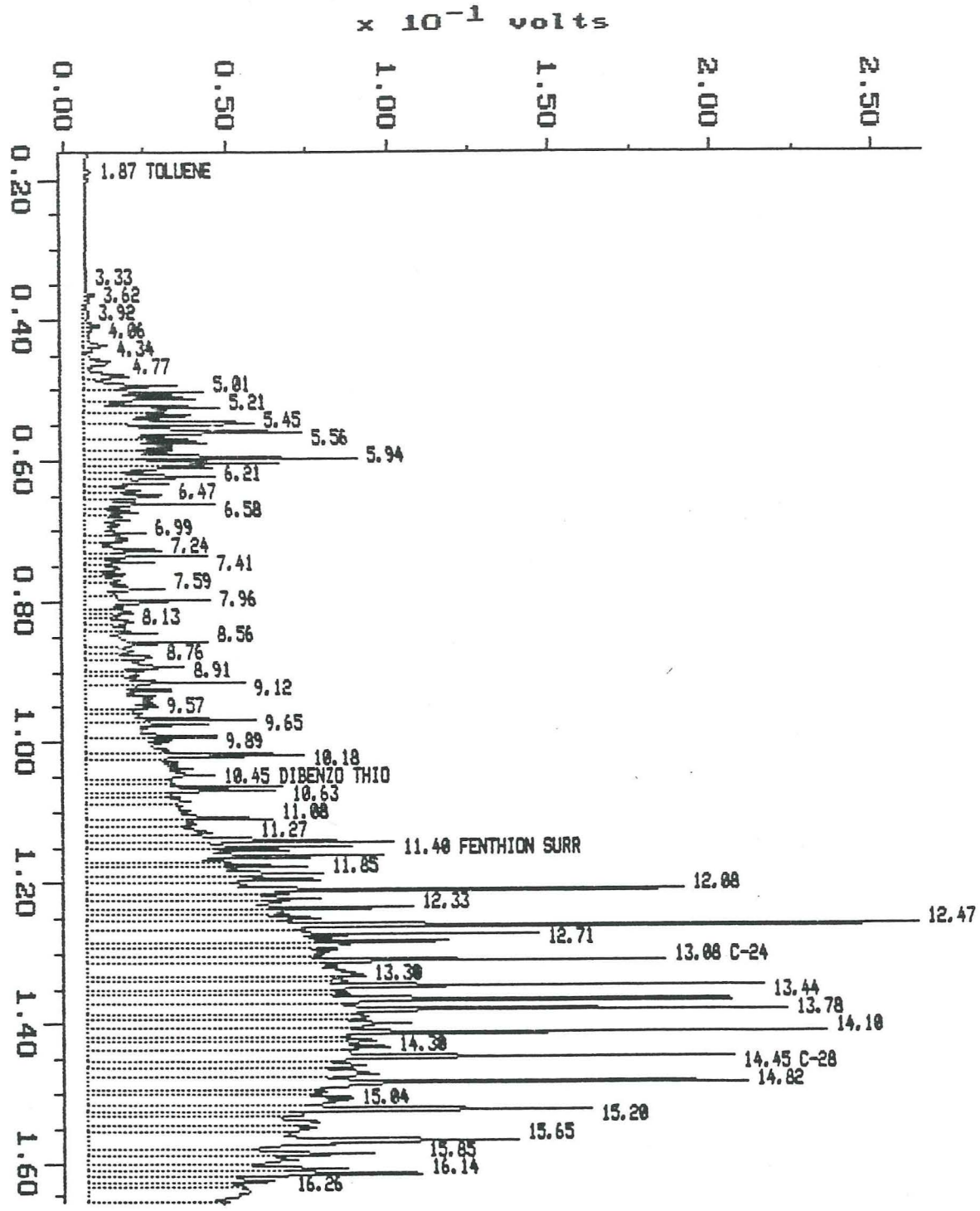


7256

Sample: M753AMS
Acquired: 05-JAN-96 22:26

Channel: FID 2-DB5 .32
Method: C:\MAX\HCIDMTH\JAN02-2

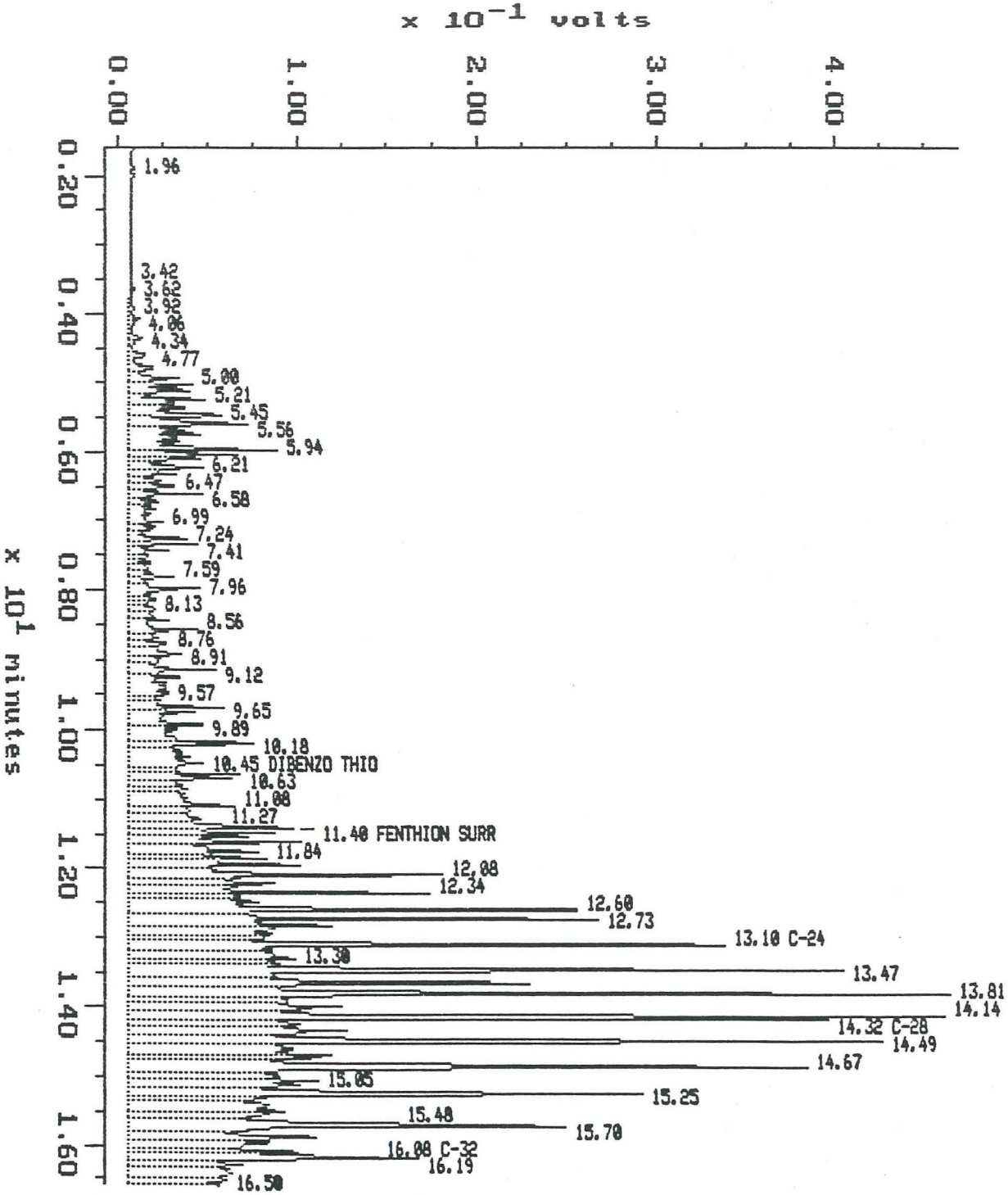
Filename: 010288
Operator: BC

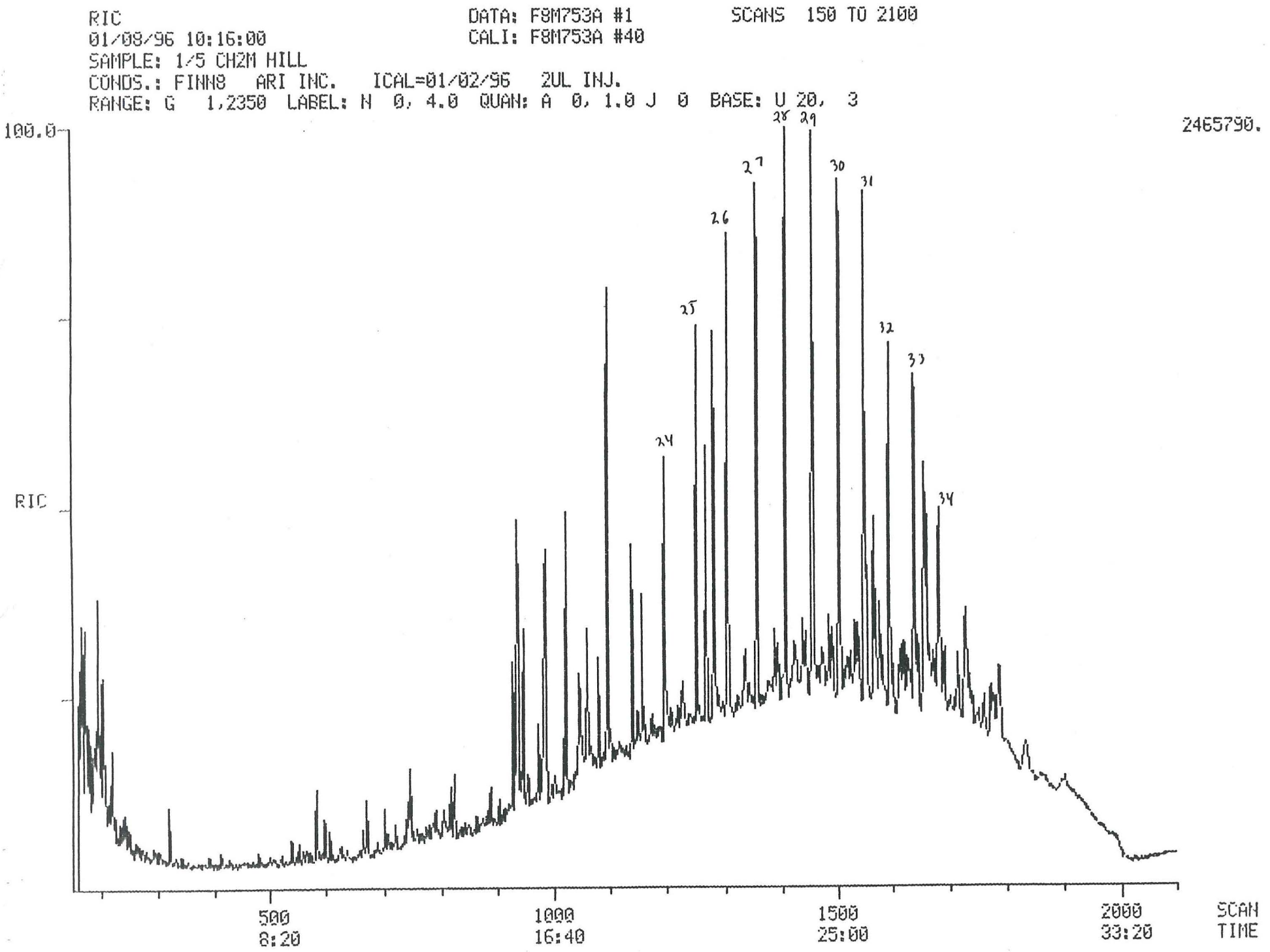


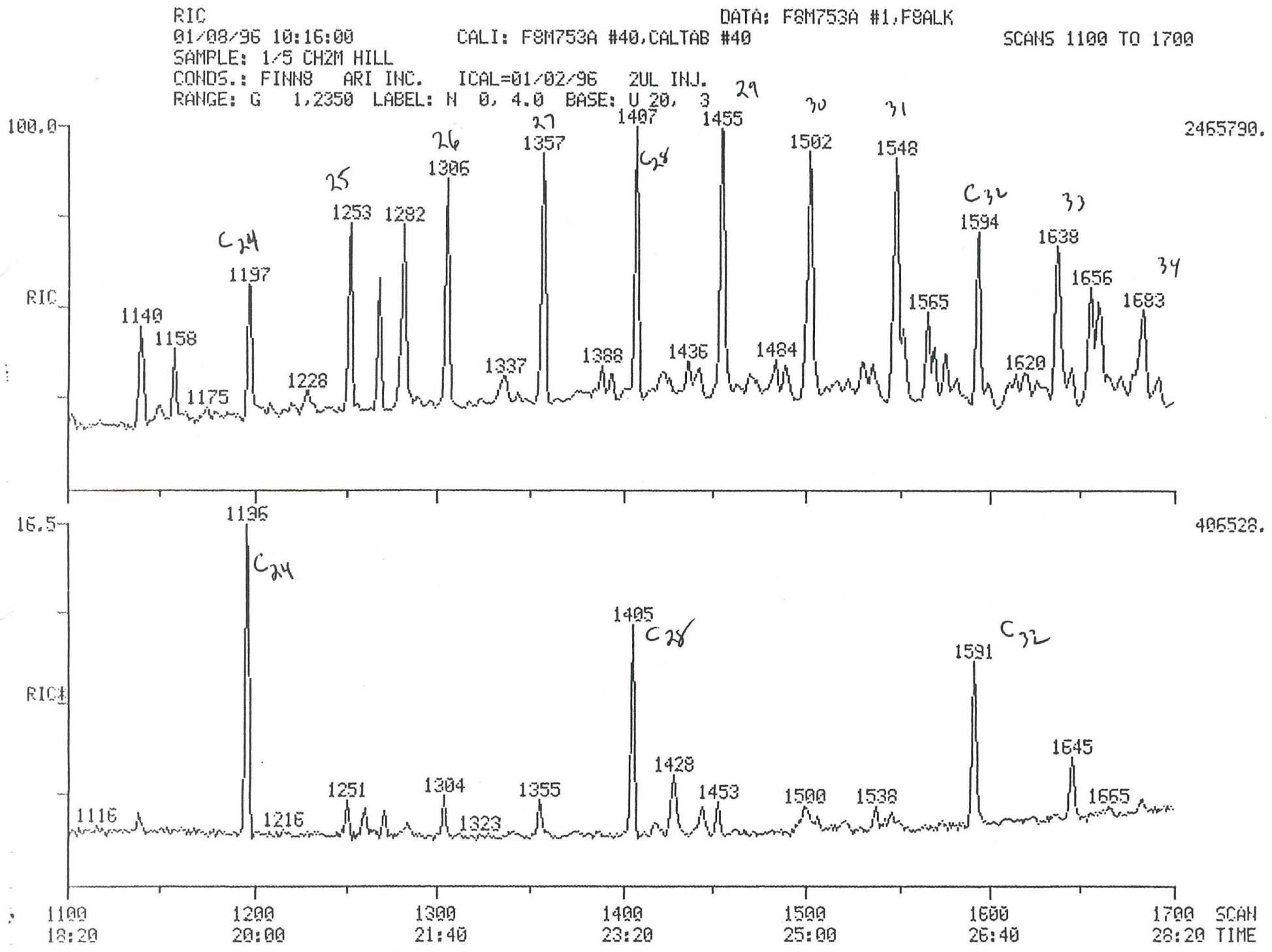
Sample: M753AMSD
Acquired: 05-JAN-96 23:05

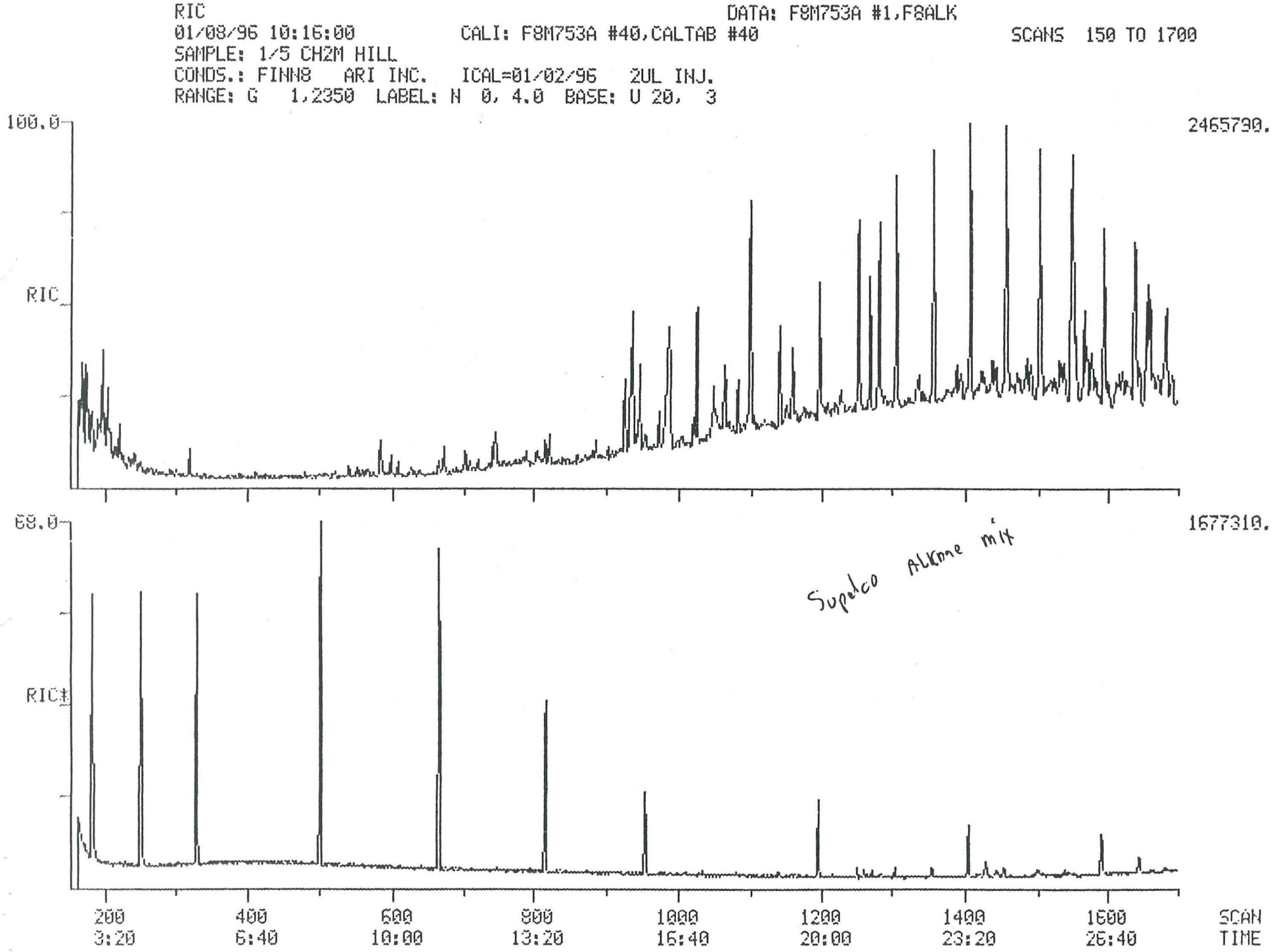
Channel: FID 2-DB5 .32
Method: C:\MAX\HCIDMTH\JAN02-2

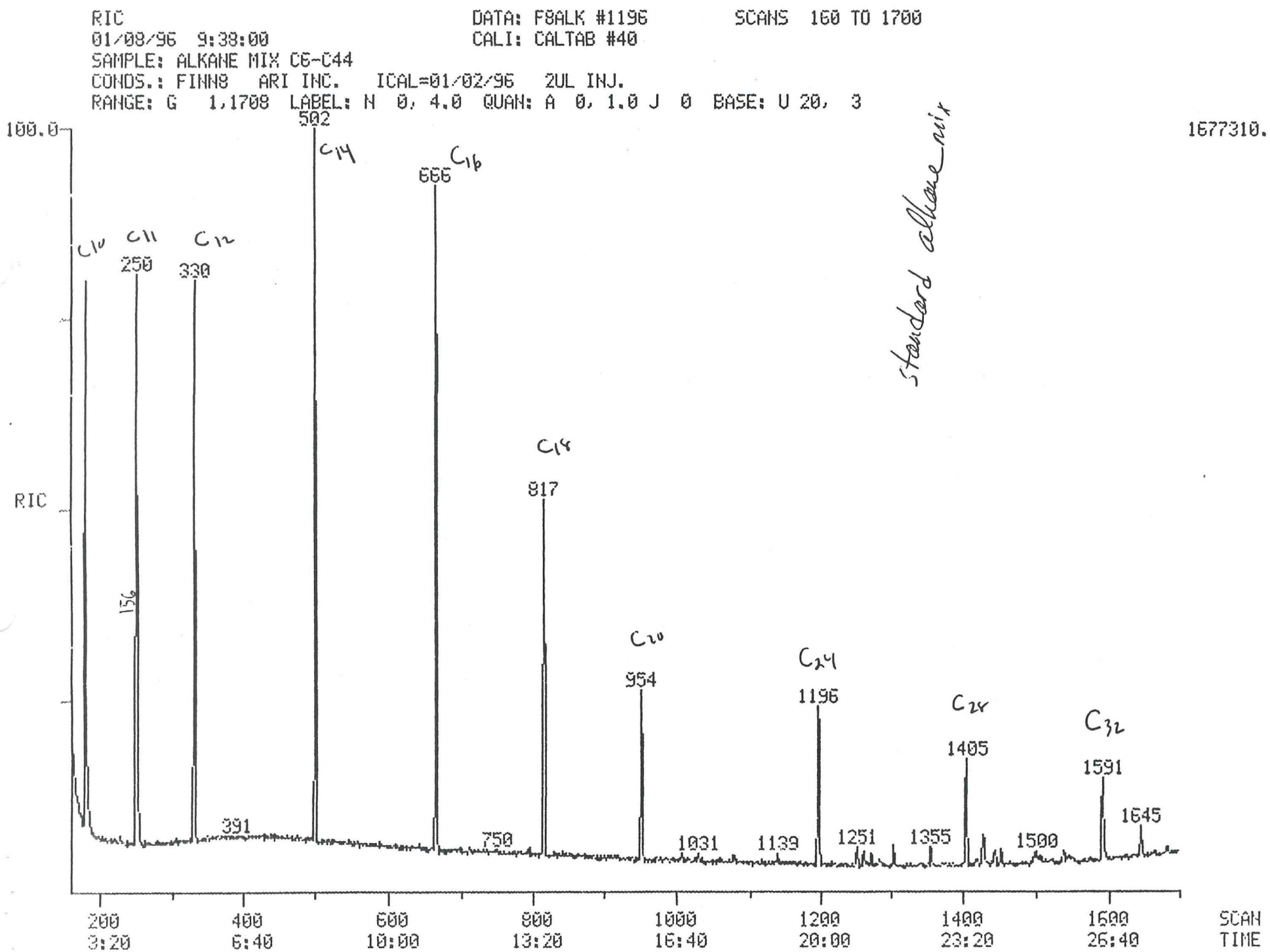
Filename: 010289
Operator: BC




RIC
01/08/96 10:16:00
SAMPLE: 1/5 CH2M HILL
CONDS.: FINN8 ARI INC. ICAL=01/02/96 2UL INJ.
RANGE: G 1,2350 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3
DATA: F8M753A #1
CALI: F8M753A #40
SCANS 150 TO 2100
100.0
2465790.
RIC
24
25
26
27
28
29
30
31
32
33
34
500
8:20
1000
16:40
1500
25:00
2000
33:20
SCAN
TIME


RIC
01/08/96 10:16:00
SAMPLE: 1/5 CH2M HILL
CONDS.: FINN8 ARI INC.
RANGE: G 1,2350 LABEL: N 0, 4.0 BASE: U 20, 3
DATA: F8M753A #1,F8ALK
CALI: F8M753A #40,CALTAB #40
ICAL=01/02/96 2UL INJ.
SCANS 1100 TO 1700
100.0
RIC
2465790.
1140
1158
1175
1197
C24
1228
1253
25
1282
1306
26
1337
1357
27
1388
1407
C28
1436
1455
29
1484
1502
30
1548
31
1565
1594
C32
1620
1638
33
1656
1683
34
16.5
RIC
406528.
1116
1136
C24
1216
1251
1304
1323
1355
1405
C28
1428
1453
1500
1538
1591
C32
1645
1665
1100
18:20
1200
20:00
1300
21:40
1400
23:20
1500
25:00
1600
26:40
1700
28:20
SCAN
TIME


RIC
01/08/96 10:16:00
SAMPLE: 1/5 CH2M HILL
CONDS.: FINN8 ARI INC. ICAL=01/02/96 2UL INJ.
RANGE: G 1,2350 LABEL: N 0, 4.0 BASE: U 20, 3
CALI: F8M753A #40,CALTAB #40
DATA: F8M753A #1,F8ALK
SCANS 150 TO 1700
100.0
RIC
2465730.
88.0
RIC
1677310.
Supelco Alkane mix
200
3:20
400
6:40
600
10:00
800
13:20
1000
16:40
1200
20:00
1400
23:20
1600
26:40
SCAN
TIME

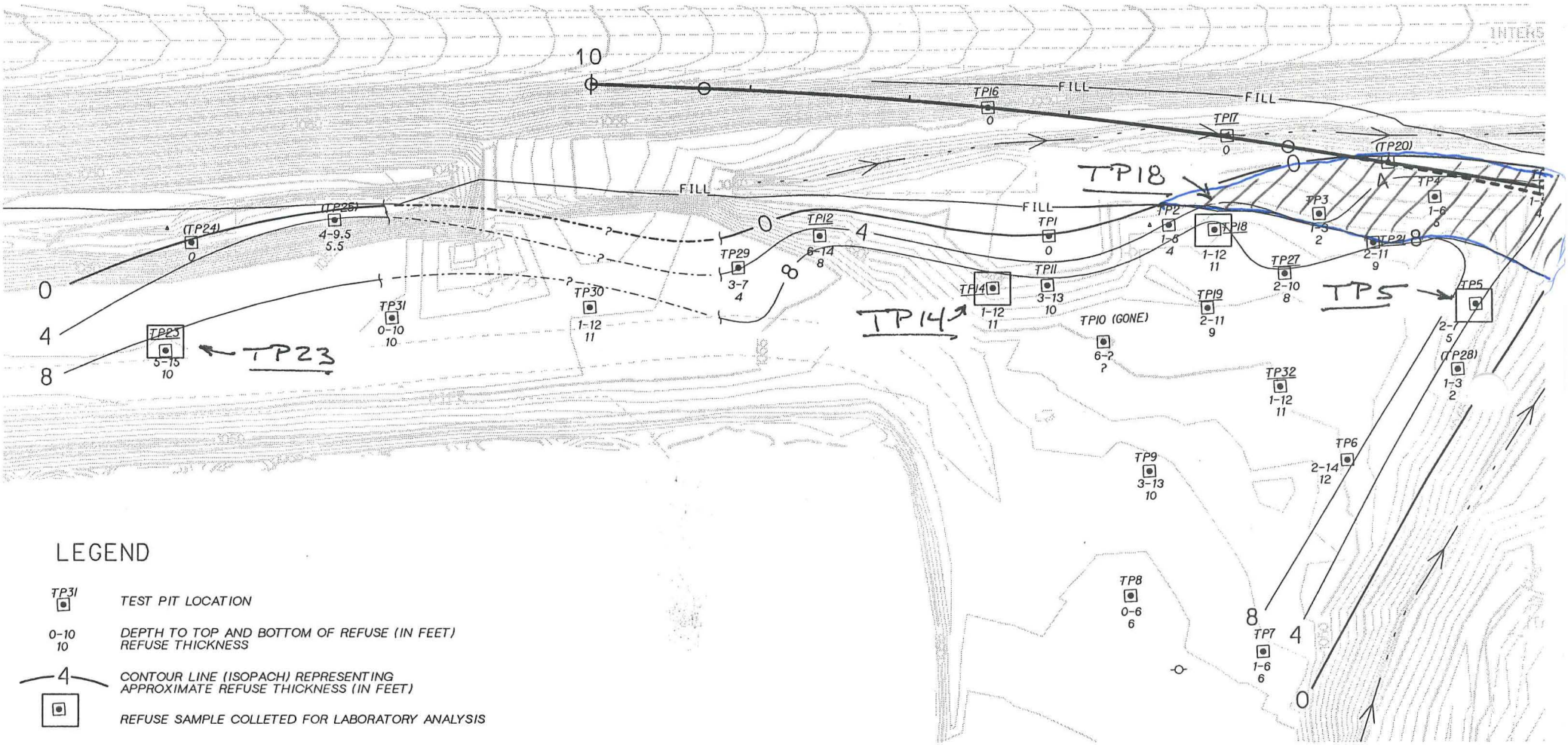

RIC
01/08/96 9:38:00
SAMPLE: ALKANE MIX C6-C44
CONDS.: FINN8 ARI INC. ICAL=01/02/96 2UL INJ.
RANGE: G 1,1708 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3
DATA: F8ALK #1196
CALI: CALTAB #40
SCANS 160 TO 1700
100.0
1677310.
RIC
Standard alkane mix
C10
C11
C12
C14
C16
C18
C20
C24
C28
C32
156
250
330
391
502
666
750
817
954
1031
1139
1196
1251
1355
1405
1500
1591
1645
200
3:20
400
6:40
600
10:00
800
13:20
1000
16:40
1200
20:00
1400
23:20
1600
26:40
SCAN
TIME

Summary of Refuse Characterization Data

Test Pit No.	TCLP Metals (mg/l)	TPH[1] (mg/kg)	Notes
TP-5	Below DW threshold	10,800	
TP-14	Below DW threshold	3,900	
TP-18	Below DW threshold	4,160	Re-analyzed on January 9, 1996 with result of 3,280 mg/kg. Presence of petroleum hydrocarbons confirmed by GC/MS.
TP-23	Below DW threshold	3,800	

[1] WTPH Diesel -- extended

DW -- Dangerous Waste as defined by WAC 173-303-090



LEGEND

TP31	TEST PIT LOCATION
0-10 10	DEPTH TO TOP AND BOTTOM OF REFUSE (IN FEET) REFUSE THICKNESS
4	CONTOUR LINE (ISOPACH) REPRESENTING APPROXIMATE REFUSE THICKNESS (IN FEET)
	REFUSE SAMPLE COLLETED FOR LABORATORY ANALYSIS

TAR Ramp Refuse/Drainage

Option 1 - Remove Refuse

1A. No ditch – divert flow to north

1B. Ditch at toe of TAR

1C. Pipe at toe of TAR

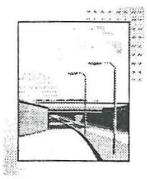
Option 2 - Fill on Refuse

2A. No ditch – divert flow to north

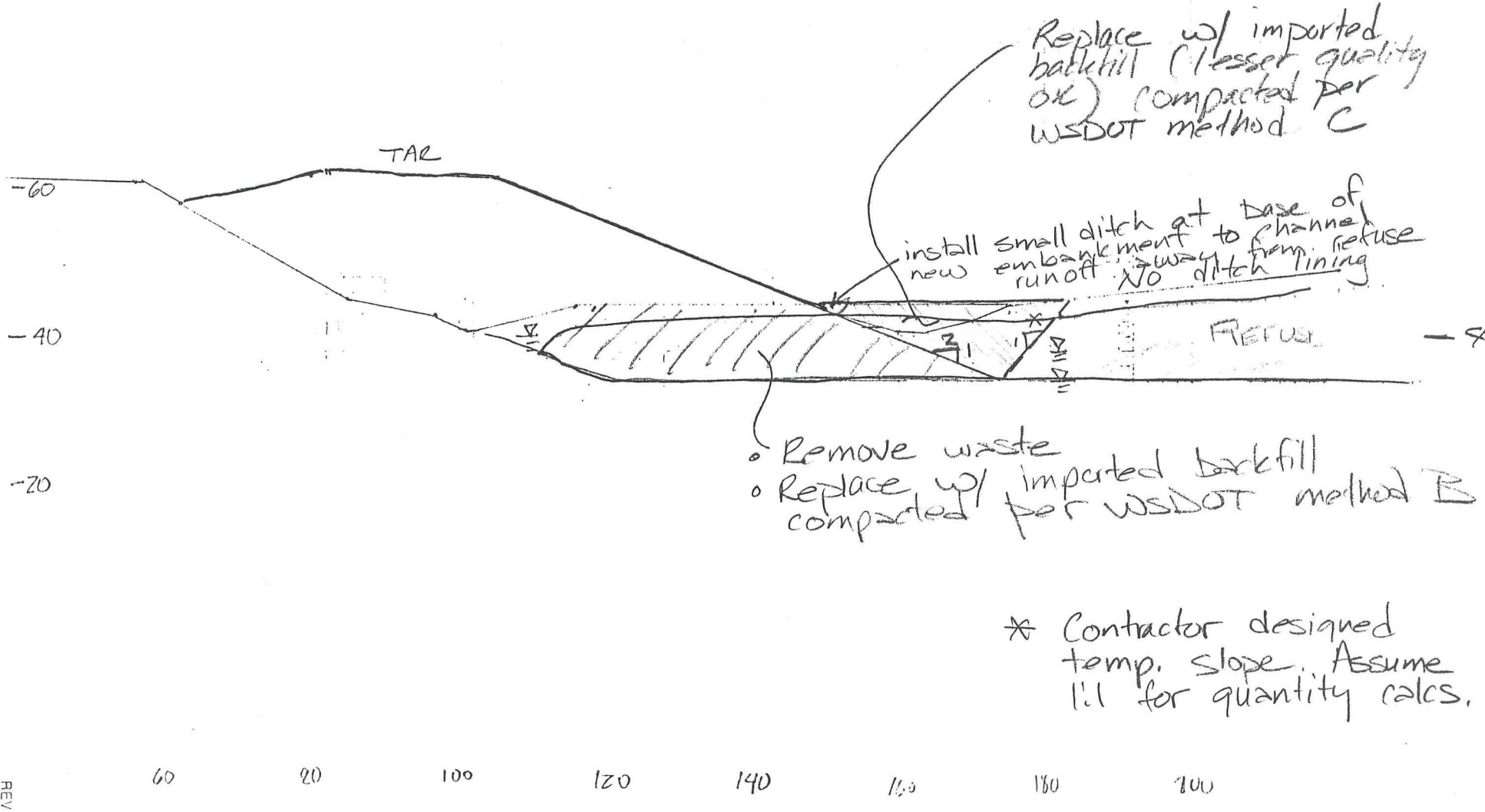
2B. Ditch at toe of TAR

2C. Pipe at toe of TAR

2D. Pipe at existing ditch

YAKIMA  GATEWAY

OPTION 1A
REMOVE REFUSE — NO DITCH



SUBJECT

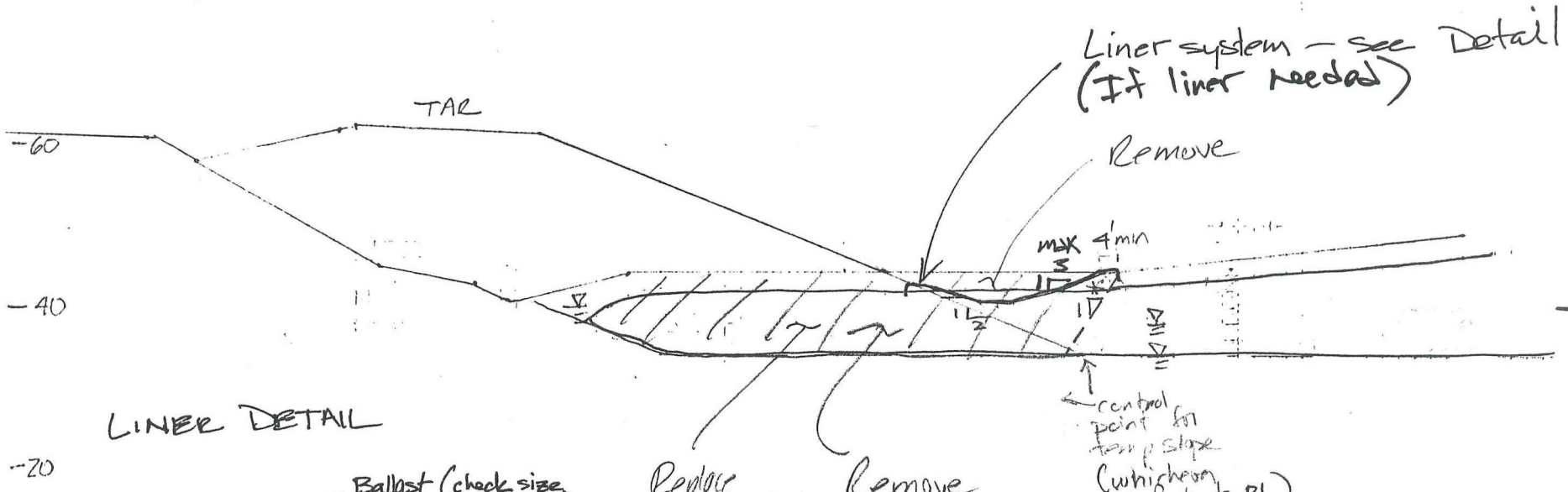
BY

SHEET ___ of ___ DATE

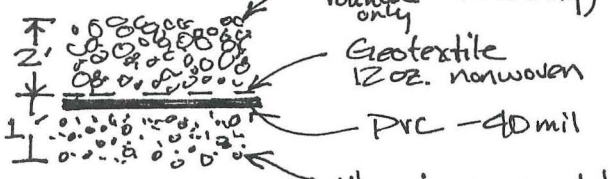
PROJ. NO.

REV 9/93 FORM 165

OPTION 1B
REMOVE REFUSE - DITCH @ TAR TOE

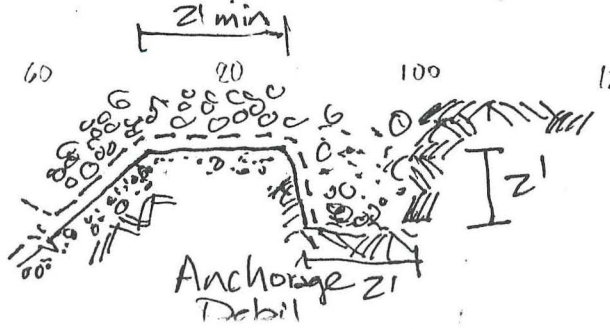


LINER DETAIL



* Contractor designed temp. slope. Assume 1:1 in quantity calcs.

Max slope for liner = 3:1



SUBJECT

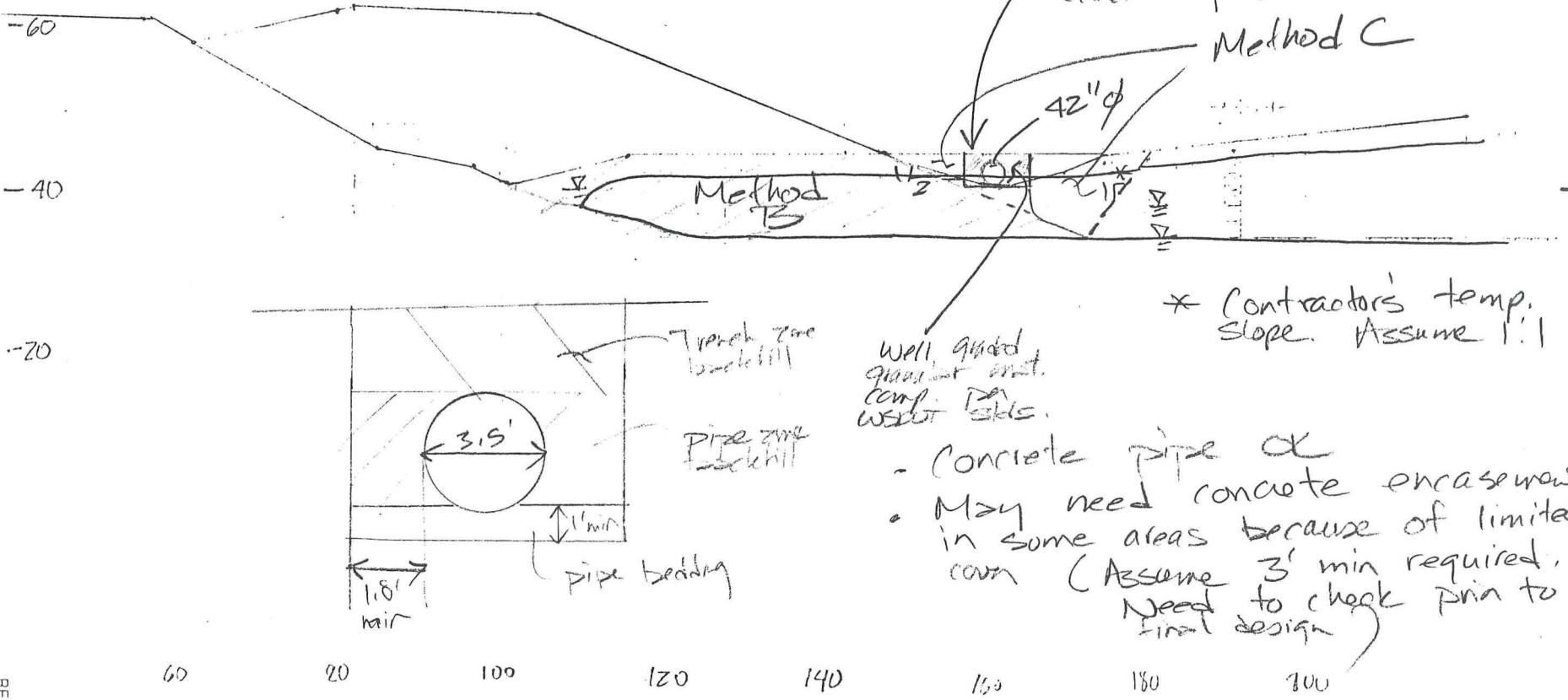
BY

SHEET NO. ____ of ____ DATE

PROJ. NO.

REV 9-93 FORM 163

OPTION 1C
REMOVE REFUSE - PIPE @ TAR TOE



SUBJECT

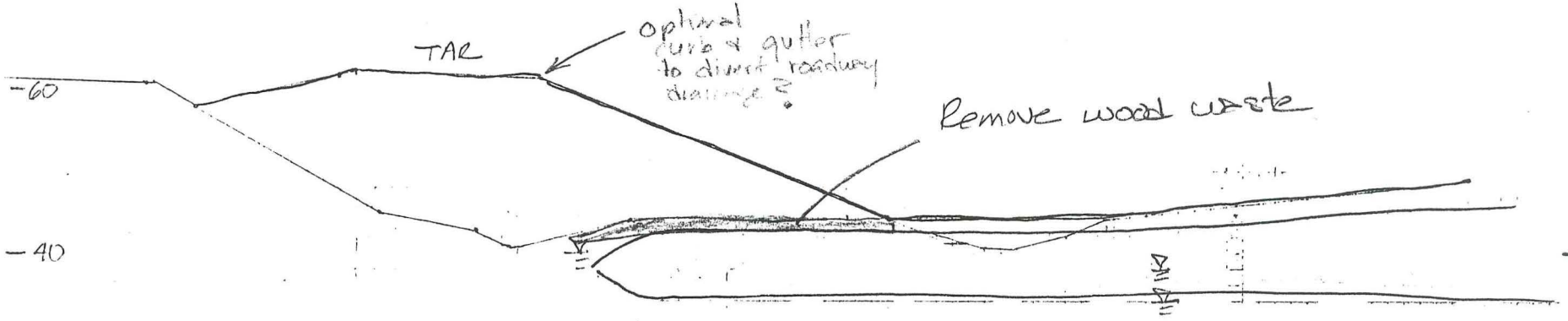
BY

SHEET NO. ___ of ___

PROJ NO. DATE

REV 9/93 FORM 165

OPTION 2A
FILL ON REFUSE - NO DITCH



Primary Settlement ~ 15"-19" occuring mostly within 1 mo. → recommend settlement plates for monitoring & knowing when to pave

Secondary Settlement ~ v. difficult to predict

Time after constr.	Secondary
1 yr	0.1" to 1"
5 yr	0.5" to 2"
20 yr	1.5" to 3"

} under current loading condition -long alignment

60 80 100 120 140 160 180 200

SUBJECT

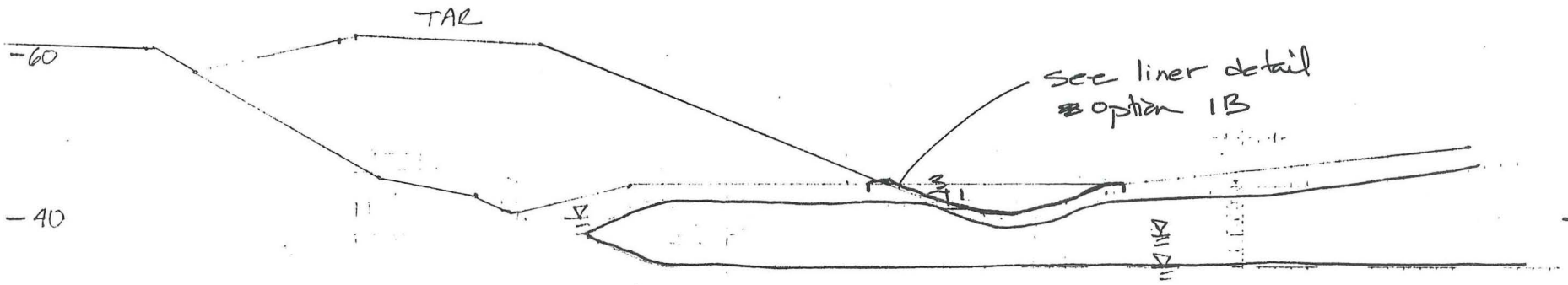
BY

SHEET NO. of

PROJ NO. DATE

REV 9-93 FORM 18B

OPTION 2B - FILL ON REFUSE - DITCH AT TAR TOE



Primary & Secondary settlement → same as option 2A

60 80 100 120 140 160 180 200

SUBJECT

BY

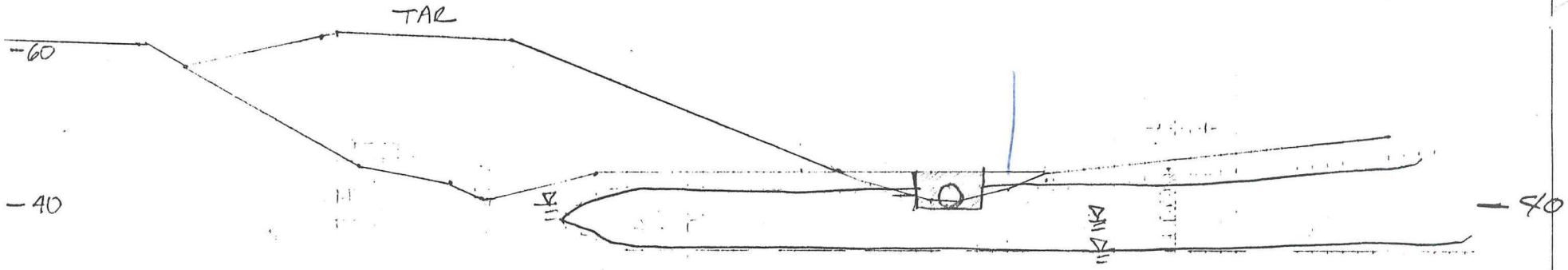
SHEET NO. of DATE

PROJECT NO.

REV 9.93 FORM 185

OPTION 2C

FILL OVER REFUSE – PIPE @ TAR TOE



Embankment Settlement

Same as Option 2A, 2B

Pipe Considerations

- May not have adequate cover for traffic loads. Concrete encasement increases settlement.
- Backfilling with normal pipe bedding, pipe zone backfill could result in 1" to 1.5" primary settlement. More if additional cover required.
- Backfilling w/ refuse better for settlement but no tolerance to traffic loads
- Backfill w/ light-weight fill or geofoam for settlement. Still lack cover requirements.
- Probably use HDPE or other flexible pipe

SUBJECT

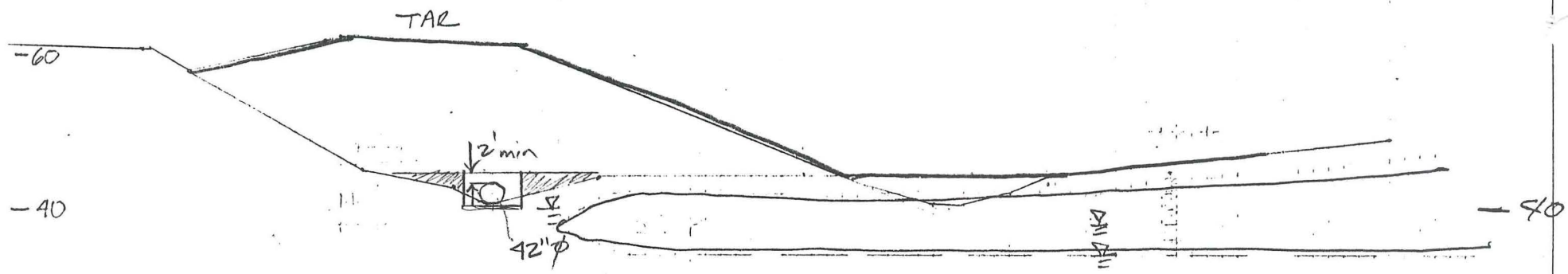
BY

SHEET NO. of

PROJECT NO. DATE

REV 9-93 FORM 18B

OPTION 2D
FILL OVER REFUSE — PIPE IN EXISTING DITCH



EMBANKMENT SETTLEMENT

Same as options 2A, 2B

60 80 100 120 140 160 180 200

PIPE CONSIDERATIONS

- Probably no refuse, ∴ no settlement problem beneath existing ditch
- No refuse removal
- No problem w/ insufficient cover
- Overexcavate to get grade, remove unsuitable pipe & bedding material (cost ~ 1/1
- Construct embankment at least 2' above pipe crown prior to excavating trench
- Concrete pipe OK.
- No access from ground for repairs or maintenance.

SUBJECT

BY

SHEET NO. ____ of ____ DATE

PROJECT

REV 9.93 FORM 185