BISON ENVIRONMENTAL
NORTHWEST, INC.

DEPARTMENT OF ECOLOGY
NWRO/TCP TANK UNIT
1716
INTERIM CLEANUP REPORT [X]
SITE CHARACTERIZATION [ ]
FINAL CLEANUP REPORT [ ]
OTHER _____ [ ]
AFFECTED MEDIA: SOIL [X]
OTHER _____ GW [ ]
INSPECTOR (INIT.) [illegible] DATE 1-25-93

Cowman ; Campbell

SITE ASSESSMENT
C & C PAINT COMPANY

Prepared for

C & C Paint Company
5221 Ballard Avenue
Seattle, WA 98107-0328

Prepared by
Bison Environmental Northwest, Inc.
33720 9th Ave. S., Suite 4
Federal Way, WA 98003

February 19, 1991

CERTIFICATION OF REPORT INTEGRITY

Bison Environmental Northwest, Inc. certifies that this site assessment represents an accurate accounting of the presence and condition of environmental contamination from underground storage tanks at the 5221 Ballard Avenue address, Seattle, Washington. This assessment is based upon visual inspection, and physical sampling in accordance with acceptable professional standards. Every reasonable effort was made to obtain accurate and representative data in accordance with limits and objectives of the agreement and standard site assessments.

Primary Investigator: William R. Shuck

Investigator Signature: William R. Shuck

Reviewer: Harry E. Bush

Title: Project Manager

Date: February 19, 1991

SITE ASSESSMENT REPORT

February 19, 1991

Prepared for
C & C Paint Company
5221 Ballard Avenue
Seattle, WA 98107-0328

Prepared by
Harry E. Bush, Registered UST Site Assessor
Bison Environmental Northwest, Inc.
33720 9th Avenue South, Suite 4
Federal Way, WA 98003

EXECUTIVE SUMMARY

C & C Paint Company contracted with the Lee Morse Construction Company to remove six underground storage tanks and, after discovery, to remove contaminated soils. Bison Environmental supervised the removal of contaminated soils and soil sampling. The excavation process was carried out throughout the area of the tank site to a depth of approximately 8.5 feet. Soil samples were taken at the excavation site and head space samples were read with an Organic Vapor Meter (OVM) at numerous locations. The location and results of the soil samples are shown in the appendices.

Two borings were made on the site, one in the area of the tank removal and a second approximately four feet toward Shilshole Avenue from the west wall of the laboratory building. These borings were intended to be water monitoring wells. However, after drilling five feet into hardpan without finding water (a total depth of approximately 15'), soil samples were taken to determine if the contaminants had gone into this layer. Laboratory results showed no contamination in the hard layer of soil so no further drilling was done at either boring site.

During the boring operation on the west side of the laboratory, material of approximately 96% hydrocarbon product was flushed from the boring indicating that material (primarily Mineral Spirits) has pooled under or near this building. Remedial action for this situation has been proposed and is in process.

BACKGROUND

In November, 1990, six USTs were removed from an area near the loading dock of C & C Paint Co., 5221 Ballard Ave. Seattle, WA. Of the six soil samples taken at the time of removal, one was above acceptable levels (#S-6, 470 ppm Mineral Spirits). One sample from below a Glycol Tank was not analyzed for Glycol which led to some uncertainty about the integrity of that tank.

Based on the above results, Bison was asked to assist in designing and overseeing remedial action to remove contaminated soil at and around the area of the Mineral Spirit Tank. Based on information from the tank removal company and employees, it was assumed that any contamination would be minimal. It was determined that a conservative approach would be utilized including moving the top few feet of soil in the area of potential contamination and, when reaching close to the level of the old tank, excavating the soil tank for on-site remediation.

In setting up to do the excavation, crushed rock was added to the pit at the north edge of the excavation. This was done to support the weight of the equipment used to remove and remediate contaminated soils. It was noted that a strong diesel odor was present during and after this material had been placed in the pit. Analysis by method 8015 verified that the gravel used for fill was contaminated with diesel fuel up to 213 ppm. After analyzing this material, it was removed from the excavation along with non-contaminated gravel which had been added for fill plus approximately 10 yards of soil which may have been "tainted" by the gravel. This material was sent to Fife Sand & Gravel. During later removal operations, approximately 60 yards of potentially contaminated soil was stored on site, under cover to the east of the pit and approximately 92 yards of contaminated soil excavated and transported to Fife Sand & Gravel for remedial action.

During the excavation, soil samples were taken for on-site analysis and laboratory analysis. An organic vapor meter was used to check the pit and pit walls in addition to eight soil samples for the laboratory. Soil samples were taken throughout the pit and composite samples were made of the collected soils to the east. The composites of the stored material contained the levels of contamination of 136 and 178 ppm respectively. This material was eventually put back into the excavation. Sample locations are shown in Appendix A.

In addition to laboratory samples, many locations were checked with the OVM, by a head space analysis. These samples showed clearly that the south and west walls had areas of significant but localized contamination and that the north and west walls had no levels of contamination exceeding or even approaching unacceptable limits. At this point, the determination was made that further sampling would not be necessary since both the south and east walls could no longer be excavated due to the proximity of the buildings.

Based on the on-site results and laboratory analysis, it was decided to install two water monitoring wells - one in the area of the tank removals and one near the street on the west side of the laboratory. During the boring operation to install these wells, seven soil and one liquid samples were taken. The liquid sample was of material flushed up through the test boring with water. All but one of the samples taken during this phase were analyzed at Sound Analytical Services, Inc. for Total Petroleum Hydrocarbons (TPH) by EPA Method 418.1. One sample was taken during within the removal area and analyzed at Analytical Resources Inc. for Glycol. In addition, two of the samples were further analyzed for BTEX levels.

Of the sixteen samples taken, those that evidenced levels of contamination above acceptable levels were soil samples # 9 and # 13 and the liquid sample # 15. In addition to these laboratory samples, several of the head space samples showed high levels of hydrocarbons particularly on the southeast and southwest walls of the excavation pit (near the buildings). The contamination could be seen "trapped" in a layer of sandy material approximately 6" thick running from approximately 3' to 5' below surface.

While the pit was being filled, a four inch slotted pipe, plugged at on end and vented to the surface at the other, was placed on top of approximately ten inches of pit run gravel which covers the entire bottom of the pit. The slotted pipe runs along the south and west walls with solid PVC pipe running up to the vent in the southeast corner of the excavation near the wall of the plant. It was installed in this way so that vapor readings can be taken and if deemed necessary, an air pump can be placed into service in the future to extract vapors more rapidly. It will also be possible to introduce nutrients and microorganisms through this system.

CONCLUSIONS & RECOMMENDATIONS

Based on the visual and analytical evidence, we found that significant contamination has occurred. This contamination is not, however, a result of anything which presents an ongoing or continuous process source of contamination. In addition, the contamination appears to be trapped in a band of sandy material running throughout the excavation area. Samples taken above and below the "layer" of sand show only limited migration into the harder clay soil. Samples taken at the bottom of the excavation area show no contamination into the hard layer of soil.

We propose to address the excess contamination under the laboratory building and along the southeast wall in the following manner:

Nutrients that will enhance microorganism populations will be mixed with excess water and introduced through the 4" vent pipe.

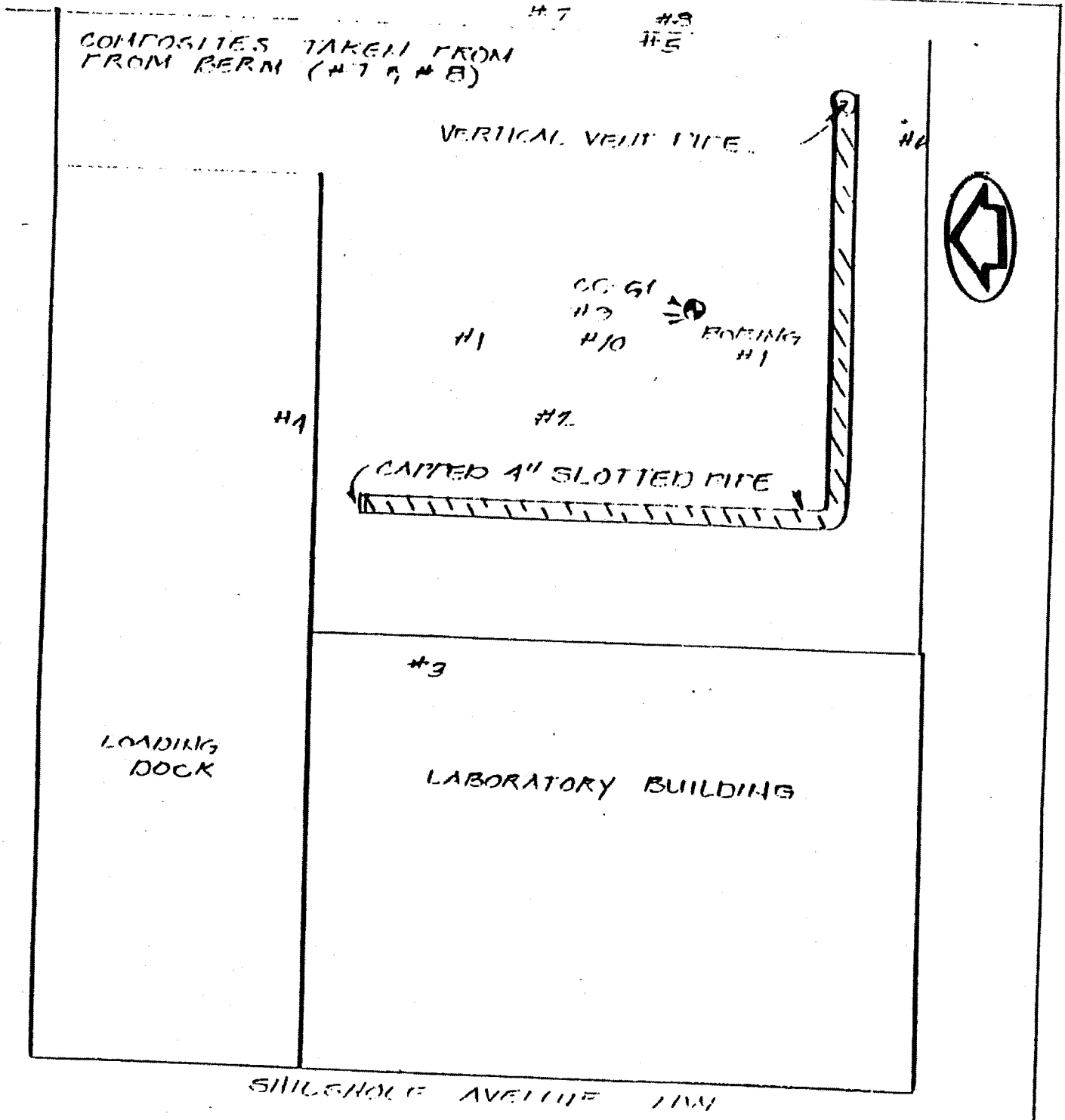
This will be done on a regularly scheduled basis that will be determined as the project progresses. The intent is to not only introduce the nutrients into the area but to accomplish a flushing action by incorporating excess amounts of water into the contaminated area. As these contaminants are flushed through the area they will be pumped from the test boring on the west side of the laboratory building.

Microorganisms will be introduced in the same procedure when we are safe in assuming that the danger of high solvent type membrane toxicity is substantially reduced. The addition of water and nutrients over an extended period should condition the site, making in-situ bio-remediation possible and a very practical solution to the contamination on this site.

Our base line data would indicate that sampling the materials pumped from the test boring on the west side of the property could start approximately six months after the initiation of the project. We have no indication how rapidly water will move through the affected area. Ph monitoring and vapor readings will be a way to track the progress in the early stages. A detailed and comprehensive plan will be developed as data is gathered and analyzed.

APPENDIX A

SAMPLING DIAGRAM



SAMPLING DIAGRAM
C.E.C. PAINTS
1" = 60'

HYDRANT

#11, 12, 13
14 & 15

BORING #2

BISON Environmental Northwest, Inc.

APPENDIX B

SAMPLE RESULTS

APPENDIX B: SAMPLE RESULTS

SAMPLE #	SAMPLE LOCATION	ANALYSIS	RESULTS
1	Surface water after UST removal	TPH	<1.0 PPM
2	Bottom of pit after excavation	TPH	12.7 PPM
3	6' into SW wall (under lab)	TPH	80.5 PPM
4	3' under loading ramp N. side	TPH	11.4 PPM
5	East Wall	TPH	12.0 PPM
6	N. E. Wall	TPH	<10.0 PPM
7	Composite of excavated soils	TPH	178 PPM
8	Composite of excavated soils	TPH	136 PPM
CC-61	4' deep, boring #1	GLYCOL	<10.0 PPM
9	4' deep, boring #1	TPH	200 PPM
9	4' deep, boring #1	BENZENE	<0.05 PPM
		E BENZENE	0.29 PPM
		TOLUENE	15.20 PPM
		XYLENE	82.40 PPM
10	15.5' deep, boring #1	TPH	19.20 PPM
11	6' deep, boring #2	TPH	11.00 PPM
12	9' deep, boring #2	TPH	<10.00 PPM
13	9.5' tailings, boring #2	TPH	70,476 PPM
14	13'deep, boring #2	TPH	51.00 PPM
15	Liquid from boring #2	TPH	969,750 PPM
		BENZENE	< 400 PPM
		E BENZENE	2,929 PPM
		TOLUENE	19,920 PPM
		XYLENE	565,635 PPM

ANALYTICAL
RESOURCES
INCORPORATED

Analytical
Chemists &
Consultants

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

ORGANICS ANALYSIS DATA SHEET
Ethylene Glycol by GC/FID

Matrix: Soil

QC Report: 7697-Bison Env.

Date Received: 02/04/91

Data Release Authorized: Report prepared: 02/04/91 - MAC:C IIAT

Reported in ppm (mg/kg)

Sample #:	Method Blank	CC-G1
ARI Lab ID:	MB0204	A
Date Extracted:	02/04/91	02/04/91
Date Analyzed:	02/05/91	02/05/91
Dry Weight:	5.00 g	4.64 g
Dilution:	1:10	1:10
Ethylene Glycol	10 U	10 U
*Surrogate %	90%	92%

* Surrogate is Propylene Glycol.

U indicates compound was analyzed for but not detected at the given detection limit.
J indicates an estimated value when the result is less than the calculated detection limit.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Bison Engineering

Date: December 17, 1990
Revised: December 18, 1990

Report On: Analysis of Soil

Lab No.: 15143

IDENTIFICATION:
Samples Received on 12-14-90
Project: C & C Paint

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
RUSH 1	CC1	85 Diesel
RUSH 2	SB1	197 Diesel
RUSH 3	SB2	213 Diesel

*TPH by EPA SW-846 Modified Method 8015

SOUND ANALYTICAL SERVICES

G. LARRY ZURAW

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 · TELEPHONE (206)922-2310 · FAX (206)922-5047

Report To: Bison Engineering

Date: January 21, 1991

Report On: Analysis of Soil & Water

Lab No.: 15519

IDENTIFICATION:
Samples Received on 01-17-91
Project: 0654 C & C Paint

ANALYSIS:

Lab Sample No.	Client ID	Total Petroleum Hydrocarbons, ppm by EPA Method 418.1
1	W-1 (Water)	< 1.0
2	1 (Soil)	12.7
3	2 (Soil)	80.5
4	3 (Soil)	11.4
5	5 (Soil)	12.0
6	6 (Soil)	< 10
7	7 (Soil)	178
8	8 (Soil)	136

SOUND ANALYTICAL SERVICES

STAN P. PALMQUIST

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Bison Engineering Date: February 13, 1991

Report On: Analysis of Soil & Liquid Lab No.: 15898

IDENTIFICATION:
Samples Received on 02-08-91
Project: 654 C & C Paint

ANALYSIS:

Lab Sample No.	1	2	3	4
Client Identification	15	9	11	12
Matrix/Units	Liquid ppm	Soil ppm	Soil ppm	Soil ppm
Benzene	< 400	< 0.05	NT	NT
Toluene	2,929	0.29	NT	NT
Ethyl Benzene	119,920	15.2	NT	NT
Xylenes	565,635	82.4	NT	NT
BTEX by EPA SW-846 Method 8020				
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	969,750	200	11	< 10
TPH as	Mineral Spirits	Mineral Spirits	Mineral Spirits	Mineral Spirits

NT = Not Tested

Note - Results reported on an as received basis.

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Bison Engineering
Project: 654

Lab No. 15898
February 13, 1991

Lab Sample No.	5	6	7
Client Identification	13	14	10
Matrix/Units	Soil ppm	Soil ppm	Soil ppm
Total Petroleum Hydrocarbons by EPA Method 418.1	NT	NT	19.2
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	70,476	51	NT
TPH as	Mineral Spirits	Mineral Spirits	

NT = Not Tested

Note - Results reported on an as received basis.

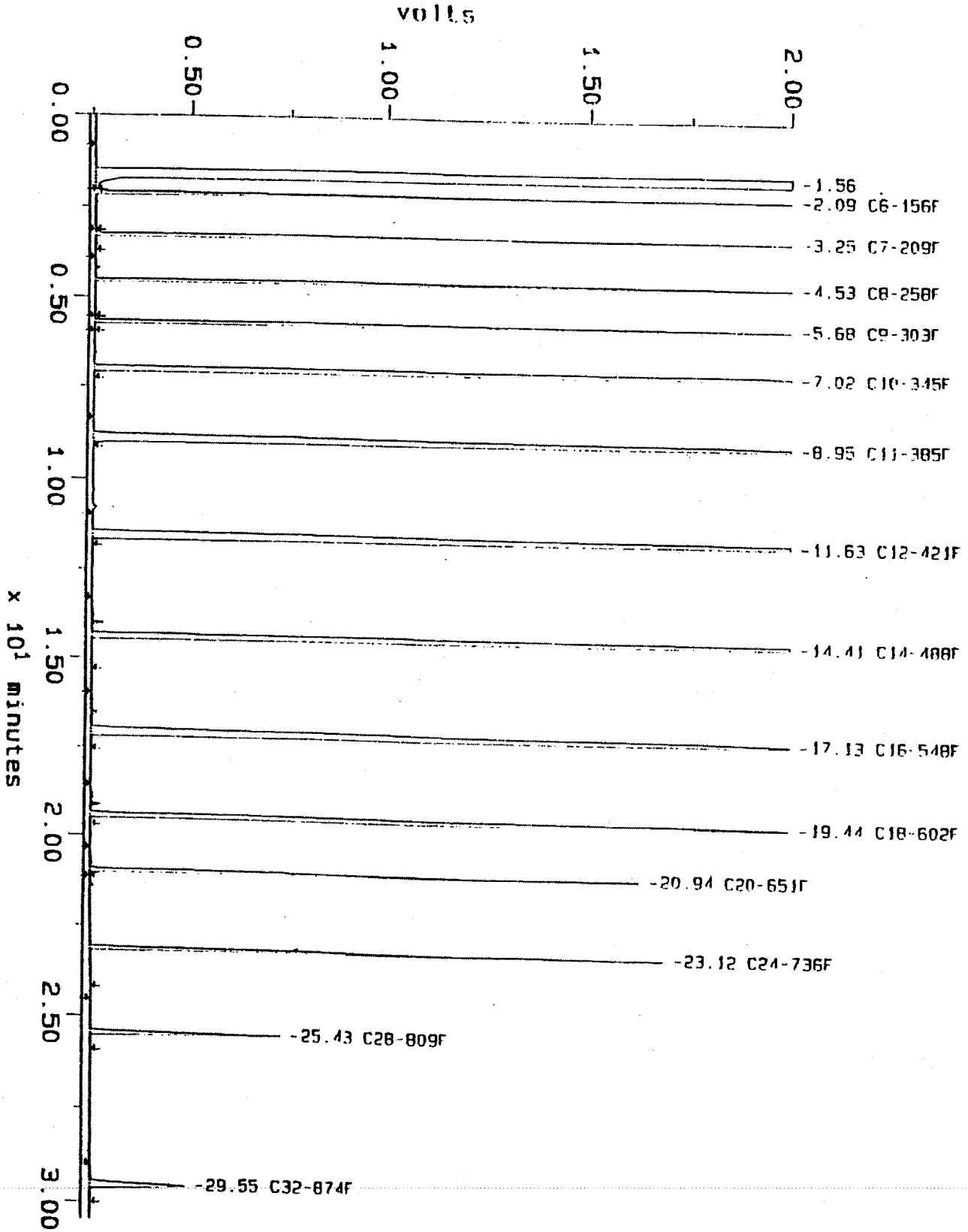
SOUND ANALYTICAL SERVICES

C. LARRY ZURAW

Sample CALB STD
Acquired 07-SEP-90 14 50

Channel detector
Method C:\HAX...

Filename C53
Operator



Sample 15MAR 2
Acquired 12 FEB 91 20:
Solution 1 10.000

Channel detector 1
Method C:\MAX\DATA\MAR15
Amount 2.577

Calibrant (urea)
Operator

x 10^{-1} volts

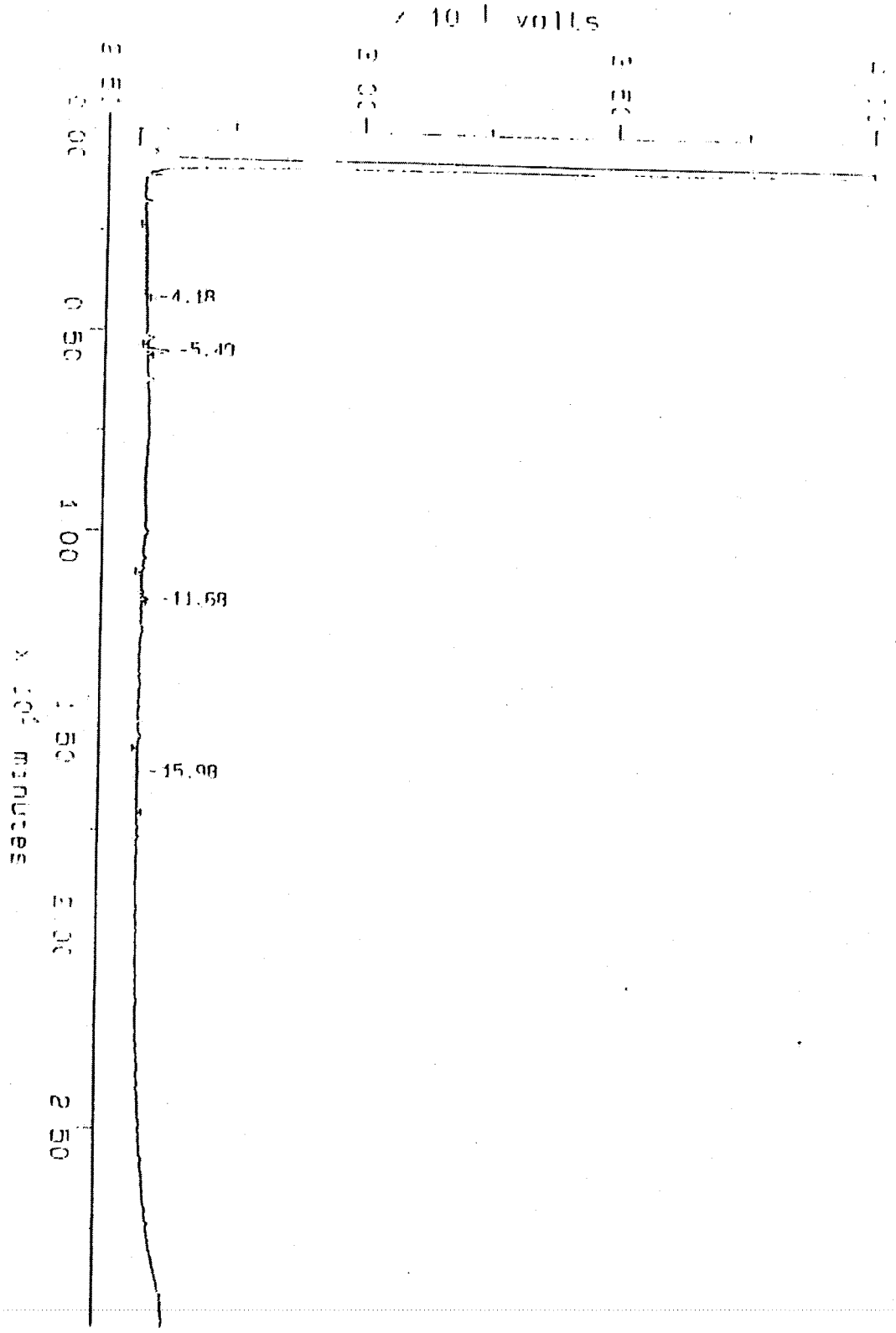
seconds

-5.18
-5.50
6.21
6.45
6.97
18.08
23.53

Sample 15898 3
Acquired 12 FEB 91 21:11
Dilution 1 : 10.000

Channel: detector 1
Method: C:\MAX\DATA4\B015
Amount: 2.114

Filename: 15898 3
Operator



Sample 15890 4
Acquired 12 FEB 91 21:50
Dilution 1 : 10.000

Channel detector 1
Method C:\MAX\DATA4\0015
Amount 2.444

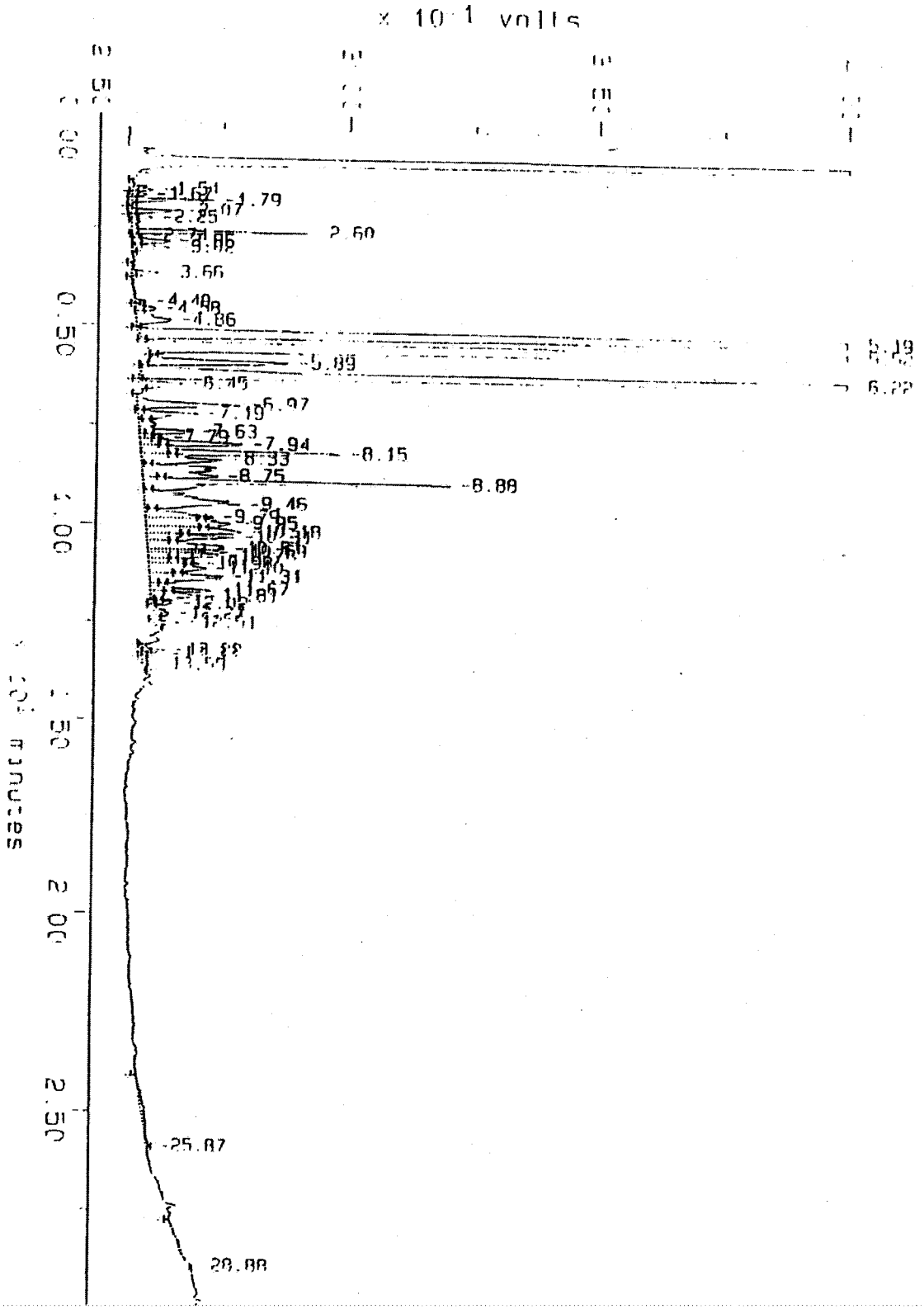
Filename 15890 4
Operator

x 10^{-1} volts

Sample: 15098 5
Acquired: 13 FEB 91 12:41
Dilution: 1 : 100.000

Channel: detector 1
Method: C:\MAX\DATA4\8015
Amount: 2.616

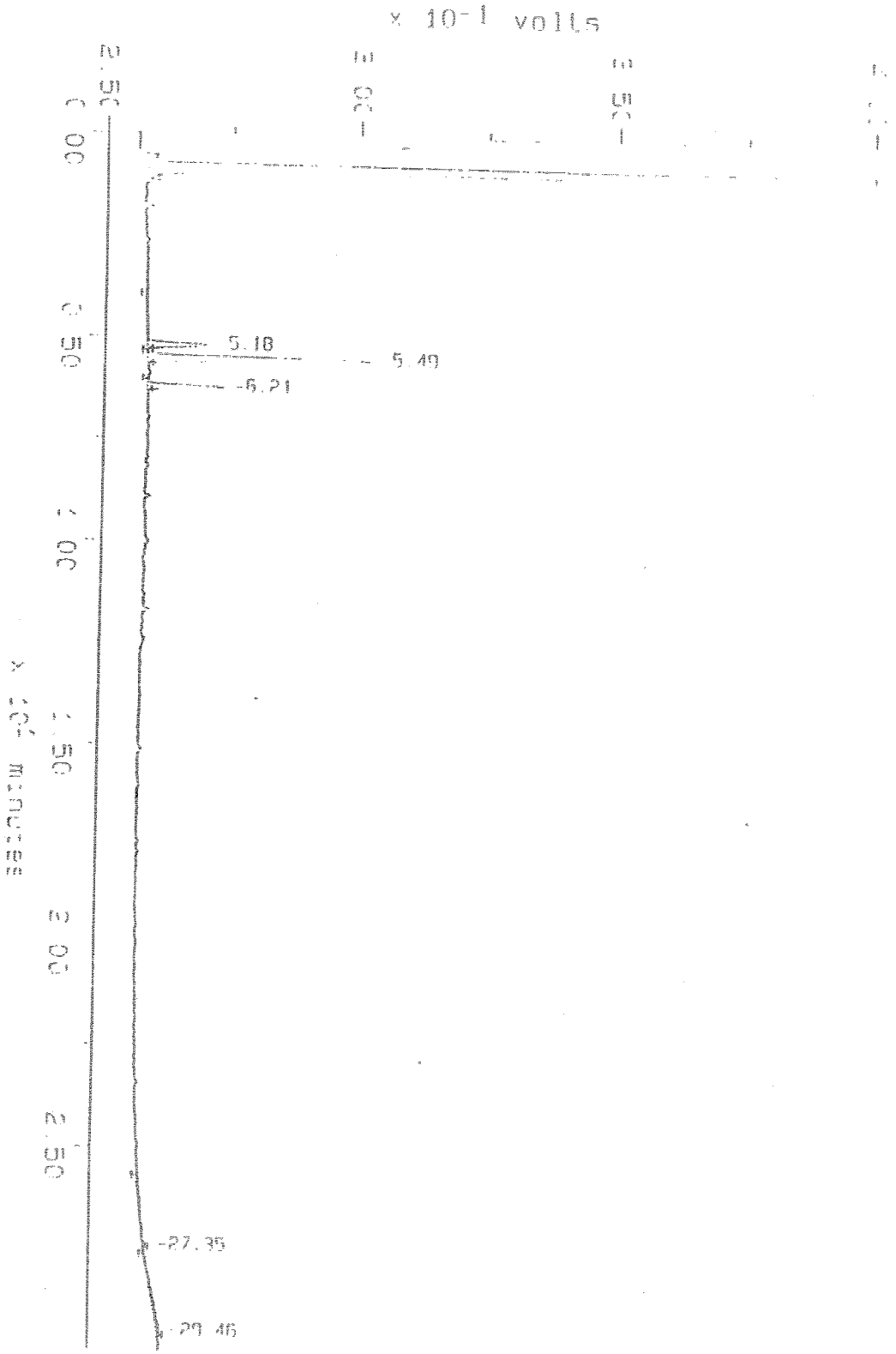
Filename: 15098 5
Operator:



Sample 15908 6
Acquired 12-FEB 91 23 04
Dilution 1 10 000

Channel detector 1
Method C:\MAX\DATA4\B015
Amount 2 778

Filename 15908 6
Operator

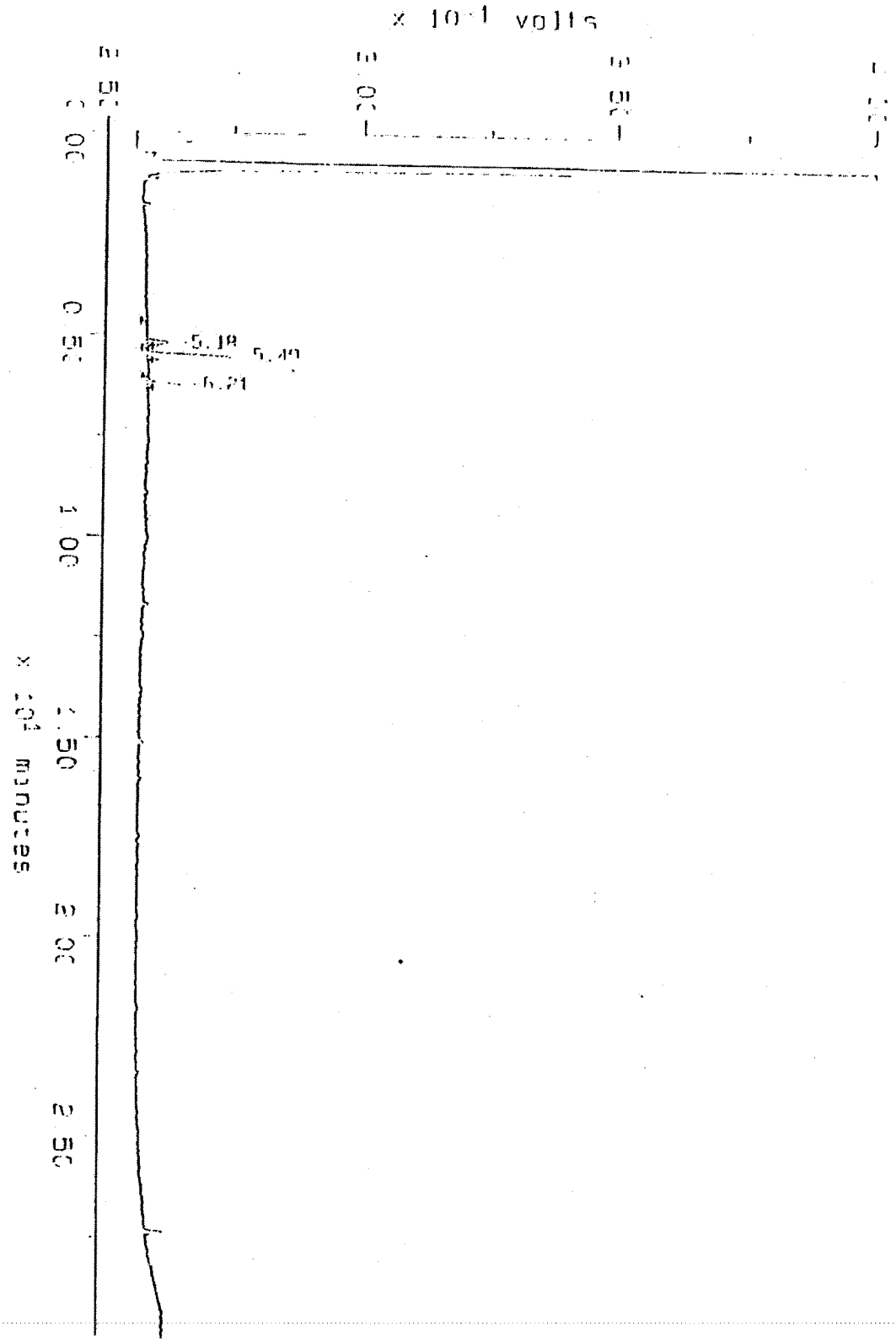


Sample: 15898-60
Acquired: 12-FEB-91 23:41
Dilution: 1 10.000

Channel: detector 1
Method: C:\MAX\DATA4\8015
Amount: 2.062

Filename: 15898 60
Operator:

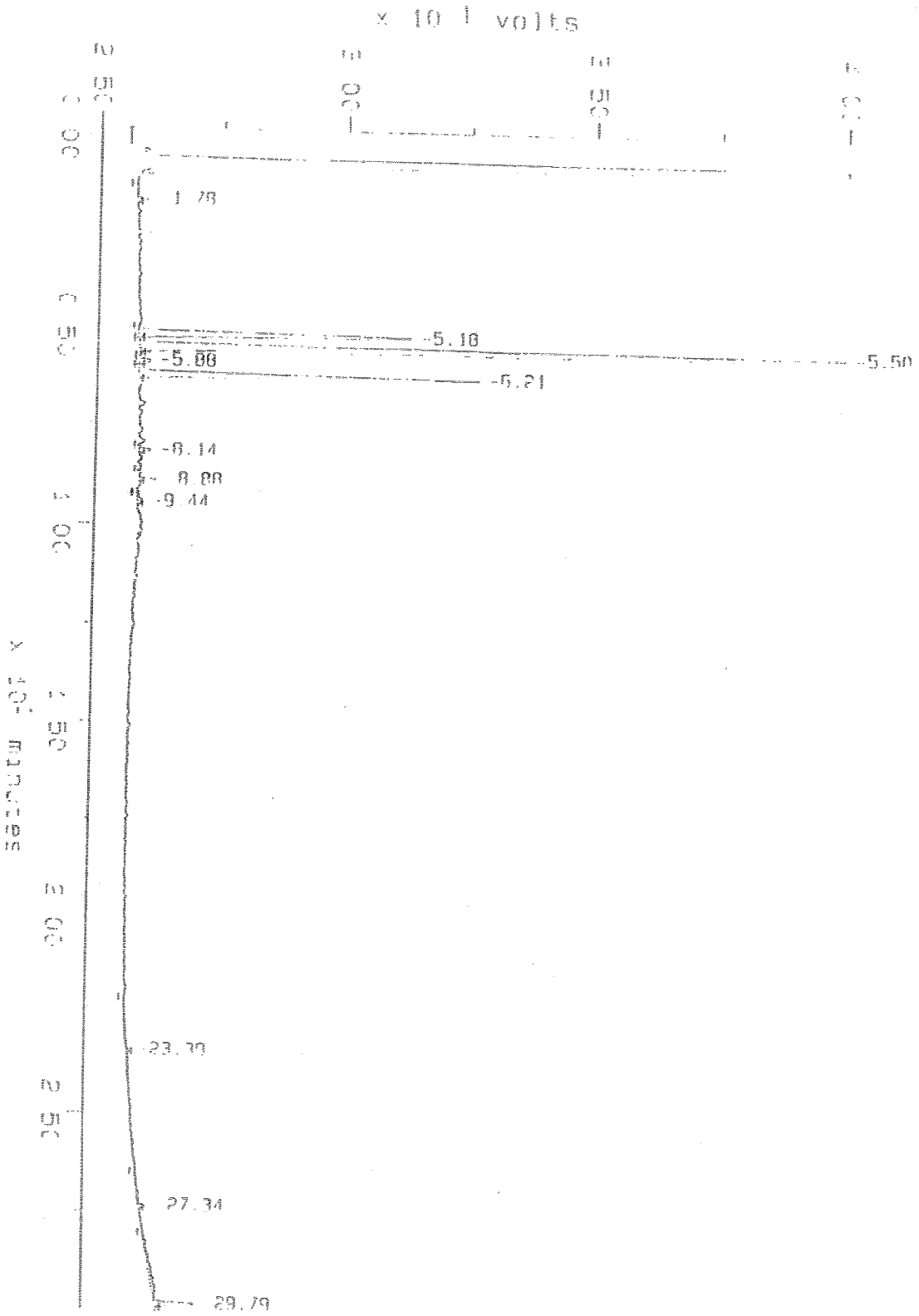
(4 Duplicate



Sample 15008 1
Acquired 12 FEB 91 19:50
Dilution 1 10000.000

Channel detector 1
Method C:\MAX\DATA4\0015

Filename 15008 1
Operator



APPENDIX C

CHAIN OF CUSTODY RECORDS

4 rings

CHAIN OF CUSTODY RECORD

BISON ENGINEERING, INC.
ENGINEERS • SCIENTISTS • PLANNERS
[illegible] Ash Ave. Ste.
[illegible], WA [illegible]
Office 206-[illegible]-7261
Fax 206-827-3818
Federal Way, WA [illegible]

Project # 0654
Page 1 of 1

CLIENT Car Parr
TELEPHONE
PURCHASE ORDER #
PROJECT NAME

Sample No.	Location	Sample Description	Date	Time	Sample Type: Bulk	Air	Soil	Water	Other	Analysis Required
W-1	South Center of Excav.	Standing Water	1-3-91	11:00 a				✓		TPH 418.1
1	Bottom of P.T. - M.S. Tank	8-9' depth	1-9-91	12:00 p			✓			"
2	SW Wall under Idle	6' into wall	1-9-91	2:45 p			✓			"
3	West wall under ramp	3' under footing under ramp	1-9-91	3:00 p			✓			"
4	Bottom of P.T. Gas Tank		1-9-91	3:15 p			✓			Chlor (Ethylene)
5	East wall under Bldg.	4-5' depth - 20' from Idle	1-10-91	1:15 p			✓			"
6	NE wall.	4-5' depth - 10' from Bldg at edge of concrete slab	1-10-91	2:40 p			✓			"
7	COMPOSITE - PILE	EXCAVATIONS	1-14	1:30			✓			"
8	COMPOSITE - PILE	EXCAVATIONS	1-14	1:40			✓			"

Special Instructions

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished by: Bison Engineering 1/14/91
   Received by: William Kruger 1-17-91
2. Relinquished by:
   Received by:

Delivered by: Hand _____ UPS _____ Airborne _____ Fed X _____ Other _____

CHAIN OF CUSTODY RECORD

BISON ENGINEERING, INC.
ENGINEERS • SCIENTISTS • PLANNERS
33720 9th Ave. So. Suite 4 Federal Way, WA 98003
Office 206-838-7281
Fax 206-927-3610

Project # 1254
Page 1 of 1

CLIENT C & C Petroleum
TELEPHONE
PURCHASE ORDER #
PROJECT NAME

Sample No.	Location	Sample Description	Date	Time	Sample Type Bulk	Air	Soil	Water	Other	Analysis Required
9	Tank Removal Hole - Water Monitor Hole	From Boring Split at ± 4' depth	2-4	9:00			✓			BTEX 8020 TPH 8015
10	Tank Removal Hole Monitor Hole	Split Spoon Sample at ± 15.5'	2-4	10 20			✓			TPH 418.1
11	Front Parking Monitor Hole	Split Spoon sample at ± 5-6.5'	2-5	9:20			✓			TPH 8015
12	Front Parking Monitor Hole	Split Spoon @ ± 9'	2-5	9:25			✓			TPH 8015
13	Front Parking Monitor Hole	From Boring Split at ± 9-10'	2-5	9.35			✓			TPH 8015
14	Front Parking Monitor Hole	Split Spoon @ ± 13'	2-5	9.40			✓			TPH 8015
15	Front Parking Monitor Hole	Liquid from bottom of Hole Location on Water	2-5	10.50				✓	✓	TPH 8015 BTEX 8020

Special Instructions

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished by: Susan Blasey - Bison 2/8/91 1:15
   Received by: Mary Carter 2/8/91 1:15
2. Relinquished by:
   Received by:

Delivered by: Hand X UPS Airborne Fed X Other

Chain of Custody Record & Laboratory Analysis Request

Date: 2-4-91

Page 1 of 1

Number of coolers:

ANALYTICAL RESOURCES INCORPORATED

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

ARI Client: Bison Environmental Phone #: 938-7261

Client Contact: Bill Shuck

Client Project ID: C & C Paint

Samplers: B. Shuck

	Sample ID	Date	Time	Matx	No Cont	Lab ID	Analysis Required: Glycol G	Notes/Comments
1	CC-G1	2-4-91	10:20	Soil		7697-A		
2								
3								
4								
5								
6								
7								
8								

Comments/Special Instructions:

Relinquished by: (Signature)	Relinquished by: (Signature)	Relinquished by: (Signature)
Printed Name: W. R. Shuck	Printed Name:	Printed Name:
Company: Bison	Company:	Company:
Date: 2-4-91 Time: 9:56	Date: Time:	Date Time
Received by: (Signature) Dan Fellows	**Received by: (Signature)**	**Received by: (Signature)**
Printed Name: Dan Fellows	Printed Name:	Printed Name:
Company: A.R.I.	Company:	Company:
Date: 2/4/91 Time: 2:56	Date: Time:	Date Time:

05-7-4-7607