SDMS US EPA Region V

Imagery Insert Form

Document ID: 203302

Some images in this document may be illegible or unavailable in SDMS. Please see reason(s) indicated below:

EPA Region 5 Records Ctr.

203302

[ ] Illegible due to bad source documents Image(s) in SDMS is equivalent to hard copy

Specify Type of Document(s) / Comments:

[ ] Includes ____ COLOR or _____ RESOLUTION variations
Unless otherwise noted, these pages are available in monochrome The source document page(s) is more legible than the images The original document is available for viewing at the Superfund Records Center

Specify Type of Document(s) / Comments:

[ ] Confidential Business Information (CBI)
This document contains highly sensitive information Due to confidentiality, materials with such information are not available in SDMS You may contact the EPA Superfund Records Manager if you wish to view this document

Specify Type of Document(s) / Comments:

[X] Unscannable Material
Oversized __X__ or _____ Format
Due to certain scanning equipment capability limitations, the document page(s) is not available in SDMS The original document is available for viewing at the Superfund Records center

Specify Type of Document(s) / Comments:

SHEETS 138, 141, 142 - OVERSIZED DATA PRINTOUT FROM COMPUTER, SOME WELL LOCATION MAPS

[ ] Document is available at the EPA Region 5 Records Center

Specify Type of Document(s) / Comments:

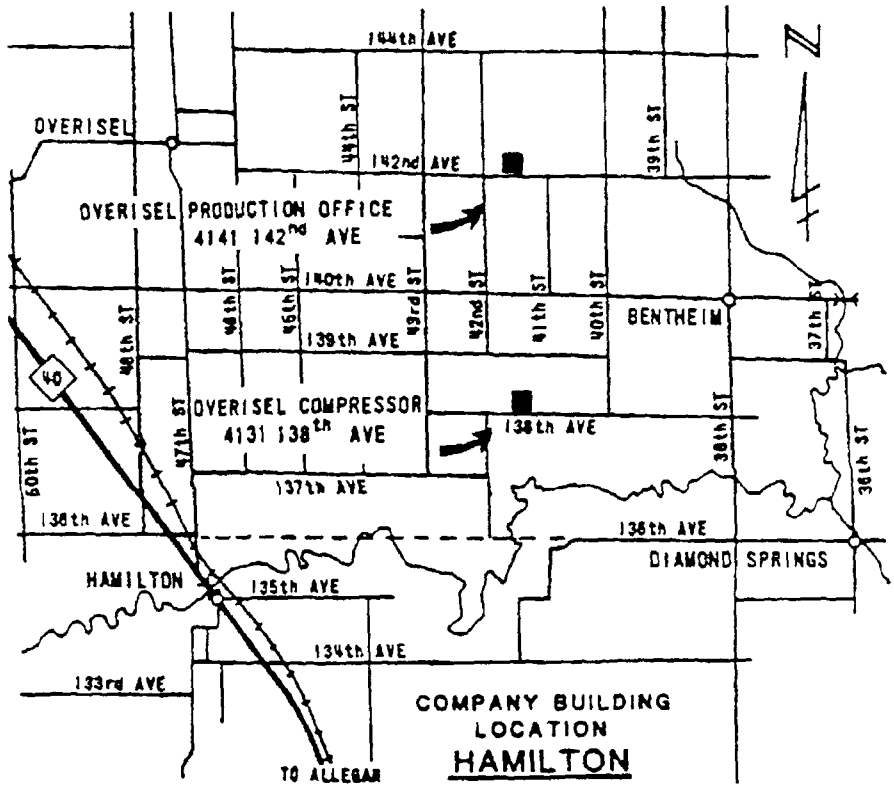
Rev 07/10/02

OVERISEL GAS COMP.

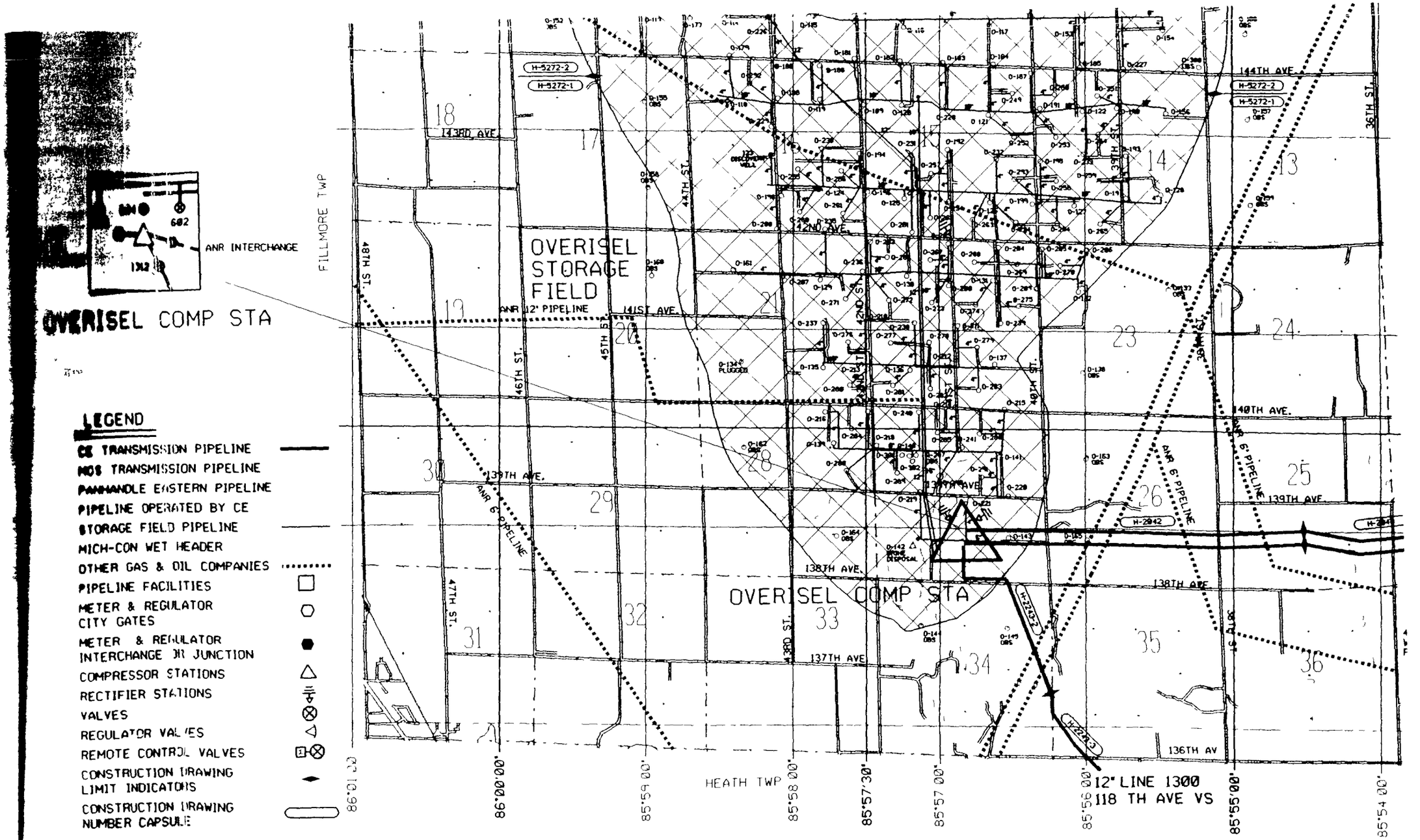
K00000001

Hamilton Gas P&T

OVERISEL
GAS Comp. Sta.

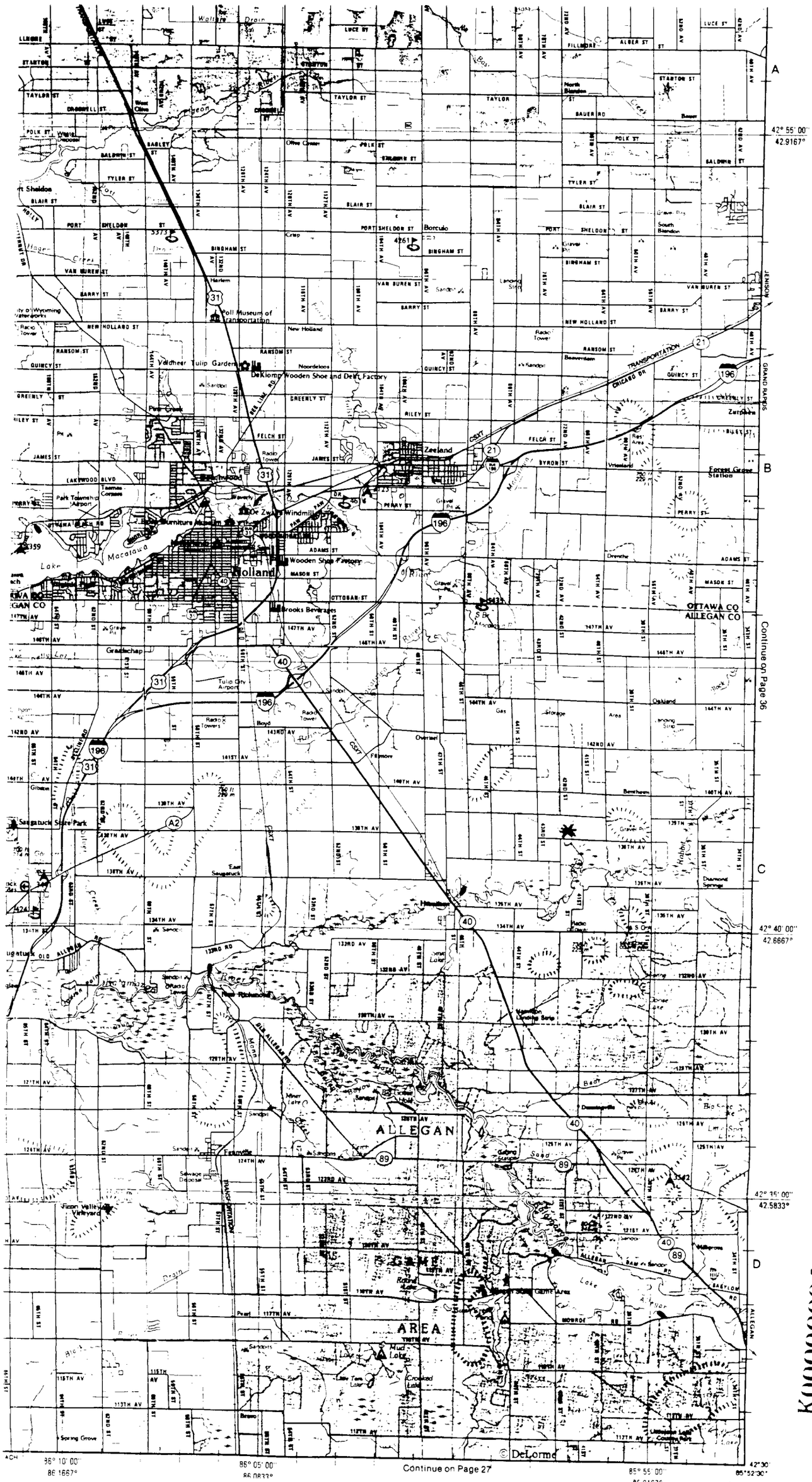


K00000002



Regis Klingler 8-06-03

K00000003



Continue on Page 36

Continue on Page 27

K00000004

CONSUMERS POWER COMPANY
MICHIGAN GAS STORAGE COMPANY
PCB DATA FOR COMPRESSOR STATIONS
*Indicates additional data reported
since the 2-5-88 listing

White Pigeon

1. 1-22-87 report of 1-15-87 soil, sludge, water and glycol samples in and around Plants 1 and 2 (1st wave)

2. 2-26-87 report of 2-4-87 water, air, soil, oil, glycol, wipe, sludge and NGL samples in and around Plants 1 and 2 (2nd wave)

3. 5-15-87 report of (interim results see No. 6 below) (3rd wave)
   a. 4-27-87 Plant 1 Overflow surface soil samples (B1 thru B13, B13A, B13B and B14 thru B37) and soil boring samples (B20 and B21)
   b. 4-28-87 Plant 1 Dry Well soil boring and sludge samples (A1 thru A4)
   c. 4-30-87 Plant 1 Air Drier Vent soil samples (H1 thru H3)
   d. 4-30-87 Plant 1 Air Storage Tank soil samples (G1 thru G6)
   e. 4-30-87 Plant 2 Manholes surface soil samples (D1 thru D8)
   f. 4-29-87 Plant 2 Dry Well soil boring and sludge samples (C1 thru C4)
   g. 4-30-87 Plant 2 Air Drier Vent soil samples (E1 thru E3)
   h. 4-30-87 Plant 2 Air Storage Tank soil samples (F1 thru F6)
   i. 4-15-87 Plants 1 and 2 sludge samples
   j. 4-30-87 Oil Storage Area soil samples (I1 thru I8)

4. 6-15-87 report of 6-11-87 air compressor crank case oil and condensate samples

5. 6-30-87 report of 6-22, 23, 24-87 Plant 1 Overflow soil boring samples (XA thru XF) (4th wave)

6. 7-20-87 report of (completion of 5-15-87 report)
   a. 4-27-87 Plant 1 Overflow surface soil samples (B1 thru B13, B13A, B13B and B14 thru B37)
   b. 4-28-87 Plant 1 Dry Well soil boring and sludge sample (A3)
   c. 4-30-87 Plant 1 Air Storage Tank soil samples (G1 thru G6)
   d. 4-30-87 Plant 2 Manholes surface soil samples (D1 thru D7)
   e. 4-30-87 Plant 2 Air Storage Tank soil samples (F1 thru F6)

7. 8-3-87 report of STS surface soil samples (SA and SB), soil boring samples (87SB-1 thru 87SB-3, 87SB-3A, 87SB-3B, 87SB-4 thru 87SB-23, 87SB-23A thru 87SB-25) and monitoring wells (87MW-1 thru 87MW-3) from 7-7-87 thru 7-22-87 (5th wave)

8. 8-25-87 report of 8-24-87 groundwater levels in monitoring wells 87MW-1 thru 87MW-3

9. 9-9-87 report of 8-3-87 monitoring well groundwater samples and groundwater levels in 87MW-1 thru 87MW-3

10. 9-22-87 report of 8-3-87 and 8-24-87 Plant 1 Overflow surface soil samples (B37-2, B38 thru B61, B62-1, B62-2 and B63 thru B89)

11. 10-12-87 report of 10-10-87 Plant 1 Air Storage Tank soil boring samples (A thru K)

12. 10-12-87 report of 8-3-87 Plant 2 Air Storage Tank soil samples (F7 thru F15)

13. 12-9-87 report on the extent of soil and groundwater contamination at the Plant 1 Dry Well and Overflow and Plant 2 Dry Well prepared by STS Consultants, Ltd.

14. 1-26-88 report on groundwater contours for 7-30-87, 8-3-87 and 8-24-87 prepared by STS Consultants, Ltd.

15. 2-1-88 report on groundwater contours for 2-1-88 prepared by STS Consultants, Ltd.

*16. 2-15-88 report of depth to groundwater measurements made on 2-15-88 in Monitoring Wells MW 1, 2, 2A, 3, 4 and 4A

*17. 2-17-88 report of STS soil boring samples (88SB-1, 88MW-2A, 88MW-4, 88MW-4A) from 2-2-88 thru 2-9-88

*18. 3-7-88 report of depth to groundwater measurements made on 3-7-88 in Monitoring Wells 1, 2, 2A, 3, 4 and 4A

*19. 3-9-88 report of 2-15-88 groundwater samples from Monitoring Wells 1, 2, 2A, 3, 4 and 4A

*20. 5-9-88 report of 4-29-88 groundwater samples from Monitoring Wells 87MW-1 and 88MW-2A and water levels in Wells 1, 2, 2A, 3, 4A and 4B

*21. 5-10-88 report of additional soil borings and monitoring wells prepared by STS Consultants, Ltd.

*22. 5-2-88 report of 4-25-88 Plants 1 and 2 air system, Plant 2 spill test, air compressor 212 and site backfill soil

*23. 5-31-88 reports of 5-18-88 and 5-24-88 spill tests in Plant 1 wastewater system from Auxiliary Building floor drain to manhole.

*24. 5-31-88 report of 5-18-88 soil samples to verify adequate decontamination of Plant 2 Air Drier Vent (sample Nos 1 thru 7).

*25. 5-31-88 report of 5-18-88 soil samples to verify adequate decontamination of Plant 2 Air Receiver Tank (sample Nos 8 thru 17).

*26. 5-31-88 report of 5-24-88 soil samples to veriy adequate decontamination of Plant 2 Air Receiver Tank (sample Nos 19 thru 42).

*27. 6-28-88 report on Plant 1 soil decontamination verification samples.

*28. 7-26-88 report on samples of sludge from inside of the Plant 1 Auxiliary Building floor drain line and header outside of building.

*29. 8-9-88 report of 8-5-88 samples from inside of the roof drain pipe at Plant 1 Auxiliary and Compressor Buildings.

*30. 8-16-88 report of 8-12-88 samples from inside of the roof drain pipes at the Plants 1 and 2 Auxiliary Buildings.

*31. 8-26-88 report of samples from inside of the roof drain pipe at the Plant 1 Auxiliary and Compressor Buildings.

*32. 9-1-88 report of 8-29-88 samples to verify adequate decontamination of soil at the Plant 2 manholes.

*33. 9-1-88 report of samples from inside of the drain pipes at the Plant 1 Auxiliary Building.

*34. 9-12-88 report of samples from inside of drain pipes at the Plant 1 Auxiliary and Compressor Buildings and the Plant 2 Compressor Building.

*35. 9-14-88 report of 9-13-88 samples from inside of the roof drain pipes at the Plant 1 Compressor Building.

*36. 9-20-88 report of samples from inside of the roof drain pipe at the Plant 2 Auxiliary Building.

*37. 9-23-88 report of a sample from inside of the roof drain pipe at the Plant 2 Compressor Building.

*38. 10-4-88 report of 9-28-88 surface wipe samples to verify adequate decontamination of the Plant 2 Air Compressors Nos 211 and 212.

*39 10-5-88 report of a sample from inside of the Plant 2 roof drain pipe on the west side of the Compressor Building.

*40. 10-11-88 report of 10-7-88 samples from a Plant 1 Auxiliary Building floor drain and a Plant 1 Compressor Building roof drain.

<u>Overisel</u>

1. 6-22-87 report of 6-3-87 water, oil and sludge samples in and around Station

2. 7-20-87 report of 7-1-87 surface water and sediment samples from Rabbit River, Busscner Drain and oil-water separator discharge pit

3. 10-12-87 report of
   a. 9-16-87 Air Logs surface soil samples (1 thru 19) (interim results see No 4 and No 11a below)
   b. 9-16-87 Oil-Water Separator Discharge Area surface soil samples (1 thru 24)
   c. 9-28-87 Oil-Water Separator Discharge Area surface soil samples (25 thru 73) (interim results see No. 8 below)

4. 10-19-87 report of Air Logs surface soil samples (1-19) (completion of 10-12-87 report)

5. 11-17-87 report of 11-3-87 Oil-Water Separator Discharge Area surface soil samples (74 thru 100)

6. 12-3-87 report of 11-23-87 Oil-Water Separator Discharge Area surface soil samples (101 thru 119)

7. 12-3-87 report of 9-16-87 Oil-Water Separator Discharge Area surface soil samples (6, 8, 10 thru 15, 17 and 19) (completion of 10-12-87 report)

8. 12-3-87 report of 9-28-87 Oil-Water Separator Discharge Area surface soil samples (32, 39 thru 41, 45, 46, 51, 52, 66, 69, 71 and 73) (completion of 10-12-87 report)

9. 12-7-87 report of 11-23-87 Oil-Water Separator Discharge Area soil boring samples (A thru D)

10. 2-1-88 report of 1-21-88 Oil-Water Separator Discharge Area surface soil samples (120 thru 131)

11. 2-1-88 report of:
    a. 9-16-87 Air Logs surface soil samples (1 thru 19) (Completion of 10-12-87 report)
    b. 1-21-88 Air Logs surface soil samples (20 thru 49)

*12. 3-25-88 report of soil boring samples from 3-4-88 thru 3-17-88 (88MW-1, 2, 2A, 3 and 3A and 88SB-1, 1A, 2 thru 11)

*13. 3-28-88 report of 3-25-88 groundwater levels in monitoring wells 88MW-1, 2, 2A, 3 and 3A

*14. 4-19-88 report of 3-25-88 groundwater samples collected from Monitoring Wells 88MW-1, 2, 2A, 3 and 3A

*15. 6-1-88 report of 5-26-88 soil samples to verify adequate decontamination of Air Logs (Sample Nos 16 thru 25).

*16. 6-1-88 report of 5-26-88 soil samples below Emergency Generator Starter Motor Vent.

*17. 6-1-88 report of 5-26-88 soil sample of onsite backfill material.

*18. 6-27-88 report of 6-25-88 samples of groundwater collected from Monitoring Wells 88MW-4 and 4A.

*19. 7-18-88 report of 7-12-88 groundwater samples collected from Monitoring Wells 88MW-4 and 4A.

*20. 6-29-88 report of 6-21-88 and 6-22-88 samples from the station air system.

*21. 7-28-88 report on the extent of PCB contamination in the oil-water separator overflow area prepared by STS Consultants, Ltd.

*22. 8-8-88 report of samples from inside of the wastewater piping.

*23. 8-8-88 report of 8-4-88 groundwater samples collected from Monitoring Wells 88MW-4 and 4A.

*24. 8-22-88 report of sample from inside of the Auxiliary Building roof drain pipe.

*25. 9-6-88 report of samples from inside of drain lines.

*26. 9-23-88 report of a sample from inside of the roof drain pipe at the Auxiliary Building.

Northville

1. 6-22-87 report of 6-5-87 water, oil, soil and sludge samples in and around Station

*2. 3-24-88 report of surface soil samples 1 thru 36 collected on 2-19-88 and 3-1-88 around the Air Drier Vent

*3. 3-24-88 report of surface soil samples 1 thru 34 collected on 2-19-88 and 3-1-88 around the Air Log Blowdown

*4. 3-24-88 report of surface soil samples 1 thru 63 collected on 2-18-88 and 3-1-88 in the Overflow area

*5. 7-17-58 report of 9 soil borings from 1958-59 by Raymond

*6. 7-8-88 report of STS soil borings 88SB-1 thru 15 collected 6-23-88 thru 6-29-88.

*7. 7-25-88 report of samples of liquids in the air system.

*8. 9-22-88 report on the extent of soil contamination in the area of the oil-water separator overflow prepared by STS Consultants, Ltd.

*9. 9-16-88 report of a 9-14-88 sample of onsite backfill soil.

*10. 10-3-88 report of 9-28-88 soil samples to verify adequate decontamination of the Air Logs area.

*11. 10-6-88 report of 10-4-88 soil samples to verify adequate decontamination of the Air Logs area and Air Dryer Vent area.

*12. 10-10-88 report of soil samples to verify adequate decontamination of the Air Dryer Vent area.

St Clair

1. 8-10-87 report of 7-2-87 oil, water and soil samples in and around Plants 1 and 2

Ray

1. 8-10-87 report of 7-8-87 oil, water, soil and glycol samples in and around Plants 1 and 2

2. 11-17-87 report of 11-2-87 Plant 2 Air Drier Vent soil sample and Dry Well water sample

3. 12-7-87 report of reanalysis of 11-2-87 Plant 2 Air Drier Vent soil sample

4. 1-12-88 (2-4-88) report of 1-6-88 Plant 2 Air Drier Vent soil sample

*5. 9-15-88 report of 8-8-88 samples of soil near the Plant 2 Auxiliary Building Air Dryer Vent.

Muskegon River

1. 4-20-87 report of 3-27-87 old Dehyration Reflux Tank Dike soil sample

2. 9-22-87 report of 8-4-87 oil and water samples in and around Plants 1 and 2 and the Btu Plant

Freedom

1. 5-28-87 report of 5-6-87 Plants 1 and 2 waste oil and Plant 2 Scrubber Drip Tank and Compressor Drip Tank

2. 9-22-87 report of 8-6-87 oil, water and soil samples in and around Plants 1 and 2

3. 11-19-87 report of 11-2-87 Plant 1 Air Compressor Condensate Discharge soil samples (B1 thru B15)

4. 11-19-87 report of 11-2-87 Plant 2 Air Compressor Condensate Discharge soil samples (B1 thru B6)

*5. 9-15-88 report of 8-18-88 samples of soil near the air compressor condensate discharges from the Plants 1 and 2 Auxiliary Buildings.

*6. 10-11-88 report of 9-21-88 samples of soil near the air compressor condensate discharges from the Plants 1 and 2 Auxiliary Buildings.

BWRasher/10-13-88

To G Dykstra, Overisel Comp. Station

From HWVoigt, T-260, Jackson

Date September 6, 1988

Subject PCB ANALYSIS RESULTS

CONSUMERS POWER COMPANY

Internal Correspondence

CC

RL Moore, JSC 251
BW Roesher, P12-103

Project No 528817552319
Analysis No 1630

Analyst GL Cattell

The following samples have been analyzed for PCB concentration. The indicated PCB concentration is reported as parts per million by weight as the indicated Aroclor.

Entry	Control Number	Tag Number	PCB ppm	Aroclor 42	54	60	Location
1	882-319-1	NA	130		✓		6" Aux. drain
2	-2	NA	<1				Air compressor condensate
3	-3	NA	3		✓		dehy. drain
4	-4	NA	<2		✓		warehouse drain
5	-5	NA	8		✓		12" drain
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

K00000012

0887-106-48T

To G. Dykstra, Overisel Gas Comp. Station

From HWVoigt, T-260, Jackson

Date August 12, 1988

Subject PCB ANALYSIS RESULTS

CONSUMERS POWER COMPANY

Internal Correspondence

CC

RL Moore, JSC251

BW Rasher, P12-103

Project No 528817552215

Analysis No 1604

Analyst GL Cattell

The following samples have been analyzed for PCB concentration. The indicated PCB concentration is reported as parts per million by weight as the indicated Aroclor.

Entry	Control Number	Tag Number	PCB ppm	Aroclor 42	54	60	Location
1	882-215	NA	15000		✓		22 ft. East of Seal #2
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

K00000014

0887-106-48T

To G. Dykstra, Overisel Gas Comp. Station

From HWVoigt, T-260, Jackson

Date August 22, 1988

Subject PCB ANALYSIS RESULTS

CONSUMERS POWER COMPANY

Internal Correspondence

CC

RL Moore, JSC 251

BW Rosher P12-103

Project No 528817552239

Analysis No 1608, 1611

Analyst GL Cattell

The following samples have been analyzed for PCB concentration. The indicated PCB concentration is reported as parts per million by weight as the indicated Aroclor.

Entry	Control Number	Tag Number	PCB ppm	Aroclor 42	54	60	Location
1	882-239-1	NA	10		✓		drain - 6" deh.
2	-2	NA	39		✓		12" east of seal #2, drain
3	-3	NA	<1				100 gal of air comp. condensate - H_2O
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

K00000015

0887-106-48T

To BWRasher, P-12-103

From HWVoigt, T-260 HWV

Date August 8, 1988

CONSUMERS POWER COMPANY

Internal Correspondence

Subject OVERISEL COMPRESSOR STATION MONITORING
WELLS MW-4 AND MW-4A
SAMPLE DATE AUGUST 4, 1988

CC

On August 4, 1988 personnel from the Chemical Division of L&FTS completed groundwater sampling at the Overisel Compressor Station MW-4 and MW-4A monitoring wells. Groundwater samples were returned to L&FTS for determination of PCB concentration.

METHODS

Depth-To-Water - Wetted Tape Method

Sample Collection - Each monitoring well was pumped for 20 gallons, then a water sample collected with a bailer. The wells were then pumped for an additional 60 gallons and a second water sample collected with a bailer.

Pumping was done with the pump hose foot-valve at the depth-to-water level so that the completed well casing volume was exchanged. Bailer samples were collected at screen depth.

PCB Analysis - Method 8080, SW846

RESULTS

Parameter	MW-4	MW-4A
Depth-To-Water (ft TOC)	2.84	2.88
Screen Depth	11.5	19.5
PCB, ug/L as A1254		
20 gal pump volume	1.25	1.20
80 gal pump volume	0.85	0.49
Calculated Well Volumes		
20 gal pump volume	14	7
80 gal pump volume	56	30

K00000016

0888-047-75T

To G. Dykstra, Overisel gas Comp. station

From HWVoigt, T-260, Jackson

Date August 8, 1988

Subject PCB ANALYSIS RESULTS

CONSUMERS POWER COMPANY

Internal Correspondence

CC

Project No 528817552172, 528817552173

Analysis No 1596

Analyst GL Cattell

KL Moore, JSC 251

BW Rasher, P12-103

The following samples have been analyzed for PCB concentration. The indicated PCB concentration is reported as parts per million by weight as the indicated Aroclor.

Entry	Control Number	Tag Number	PCB ppm	Aroclor 42	54	60	Location
1	882-172	NA	140		✓		Inside 6" pipe going to de-hy. building near Seal #3
2	882-173	NA	94000		✓		Inside 12" waste water pipe North of Seal #2 in
3							engine room.
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

K00000017

0887-106-48T

FROM CONSUMERS POWER COMPANY
Overisel Compressor Station

TO H W Voigt, T-260

ATTN G Dykstra

SUBJECT

DATE 8-10-88

FOLD ↑ Enclosed is one sample of the inside of our waste water piping (12") from the engine room — This sample was taken when the seal off (located on the north west end of aux bldg.) was removed — Please analize for PCB content —

Please RUSH

PLEASE REPLY TO →

SIGNED

RECEIVED
AUG 05 1988
GLC (1)
CHEMICAL DIVISION

882-173

DATE

SIGNED

SEND WHITE AND PINK COPIES WITH CARBONS INTACT PINK COPY IS RETURNED WITH REPLY

K00000018

To G. Dykstra, Overisel gas Comp. station

From HWVoigt, T-260, Jackson

Date August 8, 1988

Subject PCB ANALYSIS RESULTS

CONSUMERS POWER COMPANY

Internal Correspondence

CC

RL Moore, JSC 251
BW Rasher, P12-103

Project No 528817552172, 528817552173
Analysis No 1596
Analyst GL Cattell

The following samples have been analyzed for PCB concentration. The indicated PCB concentration is reported as parts per million by weight as the indicated Aroclor.

Entry	Control Number	Tag Number	PCB ppm	Aroclor 42	54	60	Location
1	882-172	NA	140		✓		Inside 6" pipe going to de-hy. building near Seal #3
2	882-173	NA	94000		✓		Inside 12" waste water pipe North of Seal #2 in
3							engine room.
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

K00000019

0887-106-48T

To GDDykstra, Overisel Compressor Station

From HWVoigt, T-260, Jackson

Date May 31, 1988

Subject WASTE MATERIAL ANALYSIS REPORT

CC REGillett, T-250
WJWilson, P-12-308

CONSUMERS POWER COMPANY

Internal Correspondence

File Index: 518817-510-802

The following waste material/oil samples were received by the Chemical Division of L&FTS for characterization of physical and chemical properties.

Facility Name

Overisel Compressor Station

Sample Date: 05/18/88 Received Date: 05/24/88

Lab Number	Facility Number	Sample Origin and Physical Appearance
88-802	NA	Air Compressor Condensate (Oily Water)

Test Parameter	Sample Analysis Results
Lab Number	88-802
Facility Number	NA
Flash Point-D93, °F	-
PH, Units	-
PCB, ug/g	574
Data Reference:	PCB-1533

K00000020

Reviewed by: HWJ Date: 5/31/88

Metals reported as _____ total metals _____ extracted metals. (NA - Not Analyzed)

Flash point indicated as "BP" indicates no flash point at boiling point

0688-001-69T

To BW Rasher, P12-103

From HW Voigt, T-260 HWV

Date June 27, 1988

Subject OVERISEL COMPRESSOR STATION

Monitoring Wells MW-4 and MW-4A

CONSUMERS POWER COMPANY

CC

File Index No.
518817-552-965

==========

On June 25, 1988 personnel from the Laboratory and Field Technical Services Department - Chemical Division, completed depth-to-water measurements and water sample collection from the Overisel Compressor Station MW - 4 and MW - 4A monitoring well installations .

METHODS

Depth-To-Water Measurements - Wetted Tape Method.

Sample Collection - Water samples were collected at the well screen depth with a bailer.

PCB Analysis - Method 8080, SW846.

RESULTS

Monitoring Well ID	Depth-To-Water	Screen Depth	PCB, as A1254
Overisel	(ft)	(ft)	(ug/L)
MW - 4	2.60	11.7	17.1
MW - 4A	2.65	20.2	6.7

K00000021

hwv

MOMITORING WELL DEPTH-TO-WATER MEASUREMENTS

LOCATION OVERISEL

DATE 06/24/88 PROJECT NUMBER

WELL ID Number	Time	Trial-1 Top-Of Casing (ft)	Trial-1 Wetted Tape (ft)	Trial-1 DWL (ft)	Trial-2 Top-Of Casing (ft)	Trial-2 Wetted Tape (ft)	Trial-2 DWL (ft)	SCRN (ft)
SMW-4A	11:05	8.00	5.35		9.00	6.35		20.2
SSMW-4	11:09	3.00	0.40		4.00	1.40		11.7

Notes : DWL measurements are read to the nearest 0.01 ft.

Remarks:

K00000022

Measurements Taken By

Reviewed By Date

****

To BW Rasher, P11-101

From HW Voigt, T-260 HWV

Date June 27, 1988

Subject OVERISEL COMPRESSOR STATION

Monitoring Wells MW-4 and MW-4A

CONSUMERS POWER COMPANY

CC

File Index No.
918817-552-965

==========

On June 25, 1988 personnel from the Laboratory and Field Technical Services Department - Chemical Division, completed depth-to-water measurements and water sample collection from the Overisel Compressor Station MW - 4 and MW - 4A monitoring well installations .

METHODS

Depth-To-Water Measurements - Wetted Tape Method.

Sample Collection - Water samples were collected at the well screen depth with a bailer.

PCB Analysis - Method 8080, SW846.

RESULTS

Monitoring Well ID	Depth-To-Water	Screen Depth	PCB, as A1254
Overisel	(ft)	(ft)	(ug/L)
MW - 4	2.60	11.7	17.1
MW - 4A	2.65	27.2	0.7

K00000023

hwv

~~#965~~

#88-552-965

Overview

4 - 1.63 ug/ml = 7.1

4A 0.64 ug/ml [illegible]

---

5 6/ 966

~~Analysis~~

Analysis
5730
6/25/88

K00000024

To BW Rasher, P12-103

From HW Voigt, T-260 HWV

Date April 19, 1988

Subject OVERISEL COMPRESSOR STATION -

Monitoring Well Samples - PCB Results

cc

File Index #
518817-552-480

==========

On March 25, 1988 personnel from the Chemical Division of Laboratory Services completed Depth-To-Water (DWL) measurements and collected groundwater samples from 5 monitoring well installations at the Overisel Compressor Station. Water samples were analyzed for PCB concentration.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - Water samples were collected with a bailer after 2 gallons of water was removed.

PCB Analysis - EPA Method 608.

RESULTS

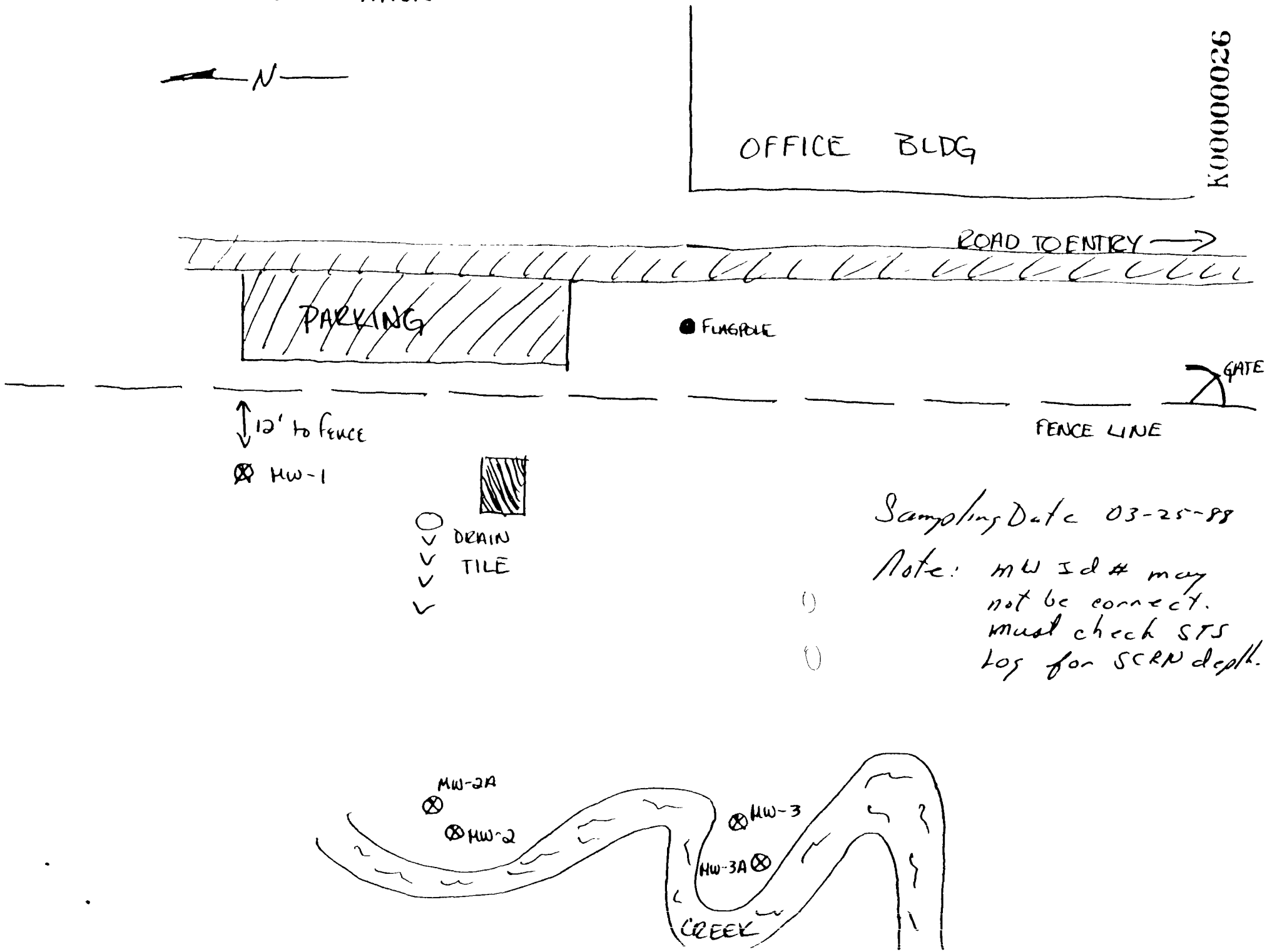
Control Number	Monitoring Well ID	Depth-To-Water (ft)	Bottom Of Screen ft	PCB * A-1254 ug/L
88480A	MW - 1	13.66	21.78	<0.53
88480B	MW - 2	3.01	12.04	<0.53
88480C	MW - 2A	3.00	23.15	<0.53
88480D	MW - 3	2.95	11.50	<0.53
88480E	MW - 3A	1.87	18.37	<0.53
88480F	Field Blank	NA	NA	<0.53

* Sample detection limit <0.53 ug/L, PCB as A-1254

K00000025

hwv

CNERISEL COMPRESSOR STATION



Sampling Date 03-25-88

Note: MW Id # may not be correct. must check STS log for SCRN depth.

K0000026

MONITORING WELL - DEPTH-TO-WATER MEASUREMENTS

LOCATION OVERISEL COMPRESSOR STATION

DATE 25-MAR-88 PROJECT NUMBER 518817-552-480

WELL ID Number	Time	Trial - 1 Top-Of Casing (ft)	Trial - 1 Wetted Tape (ft)	Trial - 1 DWL (ft)	Trial - 2 Top-of Casing (ft)	Trial - 2 Wetted Tape (ft)	Trial - 2 DWL (ft)	SCRN Depth (ft)
MW-1	10:50a.	15.0	1.34	13.66	16.0	2.34	13.66	21.78
MW-2A	11:20a	4.0	1.00	3.00	5.0	2.00	3.00	23.15
MW-2	11:22a.	4.0	0.99	3.01	5.0	1.99	3.01	12.04
MW-3	11:45a.	4.0	1.05	2.95	5.0	2.05	2.95	11.50
MW-3A	11:47a.	3.0	1.13	1.87	4.0	2.13	1.87	18.37

Note: Measurements are taken to the nearest 0.01 ft.

Remarks: WEATHER: SUNNY & WARM

Note: mw Id # may not be correct — must check STS log for SCRN depth.

Measurements Taken By JKH/MAH

K00000027

Reviewed By HW Vogt Date 03-28-88

MONITORING WELL - DEPTH-TO-WATER MEASUREMENTS

LOCATION OVERISEL COMPRESSOR STATION

DATE 25-MAR-88 PROJECT NUMBER J/8817-552-480

WELL ID Number	Time	Trial - 1 Top-Of Casing (ft)	Trial - 1 Wetted Tape (ft)	Trial - 1 DWL (ft)	Trial - 2 Top-of Casing (ft)	Trial - 2 Wetted Tape (ft)	Trial - 2 DWL (ft)	SCRN Depth (ft)
MW-1	10:50a.	15.0	1.34	13.66	16.0	2.34	13.66	21.78
MW-2A	11:20a	4.0	1.00	3.00	5.0	2.00	3.00	23.15
MW-2	11:22a.	4.0	0.99	3.01	5.0	1.99	3.01	12.04
MW-3	11:45a.	4.0	1.05	2.95	5.0	2.05	2.95	11.50
MW-3A	11:47a.	3.0	1.13	1.87	4.0	2.13	1.87	18.37

Note: Measurements are taken to the nearest 0.01 ft.

Remarks: WEATHER: SUNNY & WARM

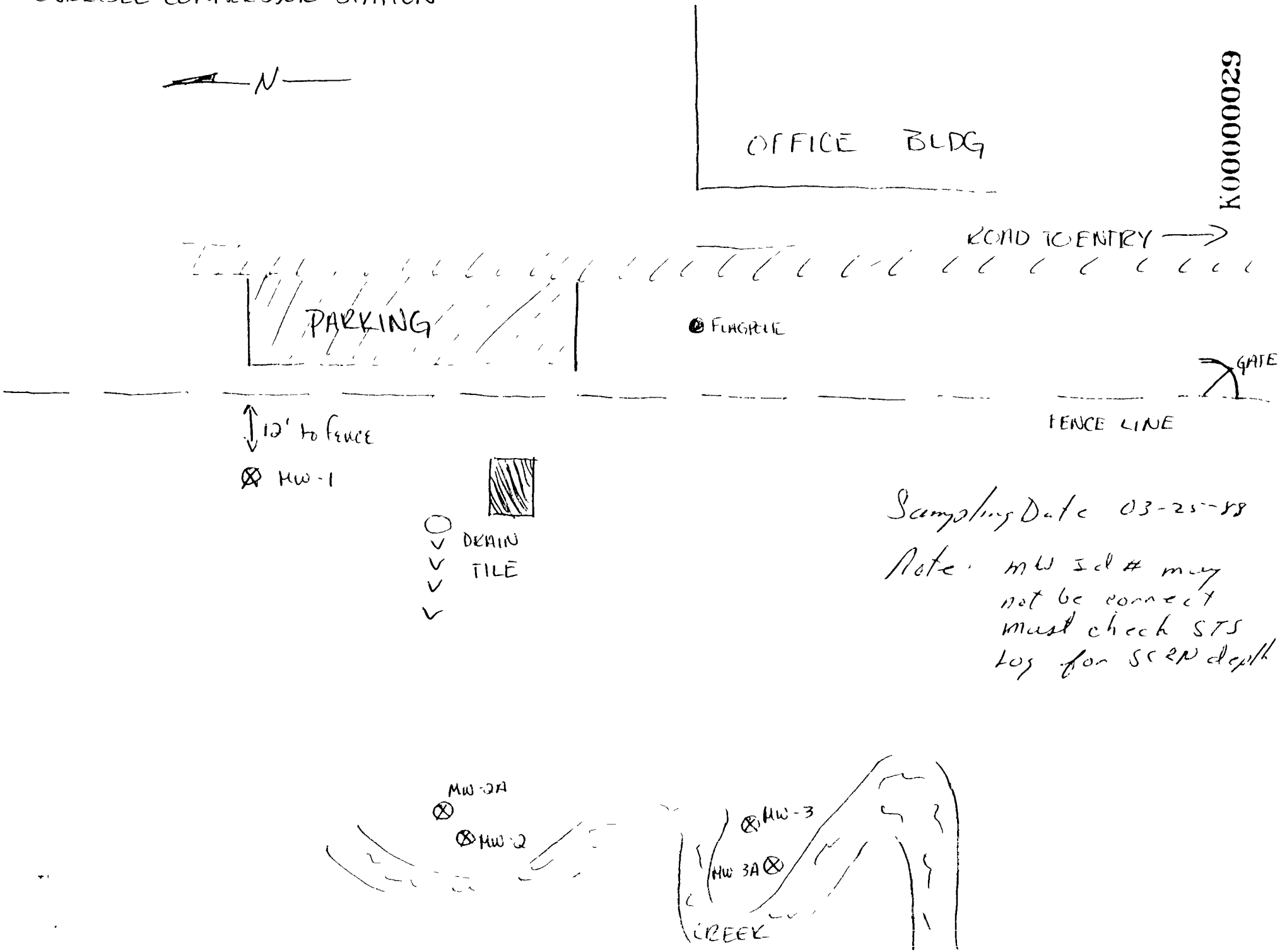
Note: mw Id # may not be correct — must check STS log for SCRN depth.

K00000028

Measurements Taken By JKH / MAH

Reviewed By MW Vaught Date 03-28-88

CNERISEL COMPRESSOR STATION



Sampling Date 03-25-88

Note: MW Id # may not be correct must check STS log for SCRN depth

K00000029

MONITORING WELL - DEPTH-TO-WATER MEASUREMENTS

LOCATION OVERISEL COMPRESSOR STATION

DATE 25-MAR-88 PROJECT NUMBER 51881 7-552-480

WELL ID Number	Time	Trial - 1 Top-Of Casing (ft)	Trial - 1 Wetted Tape (ft)	Trial - 1 DWL (ft)	Trial - 2 Top-of Casing (ft)	Trial - 2 Wetted Tape (ft)	Trial - 2 DWL (ft)	SCRN Depth (ft)
MW-1	10:50a.	15.0	1.34	13.66	16.0	2.34	13.66	21.78
MW-2A	11:20a	4.0	1.00	3.00	5.0	2.00	3.00	23.15
MW-2	11:22a.	4.0	0.99	3.01	5.0	1.99	3.01	12.04
MW-3	11:45a.	4.0	1.05	2.95	5.0	2.05	2.95	11.50
MW-3A	11:47a.	3.0	1.13	1.87	4.0	2.13	1.87	18.37

Note: Measurements are taken to the nearest 0.01 ft.

Remarks: WEATHER: SUNNY & WARM

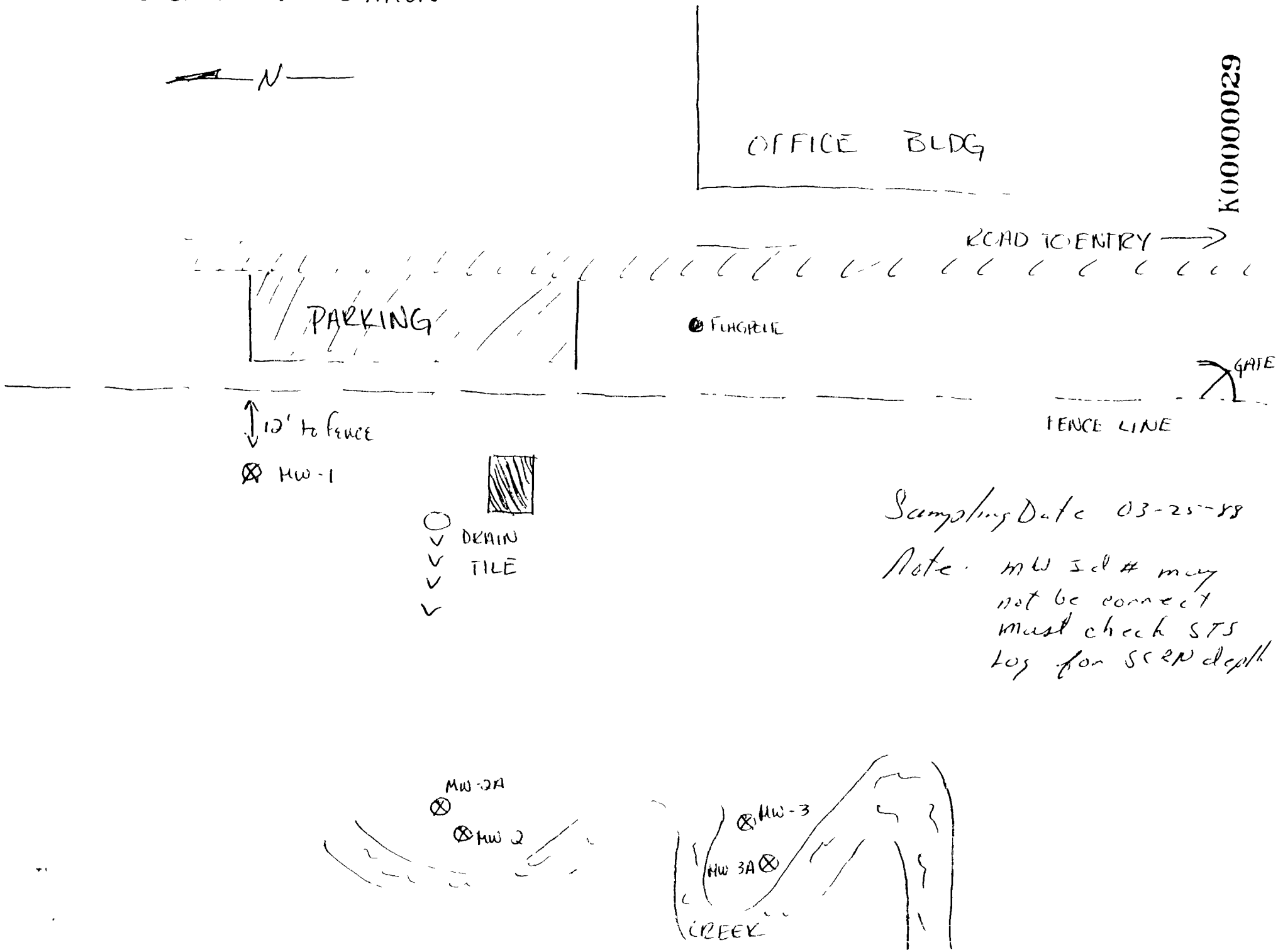
Note: mw Id # may not be correct — must check STS log for SCRN depth.

K00000028

Measurements Taken By JKH / MAH

Reviewed By MW Vogt Date 03-28-88

CNERISEL COMPRESSOR STATION



Sampling Date 03-25-88

Note. MW Id # may not be correct must check STS log for SCRN depth

K00000029

Form 433 3000M 3 87

OFFICE MEMO

To: Bill Voigt T266	Date: 3-9-88
From: Bruce Busher	Time:
Phone:	☐ Phoned ☐ Call ☐ Will Call Back ☐ Returned Your Call ☐ Wants To See You

- ☐ As Requested
- ☒ For Your Information
- ☐ As Discussed
- ☐ Take Appropriate Action
- ☐ Investigate and Report
- ☐ Note and See Me
- ☐ Return With More Details
- ☐ Review the Attached
- ☐ Prepare Reply
- ☐ Review and Approve
- ☐ Sign
- ☐ Type Draft ☐ Type Final
- ☐ File ☐ Route
- ☐ Make _____ Copies

Required by _____

Message/Comments

Operator

K00000030

3-9-88
M405.4

STS Letter of Transmittal

To: [redacted] 80331
Environmental Dept.

Date 3/8/88 STS Project No. 1151XH

From: TK Dahlstrand

Project Overisel

Location

We are sending:

☒ attached ☐ under separate cover via

the following item(s):

☐ Prints ☐ Copy of Letter ☐ Samples
☐ Shop Drawings ☐ Change Order ☐ Test Results
☐ Specifications ☐ Boring Logs ☐ Proposal/Report
☐ Other

They are transmitted as indicated:

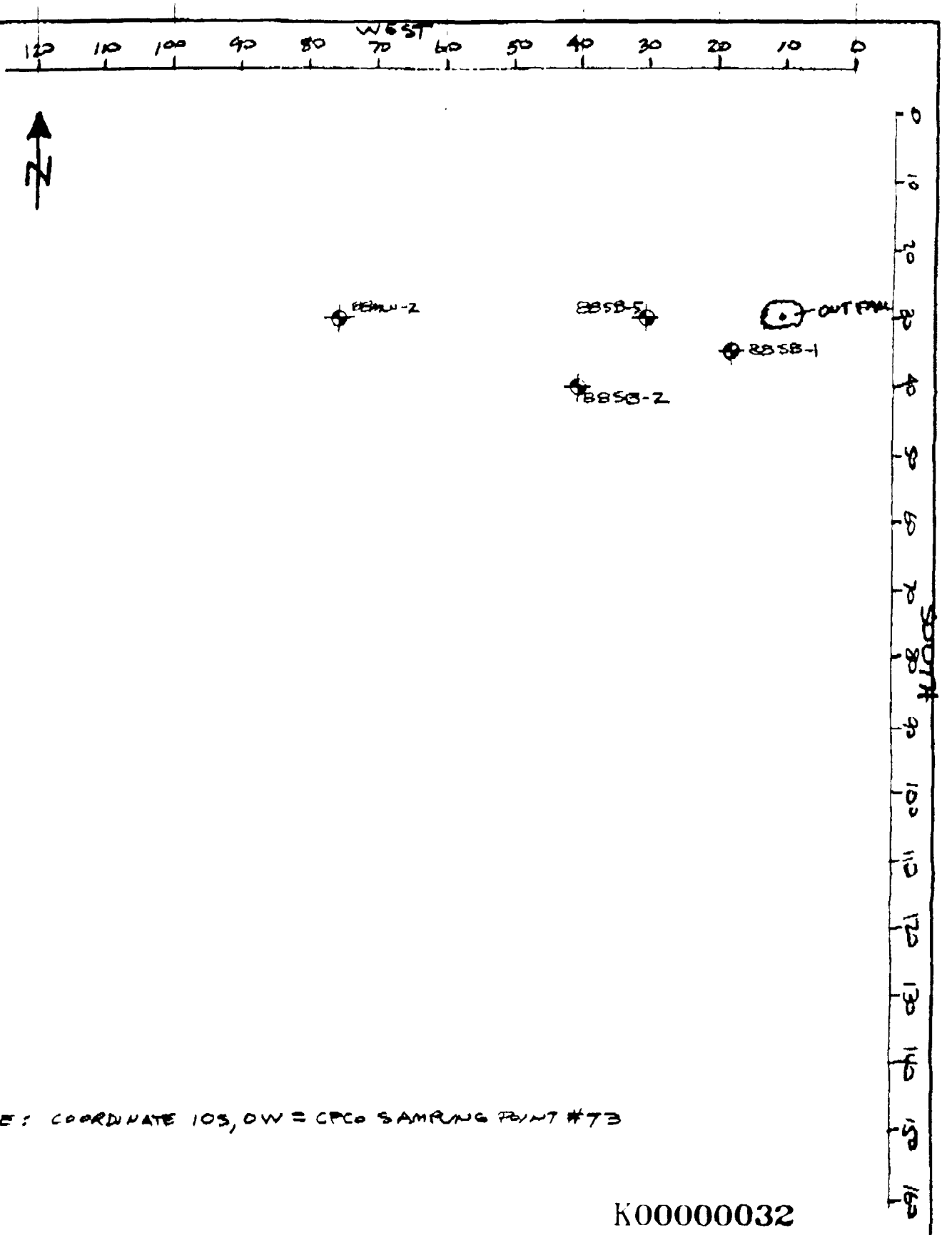
☐ For Approval ☐ As Requested
☒ For Your Use ☐ For Review and Comment

Remarks:

- LOCATION DIAGRAM
- TENTATIVE LOCATIONS OF BORINGS
- PCB RESULTS

K00000031

STS Representative TKDahlstrand



NOTE: COORDINATE 105, 0W = CPCo SAMPLING POINT #73

K00000032

STS Consultants Ltd.
Consulting Engineers

PROJECT/CLIENT
OVERISEL COMPRESSOR STATION
BORING AND WELL LOCATIONS

DRAWN BY	TKD	3/8/88
CHECKED BY		
APPROVED BY		
SCALE	FIGURE NO	
STS DRAWING NO 1151XH		

3/8/88
115XH
Overisel

Outfall Borings	Tentative Location Coordinates
88SB-1	35S, 17.5W
88SB-2	40S, 40W
88SB-3	25S, 15W
88SB-4	40S, 20W
88SB-5	30S, 30W
88SB-6	35S, 10W

3/8/88
115 XH

Location	Depth	PCB, ppm
88MW-1	15'-17'	<1
	17'-19'	<1
88SB-1	0-2'	1
	2-4'	<1
	4-6'	1
	6-8'	<1
	8'-10'	<1
	10'-12'	<1
	12'-14'	2
	14'-16'	<1
	16'-18'	28
	18-20'	16
88MW-2	7'-9'	<1
	9'-11'	<1

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-1

Sample Date 030488 Collected By STS

Received Date 030488 Analysis Number 1476

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-1	SB-1	1	0-2		1
2		2	2-4		<1
3		3	4-6		1
4		4	6-8		<1 *
5		5	8-10		<1
6		6	10-12		<1
7		7	12-14		2
8		8	14-16		<1
9		9	16-18		28
10		10	18-20		16

* Result <1 But Detectable

K00000035

LOCATION Doersel

Project Number 518817 552-383 Report Date

Borehole ID 88 SB-1A

Sample Date 030888 Collected By STS

Received Date 030888 Analysis Number 1478/1479

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-25	SB-1A	1	20-22		<1
26		2	22-24		<1
27		3	24-26		<1
28		4	26-28		<1
29		5	28-30		<1
30		Mud	25		8
31		mud	28		12
54	SB-1A	mud	28		16
	(030988)				

K00000036

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-2

Sample Date 03 07 88 Collected By STS

Received Date 03 08 88 Analysis Number 1478/1479

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCB mg/kg
88383-15	SB-2	1	0-2		1
16		2	2-4		<1
17		3	4-6		<1
18		4	6-8		<1
19		5	8-10		<1
20		6	10-12		<1*
21		7	12-14		5
22		8	14-16		<1*
23		9	16-18		1
24		10	18-20		7

* Result <1 But Detectable

K00000037

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-3

Sample Date 030988 Collected By STS

Received Date 031088 Analysis Number 1480/1481/1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-55	SB-3	1	0-2		2
56		2	2-4		<1
57		3	4-6		1
58		4	6-8		<1
59		5	8-10		<1
60		6	10-12		<1
61		7	12-14		<1
62		8	14-16		<1
63		9	16-18		1
64		10	18-20		1
65		11	20-22		2
77		12	22-24		<1
78		13	24-26		<1
79		14	26-28		<1
80		15	28-30		<1
81		mud	18		1
82		mud	28		1
				K00000038	

LOCATION Ouensel

Project Number 518817 552-383 Report Date

Borehole ID 88 SB-4

Sample Date 030988 Collected By STS

Received Date 031088 Analysis Number 1480/1481/1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-66	SB-4	1	0-2		82
67		2	2-4		<1
68		3	4-6		2
69		4	6-8		1
70		5	8-10		<1
71		6	10-12		<1
72		7	12-14		1
73		8	14-16		1
74		9	16-18		1
75		10	18-20		<1*
76		11	20-22		8

* Result <1 But Detected

K00000039

LOCATION Overisel

Project Number 5188/2552-383 Report Date

Borehole ID 88SB-5

Sample Date 030888 Collected By STS

Received Date 030988 Analysis Number 1479/1480

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCB mg/kg
88383-32	SB-5	1	0-2		<1
33		2	2-4		<1
34		3	4-6		<1
35		4	6-8		<1
36		5	8-10		<1
37		6	10-12		<1
38		7	12-14		15
39		8	14-16		27
40		9	16-18		4
41		10	18-20		2

K00000040

LOCATION Overise 1

Project Number 518817552383 Report Date

Borehole ID 88SB-6

Sample Date 030988 Collected By STS

Received Date 030988 Analysis Number 1479/1480

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-42	SB-6	1	0-2		1
43		2	2-4		<1
44		3	4-6		<1
45		4	6-8		1
46		5	8-10		<1
47		6	10-12		<1
48		7	12-14		<1
49		8	14-16		<1
50		9	16-18		1
51		10	18-20		<1*
52		11	20-22		<1
53		12	22-24		12
				K00000041	

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-7

Sample Date 031088 Collected By STS

Received Date 031188 Analysis Number 1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-86	SB7	1	0-2		3
87		2	2-4		<1
88		3	4-6		<1*
89		4	6-8		<1
90		5	8-10		<1
91		6	10-12		<1
92		7	12-14		<1
93		8	14-16		<1
94		9	16-18		1
95		10	18-20		4
96		11	20-22		<1
97		wash water	20		<1
		Sediment	20		2

* Result <1 But Detected

K00000042

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-8

Sample Date 031488, 031588 Collected By SJS

Received Date 031588 Analysis Number 1484, 1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCB mg/kg
88383-100	SB-8	1	0-2		<1
101		2	2-4		<1
102		3	4-6		3
103		4	6-8		<1
104		5	8-10		<1
105		6	10-12		<1
106		7	12-14		2
107		8	14-16		<1
108		9	16-18		<1
109		10	18-20		<1
110		11	20-22		<1
111		12	22-24		<1

K00000043

LOCATION Overisel

Project Number 518817 552-383 Report Date

Borehole ID 88 SB-9

Sample Date 031488, 031588 Collected By STS

Received Date 031588 Analysis Number 1484, 1487

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCE mg/kg
88-383-112	SB9	1	0-2		<1
113		2	2-4		<1
114		3	4-6		<1
115		4	6-8		<1
116		5	8-10		<1
117		6	10-12		<1
118		7	12-14		<1
119		8	14-16		<1
120		9	16-18		<1
121		10	18-20		<1
122		11	20-22		<1
123		12	22-24		<1
124		mud	22		<1

K00000044

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-10

Sample Date 031688 Collected By STS

Received Date 031688 Analysis Number 1485, 1487

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCB mg/kg
88-383-125	SB10	1	0-2		<1
126		2	2-4		<1
127		3	4-6		<1
128		4	6-8		<1
129		5	8-10		<1
130		6	10-12		<1
131		7	12-14		<1
132		8	14-16		<1
133		9	16-18		<1
134		10	18-20		<1
135		11	20-22		<1
136		12	22-24		<1
137		MUD	22		<1
				K00000045	

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-11

Sample Date 031688, 031788 Collected By STS

Received Date 031788 Analysis Number 1487, 1488

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-141	SB-11	1	2-4		5400
142		2	4-6		1
143		3	6-8		<1*
144		4	8-10		<1*
145		5	10-12		<1
146		6	12-14		78
147		7	14-16		<1
148		8	16-18		<1
149		9	18-20		<1
150		10	20-22		<1
151		11	22-24		<1
152		12	24-26		<1
153		13	26-28		<1
154		14	28-30		<1
155		mud	18-20		36
156		mud	24		10
157		mud	28		6
				K00000046	
	* Result <1	But Detected			

LOCATION Overisel

Project Number 518817 552-383 Report Date

Borehole ID 88mw-1

Sample Date 03 04 88 Collected By STS

Received Date 030488 Analysis Number 1476

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-11	mw-1	1	15-17		<1
12		2	17-19		<1

K00000047

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88 mw-2

Sample Date 030788 Collected By STS

Received Date 030788 Analysis Number 1477

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
68383-13	mw-2	1	7-9		<1
14		2	9-11		<1

K00000048

LOCATION Quensel

Project Number 518817 552-383 Report Date

Borehole ID mw 2A

Sample Date 031088 Collected By SJS

Received Date 031188 Analysis Number 1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-83	mw 2A	1	16-18		<1
84		2	18-20		<1
85		wash water	unk		<1

K00000049

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88mw-3

Sample Date 031488 Collected By STS

Received Date 031488 Analysis Number 1484

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-98	mw3	1	6-8		<1
99	mw3	2	8-10		<1

K00000050

LOCATION Overise 1

Project Number 518817552-383 Report Date

Borehole ID 88MW-3A

Sample Date 031688 Collected By STS

Received Date 031788 Analysis Number 1487

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-138	MW3A	1	16-18		<1
139		2	18-20		<1
140		wash water	20		<1
				K00000051	

Overlaid

K00000052

To: G. Dykstra, overisel compressor
From: HW Voigt, Jackson
Date: June 26, 1989
Subject: PCB Results

File # 528917-552-119
Analysis # 1878

Overisel Compressor station
Surface wipes for PCBs
Collected: 06-16-89

Lab control #	Description	PCBs, ug/100cm^2
89-1119-1	2nd stage head	4
89-1119-2	intake elbow	2
89-1119-3	packing spaces; representative of 39	10

K00000053

To: G. Dykstra, overisel compressor
From: HW Voigt, Jackson
Date: June 26, 1989
Subject: PCB Results

File # 528917-552-119
Analysis # 1878

Overisel Compressor station
Surface wipes for PCBs
Collected: 06-16-89

Lab control #	Description	PCBs, ug/100cm^2
89-1119-1	2nd stage head	4
89-1119-2	intake elbow	2
89-1119-3	packing spaces, representative of 39	10

K00000054

To: G. Dykstra, overisel compressor

From: HW Voigt, Jackson

Date: June 26, 1989

Subject: PCB Results

File # 528917-552-119

Analysis # 1878

Overisel Compressor station
Surface wipes for PCBs
Collected: 06-16-89

Lab control #	Description	PCBs, $\mu g/100 cm^2$
89-1119-1	2nd stage head	4
89-1119-2	intake elbow	2
89-1119-3	packing spaces; representative of 39	10

K00000055

528917-552-119

OVERISEL COMPRESSOR STATION
PCB WIPES

16-JUN-89

ID #	COMP #	DESCRIPTION	APPROX SHAPE	AREA MEASURE, CM
1	NA	2ND STAGE HEAD	CYL	2.8 X 5.0 dia
2	NA	INTAKE ELBOW	CYL	4.0 x 7.9 dia
~~3~~	~~NA~~	~~APPARATUS~~		
3	NA	PACKING SPACERS (REP/39)	CYL	2.4 x 3.2 dia
4	NA	HEXANE		

RECEIVED
JUN 16 1989
SKG
CH
89-1119

To G Dykstra, Ovensel

From HW Voigt, T260

Date May 26, 1989

Subject WASTE MATERIAL ANALYSIS REPORT

CONSUMERS POWER COMPANY

Internal Correspondence

CC WJWilson, P-12-308

File Index: 518917552-955

The following waste material/oil samples were received by the Chemical Division of L&FTS for characterization of physical and chemical properties.

Facility Name Ovensel Compression

Sample Date: 052289 Received Date: 052389

Lab Number	Facility Number	Sample Origin and Physical Appearance
89942	na	Rain Water from Slop Tank,

Test Parameter	Sample Analysis Results
Lab Number	89-942
Facility Number	—
Flash Point-D93, °F	—
PH, Units	—
PCB, ug/g	<1
Metals, ppm	**********
Copper	|
Chromium	na
Lead	|
Zinc	|
Cl-Solvents, ppm	**********
Methylene Chloride	|
111-Trichloroethane	|
112-Trichloroethene	|
Perchloroethylene	na
Freon-113	|
112-Trichloroethane	|
Total Halogens, ppm	|

Data Reference: PCB 1855

Reviewed by: HWJ Date: 05 26 89

Metals reported as ____ total metals ____ extracted metals. (NA - Not Analyzed)

Flash point indicated as "BP" indicates no flash point at boiling point

K00000057

TO Voigt W Lab & Fld Tech. Sec

FROM: CONSUMERS POWER COMPANY
G. Dykstra Overisel
Compressor STA.

ATTN:

SUBJECT: PCB Test Sample

DATE: 5-22-89

FOLD ↑

Please check for PCB! — This sample is rain water ~~[illegible]~~ from our slop tank.

PLEASE REPLY TO → SIGNED [signature]

RECEIVED
MAY 23 1989
C[illegible]

89-942

DATE | SIGNED

SEND WHITE AND PINK COPIES WITH CARBONS INTACT. PINK COPY IS RETURNED WITH REPLY.

K00000058

TO Voigt W. Lab & Fld Tech. Sep

G. Dykstra Overseer Compressor Sta.

ATTN:

SUBJECT: PCB Test Sample

DATE: 5-22-89

FOLD ↑

Please Check For PCB! — This sample is Rain water ~~Test~~ From our Slop Tank.

PLEASE REPLY TO →

SIGNED

MAY 23 1989

89-942

DATE

SIGNED

SEND WHITE AND PINK COPIES WITH CARBONS INTACT. PINK COPY IS RETURNED WITH REPLY.

K00000059

To G Dykstra, Ovensel

From HW Voigt, T260

Date May 26, 1989

Subject WASTE MATERIAL ANALYSIS REPORT

CONSUMERS POWER COMPANY

Internal Correspondence

CC WJWilson, P-12-308

File Index: 518917552-955

The following waste material/oil samples were received by the Chemical Division of L&FTS for characterization of physical and chemical properties.

Facility Name Ovensel Compression

Sample Date: 052289 Received Date: 052389

Lab Number	Facility Number	Sample Origin and Physical Appearance
89942	na	Rain Water From Slop Tank,

Test Parameter	Sample Analysis Results
Lab Number	89-942
Facility Number	—
Flash Point-D93, °F	—
PH, Units	—
PCB, ug/g	<1
Metals, ppm	**********
Copper	|
Chromium	na
Lead	|
Zinc	
Cl-Solvents, ppm	**********
Methylene Chloride	|
111-Trichloroethane	|
112-Trichloroethene	|
Perchloroethylene	na
Freon-113	|
112-Trichloroethane	|
Total Halogens, ppm	|

Data Reference: PCB 1855

Reviewed by: HWJ Date: 05 26 89

Metals reported as ____ total metals ____ extracted metals. (NA - Not Analyzed)

Flash point indicated as "BP" indicates no flash point at boiling point

K00000060

TO Voigt W. Lab & Fld Tech. Ser.

G. Dykstra Overiser
Compressor STA.

ATTN:

SUBJECT: PCB Test Sample

DATE: 5-22-89

FOLD ↑

Please check for PCB! — This sample is rain water ~~[illegible]~~ from our slop tank.

PLEASE REPLY TO → SIGNED [signature]

RECEIVED
MAY 23 1989
[illegible]

89-942

DATE

SIGNED

SEND WHITE AND PINK COPIES WITH CARBONS INTACT. PINK COPY IS RETURNED WITH REPLY.

K00000061

FORM 40

FROM CONSUMERS POWER COMPANY
G. Dykstra Overseer
Compressor STA

TO: Voigt W. Lab & Fld Tech, Ser

ATTN:

SUBJECT: PCB Test Sample

DATE: 5-22-89

FOLD ↑

Please check for PCB — This sample is rain water ~~[illegible]~~ from our slop tank

PLEASE REPLY TO → SIGNED [signature]

RECEIVED
MAY 23 1989
CH[illegible]

DATE | SIGNED

DETACH THIS COPY — RETAIN FOR ANSWER

K00000062

89-942

CONSUMERS POWER COMPANY

LABORATORY AND FIELD
TECHNICAL SERVICES DEPARTMENT
CHEMICAL DIVISION
ENGINEERING EVALUATIONS & METALLURGY DIVISION
VIBRATION & MECHANICAL PROJECTS DIVISION
WORK REQUEST

MAY 23 1989

NOTE: FILL OUT FORM COMPLETELY PER INSTRUCTIONS ON THE REVERSE SIDE.

1. Requesting Party Information
   Name Glenn D. Kstra Location _____ Phone _____
   Dept _____ Req.Dept. ID Number _____
2. Project W.O., FERC or Area and Function Number _____
3. Request Date _____ Required Completion Date _____
4. Report Distribution (Name, Room Number/Location) _____
5. QA Program Requirements
   Is our QA Program required to be applied to the work requested? Yes ____ No ✓
   Remarks _____
6. UFI Number(s) _____
7. Material Description and Origin Rain H_2O from slop tank
8. Mfr _____ ID No _____ CPCo Stock No _____
9. Requested Test, Analysis, Study, etc PCBs
10. Reason for Test _____
11. Acceptance Criteria _____
12. Applicable Test Procedures _____
13. Reference Documents _____
14. Material Disposition _____

LAB SERVICES USE ONLY

Project Number 5,1,8,9,1,7,5,5,2,9,4,2 Receipt Date 0,5,2,3,8,9 Due Date _____

Project Description _____

Project Leader H,W,V Assigned To _____ Est Hours _____

Recharge Number _____ Requesting Dept ID Number _____

Sec Supvr Approval _____ Div/Dept Supvr Approval _____

K00000063

NUMBER OF SAMPLES 1

PROJECT NUMBER 5789172552942 CHM

PROJECT DESCRIPTION _____ RECHARGE # _____ % COMPLETE 99

NUMBER	CODE	TESTS	INDIVIDUAL	LABOR (HOURS)	COST

EXPENSES	INDIVIDUAL	MEALS		MILEAGE	COST	LODGING	COST
		$12	$25	0.23			

K00000064

R = RUSH (X 1.75) OS = SUNDAY (X 1.5)
TOTAL COST _____
O = OVERTIME (X 1.3) OH = HOLIDAY (X 2.0)

0188-016-15M

OVERISEL COMPRESSOR STATION
PCB WIPE SAMPLING

578917-552-955

5/24/89

SMPL #	PCB µg/100 cm2	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
1	3	TURBO PRE LUBE S/O	CYL	2.0L x 1.9dia
2	1	INTAKE ELBOW	CYL	4.0L x 7.9dia
3	4	LOPRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
4	5	HIPRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
5	10	VALVE COVER PLATE	SQR	5 X 5
6	5	DISCHARGE PIPING	CYL	4.0 x 3.9 dia
7	3	HIPRESS CYL	CYL	1.8 x 7.2 dia
8	39	INTAKE ELBOW	CYL	4.0 x 7.9 dia
9	3	HIPRESS UNLOADER VALVES (REP/2)	RECT	3.7 x 5.2
10	15	2ND STAGE CYL HEAD	CYL	2.8 x 5.0 dia
11	na	HEXANE		
12	13	PACKING SPACERS (REP/39)	CYL	2.4 x 3.2 dia
13	<10	LUBRICATOR BOWL	CYL	1.2 x 1.1 dia
14	<10	↓	↓	↓
15	<10			
16	<10			
17	na	HEXANE		

PCB # 1856

RECEIVED
MAY 24 1989
CHEMICAL DIVISION

OVERISEL COMPRESSOR STATION 578917-552-955
PCB WIPE SAMPLING

5/24/89

SMPL #	PCB ug/100 cm2	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
1	3	TURBO PRE LUBE S/O	CYL	2.0L x 1.9dia
2	1	INTAKE ELBOW	CYL	4.0L x 7.9dia
3	4	LOPRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
4	5	HIPRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
5	10	VALVE COVER PLATE	SQR	5 x 5
6	5	DISCHARGE PIPING	CYL	4.0 x 3.9 dia
7	3	HIPRESS CYL	CYL	1.8 x 7.2 dia
8	39	INTAKE ELBOW	CYL	4.0 x 7.9 dia
9	3	HIPRESS UNLOADER VALVES (REP/2)	RECT	3.7 x 5.2
10	15	2ND STAGE CYL HEAD	CYL	2.8 x 5.0 dia
11	na	HEXANE		
12	13	PACKING SPACERS (REP/39)	CYL	2.4 x 3.2 dia
13	<10	LUBRICATOR BOWL	CYL	1.2 x 1.1 dia
14	<10	↓ ↓	↓	↓
15	<10			
16	<10			
17	na	HEXANE		

PCB # 1856

RECEIVED
MAY 24 1989
CHEMICAL DIVISION

Control #	PCBs, µg/ml	Extraction vol., ml	PCBs, µg	Area, cm²	PCBs, µg/cm²		PCBs, µg/100 cm²	
89-955-1	0.010	40	0.4	12	0.03		3	
-2	0.036	40	1.4	99	0.01		1	
-3	0.019	40	0.8	20	0.04		4	
-4	0.023	40	0.9	19	0.05		5	
-5	0.060	40	2.4	25	0.096		10	
-6	0.066	40	2.6	49	0.053		5	
-7	0.031	40	1.2	41	0.029		3	
-8	0.975	40	39	99	0.39		39	
-9	0.016	40	0.6	19	0.032		3	
-10	0.165	40	6.6	44	0.15		15	
-12	0.096	40	3.0 ~~3.8~~	24	0.16		~~16~~ 13	
-13	0.015	40	0.6	4	0.15	<10	15	*
-14	0.011	40	0.4	4	0.10	<10	10	*
-15	0.016	40	0.6	4	0.15	<10	15	*
-16	0.016	40	0.6	4	0.15	<10	15	*
Hexane composite of -11 & -17	0.001	—	—	—	—		—	

PCB # 1856

K00000067

OVERISEL COMPRESSOR STATION 518917-552-854
PCB WIPE SAMPLING

05/10/89

Sample #	PCB ug/100 cm²	Eng/comp	DESCRIPTION	APPRX SHAPE	MEASURE AREA, CM
1	13	4	TURBO PRE-LUBE S/O	CYL	2.0L x 1.9 dia
2	2	N/A	HIGH PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
3	22	N/A	INTAKE ELBOW	CYL	4.0L x 7.9 dia
4	14	N/A	LOPRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
5	16	N/A	HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
6	—		HEXANE		
7	39	N/A	VALVE COVER PLATE	SQR	5.0 x 5.0
8	28	N/A	DISCHARGE PIPING	CYL	4.0L x 3.9 dia
9	1	N/A	DISTANCE PIECE	RECT	12 x 24
10	13	N/A	HI PRESS CYL	CYL	1.8L x 7.2 dia
11	160	N/A	INTAKE ELBOW	CYL	4.0L x 7.9 dia
12	10	N/A	LOPRESS UNLOADER VALVES (REP/2)	RECT	4.0 x 5.1
13	20	N/A	HI PRESS UNLOADER VALVES (REP/2)	RECT	3.7 x 5.2
14	7	N/A	VALVE COVER PLATES (REP/4)	SQR	5.0 x 5.0
15	43	N/A	2ND STAGE CYL HEAD	CYL	2.8L x 5.0 dia
16	4	N/A	2ND STAGE CYL ~~HEAD~~ ROD	CYL	9.0L x 5.6 dia
17	—		HEXANE		
18	150	N/A	PACKING SPACERS (REP/39)	CYL	2.4L x 3.2 dia
19	4	N/A	LOPRESS VALVES (REP/8)	CIR	42.8 cm² PREVIOUS
20	2	N/A	HI PRESS VALVES (REP/8)	CIR	6.0 dia
21	12	N/A	LUBRICATOR BOWL	CYL	1.2L x 1.1 dia
22	15				
23	3				
24	95				
25	7				
26	49				
27	—		HEXANE		

RECEIVED
MAY 10 1989
CHEMICAL DIVISION

K00000068

OVERISEL COMPRESSOR STATION 518917-552-854
PCB WIPE SAMPLING

05/10/89

SMPL ID	µg PCB / 100 cm²	ENG/COMP #	DESCRIPTION	APPRX SHAPE	MEASURE AREA, CM
1	13	4	TURBO PRE LUBE S/O	CYL	20L x 1.9 dia
2	2	N/A	HIGH PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
3	22	N/A	INTAKE ELBOW	CYL	40L x 7.9 dia
4	14	N/A	LOPRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
5	16	N/A	HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
6	—		HEXANE		
7	39	N/A	VALVE COVER PLATE	SQR	5.0 x 5.0
8	28	N/A	DISCHARGE PIPING	CYL	4.0L x 3.9 dia
9	1	N/A	DISTANCE PIECE	RECT	12 x 24
10	13	N/A	HI PRESS CYL	CYL	1.8L x 7.2 dia
11	160	N/A	INTAKE ELBOW	CYL	4.0L x 7.9 dia
12	10	N/A	LOPRESS UNLOADER VALVES (REP/2)	RECT	4.0 x 5.1
13	20	N/A	HI PRESS UNLOADER VALVES (REP/2)	RECT	3.7 x 5.2
14	7	N/A	VALVE COVER PLATES (REP/4)	SQR	5.0 x 5.0
15	43	N/A	2ND STAGE CYL HEAD	CYL	2.8L x 5.0 dia
16	4	N/A	2ND STAGE CYL ~~HEAD~~ ROD	CYL	9.0L x 5.6 dia
17	—		HEXANE		
18	150	N/A	PACKING SPACERS (REP/39)	CYL	2.4L x 3.2 dia
19	4	N/A	LOPRESS VALVES (REP/8)	CIR	42.8 cm² PREVIOUS
20	2	N/A	HI PRESS VALVES (REP/8)	CIR	6.0 dia
21	12	N/A	LUBRICATOR BOWL	CYL	1.2L x 1.1 dia
22	15				
23	2				
24	95				
25	7				
26	490				
27	—		HEXANE		

RECEIVED
MAY 10 1989
CHEMICAL DIVISION

K00000069

89 854

	mg PCB	Area	mg PCB/100 cm2
1	1.5	11.9	13
2	1.6	75.4	2
3	22	99	22
4	2.9	20.4	14
5	3.1	19.2	16
6	~~9.8~~ na	na	na
7	9.8	25	39
8	14	49	28
9	4.2	388	1
10	5.4	40.7	13
11	160	99	161
12	2.1	20	10
13	38	19.2	20
14	1.7	25.	7
15	19	44	43
16	7.0	158	4
17	na	na	na
18	36	24.1	149
19	1.7	42.8	4
20	0.6	28.3	2
21	0.5	4.1	12
22	0.6	4.1	15
23	0.1	4.1	2
24	3.9	4.1	95
25	0.3	4.1	7
26	20	4.1	490.
27	na	na	na

K00000070

OVERISEL COMPRESSOR STATION 518917-552-854
PCB WIPE SAMPLING

05/10/89

Sample #	PCB ug/100 cm2	Eng/comp	DESCRIPTION	APPRX SHAPE	MEASURE AREA, CM
1	13	4	TURBO PRE-LUBE S/O	CYL	2.0L x 1.9 dia
2	2	N/A	HIGH PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
3	22	N/A	INTAKE ELBOW	CYL	4.0 L x 7.9 dia
4	14	N/A	LOPRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
5	16	N/A	HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
6	—		HEXANE		
7	39	N/A	VALVE COVER PLATE	SQR	5.0 x 5.0
8	28	N/A	DISCHARGE PIPING	CYL	4.0L x 3.9 dia
9	1	N/A	DISTANCE PIECE	RECT	12 x 24
10	13	N/A	HI PRESS CYL	CYL	1.8L x 7.2 dia
11	160	N/A	INTAKE ELBOW	CYL	4.0L x 7.9 dia
12	10	N/A	LOPRESS UNLOADER VALVES (REP/2)	RECT	4.0 x 5.1
13	20	N/A	HI PRESS UNLOADER VALVES (REP/2)	RECT	3.7 x 5.2
14	7	N/A	VALVE COVER PLATES (REP/4)	SQR	5.0 x 5.0
15	43	N/A	2ND STAGE CYL HEAD	CYL	2.8L x 5.0 dia
16	4	N/A	2ND STAGE CYL ~~HEAD~~ ROD	CYL	9.0L x 5.6 dia
17	—		HEXANE		
18	150	N/A	PACKING SPACERS (REP/39)	CYL	2.4L x 3.2 dia
19	4	N/A	LOPRESS VALVES (REP/8)	CIR	42.8 cm² PREVIOUS
20	2	N/A	HI PRESS VALVES (REP/8)	CIR	6.0 dia
21	12	N/A	LUBRICATOR BOWL	CYL	1.2L x 1.1 dia
22	15				
23	3				
24	95				
25	7				
26	49				
27	—		HEXANE		

RECEIVED
MAY 10 1989
CHEMICAL DIVISION

K00000071

Overisel Compressor Station 4/29/89

1g PCB / 100cm2	sample No	Eq. #	Description	approx shape	Area Measure CM
210	1	4	Turbo Prelube Dstoff	Cyl.	1.9 dia x 2.0 L
9 *	2	2	Turbo Prelube Pump	Cyl.	2.5 dia x 2.0 L
24	3	A/C	Lubricator Bowl	Cyl.	1.1 dia x 1.2 L
48	4		" "	"	
73	5		" "	"	
170	6		" "	"	
48	7		" "	"	
24	8		" "	"	
na	9		H spool		

* Priority

RECEIVED
APR 28 1989
29 HWJ
CHEM.
DIV.

89-763

1838
1839

89 763

	us	Area	
1	25	11.9	210
2	7.4	15.7	9 (8.9)
3	1	4.1	24
4	2	4.1	48
5	3	4.1	73
6	7	4.1	170
7	2	4.1	48
8	1	4.1	24
9	0.4	na	na

K00000073

4/29/89

OVERISEL COMPRESSOR STATION 518917-552-757
PCB WIPE SAMPLES
COMPRESSOR ENGINES 04-20-89

PCB µg/100cm²	SMPL #	ENG #	DESCRIPTION		APPX SHAPE	AREA MEASURE, CM
5	1	NA	Instrument air regulator	AIR COMPRESSOR PARTS	CYL	4.0L x 3.3dia
9	2	3	TURBO PRE-LUBE PUMP		CYL	4.5L x 2.2dia
16	3	2	TURBO PRE-LUBE PUMP		CYL	3.5L x 1.9dia
4	4	3	DRESSER CPLG (REP/23)		CYL	4.5L x 7.8dia
9	5	4	ENGINE PRE-LUBE REGULATOR		CYL	2.8L x 3.0dia
6	6	NA	INSTRUMENT AIR DRYER TRAP		CYL	4.5L x 6.0dia
5	7	4	ENGINE PRE-LUBE LINES		CYL	2.5L x 1.1dia
170	8	4	TURBO PRE LUBE REGULATOR		CYL	1.3L x 2.0dia
na	9	NA	HEXANE			

RECEIVED
APR 28 1989
CHEMICAL
DIV

K00000074

4/29/89

OVERISEL COMPRESSOR STATION 518917-552-757
PCB WIPE SAMPLES
COMPRESSOR ENGINES 04-20-89

PCB µg/100cm²	SMPL #	ENG #	DESCRIPTION		APPX SHAPE	AREA MEASURE, CM
5	1	NA	Instrument air regulator	AIR COMPRESSOR PARTS	CYL	4.0L x 3.3dia
9	2	3	TURBO PRE-LUBE PUMP		CYL	4.5L x 2.2dia
16	3	2	TURBO PRE-LUBE PUMP		CYL	3.5L x 1.9dia
4	4	3	DRESSER CPLG (REP/23)		CYL	4.5L x 7.8dia
9	5	4	ENGINE PRE-LUBE REGULATOR		CYL	2.8L x 3.0dia
6	6	NA	INSTRUMENT AIR DRYER TRAP		CYL	4.5L x 6.0dia
5	7	4	ENGINE PRE-LUBE LINES		CYL	2.5L x 1.1dia
170	8	4	TURBO PRE LUBE REGULATOR		CYL	1.3L x 2.0dia
na	9	NA	HEXANE			

RECEIVED
APR 28 1989
CHEMICAL
DIV

K00000075

89757 Overside 1836

Sample	ug	Area	ug/100cm²
1			
2	2.1	41.4	5
3	2.8	31.1	9
4	3.4	20.9	16
5	4.3	110	~~3.9~~ 4
6	2.5	26.4	9
7	1.2	18.9	6
8	0.4	8.6	~~4.7~~ 5
9	14	8.2	170
	na	na	na

K00000076

OVERISEL COMPRESSOR STATION 518917-552-757
PCB WIPE SAMPLES
COMPRESSOR ENGINES 04-28-89

SMPL #	ENG #	DESCRIPTION		APPX SHAPE	AREA MEASURE, CM
1	NA	Instrument air regulator	AIR COMPRESSOR PARTS	CYL	4.0L x 3.3dia
2	3	TURBO PRE-LUBE PUMP		CYL	4.5L x 2.2dia
3	2	TURBO PRE - LUBE PUMP		CYL	3.5L x 1.9dia
4	3	DRESSER CPLG (REP/23)		CYL	4.5L x 7.8dia
5	4	~~ENGINE~~ ENGINE PRE-LUBE REGULATOR		CYL	2.8L x 3.0dia
6	NA	INSTRUMENT AIR DRYER TRAP		CYL	4.5L x 6.0dia
7	4	ENGINE PRE-LUBE LINES		CYL	2.5L x 1.1dia
8	4	TURBO PRE LUBE REGULATOR		CYL	1.3L x 2.0dia
9	NA	HEXANE			

RECEIVED
APR 28 1989
CHEMICAL
DIV

Pg 1

Overisel Compressor Station
PCB Wipe Sampling
Air Compressors I & II 04-25-89

518917-552-731

SMPL #	COMP #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
2	1	1	MAIN BODY CYLINDER	SQR	10 X 10
8	2	2	MAIN BODY CYLINDER	SQR	10 X 10
4	3	NA	LOW PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
1	4		DISTANCE PIECE (LOOSE)	SQR	12 x 24
1	5		DISTANCE PIECE (ATT'D)	RECT	12 X 24
3	6		HI PRESS CYL	CYL	18L x 7.2 dia
16	7		HI PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
29	8		INTAKE ELBOW	CYL	4.0L x 7.9 dia
345	9		LOPRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
93	10		HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
na	11	1 & 2	HEXANE		
288	12	NA	VALVE COVER PLATE (REP/4)	SQR	5.0 x 5.0
8	13		2ND STAGE CYL HEAD	CYL	2.8L x 5.0 dia
4	14		2ND STAGE PISTON ROD	CYL	9.0L x 5.6 dia
10	15		LOPRESS PISTON & ROD	RECT	6.0 x 16.5
4	16		HI PRESS PISTON	RECT	13.5 x 7.5
8	17		LUBRICATOR GEAR BOX	RECT	10 x 9.5
1	18		INTER-STAGE SEPARATOR	CYL	8.5L x 8.0 dia
	~~19~~		~~LOPRESS PACKING GLAND~~	~~CYL~~	~~4.0L x 6.0 dia~~
12	19		DISCHARGE PIPING	CYL	3.0L x 3.9 dia
8	20		DISCHARGE PIPING	CYL	4.0L x 3.9 dia
3	21		LOPRESS PACKING GLAND	CYL	4.0L x 6.0 dia
na	22		HEXANE		
19	23		DISTANCE PIECE (LOOSE)	RECT	12 x 24
5	24		DISTANCE PIECE (ATT'D)	RECT	12 x 24
64	25		HI PRESS CYL	CYL	18L x 7.2 dia
4	26		HI PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
91	27		INTAKE ELBOW	CYL	4.0L x 7.9 dia
130	28		LOPRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
32	29		HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
12	30		VALVE COVER PLATE (REP/4)	SQR	5.0 x 5.0
32	31		2ND STAGE CYL HEAD	CYL	2.8L x 5.0 dia
16	32		2ND STAGE PISTON ROD	CYL	9.0L x 5.6 dia
na	33		HEXANE		

RECEIVED
APR 25 1989

K00000078

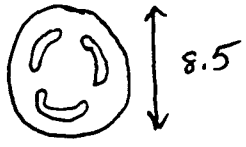
Samples are identified by number at site

Overisel Compressor Station 731 (pg 2)
PCB Wipe Sampling
Air Compressors I & II 04-25-89

	SMPL #	COMP #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
6	34	NA	LoPress Piston & Rod	RECT	6.0 x 16.5
3	35		Hi Press Piston	RECT	13.5 x 7.5
5	36		Lubricator Gear Box	RECT	10.0 x 9.5
2	37		Inter Stage Separator	CYL	8.5L x 8.0 dia
88	38		Packing Spacers (Rep/39)	CYL	2.4L x 3.2 dia
17	39		LoPress Valve (Rep/8)	CIR	See Drwg #1
11	40		Hi Press Valve (Rep/8)	CIR	6.0 dia
3	41		Valve Chair (Rep/8)	CIR	9.5 dia
134	* 42		Air Dryer Trap	CYL	4.0L x 1.4 dia
14	* 43		Instrument Air Regulator	CYL	4.0L x 3.3 dia
na	44		HEXANE		
			Compressor Engine Re-wipes		
5	* 45	#2	Dresser Cplg (Rep/23)	CYL	4.5L x 7.8 dia
20	* 46	#2	Turbo Pre-Lube Pump		4.5L x 2.7 dia
32	* 47	#3	Dresser Cplg (Rep/23)		4.5L x 7.8 dia
60	* 48	#3	Turbo Pre-Lube Pump		4.5L x 1.9 dia
19	* 49	#4	Engine Pre Lube Reg		4.5L x 3.1 dia
240	* 50	#4	Turbo Pre-Lube Reg		4.5L x 1.9 dia
18	* 51	#4	Turbo Lines (Rep/3)		4.5L x 1.9 dia
na	52	2-4	HEXANE		

* Indicates High Priority Analysis

#1



56.7

holes are 4.2 Long x 1.1 across = 4.6 cm² x 3 = -13.9 cm² = 42.8

K00000079

Samples are identified by number at site

Pg 1

Overisel Compressor Station
PCB Wipe Sampling
Air Compressors I & II 04-25-89

518917-552-731

RECEIVED
APR 25 1989

	SMPL #	COMP #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
2	1	1	MAIN BODY CYLINDER	SQR	10 X 10
8	2	2	MAIN BODY CYLINDER	SQR	10 X 10
4	3	NA	LOW PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
1	4		DISTANCE PIECE (LOOSE)	SQR	12 x 24
1	5		DISTANCE PIECE (ATT'D)	RECT	12 x 24
3	6		HI PRESS CYL	~~SQR~~ CYL	18L x 7.2 dia
16	7		HI PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
29	8		INTAKE ELBOW	CYL	4.0L x 7.9 dia
345	9		LO PRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
93	10		HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
na	11	1 & 2	HEXANE		
288	12	NA	VALVE COVER PLATE (REP/4)	SQR	5.0 x 5.0
8	13		2ND STAGE CYL HEAD	CYL	2.8L x 5.0 dia
4	14		2ND STAGE PISTON ROD	CYL	9.0L x 5.6 dia
10	15		LO PRESS PISTON & ROD	RECT	6.0 x 16.5
4	16		HI PRESS PISTON	RECT	13.5 x 7.5
8	17		LUBRICATOR GEAR BOX	RECT	10 x 9.5
1	18		INTER-STAGE SEPARATOR	CYL	8.5L x 8.0 dia
	~~19~~		~~LO PRESS PACKING GLAND~~	~~CYL~~	~~4.0L x 6.0 dia~~
12	19		DISCHARGE PIPING	CYL	4.0L x 3.9 dia
8	20		DISCHARGE PIPING	CYL	4.0L x 3.9 dia
3	21		LO PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
na	22		HEXANE		
19	23		DISTANCE PIECE (LOOSE)	RECT	12 x 24
5	24		DISTANCE PIECE (ATT'D)	RECT	12 x 24
64	25		HI PRESS CYL	CYL	1.8L x 7.2 dia
4	26		HI PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
91	27		INTAKE ELBOW	CYL	4.0L x 7.9 dia
130	28		LO PRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
32	29		HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
12	30		VALVE COVER PLATE (REP/4)	SQR	5.0 x 5.0
32	31		2ND STAGE CYL HEAD	CYL	2.8L x 5.0 dia
16	32		2ND STAGE PISTON ROD	CYL	9.0L x 5.6 dia
na	33		HEXANE		

K00000080

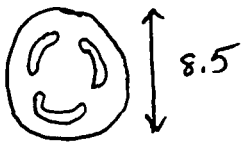
Samples are identified by number at site

Overisel Compressor Station 731 (pg 2)
PCB Wipe Sampling
Air Compressors I & II 04-25-89

	SMPL #	COMP #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
6	34	NA	LoPress Piston & Rod	RECT	6.0 x 16.5
3	35		Hi Press Piston	RECT	13.5 x 7.5
5	36		Lubricator Gear Box	RECT	10.0 x 9.5
2	37		Interstage Separator	CYL	8.5L x 8.0 dia
88	38		Packing Spacers (Rep/39)	CYL	2.4L x 3.2 dia
17	39		LoPress Valve (Rep/8)	CIR	See Drwg #1
11	40		Hi Press Valve (Rep/8)	CIR	6.0 dia
3	41		Valve Chair (Rep/8)	CIR	9.5 dia
134	* 42		Air Dryer Trap	CYL	4.0L x 1.4 dia
14	* 43		Instrument Air Regulator	CYL	4.0L x 3.3 dia
na	44		HEXANE		
			Compressor Engine Re-wipes		
5	* 45	#2	Dresser Cplg (Rep/23)	CYL	4.5L x 7.8 dia
20	* 46	#2	Turbo Pre-Lube Pump		4.5L x 2.7 dia
32	* 47	#3	Dresser Cplg (Rep/23)		4.5L x 7.8 dia
60	* 48	#3	Turbo Pre-Lube Pump		4.5L x 1.9 dia
19	* 49	#4	Engine Pre Lube Reg		4.5L x 3.1 dia
240	* 50	#4	Turbo Pre-Lube Reg		4.5L x 1.9 dia
18	* 51	#4	Turbo Lines (Rep/3)		4.5L x 1.9 dia
na	52	2-4	HEXANE		

* Indicates High Priority Analysis

#1



56.7

holes are 4.2 Long x 1.1 across = 4.6 cm² x 3 = -13.9 cm² = 42.8

K00000081

Samples are identified by number at site

Pg 1

Overisel Compressor Station
PCB WIPE SAMPLING
AIR COMPRESSORS I & II 04-25-89

518917-552-731

RECEIVED
APR 25 1989

	SMPL #	COMP #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
2	1	1	MAIN BODY CYLINDER	SQR	10 X 10
8	2	2	MAIN BODY CYLINDER	SQR	10 X 10
4	3	NA	LOW PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
1	4		DISTANCE PIECE (LOOSE)	SQR	12 x 24
1	5		DISTANCE PIECE (ATT'D)	RECT	12 x 24
3	6		HI PRESS CYL	~~SQR~~ CYL	18L x 7.2 dia
16	7		HI PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
29	8		INTAKE ELBOW	CYL	4.0L x 7.9 dia
345	9		LOPRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
93	10		HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
na	11	1 & 2	HEXANE		
288	12	NA	VALVE COVER PLATE (REP/4)	SQR	5.0 x 5.0
8	13		2ND STAGE CYL HEAD	CYL	2.8L x 5.0 dia
4	14		2ND STAGE PISTON ROD	CYL	9.0L x 5.6 dia
10	15		LOPRESS PISTON & ROD	RECT	6.0 x 16.5
4	16		HI PRESS PISTON	RECT	13.5 x 7.5
8	17		LUBRICATOR GEAR BOX	RECT	10 x 9.5
1	18		INTER-STAGE SEPARATOR	CYL	8.5L x 8.0 dia
	~~19~~		~~LOPRESS PACKING GLAND~~	~~CYL~~	~~4.0L x 6.0 dia~~
12	19		DISCHARGE PIPING	CYL	3.0L x 3.9 dia
8	20		DISCHARGE PIPING	CYL	4.0L x 3.9 dia
3	21		LOPRESS PACKING GLAND	CYL	4.0L x 6.0 dia
na	22		HEXANE		
19	23		DISTANCE PIECE (LOOSE)	RECT	12 x 24
5	24		DISTANCE PIECE (ATT'D)	RECT	12 x 24
64	25		HI PRESS CYL	CYL	18L x 7.2 dia
4	26		HI PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
91	27		INTAKE ELBOW	CYL	4.0L x 7.9 dia
130	28		LOPRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
32	29		HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
12	30		VALVE COVER PLATE (REP/4)	SQR	5.0 x 5.0
32	31		2ND STAGE CYL HEAD	CYL	2.8L x 5.0 dia
16	32		2ND STAGE PISTON ROD	CYL	9.0L x 5.6 dia
na	33		HEXANE		

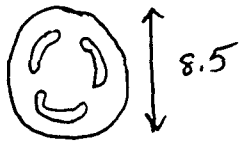
K00000082

Oversiel Compressor Station 731 (pg 2)
PCB Wipe Sampling
Air Compressors I & II 04-25-89

	SMPL #	COMP #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
6	34	NA	LoPress Piston & Rod	RECT	6.0 x 16.5
3	35		Hi Press Piston	RECT	13.5 x 7.5
5	36		Lubricator Gear Box	RECT	10.0 x 9.5
2	37		Inter Stage Separator	CYL	8.5 L x 8.0 dia
88	38		Packing Spacers (Rep/39)	CYL	2.4 L x 3.2 dia
17	39		LoPress Valve (Rep/8)	CIR	See Drwg #1
11	40		Hi Press Valve (Rep/8)	CIR	6.0 dia
3	41		Valve Chair (Rep/8)	CIR	9.5 dia
134	* 42		Air Dryer Trap	CYL	4.0 L x 1.4 dia
14	* 43		Instrument Air Regulator	CYL	4.0 L x 3.3 dia
na	44		HEXANE		
			Compressor Engine Re-wipes		
5	* 45	#2	Dresser Cplg (Rep/23)	CYL	4.5 L x 7.8 dia
20	* 46	#2	Turbo Pre-Lube Pump		4.5 L x 2.7 dia
32	* 47	#3	Dresser Cplg (Rep/23)		4.5 L x 7.8 dia
60	* 48	#3	Turbo Pre-Lube Pump		4.5 L x 1.9 dia
19	* 49	#4	Engine Pre Lube Reg		4.5 L x 3.1 dia
240	* 50	#4	Turbo Pre-Lube Reg		4.5 L x 1.9 dia
18	* 51	#4	Turbo Lines (Rep/3)		4.5 L x 1.9 dia
na	52	2-4	HEXANE		

* Indicates High Priority Analysis

#1



56.7

Holes are 4.2 Long x 1.1 across = 4.6 cm² x 3 = 13.9 cm² = 42.8

K00000083

Samples are identified by number at site

89731- Oversiel Wipes 1834
183

Sample Number	PCB ug	Area cm2	ug/100cm2
1	1.9	100	2
2	8.4	100	8
3	2.8	75	~~3~~ 4
4	1.9	288	~~2~~ 1
5	2.2	288	1
6	12.4	407	3
7	12	75	16 *
8	29	99	29
9	69	20	345
10	17.8	19	93
11	1.1	na	na
12	72	25	288
13	3.5	44	8
14	6	158	4
15	9.8	99	10
16	4.3	101	4
17	7.2	95	8
18	1.7	213	1
19	4.6	~~30~~ 37	12
20	4.1	49	8
21	2.6	75	3
22	0.5	na	na
23	55	288	19
24	14.5	288	5
25	26.4	41	64

K00000084

1833

89731 Overall

#	ug	Area	ug/100cm2
26	3.0	75	4
27	90	99	91
28	26	20	130
29	6	19	32
30	3	25	12
31	14	44	32
32	25	158	16
33	na	na	na
34	6.2	99	6
35	3.3	102	3
36	4.7	95	5
37	5.1	213	2
38	21.	24	88
39	7.2	42.8	17
40	3.0	28	11
41	1.8	71	3
42	23.6	17.6	134
43	6.0	41.4	14
44	na	na	na
45 (#2)	5.4	110	5
46 (#2)	7.6	38.1	20
47 (#3)	34.9	110	32
48 (#3)	16.1	26.8	60
49 (4)	8.5	438	19
50 (4)	64.4	26.8	240
51 (4)	4.8	26.8	18
52	na	na	na

K00000085

Pg. 1

Oversel Compressor Station
PCB Wipe Sampling
Air Compressors I & II 04-25-89

518917-552-731

SMPL #	COMP #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
1	1	MAIN BODY CYLINDER	SQR	10 X 10
2	2	MAIN BODY CYLINDER	SQR	10 X 10
3	NA	LOW PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
4	↓	DISTANCE PIECE (LOOSE)	SQR	12 x 24
5	↓	DISTANCE PIECE (ATT'D)	RECT	12 X 24
6	↓	HI PRESS CYL	~~SQR~~ CYL	18L x 7.2 dia
7	↓	HI PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
8	↓	INTAKE ELBOW	CYL	4.0L x 7.9 dia
9	↓	LO PRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
10	↓	HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
11	1 & 2	HEXANE		
12	NA	VALVE COVER PLATE (REP/4)	SQR	5.0 x 5.0
13	↓	2ND STAGE CYL HEAD	CYL	2.8L x 5.0 dia
14	↓	2ND STAGE PISTON ROD	CYL	9.0L x 5.6 dia
15	↓	LO PRESS PISTON & ROD	RECT	6.0 x 16.5
16	↓	HI PRESS PISTON	RECT	13.5 x 7.5
17	↓	LUBRICATOR GEAR BOX	RECT	10 x 9.5
18	↓	INTER-STAGE SEPARATOR	CYL	8.5L x 8.0 dia
~~19~~		~~LO PRESS PACKING GLAND~~	~~CYL~~	~~4.0L x 6.0 dia~~
19	↓	DISCHARGE PIPING	CYL	3.0L x 3.9 dia
20	↓	DISCHARGE PIPING	CYL	4.0L x 3.9 dia
21	↓	LO PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
22	↓	HEXANE		
23	↓	DISTANCE PIECE (LOOSE)	RECT	12 x 24
24	↓	DISTANCE PIECE (ATT'D)	RECT	12 x 24
25	↓	HI PRESS CYL	CYL	18L x 7.2 dia
26	↓	HI PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
27	↓	INTAKE ELBOW	CYL	4.0L x 7.9 dia
28	↓	LO PRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
29	↓	HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
30	↓	VALVE COVER PLATE (REP/4)	SQR	5.0 x 5.0
31	↓	2ND STAGE CYL HEAD	CYL	2.8L x 5.0 dia
32	↓	2ND STAGE PISTON ROD	CYL	9.0L x 5.6 dia
33	↓	HEXANE		

RECEIVED
APR 25 1989

K00000086

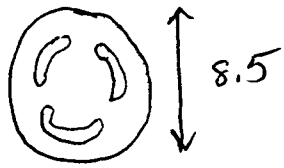
Samples are identified by number at site

Overisel Compressor Station 7.31 (pg 2)
PCB Wipe Sampling
Air Compressors I & II 04-25-89

SMPL #	COMP #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
34	NA	LoPress Piston & Rod	RECT	6.0 x 16.5
35	↓	Hi Press Piston	RECT	13.5 x 7.5
36	↓	Lubricator Gear Box	RECT	10.0 x 9.5
37	↓	Interstage Separator	CYL	8.5 L x 8.0 dia
38	↓	Packing Spacers (Rep/39)	CYL	2.4 L x 3.2 dia
39	↓	LoPress Valve (Rep/8)	CIR	See Drwg #1
40	↓	Hi Press Valve (Rep/8)	CIR	6.0 dia
41	↓	Valve Chair (Rep/8)	CIR	9.5 dia
* 42		Air Dryer Trap	CYL	4.0 L x 1.4 dia
* 43		Instrument Air Regulator	CYL	4.0 L x 3.3 dia
44		Hexane		
		Compressor Engine Re-wipes		
* 45	#2	Dresser Cplg (Rep/23)	CYL	4.5 L x 7.8 dia
* 46	#2	Turbo Pre-Lube Pump	↓	4.5 L x 2.7 dia
* 47	#3	Dresser Cplg (Rep/23)	↓	4.5 L x 7.8 dia
* 48	#3	Turbo Pre-Lube Pump	↓	4.5 L x 1.9 dia
* 49	#4	Engine Pre Lube Reg	↓	4.5 L x 3.1 dia
* 50	#4	Turbo Pre-Lube Reg	↓	4.5 L x 1.9 dia
* 51	#4	Turbo Lines (Rep/3)	↓	4.5 L x 1.9 dia
52	2-4	Hexane		

* Indicates High Priority Analysis

#1



holes are 4.2 Long x 1.1 across

K00000087

Samples are identified by number at site

OVERISEL COMPRESSOR STATION 578917-552-711
PCB WIPES
COMPRESSOR ENGINE 04-21-89

RECEIVED
APR 21 1989
CH

µg/100cm²	SHPL #	ENGIN #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
1	* 1	1	STARTING AIR RECEIVER INLET - ELL	CYL	5.0L x 10.2 dia
4	* 2	1			
7	3	1			
1	4	1			
3	5	1	TURBINE PRE-LUBE PUMP	CYL	4.5L x 2.7 dia
<1	6	1	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
1	7	1	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 2.2 dia
10	8	1	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 2.5 dia
6	9	1	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
na	10	1	HEXANE		
13	11	2	TURBINE PRE LUBE PUMP	CYL	4.5L x 2.7 dia
<5	12	2	ENGINE PRE LUBE PUMP	CYL	4.5L x 2.6 dia
2	13	2	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 2.2 dia
6	14	2	ENGINE PRE LUBE REGULATOR	CYL	4.5L x 2.5 dia
99	15	2	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
11	* 16	3	TURBINE PRE-LUBE PUMP	CYL	4.5L x 1.9 dia
9	* 17	3	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
7	* 18	3	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 1.9 dia
8	* 19	3	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 1.8 dia
na	* 20	2-3	HEXANE		
403	* 21	3	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
5	* 22	4	TURBINE PRE-LUBE PUMP	CYL	4.5L x 2.7 dia
4	* 23	4	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
66	* 24	4	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 1.9 dia
15	* 25	4	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 3.0 dia
6	* 26	4	AIR INJECTION HEADER - DRESSER CPL (REP/23)	CYL	4.5L x 7.8 dia
40	* 27	4	TURBO AIR LINES (REP/3)	CYL	4.5L x 1.9 dia
na	* 28	3-4	HEXANE		
3	* 29		GENERATOR STARTER MOTOR	CYL	2.0L x 5.4 dia
5	* 30		SOLENOID ASSY - STARTER MOTOR (REP/9)	CYL	5.0L x 7.5 dia
5	* 31		REGULATOR LINE - STARTER MOTOR (REP/8)	CYL	5.0L x 4.1 dia
na	32		Hexane		

K00000088

* HIGH PRIORITY

OVERISEL COMPRESSOR STATION 578917-552-711
PCB WIPES
COMPRESSOR ENGINES 04-21-89

RECEIVED
APR 21 1989
CH...

ug/100cm²	SMPL #	ENGIN #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
1	* 1	1	STARTING AIR RECEIVOR INLET - ELL	CYL	5.0L x 10.2 dia
4	* 2	1	↓	↓	↓
7	3	1			
1	4	1			
3	5	1	TURBINE PRE-LUBE PUMP	CYL	4.5L x 2.7 dia
<1	6	1	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
1	7	1	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 2.2 dia
10	8	1	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 2.5 dia
6	9	1	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
na	10	1	HEXANE		
13	11	2	TURBINE PRE LUBE PUMP	CYL	4.5L x 2.7 dia
<5	12	2	ENGINE PRE LUBE PUMP	CYL	4.5L x 2.6 dia
2	13	2	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 2.2 dia
6	14	2	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 2.5 dia
99	15	2	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
11	* 16	3	TURBINE PRE-LUBE PUMP	CYL	4.5L x 1.9 dia
9	* 17	3	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
7	* 18	3	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 1.9 dia
8	* 19	3	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 1.8 dia
na	* 20	2-3	HEXANE		
403	* 21	3	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
5	* 22	4	TURBINE PRE-LUBE PUMP	CYL	4.5L x 2.7 dia
4	* 23	4	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
66	* 24	4	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 1.9 dia
15	* 25	4	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 3.1 dia
6	* 26	4	AIR INJECTION HEADER - DRESSER CPL (REP/23)	CYL	4.5L x 7.8 dia
40	* 27	4	TURBO AIR LINES (REP/3)	CYL	4.5L x 1.9 dia
na	* 28	3-4	HEXANE		
3	* 29		GENERATOR STARTER MOTOR	CYL	2.0L x 5.4 dia
5	* 30		SOLENOID ASSY - STARTER MOTOR (REP/9)	CYL	5.0L x 7.5 dia
5	* 31		REGULATOR LINE - STARTER MOTOR (REP/8)	CYL	5.0L x 4.1 dia
na	32		Hexane		

* HIGH PRIORITY

K00000089

OVERISEL COMPRESSOR STATION 578917-552-711
PCB WIPES
COMPRESSOR ENGINE 04-21-89

RECEIVED
APR 21 1989
CH

µg/100cm²		SHPL #	ENGIN #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
1	*	1	1	STARTING AIR RECEIVER INLET - ELL	CYL	5.0L x 10.2 dia
4	*	2	1			
7		3	1			
1		4	1			
3		5	1	TURBINE PRE-LUBE PUMP	CYL	4.5L x 2.7 dia
<1		6	1	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
1		7	1	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 2.2 dia
10		8	1	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 2.5 dia
6		9	1	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
na		10	1	HEXANE		
13		11	2	TURBINE PRE LUBE PUMP	CYL	4.5L x 2.7 dia
<5		12	2	ENGINE PRE LUBE PUMP	CYL	4.5L x 2.6 dia
2		13	2	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 2.2 dia
6		14	2	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 2.5 dia
99		15	2	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
11	*	16	3	TURBINE PRE-LUBE PUMP	CYL	4.5L x 1.9 dia
9	*	17	3	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
7	*	18	3	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 1.9 dia
8	*	19	3	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 1.8 dia
na	*	20	2-3	HEXANE		
403	*	21	3	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
5	*	22	4	TURBINE PRE-LUBE PUMP	CYL	4.5L x 2.7 dia
4	*	23	4	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
66	*	24	4	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 1.9 dia
15	*	25	4	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 3.1 dia
6	*	26	4	AIR INJECTION HEADER - DRESSER CPL (REP/23)	CYL	4.5L x 7.8 dia
40	*	27	4	TURBO AIR LINES (REP/3)	CYL	4.5L x 1.9 dia
na	*	28	3-4	HEXANE		
3	*	29		GENERATOR STARTER MOTOR	CYL	2.0L x 5.4 dia
5	*	30		SOLENOID ASSY - STARTER MOTOR (REP/9)	CYL	5.0L x 7.5 dia
5	*	31		REGULATOR LINE - STARTER MOTOR (REP/8)	CYL	5.0L x 4.1 dia
na		32		Hexane		

* HIGH PRIORITY

K00000090

OVERISEL COMPRESSOR STATION 578917-552-711
PCB WIPES
COMPRESSOR ENGINE 04-21-89

RECEIVED
APR 21 1989
CH

SMPL #	ENGIN #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
* 1	1	STARTING AIR RECEIVER INLET - ELL	CYL	5.0L x 10.2 dia
* 2	1	↓	↓	↓
3	1			
4	1			
5	1	TURBINE PRE-LUBE PUMP	CYL	4.5L x 2.7 dia
6	1	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
7	1	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 2.2 dia
8	1	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 2.5 dia
9	1	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
10	1	HEXANE		
11	2	TURBINE PRE LUBE PUMP	CYL	4.5L x 2.7 dia
12	2	ENGINE PRE LUBE PUMP	CYL	4.5L x 2.6 dia
13	2	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 2.2 dia
14	2	ENGINE PRE LUBE REGULATOR	CYL	4.5L x 2.5 dia
15	2	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
* 16	3	TURBINE PRE-LUBE PUMP	CYL	4.5L x 1.9 dia
* 17	3	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
* 18	3	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 1.9 dia
* 19	3	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 1.8 dia
* 20	2-3	HEXANE		
* 21	3	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
* 22	4	TURBINE PRE-LUBE PUMP	CYL	4.5L x 2.7 dia
* 23	4	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
* 24	4	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 1.9 dia
* 25	4	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 3.1 dia
* 26	4	AIR INJECTION HEADER - DRESSER CPL (REP/23)	CYL	4.5L x 7.8 dia
* 27	4	TURBO AIR LINES (REP/3)	CYL	4.5L x 1.9 dia
* 28	3-4	HEXANE		
* 29		GENERATOR STARTER MOTOR	CYL	2.0L x 5.4 dia
* 30		SOLENOID ASSY - STARTER MOTOR (REP/4)	CYL	5.0L x 7.5 dia
* 31		REGULATOR LINE - STARTER MOTOR (REP/8)	CYL	5.0L x 4.1 dia
32		Hexane		

* HIGH PRIORITY

K00000091

OVERISEL COMPRESSOR STATION 518/17-552-711
PCB WIPES
COMPRESSOR ENGINE 04-21-89

RECEIVED
APR 21 1989
CH

	SMPL #	ENGIN #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
*	1	1	STARTING AIR RECEIVOR INLET - ELL	CYL	5.0L x 10.2 dia
*	2	1	↓	↓	↓
	3	1			
	4	1			
	5	1	TURBINE PRE-LUBE PUMP	CYL	4.5L x 2.7 dia
	6	1	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
	7	1	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 2.2 dia
	8	1	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 2.5 dia
	9	1	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
	10	1	HEXANE		
	11	2	TURBINE PRE LUBE PUMP	CYL	4.5L x 2.7 dia
	12	2	ENGINE PRE LUBE PUMP	CYL	4.5L x 2.6 dia
	13	2	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 2.2 dia
	14	2	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 2.5 dia
	15	2	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
*	16	3	TURBINE PRE-LUBE PUMP	CYL	4.5L x 1.9 dia
*	17	3	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
*	18	3	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 1.9 dia
*	19	3	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 1.8 dia
*	20	2-3	HEXANE		
*	21	3	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
*	22	4	TURBINE PRE-LUBE PUMP	CYL	4.5L x 2.7 dia
*	23	4	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
*	24	4	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 1.9 dia
*	25	4	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 3.1 dia
*	26	4	AIR INJECTION HEADER - DRESSER CPL (REP/23)	CYL	4.5L x 7.8 dia
*	27	4	TURBO AIR LINES (REP/3)	CYL	4.5L x 1.9 dia
*	28	3-4	HEXANE		
*	29		GENERATOR STARTER MOTOR	CYL	2.0L x 5.4 dia
*	30		SOLENOID ASSY - STARTER MOTOR (REP/4)	CYL	5.0L x 7.5 dia
*	31		REGULATOR LINE - STARTER MOTOR (REP/8)	CYL	5.0L x 4.1 dia
	32		Hexane		

* HIGH PRIORITY

K00000092

Overall Wipe
04-21-89
04-24-89

PCB # 1829

Sample #	µg	area	µg/100cm²
1	1.6	160	1
2	6.4	160	4
3	11.5	160	7
4	1.8	160	1
5	1.2	38	3
6	<0.4	37	<1
7	0.4	31	1
8	3.6	35	10.3
9	6.8	110	6
10	<0.4	na	— na
11	5.0	38	13
12	<2.0	37	<5
13	0.7	31	2
14	2.1	35	6
15	109.	110	99
16	3.1	27	11
17	3.4	37	9
18	1.8	27	7
19	1.9	25	8
20	<0.4	na	— na
21	444.	110	403
22	2.0	38	5
23	1.6	37	4

K00000093

Sample #	ug	area	ug/100cm²
24	16.5	25	66
25	6.6	44	15
26	6.9	110	6
27	10.0	25	40
28	< 0.4	na	— na
29	1.0	34	3
31	5.5	118	5
31	3.4	64	5
32	< 0.4	na	— na

K00000094

To DT Ketcham, P-25-131

From HWVoigt, T-260, Jackson

Date April 18, 1989

Subject PCB ANALYSIS RESULTS

CONSUMERS POWER COMPANY

Internal Correspondence

CC

BW Rasher P12-103
WJ Wilson P12-308
Dykstra, Overisel

Project No 518917 552 668
Analysis No 1823

Analyst GL Cattell

The following: drain samples have been analyzed for PCB concentration. The indicated PCB concentration is reported as parts per million by weight as the indicated Aroclor.

Entry	Control Number	Tag Number	PCB ppm	Aroclor 42	54	60		Φ	Sample Description type	Location
1	89-668-1	NA	2			✓	—	—	water	slop tank — barrel #1
2	-2	NA	1400		✓		—	—	sludge	slop tank — barrel #7
3	-3	NA	280		✓		—	—	sludge	slop tank — barrel #8
4										Overisel Station
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

K00000095

0887-106-48T

4/14/89 Sample from #8
89-668-3 Barrel/of Floor Drain collection
Tank
Overisel Compressor
Station
DTKetcham 3495 108.202 2

Slop tank
#1
89-668-1
Overisel Compressor
Station
4/14/89

4/14/89 Sample from #7
Barrel/of Floor Drain
Collection Tank
89-668-2 Overisel Compressor
Station
DT Ketcham

K00000096

To be run as
a PCB only - not as
a waste

K00000097

FORM 40

FROM CONSUMERS POWER COMPANY
Overisel COMPRESSOR STATION

TO DICK GILLETTE
TRAIL ST. LAB.

ATTN:

SUBJECT: SAMPLE OF: Water

DATE: 4-14-89

FOLD ↑ TAKEN FROM: Slop Tank

TEST TO DETERMINE: PCB content (if any)
Sample # 7 & # 8

OTHER:

PLEASE REPLY TO → SIGNED [signature]

RECEIVED
89-668-2&-3
APR 17 1989
[initials]
CHEMICAL DIVISION

DATE | SIGNED

Send white and pink copies with carbons intact. Pink copy is returned with reply.

DETACH THIS COPY — RETAIN FOR ANSWER

K00000098

Revision 1

WASTE MATERIAL INFORMATION SHEET

Lab Control No _____
ED CC M906.18
P Zombo, P-11-302

GENERATOR COMPLETES

A. General Information

Date of Request 4-14-88 Facility Name Overisel Compressor STA
If Assigned, Facility Waste Sample Number 7
Facility Hazardous Waste Management Coordinator or Environmental Site Coordinator
Name G Dykstra Phone Number 616-751-4391
Name of Person Completing Form G. Dykstra Phone Number _____
Generator Category of Facility (Current) Very Small

B. Waste Information (Complete as appropriate.)

1. Source of Waste Slop Tank

2. Unused Chemical: Name of Manufacturer of Product _____
Address of Manufacturer _____
City _____ State _____
Phone Number _____ ZIP Code: _____

a. ____ Gasoline (____ leaded ____ unleaded)
b. ____ Gasoline and Water Mixture (____ leaded ____ unleaded)
c. ____ Herbicides/Pesticides (List product (by name) in waste.) Unknown ____

d. ____ Paint/Lacquers/Stains Unknown ____
List products (by names) in waste.

e. Unknown ____

3. Used Product Waste or Waste Streams

Waste material is best described as the following class of material:

a. ____ Mineral Oil (Elect Equip)
b. ____ PCB Fluid
c. ____ PCB Contaminated Solid Waste (soils, rags, etc)
d. ____ Uncontaminated Used Oil (____ motor ____ hydraulic ____ ATF hydraulic ____ lube ____ compressor)
e. ____ Paint Thinners
List all products (by name) in waste: Unknown ____

f. ____ Solvent/Solvent Mixture
List all products (by name) in waste: Unknown ____

g. Kerosene ____ Mineral Spirits ____

h. ____ Antifreeze
List products (by names). _____

i. ____ Acids Type _____

j. ____ Caustic Type _____

K00000099

GENERATOR COMPLETES

k. ____ Contaminated Oil
(Name all potential contaminants [products used in work area(s) or other waste which have been put or discharged into oil tank or container].) Unknown ____

l. X Waste Water
(Name all potential contaminants.) Unknown ____

PCB

m. ____ Contaminated Soil
(Name all potential contaminants.) Unknown ____

n. ____ Tank Bottom Sludge / Liquids (Identify contents / contaminants.) Unknown ____

o. ____ Other (Specify type of waste and contents.) Unknown ____

p. ____ Unknown

4. Previously evaluated? Yes ____ No ✓ If yes, provide date of evaluation. ____

5. Waste does not contain the following metals / compounds:

a.	Arsenic	✓	d.	Chromium	✓	g.	Lead	✓	j. Silver ✓
b.	Barium	✓	e.	Copper	✓	h.	Mercury	✓	k. Thallium ✓
c.	Cadmium	✓	f.	Cyanide	✓	i.	Selenium	✓	l. Zinc ✓

- Solvents/Thinners Containing F001/F002 Chemicals ✓
- Solvents/Thinners Containing F003/F005 Chemicals ✓
- Halogeneted Organic Compounds ✓
- Herbicides/Pesticides ✓
- Water ____
- PCB ____

C. Container Information (Please complete the following to assist in handling the waste which is being analyzed.)

1. Drums 1 Tanks ____ Other (Specify) ____

D. Waste Material Is Intended for Disposal X; Recycle (nonfuel) ____; Recycle (Fuel) ____

Unknown ____

ENVIRONMENTAL / LABORATORY COMPLETE

E. Waste Classification Information Date ____ Control Number ____

Classification ____ Completed by ____

Hazardous Waste Parameters/Code

Restricted (Land Ban) Waste Yes ____ No ____ Exempt Status Yes ____ No ____
Parameters

Comments K00000100

10/21/88

Revision 1

WASTE MATERIAL INFORMATION SHEET

Lab Control No _____
ED CC M906.18
P Zombo, P-11-302

GENERATOR COMPLETES

A. General Information

Date of Request 4-14-89 Facility Name Overisel Comp. Station
If Assigned, Facility Waste Sample Number # 8
Facility Hazardous Waste Management Coordinator or Environmental Site Coordinator
Name G. Dykstra Phone Number 616 751-4391
Name of Person Completing Form G. Dykstra Phone Number _____
Generator Category of Facility (Current) Very Small

B. Waste Information (Complete as appropriate.)

1. Source of Waste Slop Tank

2. Unused Chemical: Name of Manufacturer of Product _____
Address of Manufacturer _____
City _____ State _____
Phone Number _____ ZIP Code: _____

a. ____ Gasoline (____ leaded ____ unleaded)
b. ____ Gasoline and Water Mixture (____ leaded ____ unleaded)
c. ____ Herbicides / Pesticides (List product (by name) in waste.) Unknown ____

d. ____ Paint / Lacquers / Stains Unknown ____
List products (by names) in waste.

e. Unknown ____

3. Used Product Waste or Waste Streams

Waste material is best described as the following class of material:

a. ____ Mineral Oil (Elect Equip)
b. ____ PCB Fluid
c. ____ PCB Contaminated Solid Waste (soils, rags, etc)
d. ____ Uncontaminated Used Oil (____ motor ____ hydraulic ____ ATF hydraulic ____ lube ____ compressor)
e. ____ Paint Thinners
List all products (by name) in waste: Unknown ____

f. ____ Solvent / Solvent Mixture
List all products (by name) in waste: Unknown ____

g. Kerosene ____ Mineral Spirits ____

h. ____ Antifreeze
List products (by names). _____

i. ____ Acids Type _____

j. ____ Caustic Type _____

K00000101

GENERATOR COMPLETES

k. ____ Contaminated Oil
(Name all potential contaminants [products used in work area(s) or other waste which have been put or discharged into oil tank or container].) Unknown ____

l. X Waste Water
(Name all potential contaminants.) Unknown ____
PCB

m. ____ Contaminated Soil
(Name all potential contaminants.) Unknown ____

n. ____ Tank Bottom Sludge / Liquids (Identify contents / contaminants.) Unknown ____

o. ____ Other (Specify type of waste and contents.) Unknown ____

p. ____ Unknown

4. Previously evaluated? Yes ____ No ✓ If yes, provide date of evaluation. ____

5. Waste does not contain the following metals / compounds:

a. Arsenic ✓	d. Chromium ✓	g. Lead ✓	j. Silver ✓
b. Barium ✓	e. Copper ✓	h. Mercury ✓	k. Thallium ✓
c. Cadmium ✓	f. Cyanide ✓	i. Selenium ✓	l. Zinc ✓

- Solvents/Thinners Containing F001/F002 Chemicals ✓
- Solvents/Thinners Containing F003/F005 Chemicals ✓
- Halogeneted Organic Compounds ✓
- Herbicides/Pesticides ✓
- Water ____
- PCB ____

C. Container Information (Please complete the following to assist in handling the waste which is being analyzed.)

1. Drums 1 Tanks ____ Other (Specify) ____

D. Waste Material Is Intended for Disposal X; Recycle (nonfuel) ____; Recycle (Fuel) ____
Unknown ____

ENVIRONMENTAL / LABORATORY COMPLETE

E. Waste Classification Information Date ____ Control Number ____

Classification ____ Completed by ____

Hazardous Waste Parameters/Code

Restricted (Land Ban) Waste Yes ____ No ____ Exempt Status Yes ____ No ____
Parameters

Comments ____

K00000102

10 / 21 / 88

FORM 40

FROM CONSUMERS POWER COMPANY
Overisel COMPRESSOR STATION

TO DICK GILLETTE

TRAIL ST. LAB.

ATTN:

SUBJECT: SAMPLE OF: Water DATE: 4-14-89

TAKEN FROM: SLOP TANK

TEST TO DETERMINE: P.C.B. content (if ANY)

OTHER: WO # 3495 - 108.202-2

PLEASE REPLY TO → SIGNED [signature]

RECEIVED
89-668-1
APR 17 1989
[illegible]
C.
DIV.

DATE | SIGNED

Send white and pink copies with carbons intact. Pink copy is returned with reply.

DETACH THIS COPY — RETAIN FOR ANSWER

K00000103

Revision 1

WASTE MATERIAL INFORMATION SHEET

Lab Control No _____
ED CC M906.18
P Zombo, P-11-302

A. General Information

Date of Request 4-14-89 Facility Name Overisel Compressor STA
If Assigned, Facility Waste Sample Number #1
Facility Hazardous Waste Management Coordinator or Environmental Site Coordinator
Name Glenn D. Dykstra Phone Number 616 751-4391
Name of Person Completing Form Glenn Dykstra Phone Number _____
Generator Category of Facility (Current) Very Small

B. Waste Information (Complete as appropriate.)

1. Source of Waste Slop Tank — Rain Water From Roof

2. Unused Chemical: Name of Manufacturer of Product —
Address of Manufacturer _____
City _____ State _____
Phone Number _____ ZIP Code: _____

a. ____ Gasoline (___ leaded ___ unleaded)
b. ____ Gasoline and Water Mixture (___ leaded ___ unleaded)
c. ____ Herbicides/Pesticides (List product (by name) in waste.) Unknown ____

d. ____ Paint/Lacquers/Stains Unknown ____
List products (by names) in waste.

e. Unknown ___

3. Used Product Waste or Waste Streams

Waste material is best described as the following class of material:

a. ____ Mineral Oil (Elect Equip)
b. ____ PCB Fluid
c. ____ PCB Contaminated Solid Waste (soils, rags, etc)
d. ____ Uncontaminated Used Oil (___ motor ___ hydraulic ___ ATF hydraulic ___ lube ___ compressor)
e. ____ Paint Thinners
List all products (by name) in waste: Unknown ____

f. ____ Solvent/Solvent Mixture
List all products (by name) in waste: Unknown ____

g. Kerosene ____ Mineral Spirits ____

h. ___ Antifreeze
List products (by names). _____

i. ____ Acids Type _____

j. ____ Caustic Type _____

GENERATOR COMPLETES

K00000104

GENERATOR COMPLETES

k. ____ Contaminated Oil
(Name all potential contaminants [products used in work area(s) or other waste which have been put or discharged into oil tank or container].) Unknown ____

l. X Waste Water
(Name all potential contaminants.) Unknown ____
PCB

m. ____ Contaminated Soil
(Name all potential contaminants.) Unknown ____

n. ____ Tank Bottom Sludge / Liquids (Identify contents / contaminants.) Unknown ____

o. ____ Other (Specify type of waste and contents.) Unknown ____

p. ____ Unknown

4. Previously evaluated? Yes ____ No X If yes, provide date of evaluation. ____

5. Waste does not contain the following metals / compounds:

a. Arsenic	✓	d. Chromium	✓	g. Lead	✓	j. Silver	✓
b. Barium	✓	e. Copper	✓	h. Mercury	✓	k. Thallium	✓
c. Cadmium	✓	f. Cyanide	✓	i. Selenium	✓	l. Zinc	✓

- Solvents/Thinners Containing F001/F002 Chemicals ✓
- Solvents/Thinners Containing F003/F005 Chemicals ✓
- Halogeneted Organic Compounds ✓
- Herbicides/Pesticides ✓
- Water ____
- PCB ____

C. Container Information (Please complete the following to assist in handling the waste which is being analyzed.)

1. Drums 4 Tanks ____ Other (Specify) ____

D. Waste Material Is Intended for Disposal X; Recycle (nonfuel) ____; Recycle (Fuel) ____
Unknown ____

ENVIRONMENTAL / LABORATORY COMPLETE

E. Waste Classification Information Date ____ Control Number ____

Classification ____ Completed by ____

Hazardous Waste Parameters/Code

Restricted (Land Ban) Waste Yes ____ No ____ Exempt Status Yes ____ No ____
Parameters

Comments ____

K00000105

10/21/88

Overisel Aug 01

K00000106

To GDDykstra, Overisel Compressor Station

From REGillett, T-215, Jackson

Date August 3, 1989

Subject SLOP TANK PCB

CC BWRasher, P-12-103 WJWilson, P-12-308
HWVoigt, T-260

CONSUMERS POWER COMPANY

Internal Correspondence
REG-35-89

File Index: 528917-510-386

Three samples of water from the removed slop tank at Overisel Compressor Station and two dirt samples taken from under the old slop tank before the new slop tank was installed were received at the Chemistry Department of ESTS July 27 with a request to determine PCB content of each sample.

Lab Number	Facility Number	PCB ug/g	Sample Type
89-1386-1	1	<1 water 800 sludge	Water with black sludge
89-1386-2	2	<1 water 960 sludge	Water with black sludge
89-1386-3	3	<1 800 sludge	Water with black sludge
89-1386-4	4	<1	Dirt
89-1386-5	5	<1	Dirt

Data Reference: PCB-1918

K00000107

0889-032-3B

To GDDykstra, Overisel
DHPendleton/DTKetcham, P-25-131
~~WHVoigt, T-260~~

From BWRasher, P-12-103

Date March 2, 1989

Subject OVERISEL POST-CLOSURE GROUNDWATER MONITORING PROGRAM

CC

CONSUMERS POWER COMPANY

Internal Correspondence

BWR 89-48
M905.4

Please review the attached draft and let me know if you have any suggested changes by March 15, 1989.

K00000108

IC0389-04BWR-EN03

CONSUMERS POWER COMPANY
OVERISEL COMPRESSOR STATION

POST-CLOSURE GROUNDWATER MONITORING PROGRAM

1.0 PURPOSE
To specify the requirements, responsibilities and methods for assuring implementation of the post-closure groundwater monitoring agreement with the Michigan Department of Natural Resources at the Overisel Compressor Station.

2.0 SCOPE
This program is applicable to the Gas Production & Transmission, Laboratory & Field Technical Services - Chemical Division and Environmental Departments for the acquisition and reporting of groundwater data at the Overisel Compressor Station.

3.0 DEFINITIONS
None

4.0 REFERENCE DOCUMENTS

4.1 PCB Action Plan for Overisel Compressor Station filed with the Michigan Department of Natural Resources on August 8, 1988 (August 8, 1988 letter from Bruce Rasher to Timothy J McGarry, Files BWR 88-112 and M905.4)

5.0 REQUIREMENTS AND RESPONSIBILITIES

5.1 GAS PRODUCTION & TRANSMISSION

5.1.1 The Gas Production & Transmission Department shall be responsible for assuring implementation of the post-closure groundwater monitoring agreement with the Michigan Department of Natural Resources at the Overisel Compressor Station.

5.1.2 The Gas Production & Transmission Department shall each year budget and provide the Laboratory & Field Technical Services - Chemical Division with an area/function number or other suitable account number for charges in connection with acquisition of data.

5.2 LABORATORY & FIELD TECHNICAL SERVICES - CHEMICAL DIVISION
The Laboratory & Field Technical Services - Chemical Division shall be responsible for the acquisition of groundwater data in accordance with the following requirements:

5.2.1 Monitoring Points
Monitoring shall be conducted with the seven groundwater monitoring wells located at Overisel Compressor Station: 88MW-1, 2, 2A, 3, 3A, 4 and 4A (Figure 1).

5.2.2 Sample Collection Methods

5.2.2.1 Groundwater Elevation Measurement Method
Groundwater elevations shall be determined prior to sample collection using depth-to-water measurements in the monitoring wells, replicated for agreement (ie, a minimum of two sets of measurements), by the wetted-tape method (to the nearest 0.01 ft) using the following surveyed top-of-casing elevations:

Monitoring Well	Top-of-Casing Elevation (ft)	Well Depth (ft)*
88MW-1	116.80	21.78
88MW-2	105.02	12.04
88MW-2A	105.33	23.15
88MW-3	104.43	11.50
88MW-3A	104.08	18.37
88MW-4	104.11	11.7
88MW-4A	104.30	20.2

Distance from top-of-casing to bottom of well screen

5.2.2.2 Groundwater Sample Collection Method
After measurement of groundwater elevation and prior to sample collection, the monitoring wells shall be evacuated. Representative samples of groundwater shall be collected at screen depth with a bailer and line constructed of appropriate materials which shall be cleaned prior to each use in order to prevent cross-contamination. (Care shall be given to avoid introducing any level of contaminant into the wells.) A sample shall be considered representative for the purpose of collection after a volume of water equal to a minimum of five times the storage capacity of the well is evacuated and pH and specific conductance (measured at frequent intervals) stabilize (ie, within ±10 percent).

5.2.3 Parameters

5.2.3.1 The concentration of PCB in groundwater shall be measured.

5.2.3.2 The direction of groundwater flow shall be indicated by plotting contours of the measured groundwater elevations on a scale drawing of the station.

5.2.4 Sample Handling and Preparation
Sample volume, containers, preservative, holding time and preparation shall be in accordance with appropriate standards to assure representative samples. Samples shall be properly labeled and catalogued.

5.2.5 Analytical Methods, Instruments and Detection Limit
Appropriate analytical methods and instruments shall be used to achieve the detection limit stated for the analytical method.

5.2.6 Analytical Quality Control
Appropriate analytical quality control techniques shall be used to assure the precision and accuracy of the data.

5.2.7 Monitoring Frequency and Duration
Monitoring shall be conducted during the month of August each year through the year 1997.

5.2.8 Schedule and Reports
Monitoring shall be conducted within the first five (5) business days of the month. Written notification of the date samples were collected and any problems as they may affect the data shall be provided by Laboratory & Field Technical Services - Chemical Division to the Environmental Department within three (3) business days of when the monitoring was done. A written report of field notes, sample preparation and handling, analytical methods and instruments, analytical results and quality control data shall be provided by Laboratory & Field Technical Services - Chemical Division to the Environmental Department within three (3) weeks of the date samples were collected.

5.3 ENVIRONMENTAL DEPARTMENT
The Environmental Department shall be responsible for management of data acquisition and regulatory agency reporting in accordance with the following:

5.3.1 Program Management
The Environmental Department shall assure that this program is properly implemented and perform a technical review of monitoring reports. The program shall be evaluated on an annual basis using the monitoring data to assure that any changed conditions at the station can be detected.

5.3.2 Reporting
The Environmental Department shall submit a report of the concentration of PCB in the samples to the Michigan Department of Natural Resources within five (5) weeks of the date of monitoring. Copies of the reports shall be furnished to the Station Superintendent and Gas Production & Transmission Department-GO.

To BW Rasher, P12-103

From HW Voigt, T-260 HWV

Date August 23, 1989

Subject OVERISEL COMPRESSOR STATION -

Monitoring Well Samples
PCB Results
Sampling Date - August 07, 1989

CONSUMERS POWER COMPANY

Internal Correspondence

CC

File Index # 528917-552-480

==========

On August 07, 1989 personnel from the Chemistry Department of Energy Supply Technical Services (ESTS) completed Depth-To-Water (DWL) measurements and groundwater sample collection from seven (7) monitoring well installations at the Overisel Compressor Station. Samples were returned to ESTS for PCB analysis.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - The monitoring wells were pumped at a rate of 1 gallon per minute to a constant pH and specific conductance readings with a suction pump fitted with a rubber hose and a screened foot valve. During pumping the screened foot valve was positioned 1 foot below the DWL so that the completed well volume was evacuated. Measurements of pH and specific conductance were taken at intervals corresponding to approximately one pumped casing volume for a minimum of five casing volumes. After the required pump volume was removed, a 1-quart water sample was collected at screen depth with a clean bailer. Samples were iced and returned to ESTS Chemistry Department for analysis.

Sample Handling - Sample handling was in accordance with the SW-846 recommendations for organic analytes.

pH and Specific Conductance - ESTS Procedure - CHEM-74

PCB Analysis - Samples were analyzed in accordance with Method 8080, SW-846, Organochlorine Pesticides and PCB.

MONITORING WELL DAMAGE REPORT

At 88MW-3 and 88MW-3A the above ground section of casing (2-foot section) unscrewed and came off while attempting to remove the casing caps. The sections were re-fitted after the casing caps were removed. All monitoring well casing cap had heavy rust accumulation at the casing cap - casing pipe interface. Casing cap do not have vent holes.

K00000112

RESULTS

Table 1 - PCB Analysis Results

Table 2 - Depth-To-Water Measurements

Table 3 - Field Parameter: Constant pH and Specific Conductance Readings and Pre-Sample Pump Volumes

Figure 1 - Groundwater Contour Map

K00000113

TABLE 1 PCB ANALYSIS RESULTS

Overisel Compressor Station
Sampling Date: August 07, 1989

Control Number	Monitoring Well ID	PCB, ug/L As PCB-1254	MDL ug/L
891480-1	88MW-1	ND	0.06
891480-2	88MW-2	ND	0.06
891480-3	88MW-2A	ND	0.06
891480-4	88MW-3	ND	0.06
891480-5	88MW-3A	ND	0.06
891480-6	88MW-4	0.39	0.06
891480-7	88MW-4A	0.08	0.06
891480-8	Field Blank	ND	0.06

MDL = Method Detection Limit

Method Detection Limit is based on 10-mL final extraction volume of a 950 mL water sample and a analyte practical quantitation limit of 0.06 ug/mL for PCB-1254.

K00000114

TABLE 2 STATIC WATER ELVATIONS

Overisel Compressor Station
Sampling Date: August 07, 1989

Monitoring Well ID	Elevation Top-Of-Casing (ft)	Depth-To Water (ft)	Static Water Elevation (ft)
88MW-1	116.80	13.92	102.88
88MW-2	105.02	13.22	101.80
88MW-2A	105.33	13.27	102.06
88MW-3	104.43	13.48	100.95
88MW-3A	104.08	12.17	101.91
88MW-4	104.11	12.25	101.86
88MW-4A	104.30	2.35	101.95

K00000115

TABLE 3 MONITORING WELL SAMPLING FIELD PARAMETERS

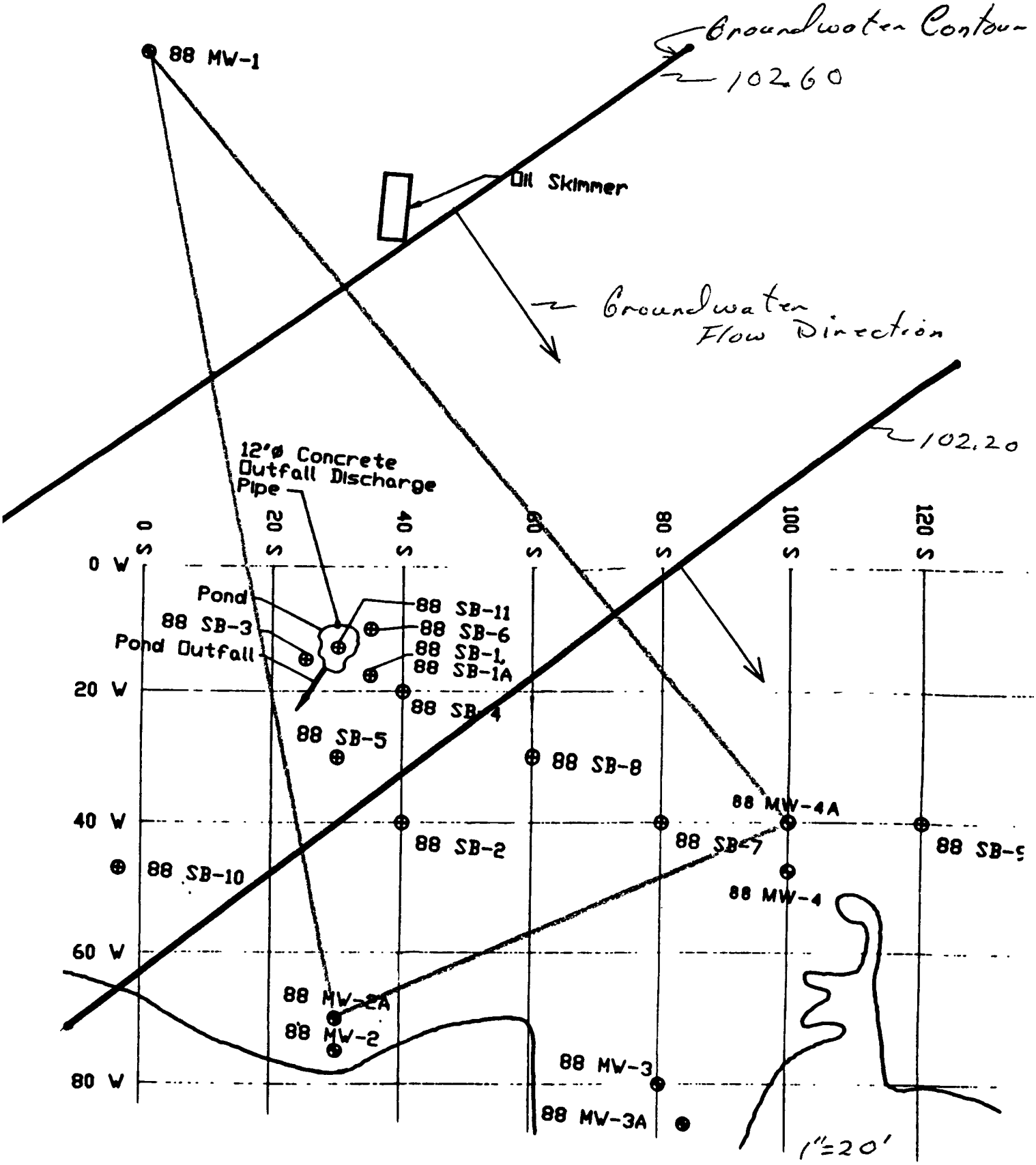
Overisel Compressor Station
Sampling Date: August 07, 1989

MW ID	SCRN Depth (ft)	DWL (ft)	Well Volume (gal)	Pump Volume (gal)	Final pH (SU)	Final Specific Conductance (umho/cm)
88MW-1	21.78	13.92	1.26	7.5	6.9	370
88MW-2	12.04	3.22	1.41	7.5	7.3	360
88MW-2A	23.15	3.27	3.18	17.0	7.6	350
88MW-3	11.50	3.38	1.28	7.5	7.0	430
88MW-3A	18.37	2.17	2.59	13.5	7.2	680
88MW-4	11.70	2.25	1.51	8.5	6.9	370
88MW-4A	20.20	2.35	2.86	15.0	7.0	350

K00000116

FIGURE 1 GROUNDWATER CONTOUR MAP

Overisel Compressor Station
Sampling Date: August 07, 1989



K00000117

APPENDIX A-1 FIELD NOTES

MONITORING WELL DEPTH-TO-WATER MEASUREMENTS

Site Location: Overisel Compnerson Station

Date: Aug 07, 1989 Project Number: 528917552-480

Leader: HW U0167 Helper: MB Brown

Monitoring Well ID 88-	Time	TRIAL - 1 Top-Of Casing	TRIAL - 1 Wetted Tape (ft)	TRIAL - 1 Depth-To-Water (ft)	TRIAL - 2 Top-Of Casing (ft)	TRIAL - 2 Wetted Tape (ft)	TRIAL - 2 Depth-To-Water (ft)
mw 4A	1050	3.00	0.65	2.35	4.00	1.65	2.35
4	1055	3.00	0.75	2.25	4.00	1.75	2.25
3A	1100	3.00	0.83	2.17	4.00	1.83	2.17
3	1105	4.00	0.52	3.48	5.00	1.52	3.48
2A	1110	4.00	0.72	3.28	5.00	1.73	3.27
2	1115	4.00	0.78	3.22	5.00	1.78	3.22
1	1340	15.00	1.08	13.92	16.00	2.08	13.92

Remarks ~~MW-1 Cannot get casing cap off~~

MW3 & MW3A 2-foot above ground casing came off while removing cap - refitted

MW2 DWL taken at highest side of casing

MW1 Casing cap ~~off~~ removed for sampling

no vent hole in casing caps

K00000119

All Measurements are recorded to the nearest 0.01 ft

Reviewed By HWJ Date 080789

MONITORING WELL SAMPLING LOG

Site Location: Juenisel Compression Station

Date: Aug 07 1989 Project Number: 528917552-480

Leader: HW Dougt Helper: MG Brown

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88 MW-1	21.78	13.92	7.86	1.26	6.30	7.5
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1345	1	1.5	7.2	350	
		2	1.5	7.0	380	
		3	1.5	7.0	380	
		4	1.5	6.9	370	
		5	1.5	6.9	370	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88MW-2	12.04	3.22	8.82	1.41	7.05	7.5
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1300	1	1.5	7.3	360	
		2	1.5	7.3	360	
		3	1.5	7.3	360	
		4	1.5	7.3	360	
		5	1.5	7.3	360	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88MW-2A	23.15	3.27	19.88	3.18	15.90	17.0
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1245	1	3.0	8.5	250	
		2	3.5	7.8	350	
		3	3.5	7.6	350	
		4	3.5	7.6	350	
		5	3.5	7.6	350	

K00000120

MONITORING WELL SAMPLING LOG

Site Location: Overisel Compressor Station

Date: Aug 07, 1989 Project Number: 52817552-480

Leader: HW Voigt Helper: MG Brown

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88mw-3	11.50	3.48	8.02	1.28	6.40	7.5
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1235	1	1.5	6.9	440	
		2	1.5	7.0	450	
		3	1.5	7.1	430	
		4	1.5	7.0	430	
		5	1.5	7.0	430	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88mw-3A	18.37	2.17	16.20	2.59	12.95	13.5
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1215	1	3.0	7.2	600	
		2	3.0	7.2	700	
		3	2.5	7.2	680	
		4	2.5	7.2	680	
		5	2.5	7.2	680	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88mw-4	11.70	2.25	9.45	1.51	7.55	8.5
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1155	1	2.0	6.8	350	
		2	2.0	6.9	350	
		3	1.5	6.9	370	
		4	1.5	6.9	370	
		5	1.5	6.9	370	

K00000121

MONITORING WELL SAMPLING LOG

Site Location: Overisel Compressor Station

Date: Aug 07, 1988 Project Number: 528917552-480

Leader: HW Voigt Helper: MG Brown

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88mw-4A	20.20	2.35	17.85	2.86	14.30	15.0

Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
1125	1	3	7.0	280	
	2	3	6.8	350	
	3	3	6.9	350	
	4	3	7.0	350	
	5	3	7.0	350	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
na						

Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
na						

Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	

K00000122

MONITORING WELL SAMPLING EQUIPMENT LOG

Site Location: Overisel Compressor Station

Date: Aug 07, 1989 Project Number: 528917552-480

Leader: HW VOIGT Helper: MG Brown

++

CALIBRATION SOLUTIONS - pH BUFFER SOLUTIONS

pH Buffer	Source	Lot Number
4.0	Fisher	890181 - 24
7.0	↓	890146 - 24
10.0	↓	883853 - 24

CALIBRATION SOLUTIONS - SPECIFIC CONDUCTANCE SOLUTIONS

umho/cm	Source	Lot Number
46.7	Myron	442 - 30
447	↓	442 - 300
1410	↓	442 - 1000

++

FIELD EQUIPMENT CALIBRATION

pH Meter

Meter ID Metrohm E 588 S/N 189-191

pH Buffer	Start Of Day Check pH	Start Of Day Check Time	End Of Day Check pH	End Of Day Check Time
4.0	4.0	1110	4.01	1415
7.0	7.0	↓	7.00	↓
10.0	10.0	↓	9.95	↓

Specific Conductance Meter

Meter ID Myron L S/N 1060347

umho/cm	Start Of Day Check umho/cm	Start Of Day Check Time	End Of Day Check umho/cm	End Of Day Check Time
447	40	1115	40	1415
447	450	↓	450	↓
1410	1400	↓	1450	↓

++

K00000123

To BW Rasher, P12-103

From HW Voigt, T-260 HWV

Date August 9, 1989

Subject OVERISEL COMPRESSOR STATION
NOTIFICATION OF GROUNDWATER MONITORING

CONSUMERS POWER COMPANY

Internal Correspondence

CC

File Index # 528917-552-480

==========

On August 7, 1989 personnel from the Chemistry Department of Energy Supply Technical Services (ESTS) completed groundwater elevation measurements and groundwater sample collection for seven (7) groundwater monitoring wells located at the Overisel Compressor Station. Groundwater samples were returned to ESTS for analysis of PCB concentration.

STATIC WATER ELEVATIONS

Monitoring Well ID	Top-of-Casing Elevation (ft)	Depth-To-Water Level (ft)	Static Water Elevation (ft)
88MW-1	116.80	13.92	102.88
88MW-2	105.02	3.22	101.80
88MW-2A	105.33	3.27	102.06
88MW-3	104.43	3.48	100.95
88MW-3A	104.08	2.17	101.91
88MW-4	104.11	2.25	101.86
88MW-4A	104.30	2.35	101.95

SITE NOTES

1 - All monitoring well casing threaded-caps had rust accumulation at the casing-cap interface. All casing threaded-caps were difficult to removed.

2 - At 88MW-3 and 88MW-3A, the above ground section of casing (2-foot section) unscrewed and came off while attempting to remove the casing cap. The sections were re-fitted after the casing caps were removed.

3 - At 88MW-2 the monitoring well casing is not vertical. Top-of-casing was taken to be the highest side.

4 - All monitoring well casing threaded-caps do not have a vent-holes. With the rust accumulation noticed, the monitoring wells may not be a atmospheric pressure.

K00000124

hwv

APPENDIX A-2 ANALYTICAL WORKSHEETS

PCB - WATER SAMPLE

Project Number 528917552-480

SAMPLE CONTROL NUMBER
SAMPLE IDENTIFICATION

Date 08 08 89

Analyst HWU

PROJECT NAME Ovenisel Compressor Station

Control Number	Sample Identification	Remarks
891480-1	88mw-1	
2	88mw-2	
3	88mw-2A	
4	88mw-3	
5	88mw-3A	
6	88mw-4	
7	88mw-4A	
8	Field Blank	
9	88mw-4A	2nd sample
	DWL Log	
	Pump Log	
	Equip Log	
		K00000126

PCB - WATER SAMPLE

Project Number 528917552-480

CALIBRATION STANDARDS PREPARATION

Date 08-11-85

Analyst HWJ

Material Name Aroclor 1254

Material Source Altech

Material Lot Number PE014 Material Stock Number PE014

Purity or Concentration >98% Units % wt

Stock Preparation By Weight ✓ Stock Preparation As Received ____

Balance ID 3744-00063

Final Wt 0.01153
Tare Wt 0.00000
Sample Wt 0.01153

Dilution Solvent nC6

Dilution Volume 100 mL

Initial Stock Concentration 115.3 ug/mL

Working Dilutions Of Stock Concentration

Dilution Solvent nC6

A = Initial Stock Concentration Of 115.3 ug/mL

B = Dilute A By 1 To 100 = 115.3 x 1 / 100 = 1.153

C = Dilute B By 10 To 50 = 1.153 x 10 / 50 = 0.230

D = Dilute B By 5 To 50 = 1.153 x 5 / 50 = 0.115

E = Dilute B By 6 To 100 = 1.153 x 6 / 100 = 0.069

F = Dilute B By 1 To 100 = 1.153 x 1 / 100 = 0.011

G = Dilute B By 0.5 To 100 = 1.153 x 0.5 / 100 = 0.006

Standard ID	Final Concentration	
S54-1	1.153 ug/mL	B
S54-2	0.230	C
S54-3	0.115	D
S54-4	0.069	E
S54-5	0.011	F
S54-6	0.006	G

K00000127

PCB - WATER SAMPLE

Project Number 528917552-480

QC CONCENTRATE PREPARATION

Date 08-11-85

Analyst HWD

Material Name Aroclor 1254

Material Source Supelco

Material Lot Number 31958 Material Stock Number 4-8825

Purity or Concentration 200 Units ug/mL

Stock Preparation By Weight ___ Stock Preparation As Received ✓

Balance ID na

Final Wt na
Tare Wt na
Sample Wt na

Dilution Solvent na

Dilution Volume na

Initial Stock Concentration ~~200 ug/mL~~ na

Working Dilutions Of Stock Concentration

Dilution Solvent Acetone

A = Initial Stock Concentration Of 200 ug/mL

B = Dilute A By 0.5 To 100 = 200 x 0.5 / 100 = 1.00

C = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

D = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

E = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

F = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

G = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

QC Conc. ID	Final Concentration	
QC1	1.00 ug/mL	B
		K00000128

PCB - WATER SAMPLE

EXTRACTION WORKSHEET

Project Number 528912552-480

Date 08-14-89

Analyst GLC / HWU

Extraction Solvent $MeCl_2$

Exchange Solvent nC_6

Extraction Method: Separatory Funnel ✓

Continous Liquid - Liquid Extractor ____

Extraction Number	Control Number 891480	Sample Volume (mL)	Final Volume (mL)	Remarks
1-1	mw-1	950	10	
1-2	mw-2	950	10	
1-3	mw-2A	950	10	
1-4	mw-3	950	10	
1-5	mw-3A	950	10	
1-6	mB	1000	10	Method Blank

K00000129

PCB - WATER SAMPLE

EXTRACTION WORKSHEET

Project Number 528917552-480

Date 08-15-89

Analyst HWU/GLC

Extraction Solvent $MeCl_2$

Exchange Solvent nC_6

Extraction Method: Separatory Funnel ✓

Continous Liquid - Liquid Extractor ____

Extraction Number	Control Number 891480	Sample Volume (mL)	Final Volume (mL)	Remarks
2-1	MW-4	950	10	
2-2	MW-4A	950	10	
2-3	FB	950	10	Field Blank
2-4	MW4AS	1000	10	QC Spike
2-5	THS	1000	10	QC Standard
2-6	MB	1000	10	method Blank

K00000130

PCB - WATER SAMPLE

Project Number 528917552-480

INITIAL CALIBRATION RUN
CALIBRATION CHECK RUN

Date 08-20-89

Analyst HWJ

PCB A1254

INITIAL CALIBRATION

Standard ID	Standard Conc	Found	Acceptance Criterion
S54-1	1.153	0.996	1.153 +/- 0.115
S54-2	0.230	0.225	0.230 +/- 0.023
S54-3	0.115	0.107	0.115 +/- ~~0.00~~ 0.012
S54-4	0.069	0.065	0.069 +/- 0.007
S54-5	0.011	0.010	0.011 +/- 0.001
S54-6	0.006	0.006	0.006 +/- 0.001

MIDDLE - OF - RUN CALIBRATION CHECK

Standard ID	Standard Conc	Found	Acceptance Criterion
na	na	na	na +/-
			+/-
			+/-
			+/-
			+/-
			+/-

K00000131

END - OF - RUN CALIBRATION CHECK

Standard ID	Standard Conc	Found	Acceptance Criterion
S54-1	1.153	1.015	1.153 +/- 0.173
S54-2	0.230	0.232	0.230 +/- 0.035
S54-3	0.115	0.110	0.115 +/- 0.017
S54-4	0.069	0.065	0.069 +/- 0.010
S54-5	0.011	0.013	0.011 +/- 0.002
S54-6	0.006	0.007	0.006 +/- 0.002

PCB - WATER SAMPLE

SAMPLE LIST

Project Number 528917552-480

Date 08-28-89

Analyst HWU

Btl #	Control Number 891480	Concentration Calculated As PCB- 1254 Units ug/mL	Sample Dilution Fractor	Final Conc Calculated As PCB- 1254 Units ug/L
06	S54-1	0.996	na	na
07	S54-2	0.225		
08	S54-3	0.107		
09	S54-4	0.065		
10	S54-5	0.010		
11	S54-6	0.006		
12	mw-1	<0.006	na	<0.06
13	mw-2	<0.006		<0.06
14	mw-2A	<0.006		<0.06
15	mw-3	<0.006		<0.06
16	mw-3A	<0.006		<0.06
17	mB-1	<0.006		<0.06
18	mw-4	0.037		0.39
19	mw-4A	0.008		0.08
20	mB-2	<0.006		<0.06
21	FB	<0.006		<0.06
22	mw-4AS	0.280		2.80
23	THS	0.181		1.81
24	S54-1	1.015	na	na
25	S54-2	0.232		
26	S54-3	0.110		
27	S54-4	0.065		
28	S54-5	0.013		
29	S54-6	0.007		

K00000132

PCB - WATER SAMPLE

QC

Project Number 528917552480

Date 08-14-89 & 08-20-89

Analyst HWV

QC SPIKE PREPARATION

Spike Material A 1254

Control Number 891480	Sample Matrix	Initial Sample Volume, L	Spike Conc In Sample ug/L	QC Concentrate Added QC ID 891480	mL Added
MW-4A5	mw-4A	1L *	3	QC1	3.0mL
THS	TH Standard	1L	2	na	na
		* Adj	to 1L		

QC PERCENT RECOVERY

Spike Material A1254

Control Number 891480	Conc Added ug/L	Conc Found ug/L	Actual Percent Recovery %	Acceptance Criteria Range For Percent Recovery %
MW-4A5	3.08	2.80	91	D - 700
THS	2.0	1.81	91	D - 500

METHOD BLANKS

Control Number 891480	Sample Name	Final Concentration Found As A1254 ug/L
MB-1	MB-1	<0.06
MB-2	MB-2	<0.06

K00000133

PCB - WATER SAMPLE

INSTRUMENT CONDITIONS

Project Number 5289/7552-480

Date 08-20-89

Analyst HWU

Gas Chromatograph Model HP 5730

Number 3741-60367

Detector ECD - Ni63 S/N H2464

Column: Phase 3% OV1

Support 100/120 Supelaport

Column Material Glass

Length 6' od 1/4" id 4mm

Oven Temperature Profile:

Initial Temp 200 Initial Time 0

Program Rate 0 C/mim

Final Temp 200 Final Time 80

Carrier Gas P5 Flow Rate 50mL/min

Detector Temp 300 Injector Temp 300

Auto - Sampler Model HP 7672A

Injection Volume 4.0 uL

Calibration Date Aug 20, 1989

K00000134

To BWRasher, P-12-103

From HWVoigt, T-260 HWV

Date August 8, 1988

CONSUMERS POWER COMPANY

Internal Correspondence

Subject OVERISEL COMPRESSOR STATION MONITORING
WELLS MW-4 AND MW-4A
SAMPLE DATE AUGUST 4, 1988

CC

On August 4, 1988 personnel from the Chemical Division of L&FTS completed groundwater sampling at the Overisel Compressor Station MW-4 and MW-4A monitoring wells. Groundwater samples were returned to L&FTS for determination of PCB concentration.

METHODS

Depth-To-Water - Wetted Tape Method

Sample Collection - Each monitoring well was pumped for 20 gallons, then a water sample collected with a bailer. The wells were then pumped for an additional 60 gallons and a second water sample collected with a bailer.

Pumping was done with the pump hose foot-valve at the depth-to-water level so that the completed well casing volume was exchanged. Bailer samples were collected at screen depth.

PCB Analysis - Method 8080, SW846

RESULTS

Parameter	MW-4	MW-4A
Depth-To-Water (ft TOC)	2.84	2.88
Screen Depth	11.5	19.5
PCB, ug/L as A1254		
20 gal pump volume	1.25	1.20
80 gal pump volume	0.85	0.49
Calculated Well Volumes		
20 gal pump volume	14	7
80 gal pump volume	56	30

K00000135

0888-047-75T

Overside

Aug 09.

MW 4

MW 4A

K00000136

1	1.68	
0.5	0.91	
0.1	0.23	
4	0.225	20
4A	0.220	20
4	0.152	80
4A	0.087	80
MB	0.005	
0.1	0.24	
0.5	0.873	
1.0	1.59	

2.5 1.25

20 gal out

2.4 1.20

1.7 0.85

80 gal out

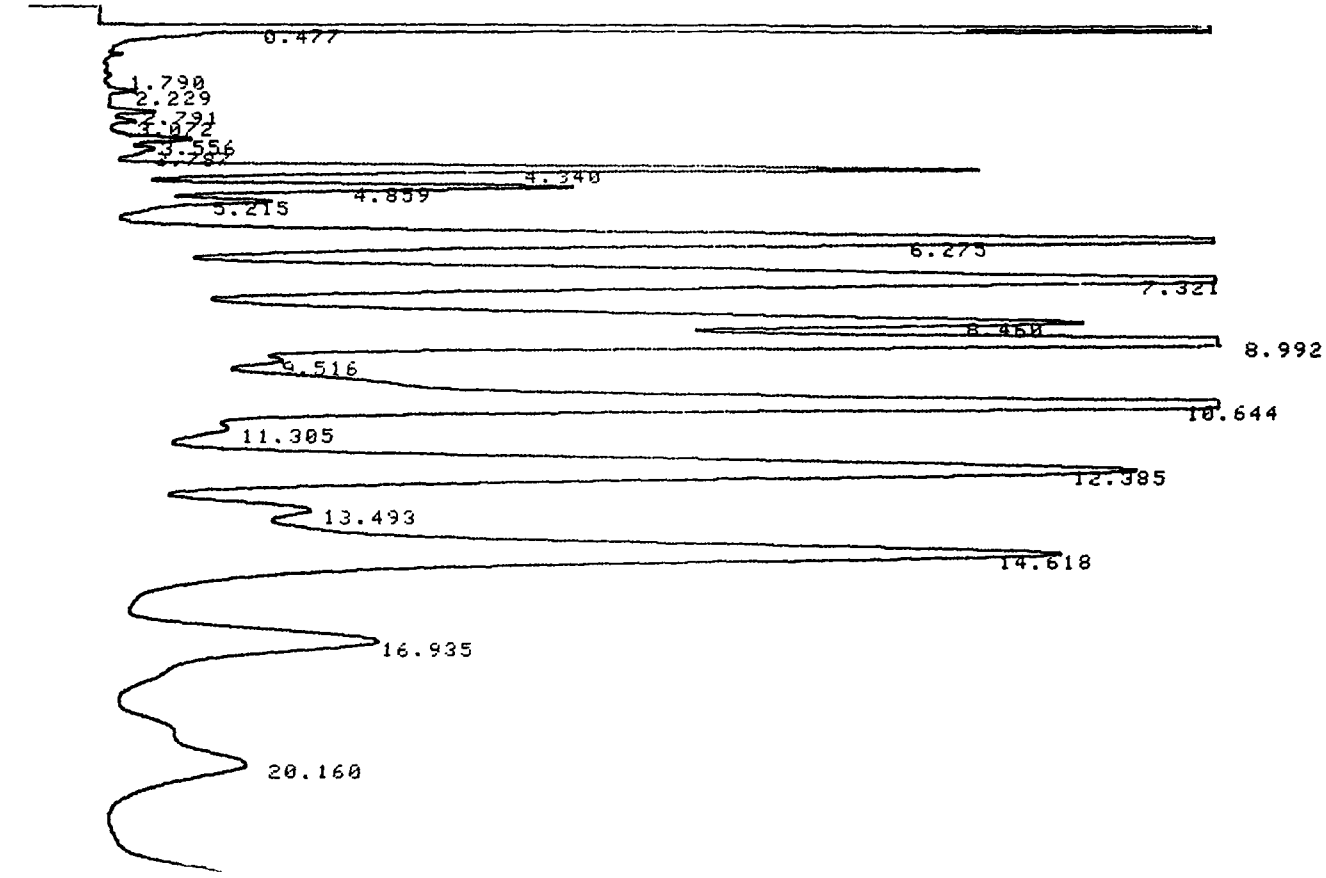
0.97 0.49

4	1.25	20
4A	1.25	20
4	0.85	80
4A	0.49	80

K00000137

K00000138

```
*DIR

VOLUME NAME: PCBOIL      DRIVE: A
DATE: AUG  6, 1988  13:55:19

   FILE NAME       LENGTH   CREATED/VERSION
Q6E30676.BNC         3840 08/05/88 06:53:44
Q6E314AF.BNC         2560 08/05/88 07:54:25
Q6E31DD6.BNC         1536 08/05/88 08:33:29
Q6E32DA7.BNC         6912 08/05/88 09:40:56
Q6E32DA7.PRO          512 08/05/88 09:51:19
Q6E330C8.BNC        10240 08/05/88 09:54:15
Q6E330C8.PRO         1024 08/05/88 10:09:29
Q6E335DD.BNC        19968 08/05/88 10:15:59
Q6E335DD.PRO         1024 08/05/88 10:46:16
Q6E33E4C.BNC        33024 08/05/88 10:51:59
Q6E33E4C.PRO         1280 08/05/88 11:42:08
PCBD     .CAL         512 08/05/88 12:48:22
Q6E4A009.BNC         3840 08/06/88 12:01:16
Q6E4AFF4.BNC         3072 08/06/88 13:09:11

              USED        FREE         MAX
FILES           14         241         256
BYTES        89344      531968      630784

*
SEQ5 READY AS SAMPLE RUN
KEY (SEQ) (START) TO START RUN
BYE



*  SEQ  START
NOW LOADING M:PCBD.MET

RUN #  619     AUG  6, 1988  13:58:24
START-Source
```



MOMITORING WELL DEPTH-TO-WATER MEASUREMENTS

LOCATION Oversel Comp Sta

DATE 04-AUG-88 PROJECT NUMBER

WELL ID Number	Time	Trial-1 Top-Of Casing (ft)	Trial-1 Wetted Tape (ft)	Trial-1 DWL (ft)	Trial-2 Top-Of Casing (ft)	Trial-2 Wetted Tape (ft)	Trial-2 DWL (ft)	SCRN (ft)
MW-4	10:00	4.0	1.16	2.84	5.0	2.16	2.84	11.5
MW-4A	10:10	5.0	2.12	2.88	6.0	3.12	2.88	19.5

Notes : DWL measurements are read to the nearest 0.01 ft.

Remarks:

K00000139

Measurements Taken By [signature]

Reviewed By Date

****

				1.015 ~~1.0015~~
S54 A	0.996			0.232
B	0.225			
C	0.109			0.110
C	0.106			0.065
D	0.065			0.010
E	0.013	(0.011)		0.006
F	0.007	0.0055		
MW 1	<0.007	✓		
2	<	✓		
2A	<			
3	<			
3A	<			
MB	<			0.
4	0.037			
4A	~~0.011~~ 0.008			
FB	<			
MB	<			
4AS	0.280	2.80		3.00
QC54	0.181	1.80		2.00

K00000140

REPORT # 3837 20 AUG, 1989 10:46 PCB

CHANNEL: 9 METHOD: A1254 BOTTLE: 4

SAMPLE: *CALIBRATION INJECTED ON: 20 AUG, 1989 10:11

MIN AR	MV/M	DELAY	DVT	FACTOR	ID-LVL	REF-RTW	%RTW
100	.300	0.00	0.00	1.0000E+ 0	0	.30	5

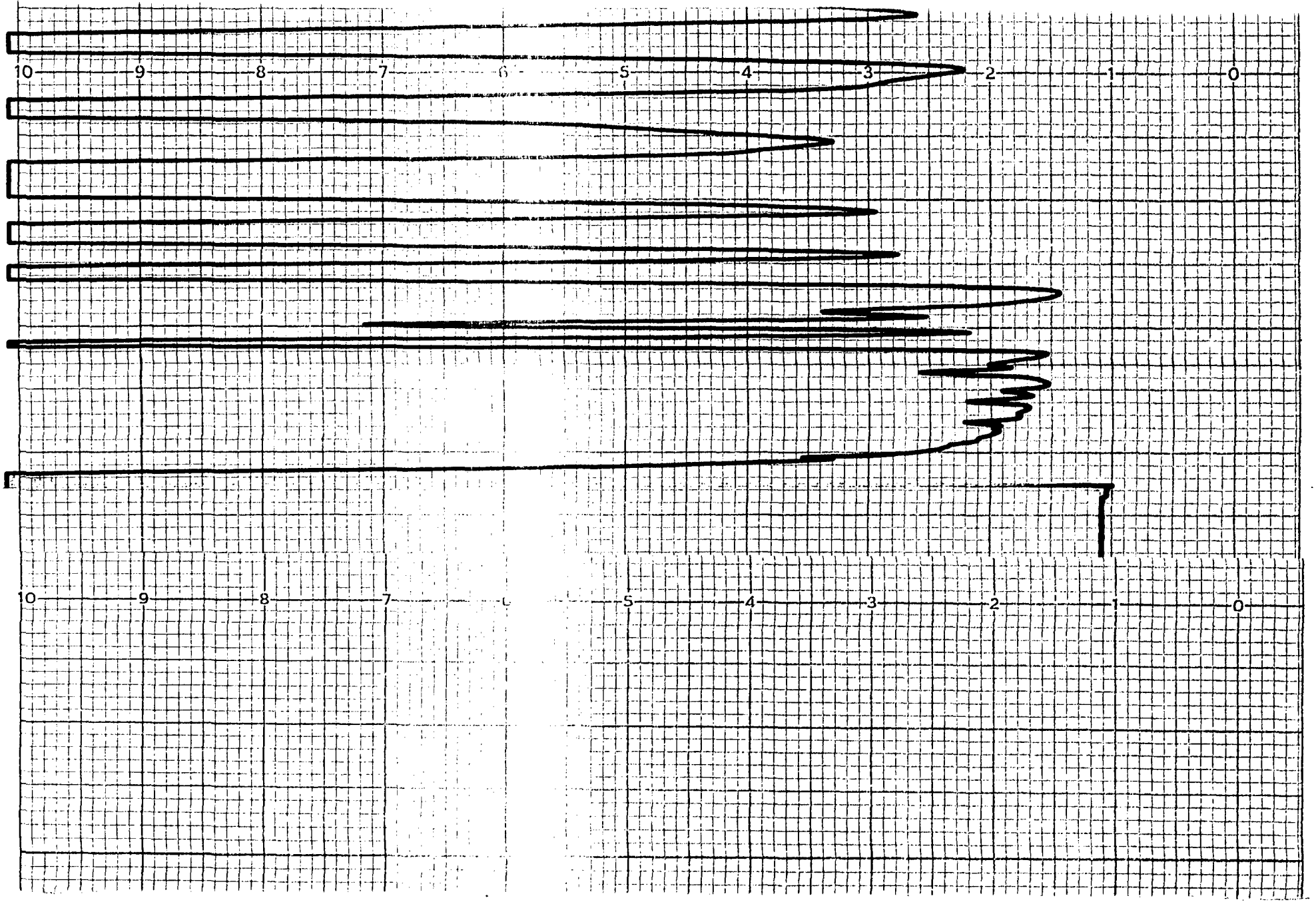
ENDED NOT ON BL

RT	ITM	FACTOR	AREA		NG/ML	NAME
.51		0.0000E+ 0	4685453	BS	0.000	
2.24		0.0000E+ 0	133	BV	0.000	
2.44		0.0000E+ 0	801	VB	0.000	
3.10		0.0000E+ 0	1584	BV	0.000	
3.42		0.0000E+ 0	951	VV	0.000	
3.99		0.0000E+ 0	3907	VV	0.000	
4.25		0.0000E+ 0	2414	VV	0.000	
4.93	5.00	1.0798E- 3	55809	VV	60.260	P047
5.53	5.60	1.0169E- 3	27722	VV	28.190	P054
5.94	6.01	1.2177E- 3	10725	VV	13.060	P058
7.19	7.19#	9.0294E- 4	142080	VV	128.290	#P070
8.44	8.52	8.6205E- 4	195047	VV	168.140	P084
9.77	9.77#	5.5644E- 4	130994	VV	72.890	#P098
10.40	10.35	6.9707E- 4	189564	VV	132.140	P104
12.37	12.37#	6.3798E- 4	228519	VV	145.790	#P125
14.42	14.36	5.2408E- 4	192871	VV	101.080	P146
15.79	15.63	0.0000E+ 0	32330	VV	0.000	P160
17.11	17.11#	3.9298E- 4	207744	VV	81.640	#P174
19.84	19.84#	2.5843E- 4	67678	VV	17.490	#P203
23.70	23.72	1.7739E- 4	54793	VV	9.720	P232
27.40		0.0000E+ 0	37555	VB	0.000	
32.28		0.0000E+ 0	24369	BF	0.000	

TOTAL AREA = 6293043

STORED AS FILE 44 *CALIBRATION 9

REPORT # 3838 20 AUG, 1989 11:23 PCB



K00000142

1	116.80	13.92	102.88
2	105.02	3.22	101.80
2A	105.33	3.27	102.06
3	104.43	3.48	100.95
3A	104.08	2.17	101.91
4	104.11	2.25	101.86
4A	104.30	2.35	101.95

K00000143

MONITORING WELL DEPTH-TO-WATER MEASUREMENTS

Site Location: _____

Date: _____ Project Number: _____

Leader: _____ Helper: _____

		TRIAL - 1			TRIAL - 2		
Monitoring Well ID	Time	Top-Of Casing	Wetted Tape (ft)	Depth-To-Water (ft)	Top-Of Casing (ft)	Wetted Tape (ft)	Depth-To-Water (ft)

Remarks _____

K00000144

All Measurements are recorded to the nearest 0.01 ft

Reviewed By _____ Date _____

mw ID	static Elevation (ft) (E)		
88MW-1	102.88	0.82	0.93
88MW-2A	102.06		
88MW-4A	101.95		

K00000145

OVERISEL
PCB ACTION
Plan

Copies

K00000146

Overisel Compressor Station PCB Action Plan

Consumers Power

POWERING MICHIGAN'S PROGRESS

K00000147

Consumers Power
POWERING MICHIGAN'S PROGRESS
General Offices 212 West Michigan Avenue Jackson MI 49201 • (517) 788 0550

Writer's direct dial (517) 788-0331

December 17, 1990

BWR90210
M905.4

Ms. Wanda Neal
Environmental Quality Analyst
Waste Management Division
Department of Natural Resources
PO Box 30028
Lansing, MI 48909

Re: Consumers Power Company
Overisel Compressor Station
PCB Action Plan

Dear Ms. Neal:

This is to let you know that Consumers Power Company has completed all of the actions set forth in the PCB Action Plan for Overisel Compressor Station. Attached are three copies of a final summary of PCB decontamination verification data and supporting data Item No 36 of Appendix A to the plan. It is my understanding that at least one copy of this update will be passed on to a representative of the US Environmental Protection Agency Region 5 by the Department.

Please contact me if you have any questions regarding this matter.

Sincerely,

Bruce W. Rasher

Bruce Rasher
Environmental Department

Distribution

DNR - 3 copies
File M905.4
PCHittle/MRPutnam
Routing (BWR)
DHPendleton/DTketcham, P11-210
RECollings, JSC-264
WHVoigt, T-260
JPDickey, M-1019
CJEssink, Overisel

K00000149

CONSUMERS POWER COMPANY
OVERISEL COMPRESSOR STATION
PCB DECONTAMINATION VERIFICATION DATA

Soils

The scope of soil removal in the area of the air logs was finalized early in 1988. Soil removal was completed down to the decontamination standard and verified by sampling by June 24, 1988.

The scope of soil removal in the area of the oil-water separator overflow was finalized in early 1988. Soil removal was completed down to the decontamination standard and verified by sampling by June 29, 1988. PCB Action Plan Sections 1, 2, 3, 5, 6, 7, 8, 9, 11 and 12 show test results for the oil separator overflow area. Action Plan Sections 3, 4, 10, 15, 16, 17, 20 and 36 show test results for the air log and generator vent areas.

Wastewater System

The decision was made early in the project to remove contaminated waste water piping rather than clean. Attached Sketch "SK1-90" shows the lines and equipment that were removed. The following listed analysis results show that the lines were removed until their contamination levels reached acceptable limits.

1. 6" Auxiliary Building Drain Line - Was removed completely to point of origin because contamination levels never reached acceptable level.

2. Compressor Building Drain System (Point "A" on Sketch SK1-90) - Was removed to a point at the northwest corner of the compressor building (see Action Plan Section 25, Analysis Control 882-319-5).

3. Warehouse Drain System (Point "A" on Sketch SK1-90) - Was removed to a point near the warehouse (see Action Plan Section 25, Analysis Control 882-319-4).

4. Dehydration Area Drain System (Point "B" on Sketch SK1-90) - Was removed to a point near the warehouse (see Action Plan Section 25, Analysis Control 882-319-3).

5. The compressor building floor drain collection tank was also completely removed and replaced.

Waste water contaminated piping removal was completed on September 9, 1988.

Air System

On June 21 and 22, 1988 samples were taken from the air systems to determine the extent of contamination (see Action Plan Section 20). The analysis results shown in Section 20 indicated that the air compressors, air receivers,

starting air system and a portion of the instrument air system was contaminated. The following plan was implemented for system cleanup.

1. The old air compressors were removed and replaced with new compressors.

2. The air receivers were separated from the system and individually cleaned. For PCB levels prior to cleaning, see Action Plan Section 20, Sample Control 88-946-5 and 9.

   For PCB levels after cleaning, see Action Plan as indicated below:

   a. Air Receiver 1 - Action Plan Section 35, Analysis ØV-8, Sample Control ØV-24.
   b. Air Receiver 2 - Action Plan Section 35, Analysis ØV-9, Sample Control ØV-31.
   c. Air Receiver 3 - Action Plan Section 35, Analysis ØV-10, Sample Control ØV-35.
   d. Air Receiver 4 - Action Plan Section 35, Analysis ØV-10, Sample Control ØV-40.

3. Next, the major piping systems were stripped of contaminated components that could/would be cleaned in the remote parts cleaning cabinet. Then the piping systems were divided into two areas.

   a. Piping System 1 consisted of all contaminated piping in the yard area and auxiliary building (reference Action Plan Section 20, Sample Control 88-946-1, 2, 3, 4, 5, 6 and 9). This piping was manifolded and flushed as one system. Analysis results showing decontamination levels are shown in Action Plan Section 35, Analysis ØV-4, Sample Control ØV-13 and Analysis ØV-5, Sample Control ØV-14.

   b. Piping System 2 consisted of all contaminated piping inside the compressor building (reference Action Plan Section 20, Sample Control 88-946-10, 12, 18 and 23). This piping was manifolded and flushed as one system. The PCB levels after cleaning are shown in Action Plan Section 35, Analysis ØV-2, Sample Control ØV-006.

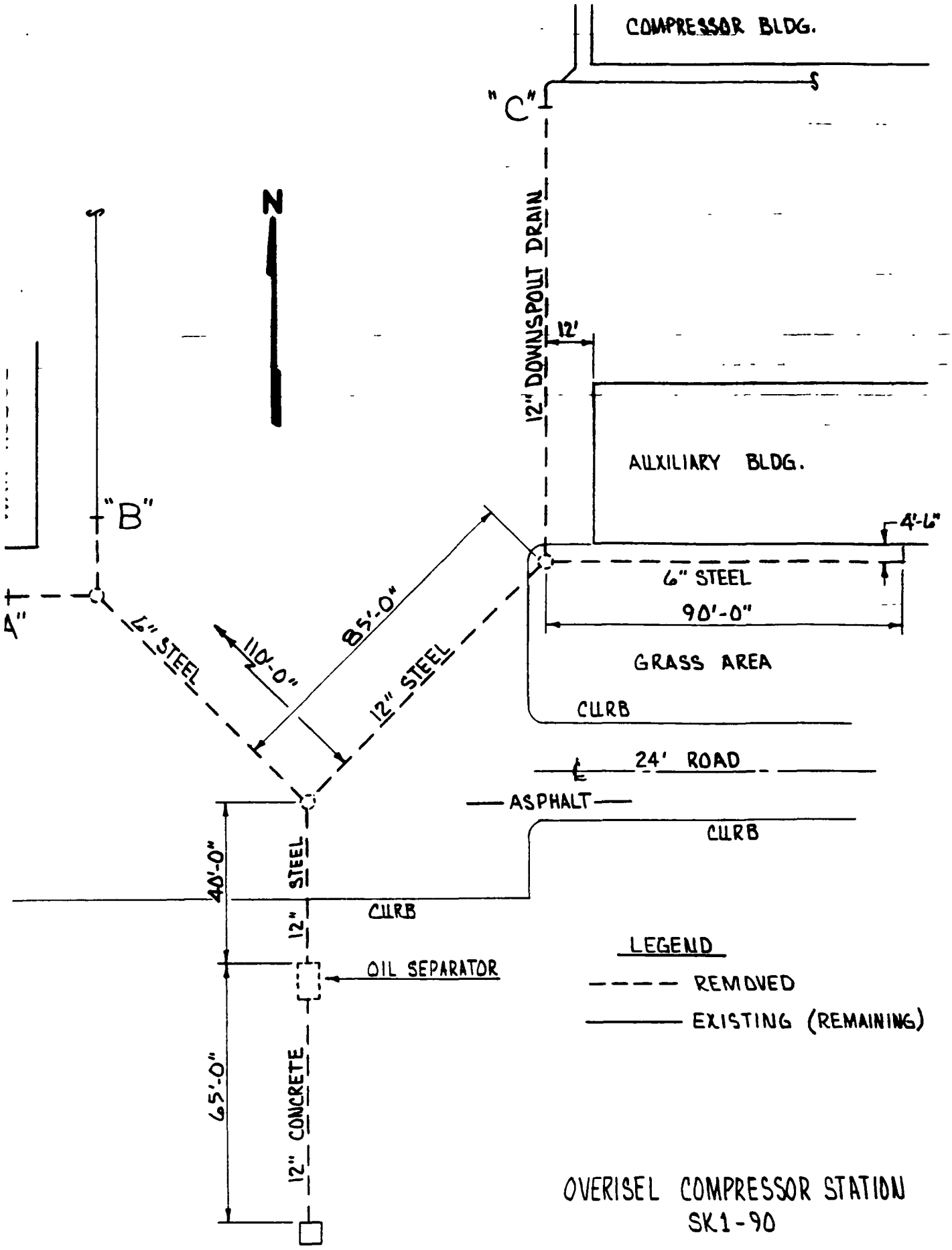
4. Small piping lengths that were removed to facilitate cleaning of the major systems were then manifolded together and flushed clean. PCB results are shown in Action Plan Section 35, Analysis ØV-1, Sample Control ØV-002.

5. The last piping system consisted of the old air compressor aftercoolers and miscellaneous small pipes. These components were manifolded together and flushed. The PCB result is shown in Action Plan Section 35, Analysis ØV-3, Sample Control ØV-008.

6. The components listed in Action Plan Section 27, 28, 30, 31, 32, 33 and 34 are air system parts that could not be cleaned in place, also the disassembled "old" air compressors parts, etc. Many of the components appear in more than one section. This indicates repeat cleanings and testing on

the same part. If a piece/part could not be decontaminated to the required level within a reasonable number of tries, then the piece/part was discarded and replaced.

RECollings
12/10/90



OVERISEL COMPRESSOR STATION
SK1-90

K00000153

Consumers Power
POWERING MICHIGAN'S PROGRESS
General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

August 9, 1989

BWR 89-134
M905.4

Mr John M Bohunsky, PE
Supervisor, Region III
Waste Management Division
Department of Natural Resources
Secondary Complex, General Office Building
PO Box 30028
Lansing, MI 48909

RE: CONSUMERS POWER COMPANY, OVERISEL COMPRESSOR STATION, PCB ACTION PLAN

Dear Mr Bohunsky:

This is to follow-up the briefing we provided to you and other representatives of the Michigan Department of Natural Resources on August 8, 1989, regarding the status of the PCB Site Review and Action Plan for the Consumers Power Company/Michigan Gas Storage Company compressor stations. Attached are three copies of an amendment to the PCB Action Plan for Overisel Compressor Station which includes the dates that the various actions were completed and the post-cleanup verification sampling data which show that the decontamination standards were met in all cases.

It is my understanding that at least one copy of the amendment will be passed on by you to representatives of the US Environmental Protection Agency in Region V.

Please contact me at (517)788-0331 if you have any questions regarding this information.

Sincerely,

Bruce Rasher
Environmental Department

OC0889-17BWR-EN03

K00000154

OVERISEL COMPRESSOR STATION

PCB Action Plan

Distribution

DNR - 3 Copies
File M905.4
Routing (BWR)
WWStille/DHPendleton/DTKetcham
RLMoore/RECollings
WHVoigt
JPDickey
PCHittle/MRPutnam
GDDykstra

BWRasher/8-9-89

MI0889-17MRP-EN03

K00000155

Consumers Power Company/Michigan Gas Storage Company

Compressor Stations

PCB Site Review and Action Plan

Status

August 1989

A. Object

The purpose of this report is to update representatives of the Michigan Department of Natural Resources (DNR) on the status of the Company's PCB Site Review and Action Plan for compressor stations.

B. Scope

1. Background

In February 1987, Consumers Power Company notified representatives of the DNR that it had used a lubricant containing the banned substance, polychlorinated biphenyl (PCB), in some of the air compressors at its White Pigeon Compressor Station, prior to the effective date of the regulation of PCB under the Toxic Substances Control Act (TSCA). New information came to light indicating that some of the PCB was released to the environment. As a result, the Company voluntarily developed and implemented a four-year program to locate and remove PCB at all seven Consumers Power Company/Michigan Gas Storage Company compressor stations, called the PCB Site Review and Action Plan.

The Company's compressor stations function to increase the pressure of natural gas transported throughout the State of Michigan via high-pressure transmission pipelines by pumping it with large compressors. In a typical gas compressor station, air compressors, which should not be confused with the gas compressors, make high-pressure air for safely starting the gas compressors, instrumentation and control, and utility purposes, such as pneumatic tools and sandblasting. The PCB lubricant was used in the air compressors only, and not in the gas compressors as was the practice by other pipeline companies, because of PCB's explosion-proof characteristics.

2. The Plan

The PCB Site Review and Action Plan is divided into five phases:

a. Phase I - Initial Screening

1. Site visit and interview station superintendent

2. Review purchase records for use of Pydraul AC (a Monsanto product distributed by Mobil Oil Co which was formulated with about 57% PCB Aroclor 1254)

3. Review plant systems for potential PCB onsite and offsite releases

4. Sample key indicator points

5. Analyze samples and report data to DNR

b. Phase II - Immediate Remedial Actions (if necessary)

Determine appropriate remedial actions, such as:

1. Isolate any PCB remaining in the system from the environment

2. Collect, characterize and properly dispose of wastes

3. Remove and properly dispose of liquids and sludges containing PCB

4. Seal systems to prevent refilling

c. Phase III - Define Extent of Prior Releases (if necessary)

Determine a site-specific plan; include some or all of the following:

1. Geophysical investigation (if applicable)

2. Soil borings

3. Sample plant systems

4. Analyze and report data

d. Phase IV - Develop Action Plan (if necessary)

1. Determine action thresholds and standards

2. Compare alternatives and their costs

3. Select cost-effective/environmentally sound action plan methods

4. Acquire Agency approval of selected method

e. Phase V - Implement Action Plan and Site Closure (if necessary)

The Company commenced implementation of the Plan in 1987; completion is scheduled for the end of 1990 (see the attached PCB Site Review and Action Plan Schedule).

C. Findings

Refer to the attached PCB Site Review and Action Plan Schedule for a summary of the completion dates discussed under this section.

1. Initial Screening

Initial screening was completed at all seven stations by August 1987. Following are the findings of the initial screening:

a. Through a combination of purchase records and sampling data, we found that PCB was apparently used for a short period during the 1960s in the air compressors of four out of the seven compressor stations:

Consumers Power Company

White Pigeon

Overisel

Northville

Michigan Gas Storage Company

Freedom

PCB was not purchased or used at:

Consumers Power Company

St Clair

Ray

Michigan Gas Storage Company

Muskegon River

The Company has completed the Plan as far as these three stations, St Clair, Ray and Muskegon River, are concerned.

b. In addition, let me stress at this point that we have not found any evidence of PCB contamination of the natural gas system that some other pipeline companies in other parts of the U.S. have experienced.

c. Our initial sampling data indicated that releases from the air systems had occurred to the surrounding soils from air receiver tanks, air dryer vents and from wastewater system discharges such as oil-water separators and dry wells. However, these were believed at that time to be confined to the station property, and access to the public is restricted by fencing.

2. Immediate Remedial Actions

By September 1987, immediate remedial actions were completed where required at White Pigeon, Overisel, Northville and Freedom. Following is a summary of the actions taken:

a. The use of house air for respiratory air supply and sandblasting was terminated.

b. All PCB releases to the environment were terminated by capturing and containerizing the discharges of condensate from air compressors, air receiver tanks, air dryer vents and other miscellaneous points.

c. The wastewater systems were drained and sealed to prevent refilling and the wastes were disposed of in accordance with PCB requirements.

3. Define Extent of Prior PCB Releases

Efforts to define the extent of PCB contamination at the four stations were completed by December 1988. In summary, following is what we found:

a. The comprehensive investigations have shown that PCB releases were confined to the station properties, except for a minor amount of contamination just outside of the fence of Northville. (The adjacent property, Maybury State Park, is owned by the State of Michigan and is not easily accessible to the public.)

b. Despite the presence of PCB at concentrations exceeding the Federal limit of 50 ppm PCB in soils at each station, there is no indication of groundwater contamination, except at Overisel where very low levels (a maximum of 17 ppb PCB in the first sampling and 1.25 ppb PCB after the well was pumped) were found but are believed to be an artifact of contamination introduced by the monitoring well installation process due to drilling through contaminated soil. The Company is committed to a 10-year, annual groundwater monitoring program at both White Pigeon and Overisel to monitor any potential future changes in the groundwater. Results of 1989 monitoring at White Pigeon continue to show no detectable levels of PCB in groundwater; results for Overisel will be available in September 1989.

c. PCB contamination was found throughout some portions of the air systems, including air compressors, air receivers, air dryers and associated piping.

d. Using the data collected, we were able to accurately estimate the scope of cleanup activities required at each station.

4. Develop Action Plan

Action plans addressing the decontamination of soil and wastewater systems were submitted to the DNR for each station by March 1989. Action plans covering the decontamination of air systems at White Pigeon and Overisel were submitted by March 1989. The plans for the Northville and Freedom air systems are due by April 1990.

a. Action thresholds and decontamination standards were determined for soil and the wastewater and air systems. For soil, we adopted the standards of 25 ppm PCB for restricted access areas and 10 ppm PCB for non-restricted access areas contained in the 1987 Environmental Protection Agency (EPA)

PCB Spill Cleanup Policy. The decontamination standard for the wastewater systems was also based on the Policy and the DNR's July 1987 guidance letter applicable to disposal of liquids with less than 10 ppm PCB. The decontamination standard for the air systems was based on the 4 ppm PCB performance standard contained in the permit issued by EPA to the decontamination contractor, Quadrex.

b. A number of decontamination methods, their efficacy and costs, were compared prior to selection of the methods recommended in the action plans submitted to the DNR. For soil, we decided to remove for disposal in an EPA-approved chemical waste landfill. Wastewater systems were also for the most part removed for disposal except, for the portions of piping which were running under the control rooms containing equipment located in the auxiliary buildings. These needed to be decontaminated because removal was not economically feasible. Decontamination of the air systems is to be accomplished using the Freon removal technique for which Quadrex holds its EPA permit.

5. Implement Action Plans and Site Closure

Decontamination of soil and wastewater systems was been completed at each station by August 1989, except that removal of a small remaining portion of the wastewater system at Northville will not be finished until October 1989. Decontamination of the air systems at White Pigeon and Overisel was completed by June 1989. Air systems at Northville and Freedom are scheduled to be decontaminated by June 1990. In all cases, the required decontamination standards have been met as verified by post-decontamination sampling. These data are included in the attached Appendix A.

Representatives of the DNR conducted an inspection at White Pigeon on May 5, 1989. In addition, a representative of the EPA conducted an inspection of the contractor, Quadrex, performing decontamination of the air systems at White Pigeon on May 26, 1989. No violations of the requirements under TSCA were found in either inspection.

D. Recommendations

The Company has successfully addressed areas of concern at its compressor stations by voluntarily carrying out a five phase PCB site review and action plan. As a result, we recommend continuation of the implementation of the plan through to its conclusion by following the scope and schedule

discussed above and submitted to the DNR in the written action plans.

The specific items to be completed include:

1. Develop and submit the action plans for decontamination of air systems at Northville and Freedom by April 1990.

2. Complete the removal of the wastewater system at Northville by October 1989.

3. Decontaminate the air systems at Northville and Freedom by June 1990.

4. The annual groundwater monitoring should be conducted at White Pigeon and Overisel as planned.

BWR/8-8-89

CONSUMERS POWER COMPANY (CPCo) / MICHIGAN GAS STORAGE COMPANY (MGSCo)
COMPRESSOR STATIONS
PCB SITE REVIEW AND ACTION PLAN SCHEDULE
COMPLETION DATES

	Phase	CPCo White Pigeon Plant 1	CPCo White Pigeon Plant 2	CPCo Overisel	CPCo Northville	MGSCo Freedom Plant 1	MGSCo Freedom Plant 2	CPCo Ray	CPCo St Clair	MGSCo Muskegon River
I	Initial Screening	Feb 87	Feb 87	Jun 87	Jun 87	Aug 87	Aug 87	Jul 87	Jul 87	Aug 87
II	Immediate Remedial Actions	Feb 87	Feb 87	Jun 87	Jul 87	Sep 87	Sep 87	Aug 87	Aug 87	Sep 87
III	Define PCB Releases	Dec 87	Dec 87	Jul 88	Sep 88	Sep 88	Dec 88	Sep 88	NA	NA
IV	Develop Action Plan									
	Soil and Wastewater System	Jul 88	Jul 88	Aug 88	Sep 88	Mar 89	Mar 89	NA	NA	NA
	Air System	Mar 89	Mar 89	Mar 89	*Apr 90	*Apr 90	*Apr 90	NA	NA	NA
V	Implement Action Plan									
	Soil	Sep 88	Sep 88	Aug 88	Nov 88	Dec 88	May 89	NA	NA	NA
	Wastewater System	*Aug 89	Apr 89	Aug 88	*Oct 89	NA	NA	NA	NA	NA
	Air Compressors	Mar 89	Dec 88	May 89	*Apr 90	*Apr 90	*Apr 90	NA	NA	NA
	Air System	Jun 89	May 89	Apr 89	*Jun 90	*Jun 90	*Jun 90	NA	NA	NA
	Closure	*Aug 89	May 89	May 89	*Jun 90	*Jun 90	*Jun 90	Sep 88	Aug 87	Sep 87
	Monitoring	*Thru 97	*Thru 97	*Thru 97	NA	NA	NA	NA	NA	NA

* Indicates actions pending as of 8-8-89 status report.

BWR/8-10-89

K000000163

Consumers Power
POWERING MICHIGAN'S PROGRESS
General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

March 20, 1989

BWR 89-63
M905.4

Mr John M Bohunsky, PE
Supervisor, Region III
Waste Management Division
Dept of Natural Resources
PO Box 30028
Lansing, MI 48909

RE: OVERISEL COMPRESSOR STATION - PCB ACTION PLAN

Dear Mr Bohunsky:

This is to let you know that decontamination of the air and wastewater systems at Consumers Power Company's Overisel Compressor Station is scheduled for April 10-18. Decontamination will be undertaken by the contractor, Quadrex, in accordance with the attached scope and an Approval to Dispose of PCBs issued by EPA on July 18, 1988.

Please contact me at (517)788-0331 if you have any questions on this matter.

Sincerely,

Bruce Rasher
Environmental Department

OC0389-43BWR-EN03

Distribution

DNR - 3 copies
File M905.4
Routing (BWR)
WWStille/DHPendleton/DTKetcham, P-25-131
RLMoore/RECollings, JSC-131
GDDykstra, Overisel Comp Station
WHVoigt, T-260
JPDickey, M-1019
PCHittle/MRPutnam, P-12-125A

CONSUMERS POWER COMPANY

OVERISEL COMPRESSOR STATION

Decontamination of Air and Wastewater Systems

Scope

A. Air System

1. Replace contaminated air compressors and decontaminate for reuse
2. Decontaminate pipe from the air compressor discharge to:
   a. Air logs (included)
3. Decontaminate pipe from air logs discharge to:
   a. Auxiliary Building thru auxiliary generator starter motor vent
   b. Compressor Building thru:
      (1) Starting air header
      (2) Air starting check valves on each engine
      (3) Pre-lube pump on each engine
      (4) Up to gate valve at North wall
   c. Air dryer (included - replace desiccant and filters)

What's not included:

1. Instrument air lines downstream of air dryer (including turbines)
2. Auxiliary and Compressor Buildings house air outlets
3. Scrubber (inlet condensate blowdown)
4. Crane
5. Barring jacks

B. Wastewater System

1. Decontaminate Compressor Building floor drain collection tank

BWRasher/1-26-89

RP1088-0233A-EN03

K00000166

OVERISEL AIR SYSTEM
DECONTAMINATION SCOPE

1. 2" from air compressors to and including 12" knockout drum and auxiliary generator starter motor and vent

2. 8" inlet header, on starting air tanks, and 4" tank inlets/outlets to valves inside compressor building

3. 1-1/2" header from 8" inlet header at starting air tanks through air dryer, including air dryer vent but not instrument air discharge piping

4. Four starting air tanks

5. 4" header inside compressor building, including piping around moisture separator, injection lines to engine cylinders, supply lines to auxiliary oil pump air motors and vent lines from air motors to outside compressor building

6. One 2,000-gallon floor drain collection tank

7. Numerous small equipment and piping pieces to be cleaned in the remote cleaning unit

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 18 1988

OFFICE OF PESTICIDES AND TOXIC SUBSTANCES

Mr. Robert Bruce
President
Quadrex HPS, Incorporated
1940 N. W. 67th Place
Gainesville, Florida 32601

JUL 19 RECD
KCA

Dear Mr. Bruce:

Enclosed is a document entitled "Approval to Dispose of Polychlorinated Biphenyls (PCBs)." This document permits Quadrex HPS, Incorporated (Quadrex) to use its solvent extraction method to remove PCBs from mineral oil dielectric fluid (MODEF) transformers; heat transfer and hydraulic fluid systems; PCB askarel transformers; surface contaminated office equipment; and paper contaminated with askarel transformer fluid; subject to the listed conditions of approval. This approval is issued pursuant to Section 6(e)(1) of the Toxic Substances Control Act (TSCA) of 1976 (Public Law 94-469), and the Federal PCB Regulations, 40 CFR Part 761.60(e) (48 FR 13181, March 30, 1983).

The approval is based upon the ability of the Quadrex solvent extraction method to remove PCBs to a level below 2 parts per million (ppm) with no detectable PCB emissions to air or releases to water. (The 2 ppm was chosen because it is the Environmental Protection Agency (EPA)-designated limit of detection of PCBs in oil). In addition, the approval is based upon the Agency's conclusion that the Quadrex solvent extraction method does not present an unreasonable risk of injury to public health or the environment.

This approval shall be effective immediately and shall extend to July 5, 1991. The approval may be withdrawn, or further conditions may be added to it at any time EPA has reason to believe that operation of the Quadrex solvent extraction method presents an unreasonable risk of injury to public health or the environment. Withdrawal of the approval or the imposition of further conditions may also result from future EPA rulemaking with respect to PCBs. Moreover, violation of any condition included as part of this approval may subject Quadrex to enforcement action and/or termination of the approval.

K00000168

Please be advised that approval for treating higher concentrations of PCBs in the specified matrices (MODEF, heat transfer fluid, hydraulic fluid, and PCB-askarel, office equipment, or askarel contaminated paper products), or for treating PCBs in other matrices, may be considered when Quadrex demonstrates such capability to the satisfaction of EPA. Such a demonstration may be accomplished either during commercial processing or through other controlled experimentation. Authorized EPA representatives may be present to witness the demonstration and obtain split samples for verification of analytical results.

It is the responsibility of you and your company, Quadrex HPS, Incorporated to comply with all applicable provisions of TSCA and the Federal PCB Regulations in treating the matrices specified in this approval. Violation of any of the applicable provisions and/or the conditions of approval may be cause for recision of this approval. Furthermore, this approval does not relieve you of the responsibility to comply with all other applicable Federal, State and local regulations and ordinances for transportation, siting, operation, and maintenance of the Quadrex solvent extraction method.

EPA reserves the right to inspect Quadrex processes to be used for the disposal of PCBs and the records which Quadrex is required to maintain under the Federal PCB Regulations during operation and at other reasonable times.

Please contact John Smith of my staff at (202) 382-3964 if you have any questions pertaining to this approval.

Sincerely,

for Elizabeth F. Bryan
Martin P. Halper, Director
Exposure Evaluation Division

Enclosure

cc: Regional Administrators
Regions I - X

PCB Coordinators
Regions I - X

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

IN THE MATTER OF	)	APPROVAL TO DISPOSE
	)	
QUADREX HPS, INCORPORATED	)	OF POLYCHLORINATED
	)	
GAINESVILLE, FLORIDA	)	BIPHENYLS (PCBs)

AUTHORITY

This approval is issued pursuant to Section 6(e)(1) of the Toxic Substances Control Act of 1976, Public Law No. 94-469, and the Federal PCB Regulations, 40 CFR 761.60(e) (48 FR 13181, March 30, 1983).

EFFECTIVE DATE

This approval shall be efective upon the signature of the Director of the Exposure Evaluation Division.

BACKGROUND

Section 6(e)(1)(A) of the Toxic Substances Control Act (TSCA) requires that EPA promulgate rules for the disposal of polychlorinated biphenyls (PCBs). The rules implementing section 6(e)(1)(A) were published in the Federal Register on May 31, 1979 (44 FR 31514) and recodified in the Federal Register of May 6, 1982 (47 FR 19527). Those rules require, among other things, that various types of PCBs and PCB Articles be disposed of in EPA-approved landfills (40 CFR 761.75), incinerators (40 CFR 761.70), high efficiency boilers (40 CFR 761.60), or by alternative methods (40 CFR 761.60(e)) that demonstrate a level of performance equivalent to EPA-approved incinerators or high efficiency boilers. The May 31, 1979 Federal Register also designated Regional Administrators as the approval authority for PCB disposal facilities.

On March 30, 1983, EPA issued a procedural rule amendment to the PCB rule (48 FR 13181). This procedural rule change transferred the review and approval authority of mobile and other PCB disposal facilities that are used in more than one region to the Office of Pesticides and Toxic Substances (OPTS). The purpose of the amendment is to eliminate duplication of effort in the regional offices and to unify the Agency's approach to PCB disposal. The amendment gives the Assistant Administrator authority to issue nationwide approvals (i.e., approvals which will be effective in all ten EPA regions) to mobile and other PCB disposal facilities that are used in more than one region.

On November 17, 1984, Quadrex HPS, Incorporated (Quadrex) submitted to EPA a permit application and demonstration test plan for nationwide approval to treat the interior of drained mineral oil dielectric fluid (MODEF) transformers, heat transfer fluid and hydraulic fluid systems containing PCBs. The demonstration test plan was approved by the Director of the Office of Toxic Substances on April 19, 1985, and Quadrex commenced the trial demonstration at the Quadrex facility in Gainesville, Florida on April 22, 1985. MODEF, heat transfer fluid, and hydraulic fluid were selected for processing for purposes of the trial demonstration. EPA personnel witnessed the demonstration to verify Quadrex's on-site chemical analysis of the treated MODEF, heat transfer fluid, hydraulic fluid, processed solvent, and to obtain split samples for subsequent analysis and verification. Quadrex completed the demonstration on April 26, 1985.

The results of this April 1985 demonstration indicated that the Quadrex process successfully removed PCBs from a Freon 113 test matrix which included hydraulic fluid, heat transfer fluid, or MODEF containing PCBs. EPA found that the Quadrex process is equivalent to a 40 CFR 761.70 incinerator or 40 CFR 761.60 high efficiency boiler and that the operation of the Quadrex PCB disposal unit does not present an unreasonable risk of injury to human health or the environment. Quadrex was issued a final nationwide PCB disposal approval on July 5, 1985. In this approval, the concentration of PCBs in the Freon/MODEF mixture prior to the distillation process may not exceed 920 ppm. The concentration of PCBs in the Freon/heat transfer fluid or Freon/hydraulic fluid mixtures may not exceed 3,100 ppm.

On September 4, 1985, EPA received a demonstration test plan from Quadrex outlining procedures for demonstrating the process to remove PCBs from solid surfaces and a liquid matrix. Specifically, Quadrex proposed to use its decontamination/ disposal method to clean PCB-contaminated office items and to process the PCB/Freon solvent matrix that will be generated during the cleaning operations. The demonstration was conducted September 12-13, 1985 at the New Mexico State Highway Department General Office Building in Santa Fe, New Mexico.

On August 4, 1986, EPA received a demonstration test plan from Quadrex for the separation of PCBs from an additional proprietary solvent. The demonstration was performed on August 25-29, 1986 at the Quadrex facility located in Gainesville, Florida. EPA personnel witnessed the September 1985 and August 1986 demonstrations to monitor the Quadrex operations and verify the on-site chemical analysis of the treated materials. In addition, split samples were obtained for subsequent analysis and verification.

EPA received an application dated January 11, 1988 from Quadrex to clean air compressor pipeline and air compressor pressurized receiver tanks, which were associated with natural gas pipeline comperessor stations, as a decontamination

process. EPA also received supplemental procedures dated February 5, 1988. From January 26-28, 1988 and February 12-14, 1988 Quadrex demonstrated the process on air compressor pipeline and air compressor pressurized tanks at a United Gas Pipeline natural gas compressor station in Sligo, Louisiana. This demonstration was evaluated on-site by EPA technical specialists. The condensate in the pressurized tanks had been measured at approximately 1,000 parts per million (ppm) PCBs at an earlier compliance monitoring inspection conducted by EPA Region VI. The Office of Toxic Substances (OTS), after consultation with the EPA Regions, had established a cleanup up level of less than one hundred micrograms per one hundred square centimeters on the surfaces on which Quadrex used the rinse process. EPA collected split samples of the treated and untreated rinse solvent to verify the analytical results from the off site Quadrex laboratory in Gainesville, Florida.

The findings presented below are for the Quadrex PCB disposal demonstrations conducted during September 1985, August 1986, January 1988, and February 1988. Complete, acceptable demonstration test reports for both of these demonstrations are in EPA's files.

FINDINGS

1. Quadrex HPS, Incorporated of Gainesville, Florida, has demonstrated a solvent extraction process whereby items contaminated with PCB askarel are washed with a solvent, trichlorotrifluoroethane (Freon 113_{TM}, and PCBs are subsequently removed from solvent using filters and a distillation method. In addition, Quadrex has demonstrated removal of PCBs from a proprietary solvent using filters and a distillation method. This distillation method is effective in removing PCBs from the Freon 113_{TM} or proprietary solvent to a concentration of PCBs less than 2 parts per million (ppm) (total concentration). The concentrated PCB still bottoms are then prepared for removal and sent to an EPA-approved PCB disposal facility. The distillation process has already been approved by EPA for treatment of MODEF transformers, heat transfer and hydraulic fluid systems using Freon 113_{TM}. This permit only applies to PCB decontamination/disposal units operated by Quadrex personnel. Quadrex-manufactured PCB decontamination/disposal units under lease to other companies or persons are <u>not</u> approved for operation under this permit.

2. The Quadrex PCB decontamination/disposal unit is a completely enclosed mobile process that is designed to prevent release of PCBs to air, water, or to surfaces. The Quadrex PCB decontamination/disposal unit was developed by Quadrex and is analogous to similar units developed for clean-up of radioactive materials. From the results of a demonstrations conducted during September 1985, August 1986, January 1988, and February 1988, the distillation process is effective in removing PCBs from either Freon 113_{TM} or the proprietary solvent to below the level of 2 ppm total concentration, as compared to an external standard.

3. In the September 1985 demonstration, PCB-contaminated items (e.g., typewriters, computers, tools, and other equipment) were placed on a movable table in a closed cleaning chamber. The table was rotated back and forth as Freon 113_{TM} was sprayed on the items. In the August 1986 demonstration, proprietary solvent was spiked with PCB askarel fluid. In the January 1988 and February 1988 demonstrations, Freon 113_{TM} was high-pressure sprayed on the interior surfaces or pressurized tank vessels and pipes running from air compressors to the pressurized tanks. The PCB-contaminated Freon 113_{TM} generated from the cleaning operations or PCB-contaminated proprietary solvent were filtered first for PCB removal via canistered filtration media and/or placed in a distillation unit where the temperature was elevated to permit the Freon 113_{TM} or proprietary solvent to vaporize. The Freon 113_{TM} or proprietary solvent were then cooled and allowed to return to the liquid state for reuse. After complete distillation of the Freon 113_{TM} or proprietary solvent, the distillation unit was thermostatically turned off and the remaining PCB material was drained and packaged for disposal at an EPA-approved incinerator. Filtration canisters were also prepared for transfer to a disposal site (incineration). Further details of the methods and equipment used in distillation for the separation of PCBs from Freon 113_{TM} and proprietary solvent are included in the permit application and process demonstation test plans on file at EPA Headquarters.

4. The Quadrex PCB decontamination/disposal unit operates as a batch process which uses a variable amount of Freon 113_{TM} or proprietary solvent to remove PCBs from surfaces and from PCB liquids such as askarel, MODEF, heat transfer fluid or hydraulic fluid which adhere to surfaces. After cleaning the PCB Items, the Freon 113_{TM} or proprietary solvent were then run through the distillation process until Quadrex personnel determined through on-site analysis (off-site for the September 1985, January 1988, and February 1988 demonstrations) that the total concentration of PCBs in the Freon 113_{TM} or proprietary solvent were less than 2 ppm. The Freon 113_{TM} or proprietary solvent recovered were then ready for reuse. PCB still bottoms were removed, along with any contaminated filters, for disposal by incineration. All records of chemical analysis conducted during the demonstrations were submitted to EPA in accordance with the procedures and schedules outlined in the process demonstration test plans.

5. The Quadrex decontamination unit is designed with shut-off valves at key locations and other safety features that will act to prevent spills into the environment. The decontamination/ disposal unit is under low pressure, and is designed with automatic shut-off devices should pressure or temperature exceed specified safety limits.

6. The Quadrex decontamination/disposal unit is a closed system, and does not emit harmful materials into the air, water, soils, or other surfaces. The process demonstration test plans state that operators of the unit, and persons conducting sampling of the unit use specified safety procedures and have proper protective clothing to minimize worker exposure. Liquid still bottom residues will be drained, then packaged in Department of Transportation (DOT) and EPA acceptable packaging to include appropriate liquid transport drums of 55 gallon or 30 gallon size and/or 1 to 5 gallon placed in an overpack 55 gallon or 30 gallon drum with absorbent materials sufficient to absorb twice the volume of the liquid present. These liquid wastes will be disposed of by incineration at an EPA-approved disposal site.

7. The Quadrex disposal process was shown to have a level of performance equivalent to that of thermal destruction methods (incinerators and high efficiency boilers). Under EPA regulations (40 CFR 761.60(e)) many factors are used to determine the appropriate destruction equivalency goals for alternate PCB destruction methods. Submissions from Quadrex during the permit application process have indicated that the decontamination method used to remove PCBs from Freon 113™ and a proprietary solvent meet the standards set by EPA for an approved incinerator or high efficiency boiler, in terms of the efficiency of removal. Furthermore, the Quadrex PCB decontamination/disposal unit is designed to protect workers from PCB exposure and precludes any apparent release of PCBs to the environment.

8. The Quadrex PCB disposal unit is applicable to cleaning surfaces contaminated with PCBs to acceptable levels without destruction of that surface. Therefore, EPA finds that the Quadrex PCB disposal method is equivalent to a 40 CFR 761.70 incinerator or 40 CFR 761.60 high efficiency boiler and that operation of the Quadrex PCB disposal unit does not pose an unreasonable risk of injury to human health or the environment.

CONDITIONS OF APPROVAL

1. Advance Notification

Quadrex shall provide a non-confidential, advance notification to be received by the addressee (as described below) prior to the conduct of a permitted PCB disposal activity. The addressees shall be at a minimum: EPA Headquarters' Office of Toxic Substances (Mail Code: TS-798), the appropriate EPA Regional Office, the appropriate State Agency, and the appropriate county/local/town official(s).

The written advance notification requirements shall be divided into three (3) categories based on the length of time uuadrex is at a single site. In general, categories are defined below and advance written notification requirements follow:

Category 1 - Mobile Operations

Location of the mobile unit at a particular site for less than 90 days requires at least 30 days (but no more than 90 days) advance written notification.

Category 2 - Temporary Operations

Location of the mobile unit at a particular site for at least 90 days, but less than 3 years, requires at least 120 days advance written notification.

Category 3 - Permanent Operations

Location of the mobile unit at a particular site for 3 years or longer requires at least 180 days advance written notification.

The information which must be included in the advance written notification for each category is described below. Advance notification requirements may be waived at Superfund sites according to Comprehensive Environmental Response Compensation and Liability (CERCLA) provisions.

Category 1

The following information must be included in a 30-day advance written notification where Quadrex is located at a particular site for less than 90 days:

(A) Company identification; company, client and government officials responsible for disposal operations and oversight. The name and telephone number of the Quadrex home office contact shall also be included.

(B) The nature of the PCB disposal activity, including the amount of PCB material to be treated and the concentration of PCBs in the material.

(C) The location(s), such as street address of a facility where the PCB disposal will occur (or, if there is no street address, the plant site location with a telephone contact such that the exact location(s) may be determined by telephone inquiry).

(D) The exact time(s) and date(s) the PCB disposal will take place. If a disposal operation is scheduled to begin after business hours, before 8:00 a.m. or after 5:00 p.m. local time on weekdays (except for official U.S. Government holidays) at the site of operations, the notice should indicate the start up is on the following weekday.

For mobile PCB disposal operations under Category 1 where there are frequent site changes, i.e., situations where the Quadrex unit is at a site one week or less, the following additional notification is required:

(E) Every week, Quadrex shall provide by telephone facsimile transmission to the OTS and each of the Regional EPA Contacts below, a notification of all disposal activities for the following two weeks and the expected duration of treatment at each site. Quadrex must either (a) submit the operations information for all ten EPA Regions to each of the ten EPA Regions and OTS, or (b) submit information for each EPA Region only to the appropriate EPA Region. If Quadrex chooses (b), to submit EPA Region-specific information only the appropriate EPA Region, then Quadrex must also submit a copy of the information from all ten EPA Regions to OTS.

If Quadrex changes the date, location, or scale of operations after EPA has received its weekly update, Quadrex must telephone OTS and the appropriate Regional Contact, whose jurisdiction includes the location where the operations were previously scheduled to occur and provide notification as follows:

(1) When the change is known more than 48 hours in advance of the originally scheduled date/time, the message must be sent at least 48 hours in advance of the previously scheduled date/time; and

(2) When the change is known less than 48 hours in advance of the originally scheduled date/time, the message must be made as soon as the change is known or at the first opportunity during business hours, 8:00 a.m. to 5:00 p.m. local time, on weekdays except official U.S. Government holidays, at the appropriate EPA Regional office where the operations had been originally scheduled.

(F) For operations where the Quadrex mobile PCB disposal unit is at a different site one week or less per site, Quadrex shall set up a recorded telephone message system accessible 24 hours a day by EPA Regional compliance monitoring staff and OTS staff. The recorded message, which will be changed every work day, will include the exact location, including street address, of all of the Quadrex's mobile treatment operations until the next message update. The message shall be updated at 8:00 a.m. and 5:00 p.m. EST/EDT on weekdays (except for official U.S. Government holidays). If this recorded message is considered confidential business information, the message may be accessed by a code distributed to the EPA Regional Contacts and OTS officials above.

Should an Quadrex mobile PCB disposal unit which is originally projected to be located at a single site for less than 90 days under Category 1, and at some point before 90 days into the operations it is determined that the unit will be located at the site for 90 days or greater, Quadrex must immeiately provide written and telephone notification of this change to the EPA Headquarters' Office of Toxic Substances (OTS) and the appropriate EPA Regional Office. Upon receipt of this notification, EPA will decide if (1) PCB disposal operations must cease until additional information (akin to Category 2 below) can be provided; or (2) in the case of a very small increase of no more than 5 additional days at the site, to allow completion of the disposal activity without submission of additional information.

An example form for transmitting notification under Category 1 is included as Appendix 1.

Category 2 - Temporary Operations

The following information must be included in a 120-day advance written notification where Quadrex is projected to be at a single location for at least 90 days but less than 3 years. This advance written notification shall include a complete site evaluation performed and submitted by Quadrex and EPA will publish a public notice regarding the proposed operations. In addition, a public meeting may be held at the discretion of EPA, based on comments resulting from the public notification. The advance written notification must include the following:

(A) All information required under items 1 through 4 of Category 1 above.

(B) Limited site evaluation which includes:

(1) Estimates of fugitive emissions of PCBs and any other hazardous materials;

(2) Amounts of waste generated during the entire operation and how that waste will be disposed;

(3) Plans of action in case of an emergency (including arrangements with local fire fighters, law enforcement personnel, and public health officials);

(4) Any special site-specific spill prevention control and countermeasures (SPCC) plan or containment installations and procedures; and,

(5) Site cleanup/restoration procedures and bonds.

After Quadrex has given the EPA Regional Office and the State and local governments a notice of intent to locate at a site for at least 90 days but less than 3 years, and once OTS and the local EPA Region are satisfied that the site specific information submitted in this notice meets the general requirements, a 120 day public notification review process shall begin.

The first part of the notice period shall be a 30-day notice of a public meeting. The public meeting will be hosted by the EPA Region. The public meeting shall be held to (a) discuss comments made by the public during the 30-day notification period for the public meeting, (b) allow the public to make comments on the proposed operations at the site, and (c) allow the public to ask questions of EPA representatives on the proposed operations.

Based on the comments and questions received during the 30-day comment period, the EPA Region may determine that a public meeting is not necessary. EPA has no more than 90 days after the public meeting, or in the event that there is no public meeting, 120 days after the 30-day notice of public meeting, to issue a decision on authorization of Temporary Operations. The decision will be based on a review of comments during the 30-day notice of public meeting period, and comments made during the public meeting, if applicable. The decision could be that the Quadrex may begin Temporary Operations without additional permit conditions, or the decision could be made to require additional site-specific permit conditions which must be met before Temporary PCB Disposal Operations may begin PCB disposal at the site.

(C) If Quadrex operations are occurring at a site based on an earlier projection of less than 90 days location at a site under Category 1, and Quadrex expects to be at the site for 90 days or greater, then at the discretion of OTS, disposal operations may be suspended until Quadrex submits an acceptable site evaluation, a comment period is completed, and an EPA review of the site evaluation and the comments is completed. This site evaluation, comment, and review period shall be no longer than 120 days after receipt by EPA of acceptable site evaluation information from Quadrex.

Should a Quadrex mobile PCB disposal unit which is originally projected to be located at a single site for at least 90 days but less than 3 years under Category 2, and at some point before 3 years into the operations it is determined that the unit will be located at the site for 3 years or greater, Quadrex must immediately provide written and telephone notification of this change to OTS and the appropriate EPA Regional Office. Upon receipt of this notification, EPA will decide if (1) disposal operations must cease until additional information (akin to Category 3 below) can be provided; or (2) in the case of a very small increase in the location time at the site, to allow completion of the disposal activity without submission of additional information.

Please be advised that under Category 2 - Temporary Operations, it is assumed there will be only minimal transportation of PCB wastes onto the site, and minimal on-site storage of unprocessed PCB wastes from other sites. If these assumptions do not apply to certain proposed Temporary Operations, Quadrex may be required to provide additional information.

Details of the requirements for Temporary Operations appear in Appendix 2.

Category 3 - Permanent Operations

The written notification must be received by the addresses at least 180 days in advance of the operation at a particular site. Note that before operations under this category can commence, a mandatory public meeting will be held.

Where Quadrex is located at a particular site for 3 years or more, the following information must be included the notification an approve by EPA before the official 180 day review period can begin:

(A) Quadrex shall meet all notifications requirements described above for Category 2 - Temporary Operations.

(B) In addition, for Permanent Operations, Quadrex must meet additional notification requirements; the public must have an opportunity to review and comment on Quadrex's submissions of site evaluation information; EPA must review and evaluate the submissions and public comments; and EPA must decide on the appropriateness of the proposed Permanent Quadrex mobile disposal unit operations. Therefore, Quadrex shall submit information detailed in Appendix 3 prior to a 30-day notification of a public meeting. The site evaluation information required in Appendix 3 shall include an assessment of:

(1) Lifetime exposure to process operations;

(2) Risks from the transport of PCB waste to the site; and,

(3) Risks from on-site storage of PCB waste for disposal.

For proposed Permanent Operations, there shall always be a public meeting, hosted by the local EPA Region. OTS and the local EPA Region shall collectively determine what the schedule and the agenda for the public meeting shall be. The public meeting shall be held to (a) discuss comments made by the public during the thirty days of notification for the public meeting; (b) allow the public to make comments on the proposed operations and site; and (c) allow the public to ask questions of EPA representatives on the proposed operations. Within 150 days following the public meeting, EPA shall make a decision on what additional conditions, if any, shall be imposed for Quadrex Permanent Operations. The decision will be based on a review of comments during the 30 day notice of public meeting period and comments made during the public meeting. The decision, made no later than 150 days after the close of the meeting, could be that Quadrex may begin operations without additional permit conditions or the decision could be that additional site-specific permit conditions must be met before Quadrex Permanent MOBILE UNIT Operations may begin.

If Quadrex operations are already occurring at a site based on an earlier assessment and assuming a lesser duration of location at the site (i.e. less than 3 years), then at the discretion of OTS, Quadrex operations may be suspended until Quadrex submits an acceptable site evaluation, a comment period is completed, and EPA review of the site evaluation and the comments is completed.

EPA REGIONAL CONTACTS

Name, Region	Telefax Number	Contact Number
Andy O'Palko, EPA Headquarters	(202) 382-7884	(202) 382-3962
Tony Palermo, Region I	(617) 565-3468	(617) 565-3279
Dan Kraft, Region II	(201) 321-6622	(201) 321-6669
Ed Cohen, Region III	(215) 597-7906	(215) 597-7668
Bob Stryker, Region IV	(404) 347-4702	(404) 347-3222
Sheldon Simon, Region V	(312) 886-9096	(312) 886-6087
Jim Sales, Region VI	(214) 655-2142	(214) 655-6785
C.E. Poindexter, Region VII	(913) 236-2845	(913) 236-2835
Kay Modi, Region VIII	(303) 293-1647	(303) 293-1738
Greg Czajkowski, Region IX	(415) 974-7361	(415) 974-7295
Gil Haselberger, Region X	(206) 442-4672	(206) 442-1094

2. Quadrex must obtain all necessary environmental approvals and/or permits from the appropriate Federal, State and local agencies prior to the treatment of PCBs at any site.

3. The Quadrex mobile PCB disposal unit has been authorized for three distinct functions. For each of these functions the solvent used is either Freon 113$_{TM}$ or the Quadrex proprietary solvent (QPS). Neither solvent may be reused unless the concentration in the distilled solvent is less than two micrograms PCBs per gram of solvent. Quantitation is based on the original formulation of PCBs in the material rinsed (Aroclor$_{TM}$ quantitation).

A. The rinsing with Freon 113$_{TM}$ of individual drained transformers which had contained PCB askarel or MODEF and drained systems containing heat transfer and hydraulic fluid.

Prior to treatment, the systems or transformers must be drained of all free-flowing fluids. The drained fluids must be disposed of in accordance with 40 CFR 761.60. In addition, Quadrex must advise its customers that transformers treated with the Quadrex process and returned to service cannot be reclassified unless the replacement dielectric fluid is tested following a minimum of ninety days of in-service use. In-service use is defined as use under electrically loaded conditions in which the dielectric fluid is raised to a minimum of 50°C.

B. The use of Freon 113$_{TM}$ to spray clean office equipment such as:

EPA SAID MEANS OTHER THAN JUST OFFICE TOOL, METAL PARTS.

(1) telephones, desk calculators, typewriters, tools, metal parts, printed circuit boards, and other similar articles, and

(2) paper, filefolders, and other cellulose-based documents and small document containers (excluding cardboard boxes) when these items have become surface contaminated with askarel transformer fluids.

The contaminated Freon 113$_{TM}$ resulting from this spray cleaning must be distilled and the still bottoms disposed of in accordance with 40 CFR 761.60.

C. The use of Freon 113$_{TM}$ to rinse natural gas pipeline air compressor systems, as an alternative to disposal of the system in a TSCA approved incinerator or TSCA approved chemicla waste landfill, which includes: air compressors; compressed air receiver tanks; the piping between the air compressor and the compressed air receiver tanks; and the piping between the receiver and other natural gas pipeline compressor station equipment such as instruments and tools driven by compressed air. This authorization in in accordance with procedures documented in applications to EPA

dated January 11, 1988 and February 5, 1988.

In order for previously contaminated surfaces to be unregulated for further distribution in commerce, use , or disposal, residual PCBs on the cleaned surfaces of the entire air compressor system must be below 100 micrograms per 100 square centimeters, which is the same as one microgram per square centimeter (1 ug/cm^2). Failure to adhere to these levels (or lower levels) of cleanup subject the equipment to TSCA requirements based on the measured concentraion of PCBs in the system prior to decontamination. It is recognized that an EPA consent agreement/decree may require or allow other surface levels or other residual PCB levels in a solvent rinse. In order for Quadrex to determine whether the Quadrex process has met the 1 ug/cm^2 surface level requirements, Quadrex must proceed as follows:

(1) When Quadrex decides to conduct the surrogate surface area rinse test,

a. Quadrex shall drain any previous wash/flush solvent from the receiver(s) and the Quadrex processing system. Next Quadrex shall make three passes through the receiver(s) with solvent containing less than 2 ppm PCBs. A pass is defined by the procedure described in the Quadrex application and includes spraying the solvent under high pressure on all interior surfaces of the receiver(s).

b. Quadrex shall estimate the interior surface area (ESA) of the receiver(s) being rinsed,

c. Quadrex shall obtain the total weight, in grams, of the rinse solvent (W_{RS}) used to for the three rinse passes over the air compressor receiver(s), and

d. Quadrex shall calculate the theoretical concentration in micrograms per gram (ug/g), which is equivalent to parts per million, of residual PCBs in the rinse solvent using the weight in grams (W_{RS}) in b. (above), the estimated surface area (ESA) in a above, and 1 ug/cm^2 surface requirement, as follows:

$$\text{Theoretical PCB Concentration} = \frac{(ESA)(1\ ug/cm^2)}{(W_{RS})}$$

If the calculated Theoretical PCB Concentration of the rinse solvent is four parts per

million or less, Quadrex shall rinse the air compressor system clean until the PCB concentration in the rinse solvent is less than four parts per million as measured by definitive gas chromatographic analysis. If the calculated theoretical rinse solvent concentration is greater than four parts per million, Quadrex shall rinse the air compressor system clean until the PCB concentration in the rinse solvent is equal to or less than the calculated theoretical PCB concentration as determined by definitive gas chromatographic analysis.

e. The collected rinse solvent is then weighed or the weight is calculated by multiplying total volume times density. Quadrex shall then take representative sample of this rinse and analyze the sample for the presence of PCBs. The analytical procedures used are described in previous Quadrex applications. A representative sample may be collected by either of the following:

- o Collect all of the rinse in a single container. Circulate the solvent by pumping out of the bottom of the container and into the top until at least three total volumes of the solvent that has been pumped. Stop the pumps and immediately sample the solvent, or

- o Using a small peristaltic pump, over the entire time of the three or more passes, continuously sample a small portions of the solvent at the point where the solvent flows out of the receiver(s) into the pump. The sample shall be collected before any filters. The peristaltic pump rate shall be sufficient to collect a sample large enough for the Quadrex chemical analysis procedure.

f. If the measured concentration of the rinse solvent is less than the requirements in d. above the receiver would be unregulated for distribution in commerce, use or disposal.

If Quadrex does not reach the desired cleanup level in the receiver(s) using the above procedures in a-e, Quadrex may rerinse and repeat the determination process (a-e above), or merely repeat the determination process. In either case the Theoretical PCB Concentration requirements in d. above must be met in order for the receiver(s) to be unregulated.

(2) For the remainder of the air compressor system

including the air compressors themselves; the piping between the air compressor and the compressed air receiver tanks; and the piping between the receiver and other natural gas pipeline compressor station equipment such as instruments, and compressed air driven tools, there are somewhat different requirements. The differences arise because the cleaning process involves filling the entire air compressor system and Quadrex processing system with solvent and pumping all of this solvent through both systems. Some of the solvent will occupy/rinse surfaces which were not originally contaminated (the Quadrex process surfaces). This additional solvent would force the Theoretical PCB Concentration (see d. above) below the practical limit of quantitation for the approved Quadrex chemical analysis procedures. Therefore Quadrex shall use a performance oriented system for cleaning these systems. Quadrex shall provide data and other information as indicated below.

? DISCUSSED - SEGMENTS OK

a. Quadrex shall first fill the entire air compressor system, exclusive ot the receiver tank(s) with solvent containing less than 2 ppm PCBs. The solvent shall be circulated through the system with the circulating pump for on hour. This time period should provide at least three volumes of solvent to pass through the system. Quadrex shall then drain the solvent

ONE HOUR

b. Next Quadrex shall take a representative sample of the solvent and, on the same day the sample is collected, send a split sample of this solvent with appropriate identifying information to the Chief of the PCB Disposal Section for analysis. Quadrex shall then analyze the sample and provide a description of the physical configuration of each air compressor system with the chemical analysis results to EPA within thirty days of the end of the treatment process for each air compressor system.

? TECHNICAL CLARITY.

c. Repeat a.

d. Repeat b

e. Repeat a

f. Repeat b

g. Next Quadrex shall refill the entire air compressor system, exclusive of the receiver tank(s) and recirculate three total volumes through the system of pump for fifteen minutes whichever is longer.

h. Repeat b.

i. Quadrex shall use the chemical analysis procedures used are described in previous Quadrex applications. A representative sample shall be collected by either of the following:

- o Collect all of the rinse in a single container. Circulate the solvent by pumping out of the bottom of the container and into the top until at least three total volumes of the solvent that has been pumped. Stop the pumps and immediately sample the solvent, or

- o Using a small peristaltic pump, over the entire time of the circulation of rinse solvent therough the air compressor system being tested and the Quadrex processing system, continuously sample a small portion~~s~~ of the solvent at the point where the solvent flows into a pump. The sample shall be collected before any filters. The peristaltic pump rate shall be sufficient to collect a sample large enough for the Quadrex chemical analysis procedure.

Quadrex shall repeat this procedure for all air compressor systems. Following treament of no fewer than ten systems Quadrex may request a major modificaiton to this condition.

4. The PCB concentration of the Freon 113_{TM} mixture in the still may not exceed the following levels:

- o MODEF, 920 ppm total PCBs;
- o Heat transfer fluid, 3,100 ppm total PCBs;
- o Hydraulic fluid, 3,100 ppm total PCBs; and
- o Askarel dielectric fluid, 5,000 ppm total PCBs.

The PCB concentration in a the QPS mixture in the still may not exceed the following levels:

- o 920 ppm Aroclor 1242
- o 4,200 ppm Aroclor 1260
- o A total of no more than 5,120 ppm Aroclors 1242, 1254, and 1260 where the Aroclor 1242 concentration is no more than 920 ppm, the Aroclor 1254 concentration is no more than 920 ppm, and the Aroclor 1260 concentration is no more than 4,200 ppm.

Prior to treatment, samples of the Freon 113_{TM} or QPS mixture

19

must be obtained from the still and analyzed using gas chromatography procedures specified in EPA approved procedures outlined in the following documents:

"Guidelines for PCB Destruction Permit Applications and Demonstration Test Plans for PCB Disposal by Non-Thermal Alternative Methods," August 21, 1986;

"Recommended Analytical Requirements for PCB Data Generated On Site During Non-Thermal PCB Destruction Tests," USEPA, March 19, 1986 (Draft);

"Quality Assurance and Quality Control Procedures for Demonstrating PCB Destruction in Filing for PCB Disposal Permit," USEPA, June 28, 1983 (Draft); and

"Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans," QAMS-005/80, Office of Research and Development, USEPA, December 29, 1980.

Should Quadrex HPS, Incorporated successfully demonstrate to EPA through controlled experimentation or actual demonstration that the Quadrex process is capable of treating higher concentrations of PCBs in a particular fluid, this condition may be modified accordingly. Authorized EPA representatives may witness the demonstration and obtain split samples for verification of analytical results.

5. A sample of each batch of treated Freon 113_{TM} or QPS must be drawn, and analyzed in duplicate (i.e., duplicate analysis) by gas chromatography for the concentration of PCBs at each site where the Quadrex PCB Disposal Process is being used. If the concentration of PCBs in the treated sample is 2 ppm or greater, the Freon 113_{TM} or QPS must be reprocessed and reanalyzed to show less than 2 ppm per peak before the next transformer or system is treated.

6. If the quality control testing, as described in Condition (5), reveals that the PCBs have not been adequately removed after repeated processing (not to exceed three times the estimated theoretical time necessary for complete reaction), the affected unit shall cease operation. The facility operator must notify the PCB Disposal Site Coordinator in the appropriate EPA region immediately and file a written report with that region within seven (7) days. The affected unit shall not resume operation until the problem has been corrected to the satisfaction of the appropriate EPA region.

7. Provisions must be made to assure that the following process elements are suitably monitored and recorded for each transformer or system processed, such that materials harmful to health or the environment are not inadvertently released:

a. name, address, and telephone number of the Quadrex

disposal unit operator and supervisor;

b. the name and business address of the person or firm whose PCB containing transformer/air compressor system is being processed;

c. the location, manufacturer, rated capacity and identification (serial) number of the transformer, heat transfer system or hydraulic system;

d. a description of the air compressor system including the estimated dimensions of all recivers and the estimated dimensions of the air compressor system exclusive of the receivers, including the diameter and length of the all pipe in the system;

e. the date the transformer/system is received by Quadrex, the date(s) processed, and the date returned to the custody of the owner (if applicable);

f. estimated quantity and quality of solvent charged into the transformer, heat transfer system, hydraulic fluid system, and/or air compressor system;

g. estimated quantity and quality of treated solvent and other treated materials produced;

h. date, time and duration of treatment per transformer or system;

i. a copy of the gas chromatograph and/or other records from tests conducted to determine the final concentration of the treated solvent;

j. estimated quantity and quality of wastes produced, the method of disposal and location of the disposal facility for each waste must be documented; and

k. temperature of separation process in at least one-half hour intervals.

Disposal recordkeeping documents must be compiled within 60 days of the testing date, must be kept at one centralized location, and must be made available for inspection by authorized representatives of the EPA. Such documents shall be maintained for a least five years. Quadrex must also maintain the records required by 40 CFR 761.180(f). If Quadrex or its authorized agents terminate business, these records or their copies must be submitted to the Director of the Exposure Evaluation Division.

In addition, Quadrex must maintain, aboard the mobile unit, a record of the PCB disposal services performed by the unit during the previous month. These records must be available for inspection by authorized representatives of EPA.

8. In the event Quadrex or an authorized facility operator of the Quadrex mobile unit believes, or has reason to believe, that a release of PCBs has or might have occurred, the facility operator must inform the appropriate EPA region by telephone immediately.

A written report describing the incident must be submitted to the appropriate EPA Region within five (5) business days. No PCBs may be processed in that facility until the release problem has been corrected to the satisfaction of the appropriate EPA region.

9. Any spills of PCBs or other fluids shall be promptly controlled and cleaned up as provided in Quadrex's spill prevention plan, and in accordance with the PCB spill cleanup procedures of the appropriate EPA region. In addition, a written report describing the spill, operations involved, cleanup actions and changes in operation to prevent such spills in the future must be submitted to the appropriate EPA region within seven (7) business days.

PCB spills must be reported in accordance with the PCB spill reporting requirements prescribed under Part 311 of the Clean Water Act for discharges to navigable waters and under the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) for discharges to other media.

10. Quadrex must take all necessary precautionary measures to ensure that operation of the Quadrex mobile unit(s) is in compliance with the applicable safety and health standards, as required by Federal, State and local regulations and ordinances.

11. The Quadrex mobile unit shall be secured (e.g., fence, alarm system, etc.) at each commercial site to restrict public access to the area. Any bodily injury occurring as a result of the Quadrex PCB Disposal Process must be reported to the PCB Disposal Site Coordinator in the appropriate EPA region by the next regular business day.

12. Any reports required by Conditions (6), (8), (9), and (11) are to be submitted by telephone to the appropriate regional PCB Disposal Site Coordinator within the time frame specified. In addition, Quadrex shall file written reports with the Regional Administrator of the appropriate EPA region, and the Director of the Exposure Evaluation Division within the time frame specified in the aforementioned conditions.

13. Quadrex shall be responsible for ensuring that personnel directly involved with the handling or disposal of PCB-contaminated fluid using the Quadrex PCB Disposal Process are demonstrably familiar with the general requirements of this approval. At a minimum, this must include:

a. the type of materials which may be treated using the Quadrex PCB Disposal Process, and the upper limit of PCB

contamination which may be treated;

b. basic recordkeeping requirements under this approval and the location of records;

c. notification requirements;

d. waste disposal requirements for process and by-product wastes generated during the operation of the Quadrex PCB Disposal Process; and

e. reporting requirements.

In this regard, Quadrex must maintain on-site during the operation of its mobile unit a copy of this approval; the spill prevention and cleanup plan; and sampling and analytical procedures used to determine PCB concentrations in untreated and treated materials.

14. Untreated PCB fluids may not be transported off-site on the Quadrex mobile unit. Process equipment (i.e., reactors, pumps, hoses, etc.) on the mobile unit must be decontaminated in accordance with procedures described in Quadrex's permit application and test plan, prior to transporting off-site. PCB-contaminated equipment must be transported in accordance with 40 CFR 761.40 and the U.S. Department of Transportation (USDOT) requirements of Title 49, CFR Part 172, including placarding the mobile facility and labelling all PCBs.

15. The carbon entrapment cannister must be replaced every six (6) months or immediately after 600 hours of unit operation.

16. All wastes generated by the Quadrex PCB Disposal Process other than the successfully cleaned Freon 113$_{TM}$ or QPS solvent, (i.e., filter media, sludges, water or other effluents, etc.) must be disposed of as if it contains the original PCB feedstock concentration. EPA will consider amending this condition only after such waste has been fully characterized to determine all components, and gas chromatography analysis of the waste demonstrates that the PCB concentration is below 2 ppm.

17. Quadrex shall incorporate financial assurance of closure and liability coverage provisions into its closure plan. These provisions must be equivalent to those specified in 40 CFR Part 264, Subpart H of the Resource Conservation and Recovery Act (RCRA), and provide funds for:

a. proper closure of the mobile PCB disposal units, and

b. compensating others for bodily injury and property damage caused by accidents arising from operations of the mobile disposal units.

18. Quadrex must file a written pre-operation report with the

Director of the Exposure Evaluation Division within thirty (30) days from the date of manufacture of each additional Quadrex mobile unit which is to be operated in the United States. This report shall contain the following information:

a. date of manufacture of the unit;

b. identification and/or serial number of the new Quadrex mobile unit;

c. certification by an independent, registered professional engineer to the effect that the Quadrex mobile unit is substantially identical to the original unit in terms of engineering design, hardware, process capacity, quality and workmanship;

d. certification by the chief executive officer of Quadrex HPS, Incorporated signifying that the Quadrex mobile unit construction has been completed in such manner; and

e. a list of all substantive and nonsubstantive changes made to the design and construction of any new Quadrex mobile unit which is not identical to the original Quadrex mobile unit.

19. No major modifications may be made to the Quadrex unit design, as described in the application and demonstration plan for this approval, without written approval of the Director of the Exposure Evaluation Division. For the purpose of this approval, "major modification" shall be defined as any change to capacity, design, efficiency, waste type, or any other changes affecting overall performance or environmental impact.

20. Quadrex must notify EPA at least 30 days before transferring ownership in the Quadrex PCB Disposal Process. Quadrex must also submit to EPA, at least 30 days before such transfer, a notarized affidavit signed by the transferee which states that the transferee will abide by Quadrex's EPA approval. Within thirty days of receiving such notification and affidavit, EPA will issue an amended approval substituting the transferee's name for the Quadrex name, or EPA may require the transferee to apply for a new PCB disposal approval. In the latter case, the transferee must abide by Quadrex's EPA approval until EPA issues the new approval to the transferee.

21. Quadrex shall comply with all applicable requirements of the Federal PCB Regulation, 40 CFR Part 761, in the operation of the mobile Quadrex PCB Disposal unit(s). Particular note shall be given to:

a. 40 CFR, section 761.65 - storage for disposal;

b. 40 CFR, section 761.79 - decontamination; and

c. 40 CFR, section 761.180 - records and monitoring.

22. The conditions of this approval are severable, and if any provision of this approval or any application of any provision is held invalid, the remainder of this approval shall not be affected thereby.

23. This approval shall supersede all previous U.S. EPA Headquarters and/or U.S. EPA Regional PCB disposal approvals or amendments for the Quadrex PCB Disposal Process.

24. This approval shall expire on July 5, 1991. For a renewal approval, EPA may require additional information and/or testing of the Quadrex PCB Disposal Process. In order to continue the effectiveness of this approval pending EPA action on reissuance, Quadrex must submit a renewal request letter to EPA at least 90 days, but not more than 180 days, prior to the expiration date of this approval.

APPROVAL

1. Approval to dispose of PCBs is hereby granted to Quadrex HPS, Incorporated of Gainesville, Florida subject to the conditions expressed herein, and consistent with the material and data included in the application filed by the company. EPA reserves the right to impose additional conditions when it has reason to believe that the continued operation of the Quadrex mobile unit presents an unreasonable risk to public health or the environment, new information requires changes, or EPA issues new regulations or standards for issuing permits.

Any departure from the conditions of this approval or the terms expressed in the application must receive prior written authorization from the Director of the Exposure Evaluation Division. In this context, "application" shall be defined as all data and materials which have been received by this Agency from Quadrex HPS, Incorporated regarding the Quadrex PCB Disposal Process.

2. This approval to dispose of PCBs does not relieve Quadrex HPS, Incorporated of the responsibility to comply with all applicable Federal, State and local regulations. Violation of any applicable regulations will be subject to enforcement action, which may include termination of this approval. This approval may be rescinded at any time for failure to comply with the terms and conditions herein, or for other reasons which the Director of the Exposure Evaluation Division deems necessary to protect the public health and the environment.

3. Quadrex HPS, Incorporated shall be responsible for the actions of any authorized Quadrex PCB Disposal Process employees when those actions are within the scope of operating or moving the Process, and shall assume full responsibility for compliance with all applicable Federal, State and local regulations including, but not limited to, any advance or emergency notification and accident reporting requirements.

4. EPA reserves the right for its employees or agents to inspect Quadrex PCB disposal activities at any location or reasonable time.

7/18/88
Date

Elizabeth F. Bryan
for Martin P. Halper, Director
Exposure Evaluation Division

Appendix 1

****

EXAMPLE THIRTY DAY NOTIFICATION FORM FOR PART A

Company Name, Address, Phone Number, and Contact Person:

Person, Organizational Affiliation/Title, and Phone Number for:

EPA Regional Contact:

State Contact:

Local (Town/City/County) Contact:

Nature of the Disposal Activity:

Kind of PCB Disposal Process:

Kinds of Material Containing PCBs:

Numbers and Sizes of Pieces of Equipment Containing PCBs:

Quantity of Solids and/or Volume of Liquid(s) Containing PCBs:

Concentration(s) of PCBs in the Material Treated:

Location

Street Address or Other Identifier for All Sites:

Telephone Contact and Address for Site Manager:

Time of Processing

Date(s):

Time(s):

****

Appendix 2

PART B OF PCB DISPOSAL PERMIT NOTIFICATION REQUIREMENTS:

Site Evaluation Requirements
for Temporary Mobile Disposal Unit (MDU) Operations

The following information must be submitted to the Office of Toxic Substances and the appropriate EPA Region as part of an application to operate a permitted MDU at a site for from ninety days to three years. A public meeting notice will not be generated until a complete submission of these requirements has been received and approved by EPA.

There are a number of details which were submitted to EPA as part of the original PCB disposal permit application which must be updated/revised for Temporary MDU Operations. All of these details are related to the site of operations directly or indirectly.

Project Personnel

The first requirement is a list of names and an organizational chart, brief job description, and responsibilites for all staff to be employed by the permittee at the proposed site. In addition, names, mailing addresses, and telephone numbers of primary parent organization contacts with EPA, such as environmental affairs officers or government liasion contacts must be given. Job qualifications and training, including the time, frequency and content, required must be included.

Facility Description

Details of the disposal operations as they apply to the physical layout at the disposal site. To be included are (1) a to scale, site layout, of where operations will occur, and (2) the location of: safety equipment, fire protection equipment, disposal equipment, supplies, waste handling equipment, process/waste loading/unloading points for transportatin, flood proofing/protection structures, security structures, etc..

If the disposal operation will be at a previously developed site, in addition to the above requirements, other site modifications must be described and justified. Buildings for personnel, construction, maintenance and laboratories are exempted, unless there are discharges to the environment. Laboratory vents, sewer discharges from the laboratory or any area that may be associated with any contact with PCBs or any hazardous waste handled/generated as the result of PCB disposal must be discussed. Included should be discussions of all storage facilities and their containment, process water systems, and other waste stream processing.

Disposal Activites to Be Conducted On-Site

A summary of the process operations as described in detail in the original permit application, not to exceed one typewritten single spaced page. The permittee shall discuss activities and the amount of time involved in setting up (taking down) disposal operations following arrival (prior to departure) of the MDU at (from) the site. Also, the permittee shall provide a discussion of monthly and annual: amounts and concentrations of waste and amount of PCBs to be processed; amounts and concentrations of PCBs and other hazardous materials stored on site; amounts and concentrations of contained, controlled, and fugitive emissions of toxic and non-toxic materials and how contained materials will be disposed of; proposed hours of operations; expected duration of disposal activites at the site.

Safety Measures

The permittee must describe systems and/or structures for the detection and/or containment of leaks and hazardous wastes/by-products must be described, as should process shutdowns resulting from automated monitoring of process emissions. A brief discussion of the automatic process controls, such as those which control extreme temperature and pressure fluctations or departure from a permitted range, must be included. The location and action plans for all other emergency equipment shall be provided. Maintenance plans and scheules shall be provided. Safety and/or quality control/quality assurance inspection schedules, procedures, and recordkeeping must be detailed.

Emergency Preparedness and Contingency Plans

Emergency preparedness plans must be completed and reviewed by local authorities and approved by the EPA Region. These plans shall include (1) exactly what actions take place for each level of problem, (2) who the responsible permittee parties are for expected problems, and (3) facility personnel names and appropriate phone numbers for 24-hours a day contact in the event of an emergency. Frequent problems and reasonable worst case problem scenarios such as: spills during processing, storage, and transportation; fires; floods; and equipment malfuction resulting in personal injury must be addressed. The information shall include (1) names and phone numbers of fire, police, medical emergency contacts, and (2) training sessions, documents, or other information provided to these services.

Transportation Routes and Volumes to be Transported to the Site

Transportaion route information is to be detailed if such routes include any roads other than interstate highways. Information is to include residential or commercial areas associated with the roads to be used by hazardous waste transporters. List all amounts/volumes of PCB materials located near the site (minimal transportation and storage associated).

Financial Assurance and Closure

The permittee shall summarize the financial assurance and closure provisions from the permit application including exactly what situations are covered by insurance or other financial backing and the amount of the backing. Additional financial assurance and closure provisions for the time of extended PCB disposal operations at a single site must be described in detail.

Exposure Assessment

An exposure and risk assessment shall be provided for activites included in normal operations and in the event of reasonable worst case accidents/problems. The exposures shall include those resulting from storage; contained and fugitive emissions; handling and processing PCBs and other hazardous waste/process materials; operation of industial equipment; and transportation related releases such as spills and collisions.

Situations which are not considered reasonable worst case situations, are a double tornado, a terrorist attack, a nuclear strike, a plane crash into the facility, a meteor strike, and damage from an earthquake when there is not an active major geological fault near enough to expect major plant facility damage and release of PCB material.

Appendix 3

PART B OF PCB DISPOSAL PERMIT NOTIFICATION REQUIREMENTS:

Site Evaluation Requirements
for Permanent Mobile Disposal Unit (MDU) Operations

The following information must be submitted to the Office of Toxic Substances and the appropriate EPA Region as part of an application to operate a permitted MDU at a site for longer than three years. A public meeting notice will not be generated until a complete submission of these requirements has been received and approved by EPA.

There are a number of details which were submitted to EPA as part of the original PCB disposal permit application which must be updated/revised for Permanent MDU Operations. All of these details are related to the site of operations directly or indirectly.

The information shall be in the same general catagories as information required for Temporary MDU Operations, but the information for permanent MDU operations shall be based on the increased period of disposal operations during the time period of the permanent operations. The required submissions with respect to financial assurance, amounts of material treated, emissions, exposure assessment, and risk/benefit must reflect the longer period and the expected increased amount of material processed during operations.

Project Personnel

The first requirement is a list of names and an organizational chart, brief job description, and responsibilites for all staff to be employed by the permittee at the site. In addition, names, mailing addresses, and telephone numbers of primary parent organization contacts with EPA, such as environmental affairs officers or government liasion contacts must be given. Job qualifications and training, including the time, frequency and content, required must be included.

Facility Description

Details of the disposal operations as they apply to the physical layout at the disposal site. To be included are (1) a to scale, site layout, of where operations will occur, and (2) the location of: safety equipment, fire protection equipment, disposal equipment, supplies, waste handling equipment, process/waste loading/unloading points for transportatin, flood proofing/protection structures, security structures, etc..

If the disposal operation will be at a previously developed site, in addition to the above requirements, other site modifications must be descibed and justified. Buildings for personnel, construction, maintenance and laboratories are exempted, unless there are discharges to the environment. Laboratory vents, sewer discharges from the laboratory or any area that may be associated with any contact with PCBs or any hazardous waste handled/generated as the result of PCB disposal must be discussed. Included should be discussions of all storage facilities and their containment, process water systems, and other waste stream processing.

Disposal Activites to Be Conducted On-Site

A summary of the process operations as described in detail in the original permit application, not to exceed one typewritten single spaced page. The permittee shall discuss activities and the amount of time involved in setting up (taking down) disposal operations following arrival (prior to departure) of the MDU at (from) the site. Also, the permittee shall provide a discussion of monthly and annual: amounts and concentrations of waste and amount of PCBs to be processed; amounts and concentrations of PCBs and other hazardous materials stored on site; amounts and concentrations of contained, controlled, and fugitive emissions of toxic and non-toxic materials and how contained materials will be disposed of; proposed hours of operations; expected duration of disposal activites at the site.

Safety Measures

The permittee must describe systems and/or structures for the detection and/or containment of leaks and hazardous wastes/by-products must be described, as should process shutdowns resulting from automated monitoring of process emissions. A brief discussion of the automatic process controls, such as those which control extreme temperature and pressure fluctations or departure from a permitted range, must be included. The location and action plans for all other emergency equipment shall be provided. Maintenance plans and scheules shall be provided. Safety and/or quality control/quality assurance inspection schedules, procedures, and recordkeeping must be detailed.

Emergency Preparedness and Contingency Plans

Emergency preparedness plans must be completed and reviewed by local authorities and approved by the EPA Region. These plans shall include (1) exactly what actions take place for each level of problem, (2) who the responsible permittee parties are for expected problems, and (3) facility personnel names and appropriate phone numbers for 24-hours a day contact in the event of an emergency. Frequent problems and reasonable worst case problem scenarios such as: spills during processing, storage, and transportation; fires; floods; and equipment malfuction resulting in personal injury must be addressed. The information shall

include (1) names and phone numbers of fire, police, medical emergency contacts, and (2) training sessions, documents, or other information provided to these services.

Transportation Routes and Volumes to be Transported to the Site

Transportaion route information is to be detailed if such routes include any roads other than interstate highways. Information is to include residential or commercial areas associated with the roads to be used by hazardous waste transporters). List all amounts/volumes of PCB materials located near the site (minimal transportation and storage associated).

Financial Assurance and Closure

The permittee shall summarize the financial assurance and closure provisions from the permit application including exactly what situations are covered by insurance or other financial backing and the amount of the backing. Additional financial assurance and closure provisions for the time of extended PCB disposal operations at a single site must be described in detail.

Exposure Assessment

An exposure and risk assessment shall be provided for activites included in normal operations and in the event of reasonable worst case accidents/problems. The exposures shall include those resulting from storage; contained and fugitive emissions; handling and processing PCBs and other hazardous waste/process materials; operation of industial equipment; and transportation related releases such as spills and collisions.

Situations which are not considered reasonable worst case situations, are a double tornado, a terrorist attack, a nuclear strike, a plane crash into the facility, a meteor strike, and damage from an earthquake when there is not an active major geological fault near enough to expect major plant facility damage and release of PCB material.

Consumers Power
POWERING MICHIGAN'S PROGRESS
General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

August 8, 1988

BWR 88-112
M905.4

Mr. John M. Bohunsky, P.E.
Supervisor, Region III
Waste Management Division
Department of Natural Resources
Secondary Complex, General Office Building
PO Box 30028
Lansing, MI 48909

RE OVERISEL COMPRESSOR STATION
PCB ACTION PLAN

Dear Mr. Bohunsky:

Enclosed are three copies of the PCB Action Plan for Consumers Power Company's Overisel Compressor Station. This portion of the plan deals with decontamination of soil and the wastewater system. Actions for the air system are currently being prepared and will be submitted in the near future.

The plan consists of action thresholds and decontamination standards, a description of station systems, data on PCB contamination, alternative actions for systems exceeding action thresholds and the Company's planned actions including schedule and PCB health and safety procedures.

Following is an update on the status of development and implementation of the plan.

Soil
The scope of soil removal (estimated 39 cubic yards) in the area of the air logs was finalized by May 3, 1988. Soil removal was completed down to the decontamination standard and verified by sampling by June 24, 1988. The excavation will be held open to allow access for decontamination of the interior of the air logs later this year. As of July 17, 1988, 44 tons (30 cubic yards) of PCB-contaminated soil had been manifested in three shipments and accepted at an EPA-approved chemical waste landfill in New York.

The scope of soil removal (estimated 488 cubic yards) in the area of the oil-water separator overflow was finalized by May 19, 1988. Soil removal commenced on July 25, 1988 and is scheduled to be completed by August 19, 1988 and backfilled by September 2, 1988.

Wastewater System
A decision to remove and dispose of the wastewater system in an EPA-approved

chemical waste landfill as a PCB waste was made because it was judged more cost-effective than attempting to decontaminate and reuse or abandon the system in place. Removal is scheduled to commence on or about August 1, 1988 and to be completed by September 2, 1988.

Air System

The actions for the air system are still under development. A bid package was mailed to two decontamination contractors on July 15, 1988 requesting cost estimates for detailed specifications by August 1, 1988. The estimated costs for decontamination from the bids and for replacement of selected segments of the system, will be compared to determine what combination of decontamination and replacement will provide for the most cost-effective actions to meet the decontamination standard. Actions will commence upon completion of replacement of the air compressors, which is expected by October 8, 1988, so as to prevent recontaminating the cleaned or replaced segments by PCB-contaminated condensates from existing air compressors upstream in the system.

Should you have any questions on this matter, contact me at (517) 788-0331.

Sincerely,

Bruce W. Rasher
Environmental Department

Enclosures
BWR/vp

OC0888-0045A-EN03

K00000201

Overisel Compressor Station
PCB Action Plan

Distribution

DNR - 3 copies

File M905.4

Routing (BWR)

WWStille/DHPendleton/DTKetcham

RLMoore

GDDykstra

WHVoigt

JPDickey

PCH/MRP

BWR/7-20-88

CONSUMERS POWER COMPANY
Overisel Compressor Station

PCB Action Plan

INTRODUCTION

On February 2, 1987, Consumers Power Company notified representatives of the Michigan Department of Natural Resources that it had used a lubricant containing PCB in the air compressors at its White Pigeon Compressor Station prior to the enactment of the Toxic Substances Control Act. As a result, the Company voluntarily developed a PCB Site Review and Action Plan applicable to the seven Consumers Power Company/Michigan Gas Storage Company Compressor Stations.

The PCB Site Review and Action Plan consists of five phases as follows:

Phase I - Initial Screening

1. Site visit and interview station superintendent

2. Review purchase records for Pydraul AC

3. Review plant systems for potential PCB onsite and offsite releases

4. Sample key indicator points

5. Analyze samples and report data

Phase II - Immediate Remedial Actions (if necessary)

Determine appropriate immediate remedial actions, such as:

1. Isolate any PCB remaining in the system from the environment

2. Collect, characterize and properly dispose of wastes

3. Remove and properly dispose of liquids and sludges containing PCB

4. Seal systems to prevent refilling

Phase III - Define Extent of Prior PCB Releases (if necessary)

Determine a site-specific plan; include some or all of the following:

1. Geophysical investigation (if applicable)

2. Soil borings

3. Groundwater monitoring

4. Sample plant systems

5. Analyze samples and report data

Phase IV - Develop Action Plan (if necessary)

1. Determine action thresholds and standards

2. Compare alternatives and their costs

3. Select cost-effective/environmentally sound action plan methods

4. Acquire Agency approval of selected method

Phase V - Implement Action Plan and Site Closure (if necessary)

The Plan has been implemented in accordance with the following schedule:

Location	Phase I	Phase II	Phase III	Phase IV	Phase V
White Pigeon	November 21, 1986-February 2, 1987	January 29-February 5, 1987	February 4-December 9, 1987	January-March 1988	April-October 1988
Overisel	June 3-25, 1987	By June 29, 1987	September 1987-April 1988	May 1988	June-November 1988
Northville	June 5-25, 1987	March-July 1, 1987	March-May 1988	June-July 1988	April-September 1989
St Clair	July 2-31, 1987	August 1987	NA	NA	NA
Ray Plant 2	July 2-31, 1987	August 1987	June-August 1988	September-October 1988	1990
Muskegon River	August 4-31, 1987	September 1987	NA	NA	NA
Freedom	August 6-31, 1987	September 1987	September-November 1988	December 1988-January 1989	1990

Results of the site investigations indicate that:

- PCBs were used only in the compressed air systems.
- There is no indication of natural gas contamination.
- PCBs were never used at St Clair, Ray (Plant 1) and the Muskegon River Station.
- PCB releases are confined to the immediate station area.

This document is the PCB Action Plan for the Overisel Compressor Station. What follows are sections dealing with action thresholds and decontamination standards, a description of station systems, data on PCB contamination, alternative actions for systems exceeding action thresholds and the Company's planned actions including PCB health and safety procedures.

I. ACTION THRESHOLDS AND DECONTAMINATION STANDARDS

A. SOIL

1. Action Threshold

40 CFR 761.60(d) provides in part that:

(1) Spills and other uncontrolled discharges of PCBs at concentrations of 50 ppm or greater constitute the disposal of PCBs.

(2) PCBs resulting from the cleanup and removal of spills, leaks or other uncontrolled discharges must be stored and disposed of in accordance with Paragraph (a) of this section.

In addition, 40 CFR 761.1(b) states in part that:

No provision specifying a PCB concentration may be avoided as a result of any dilution, unless otherwise specifically provided.

As a result, the action threshold for PCB in soil is any detectable concentration in excess of the decontamination standard.

2. Decontamination Standards

Decontamination of soil at Overisel Compressor Station is excluded from the PCB Spill Cleanup Policy (Subpart G of 40 CFR 761) because the spill occurred prior to May 4, 1987 (40 CFR 761.120(a)(1)). However, decontamination standards specified in the Policy have been adopted in this Plan as follows:

It is assumed that the requirements for cleanup of high-concentration spills and low-concentration spills involving 1 pound or more PCBs by weight (270 gallons or more of untested mineral oil) (40 CFR 761.125(c)) are applicable in this instance, although it is not clear that there is 1 pound or more at the site. High-concentration PCBs mean PCBs that contain 500 ppm or greater PCBs, or those materials which EPA requires to be assumed to contain 500 ppm or greater PCBs in the absence of testing (40 CFR 761.123).

Pydraul AC is believed to have been used sometime in 1963 to 1965 in two air compressors, located in an auxiliary building, which provide high-pressure air for instrumentation and engine starting. It is estimated that 1 - 55-gallon drum of Pydraul AC was used. Pydraul AC was a fire-retardant lubricating oil formulated by Monsanto with 57% PCB Aroclor-1254. PCB found at the station has been exclusively PCB Aroclor-1254.

Soil in the environment downstream of the air compressors in which Pydraul AC was used has been tested and found to contain 500 ppm or greater PCB Aroclor-1254 in the present day (see Appendix A). For example, in the wastewater system, soil in the area of the oil-water separator overflow at the surface contained up to 5,400 mg/kg PCB.

Therefore, it should follow that the initial spill was of PCBs at a concentration of 500 ppm or greater. In defining PCBs, 40 CFR 761.123 states that as specified in 761.1(b), no requirements may be avoided through dilution of the PCB concentration.

Decontamination standards for PCB in soil are as follows:

a. Restricted Access Areas - 25 ppm PCB (40 CFR 761.125(c)(3)(v))

b. Nonrestricted Access Areas - 10 ppm PCB with excavation to a minimum depth of 10 inches and backfill with clean soil containing less than 1 ppm PCB (40 CFR 761.125(c)(4)(v))

3. Sampling To Verify Adequate Decontamination

Sampling to verify that cleanup of soil has been adequate will be conducted in accordance with the sampling requirements specified in 40 CFR 761.130.

Post-cleanup sampling is required to verify the level of cleanup under Section 761.125(c)(2) through (4). The responsible party may use any statistically valid, reproducible sampling scheme (either random samples or grid samples) provided that the requirements of Paragraphs (a) and (b) of this section are satisfied.

a. The sampling area is the greater of (1) an area equal to the area cleaned plus an additional 1-foot boundary, or (2) an area 20 percent larger than the original area of contamination.

b. The sampling scheme must ensure 95 percent confidence against false positives.

c. The number of samples must be sufficient to ensure that areas of contamination of a radius of 2 feet or more within the sampling area will be detected, except that the minimum number of samples is 3 and the maximum number of samples is 40.

d. The sampling scheme must include calculation for expected variability due to analytical error.

B. SURFACES

As a practical matter, no surfaces have been identified to date which involve a potential exposure of employees or the public to PCBs.

1. Action Threshold

No action threshold with a regulatory basis could be found.

2. Decontamination Standards

Decontamination of surfaces at Overisel Compressor Station is excluded from the PCB Spill Cleanup Policy (Subpart G of 40 CFR 761) because the spill occurred prior to May 4, 1987 (40 CFR 761.120(1)).

However, numerical surface standards specified in the requirements for cleanup of high-concentration spills and low-concentration spills involving 1 pound or more PCBs by weight (270 gallons or more of untested mineral oil) (40 CFR 761.125(c)) have been adopted in this plan as follows:

a. Restricted Access Areas

(1) High-contact solid surfaces - 10 ug/100 cm^2 (40 CFR 761.125(c)(3)(i))

(2) Low-contact, indoor, impervious solid surfaces - 10 ug/100 cm^2 (40 CFR 761.125(c)(3)(ii))

(3) Low-contact, indoor, nonimpervious surfaces - either:

(a) 10 ug/100 cm^2, or

(b) 100 ug/100 cm^2 with encapsulation
(40 CFR 761.125(c)(3)(iii))

(4) Low-contact, outdoor surfaces (both impervious and nonimpervious) - 100 ug/100 cm^2
(40 CFR 761.125(c)(3)(iv))

b. Nonrestricted Access Areas

(1) Indoor solid surfaces and high-contact outdoor solid surfaces - 10 ug/100 cm^2 (40 CFR 761.125(c)(4)(ii))

(2) Indoor vault areas and low-contact, outdoor, impervious solid surfaces - 10 ug/100 cm^2 (40 CFR 761.125(c)(4)(iii))

(3) Low-contact, outdoor, nonimpervious solid surfaces - either:

(a) 10 ug/100 cm^2, or

(b) 100 ug/100 cm^2 with encapsulation
(40 CFR 761.125(c)(4)(iv))

3. Sampling To Verify Adequate Decontamination

Sampling, to verify that surfaces have been adequately decontaminated, shall be conducted in accordance with the definition of standard wipe test in 40 CFR 761.123:

Standard wipe test means, for spills of high-concentration PCBs on solid surfaces, a cleanup to numerical surface standards and sampling by a standard wipe test to verify that the numerical standards have been met. This definition constitutes the minimum requirements for an appropriate wipe testing protocol. A standard-sized template (10 cm x 10 cm) will be used to delineate

the area of cleanup; the wiping medium will be a gauze pad or glass wool of known size which has been saturated with hexane. It is important that the wipe be performed very quickly after the hexane is exposed to air. EPA strongly recommends that the gauze (or glass wool) be prepared with hexane in the laboratory and that the wiping medium be stored in sealed glass vials until it is used for the wipe test. Further, EPA requires the collection and testing of field blanks and replicates.

C. PCB CONTAINERS

1. Action Threshold

40 CFR 761.60(c) states:

(1) Unless decontaminated in compliance with 40 CFR 761.79 or as provided in Paragraph (c)(2) of this section, a PCB container with PCB concentrations at 50 ppm or greater shall be disposed of:

(i) In an incinerator which complies with 40 CFR 761.70,

or

(ii) In a chemical waste landfill that complies with 40 CFR 761.75; provided that if there are PCBs in a liquid state, the PCB container shall first be drained and the PCB liquid disposed of in accordance with Paragraph (a) of this section.

(2) Any PCB container used to contain only PCBs at a concentration less than 500 ppm shall be disposed of as municipal solid wastes; provided that if the PCBs are in a liquid

state, the PCB container shall first be drained and the PCB liquid shall be disposed of in accordance with Paragraph (a) of this section.

2. Decontamination Standard

40 CFR 761.79(a) states:

Any PCB container to be decontaminated shall be decontaminated by flushing the internal surfaces of the container 3 times with a solvent containing less than 50 ppm PCB. The solubility of PCBs in the solvent must be five percent or more by weight. Each rinse shall use a volume of the normal diluent equal to approximately ten (10) percent of the PCB container capacity. The solvent may be reused for decontamination until it contains 50 ppm PCB. The solvent shall then be disposed of as a PCB in accordance with 40 CFR 761.60(a). Non-liquid PCBs resulting from the decontamination procedures shall be disposed of in accordance with the provisions of 40 CFR 761.60(a)(4).

NOTE: Precautionary measures should be taken to ensure that the solvent meets safety and health standards as required by applicable Federal regulations.

D. SUMMARY

Following is a summary of the action thresholds and decontamination standards for soil and equipment surfaces at Overisel Compressor Station.

	Action Threshold	Decontamination Standard
SOIL		
Restricted access	25 ppm	25 ppm
Nonrestricted access	10 ppm	10 ppm (10 inches and <1 ppm backfill)
EQUIPMENT SURFACES	None available	
Restricted access		
High-contact solid surfaces		10 ug/100 cm^2
Low-contact, indoor, impervious solid surfaces		10 ug/100 cm^2
Low-contact, indoor, nonimpervious surfaces		10 ug/100 cm^2 or 100 ug/100 cm^2 with encapsulation
Low-contact, outdoor surfaces (Both impervious and nonimpervious)		100 ug/100 cm^2
Nonrestricted access		
Indoor solid surfaces and high-contact outdoor solid surfaces		10 ug/100 cm^2
Indoor vault areas and low-contact, outdoor, impervious solid surfaces		10 ug/100 cm^2
Low-contact, outdoor, nonimpervious solid surfaces		10 ug/100 cm^2 or 100 ug/100 cm^2 with encapsulation
PCB CONTAINERS	50 ppm	Triple rinse with solvent 10 percent of container capacity

II. DESCRIPTION OF SYSTEMS

A. AIR SYSTEM

The air system consists of the following major components:

1. Auxiliary Building

   Air compressors (2)
   Air dryer system (1)
   Emergency generator air starter (1)

2. Outdoors

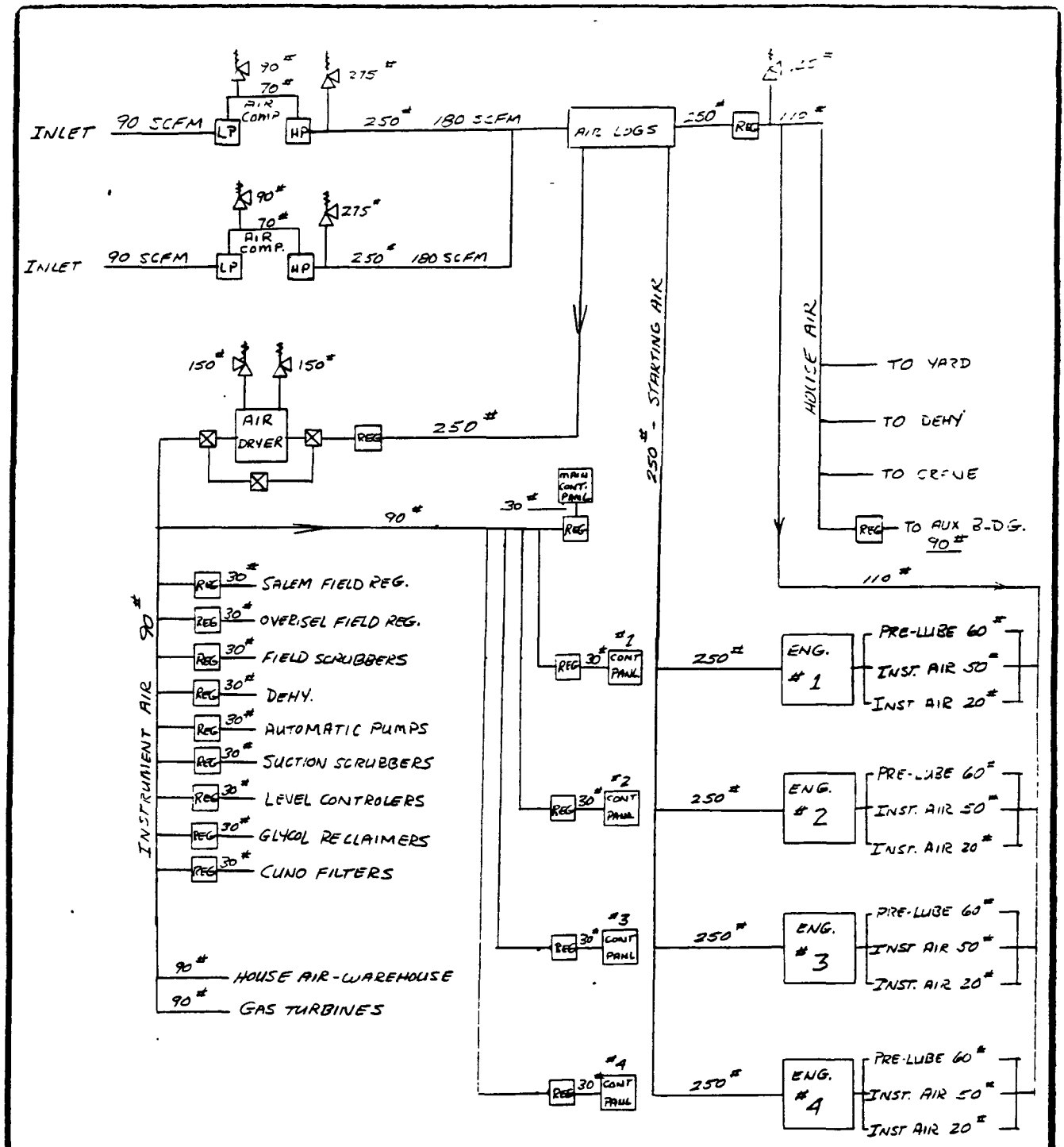
   Air receiver tanks (4)
   Turbines (3)
   Regulators
     Overisel Storage Field (3)
     Salem Storage Field (3)

3. Compressor Building

   Air starters
     Engine No 1 (1)
     Engine No 2 (1)
     Engine No 3 (1)
     Engine No 4 (1)
   Instrument panels (4)

4. Interconnecting Piping

5. Crane



	OVERISEL COMPRESSOR STATION	
WO 3495	FILE NO.	
CONSUMERS POWER CO. GAS P. & T. ENGINEERING	COMPRESSED AIR SYSTEM	6/24/88
	DR RLM / CK RLM / APP.	NO. 4

K00000215

B. WASTE WATER SYSTEM

The waste water system consists of the following major components:

1. Auxiliary Building

   Floor drain system

2. Outdoors

   Oil-water separator (1)
   Oil-water separator overflow (1)

3. Compressor Building

   Floor drain system
   Floor drain collection tank (1)

4. Interconnecting piping

III. DATA ON PCB CONTAMINATION

Data on PCB contamination at the Overisel Compressor Station are included in Appendix A.

IV. SYSTEMS REQUIRING ACTION: ALTERNATIVE AND RECOMMENDED ACTIONS

A. SOIL

The location of all potential prior PCB releases, a quantification of the soil tested and found to exceed the action threshold associated with the access to each location, and the corresponding decontamination standards and methods are summarized for Overisel Compressor Station in the table below. The remedial action specific to each location is also shown in the attached drawings.

Soil exceeding the action threshold will be removed to the decontamination standard in the area of the air receivers drain.

Soil exceeding the action threshold will be removed down to the water table in the area of the oil-water separator overflow.

Excavation below the water table in the oil-water separator overflow area in order to remove the discrete pockets of soil exceeding the action threshold will not be undertaken for the following reasons:

- Cross-contamination as an artifact of the drilling and sampling investigation is a strong probable cause for the observed apparent contamination.

- The vast majority of PCB contamination will be removed, thus eliminating the potential source for groundwater contamination.

- Data on groundwater in the direction of groundwater flow do not indicate groundwater contamination.

- Data on surface water downgradient of the area in nearby Busscner Drain and downstream in the Rabbit River indicate no surface water or sediment contamination.

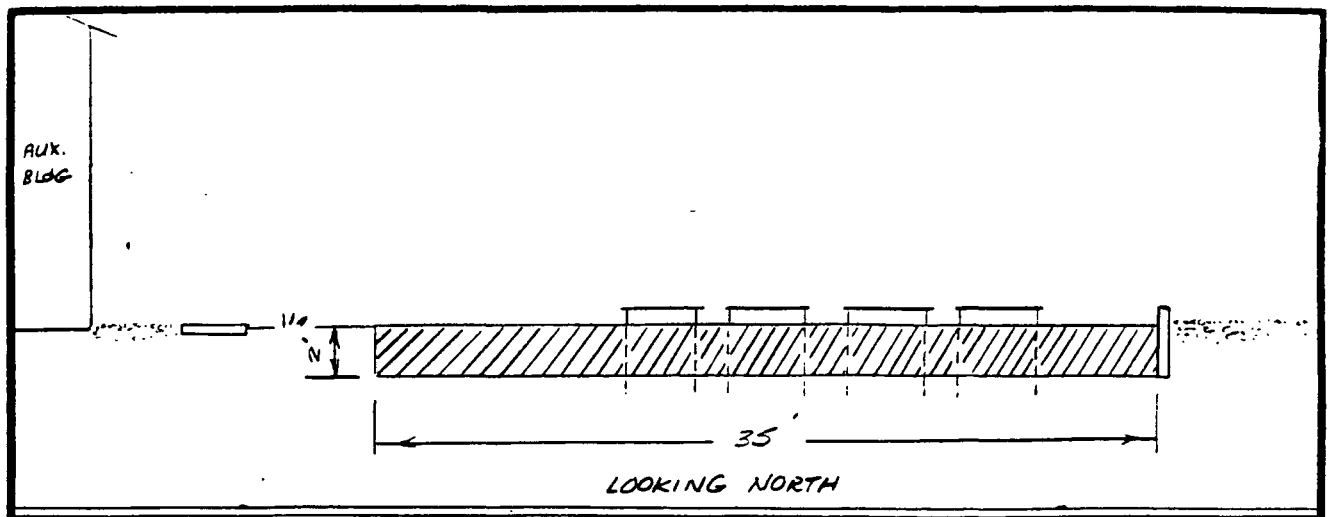
- The apparent contamination cannot be removed by any practicable methods.

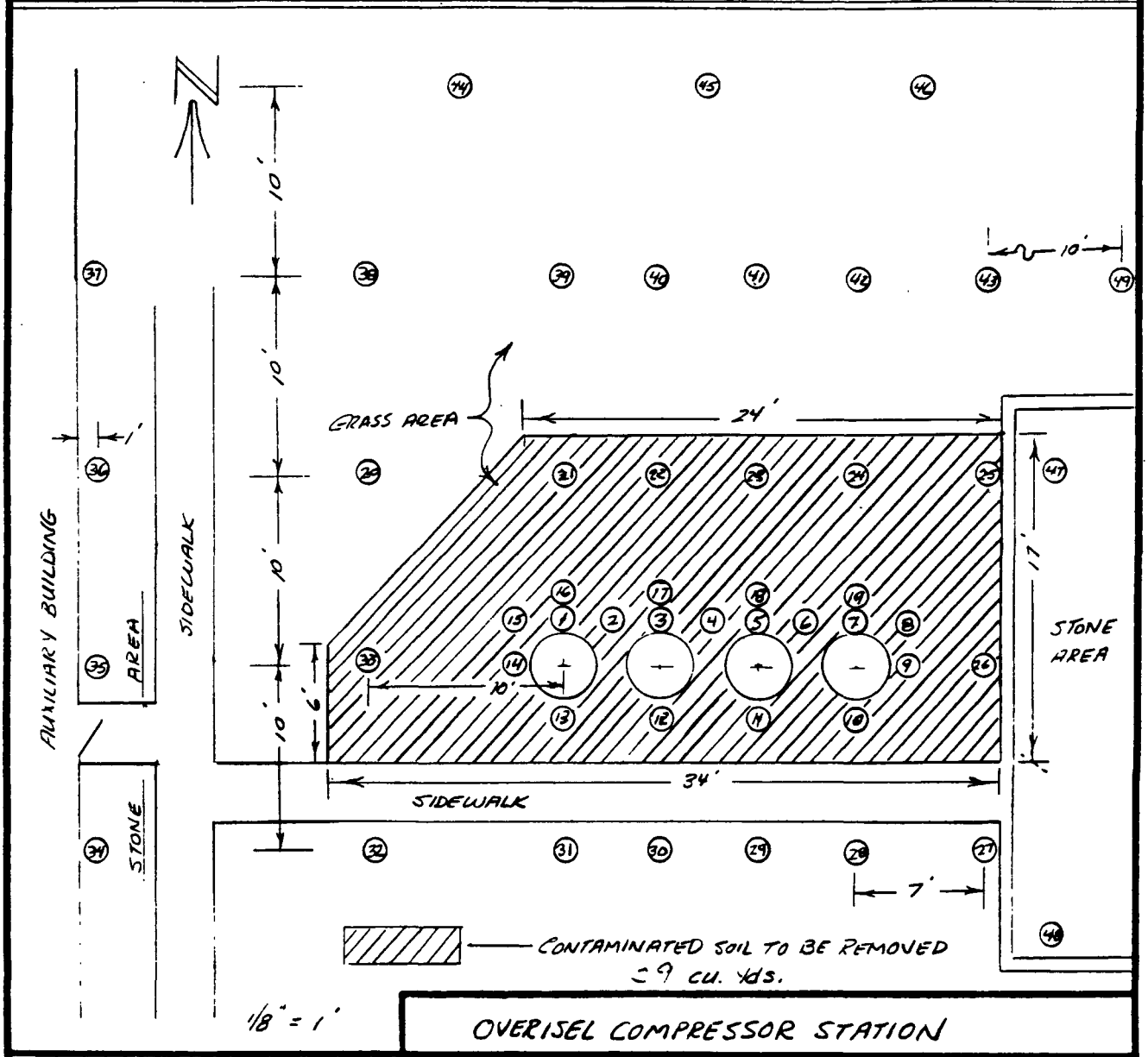
However, the Company plans to undertake a long-term, annual groundwater monitoring program to commence in 1988 utilizing the existing seven wells in order to assure that any changed conditions can be detected at the site. The duration of the program will be at least ten years, but will be evaluated on an annual basis using the data obtained from monitoring.

CONSUMERS POWER COMPANY
Overisel Compressor Station
PCB Action Plan

Summary of actions for PCB releases to soil from various systems

Location	Soil Exceeding Action Threshold Area (ft^2)	Depth (ft)	Volume (yd^3)	Restricted/ Nonrestricted Access Area	Decontamination Standard (ppm PCB)	Decontamination Method
Air Receiver Tank Drain	528	2	39	Restricted	25	Removal by hand shovel
Overflow	6,627	1	246	Nonrestricted	10	Removal by clam in tiers down to water table
	3,263	2	242			
			488			
Total			527			





OVERISEL COMPRESSOR STATION

W.O. 3495 | FILE NO.

AREA - AIR LOGS 5-3-88

CONSUMERS POWER CO.
GAS P.& T. ENGINEERING

DR. RLM | CK. RLM | APP. | NO. 1 OF 3

K00000221

AREA - AIR LOGS
SAMPLING DATE 09-10-87
REPORT DATE AND RESULTS 02-01-88

SAMPLE POINT NUMBER		SURFACE SOIL PCB mg/kg	12" DEPTH SOIL PCB mg/kg	
872-492B	1	17	37	UNDER VALVE
	2	4	24	
	3	10	31	UNDER VALVE
	4	13	23	
	5	18	11	UNDER VALVE
	6	10	23	
	7	7	25	UNDER VALVE
	8	8	14	
	9	18	17	
	10	15	1	
	11	36	3	
	12	16	3	
	13	9	3	
	14	14	38	
	15	8	14	
	16	6	17	
	17	6	11	
	18	8	22	
	19	9	27	
	20	8	3	
	21	6	20	
	22	5	11	
	23	11	23	
	24	7	13	
	25	4	12	
	26	12	27	
	27	5	<1	

OVERISEL COMPRESSOR STATION

W.O. 3495 | FILE NO.

AREA - AIR LOGS 5-3-88

CONSUMERS POWER CO.
GAS P.& T. ENGINEERING

DR RLM | CK RLM | APP. | NO. 2 OF 3

K00000222

AREA AIR LOGS
SAMPLING DATE 09-10-87
REPORT DATE AND RESULTS 02-01-88

SAMPLE POINT NUMBER	SURFACE SOIL PCB Mg/kG	12" DEPTH SOIL PCB Mg/kg	
872-492 B 28	9	1	
29	19	2	
30	10	1	
31	23	3	
32	9	1	
33	13	27	
34	5	1	
35	5	9	
36	5	9	
37	10	6	
38	13	1	
39	5	1	
40	6	17	
41	4	18	
42	13	13	
43	7	5	
44	2	1	
45	5	8	
46	8	13	
47	6	2	
48	1	<1	
49	6	3	

OVERISEL COMPRESSOR STATION

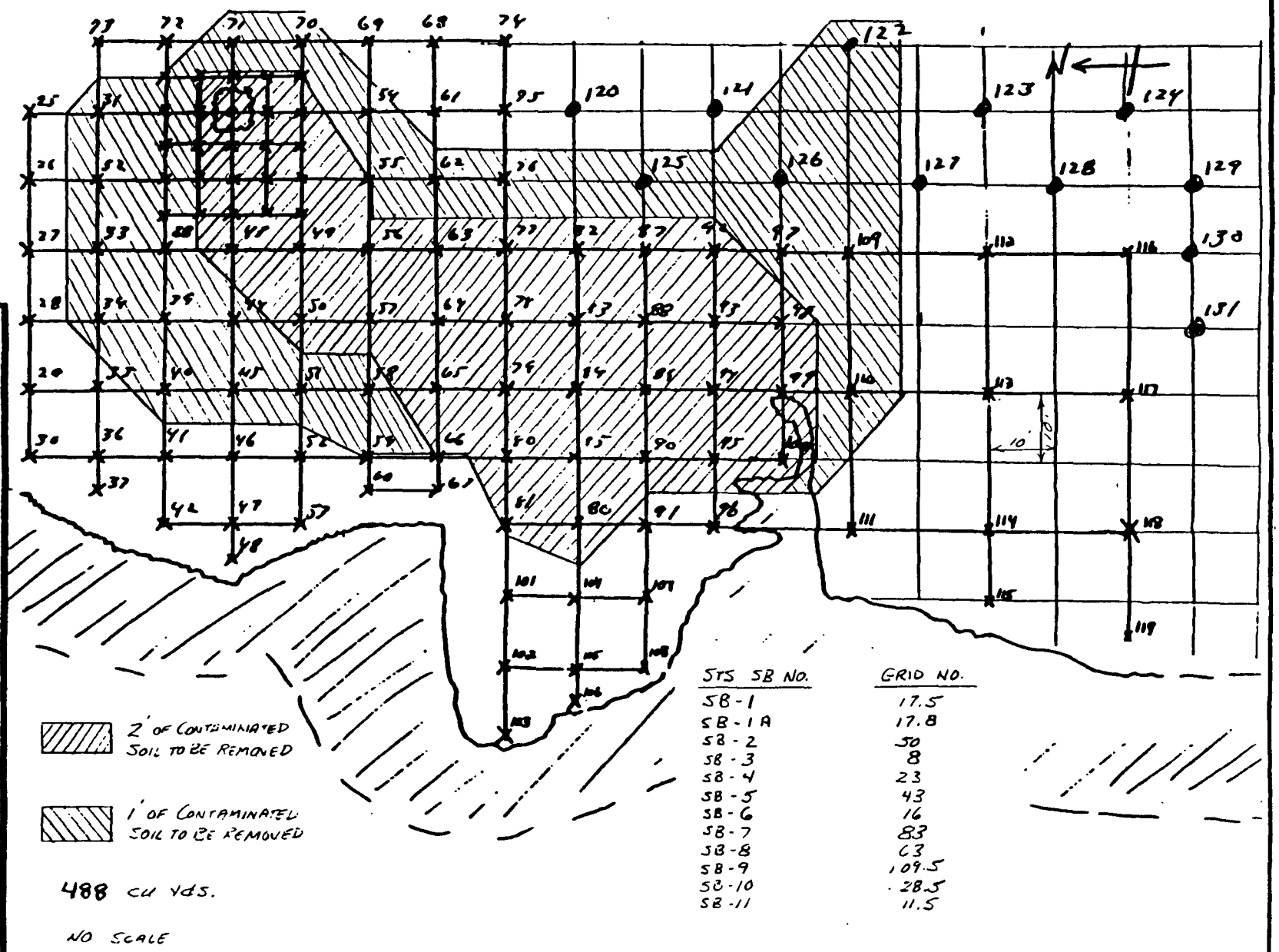
W.O. | FILE NO.

AREA - AIR LOGS 5-3-88

CONSUMERS POWER CO.
GAS P.& T. ENGINEERING

DR RLM | CK RLM | APP. | NO. 3 OF 3

K00000223



STS SB NO.	GRID NO.
SB-1	17.5
SB-1A	17.8
SB-2	50
SB-3	8
SB-4	23
SB-5	43
SB-6	16
SB-7	83
SB-8	63
SB-9	109.5
SB-10	28.5
SB-11	11.5

W.O. 3495

FILE NO.

CONSUMERS POWER CO.
GAS P.&T. ENGINEERING

DR. RLM

CK. RLM

APP.

OVERISEL COMPRESSOR STATION

OUT FALL AREA

5-19-88

NO. 1 OF 10

K00000224

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-16-87
Project # 528717781-492

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872492A-1	1	
2	8	
3	9	
4	25	
5	120	
6	2	6
7	530	7
SB-3 8	3500	2
9	490	4
10	660	10
11	9	6
~~SB-11~~ 12	1200 ~~750*~~	* 130
13	200 ~~760*~~	6
14	230 ~~200*~~	6
15	31	2
SB-6 16	4400	14
• 17.5' W of O- SB-1 17	2700	51
SB-1-A 18	3400	1100
19	260 *	* 890
20	57	
21	100	

* Over Calculation Linear Range

K00000225

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-16-87
Project # 528717 781 - 492 3 OF 10

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872492A - 22	860	
SB-4 23	1800	
24	150	

K00000226

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project # 528717-781-502 4 OF 10

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502-A 25	5	
26	2	
27	6	<1
~~SB-10~~ 28	1	
29	2	
30	<1	<1
31	12	<1
32	17	4
33	13	<1
34	9	
35	1	
36	<1	
37	<1	<1
38	800	1
39	10	<1
40	9	<1
41	1	<1
42	<1	<1
SB-5 43	3900	83
44	520	2
45	11	<1

K00000227

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project #

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502A - 46	1	<1
47	1	<1
48	1	<1
SB-2 49	450	3
50	3100	6
51	67	2
52	5	<1
53	3	<4**
54	38	2
55	110	3
56	830	15
57	820	12
58	140	2
59	9	
60	9	<1
61	5	
62	62	<1
SB-8 63	530	8
64	310	4
65	5	<1
66	1	<1

** Sample Detection Limit

K00000228

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project # 528717 781-502 6 of 10

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502A-67	1	
68	1	
69	3	<1
70	3	
71	17	8
72	1	
73	3	<1

K00000229

OVERISEL COMPRESSOR STATION

Oil-Water Separator Discharge

Sample Date 11-03-87 Project 872-690

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg	
872-690- 74	1	<1	
75	4	<1	
76	21	2	
77	110	3	
78	>520 *	15	
79	73	30	X
80	51	97	X
81	3	9	
82	>380 *	4	
SB-7 83	>570 *	56	X
84	>200 *	33	X
85	68	17	
86	7	12	
87	>270 *	25	X
88	>300 *	51	X
89	>170 *	44	X
90	100	6	
91	5	5	
92	68	3	
93	94	27	

* Over Calibration Range

K00000230

OVERISEL COMPRESSOR STATION

Oil-Water Separator Discharge

Sample Date 11-03-87 - Project 872-690

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg	
872-690- 94	> 180 *	120	X
95	27	10	
96	3	5	
97	18	1	
98	21	4	
99	85	13	
100	30	36	X ?

* Above Calibration Range

K00000231

OVERISEL COMPRESSOR STATION

Oil-Water Separator Discharge

Sample Date 11-23-87 Project 872-829

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872-829A-101	1	<1
102	1	<1
103	<1	<1
104	1	<1
105	1	1
106	1	<1
107	4	4
108	1	22
SB-9 109	15	4
110	8	3
111	1	1
112	5	3
113	4	<1
114	1	<1
115	1	1
116	6	8
117	1	<1
118	1	<1
119	1	<1

Expanded Sample Grid - 11-23-87

* Over Calibration Range

K00000232

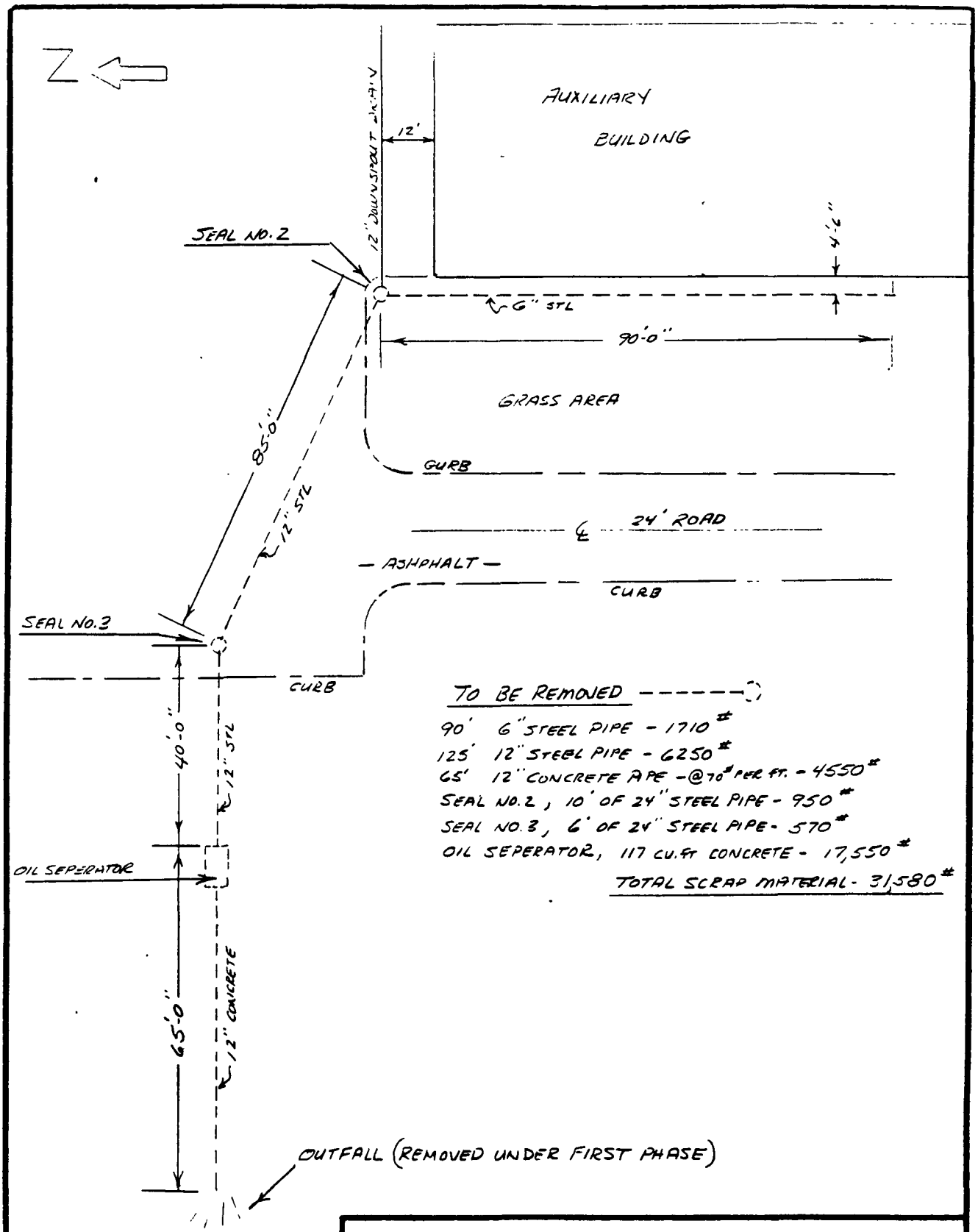
OVERISEL COMPRESSOR STATION

Area - Overfill
Sampling Date - 01-21-88
Project # 88-135
Report Date - Feb 01, 1988

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
88-135 # 120	7	1
121	6	<1
122	11	<1
123	3	5
124	6	1
125	19	1
126	10	<1
127	8	2
128	5	2
129	4	<1
130	6	1
131	9	1

B. WASTEWATER SYSTEM

The oil-water separator, and piping from the oil-water separator to the Auxiliary Building foundation and the overflow pit, will be excavated and transported to an EPA-approved chemical waste landfill for disposal as a PCB waste. The surrounding soil will be carefully inspected for signs of leakage. Should any be found, the soil will be removed down to the decontamination standards and verified by sampling.



NOT TO SCALE

W.O. 3495	FILE NO.	OVERISEL COMPRESSOR STATION
CONSUMERS POWER CO. GAS P. & T. ENGINEERING		WASTE WATER SYSTEM - TO BE REMOVED 6/24/88
DR RLM	CK RLM	APP. / NO. 3

K00000235

V. SCHEDULE

Actions planned at Overisel Compressor Station are scheduled according to the following chart.

GAS P&T COMPRESSOR STATION PCB CLEAN UP SCHEDULE

Rd Moore

7 20 88

1988 — 1989

LOCATION	ID NO	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	REF NO	START DATE	FINISH DATE	CONTRACT LIN
		4 11 18 25	2 9 16 23 30	6 13 20 27	4 11 18 25	1 8 15 22 29	5 12 19 26	3 10 17 24 31	7 14 21 28	5 12 19 26	2 9 16 23 30	6 13 20 27	6 13 20 27				
1 OVERISEL COMP STA.														1			
2														2			
3 CLEAR BRUSH & TREES (OUT FALL AREA)			COMPLETE 7/15/88											3			
4 EXCAVATE & LOAD SOILS (OUT FALL AREA)														4			
5 BACKFILL & TEMP CLEAN UP (OUT FALL AREA)														5			
6 REMOVE WASTE WATER SYSTEM														6			
7 REMOVE AIR COMPRESSORS														7			
8 CLEAN OUT & REMOVE AIR PIPING														8			
9														9			
10														10			
11														11			
12														12			
13														13			
14														14			
15														15			
16														16			
17														17			
18														18			
19														19			
20														20			

K00000237

VI. HEALTH AND SAFETY PLAN

A. EXPOSURE ROUTES

Exposure to PCBs may occur through skin contact and ingestion, as well as inhalation. PCBs may absorb through unbroken skin and enter the bloodstream. In addition to absorption, prolonged skin contact should also be prevented. Ingesting or eating PCBs will result in PCBs being absorbed into the bloodstream through the digestive system. PCBs can enter the body through the inhalation of airborne vapors. However, PCBs usually exist as a thick, heavy oil or wax and do not readily evaporate. Inhalation hazards are further reduced since this project does not involve pure PCBs but fluids, soil and other material contaminated with a low percentage of PCBs.

If PCB-containing fluids are heated significantly, then the risk of generating airborne vapors and inhalation hazards increase.

B. HEALTH HAZARDS

The most common effect following exposure to PCBs is a skin rash. This usually occurs as a result of prolonged skin contact, but may occur to some individuals following short duration exposure. This skin rash is a physical irritation that is common with exposures to most petroleum products (oils, hydraulic fluids, gasoline, etc).

A much more severe skin reaction called chloracne may result from exposure to PCBs, as well as some other chlorinated fluids. Chloracne is similar to acne experienced by adolescents; however, it is much more severe and can be disfiguring. Chloracne may occur following exposure to PCBs through skin exposure or through ingestion or inhalation. Chloracne usually is associated with long-term exposures and not typically from short-term exposures.

PCBs may cause changes in liver chemistry. These changes are not life threatening and are reversible; that is, the changes are temporary.

Some laboratory studies have shown that PCBs produce nodules in the livers of test animals that may be interpreted as cancer. For this reason, PCBs are referred to as a suspected carcinogen in humans.

PCBs are not readily eliminated from the body. PCBs are transported by blood and tend to deposit in fat tissue where they may remain for long periods.

C. CONTROL MEASURES

1. Personal Hygiene

When working with PCB fluids, good personal hygiene habits are important. Skin surfaces should be washed with soap and water following contact.

Due to ingestion hazards, hands and face should be washed prior to eating, drinking or smoking following exposure to PCB-contaminated materials.

2. Personal Protective Clothing/Equipment

The following personal protective clothing and equipment should be utilized when working with PCB-contaminated fluids and equipment. This is in addition to any protective clothing and equipment that may be required by the Accident Prevention Manual or other departmental policies and procedures.

- Safety glasses

- Goggles or face shield, if significant liquid splash hazard exists

- Gloves (disposable)

  27-62524, Size 7
  27-62552, Size 8
  27-62540, Size 9
  27-62557, Size 10

- Boots (disposable)

  27-80245, Large (9-1/2 to 11)
  27-80237, X-Large (11 to 13)
  27-80781, XX-Large (13 to 15)

- Coveralls (disposable)

  27-90228, Medium
  27-90236, Large
  27-90244, X-Large

The above-listed items are not all mandatory for every situation. Consideration should be given to the type of hazard that exists for a given operation. The key point to remember in determining appropriate clothing or equipment is minimizing or eliminating skin contact with PCBs. Once personal clothing becomes contaminated, it cannot be taken home and laundered. This adds to environmental contamination. If a job presents a risk of splashing PCB liquids onto clothing, then the disposable coveralls must be worn.

APPENDIX A

CONSUMERS POWER COMPANY
OVERISEL COMPRESSOR STATION
PCB DATA

1. 6-22-87 report of 6-3-87 water, oil and sludge samples in and around Station

2. 7-20-87 report of 7-1-87 surface water and sediment samples from Rabbit River, Busscner Drain and oil-water separator discharge pit

3. 10-12-87 report of
   a. 9-16-87 Air Logs surface soil samples (1 thru 19) (interim results see No 4 and No 11a below)
   b. 9-16-87 Oil-Water Separator Discharge Area surface soil samples (1 thru 24)
   c. 9-28-87 Oil-Water Separator Discharge Area surface soil samples (25 thru 73) (interim results see No. 8 below)

4. 10-19-87 report of Air Logs surface soil samples (1-19) (completion of 10-12-87 report)

5. 11-17-87 report of 11-3-87 Oil-Water Separator Discharge Area surface soil samples (74 thru 100)

6. 12-3-87 report of 11-23-87 Oil-Water Separator Discharge Area surface soil samples (101 thru 119)

7. 12-3-87 report of 9-16-87 Oil-Water Separator Discharge Area surface soil samples (6, 8, 10 thru 15, 17 and 19) (completion of 10-12-87 report)

8. 12-3-87 report of 9-28-87 Oil-Water Separator Discharge Area surface soil samples (32, 39 thru 41, 45, 46, 51, 52, 66, 69, 71 and 73) (completion of 10-12-87 report)

9. 12-7-87 report of 11-23-87 Oil-Water Separator Discharge Area soil boring samples (A thru D)

10. 2-1-88 report of 1-21-88 Oil-Water Separator Discharge Area surface soil samples (120 thru 131)

11. 2-1-88 report of:
    a. 9-16-87 Air Logs surface soil samples (1 thru 19) (Completion of 10-12-87 report)
    b. 1-21-88 Air Logs surface soil samples (20 thru 49)

12. 3-25-88 report of soil boring samples from 3-4-88 thru 3-17-88 (88MW-1, 2, 2A, 3 and 3A and 88SB-1, 1A, 2 thru 11)

13. 3-28-88 report of 3-25-88 groundwater levels in monitoring wells 88MW-1, 2, 2A, 3 and 3A

14. 4-19-88 report of 3-25-88 groundwater samples collected from Monitoring Wells 88MW-1, 2, 2A, 3 and 3A

15. 6-1-88 report of 5-26-88 soil samples to verify adequate decontamination of Air Logs (Sample Nos 16 thru 25)

16. 6-1-88 report of 5-26-88 soil samples below Emergency Generator Starter Motor Vent

17. 6-1-88 report of 5-26-88 soil sample of onsite backfill material

18. 6-27-88 report of 6-25-88 samples of groundwater collected from Monitoring Wells 88MW-4 and 4A

19. 7-18-88 report of 7-12-88 groundwater samples collected from Monitoring Wells 88MW-4 and 4A

20. 6-29-88 report of 6-21-88 and 6-22-88 samples from the station air system

21. 7-28-88 report on the extent of PCB contamination in the oil-water separator overflow area prepared by STS Consultants, Ltd

22. 8-8-88 report of samples from inside of the wastewater piping

23. 8-8-88 report of 8-4-88 groundwater samples collected from Monitoring Wells 88MW-4 and 4A

24. 8-22-88 report of sample from inside of the Auxiliary Building roof drain pipe

25. 9-6-88 report of samples from inside of drain lines

26. 9-23-88 report of a sample from inside of the roof drain pipe at the Auxiliary Building

27. 4-29-89 report of 4-25-89 surface wipe samples from Air Compressors Nos 1 and 2

28. 4-29-89 report of 4-28-89 surface wipe samples from the compressor engines

29. 4-18-89 report of samples from the floor drain collection tank

30. Report of 4-21-89 surface wipe samples to verify adequate decontamination of air system components

31. Report of 4-29-89 surface wipe samples to verify adequate decontamination of air system components

32. Report of 5-10-89 surface wipe samples to verify adequate decontamination of air system components

33. Report of 5-24-89 surface wipe samples to verify adequate decontamination of air system components

34. 6-26-89 report of 6-16-89 surface wipe samples to verify adequate decontamination of air system components

35. 7-7-89 report of 4-18-89 thru 4-29-89 PCB-Freon samples to verify adequate decontamination of the air system

36. Report of 6-9-88 soil samples to verify adequate decontamination of the Air Logs

BWRasher/12-17-90

Diesel Compressor Static - PCB Attachment A (1) 6-22-87 5.4
Sampling Date 06-03-87 (DSS - BWR)

Control Number	Sample Point Location - Description	Sample Type	PCB 1254	Units
87-843-1	Air Drier Filter - No sample available	—	—	—
87-843-2	Air Compressor Oil Collection System Oily water (100ml), Bottom Oil (10ml)	Oily Water	<1	mg/kg
		Btm Oil	320	mg/kg
87-843-3	Floor Drain - Aux Bldg	Water	7.7	ug/L
87-843-4	Oil-Water Separator - East Chamber Water and Bottom Sludge	Water	750	ug/L
		Btm Sludge	610	mg/kg
87-843-5	Oil-Water Separator Discharge	Water	870	ug/L
87-843-6	Air Storage Tank Condensate Discharge	Water	41	ug/L
87-843-7	#5 Jet Compressor Oil	Oil	19 *	mg/kg
87-843-8	Slop Tank - Compressor Bldg Floor Drain Collection Tank - Water and Sludge	Water	180	ug/L
		Sludge	270	mg/kg

* Detected as Aroclor-1242 (1248)

K00000244

CONSUMERS POWER COMPANY
OVERISEL GAS COMPRESSOR STATION
Laboratory Analytical Results for PCB in Samples of Surface Water and Sediment Collected on July 1, 1987 From Surface Waters in the Area of Consumers Power Company's Overisel Gas Compressor Station

Location	Sample Type	Concentration of PCB A 1254 Left	Mid	Right
Rabbit River at 38th St bridge (upstream of Busscner Drain inflow)	Water	ND[a]	ND	ND
	Sediment	ND	ND	ND
Rabbit River above Hamilton Falls (M-40) (downstream of Busscner Drain inflow)	Water	ND	ND	ND
	Sediment	NS[b]	NS	ND
Busscner Drain at weir (upstream of oil-water separator)	Water	ND	ND	ND
	Sediment	ND	ND	ND
Busscner Drain 15.5 ft downstream of weir (near oil-water separator)	Water	0.11 ug/l	NS	NS
	Sediment	ND	NS	NS
Busscner Drain 125 ft downstream of weir (downstream of oil-water separator)	Water	0.15 ug/l	ND	ND
	Sediment	ND	ND	ND

Oil-water separator discharge pit
Water at pipe 410 ug/l
Sediment E 1400 mg/kg Mid 2400 mg/kg W 250 mg/kg

[a]ND indicates not detected at the following limits of detection

	Water (ug/l)	Sediment (mg/kg)
A 1242	0.065	1
A 1254	0.11	1
A 1260	0.18	1

[b]NS indicates that no sample was collected at this location.

BWR/mlp
7/20/87

10-12-87
M905,4

(3)

To BWR
From HWU
Date 10-12-87
Subject Oversel PCB

1- Need To Complete Analysis For Selected 12" Depths At Air Logs

2- Need To Expand Grid At Overflow Discharge - Can Be Done Week of Oct 19th.

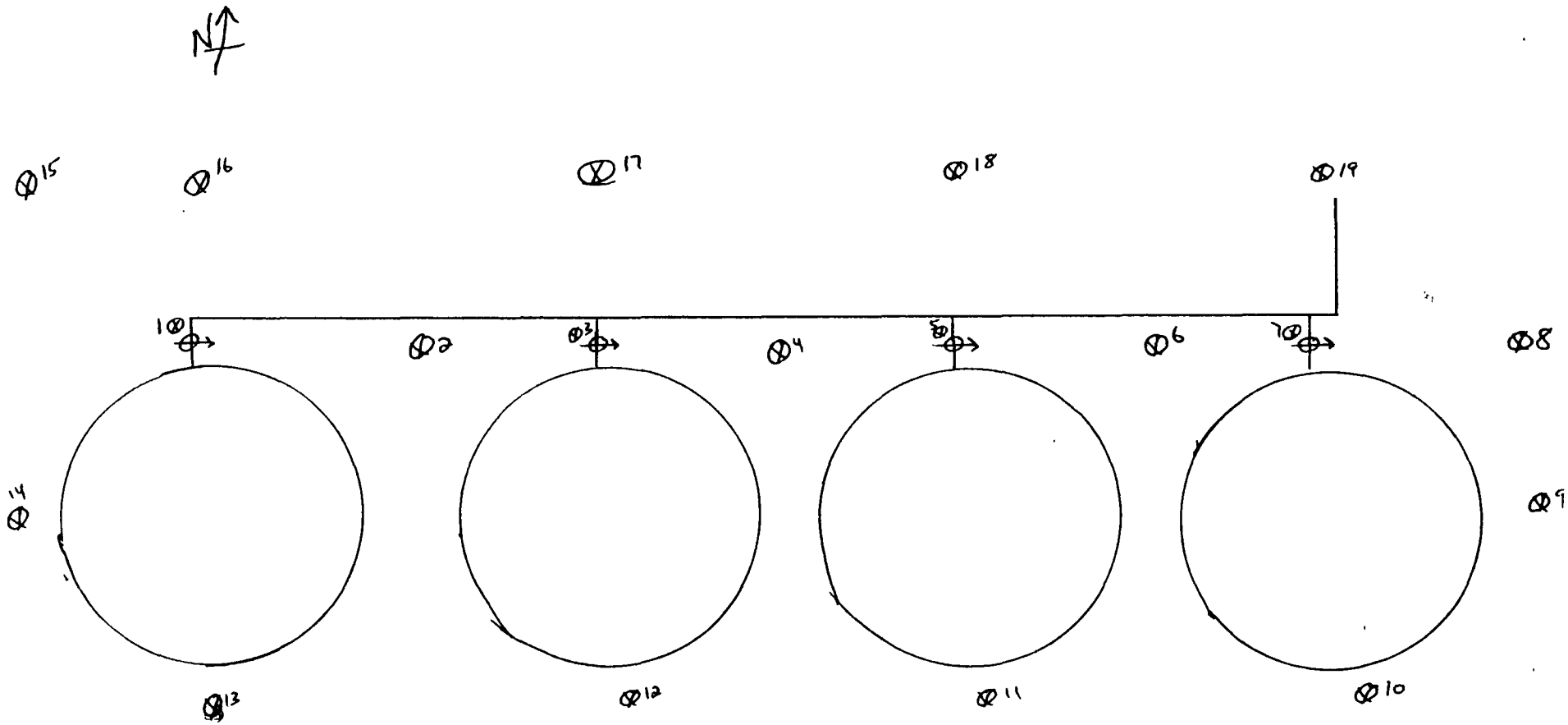
3- Need to Complete Analysis For Selected 12" Depth Samples At Overflow Discharge -

4- Attached Sheets Should Get You Started

Voyt

K00000246

overisel air logs (Not to scale)



K00000247

OVERISEL COMPRESSOR STATION

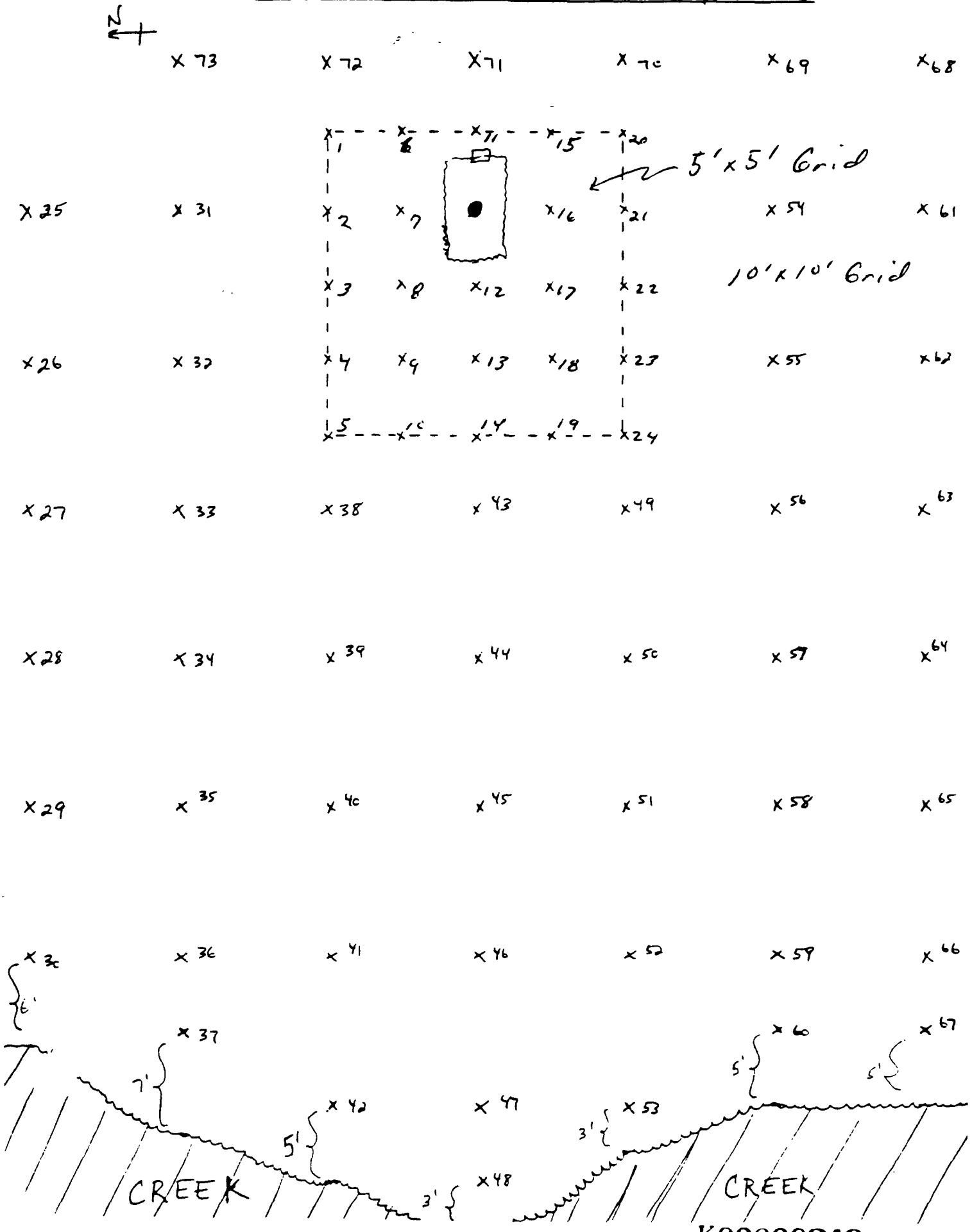
Area - Air Logs
Sampling Date - 09-16-87
Project # 528717781-492

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872492B 1	17	37
2	4	24
3	10	31
4	13	23
5	18	11
6	10	23
7	7	25
8	8	
9	18	
10	15	
11	36	3
12	16	
13	9	
14	14	
15	8	
16	6	
17	6	
18	8	
19	9	

K00000248

Overisel Gas Comp. Station Soil Sampling - 092801 - GLC/JDO/DY

(Expanded Grid for Oil/Water Sep. Discharge Point)



K00000249

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-16-87
Project # 528717781-492

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872492A-1	1	
2	8	
3	9	
4	25	
5	120	
6	2	
7	530	7
8	3500	
9	490	4
10	660	
11	9	
12	1200 ~~750*~~	
13	200 ~~760*~~	
14	230 ~~200*~~	
15	31	
16	4400	14
17	2700	
18	3400	1100
19	260 *	
20	57	
21	100	

K00000250

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-16-87
Project # 528717 781-492

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872492A-22	860	
23	1800	
24	150	

K00000251

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project # 528717-781-502

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502-A 25	5	
26	2	
27	6	<1
28	1	
29	2	
30	<1	<1
31	12	<1
32	17	
33	13	<1
34	9	
35	1	
36	<1	
37	<1	<1
38	800	1
39	10	
40	9	
41	1	
42	<1	<1
43	3900	83
44	520	2
45	11	

K00000252

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project #

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502A-46	1	
47	1	<1
48	1	<1
49	450	3
50	3100	6
51	67	
52	5	
53	3	<4**
54	38	2
55	110	3
56	830	15
57	820	12
58	140	2
59	9	
60	9	<1
61	5	
62	62	<1
63	530	8
64	310	4
65	5	<1
66	1	<1

K00000253

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project # 528717 781-502

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502A-67	1	
68	1	
69	3	
70	3	
71	17	
72	1	
73	3	

K00000254

-30-87

(4)

To BWR
From HWU
Date 10-19-87

Subject Overisel PCB

Additional results from

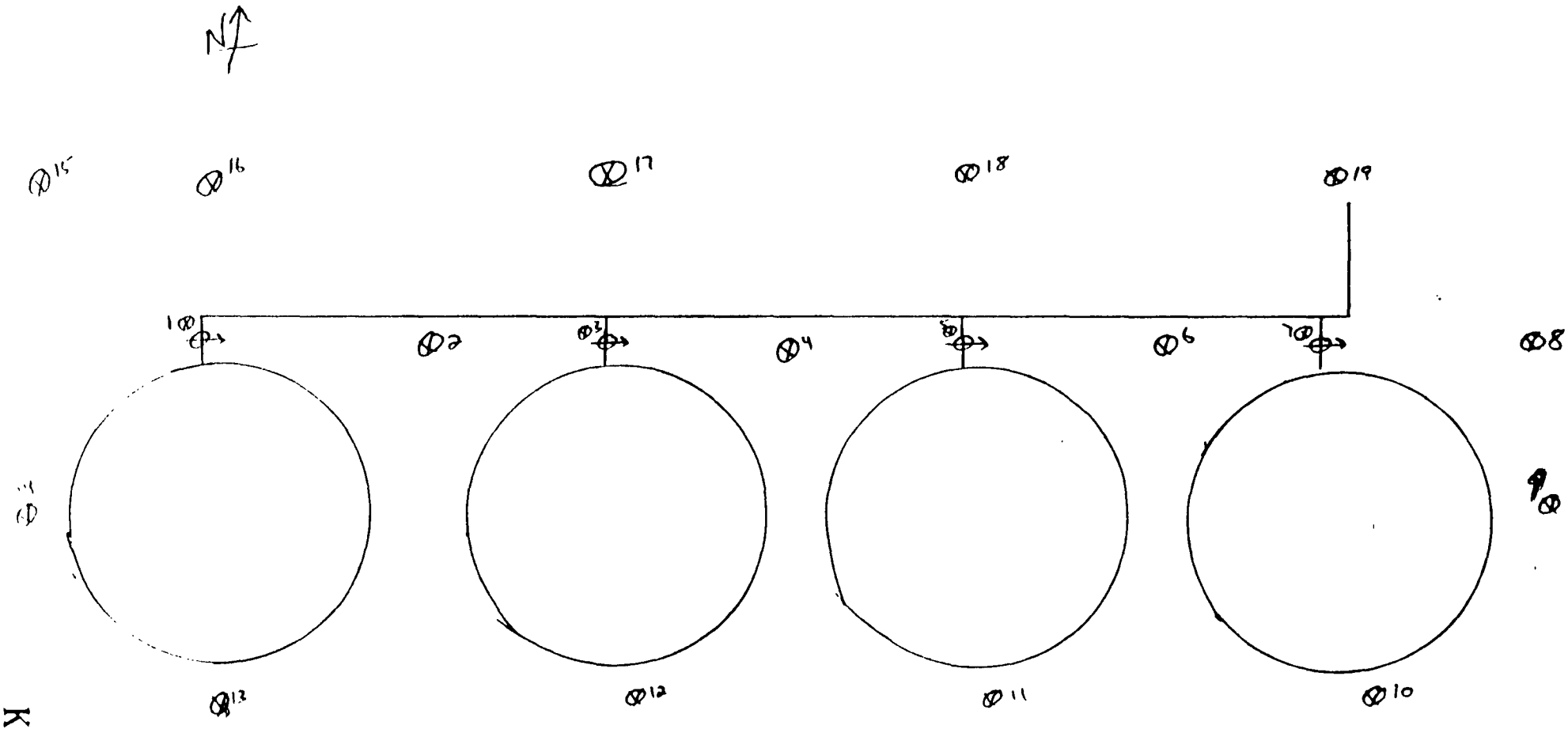
Overisel Compressor Station
Air Logs

Sample at 12" Depth
Locations 8, 9, 10
12, 13, 14
15, 16, 17
18, 19.

This will complete Air Logs site

K00000255

Overisel air logs (Not to scale)



K000000256

OVERISEL COMPRESSOR STATION

Area - Air Logs
Sampling Date - 09-16-87
Project # 528717781-492

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872492B 1	17	37
2	4	24
3	10	31
4	13	23
5	18	11
6	10	23
7	7	25
8	8	14
9	18	17
10	15	1
11	36	3
12	16	3
13	9	3
14	14	38
15	8	14
16	6	17
17	6	11
18	8	22
19	9	27

K00000257

Form 4_ 3000M 11-85 **OFFICE MEMO** 11-17-87

To BWR P12-103	Date 11/10/87
From Voigt	Time
Phone	Phoned: ☐ Please Call ☐ Returned Your Call ☐ Will Call Back

- ☐ As Requested
- ☐ For Your Information
- ☐ As Discussed
- ☐ Take Appropriate Action
- ☐ Investigate and Report
- ☐ Note and See Me
- ☐ Return With More Details
- ☐ Review the Attached
- ☐ Prepare Reply
- ☐ Review and Approve
- ☐ Sign
- ☐ Type Draft ☐ Type Final
- ☐ File ☐ Route
- ☐ Make _____ Copies

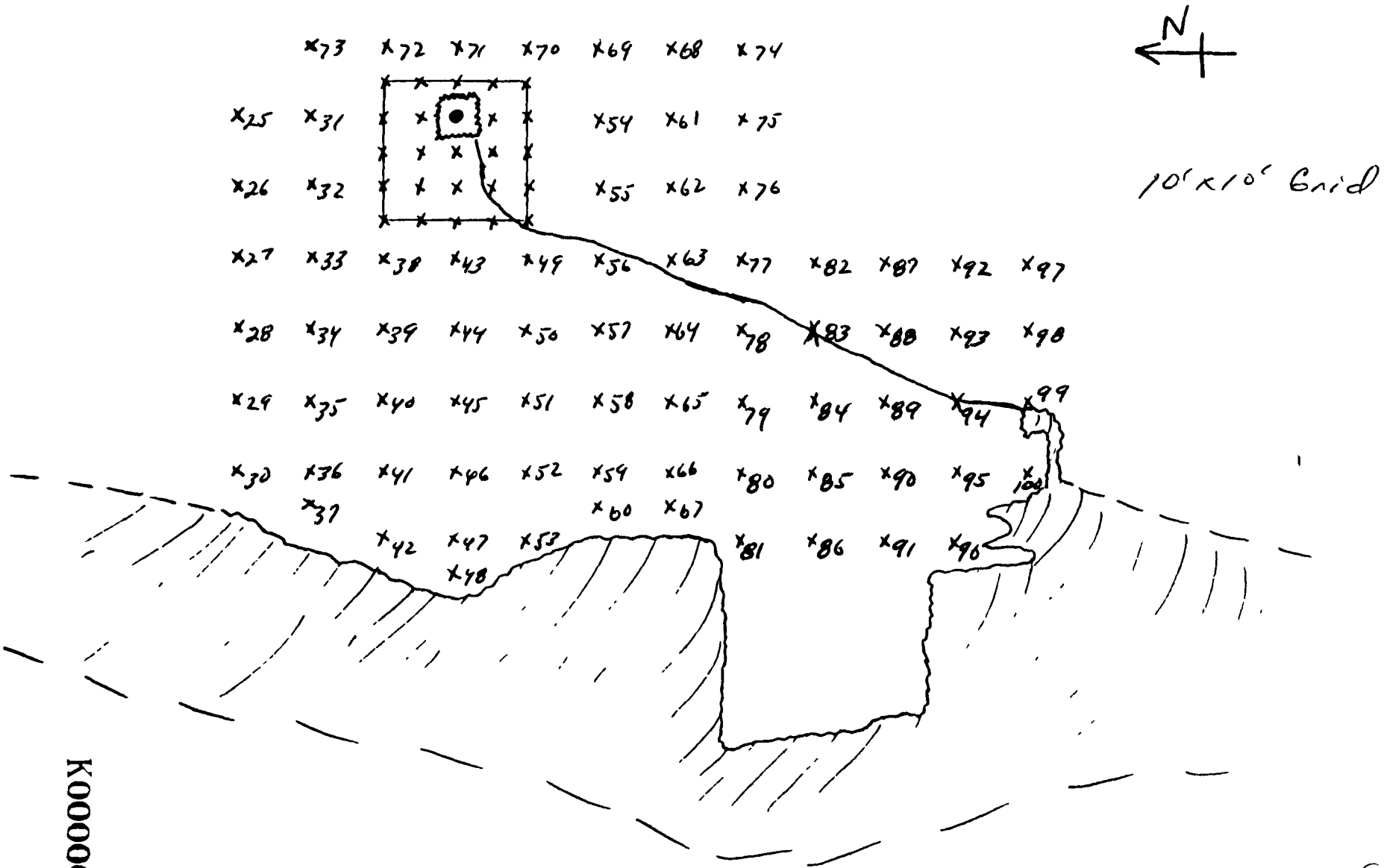
Required by _____

Message/Comments Overissel Expanded Grid

Operator

K00000258

Ov[illegible]el Gas Comp. Station Soil Sampling - [illegible]omposite Grid for 872-442, 872-502, 872-670
at the Oil/Water [illegible]rator Discharge Point



K00000259

11-17-87
M4G3,4

5

OVERISEL COMPRESSOR STATION

Oil-Water Separator Discharge

Sample Date 11-03-87 Project 872-690

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872-690- 74	1	<1
75	4	<1
76	21	2
77	110	3
78	>520 *	15
79	73	30
80	51	97
81	3	9
82	>380 *	4
83	>570 *	56
84	>200 *	33
85	68	17
86	7	12
87	>270 *	25
88	>300 *	51
89	>170 *	44
90	100	6
91	5	5
92	68	3
93	94	27

K00000260

OVERISEL COMPRESSOR STATION

Oil-Water Separator Discharge

Sample Date 11-03-87 - Project 872-690

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872-690- 94	> 180 *	120
95	27	10
96	3	5
97	18	1
98	21	4
99	85	13
100	30	36
		K00000261

M905.4

(6)

OVERISEL COMPRESSOR STATION

Oil-Water Separator Discharge

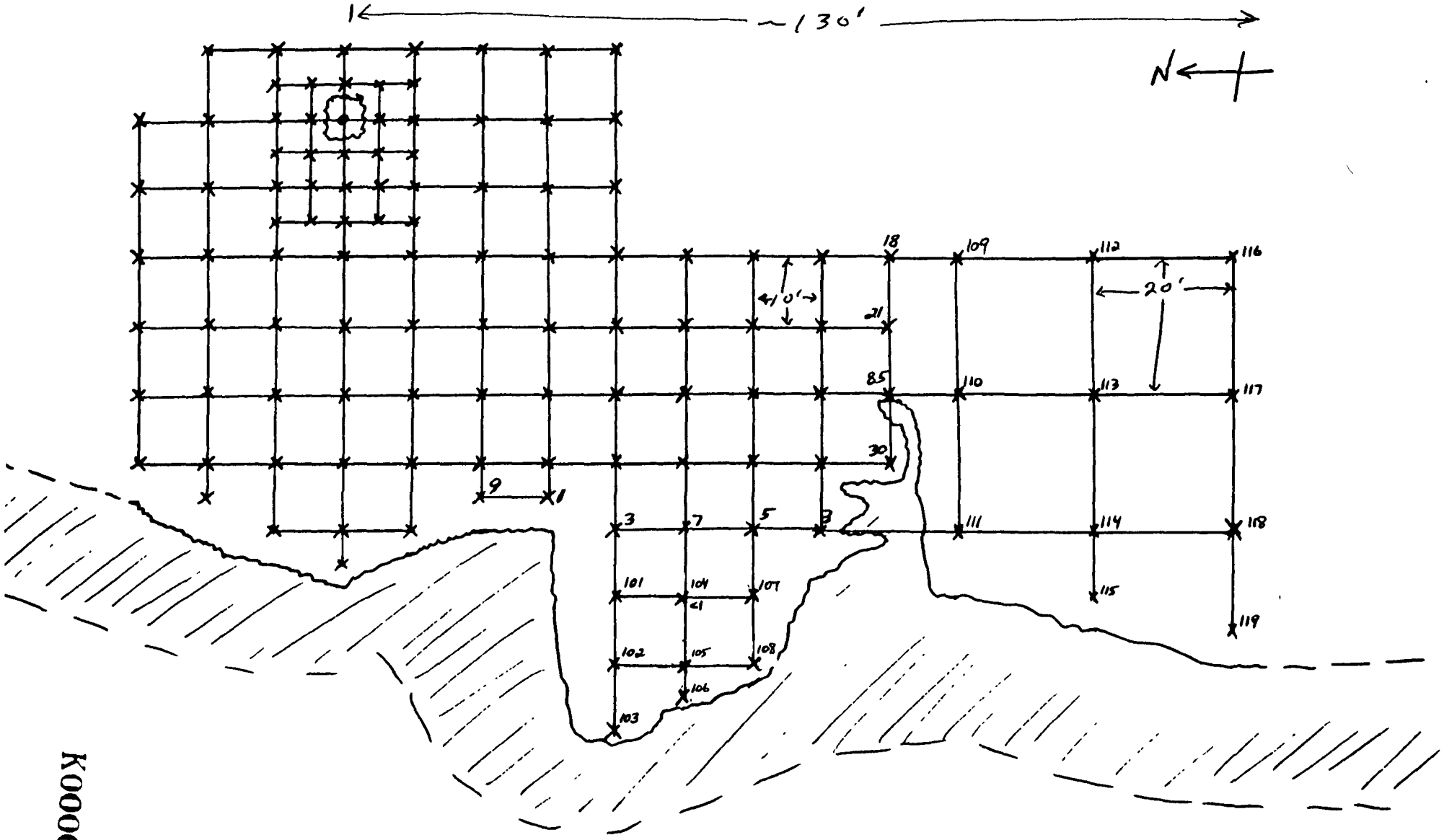
Sample Date 11-23-87 Project 872-829

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872-829A-101	1	<1
102	1	<1
103	<1	<1
104	1	<1
105	1	1
106	1	<1
107	4	4
108	1	22
109	15	4
110	8	3
111	1	1
112	5	3
113	4	<1
114	1	<1
115	1	1
116	6	8
117	1	<1
118	1	<1
119	1	<1
		K00000262

Expanded Sample Grid - 11-23-87

* Over Calibration Range

risel Gas Comp. Station Soil Samplin Composite Grid - Oil/Water Sep. Discharge Point



K00000263

12-3-87
M905.4
(7)

OVERISEL COMPRESSOR STATION

Oil-Water Separator Discharge

Sample Date 09-16-87 Project 872-492

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872-492-A 6		6
8		2
10		10
11		6
12		*130
13		6
14		6
15		2
17		51
19		* 890
		K00000264

Additional Sample Results From 09-16-87 Sample Grid

OVERISEL COMPRESSOR STATION

Oil-Water Separator Discharge

Sample Date 09-28-87 Project 872-502

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872-502-A32		4
39		<1
40		<1
41		<1
45		<1
46		<1
51		2
52		<1
66		1
69		<1
71		8
73		<1
		K00000265

Addition Sample Results From 09-28-87 Sample Grid

L ERISEL COMPRESSOR STATION
Oil-Water Separator Discharge Pit

M415.4 (9)
11-2,-87
872-829

Soil Boring Number	Sample Depth (ft)*	PCB mg/kg	Depth To Water (ft)*	Soil Type
A	1.5	1	1.5	Sand-Clay
B	1.5	7	0.8	Sand-Clay
C	1.5	140	0.4	Sand-Clay
D	1.5	32	0.5	Sand-Clay

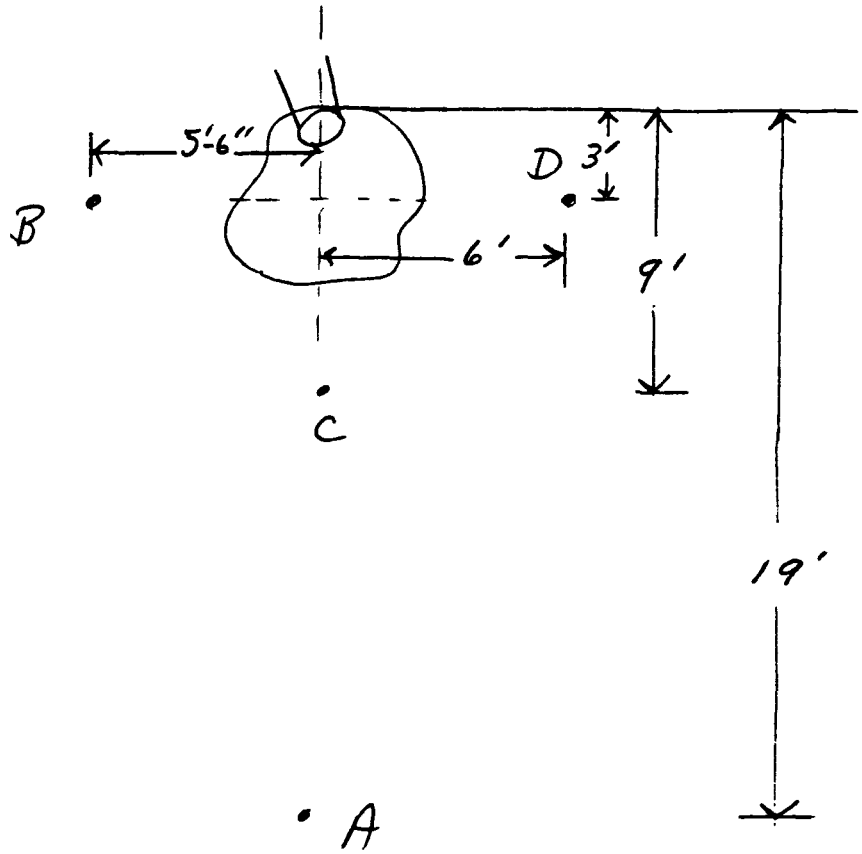
* From Surface Grade

Remarks Attachment.

K000000266

Oversel Compressor Station

Oil-Water Separator Discharge
Sampling Date 11-23-?? # 872-829



K00000267

OVERISEL COMPRESSOR STATION
Oil-Water Separator Discharge Pit
Sampling Date 11-23-87
872-829

Remarks

Discharge pit is filled with water and appears to have the potential to overflow during a heavy rain.

Ground is saturated with water

High depth-to-water around discharge pit may indicate storage of this water

All boreholes filled ~~wa~~ with water after first sample was pulled. Boreholes were terminated after first sample

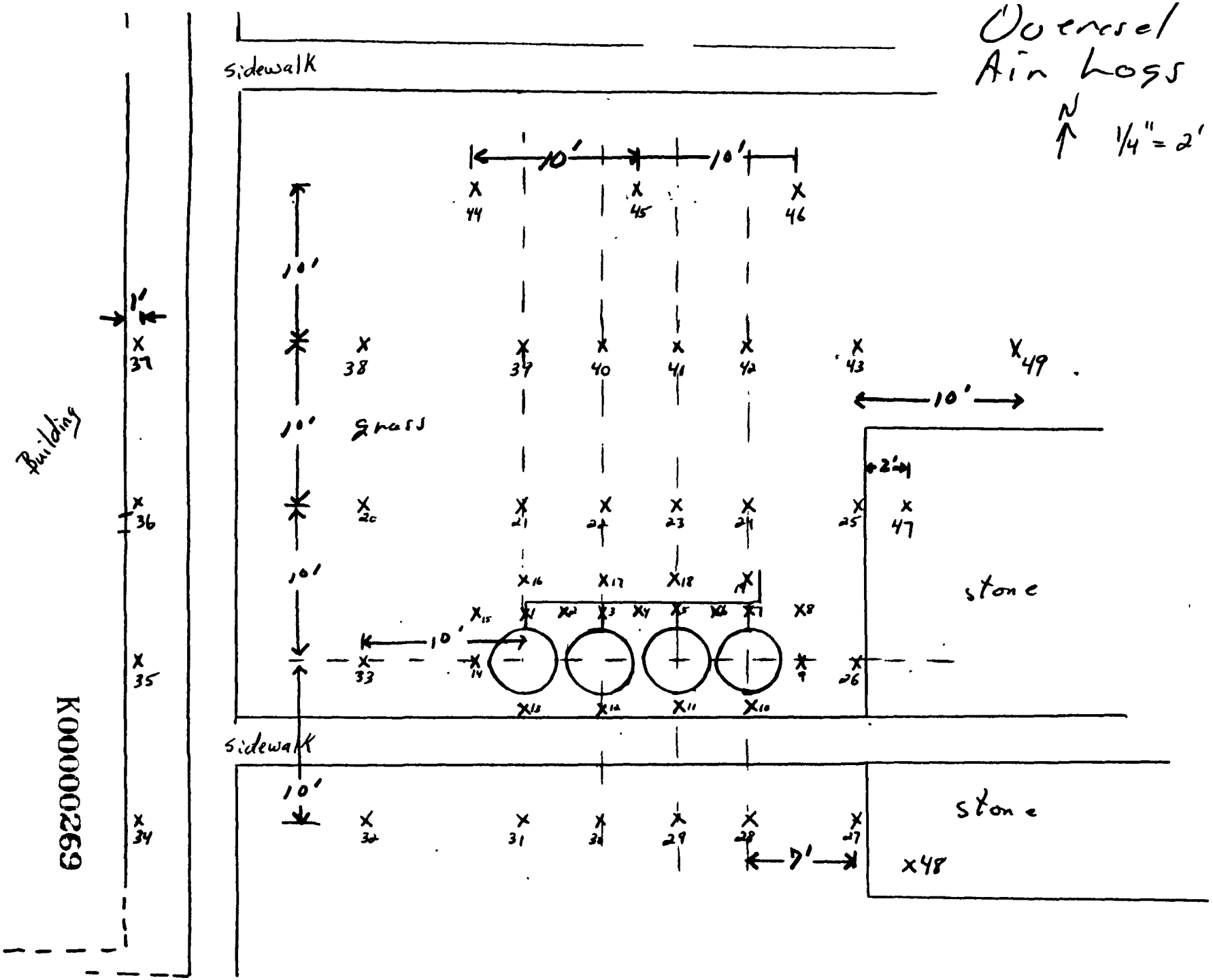
Groundwater contamination is most probable

K00000268

Vessel Air Loss

N

1/4" = 2'



(10)

3-2-88
HAG:14

Overisel - Air Storage Tanks

Sample Points #	Location
1, 3, 5, 7	Directly below valve
2, 4, 6	In line with 1, 3, 5, 7 and at midpoints between air logs
9, 10, 11, 12, 13, 14	1' from air log
16, 17, 18, 19	2' North of Air Log Valves
8	In line with # 9 and # 7
15	In line with # 1 and # 14
21, 22, 23, 24	10' North ℄ of Air Tank on ℄ of valves
28, 29, 30, 31	10' South ℄ of Air Tank on ~℄ of valves

K00000270

UNIRISEL COMPRESSOR STATION

Area - Air Logs
Sampling Date - 09-16-87
Project # 872-492B
Report Date - 02-01-88 * results

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872-492B # 1	17	37
2	4	24
3	10	31
4	13	23
5	18	11
6	12	23
7	7	25
8	8	14 *
9	18	17 *
10	15	1 *
11	36	3
12	16	3 *
13	9	3 *
14	14	38 *
15	8	14 *
16	6	17 *
17	6	11 *
18	8	22 *
19	9	27 *
		K00000271

UNIRISEL COMPRESSOR STATION

Area - Air hogs
Sampling Date - 01-21-88
Project # 88-135
Report Date - 02-01-88

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
88-135B #20	8	3
21	6	20
22	5	11
23	11	23
24	7	13
25	4	12
26	12	27
27	5	<1
28	9	1
29	19	2
30	10	1
31	23	3
32	9	1
33	13	27
		K00000272

Area - Air Logs
Sampling Date - 01-28-88
Project # 88-162
Report Date - 02-01-88

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
88162B # 34	5	1
35	5	9
36	5	9
37	10	6
38	13	1
39	5	1
40	6	17
41	4	18
42	13	13
43	7	5
44	2	1
45	5	8
46	8	13
47	6 *	2
48	1	<1
49	6	3
		K00000273

* >3 But <6

OVERISEL COMPRESSOR STATION

3-2-88
M4054

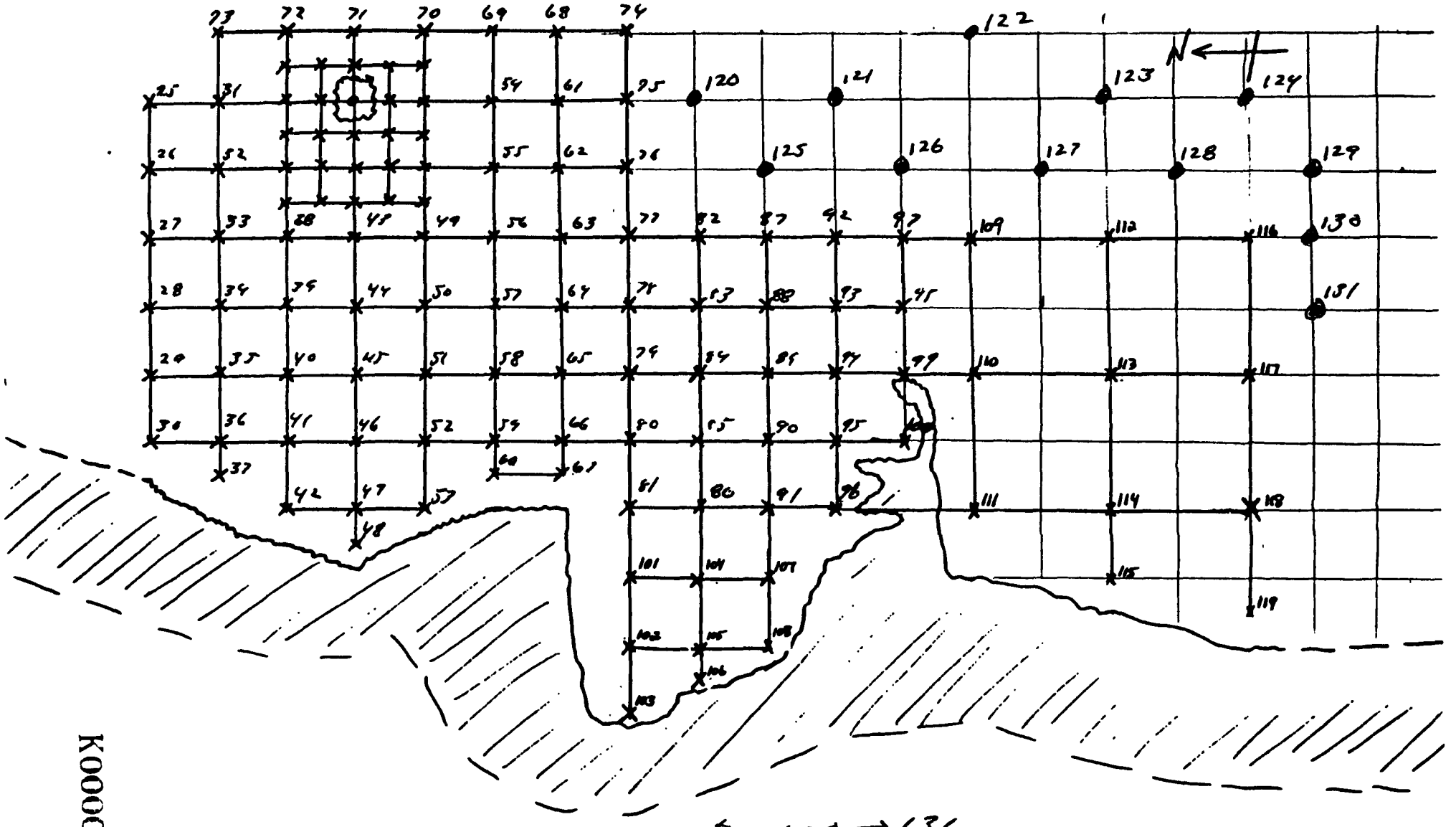
(11)

Area - Overfill
Sampling Date - 01-21-88
Project # 88-135
Report Date - Feb 01, 1988

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
88-135 # 120	7	1
121	6	<1
122	11	<1
123	3	5
124	6	1
125	19	1
126	10	<1
127	8	2
128	5	2
129	4	<1
130	6	1
131	9	1

K00000274

Verisol Gas Comp. Station Soil Samp. - Composite Grid - Oil/Water Sep. Discha Point



● Jan 21, 1988 point #120 → 131

K00000275

3-25-88 M905,4

(12)

LOCATION Overisel

Project Number 518817 552-383 Report Date

Borehole ID 88 mw -1

Sample Date 03 04 88 Collected By STS

Received Date 030488 Analysis Number 1476

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-11	mw-1	1	15-17		<1
12		2	17-19		<1

K00000276

LOCATION Overisel

Project Number 518817552-383 Report Date

rehole ID 88 mw-2

Sample Date 030788 Collected By STS

Received Date 030788 Analysis Number 1477

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCB mg/kg
88383-13	mw-2	1	7-9		<1
14		2	9-11		<1

K00000277

LOCATION Diversel

Project Number 518817 552-383 Report Date

Borehole ID mw 2A

Sample Date 031088 Collected By SJS

Received Date 031188 Analysis Number 1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-83	mw2A	1	16-18		<1
84		2	18-20		<1
85		wash water	unk		<1

K00000278

LOCATION Overisel

Project Number 5188175 52-383 Report Date

Borehole ID 88mw-3

Sample Date 031488 Collected By STS

Received Date 031488 Analysis Number 1484

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-98	mw3	1	6-8		<1
99	mw3	2	8-10		<1

K00000279

LOCATION Overise 1

Project Number 518817552-383 Report Date

Borehole ID 88MW-3A

Sample Date 031688 Collected By STS

Received Date 031788 Analysis Number 1487

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-138	MW3A	1	16-18		<1
139		2	18-20		<1
140		wash water	20		<1

K00000280

LOCATION Oversel

Project Number 518817552-383 Report Date

Borehole ID 88SB-1

Sample Date 030488 Collected By STS

Received Date 030488 Analysis Number 1476

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-1	SB-1	1	0-2		1
2		2	2-4		<1
3		3	4-6		1
4		4	6-8		<1 *
5		5	8-10		<1
6		6	10-12		<1
7		7	12-14		2
8		8	14-16		<1
9		9	16-18		28
10		10	18-20		16

K00000281

* Result <1 But Detectable

LOCATION Doerrsel

Project Number 518817 552-383 Report Date

Borehole ID 88 SB-1A

Sample Date 030888 Collected By STS

Received Date 030888 Analysis Number 1478/1479

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-25	SB-1A	1	20-22		<1
26		2	22-24		<1
27		3	24-26		<1
28		4	26-28		<1
29		5	28-30		<1
30		Mud	25		8
31		mud	28		12
54	SB-1A	mud	28		16
	(030988)				

K00000282

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88 SB-2

Sample Date 03 07 88 Collected By STS

Received Date 03 08 88 Analysis Number 1478/1479

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCE mg/kg
88383-15	SB-2	1	0-2		1
16		2	2-4		<1
17		3	4-6		<1
18		4	6-8		<1
19		5	8-10		<1
20		6	10-12		<1*
21		7	12-14		5
22		8	14-16		<1*
23		9	16-18		1
24		10	18-20		7

* Result <1 But Detectable

K00000283

LOCATION Ouensel

Project Number 518817552-383 Report Date

Borehole ID 885B-3

Sample Date 030988 Collected By STS

Received Date 031088 Analysis Number 1480/1481/148

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-55	SB-3	1	0-2		2
56		2	2-4		<1
57		3	4-6		1
58		4	6-8		<1
59		5	8-10		<1
60		6	10-12		<1
61		7	12-14		<1
62		8	14-16		<1
63		9	16-18		1
64		10	18-20		1
65		11	20-22		2
77		12	22-24		<1
78		13	24-26		<1
79		14	26-28		<1
80		15	28-30		<1
81		mud	18		1
82		mud	28		1
				K00000284	

LOCATION Ouensel

Project Number 518817 552-383 Report Date

Borehole ID 88 SB-4

Sample Date 030988 Collected By STS

Received Date 031088 Analysis Number 1480/1481/1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-66	SB-4	1	0-2		82
67		2	2-4		<1
68		3	4-6		2
69		4	6-8		1
70		5	8-10		<1
71		6	10-12		<1
72		7	12-14		1
73		8	14-16		1
74		9	16-18		1
75		10	18-20		<1*
76		11	20-22		8

* Result <1 But Detected

K00000285

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-5

Sample Date 030888 Collected By STS

Received Date 030988 Analysis Number 1479/1480

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-32	SB-5	1	0-2		<1
33		2	2-4		<1
34		3	4-6		<1
35		4	6-8		<1
36		5	8-10		<1
37		6	10-12		<1
38		7	12-14		15
39		8	14-16		27
40		9	16-18		4
41		10	18-20		2
				K00000286	

LOCATION Overise 1

Project Number 518817552383 Report Date

Borehole ID 88SB-6

Sample Date 030988 Collected By STS

Received Date 030988 Analysis Number 1479/1480

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-42	SB-6	1	0-2		1
43		2	2-4		<1
44		3	4-6		<1
45		4	6-8		1
46		5	8-10		<1
47		6	10-12		<1
48		7	12-14		<1
49		8	14-16		<1
50		9	16-18		1
51		10	18-20		<1*
52		11	20-22		<1
53		12	22-24		12
				K00000287	

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-7

Sample Date 03/08/88 Collected By STS

Received Date 03/11/88 Analysis Number 1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-86	SB7	1	0-2		3
87		2	2-4		<1
88		3	4-6		<1*
89		4	6-8		<1
90		5	8-10		<1
91		6	10-12		<1
92		7	12-14		<1
93		8	14-16		<1
94		9	16-18		1
95		10	18-20		4
96		11	20-22		<1
97		wash water	20		<1
		Sediment	20		2

* Result <1 But Detected

K00000288

LOCATION Overisel

Project Number 518817552-383 Report Date

rehole ID 88SB-8

Sample Date 0314 88, 031588 Collected By SZS

Received Date 031588 Analysis Number 1484, 1485

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-100	SB-8	1	0-2		<1
101		2	2-4		<1
102		3	4-6		3
103		4	6-8		<1
104		5	8-10		<1
105		6	10-12		<1
106		7	12-14		2
107		8	14-16		<1
108		9	16-18		<1
109		10	18-20		<1
110		11	20-22		<1
111		12	22-24		<1

K00000289

LOCATION Overisel

Project Number 518817 552-383 Report Date

Borehole ID 88 SB-9

Sample Date 031488, 031588 Collected By STS

Received Date 031588 Analysis Number 1484, 1487

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88-383-112	SB9	1	0-2		<1
113		2	2-4		<1
114		3	4-6		<1
115		4	6-8		<1
116		5	8-10		<1
117		6	10-12		<1
118		7	12-14		<1
119		8	14-16		<1
120		9	16-18		<1
121		10	18-20		<1
122		11	20-22		<1
123		12	22-24		<1
124		mud	22		<1
				K00000290	

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-10

Sample Date 031688 Collected By STS

Received Date 031688 Analysis Number 1485, 1487

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88-383-125	SB10	1	0-2		<1
126		2	2-4		<1
127		3	4-6		<1
128		4	6-8		<1
129		5	8-10		<1
130		6	10-12		<1
131		7	12-14		<1
132		8	14-16		<1
133		9	16-18		<1
134		10	18-20		<1
135		11	20-22		<1
136		12	22-24		<1
137		MUD	22		<1
				K00000291	

LOCATION Overisel

Project Number 518917552-383 Report Date

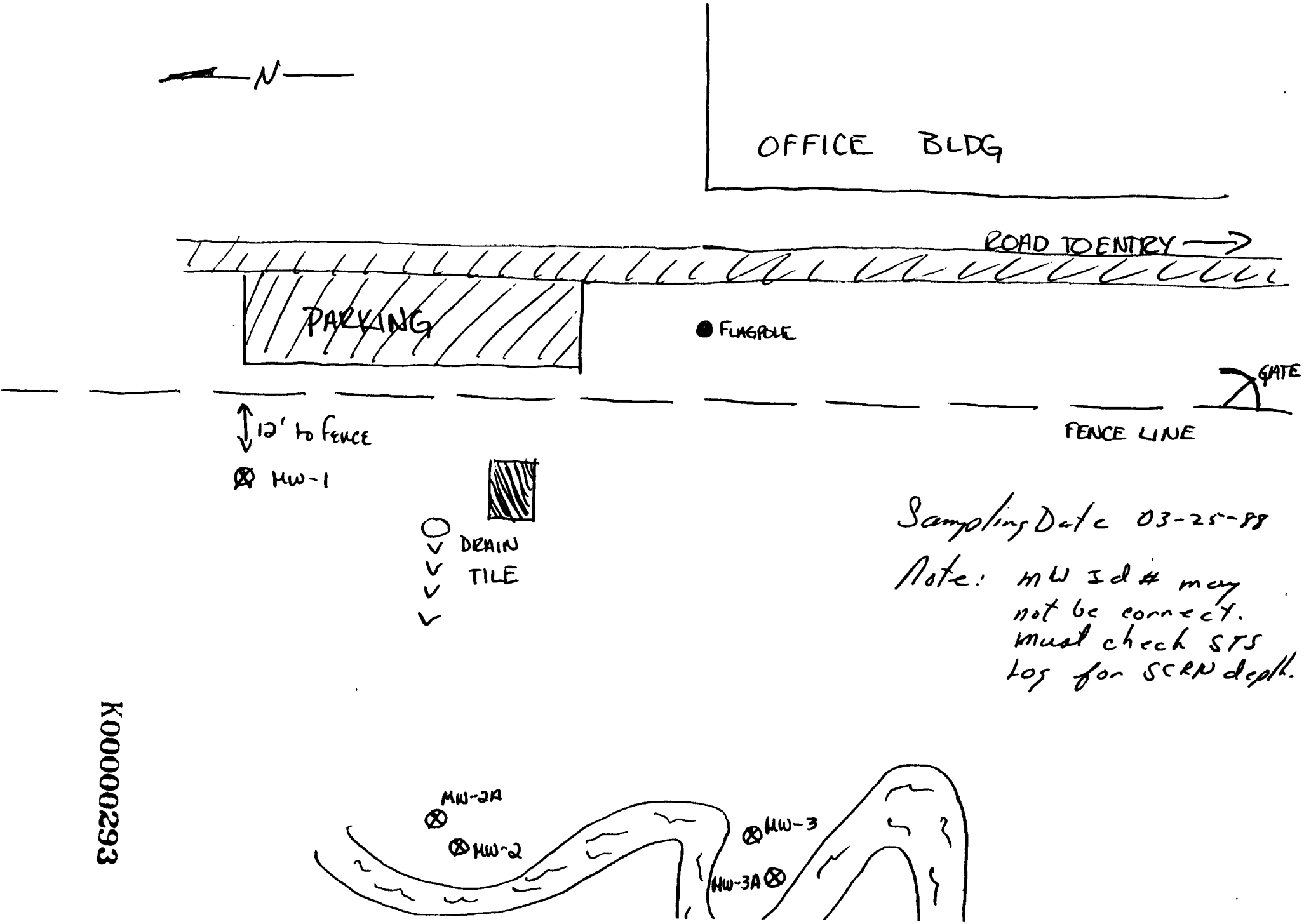
Borehole ID 8858-11

Sample Date 031688, 031788 Collected By STS

Received Date 031788 Analysis Number 1487, 1488

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-141	SB-11	1	2-4		5400
142		2	4-6		1
143		3	6-8		<1*
144		4	8-10		<1*
145		5	10-12		<1
146		6	12-14		78
147		7	14-16		<1
148		8	16-18		<1
149		9	18-20		<1
150		10	20-22		<1
151		11	22-24		<1
152		12	24-26		<1
153		13	26-28		<1
154		14	28-30		<1
155		mud	18-20		36
156		mud	24		10
157		mud	28		6
				K00000292	
	* Result <1	But Detected			

CNERIS COMPRESSOR STATION



Sampling Date 03-25-88

Note: MW Id # may not be correct. must check STS log for SCRN depth.

K00000293

3-29-88
M905.4
(13)

MONITORING WELL - DEPTH-TO-WATER MEASUREMENTS

LOCATION Overisel Compressor Station

DATE 25-Mar-88 PROJECT NUMBER 518817-552-48

WELL ID Number	Time	Trial - 1 Top-Of Casing (ft)	Trial - 1 Wetted Tape (ft)	Trial - 1 DWL (ft)	Trial - 2 Top-of Casing (ft)	Trial - 2 Wetted Tape (ft)	Trial - 2 DWL (ft)	SCRN Depth (ft)
MW-1	10:50a.	15.0	1.34	13.66	16.0	2.34	13.66	21.78
MW-2A	11:20a	4.0	1.00	3.00	5.0	2.00	3.00	23.15
MW-2	11:22a.	4.0	0.99	3.01	5.0	1.99	3.01	12.04
MW-3	11:45a.	4.0	1.05	2.95	5.0	2.05	2.95	11.50
MW-3A	11:47a.	3.0	1.13	1.87	4.0	2.13	1.87	18.37

Note: Measurements are taken to the nearest 0.01 ft.

Remarks: WEATHER: SUNNY & WARM

Note: mw Id # may not be correct — must check STS log for SCRN depth.

K00000294

Measurements Taken By JKH/MAH

Reviewed By HW Vogt Date 03-28-88

4-20-88
M905.4
(14)

To BW Rasher, P12-103

From HW Voigt, T-260 HWV

Date April 19, 1988

Subject OVERISEL COMPRESSOR STATION -

Monitoring Well Samples - PCB Results

cc

File Index #
518817-552-480

==========

On March 25, 1988 personnel from the Chemical Division of Laboratory Services completed Depth-To-Water (DWL) measurements and collected groundwater samples from 5 monitoring well installations at the Overisel Compressor Station. Water samples were analyzed for PCB concentration.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - Water samples were collected with a bailer after 2 gallons of water was removed.

PCB Analysis - EPA Method 608.

RESULTS

Control Number	Monitoring Well ID	Depth-To-Water (ft)	Bottom Of Screen (ft)	PCB * A-1254 ug/L
88480A	MW - 1	13.66	21.78	<0.53
88480B	MW - 2	3.01	12.04	<0.53
88480C	MW - 2A	3.00	23.15	<0.53
88480D	MW - 3	2.95	11.50	<0.53
88480E	MW - 3A	1.87	18.37	<0.53
88480F	Field Blank	NA	NA	<0.53

* Sample detection limit <0.53 ug/L, PCB as A-1254

K00000295

hlw

NERL COMPRESSOR STATION

N

OFFICE BLDG

ROAD TO ENTRY

PARKING

FLAGPOLE

GATE

FENCE LINE

12' to Fence

MW-1

DRAIN TILE

Sampling Date 03-25-88

Note: MW Id # may not be correct. must check STS log for SCRN depth.

MW-2A

MW-2

MW-3

MW-3A

K00000296

MONITORING WELL - DEPTH-TO-WATER MEASUREMENTS

LOCATION OVERISEL COMPRESSOR STATION

DATE 25-MAR-88 PROJECT NUMBER 518817-552-480

WELL ID Number	Time	Trial - 1 Top-Of Casing (ft)	Trial - 1 Wetted Tape (ft)	Trial - 1 DWL (ft)	Trial - 2 Top-of Casing (ft)	Trial - 2 Wetted Tape (ft)	Trial - 2 DWL (ft)	SCRN Depth (ft)
MW-1	10:50a.	15.0	1.34	13.66	16.0	2.34	13.66	21.78
MW-2A	11:20a	4.0	1.00	3.00	5.0	2.00	3.00	23.15
MW-2	11:22a.	4.0	0.99	3.01	5.0	1.99	3.01	12.04
MW-3	11:45a.	4.0	1.05	2.95	5.0	2.05	2.95	11.50
MW-3A	11:47a.	3.0	1.13	1.87	4.0	2.13	1.87	18.37

Note: Measurements are taken to the nearest 0.01 ft.

Remarks: WEATHER: SUNNY & WARM

Note: mw Id # may not be correct — must check STS log for SCRN depth.

K00000297

Measurements Taken By JKH/MAH

Reviewed By HW Vogt Date 03-28-88

COMPRESSOR STATION PCB CLEANUP

6-8-88
M905,4

(15)

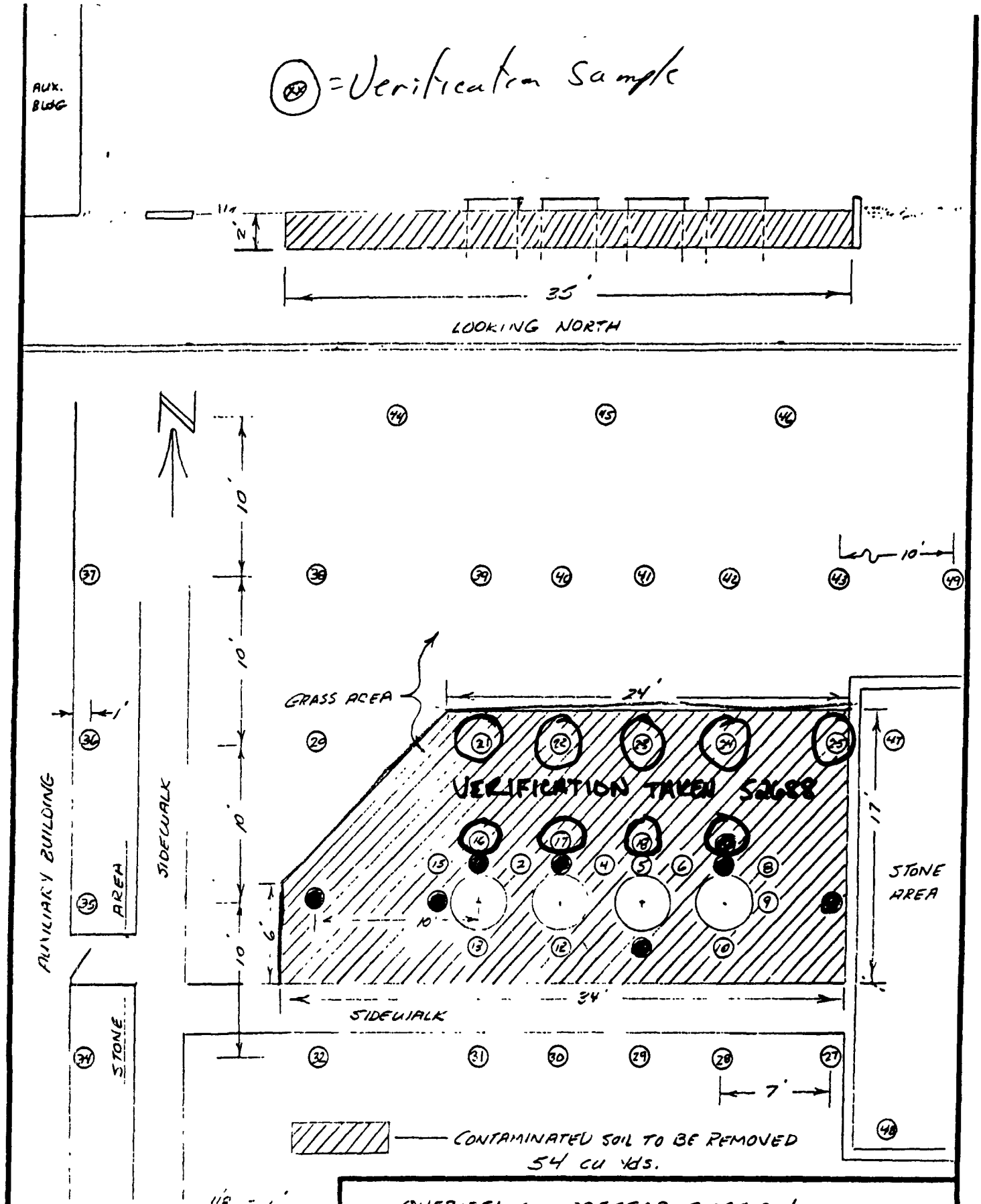
— Cleanup Verification Sampling —

STATION Ouachita

AREA Air Loss Excavation - North

SAMPLE DATE 052688 REPORT DATE 060188

Control Number	PCB mg/kg	Sample Location
88827-17	2	At Sample Point #16 (09-10-87)
18	5	#17
19	23	#18
20	32	#19
21	11	#21
22	3	#22
23	23	#23
24	10	#24
25	9	#25
		K00000298



OVERISEL COMPRESSOR STATION		
W.O. 3495	FILE NO.	AREA - AIR LOGS 5-3-88
CONSUMERS POWER CO. GAS P.& T. ENGINEERING	DR RLM / CK RLM / APP.	NO. 1 OF 3

K00000299

6-8-88
M405.4
(16)

COMPRESSOR STATION PCB CLEANUP
— Cleanup Verification Sampling —

STATION Overisel

AREA Emergency Generator Vent

SAMPLE DATE 052688 REPORT DATE 060188

Control Number	PCB mg/kg	Sample Location
88827-15	16	Surface — 2' from curb & 1½' from cooling fan pad
16	1	12' depth — 2' from curb & 1½' from cooling fan pad

K00000300

COMPRESSOR STATION PCB CLEANUP

6-8-88
M405.4

— Cleanup Verification Sampling —

(17)

STATION Overisel

AREA Fill Sand

SAMPLE DATE 052688 REPORT DATE 060188

Control Number	PCB mg/kg	Sample Location
88827-14	<1	Fill Sand

K00000301

6-30-88
M905.4

To BW Rasher, P12-103

From HW Voigt, T-260 HWV

Date June 27, 1988

Subject OVERISEL COMPRESSOR STATION

Monitoring Wells MW-4 and MW-4A

CONSUMERS POWER COMPANY (18)

CC

File Index No.
518817-552-965

==========

On June 25, 1988 personnel from the Laboratory and Field Technical Services Department - Chemical Division, completed depth-to-water measurements and water sample collection from the Overisel Compressor Station MW - 4 and MW - 4A monitoring well installations .

METHODS

Depth-To-Water Measurements - Wetted Tape Method.

Sample Collection - Water samples were collected at the well screen depth with a bailer.

PCB Analysis - Method 8080, SW846.

RESULTS

Monitoring Well ID	Depth-To-Water	Screen Depth	PCB, as A1254
Overisel	(ft)	(ft)	(ug/L)
MW - 4	2.60	11.7	17.1
MW - 4A	2.65	20.2	6.7

K00000302

hwv

7-19-88
M905.4

(19)

To BW Rasher, P12-103

From HW Voigt, T-260

Date July 18, 1988

Subject OVERISEL COMPRESSOR STATION -

Monitoring Well MW-4 and MW-4A PCB Results

cc

File Index #
528817-552-082

==========

On July 12, 1988 personnel from the Chemical Division of L&FTS completed Depth-To-Water (DWL) measurements and collected groundwater samples from MW - 4 and MW - 4A monitoring well installations at the Overisel Compressor Station. Water samples were analyzed for PCB concentration.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - The monitoring wells were pumped to a constant specific conductance and pH reading (20 gallons at one gallon per minute) and the water sample collected with a clean bailer. MW - 4 stabilized at a specific conductance of 390 umhos/cm and a pH of 7.5. MW - 4A stabilized at a specific conductance of 410 umhos/cm and a pH of 7.5.

PCB Analysis - EPA Method 608.

RESULTS

Control Number	Monitoring Well ID	Depth-To-Water (ft)	PCB * A1254 ug/L
88082-1	MW - 4	2.71	1.90
88082-2	MW - 4A	2.75	0.83
88082-3	Field Blank		<0.53
88082-4	Method Blank		<0.53

K00000303

* Sample detection limit <0.53 ug/L, PCB as A-1254

hwv

B RASHER
6-29-88
(20)

Overisel

#	Description	ppm PCBs	And #
[redacted]			
-827-47	Below Previous sample 88827-29 } SOILS	9	155
-48	" " " " -32 } SOILS	7	↓
# SP#			
-946-1	Drip Sample - Aux. Bldg, Emergency Gen. Starting Motor - Lube Bowl	12	1554
-2	" - " " " " Starting Air - Blowdown	< 5	
-3	" - " " Compressor #1 Blowdown	430	
-4	" - " " " #2 Blowdown	< 5	
-5	" - " " Air Receiver tank Blowdown	170	
-6	" - " " Outlet filter - Inst. Air dryer	330	
-9	" - " " Condensate Blowdown at Air Logs	< 5 (3)	
-10	" - Compressor Building Engine Room / Inlet condensate Blowdown under grating	< 5	
-12	" - Starting air engine #1	< 5	
-18	" - Starting air engine #4	> 1200	
-23	" - Engine pre-lube pump #1	> 17500	↓

K00000304

B. RASHER

OVERISEL COMPRESSOR STATION
SUMMARY OF OIL SYSTEM COLLECTION POINTS
(PCE CONCENTRATION)

RECIPROCATING ENGINES

ENGINE	—	NO. 1	NO. 2	NO. 3	NO. 4
STARTING AIR	—	SP-12 (ST) < 5	SP-14 (NS)	SP-16 (NS)	SP-18 (ST) 1200+
CONTROL PANEL INST AIR	—	SP-11 (NS)	SP-13 (NS)	SP-15 (NS)	SP-17 (N
TURBINE BY-PASS INST. AIR	—	SP-22 (NS)	SP-21 (NS)	SP-20 (NS)	SP-19 (N
ENGINE PRE-LUBE PUMP	—	SP-23 (ST) 17,500 +	SP-25 (NS)	SP-27 (NS)	SP-29 (N
TURBINE PRE-LUBE PUMP	—	SP-24 (NS)	SP-26 (NS)	SP-28 (NS)	SP-30 (NS

SAMPLES TAKEN 6/21 AND 6/22

SP-NO. - SAMPLE POINT NO.
ST - SAMPLE TAKEN
NS - NO SAMPLE

K00000305

3. MISCELLANEOUS

AUXILIARY BUILDING		
EMERGENCY GENERATOR		
STARTING MOTOR - LUBE BULB	SP-1 (ST)	12
STARTING AIR - BLOWDOWN	SP-2 (ST)	< 5
COMPRESSOR NO. 1 - BLOWDOWN	SP-3 (ST)	430
COMPRESSOR NO. 2 - BLOWDOWN	SP-4 (ST)	<5
AIR RECEIVER TANK - BLOWDOWN	SP-5 (ST)	170
OUTLET FILTER - INST AIR DRIER	SP-6 (ST)	330
HOUSE AIR		
NEAR WALK-IN DOOR, WEST SIDE AUX BLDG.	SP-7 (NS)	
NEAR WALK-IN DOOR, SOUTH END OF SHOP	SP-8 (NS)	
OUTSIDE		
CONDENSATE BLOW DOWN AT AIR LOCK	SP-9 (ST)	3
COMPRESSOR BUILDING		
INLET CONDENSATE BLOW-DOWN (UNDER GRATING)	SP-10 (ST)	<5
CRANE		
EXHAUST FILTER (LARGE	SP-31 (NS)	
EXHAUST FILTER (SMALL)	SP-32 (NS)	
HOUSE AIR		
S.E CORNER OF BUILDING	SP-33 (NS)	
N.E. CORNER OF BUILDING	SP-34 (NS)	
INSTRUMENT AIR		
SIGNAL SUPPLY (MAIN CONTROL PANEL)	SP-35 (NS	
YARD AREA		
SALEM FIELD REGULATORS		
WEST	SP-36 (NS)	
MIDDLE	SP-37 (NS)	
EAST	SP-38 (NS)	
OVERISEL FIELD REGULATORS		
WEST	SP-39 (NS)	
MIDDLE	SP-40 (NS)	
EAST	SP-41 (NS)	
FIELD SCRUBBERS (FROM WEST TO EAST)		
NO 1	SP-42 (NS)	
NO. 2	SP-43 (NS)	
NO 3	SP-44 (NS)	
NO 4	SP-45 (NS)	

K00000306

B. MISCELLANEOUS (CONTINUED)

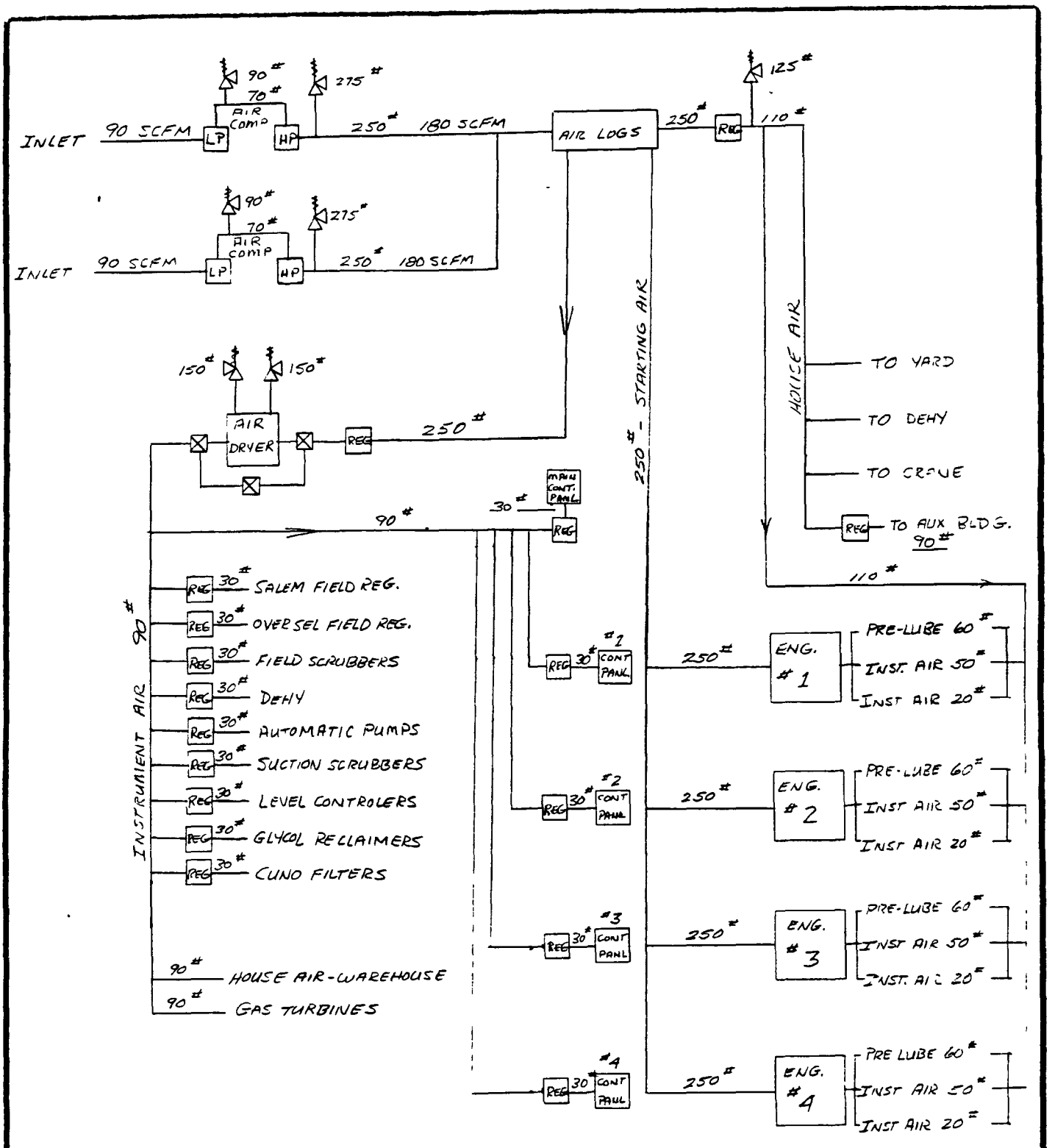
YARD AREA

AUTOMATIC DUMPS	
WEST	SP-46 (NS)
MIDDLE	SP-47 (NS)
EAST	SP-48 (NS)
AUTOMATIC SALEM DUMP	SP-49 (NS)
HOUSE AIR - #2 LIGHT POLE	SP-50 (NS)
AUTOMATIC DUMP - SUCTION SCRUBBERS	
WEST	SP-51 (NS)
EAST	SP-52 (NS)
NORTH HOUSE AREA - DEHY AREA	SP-53 (NS)
LEVEL CONTROLER - GLYCOL BOILER	
NORTH	SP-54 (NS)
SOUTH	SP-55 (NS)
GLYCOL RECLAIMER - ELECTRONIC CONTROL	SP-56 (NS)
NORTH CUNO FILTER	
WEST	SP-57 (NS)
EAST	SP-58 (NS)
HOUSE AIR - EAST SIDE OF WAREHOUSE (INSIDE)	SP-59 (NS)

C. GAS TURBINES

INSTRUMENT AIR	
NO 6 TURBINE	SP-60 (NS)
NO. 7 TURBINE	SP-61 (NS)

K00000307



K00000308

OVERISEL COMPRESSOR STATION	
WO 3495	FILE NO.
COMPRESSED AIR SYSTEM	6/24/88
CONSUMERS POWER CO. GAS P. & T. ENGINEERING	DR RLM / CK RLM / APP. / NO. 4

21

STS Consultants Ltd.
Consulting Engineers

Subsurface Exploration at the Overisel Compressor Station Hamilton, Michigan

Consumers Power Company

REPORT

K00000309

7-29-88
M905.4

STS Consultants Ltd.
Consulting Engineers

3340 Ranger Road
Lansing, Michigan 48906
(517) 321-4964

July 28, 1988

Mr. Bruce W. Rasher
Consumers Power Company
1945 West Parnall Road
Jackson, MI 49201

RE: Subsurface Exploration at the Overisel Compressor Station, Hamilton, Michigan
Consumers Power Company, P.O. No. CP13-5422

Dear Mr. Rasher:

STS Consultants, Ltd. is pleased to enclose three copies of the final report for the above referenced project. Included in this document is a description of the problem, the explorations performed, and our conclusions.

If you have any questions, please do not hesitate to call.

Sincerely,

STS CONSULTANTS, LTD.

Dianne D. Borrello

Dianne D. Borrello, E.I.T.
Assistant Project Engineer

Bernard B. Sheff/CAB

Bernard B. Sheff, P.E.
Senior Project Engineer

Timothy Dahlstrand/LCH

Timothy K. Dahlstrand, P.E., C.P.G.S.
Vice President

DDB/cab DDB3 #12

STS Project No. 1151XH

K00000310

Report

roject

Subsurface Exploration at the
Overisel Compressor Station
Hamilton, Michigan

lient

Consumers Power Company
1945 West Parnall Road
Jackson, Michigan 49201

Project # 1151XH

Date July 28, 1988

STS Consultants Ltd.
Consulting Engineers

3340 Ranger Road
Lansing, Michigan 48906
(517) 321-4964

K00000311

TABLE OF CONTENTS

	Page No.
PROJECT OVERVIEW	1
FIELD PROCEDURES	2
Drilling and Sampling	2
Equipment Decontamination	4
Surveying	4
Water Sampling	4
LABORATORY TESTING PROCEDURES	5
SOIL AND GROUNDWATER CONDITIONS	6
Regional Geology	6
Site Geology	6
Hydrogeology	6
EXPLORATION RESULTS	9
Analytical Results	9
Excavation Volumes	14
Recommendations	14
GENERAL QUALIFICATIONS	15
REFERENCES	16

TABLES

Table 1 - Groundwater Elevations	8
Table 2 - Estimated Excavation Volumes	14

FIGURES

Figure 1 - PCB Contour, Surface Concentration	10
Figure 2 - PCB Contour, Concentration at 1 foot Depth	11
Figure 3 - Envelope of PCB Detections	13

TABLE OF CONTENTS, CONTINUED

APPENDICES

Appendix A - Soil Boring Logs
Well Installation Diagrams
Standard Method ASTM D-1586
Unified Soil Classification System
Field and Laboratory Procedures

Appendix B - Consumer Power Company Analytical Data
Grain Size Analysis
Permeability Analysis

Appendix C - Boring Location and Monitoring Well Location Diagram

PROJECT OVERVIEW

The Overisel Compressor Station is located in Section 27 of Overisel Township, Michigan. Within the facility, air compressors are periodically operated. The discharge from the air compressors passed through floor drains to an oil/water separator and then discharged to the ground surface in the area known as the discharge pit. The discharge pit is located in the low lying area adjacent to Busscner Drain on the east bank. This drain discharges to the Little Rabbit River which in turn connects to the Kalamazoo River and Lake Michigan. The owner has identified that the condensate discharge is the source of the PCB contamination.

The Compressor Station began operation in October, 1959.

The chemical source of the PCB contamination is believed to be a Monsanto oil product, Pydraul A.C., supplied by Mobil Co. and used in the air compressors from 1963 until approximately 1965. According to Monsanto, Pydraul A.C. is 57% PCB (Aroclor 1254) in combination with either mineral oil or phosphate ester oil with a specific gravity believed to range between 1.09 to 1.18. After 1965, until January, 1986, Pyroguard 53 was used for lubrication. This is a phosphate ester oil which does not contain PCBs; however, it is again heavier than water. In February 1987, all condensate discharge was terminated. Other discharges into the effluent system included water softener overflows and rainwater. Available records suggest that a maximum of one 55 gallon drum of Pydraul A.C. may have been used at this site.

The purpose of this report is to describe the field explorations performed to determined the horizontal and vertical extent of PCB contamination of which, the STS exploration was limited to the outfall area. The work was performed under Consumers Power Company Purchase Order No. CP-13-5422.

FIELD PROCEDURES

The field exploration procedures for this project were divided into two segments, drilling and surveying. Prior to the initiation of any field work, a site safety plan was developed by STS for on-site STS personnel. Since we anticipated that personnel would be exposed to PCBs on the ground surface as well as during the drilling operations, personnel protection was provided in the form of Saranex suits, protective inner and outer gloves, over-boots, and particulate respirators. A site safety engineer was assigned to the project to observe any changed conditions or conditions which could impact personnel health and safety which may arise. Personnel assigned to this project participate in the STS Consultants' health screening program.

Drilling and Sampling

Using information previously compiled by Consumers Power Company, a drilling, sampling, and monitoring well installation program was initiated. Drilling was performed with a two man drill crew supervised by a field engineer. An all-terrain CME-45 drill rig was used to perform a total of eighteen (18) soil borings to collect discrete soil samples and to enable the installation of monitoring wells in five of the borings. The borings were advanced using hollow stem augers to depths ranging from 10 to 20 feet. In most cases, the hollow stem augers could not be advanced deeper than 18 feet due to the common problem of unbalanced water pressure, causing sand to move up inside the auger. Therefore, in the deeper borings, 24 to 30 feet deep, hollow stem augers were advanced to depths ranging from 14 to 20 feet and the remainder of the borehole was advanced using rotary drilling methods. In this technique, a rotary bit is advanced and bentonite mud is used to remove the soil cuttings and to hold the borehole open. In boring 88SB-7, potable water rather than bentonite mud was added inside the auger from 18 to 20 feet. Samples of the drilling fluid were collected at approximately 5 foot intervals to monitor for PCB contamination in the fluid.

Soil samples were obtained using the split barrel sampling procedure, in general accordance with ASTM specification D-1586. A brief description of this procedure is included in Appendix A. A clear plastic liner insert was placed into the split spoon and the recovered soil sample was retained in that liner. The soils were visually classified by the field engineer. The liner was sealed, and then marked for vertical orientation and sample location. The bottom 3 inches of each sample was delivered to Consumers Power Company for PCB analysis. The remainder of the sample was stored on site. All boreholes were grouted with bentonite/cement grout to the surface upon completion.

Seven monitoring wells were also installed at the site. The monitoring wells were constructed of 2 inch diameter galvanized steel stand pipe with 5 foot stainless steel screens. The well screen was placed into the water table, approximately 5 to 8 feet in monitoring wells 88MW-1, 88MW-2, 88MW-3, 88MW-4 and 18 to 20 feet in monitoring wells 88MW-2A, 88MW-3A and MW-4A. The shallow monitoring wells were installed utilizing the hollow stem augers. The deeper wells were installed with rotary methods using potable water. A bentonite pellet seal was placed above the well screen. The remaining borehole annulus was grouted to the surface and a locking protector pipe installed. The wells were not developed.

Upon completion of the drilling operations, select soil samples were returned to the STS office in Lansing, Michigan for further examination by an engineer. This examination noted color, major and minor soil components, degree of saturation, presence of organics, and whether the material appeared to be natural or fill. All soils were classified on the basis of texture and plasticity, and grouped in accordance with the Unified Soil Classification System. A brief explanation of the Unified Soil Classification System is enclosed in Appendix A. Estimated group symbols, according to this system of classification, are shown in parentheses following the soil descriptions on the soil boring logs. Boring logs and well installation diagrams are enclosed in Appendix A. Stratification lines indicated on the boring logs are approximate; in-situ, the transition between soil types in both the vertical and horizontal directions may be gradual.

Equipment Decontamination

During drilling and sampling, care was taken to minimize the possibility of PCB contamination between samples and between borehole locations. Between samples, the split spoon sampler was washed with soap and water to remove any residual soil. The sampler was then rinsed with water, hexane, and finally, water. The new plastic liners were stored off site until they were needed. This sampler decontamination procedure has been successfully used on other PCB exploration projects.

Between boreholes, drilling augers, drill rods and drilling equipment were cleaned with a portable power washer. Soil was removed from drilling equipment with brushes, as needed.

Surveying

The locations and elevations of all borings, wells, and sampling points were determined by STS field crews. The well elevations are referenced to the plant datum, utilizing the base line monument located northwest of the auxiliary building on the ground along the west fence, as shown on the enclosed drawing. The recorded elevation of this benchmark is 115.30 feet (Consumers Power Co., Overisel site datum). Boring and well locations are referenced to plant features and coordinated with the grid indicated on the drawing enclosed in Appendix C.

Water Sampling

On March 25, 1988, Consumers Power Company personnel obtained groundwater samples from MW-1, MW-2, MW-2A, MW-3 and MW-3A. Prior to sampling, two (2) gallons of water were removed from each well with a bailer. Monitoring wells 88MW-4 and 88MW-4A were sampled on June 25, 1988 and July 12, 1988. The wells were not developed prior to sampling on June 25, 1988. On July 12, 1988, the wells were pumped to a constant specific conductance and ph and a total of 20 gallons of water was removed from each well prior to sampling. Samples were returned to Consumers Power Company for analysis.

LABORATORY TESTING PROCEDURES

All PCB analyses for this project were performed by the laboratories of Consumers Power Company using Gas Chromatography - Electron Capture Detector (GC-ECD) techniques. On soil samples, the analytical detection limit was 1 mg/kg. For water samples, the detection limit was 0.53 ppb (EPA Method 608).

A limited soil testing program was performed by STS Consultants which consisted of permeability analysis on two samples and grain size analysis on two samples. In summary, the vertical soil permeability was found to be 3.7×10^{-3} cm/sec. for sample 88SB-1, S-5 (8-10 feet) and 5.7×10^{-4} cm/sec. for sample 88SB-11, S-12 (24-26 feet).

Copies of all laboratory data results are enclosed in Appendix B.

SOIL AND GROUNDWATER CONDITIONS

Regional Geology

The regional subsurface conditions of the Overisel Compressor Station are predominantly the result of the Wisconsinan Age glaciation from the Lake Michigan Ice Lobe. Surficially, glacial lake deposits of fine to coarse sand are the predominant soil with localized sand and gravel deposits associated with kame fields and outwash deposits. To the north is a clay rich till ridge, the "Covert Ridge", which is part of the Lake Border Moranic System. Shale bedrock of the Mississippian Coldwater formation is found at depths from 100 to 150 feet in the vicinity of the Overisel Compressor Station (Reference 1).

Site Geology

STS performed a total of eighteen (18) borings at the Overisel Compressor Station to depths up to 30 feet. Soils encountered were fine sands with trace amounts of medium sand, silt, and gravel, which grade to fine sands with trace amounts of silt at depth.

Hydrogeology

During the drilling and sampling operations, STS personnel noted the depth of the groundwater table. These field observations are noted on the enclosed boring logs. A groundwater table was encountered in all borings at a shallow depth, generally within several feet of the ground surface.

As previously stated, seven (7) monitoring wells were installed, three of which 88MW-1, 88MW-2, and 88MW-3 were used to estimate horizontal groundwater flow direction. The two additional wells, 88MW-2A and 88MW-3A, were utilized in conjunction with 88MW-2 and 88MW-3, respectively, to estimate vertical gradients of groundwater flow. Depth to groundwater was measured in each well and the groundwater

elevation was determined. Table 1 summarizes the groundwater elevations. The groundwater contours on the enclosed drawing, located in Appendix C, show a gradient of approximately 0.013 feet/feet to the southwest. The groundwater contours remain essentially the same for other monitoring dates.

In a vertical direction, groundwater flow gradients vary between +0.08 in the 88MW-3 and 88MW-3A pair to +0.03 in the 88MW-2 and 88MW-2A pair. These gradients are very small and approaching the limit of accuracy of the measurement technique. However, the presence of the vertical upward gradients suggest the Busscner Drain is a discharge area. It is possible that gradient reversals could occur during flood conditions.

The rate of groundwater flow can be estimated using the average hydraulic conductivity, hydraulic gradient and porosity. Based on the March 17, 1988 gradient, an average hydraulic conductivity of 6 ft/day (2.12×10^{-3} cm/sec), and an assumed porosity of 30%, the estimated horizontal groundwater velocity is approximately 96 feet per year. However, it should be recognized that this rate can vary with water surface fluctuations and changes of season.

TABLE 1
Groundwater Elevations

	Elevation*		3-17-88		3-25-88		7-12-88	
Monitoring Well	Top of Stand Pipe	Ground Surface	Depth to Water, ft.	Elevation of Groundwater	Depth to Water, ft.	Elevation of Groundwater	Depth to Water, ft.	Elevation of Groundwater
88MW-1	116.80	114.35	13.54	103.26	13.66	103.14	---	---
88MW-2	105.02	103.00	2.98	102.04	3.01	102.01	---	---
88MW-2A	105.33	103.50	2.92	102.41	3.00	102.33	---	---
88MW-3	104.43	102.34	2.98	101.45	2.95	101.48	---	---
88MW-3A	104.08	101.88	1.83	102.25	1.87	102.25	---	---
88MW-4	104.11	101.60	---	---	---	---	2.71	101.40
88MW-4A	104.30	101.56	---	---	---	---	2.75	101.55

K00000321

EXPLORATION RESULTS

The intent of the field explorations performed was to estimate the vertical and horizontal extent of PCB contamination in the area of the outfall discharge pipe. The following paragraphs discuss our findings.

The outfall at the Overisel Compressor Station consists of a 12 inch diameter concrete pipe discharge to the ground surface. It was designed to serve as an overflow for the oil/water separator system. At the discharge, an erosion pit has formed over the years and contains standing water.

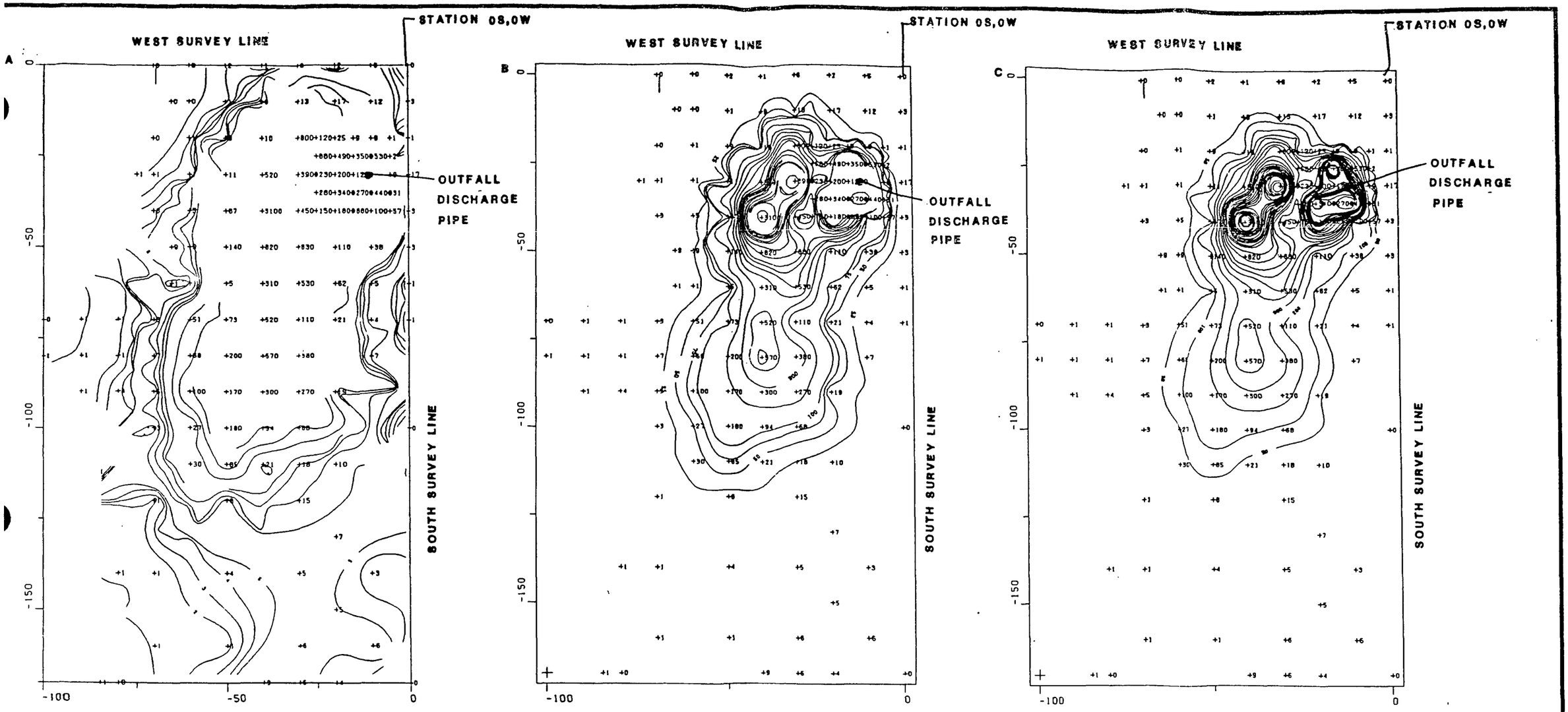
Consumers Power Company conducted an initial exploration for PCB contamination. The exploration included obtaining 131 surface samples and 87 samples from a depth of one foot and analyzing the samples for the presence of PCB.

To obtain more information on PCB distribution, eighteen (18) borings were laid out and performed by STS. The borings were extended as deep as 30 feet. A continuous sampling procedure was utilized in which soils were collected in two foot sections. In general, PCB analysis was performed on the bottom three inch portion of each sample interval. A total of 144 PCB analyses were completed on the soil samples. All Consumers Power Company data, including the initial exploration results, is enclosed in Appendix B.

Analytical Results

In order to organize and present the PCB data, contour maps of PCB concentrations versus depth were prepared for the surface and 1 foot sampling depth shown in Figures 1 and 2. This data suggests the following:

- Figure 1 (surface samples) show that when contoured at 1 ppm, the lateral extent of PCB is not completely defined. However, at limits of 25 ppm and 50 ppm, the zones of surface PCB contamination are defined.



CONTOUR INTERVALS

A - 1 PPM FOR CONCENTRATIONS OF 1 PPM TO 5 PPM
5 PPM FOR CONCENTRATIONS OF 10 PPM TO 25 PPM
25 PPM FOR CONCENTRATIONS OF 25 PPM TO 100 PPM

B - 25 PPM FOR CONCENTRATIONS OF 25PPM TO 100 PPM
100 PPM FOR CONCENTRATIONS OF 100 PPM TO 4000 PPM

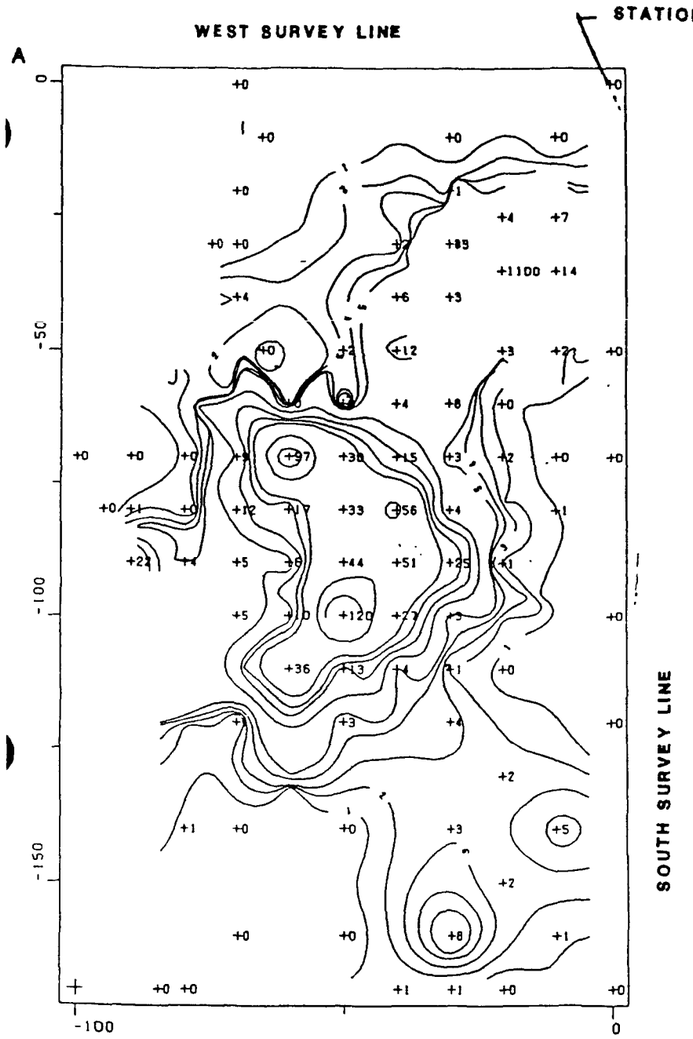
C - 50 PPM FOR CONCENTRATIONS OF 50 PPM TO 100 PPM
100 PPM FOR CONCENTRATIONS OF 100 PPM TO 4000 PPM

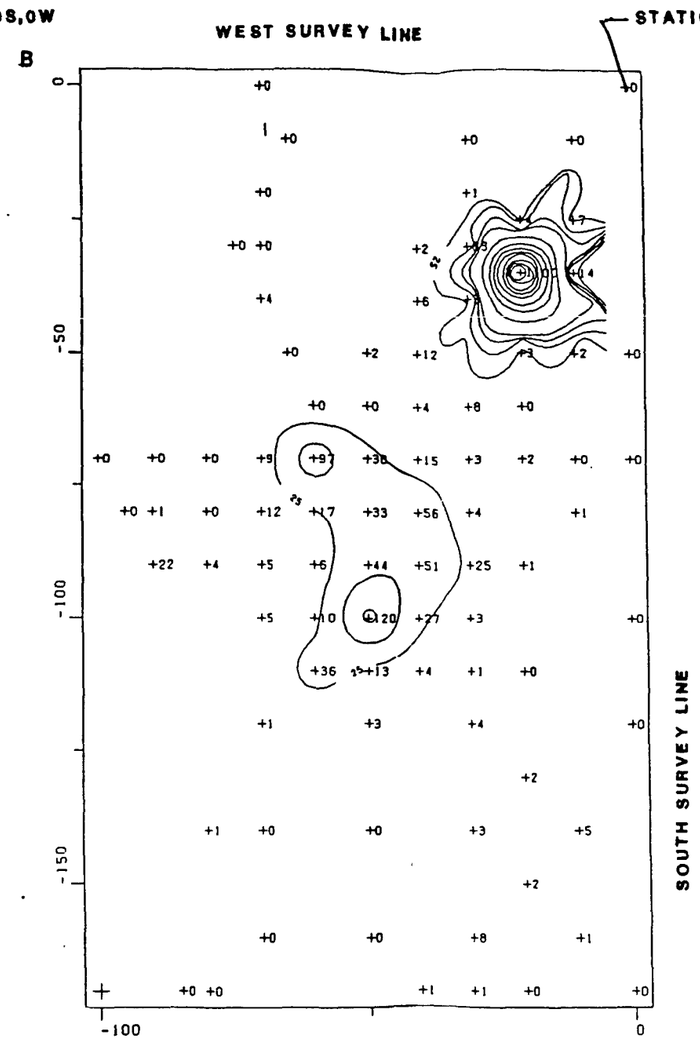
STS Consultants Ltd.
Consulting Engineers

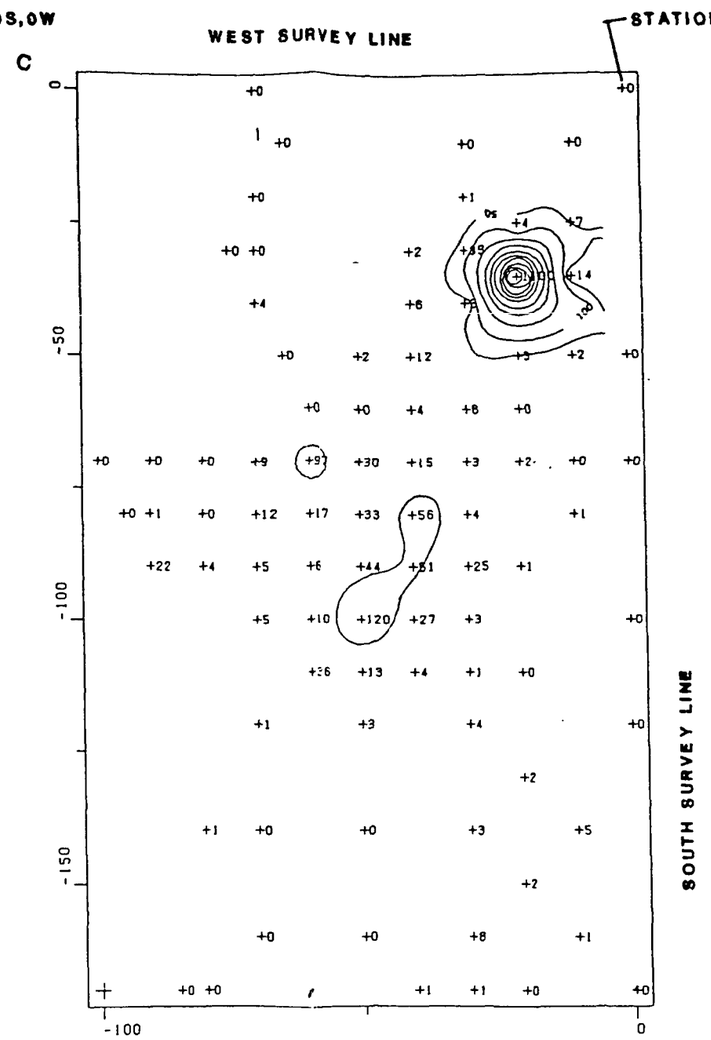
PCB CONTOUR
SURFACE CONCENTRATION
OVERISEL GAS COMPRESSOR STATION
HAMILTON, MICHIGAN
CONSUMERS POWER CO.

DRAWN BY	DATE	SCALE	STS PROJECT NO
DLG	4/14/88	1"=28'	1151XH
CHECKED BY	DATE	SHEET NO.	STS FILE NO
BBS	4/18/88	1	

K00000323







CONTOUR INTERVALS

A - 1 PPM FOR CONCENTRATIONS OF 1 PPM TO 5 PPM
5 PPM FOR CONCENTRATIONS OF 10 PPM TO 25 PPM
25 PPM FOR CONCENTRATIONS OF 25 PPM TO 100 PPM

B - 25 PPM FOR CONCENTRATIONS OF 25 PPM TO 100 PPM
100 PPM FOR CONCENTRATIONS OF 100 PPM TO 4000 PPM

C - 50 PPM FOR CONCENTRATIONS OF 50 PPM TO 100 PPM
100 PPM FOR CONCENTRATIONS OF 100 PPM TO 4000 PPM

STS Consultants Ltd.
Consulting Engineers

PCB CONTOUR
CONCENTATION AT 1 FOOT DEPTH
OVERISEL GAS COMPRESSOR STATION
HAMILTON, MICHIGAN
CONSUMERS POWER CO.

DRAWN BY	DATE	SCALE	STS PROJECT NO
DLG	4/14/88	1"=28'	1151XH
CHECKED BY	DATE	SHEET NO	STS FILE NO
BBS	4/18/88	2	

K00000324

- The principal concentrations of surface PCB are in the immediate vicinity of outfall pit with a tongue extending south and slightly west to a very slight topographic depression.

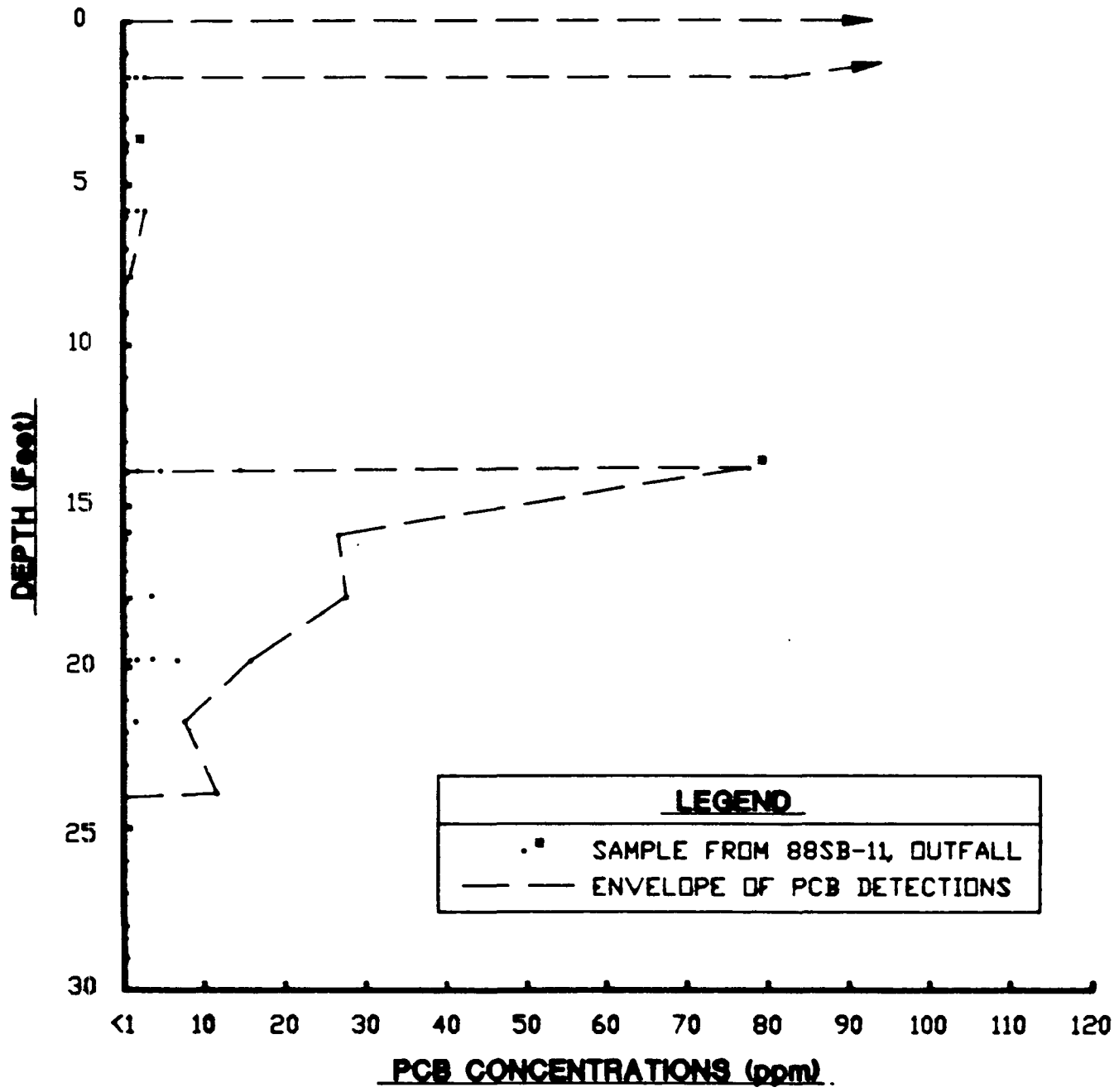
- Figure 2 (1 foot samples) nearly closes on the 1 ppm contour. The 25 ppm and 50 ppm contours close in small areas.

- The principal 1 foot deep PCB concentrations are in the immediate vicinity of the outfall pit and an area about 50 feet to the southeast.

The envelop of PCB detections (based on 11 soil borings and 7 wells) with depth is shown in Figure 3. This figure shows the surface concentration of PCB extending as deep as 2 feet with, in general, a decrease in concentration and occurrence. A second zone of PCB detects is in the 6 to 8 foot depth range, but their concentrations do not exceed 3 ppm. A broader zone of PCB is in the 14 to 24 foot zone. The PCB concentrations are mostly below 10 ppm, but go as high as 78 ppm (from directly below the outfall). Between these zones, PCB was not detected in soil samples (to a detection limit of 1 ppm).

Water samples from the seven monitoring wells were analyzed. PCB was not detected in monitoring wells 88MW-1, 88MW-2, 88MW-2A, 88MW-3 and 88MW-3A, to a detection limit of 0.53 ppb. The first set of water samples taken from monitoring wells 88MW-4 and 88MW-4A on June 25, 1988 were considered to be unreliable since the wells were not developed prior to sampling. The second set of water samples taken on July 12, 1988 were found to contain 1.9 ppb and 0.83 ppb PCB (Alochlor 1254) in monitoring wells MW-4 and MW-4A, respectively.

The soil sampling and analysis completed to date has defined the surface PCB contamination to a 25 ppm boundary. With depth the lateral extent of PCB contamination is limited. An outer limit is approximately defined by 88SB-9, 88MW-3A, 88MW-2A, 88SB-10 and the outfall area.



K00000326

STS Consultants Ltd.
Consulting Engineers

ENVELOPE OF PCB DETECTIONS
OVERISEL GAS COMPRESSOR STATION
HAMILTON, MICHIGAN
CONSUMERS POWER COMPANY

DRAWN BY	CJD	7\88
CHECKED BY	TKD	7\88
APPROVED BY	BBS	7\88
SCALE NTS	FIGURE NO. 3	
STS DRAWING NO. 11151X1-HGR		

Excavation Volumes

Based on the surface and 1 foot sample depth data, we have developed estimates of soil volumes to be excavated for cleanup levels of 1 ppm, 25 ppm, and 50 ppm. It should be recognized that data gaps exist in the PCB data for a 1 ppm limit. Our volume calculations assume the maximum excavation depth to be about 2 feet deep (or to the water table). Volumes have been computed as in-place, expanded to truck volumes and then a 15% contingency has been added.

TABLE 2
Estimated Excavation Volumes
Surface and 1 Foot Deep PCB Contamination

Cleanup Level	Estimated Truck Volume yd^3	Contingency	Estimated Total yd^3
50 ppm	160	15%	184
25 ppm	200	15%	230
10 ppm	260	15%	300*
1 ppm	520	15%	600*

* Value is a rough estimate, lateral extent of PCB at 1 ppm has not been completely defined.

Recommendations

It is suggested that monitoring wells MW-4 and MW4A be redeveloped and resampled to document the presence of PCB in the groundwater. If PCB contamination in the groundwater is confirmed in monitoring wells MW-4 and MW-4A, it is recommended that another set of monitoring wells be placed further down gradient.

GENERAL QUALIFICATIONS

The analysis contained in this report presents the initial exploration of PCB contamination at the Overisel Compressor Station. Data used for this report was obtained by STS, and data was also provided to STS by Consumers Power Company. As identified in the report, some data gaps exist, which may necessitate further study. This report represents our judgment and opinions. No warranty, either expressed or implied, is contained herein.

REFERENCES

1. Moaghan, G.W. and Larson, G.J., "The Glacial Geology of Kalamazoo County, Michigan", Department of Geological Sciences, Michigan State University (In Press), 1984.

APPENDIX A

Soil Boring Logs

Well Installation Diagrams

Standard Method ASTM D-1586

Unified Soil Classification System

Field and Laboratory Procedures

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88MW-1
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50) / STANDARD PENETRATION BLOWS/FT (10 20 30 40 50)
						SURFACE ELEVATION 114.4'		
						Drilled without sampling to 15.0'		
2.5'								
5.0'								
7.5'								
10.0'								
12.5'								
15.0'								
		1	PL			Fine sand, trace medium sand and silt-brown-loose to medium dense-saturated. (SP)	<1	18
17.5'		2	PL				<1	6
20.0'								
						END OF BORING Boring advanced to 20.0' using hollow stem auger. Monitoring Well installed. See enclosed Well Installation Diagram.		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS OR WD	BORING STARTED	STS OFFICE	
	13.5' WD	03-04-88	Lansing, MI	
WL BCR	ACR	BORING COMPLETED	DRAWN BY	SHEET NO. OF
		03-04-88	DH	1 1
WL		RIG FOREMAN	APP'D BY	STS JOB NO.
		RC CME-45	BBS	1151XH

BL 3-0687

K00000331

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88MW-2
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5)	PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50)	STANDARD PENETRATION BLOWS/FT (10 20 30 40 50)
					SURFACE ELEVATION 103.0'				
					Drilled without sampling to 7.0'.				
2.5'									
5.0'									
7.5'	1	PL			Fine sand, trace medium sand, silt and gravel-gray to dark gray-medium dense-saturated. (SP)	<1			17
10.0'	2	PL				<1			13
11.0'					END OF BORING Boring advanced to 11.0' using hollow stem auger. Monitoring Well installed. See enclosed Well Installation Diagram.				

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS OR WD	BORING STARTED	STS OFFICE	
	3.0' WD	03-07-88	Lansing, MI	
WL BCR ACR		BORING COMPLETED	DRAWN BY	SHEET NO OF
		03-07-88	DH	1 1
WL		RIG FOREMAN	APP'D BY	STS JOB NO.
		RC CME-45	BBS	1151XH

BL:3-0687

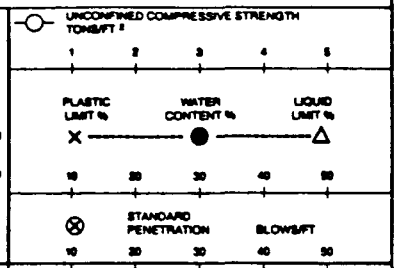
K00000332

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88MW-2A
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 103.5'	
						Drilled without sampling to 16.0'.	
2.5'							
5.0'							
15.0'							
		1	PL			Fine sand, trace medium sand and silt-grayish brown-medium dense to dense-saturated. (SP)	<1
17.5'							
		2	PL				<1
20.0'							
21.0'						END OF BORING Boring advanced to 21.0' using hollow stem auger. Monitoring Well installed. See enclosed Well Installation Diagram.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL.

WL 3.0' WD (WS OR WD)	BORING STARTED 03-11-88	STS OFFICE Lansing, MI	
WL (BCR / ACR)	BORING COMPLETED 03-11-88	DRAWN BY DH	SHEET NO. 1 OF 1
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO. 1151XH

BL:3-0687

K0000333

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88MW-3
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

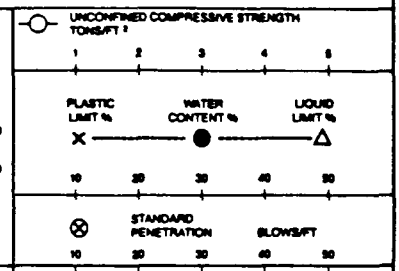
SITE LOCATION: Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 102.3'	
						Drilled without sampling to 6.0'.	
2.5'							
5.0'							
		1	PL			Fine sand, trace medium sand and silt-brown-very loose to loose-saturated. (SP)	<1
7.5'							
		2	PL				
10.0'		2A	PL			Fine sand, trace silt-light brown-loose-saturated. (SP)	<1

END OF BORING

Boring advanced to 10.0' using hollow stem auger.

Monitoring Well installed. See enclosed Well Installation Diagram.



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL 3.0' WD (WS OR WD)	BORING STARTED 03-14-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-14-88	DRAWN BY DH	SHEET NO. 1 OF 1
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO. 1151XH

BL-3-0687

K00000334

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88MW-3A
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

SURFACE ELEVATION 101.9'

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5)	PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50)	STANDARD PENETRATION BLOWS/FT (10 20 30 40 50)
						Drilled without sampling to 16.0'.				
2.5'										
5.0'										
15.0'										
		1	PL			Fine sand, trace silt-grayish brown-very loose to loose-saturated. (SP)	<1	5		
17.5'										
		2	PL				<1	24"		
20.0'										
						END OF BORING Boring advanced to 20.0' using hollow stem auger. Monitoring Well installed. See enclosed Well Installation Diagram.				

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

WL	WS OR WD	BORING STARTED	STS OFFICE	
	2.0' WD	03-16-88	Lansing, MI	
WL BCR	ACR	BORING COMPLETED	DRAWN BY	SHEET NO OF
		03-16-88	DH	1 1
WL		RIG FOREMAN	APP'D BY	STS JOB NO
		RC CME-45	BBS	1151XH

IL.3-0687

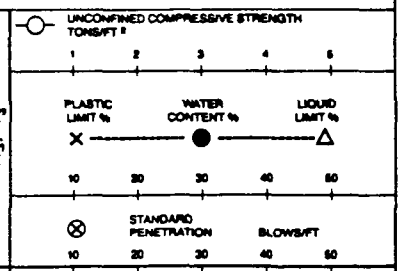
K00000335

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88MW-4
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 101.60'	
						Drilled to 5.0 feet without sampling.	
2.5							
5.0							
		1	PL			Fine sand-brown-loose-saturated. (SP)	<1
						Grading to brownish gray at 6.5'. Dark gray staining from 5 to 6.5'.	
7.5		2	PL				<1
		3	PL				<1
10.0							
						END OF BORING	
						Boring advanced to 10.0 feet using hollow stem augers.	
						Monitoring well installed. See enclosed well installation diagram.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL

WL 3.0 WD WS OR WD	BORING STARTED 6-22-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 6-22-88	DRAWN BY MS	SHEET NO 1 OF 1
WL	RIG FOREMAN JW 80	APP'D BY BBS	STS JOB NO 1151XH

BL.3-0687

K00000336

STS Consultants Ltd.	OWNER: Consumers Power Company	LOG OF BORING NUMBER: 88MW-4A
	PROJECT NAME: Overisel Gas Compressor Station	ARCHITECT-ENGINEER

SITE LOCATION: Overisel, Michigan

UNCONFINED COMPRESSIVE STRENGTH TONS/FT² 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % 10 20 30 40 50

STANDARD PENETRATION BLOWS/FT 10 20 30 40 50

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg	
						SURFACE ELEVATION 101.56		
						Drilled without sampling to 15.0'.		
2.5								
5.0								
7.5								
10.0								
12.5								
15.0								
		1	PL			Fine sand-brownish gray-very loose to loose-saturated. (SP)	<1	5
17.5		2	PL				<1	5
		3	PL				<1	2
19.5								
						END OF BORING Boring advanced to 15.0 feet using hollow stem augers. Boring advanced from 15.0 to 20.0 feet using rotary wash methods. Monitoring well installed. See enclosed well installation diagram.		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

WL 3.0 WD WS OR WD	BORING STARTED 6-22-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 6-22-88	DRAWN BY MS	SHEET NO OF
WL	RIG FOREMAN JW 80	APP'D BY BBS	STS JOB NO 115TXH

BL3-0687

K00000337

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-1
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

SURFACE ELEVATION: 103.2'

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5)	PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50)	STANDARD PENETRATION BLOWS/FT (10 20 30 40 50)
		1	PL			Medium to fine sandy topsoil, little organics-brown-very loose to loose-moist. (Topsoil: SP)				1/6"
		1A	PL			Fine sand, trace medium sand and silt-dark brown-loose to medium dense-moist. (SP) Grading to saturated at 2.0'.	1			6
2.5'		2	PL				<1			6
						Grading to grayish brown at 4.0'.				
5.0'		3	PL				1			4
		4	PL				<1*			4
7.5'										
		5	PL				<1			11
10.0'										
		6	PL			Fine sand, trace silt-gray to grayish brown-medium dense to dense-saturated. (SP)	<1			13
12.5'		7	PL				2			13
15.0'		8	PL				<1			26
		9	PL				28			25
17.5'										
		10	PL				16			31
20.0'										
						END OF BORING * Result less than 1 but detected. Boring advanced to 18.0' using hollow stem auger. Borehole backfilled with bentonite grout.				

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS OR WD	BORING STARTED	STS OFFICE	
2.0' WS		03-04-88	Lansing, MI	
WL BCR	ACR	BORING COMPLETED	DRAWN BY	SHEET NO OF
		03-04-88	DH	1 1
WL		RIG FOREMAN	APP'D BY	STS JOB NO
		RC CME-45	BBS	1151XH

BL.3-0687

K00000338

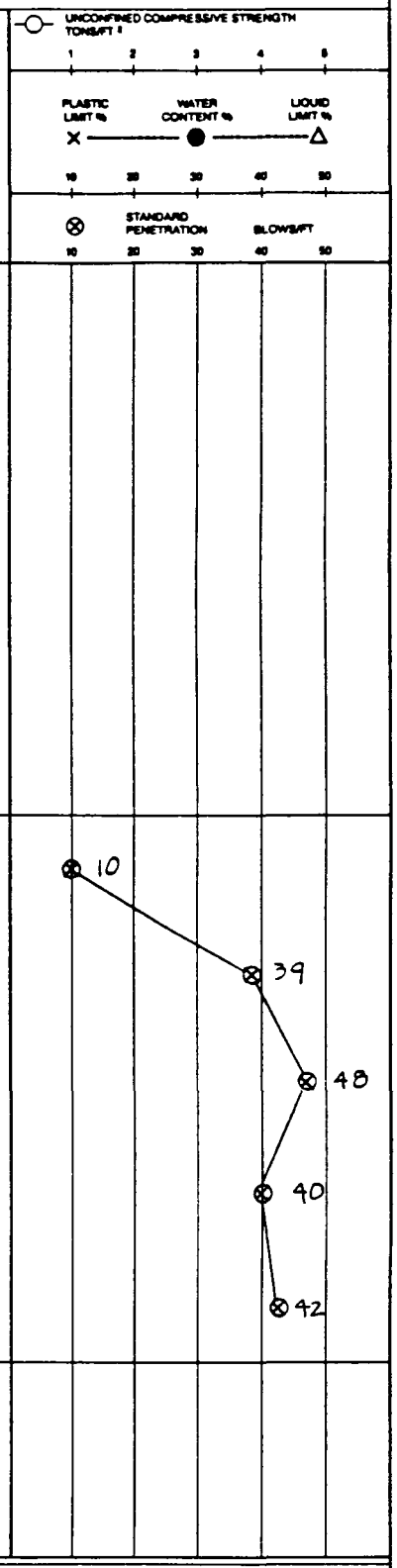
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-1A
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
					SURFACE ELEVATION 103.2'	
					Drilled without sampling to 20.0'.	
2.5'						
5.0'						
7.5'						
20.0'						
	1	PL			Fine sand, trace silt-brownish gray-medium dense to dense-saturated. (SP)	<1
22.5'	2	PL				<1
25.0'	3	PL				<1
27.5'	4	PL				<1
30.0'	5	PL				<1
					END OF BORING Boring advanced to 20.0' using hollow stem auger. Boring advanced from 20.0' to 28.0' using washed drilling techniques. Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

WL 2.0' WS (WS OR WD)	BORING STARTED 03-08-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-08-88	DRAWN BY DH	SHEET NO. 1 OF 1
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO. 1151XH

BL 3-0687

K00000339

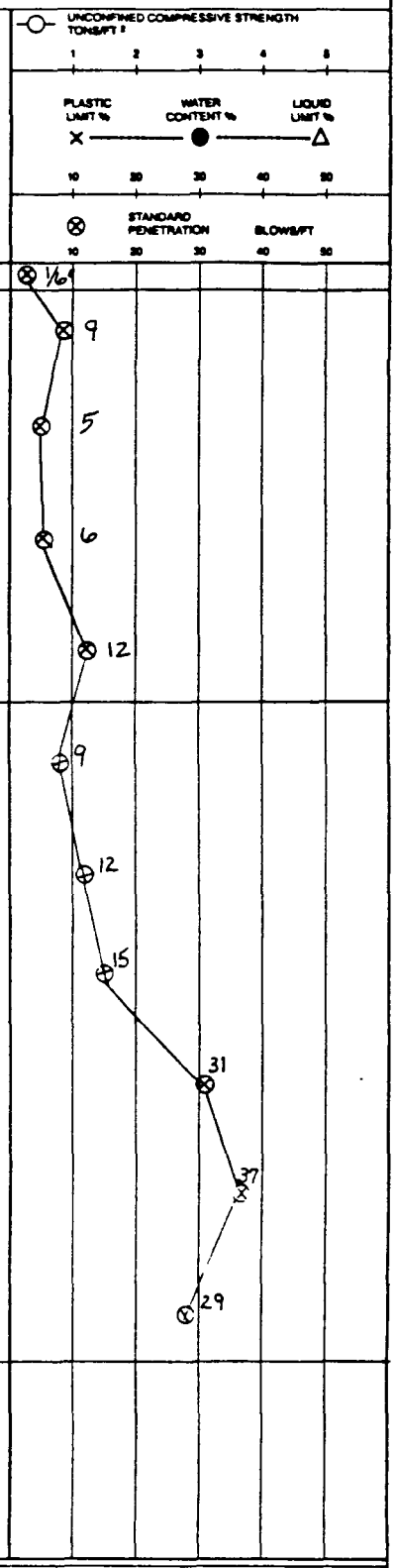
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-2
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 103.6'	
		1	PL			Fine sandy topsoil, trace medium sand and organics-dark brown-very loose-moist. (Topsoil: SP)	
		1A	PL			Fine sand, trace medium sand and silt-light brown to grayish brown-loose to medium dense-moist. (SP)	1
2.5'		2	PL				<1
						Grading to saturated at 4.0'. Grading to trace gravel from 4.0' to 6.0'.	
5.0'		3	PL				<1
7.5'		4	PL				<1
		5	PL			Fine sand, trace silt, light brown-loose to dense-saturated. (SP)	<1
10.0'		6	PL				<1*
						Grading to gray at 12.0'.	
12.5'		7	PL				5
15.0'		8	PL				<1*
		9	PL				1
17.5'							
		10	PL				7
20.0'							
						END OF BORING * Results less than 1 but detected. Boring advanced to 18.0' using hollow stem auger. Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS OR WD	BORING STARTED	STS OFFICE	
4.0' WS		03-07-88	Lansing, MI	
WL BCR	ACR	BORING COMPLETED	DRAWN BY	SHEET NO. OF
		03-07-88	DH	1 1
WL		RIG FOREMAN	APP'D BY	STS JOB NO.
		RC CME-45	BBS	1151XH

BL:3-0687

K00000340

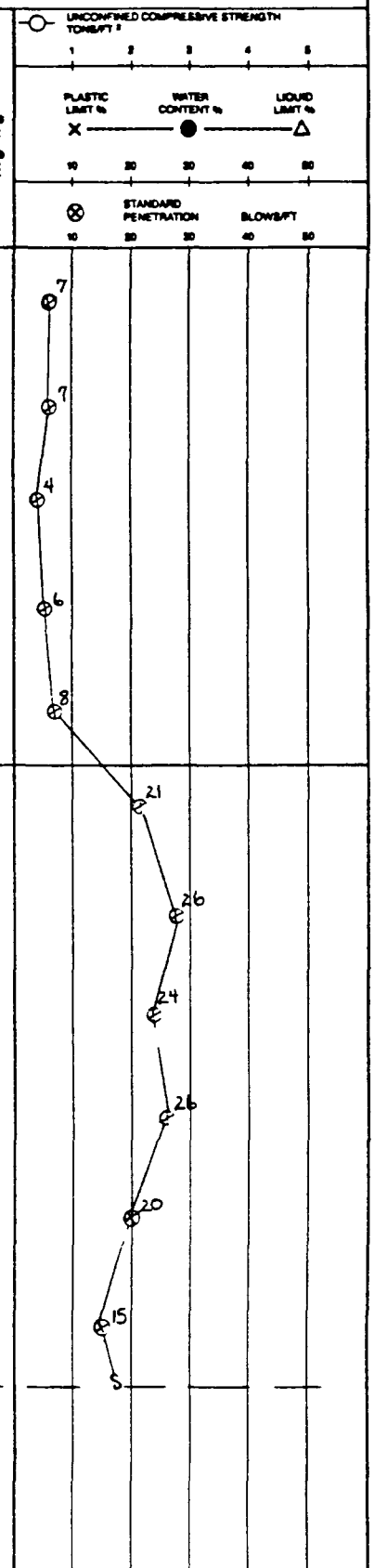
STS Consultants Ltd

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-3
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
					SURFACE ELEVATION 103.4'	
	1	PL			Fine sand, trace medium sand and silt-brown-loose-moist. (SP)	2
2.5'	2	PL				<1
					Grading to saturated at 4.0'.	
5.0'	3	PL				1
7.5'	4	PL				<1
	5	PL				<1
10.0'						
	6	PL			Fine sand, trace silt-brownish gray-medium dense to very dense-saturated. (SP) Black staining at 10.0' to 12.0'.	<1
					Grading to trace gravel from 12.0' to 14.0'.	
12.5'	7	PL				<1
					Black staining at 14.0' to 20.0'.	
15.0'	8	PL				<1
17.5'	9	PL				1
	10	PL				1
20.0'						
	11	PL				2
22.0'						
					CONTINUED ON NEXT PAGE	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

STS JOB NO 1151XH

SHEET NO 1 OF 2

BL 4-08/87

K00000341

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-3
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

SURFACE ELEVATION: 103.4'

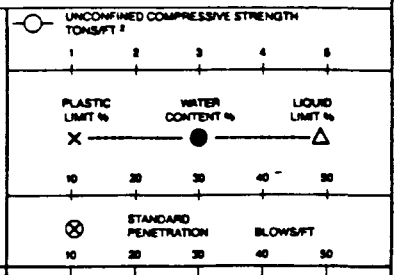
DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						CONTINUED FROM PREVIOUS PAGE	
22.0'							
22.5'		12	PL			Fine sand, trace silt-brownish gray-medium dense to very dense-saturated. (SP)	<1
25.0'		13	PL				<1
		14	PL				<1
27.5'							
		15	PL				<1
30.0'							

END OF BORING

Boring advanced to 18.0' using hollow stem auger.

Boring advanced from 18.0' to 30.0' using washed drilling techniques.

Borehole backfilled with bentonite grout.



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

WL 4.0' WS / WS OR WD	BORING STARTED 03-10-88	STS OFFICE Lansing, MI	
WL / BCR / ACR	BORING COMPLETED 03-10-88	DRAWN BY DH	SHEET NO 2 OF 2
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO 1151XH

BL3-0687

K00000342

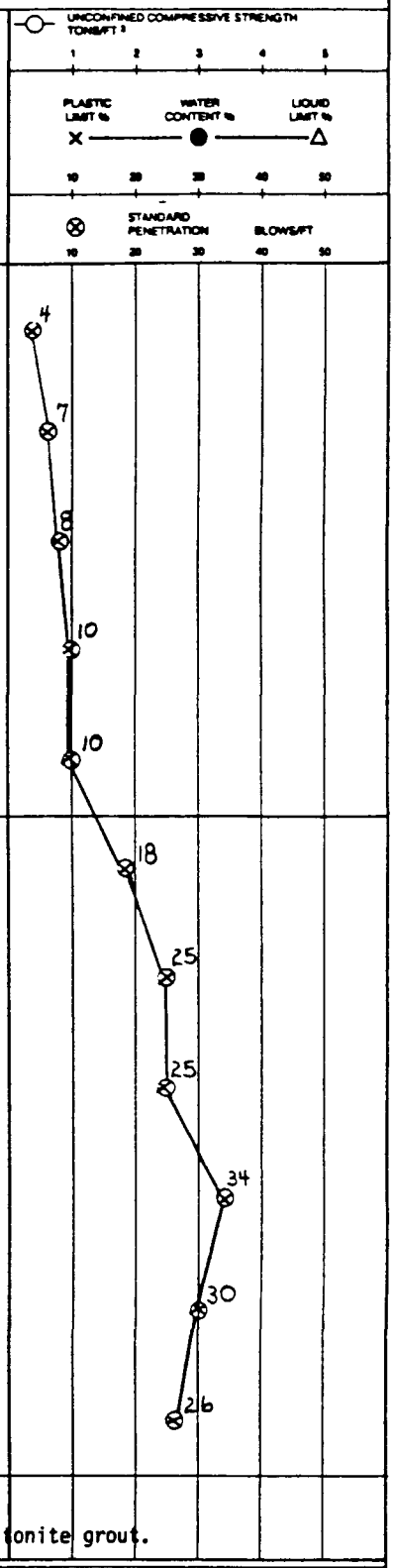
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-4
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

SURFACE ELEVATION: 103.4'

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
		1	PL			Fine sand, trace medium sand and silt-brown-loose to medium dense-moist. (SP)	82
2.5'		2	PL			Grading to saturated at 2.0'. Trace gravel at 2.0' to 6.0'.	<1
5.0'		3	PL				2
7.5'		4	PL				1
		5	PL			Black staining from 8.0' to 10.0'.	<1
10.0'							
		6	PL			Fine sand, trace silt-brownish gray-medium dense to dense-saturated. (SP)	<1
12.5'		7	PL			Black staining from 12.0' to 14.0'.	1
15.0'		8	PL				1
17.5'		9	PL				1
20.0'		10	PL				<1*
22.0'		11	PL				8
						END OF BORING * Results less than 1 but detected. Borehole advanced to 20.0' using hollow stem auger. Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

WL 2.0' WS WS OR WD	BORING STARTED 03-09-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-09-88	DRAWN BY DH	SHEET NO 1 OF 1
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO 1151XH

BL3-0687

K00000343

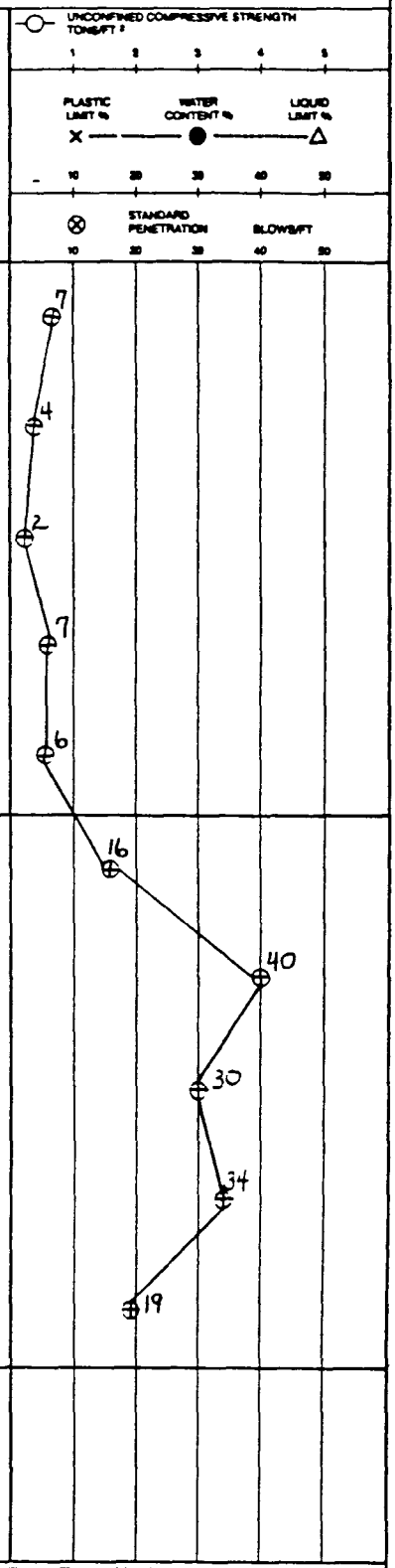
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-5
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 103.4'	
		1	PL			Fine sand, trace medium sand and silt-dark brown-very loose-moist. (SP) Grading to saturated at 2.0'.	<1
2.5'		2	PL				<1
5.0'		3	SS			Dark staining at 5.0'.	<1
7.5'		4	PL				<1
10.0'		5	PL				<1
		6	PL			Fine sand, trace silt-brownish gray-medium dense to dense-saturated. (SP) Black staining from 11.0' to 14.0'.	<1
12.5'		7	PL				15
15.0'		8	PL			Grading to gray at 16.0'.	27
17.5'		9	PL				4
20.0'		10	PL				2
						END OF BORING Boring advanced to 18.0' using hollow stem auger. Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS OR WD	BORING STARTED	STS OFFICE	
2.0'	WS	03-08-88	Lansing, MI	
WL BCR	ACR	BORING COMPLETED	DRAWN BY	SHEET NO. OF
		03-08-88	DH	1 1
WL		RIG FOREMAN	APP'D BY	STS JOB NO.
		RC CME-45	BBS	1151XH

BL:3-0887

K00000344

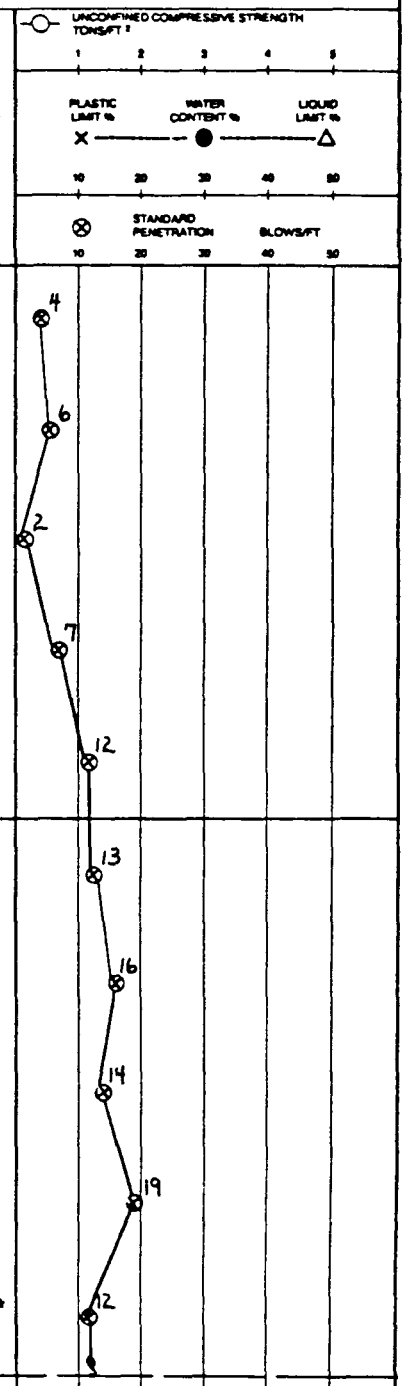
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-6
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 103.6'	
		1	PL			Fine sand, trace medium sand and silt-brown-very loose to medium dense-moist. (SP) Grading to saturated at 0.5'.	1
2.5'		2	PL				<1
						Dark staining at 4.0' to 6.0'.	
5.0'		3	PL				<1
		4	PL				1
7.5'							
		5	PL				<1
10.0'							
		6	PL			Fine sand, trace silt-brownish gray-medium dense-saturated. (SP)	<1
12.5'		7	PL				<1
15.0'		8	PL				<1
		9	PL				1
17.5'							
		10	PL				<1*
20.0'							



CONTINUED ON NEXT PAGE

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL.

STS JOB NO 1151XH

SHEET NO 1 OF 2

BL 4-0887

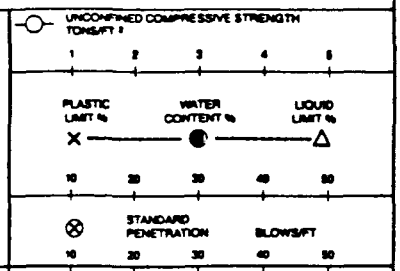
K00000345

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-6
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 103.6'	
						CONTINUED FROM PREVIOUS PAGE	
20.0'							
		11	PL			Fine sand, trace silt-brownish gray-medium dense-saturated. (SP)	<1
22.5'							
		12	PL				12
24.0'							
						END OF BORING	
						* Results less than 1 but detected.	
						Boring advanced to 16.0' using hollow stem auger.	
						Boring advanced from 16.0' to 22.0' using washed drilling techniques.	
						Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL.

WL 0.5' WS WS OR WD	BORING STARTED 03-09-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-09-88	DRAWN BY DH	SHEET NO 2 OF 2
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO. 1151XH

BL:3-0687

K00000346

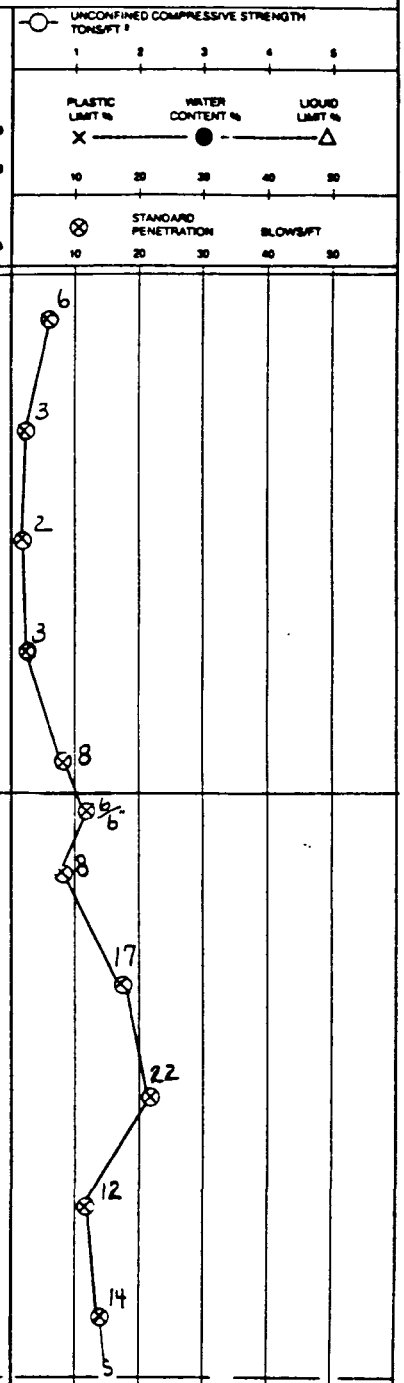
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-7
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 102.5'	
		1A	PL			Fine sandy topsoil, trace medium sand, silt and organics-dark brown-very loose-moist. (Topsoil:SP)	3
						Fine sand, trace medium sand and silt-dark brown-loose to very loose-moist. (SP) Grading to saturated at 1.5'.	
2.5'		2	PL				<1
5.0'		3	PL				<1*
						Grading to grayish brown at 6.0'.	
7.5'		4	PL				<1
		5	PL				
10.0'		5A	PL			Fine sand, trace silt-brownish gray-loose to medium dense-saturated. (SP)	<1
		6	PL				<1
12.5'		7	PL				<1
15.0'		8	PL				<1
		9	PL				1
17.5'						Grading to gray at 17.5'.	
		10	PL				4
20.0'							
						CONTINUED ON NEXT PAGE	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL.

STS JOB NO 1151XH SHEET NO 1 OF 2

BL 4-0887

K00000347

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-7
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
					SURFACE ELEVATION 102.5'	
					CONTINUED FROM PREVIOUS PAGE	
20.0'						
	11	PL			Fine sand, trace silt-brownish gray-loose to medium dense-saturated. (SP) Grading to gray at 17.5'.	<1
22.0'						
					END OF BORING	
					* Results less than 1 but detected.	
					Boring advanced to 18.0' using hollow stem auger.	
					Boring advanced from 18.0' to 20.0' using washed drilling techniques.	
					Borehole backfilled with bentonite grout.	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1, 2, 3, 4, 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10, 20, 30, 40, 50)

STANDARD PENETRATION BLOWS/FT (10, 20, 30, 40, 50)

15

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL 1.5' WS (WS OR WD)	BORING STARTED 03-11-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-11-88	DRAWN BY DH	SHEET NO. 2 OF 2
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO. 1151XH

BL.3-0687

K00000348

STS Consultants Ltd.

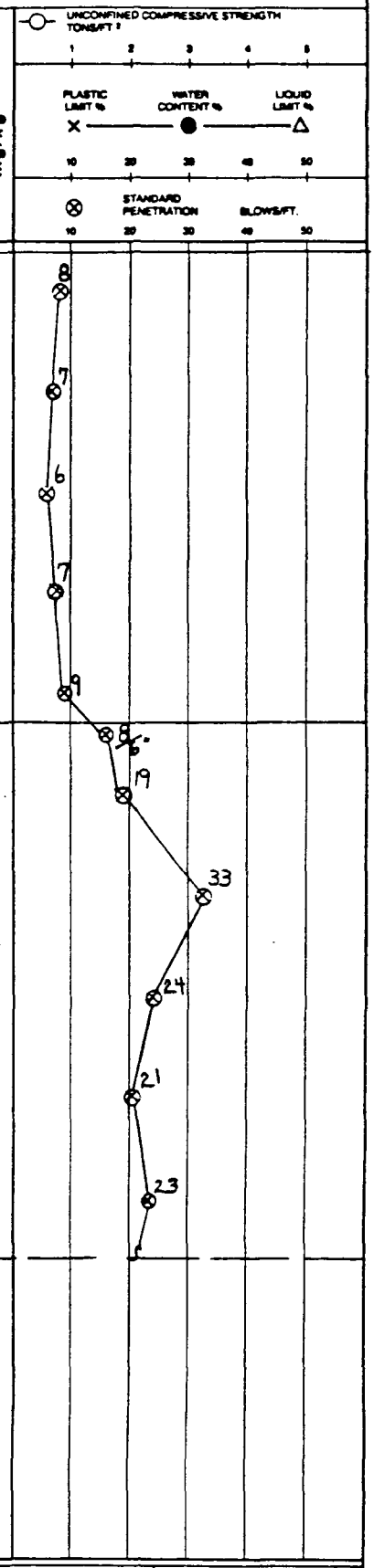
OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-8
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

SURFACE ELEVATION 103.0'

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
		1A	PL			Fine sandy topsoil, trace medium sand and silt-dark brown-very loose-moist. (Topsoil:SP)	<1
						Fine sand, trace medium sand and silt-brown-loose-moist. (SP)	
2.5'						Grading to saturated at 2.0'.	
		2	PL				2
5.0'		3	PL				3
						Black staining from 6.0' to 8.0'.	
7.5'		4	PL				<1
		5	PL				
10.0'		5A	PL			Fine sand, trace silt-brownish gray-medium dense to very dense-saturated. (SP)	<1
		6	PL				<1
12.5'		7	PL				2
15.0'		8	PL				<1
		9	PL				<1
17.5'		10	PL				<1
20.0'							
						CONTINUED ON NEXT PAGE	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

STS JOB NO 1151XH

SHEET NO 1 OF 2

BL 4-0867

K00000349

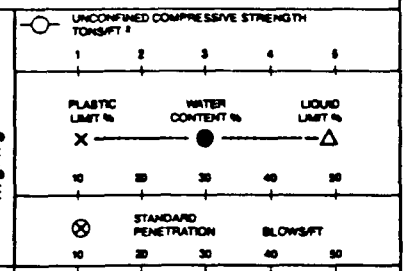
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-8
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	ARQCLOR 1254 mg/kg
						SURFACE ELEVATION 103.0'	
						CONTINUED FROM PREVIOUS PAGE	
20.0'							
		11	PL			Fine sand, trace silt-brownish gray-medium dense to very dense-saturated. (SP)	<1
22.5'							
		12	PL				<1
24.0'							
						END OF BORING Boring advanced to 18.0' using hollow stem auger. Boring advanced from 18.0' to 22.0' using washed drilling techniques. Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL 2.0' WS — WS OR WD	BORING STARTED 03-14-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-15-88	DRAWN BY DH	SHEET NO. 2 OF 2
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO 1151XH

BL 3-0687

K00000350

STS Consultants Ltd.

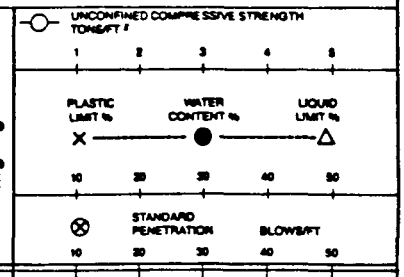
OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-9
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

SURFACE ELEVATION 102.2'

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
		1A	PL			Fine sandy topsoil, trace medium sand, silt and organics-dark brown-very loose-moist. (Topsoil: SP)	<1
						Fine sand, trace medium sand and silt-brown-loose to medium dense-moist. (SP)	
2.5'		2	PL			Grading to saturated at 3.0'.	<1
5.0'		3	PL				<1
		4	PL				
7.5'		4A	PL			Fine sand, trace silt-grayish brown-loose to very dense-saturated. (SP)	<1
		5	PL				<1
10.0'		6	PL				<1
12.5'		7	PL				<1
15.0'		8	PL				<1
		9	PL				<1
17.5'		10	PL				<1
20.0'							
						CONTINUED ON NEXT PAGE	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL.

STS JOB NO 1151XH SHEET NO 1 OF 2

BL 4-0887

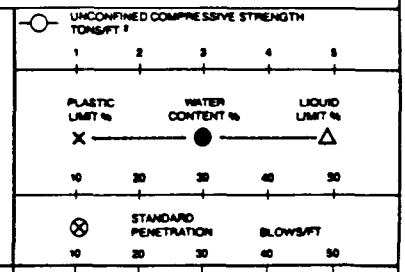
K00000351

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-9
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 102.2'	
						CONTINUED FROM PREVIOUS PAGE	
20.0'							
		11	PL			Fine sand, trace silt-grayish brown-loose to very dense-saturated. (SP)	<1
22.5'		12	PL				<1
24.0'							
						END OF BORING Boring advanced to 16.0' using hollow stem auger. Boring advanced from 16.0' to 22.0' using washed drilling techniques. Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL 3.0' WS WS OR WD	BORING STARTED 03-15-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-15-88	DRAWN BY DH	SHEET NO 2 OF 2
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO 1151XH

BL3-0687

K00000352

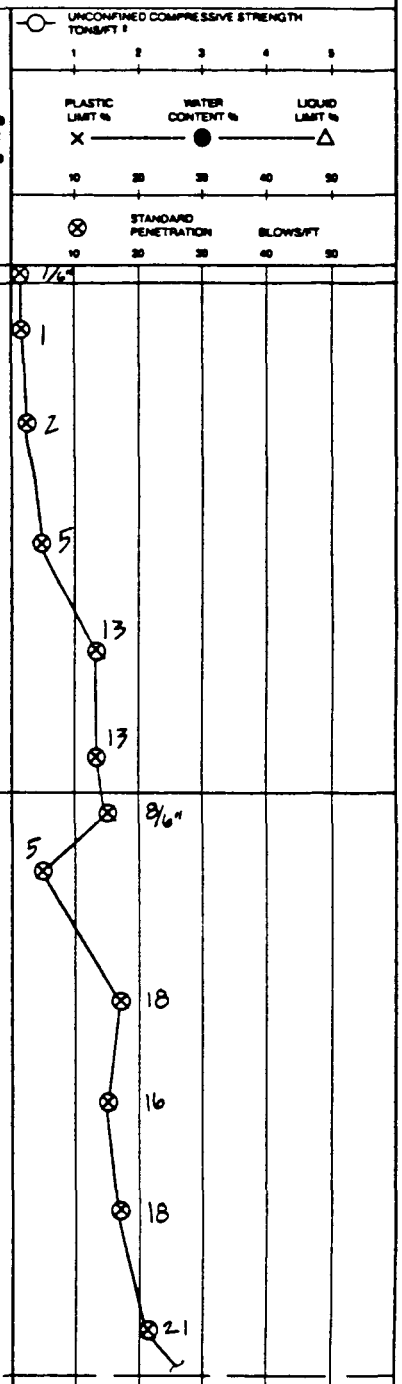
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-10
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 103.3'	
		1	PL			Fine sandy topsoil, trace medium sand, silt and organics-dark brown-very loose-moist. (Topsoil: SP)	
		1A	PL			Fine sand, trace silt and gravel-dark brown to grayish brown-very loose to medium dense-moist. (SP) Grading to saturated at 2.0'.	<1
2.5'		2	PL				<1
5.0'		3	PL				<1
7.5'		4	PL				<1
		5	PL				
10.0'		5A	PL			Fine sand, trace silt-brownish gray-loose to very dense-saturated. (SP)	<1
		6	PL			Grading to gray at 12.0'.	<1
12.5'		7	PL				<1
15.0'		8	PL				<1
17.5'		9	PL				<1
		10	PL				<1
20.0'							



CONTINUED ON NEXT PAGE

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL.

STS JOB NO 1151XH

BL 4-0867

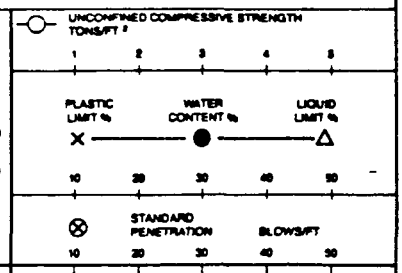
K00000353

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-10
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	-

SITE LOCATION: Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 103.8'	
						CONTINUED FROM PREVIOUS PAGE	
20.0'							
		11	PL			Fine sand, trace silt-brownish gray-loose to very dense-saturated. (SP) Grading to gray at 12.0'.	<1
22.5'							
		12	PL				<1
24.0'							
						END OF BORING Boring advanced to 16.0' using hollow stem auger. Boring advanced from 16.0' to 22.0' using washed drilling techniques. Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

WL 2.0' WS (WS OR WD)	BORING STARTED 03-16-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-16-88	DRAWN BY DH	SHEET NO 2 OF 2
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO 1151XH

3L3-0687

K00000354

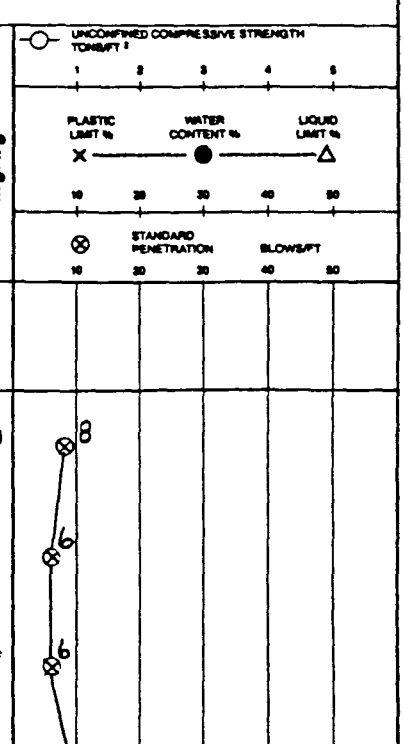
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-11
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
					SURFACE ELEVATION 104.0' Platform Elevation	
					Driller's Observation: Boring advanced from platform constructed over outfall pond. Standing water at 1.3' below platform. Ground surface 2.0' below platform.	
2.5'	1	PL			Fine sand, trace medium sand and silt-black-loose to medium dense-saturated. (SP) Black staining from 2.0' to 4.0'.	5400
					Grading to trace gravel from 4.0' to 6.0'.	
5.0'	2	PL			Grading to brown at 5.0'.	1
7.5	3	PL				<1*
	4	PL				<1*
10.0'	5	PL				<1
12.5'	6	PL				78
15.0'	7	PL			Fine sand, trace silt-grayish brown-medium dense to very dense-saturated. (SP) Black staining from 14.0' to 16.0'.	<1
17.5'	8	PL				<1
20.0'	9	PL				<1
					CONTINUED ON NEXT PAGE	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

STS JOB NO 1151XH SHEET NO 1 OF 2

BL 4-0887

K00000355

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-11
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

SURFACE ELEVATION: 104.0' Platform Elevation

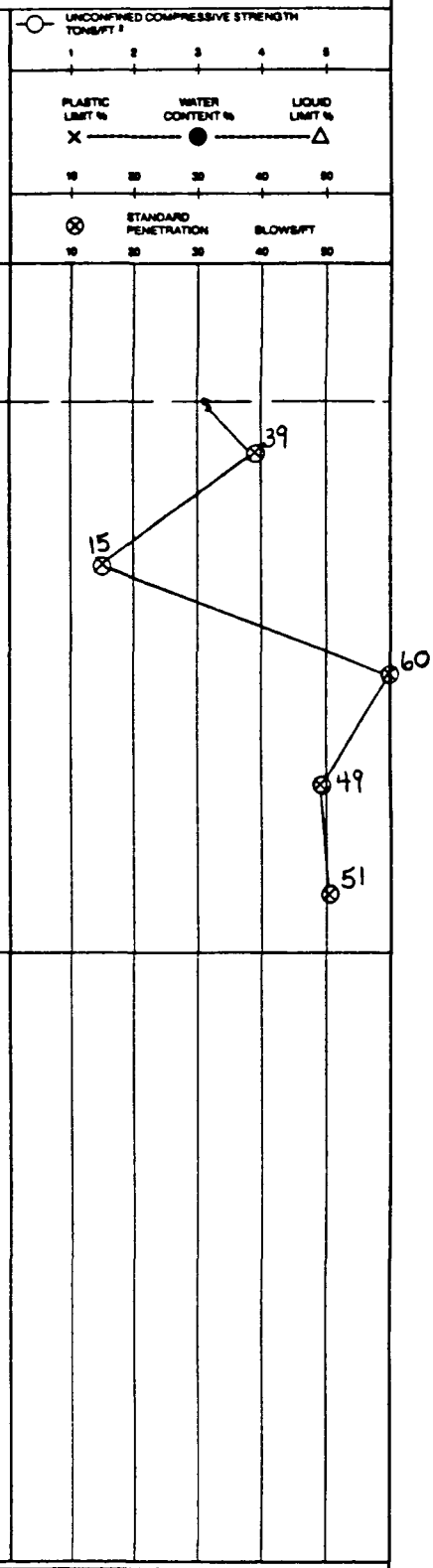
DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						CONTINUED FROM PREVIOUS PAGE	
20.0'							
		10	PL			Fine sand, trace silt-grayish brown-medium dense to very dense-saturated. (SP)	<1
22.5'		11	PL				<1
						Grading to gray at 24.0'.	
25.0'		12	PL				<1
27.5'		13	PL				<1
		14	PL				<1
30.0'							
						END OF BORING	

* Results less than 1 but detected.

Boring advanced to 14.0' using hollow stem auger.

Boring advanced from 14.0' to 28.0' using washed drilling techniques.

Borehole backfilled with bentonite grout.



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

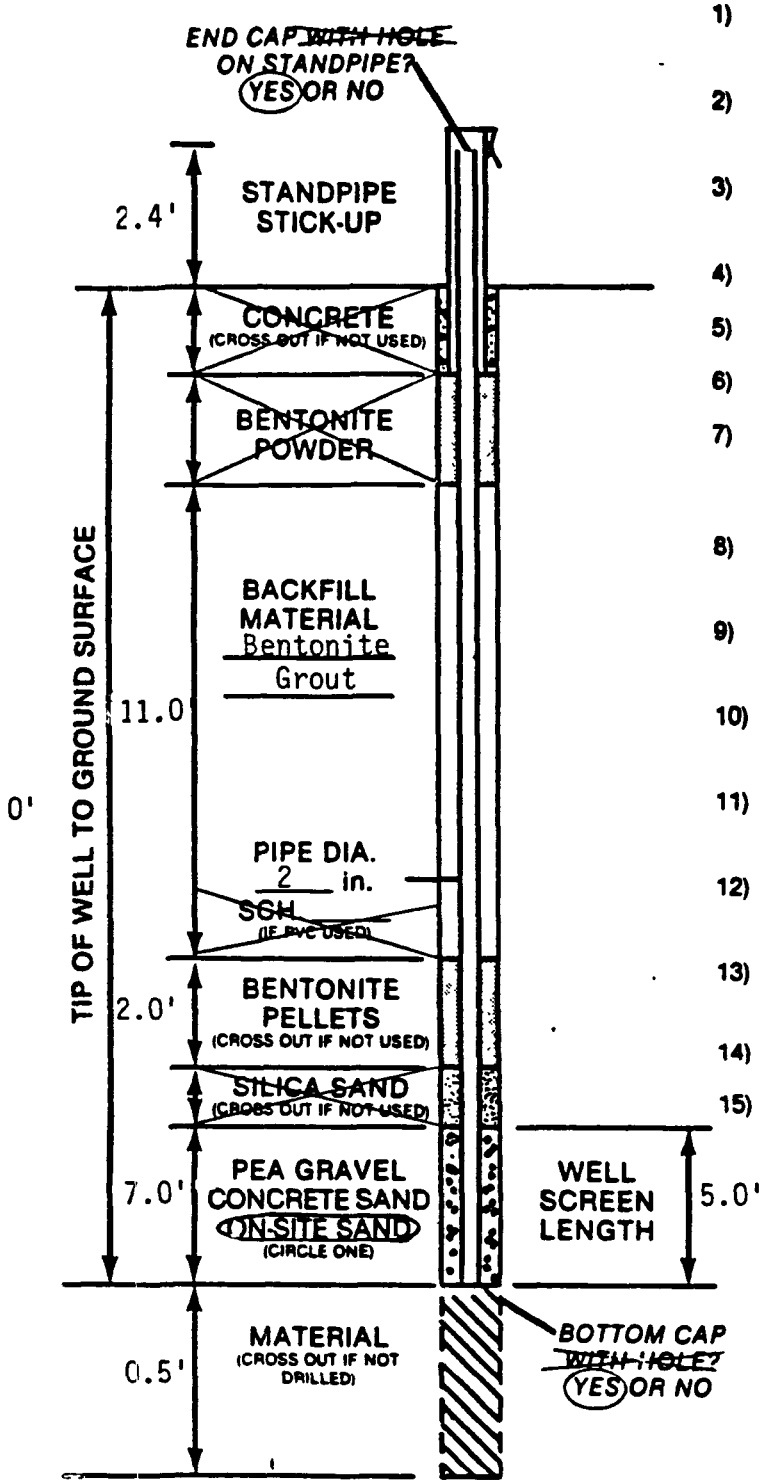
WL	WS OR WD	BORING STARTED	STS OFFICE	
1.3'		03-16-88	Lansing, MI	
WL BCR	ACR	BORING COMPLETED	DRAWN BY	SHEET NO OF
		03-17-88	DH	2 2
WL		RIG FOREMAN	APP'D BY	STS JOB NO
		RC CME-45	BBS	1151XH

BL3-0687

K00000356

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE # 10 slot

5) INSTALLED PROTECTOR PIPE ? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED? NO
SOLID AUGER, HOLLOW STEM AUGER, WATER, REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED? NOT DEVELOPED
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE 3-17-88, 13.54' Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

K00000357

Well No. 88MW-1 DATE INSTALLED 03-04-88 DRILL RIG CME-45

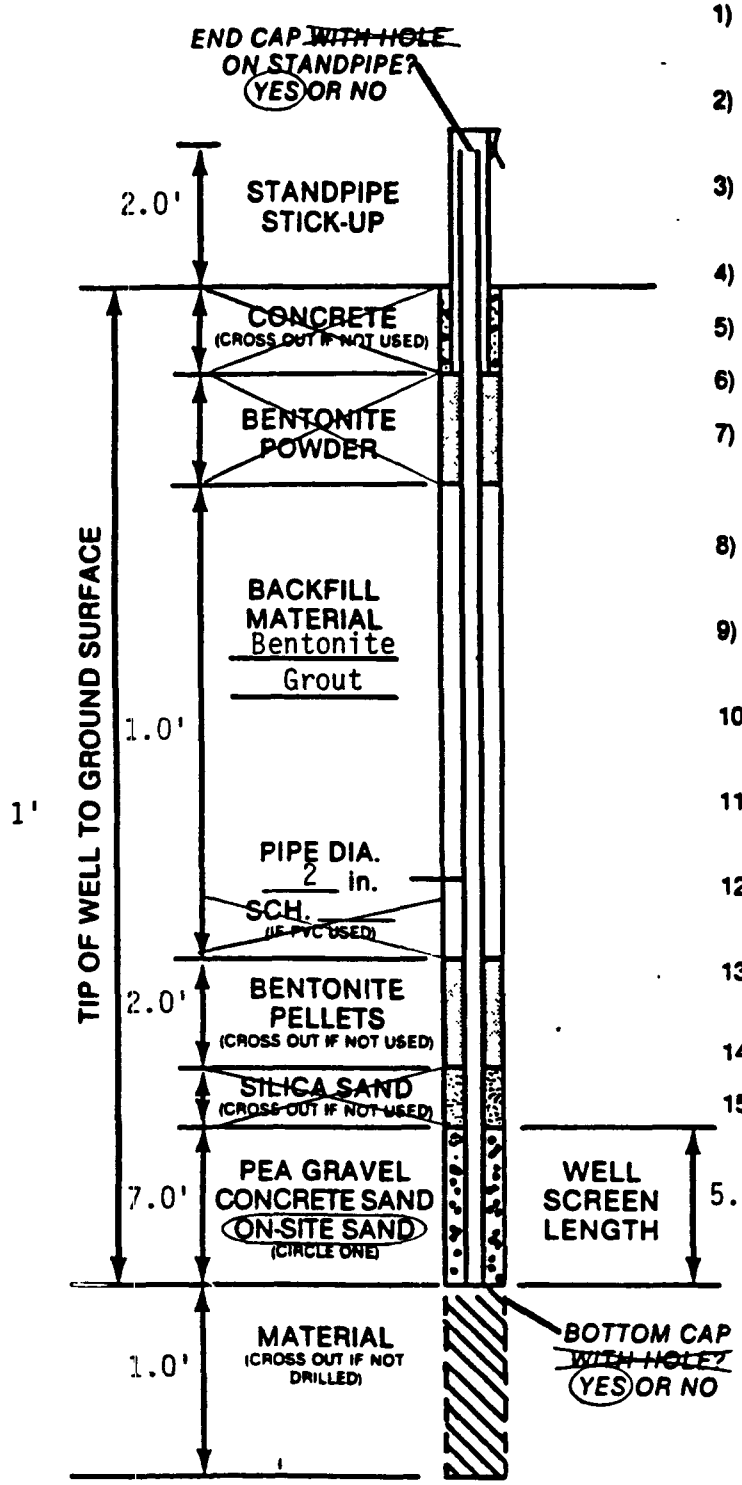
DRILLER Dick Carlson DRILL CREW Mike McConnel

JOB/CLIENT Overisel Gas Compressor Station/CPCO STS JOB No. 1151XH

FW: 1-983

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE # 10 slot

5) INSTALLED PROTECTOR PIPE ? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED? NO
SOLID AUGER, HOLLOW STEM AUGER, WATER, REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED? NOT DEVELOPED
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE 3-17-88, 2.98' Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

K00000358

Well No. 88MW-2 DATE INSTALLED 03-07-88 DRILL RIG CME-45

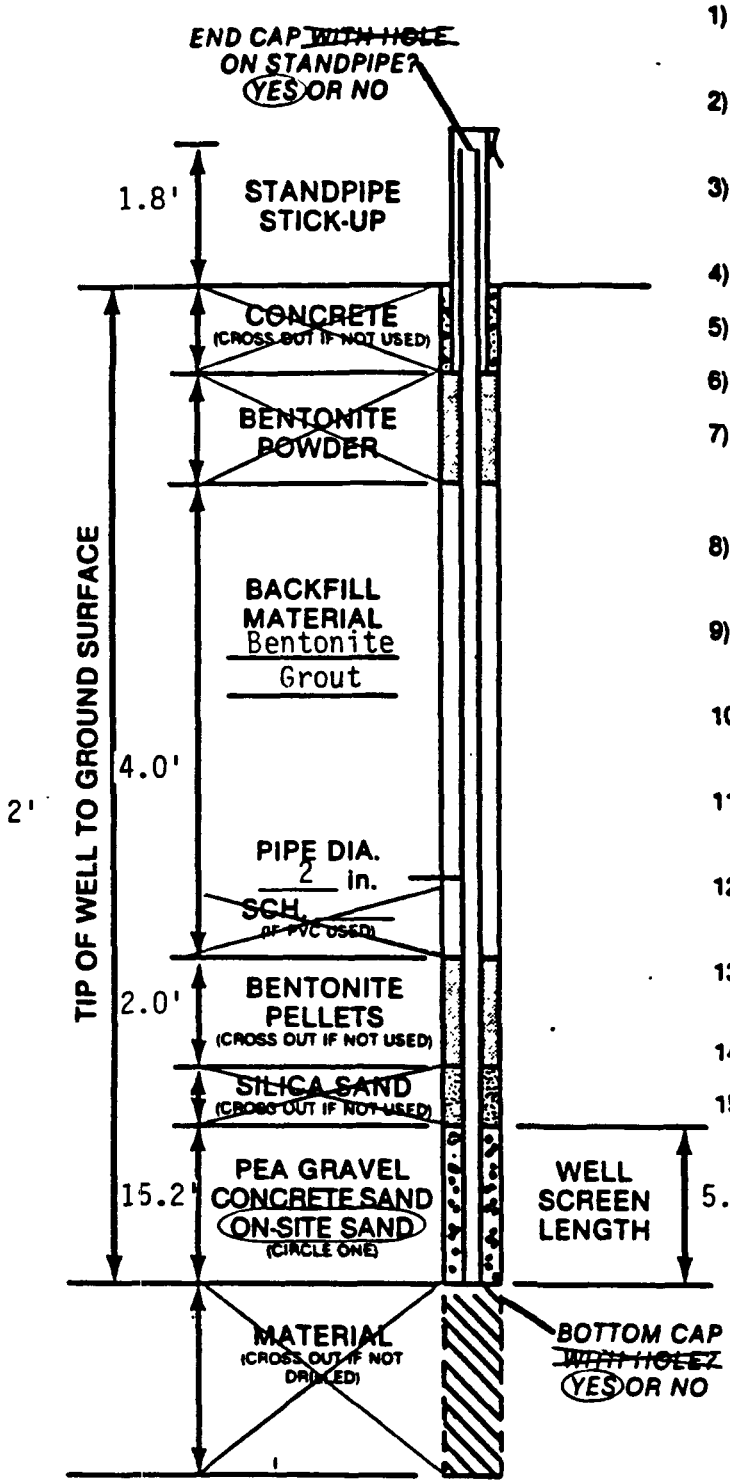
DRILLER Dick Carlson DRILL CREW Mike McConnel

JOB/CLIENT Overisel Gas Compressor Station/CPCO STS JOB No. 1151XH

FW: 1-983

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE # 10 slot

5) INSTALLED PROTECTOR PIPE ? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED? YES
SOLID AUGER, HOLLOW STEM AUGER, WATER, REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED? NOT DEVELOPED
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE 3-18-88, 2.92' Ft. FROM T. ST. PIPE

DATE _____, _____ Ft. FROM T. ST. PIPE

DATE _____, _____ Ft. FROM T. ST. PIPE

DATE _____, _____ Ft. FROM T. ST. PIPE

K00000359

Well No. 88MW-2A DATE INSTALLED 03-11-88 DRILL RIG CME-45

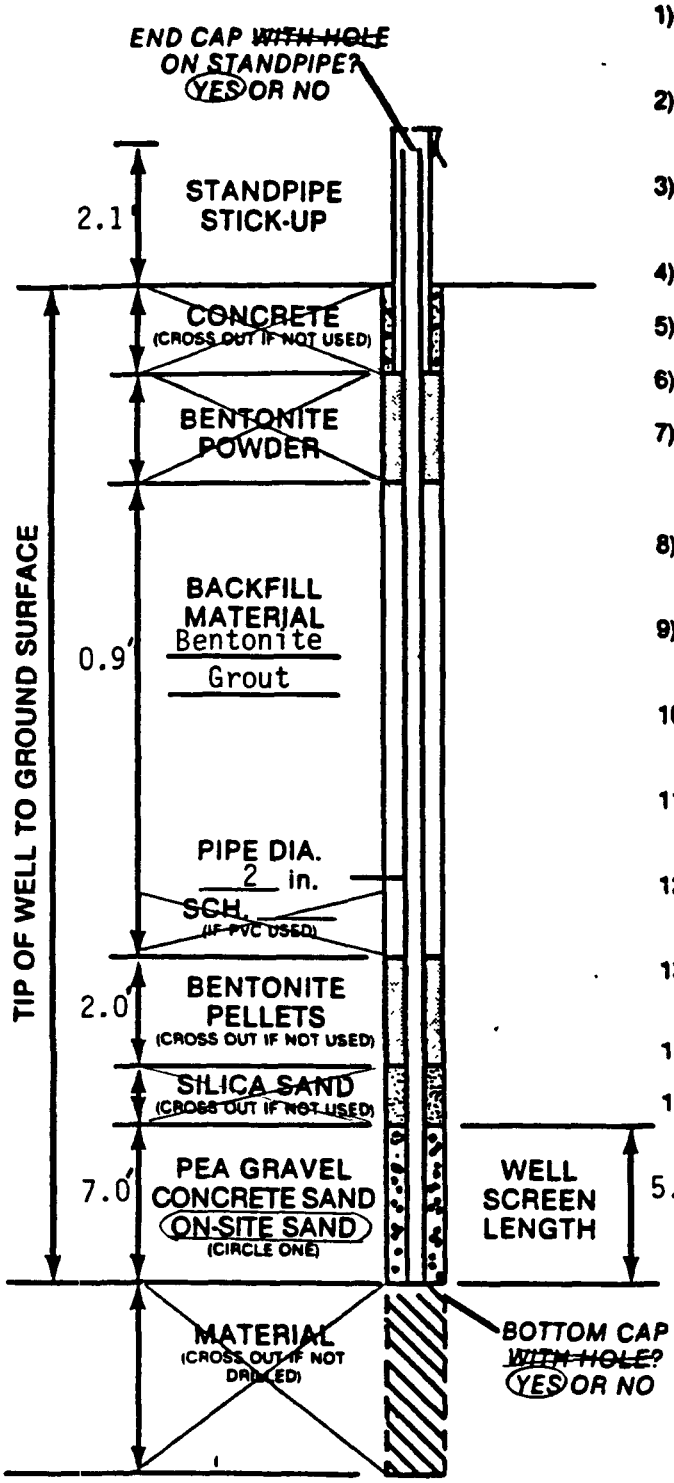
DRILLER Dick Carlson DRILL CREW Mike McConnel

JOB/CLIENT Overisel Gas Compressor Station/CPCO STS JOB No. 1151XH

FW: 1-983

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE _____

5) INSTALLED PROTECTOR PIPE? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED?
SOLID AUGER, HOLLOW STEM AUGER
WATER, REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED? NOT DEVELOPED
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE 3-17-88, 101.45 Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

K00000360

Well No. 88MW-3 DATE INSTALLED 03-14-88 DRILL RIG CME-45

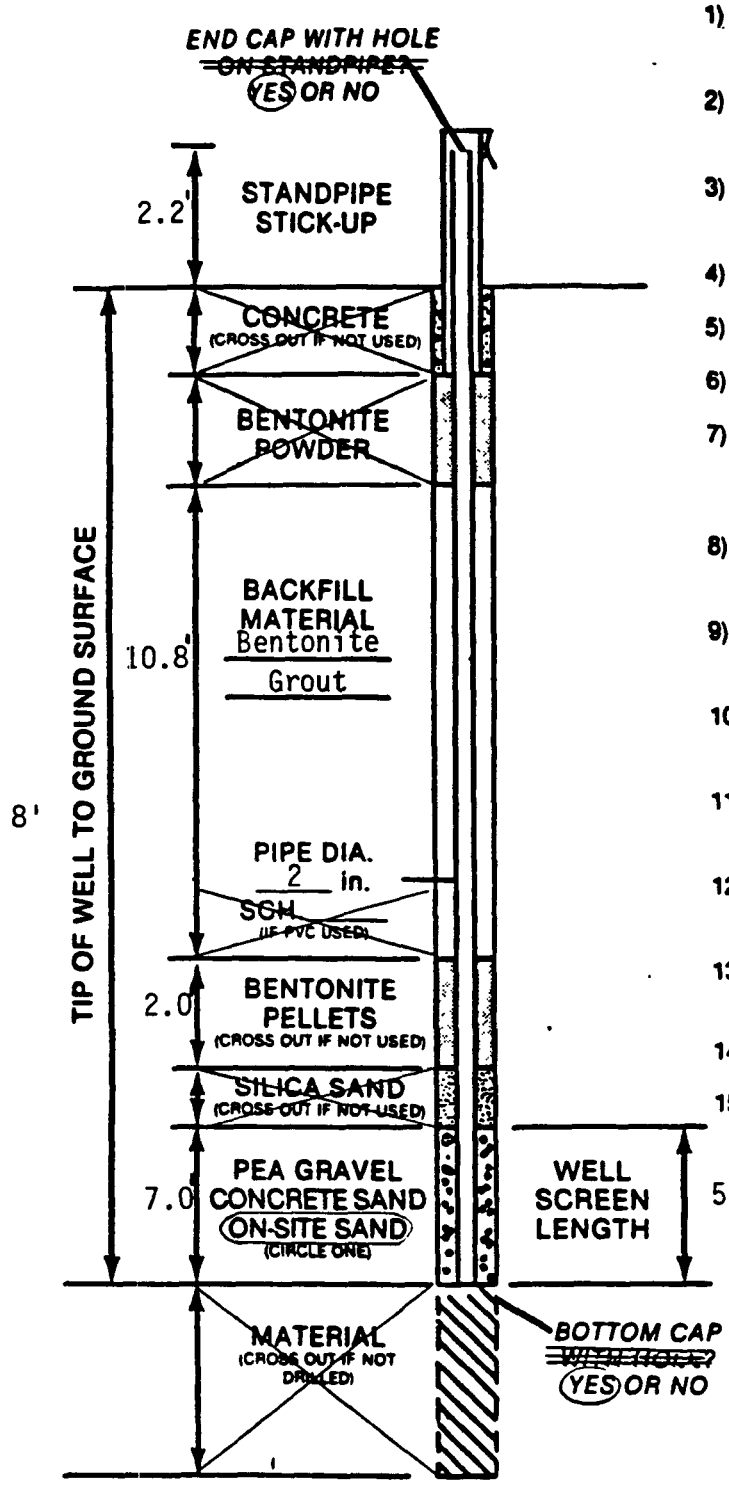
DRILLER Dick Carlson DRILL CREW Mike McConnel

JOB/CLIENT Overisel Gas Compressor Station/CPCO STS JOB No. 1151XH

N: 1-983

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE # 10 slot

5) INSTALLED PROTECTOR PIPE? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED? YES
SOLID AUGER, HOLLOW STEM AUGER, WATER, REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED? NOT DEVELOPED
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE 3-17-88, 102.25 Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

K00000361

Well No. 88MW-3A DATE INSTALLED 03-16-88 DRILL RIG CME-45

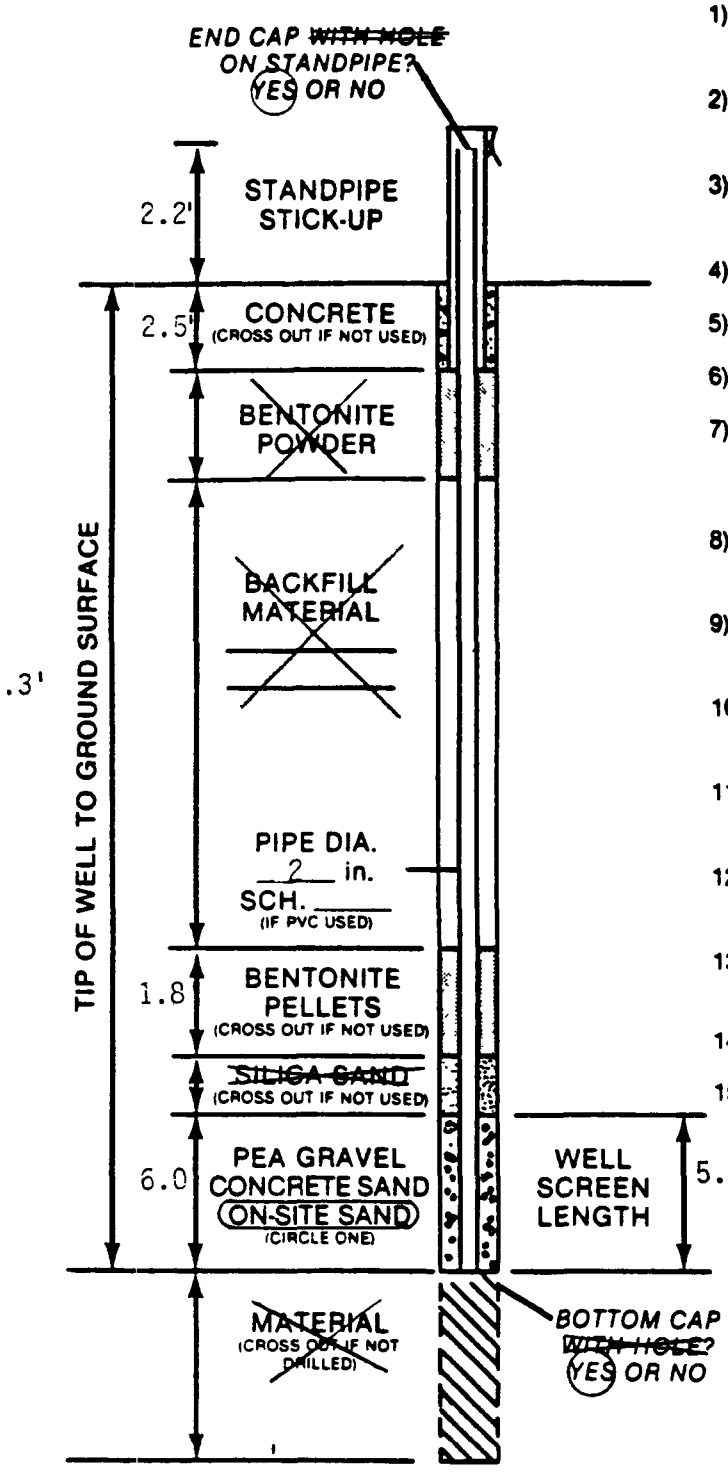
DRILLER Dick Carlson DRILL CREW Mike McConnel

JOB/CLIENT Overisel Gas Compressor Station/CPCO STS JOB No. 1151XH

W: 1-983

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE #10 slot

5) INSTALLED PROTECTOR PIPE ? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED? no
SOLID AUGER, HOLLOW STEM AUGER, WATER, REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED?
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

K00000362

Well No. 88MW-4 DATE INSTALLED 6-22-88 DRILL RIG 80

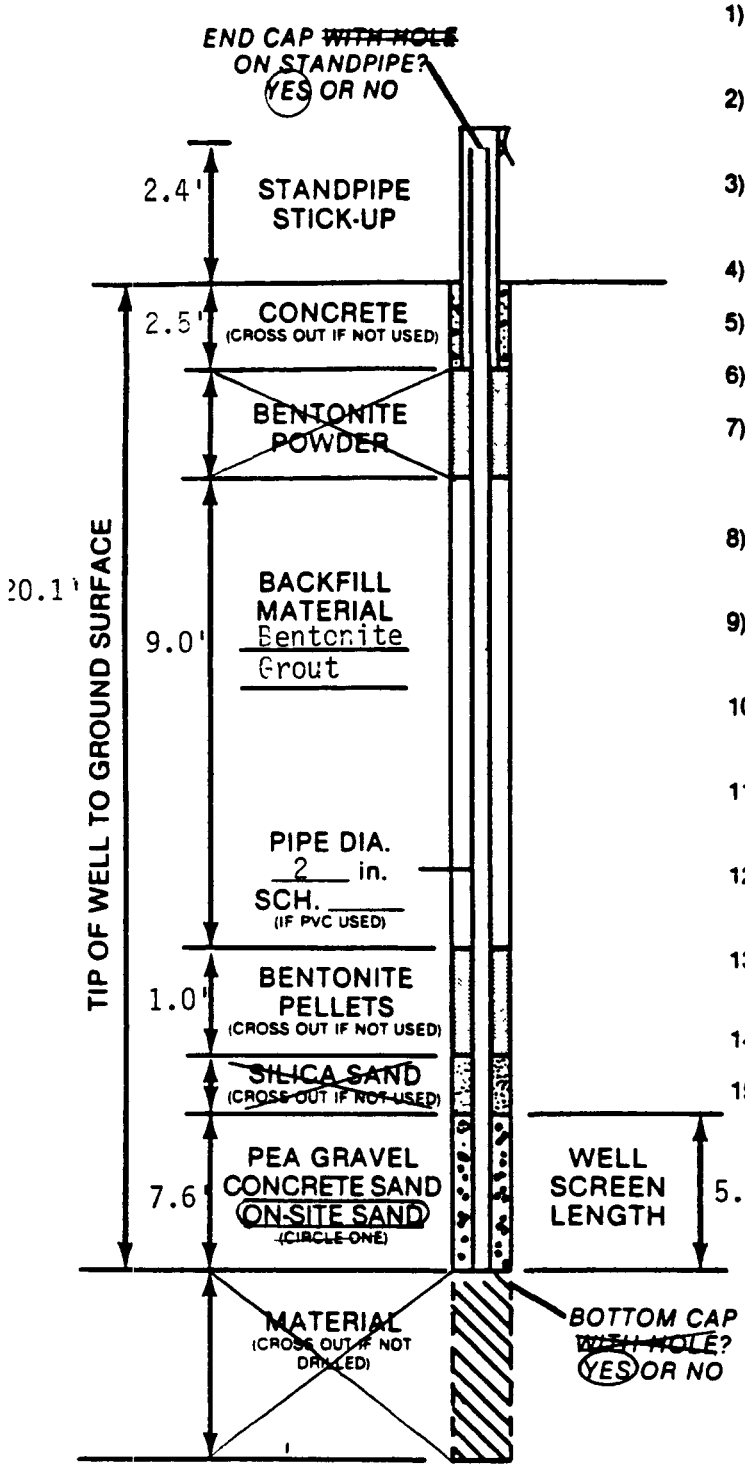
DRILLER John Wright DRILL CREW Robert Epps

JOB/CLIENT Consumers Power Company STS JOB No. 1151XH

FW 1-983

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE #10 slot

5) INSTALLED PROTECTOR PIPE ? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED? yes
SOLID AUGER, HOLLOW STEM AUGER, WATER, REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED?
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

K00000363

Well No. 88MW-4A DATE INSTALLED 6-22-88 DRILL RIG 80

DRILLER John Wright DRILL CREW Robert Epps

JOB/CLIENT Consumers Power Company STS JOB No. 1151XH

FW: 1-983

AMERICAN SOCIETY FOR TESTING AND MATERIALS

Standard Method for

PENETRATION TEST AND SPLIT-BARREL SAMPLING OF SOILS[1]

This standard is issued under the fixed designation D 1586; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This method has been approved for use by agencies of the Department of Defense and for listing in the DOD Index of Specifications and Standards.

1. Scope

1.1 This method describes the procedure, generally known as the Standard Penetration Test (SPT), for driving a split-barrel sampler to obtain a representative soil sample and a measure of the resistance of the soil to penetration of the sampler.

1.2 This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. For a specific precautionary statement, see 5.4.1

1.3 The values stated in inch-pound units are to be regarded as the standard.

2. Applicable Documents

2.1 ASTM Standards:

D2487 Test Method for Classification of Soils for Engineering Purposes[2]

D2488 Practice for Description and Identification of Soils (Visual-Manual Procedure)[2]

D4220 Practices for Preserving and Transporting Soil Samples[2]

3. Descriptions of Terms Specific to This Standard

3.1 anvil—that portion of the drive-weight assembly which the hammer strikes and through which the hammer energy passses into the drill rods.

3.2 cathead—the rotating drum or windlass in the rope-cathead lift system around which the operator wraps a rope to lift and drop the hammer by successively tightening and loosening the rope turns around the drum.

3.3 drill rods—rods used to transmit downward force and torque to the drill bit while drilling a borehole.

3.4 drive-weight assembly—a device consisting of the hammer, hammer fall guide, the anvil, and any hammer drop system.

3.5 hammer—that portion of the drive-weight assembly consisting of the 140 ± 2 lb (63.5 ± 1 kg) impact weight which is successively lifted and dropped to provide the energy that accomplishes the sampling and penetration.

3.6 hammer drop system—that portion of the drive-weight assembly by which the operator accomplishes the lifting and dropping of the hammer to produce the blow.

3.7 hammer fall guide—that part of the drive-weight assembly used to guide the fall of the hammer.

3.8 N-value—the blowcount representation of the penetration resistance of the soil. The N-value, reported in blows per foot, equals the sum of the number of blows required to drive the sampler over the depth interval of 6 to 18 in. (150 to 450 mm) (see 7.3).

3.9 ΔN—the number of blows obtained from each of the 6-in. (150-mm) intervals of sampler penetration (see 7.3).

3.10 number of rope turns—the total contact angle between the rope and the cathead at the beginning of the operator's rope slackening to drop the hammer, divided by 360° (see Fig. 1).

3.11 sampling rods—rods that connect the drive-weight assembly to the sampler. Drill rods are often used for this purpose.

3.12 SPT—abbreviation for Standard Penetration Test, a term by which engineers commonly refer to this method.

4. Significance and Use

4.1 This method provides a soil sample for identification purposes and for laboratory tests appropriate for soil obtained from a sampler that may produce large shear strain disturbance in the sample.

4.2 This method is used extensively in a great variety of geotechnical exploration projects. Many local correlations and widely published correlations which relate SPT blowcount, or N-value, and the engineering behavior of earthworks and foundations are available.

K00000364

[1]This method is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18 02 on Sampling and Related Field Testing for Soil Investigations.

Current edition approved Sept. 11, 1984. Published November 1984. Originally published as D1586—58T. Last previous edition D1586—67 (1974).

[2]Annual Book of ASTM Standards, Vol 04.08.

so that the advance of the sampler under the impact of the hammer can be easily observed for each 6-in. (0.15-m) increment.

7.2 Drive the sampler with blows from the 140-lb (63.5-kg) hammer and count the number of blows applied in each 6-in. (0.15-m) increment until one of the following occurs:

7.2.1 A total of 50 blows have been applied during any one of the three 6-in. (0.15-m) increments described in 7.1.4.

7.2.2 A total of 100 blows have been applied.

7.2.3 There is no observed advance of the sampler during the applicaion of 10 successive blows of the hammer.

7.2.4 The sampler is advanced the complete 18 in. (0.45 m) without the limiting blow counts occurring as described in 7.2.1, 7.2.2, or 7.2.3.

7.3 Record the number of blows required to effect each 6 in. (0.15 m) of penetration or fraction thereof. The first 6 in. is considered to be a seating drive. The sum of the number of blows required for the second and third 6 in. of penetration is termed the "standard penetration resistance", or the "N-value". If the sampler is driven less than 18 in. (0.45 m), as permitted in 7.2.1, 7.2.2, or 7.2.3, the number of blows per each complete 6-in. (0.15-m) increment and per each partial increment shall be recorded on the boring log. For partial increments, the depth of penetration shall be reported to the nearest 1 in. (25 mm), in addition to the number of blows. If the sampler advances below the bottom of the boring under the static weight of the drill rods or the weight of the drill rods plus the static weight of the hammer, this information should be noted on the boring log.

7.4 The raising and dropping of the 140-lb (63.5-kg) hammer shall be accomplished using either of the following two methods:

7.4.1 By using a trip, automatic, or semi-automatic hammer drop system which lifts the 140-lb (63.5-kg) hammer and allows it to drop 30 ± 1.0 in. (0.76 m ± 25 mm) unimpeded.

7.4.2 By using a cathead to pull a rope attached to the hammer. When the cathead and rope method is used the system and operation shall conform to the following:

7.4.2.1 The cathead shall be essentially free of rust, oil, or grease and have a diameter in the range of 6 to 10 in. (150 to 250 mm).

7.4.2.2 The cathead should be operated at a minimum speed of rotation of 100 RPM, or the approximate speed of rotation shall be reported on the boring log.

7.4.2.3 No more than 2¼ rope turns on the cathead may be used during the performance of the penetration test, as shown in Fig. 1.

NOTE 4—The operator should generally use either 1¾ of 2¼ rope turns, depending upon whether or not the rope comes off the top (1¾ turns) or the bottom (2¼ turns) of the cathead. It is generally known and accepted that 2¾ or more rope turns considerably impedes the fall of the hammer and should not be used to perform the test. The cathead rope should be maintained in a relatively dry, clean, and unfrayed condition.

7.4.2.4 For each hammer blow, a 30-in. (0.76-m) lift and drop shall be employed by the operator. The operation of pulling and throwing the rope shall be performed rhythmically without holding the rope at the top of the stroke.

7.5 Bring the sampler to the surface and open. Record the percent recovery or the length of sample recovered. Describe the soil samples recovered as to composition, color, stratification, and condition, then place one or more representative portions of the sample into sealable moisture-proof containers (jars) without ramming or distorting any apparent stratification. Seal each container to prevent evaporation of soil moisture. Affix labels to the containers bearing job designation, boring number, sample depth, and the blow count per 6-in. (0.15-m) increment. Protect the samples against extreme temperature changes. If there is a soil change within the sampler, make a jar for each stratum and note its location in the sampler barrel.

8. Report

8.1 Drilling information shall be recorded in the field and shall include the following:

8.1.1 Name and location of job,

8.1.2 Names of crew,

8.1.3 Type and make of drilling machine,

8.1.4 Weather conditions,

8.1.5 Date and time of start and finish of boring,

8.1.6 Boring number and location (station and coordinates, if available and applicable),

8.1.7 Surface elevation, if available,

8.1.8 Method of advancing and cleaning the boring,

8.1.9 Method of keeping boring open,

8.1.10 Depth of water surface and drilling depth at the time of a noted loss of drilling fluid, and time and date when reading or notation was made,

8.1.11 Location of strata changes,

8.1.12 Size of casing, depth of cased portion of boring,

8.1.13 Equipment and method of driving sampler,

8.1.14 Type of sampler and length and inside diameter of barrel (note use of liners),

8.1.15 Size, type, and section length of the sampling rods, and

8.1.16 Remarks.

8.2 Data obtained for each sample shall be recorded in the field and shall include the following:

8.2.1 Sample depth and, if utilized, the sample number,

8.2.2 Description of soil,

8.2.3 Strata changes within sample,

8.2.4 Sampler penetration and recovery lengths, and

8.2.5 Number of blows per 6-in. (0.15-m) or partial increment.

9. Precision and Bias

9.1 Variations in N-values of 100% or more have been observed when using different standard penetration test apparatus and drillers for adjacent borings in the same soil formation. Current opinion, based on field experience, indicates that when using the same apparatus and driller, N-values in the same soil can be reproduced with a coefficient of variation of about 10%.

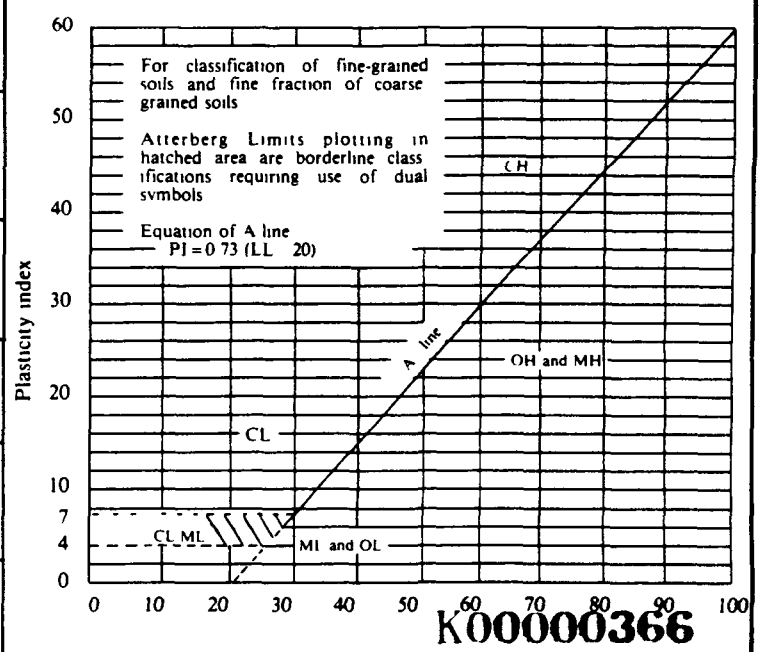
9.2 The use of faulty equipment, such as an extremely massive or damaged anvil, a rusty cathead, a low speed cathead, an old, oily rope, or massive or poorly lubricated rope sheaves can significantly contribute to differences in N-values obtained between operator-drill rig systems.

9.3 The variability in N-values produced by different drill rigs and operators may be reduced by measuring that part of the hammer energy delivered into the drill rods from the sampler and adjustng N on the basis of comparative energies. A method for energy measurement and N-value adjustment is currently under development.

K00000365

UNIFIED SOIL CLASSIFICATION

Major Divisions			Group symbols	Typical names	Laboratory classification criteria		
Coarse grained soils (More than half of material is *larger* than No 200 sieve size)	Gravels (More than half of coarse fraction larger than No 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-grades gravels, gravel sand mixtures, little or no fines	Determine percentages of sand and gravel from grain size curve Depending on percentage of fines (fraction smaller than No 200 sieve size), coarse grained soils are classified as follows Less than 5 per cent GW, GP, SW, SP More than 12 per cent GM, GC, SM, SC 5 to 12 per cent *Borderline* cases requiring dual symbols	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		Gravels with fines (Appreciable amount of fines)	GM d u	Silty gravels gravel-sand silt mixtures		Atterberg limits below "A" line or P I less than 4	Above "A" line with P I between 4 and 7 are *borderline* cases requiring use of dual symbols
			GC	Clayey gravels, gravel sand clay mixtures		Atterberg limits above "A" line with P I greater than 7	
	Sands (More than half of coarse fraction is smaller than No 4 sieve size)	Clean sands (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines		$C_u = \frac{D_{60}}{D_{10}}$ greater than 4, $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			SP	Poorly graded sands, gravelly sands little or no fines		Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM d u	Silty sands, sand-silt mixtures		Atterberg limits below "A" line or P I less than 4	Limits plotting in hatched zone with P I between 4 and 7 are *borderline* cases requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterberg limits above "A" line with P I greater than 7	
Fine-grained soils (More than half of material is *smaller* than No 200 sieve)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity			
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL	Organic silts and organic silty clays of low plasticity			
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous 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			



Plasticity Chart

K00000366

SUBSURFACE EXPLORATION PROCEDURES

Hand-Auger Drilling (HA)

In this procedure, a sampling device is driven into the soil by repeated blows of a sledge hammer. When the sampler is driven to the desired sample depth, the soil sample is retrieved. The hole is then advanced by manually turning the hand auger until the next sampling depth increment is reached. The hand auger drilling between sampling intervals also helps to clean and enlarge the bore hole in preparation for obtaining the next sample.

Power Auger Drilling (PA)

In this type of drilling procedure, continuous flight augers are used to advance the bore holes. They are turned and hydraulically advanced by a truck or track-mounted unit as site accessiblility dictates. In auger drilling, casing and drilling mud are not required to maintain open bore holes.

Hollow Stem Auger Drilling (HS)

In this drilling procedure, continuous flight augers having an open stem are used to advance the bore holes. The open stem allows the sampling tool to be used without removing the augers from the bore hole. Hollow stem augers thus provide support to the sides of the bore hole during the sampling operations.

Rotary Drilling (RB)

In employing rotary drilling methods, various cutting bits are used to advance the bore holes. In this process, surface casing and/or drilling fluids are used to maintain open bore holes.

Diamond Core Drilling (DB)

Diamond core drilling is used to sample cemented formations. In this procedure, a double tube (triple tube) core barrel with a diamond bit cuts an annular space around a cylindrical prism of the material sampled. The sample is retrieved by a catcher just above the bit. Samples recovered by this procedure are placed in sturdy containers in sequential order.

K00000367

LABORATORY PROCEDURES

Water Content (Wc)

The water content of a soil is the ratio of the weight of water in a given soil mass to the weight of the dry soil. Water content is generally expressed as a percentage.

Hand Penetrometer (Qp)

In the hand penetrometer test, the unconfined compressive strength of a soil is determined, to a maximum value of 4.5 tons per square foot (tsf), by measuring the resistance of the soil sample to penetration by a small, spring-calibrated cylinder. The hand penetrometer test has been carefully correlated with unconfined compressive strength tests, and thereby provides a useful and a relatively simple testing procedure in which soil strength can be quickly and easily estimated.

Unconfined Compression Tests (Qu)

In the unconfined compression strength test, an undisturbed prism of soil is loaded axially until failure or until 20% strain has been reached, whichever occurs first.

Dry Density (γ_D)

The dry density is the quantity used as a measure of the amount of solids in a unit volume of soil aggregate. Use of this value is often made when measuring the degree of compaction of a soil.

Classification of Samples

In conjunction with the sample testing program, all soil samples are examined in our laboratory and classified on the basis of their texture and plasticity in accordance with the Unified Soil Classification System (USCS). The soil descriptions on the boring logs are in conformance with this system and the estimated group symbols according to this system are included in parentheses following the soil descriptions on the boring logs. Included on a separate sheet entitled "General Notes" is a brief explanation of this system of soil classification.

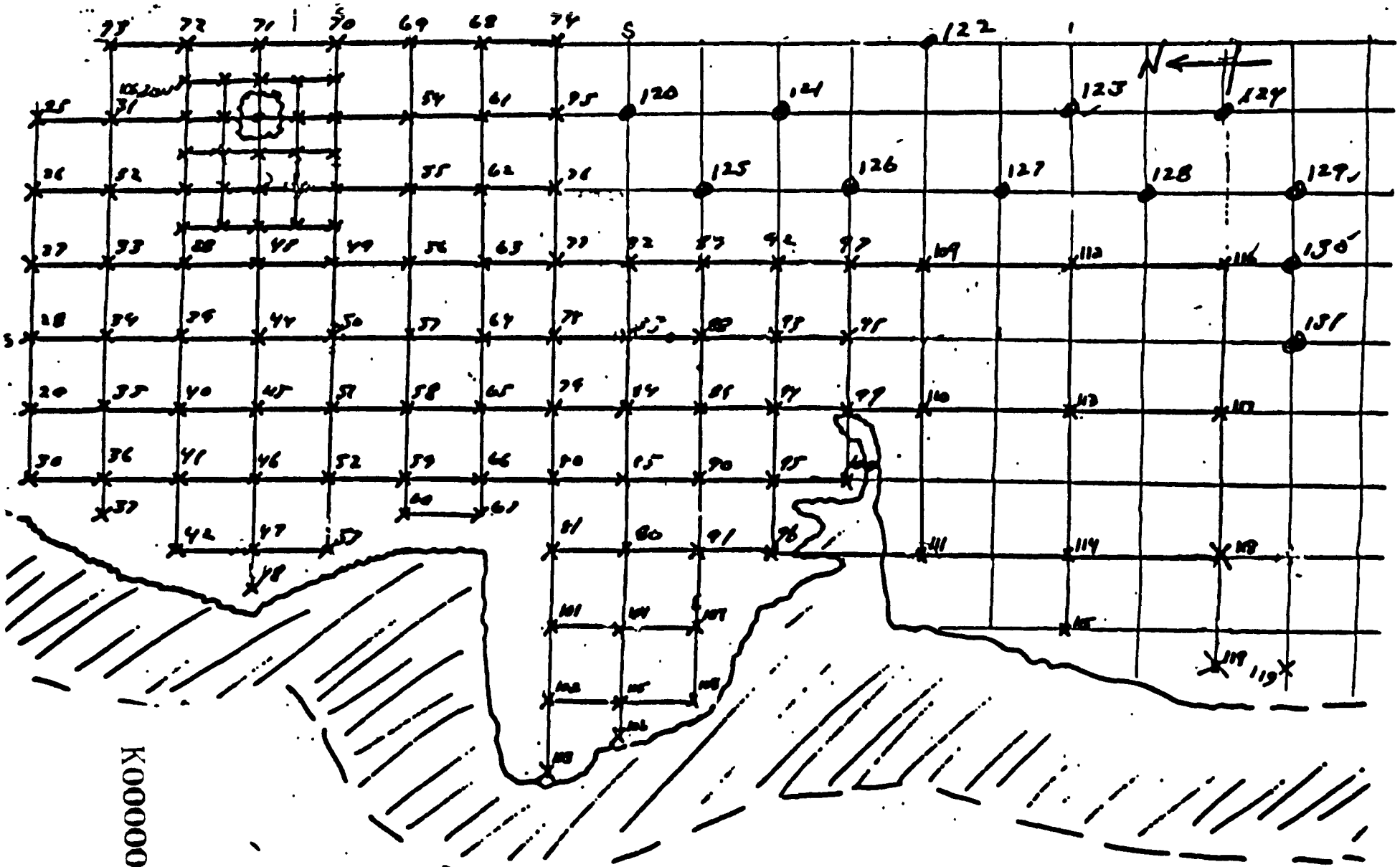
APPENDIX B

Consumers Power Company Analytical Data

Grain Size Analysis

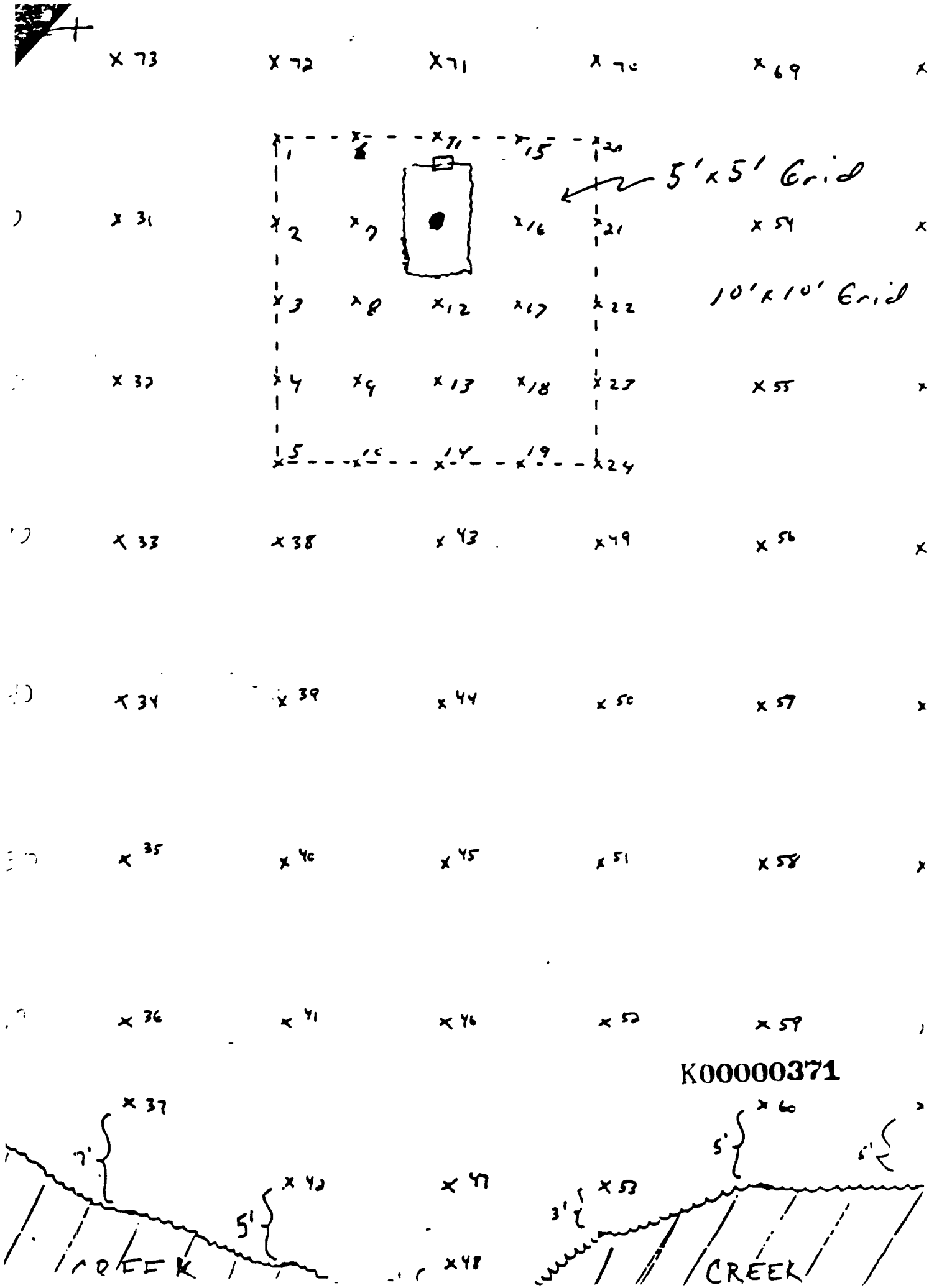
Permeability Analysis

Overisel Gas Comp. Station Soil Sampling - Composite Grid - Oil/Water Sep. Discharge Point



Jan 21, 1988 points #120 → 131

K0000003370



K00000371

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-16-87
Project # 528717781-492

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872492A-1	1	
2	8	
3	9	
4	25	
5	120	
6	2	
7	530	7
8	3500	
9	490	4
10	660	
11	9	
12	1200 ~~750*~~	
13	200 ~~760*~~	
14	230 ~~200*~~	
15	31	
16	4400	14
17	2700	
18	3400	1100
19	260 *	
20	57	

K00000372

OVERHEAD COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-16-87
Project # 528717 781-492

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872492A-22	860	
23	1800	
24	150	

K00000373

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project # 528717-781-502

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502-A 25	5	
26	2	
27	6	<1
28	1	
29	2	
30	<1	<1
31	12	<1
32	17	
33	13	<1
34	9	
35	1	
36	<1	
37	<1	<1
38	800	1
39	10	
40	9	
41	1	
42	<1	<1
43	3900	83
44	520	2
45	11	

DUERKSEN COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project #

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502A - 46	1	
47	1	<1
48	1	<1
49	450	3
50	3100	6
51	67	
52	5	
53	3	<4**
54	38	2
55	110	3
56	830	15
57	820	12
58	140	2
59	9	
60	9	<1
61	5	
62	62	<1
63	530	8
64	310	4
65	5	<1
66	1	<1

K00000375

UNIRISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project # 528717 781-502

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502A-67	1	
68	1	
69	3	
70	3	
71	17	
72	1	
73	3	
		K00000376

OVERHOLT COMPRESSOR STATION

Oil-Water Separator Discharge

Sample Date 11-03-87 Project 872-690

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872-690- 74	1	<1
75	4	<1
76	21	2
77	110	3
78	>520 *	15
79	73	30
80	51	97
81	3	9
82	>380 *	4
83	>570 *	56
84	>200 *	33
85	68	17
86	7	12
87	>270 *	25
88	>300 *	51
89	>170 *	44
90	100	6
91	5	5
92	68	3
93	94	27

K0000037?

OVERISEL COMPRESSOR STATION

Oil-Water Separator Discharge

Sample Date 11-03-87 - Project 872-690

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872-690- 94	> 180 *	120
95	27	10
96	3	5
97	18	1
98	21	4
99	85	13
100	30	36

K00000378

OVERISEL COMPRESSOR STATION

Oil-Water Separator Discharge

Sample Date 11-23-87 Project 872-829

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872-829A-101	1	<1
102	1	<1
103	<1	<1
104	1	<1
105	1	1
106	1	<1
107	4	4
108	1	22
109	15	4
110	8	3
111	1	1
112	5	3
113	4	<1
114	1	<1
115	1	1
116	6	8
117	1	<1
118	1	<1
119	1	<1

Expanded Sample Grid - 11-23-87

K00000379

COMPRESSOR STATION

3-1-88
M465,4

Area - Overfill
Sampling Date - 01-21-88
Project # 88-135
Report Date - Feb 01, 1988

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
88-135 # 120	7	1
121	6	<1
122	11	<1
123	3	5
124	6	1
125	19	1
126	10	<1
127	8	2
128	5	2
129	4	<1
130	6	1
131	9	1
		K00000380

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88 mw-2

Sample Date 030788 Collected By STS

Received Date 030788 Analysis Number 1477

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/l g
88383-13	mw-2	1	7-9		<1
14		2	9-11		<1

K00000381

LOCATION Oversel

Project Number 518817 552-383 Report Date

Borehole ID mw 2A

Sample Date 031088 Collected By STS

Received Date 031188 Analysis Number 1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-83	mw 2A	1	16-18		<1
84		2	18-20		<1
85		wash water	unk		<1

K00000382

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88mw-3

Sample Date 031488 Collected By STS

Received Date 031488 Analysis Number 1484

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-98	mw3	1	6-8		<1
99	mw3	2	8-10		<1

K00000383

OCATION Overise 1

roject Number 518817552-383 Report Date

orehole ID 88MW-3A

ample Date 031688 Collected By STS

eceived Date 031788 Analysis Number 1487

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-138	MW3A	1	16-18		<1
139		2	18-20		<1
140		wash water	20		<1

K00000384

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-1

Sample Date 030488 Collected By STS

Received Date 030488 Analysis Number 1476

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-1	SB-1	1	0-2		1
2		2	2-4		<1
3		3	4-6		1
4		4	6-8		<1 *
5		5	8-10		<1
6		6	10-12		<1
7		7	12-14		2
8		8	14-16		<1
9		9	16-18		28
10		10	18-20		16

K00000385

* Result <1 But Detectable

OCATION Overisel

roject Number 518817 552-383 Report Date

orehole ID 88SB-1A

ample Date 030888 Collected By STS

eceived Date 030888 Analysis Number 1478/1479

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-25	SB-1A	1	20-22		<1
26		2	22-24		<1
27		3	24-26		<1
28		4	26-28		<1
29		5	28-30		<1
30		Mud	25		8
31		Mud	28		12
54	SB-1A	mud	28		16
	(030988)				
				K00000386	

LOCATION Overisel

Project Number 5/8817552-383 Report Date

Borehole ID 88SB-2

Sample Date 03 07 88 Collected By STS

Received Date 03 08 88 Analysis Number 1478/1479

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-15	SB-2	1	0-2		1
16		2	2-4		<1
17		3	4-6		<1
18		4	6-8		<1
19		5	8-10		<1
20		6	10-12		<1*
21		7	12-14		5
22		8	14-16		<1*
23		9	16-18		1
24		10	18-20		7

* Result <1 But Detectable

K00000387

OCATION Overisel

roject Number 518817552-383 Report Date

orehole ID 88SB-3

ample Date 030988 Collected By STS

eceived Date 031088 Analysis Number 1480/1481/1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88383-55	SB-3	1	0-2		2
56		2	2-4		<1
57		3	4-6		1
58		4	6-8		<1
59		5	8-10		<1
60		6	10-12		<1
61		7	12-14		<1
62		8	14-16		<1
63		9	16-18		1
64		10	18-20		1
65		11	20-22		2
77		12	22-24		<1
78		13	24-26		<1
79		14	26-28		<1
80		15	28-30		<1
81		mud	18		1
82		mud	28		1
				K00000388	

LOCATION Ouensel

Project Number 518817 552-383 Report Date

Borehole ID 88 SB-4

Sample Date 030988 Collected By STS

Received Date 031088 Analysis Number 1480/1481/1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-66	SB-4	1	0-2		82
67		2	2-4		<1
68		3	4-6		2
69		4	6-8		1
70		5	8-10		<1
71		6	10-12		<1
72		7	12-14		1
73		8	14-16		1
74		9	16-18		1
75		10	18-20		<1*
76		11	20-22		8

* Result <1 But Detected

K00000389

LOCATION Overisel

Project Number 5188172552-383 Report Date

Borehole ID 88SB-5

Sample Date 030888 Collected By STS

Received Date 030988 Analysis Number 1479/1480

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-32	SB-5	1	0-2		<1
33		2	2-4		<1
34		3	4-6		<1
35		4	6-8		<1
36		5	8-10		<1
37		6	10-12		<1
38		7	12-14		15
39		8	14-16		27
40		9	16-18		4
41		10	18-20		2

K00000390

LOCATION Overise 1

Project Number 5188175523 83 Report Date

Borehole ID 88SB-6

Sample Date 030988 Collected By STS

Received Date 030988 Analysis Number 1479/1480

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-42	SB-6	1	0-2		1
43		2	2-4		<1
44		3	4-6		<1
45		4	6-8		1
46		5	8-10		<1
47		6	10-12		<1
48		7	12-14		<1
49		8	14-16		<1
50		9	16-18		1
51		10	18-20		<1*
52		11	20-22		<1
53		12	22-24		12

K00000391

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-7

Sample Date 031088 Collected By STS

Received Date 031188 Analysis Number 1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCE mg/kg
88383-86	SB7	1	0-2		3
87		2	2-4		<1
88		3	4-6		<1*
89		4	6-8		<1
90		5	8-10		<1
91		6	10-12		<1
92		7	12-14		<1
93		8	14-16		<1
94		9	16-18		1
95		10	18-20		4
96		11	20-22		<1
97		wash water	20		<1
		Sediment	20		2

* Result <1 But Detected

K00000392

LOCATION Overisel

Project Number 518817.552-383 Report Date

Borehole ID 88SB-8

Sample Date 031488, 031588 Collected By SJS

Received Date 031588 Analysis Number 1484, 1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-100	SB8	1	0-2		<1
101		2	2-4		<1
102		3	4-6		3
103		4	6-8		<1
104		5	8-10		<1
105		6	10-12		<1
106		7	12-14		2
107		8	14-16		<1
108		9	16-18		<1
109		10	18-20		<1
110		11	20-22		<1
111		12	22-24		<1
				K00000393	

LOCATION Overisel

Project Number 518817 552-383 Report Date

Borehole ID 88 SB-9

Sample Date 031488, 031588 Collected By STS

Received Date 031588 Analysis Number 1484, 1487

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCF mg/kg
88-383-112	SB9	1	0-2		<1
113		2	2-4		<1
114		3	4-6		<1
115		4	6-8		<1
116		5	8-10		<1
117		6	10-12		<1
118		7	12-14		<1
119		8	14-16		<1
120		9	16-18		<1
121		10	18-20		<1
122		11	20-22		<1
123		12	22-24		<1
124		mud	22		<1
				K00000394	

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-10

Sample Date 031688 Collected By STS

Received Date 031688 Analysis Number 1485, 1487

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
88-383-125	SB10	1	0-2		<1
126		2	2-4		<1
127		3	4-6		<1
128		4	6-8		<1
129		5	8-10		<1
130		6	10-12		<1
131		7	12-14		<1
132		8	14-16		<1
133		9	16-18		<1
134		10	18-20		<1
135		11	20-22		<1
136		12	22-24		<1
137		MUD	22		<1
				K00000395	

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-11

Sample Date 031688, 031788 Collected By STS

Received Date 031788 Analysis Number 1487, 1488

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-141	SB-11	1	2-4		5400
142		2	4-6		1
143		3	6-8		<1*
144		4	8-10		<1*
145		5	10-12		<1
146		6	12-14		78
147		7	14-16		<1
148		8	16-18		<1
149		9	18-20		<1
150		10	20-22		<1
151		11	22-24		<1
152		12	24-26		<1
153		13	26-28		<1
154		14	28-30		<1
155		MUD	18-20		36
156		MUD	24		10
157		MUD	28		6
				K00000396	
	* Result <1	But Detected			

7-14-88
M905.4

To BW Rasher, P12-103

From HW Voigt, T-260

Date July 18, 1988

Subject OVERISEL COMPRESSOR STATION -

Monitoring Well MW-4 and MW-4A PCB Results

cc

File Index #
528817-552-082

On July 12, 1988 personnel from the Chemical Division of L&FTS completed Depth-To-Water (DWL) measurements and collected groundwater samples from MW - 4 and MW - 4A monitoring well installations at the Overisel Compressor Station. Water samples were analyzed for PCB concentration.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - The monitoring wells were pumped to a constant specific conductance and pH reading (20 gallons at one gallon per minute) and the water sample collected with a clean bailer. MW - 4 stabilized at a specific conductance of 390 umhos/cm and a pH of 7.5. MW - 4A stabilized at a specific conductance of 410 umhos/cm and a pH of 7.5.

PCB Analysis - EPA Method 608.

RESULTS

Control Number	Monitoring Well ID	Depth-To-Water (ft)	PCB * A1254 ug/L
88082-1	MW - 4	2.71	1.90
88082-2	MW - 4A	2.75	0.83
88082-3	Field Blank		<0.53
88082-4	Method Blank		<0.53

* Sample detection limit <0.53 ug/L, PCB as A-1254

K00000397

hwv

7-13-88

To GDDykstra, Overisel Compressor Station

From HWVoigt, T-260, Jackson

Date July 8, 1988

Subject WASTE MATERIAL ANALYSIS REPORT

CONSUMERS POWER COMPANY

Internal Correspondence

CC BWRasher, P-12-103 PSZombo, P-11-203 File Index: 528817-510-010
WJWilson, P-12-308

The following waste material/oil samples were received by the Chemical Division of L&FTS for characterization of physical and chemical properties.

Facility Name

Overisel Compressor Station

Sample Date: 06-24-88 Received Date: 06-24-88

Lab Number	Facility Number	Sample Origin and Physical Appearance
88-1010-1	BBL-1	Water - MW4 & 4A
88-1010-2	BBL-2	Water - MW4 & 4A
88-1010-3	BBL-3	Soil - MW4 & 4A
88-1010-4	BBL-4	Soil - MW4 & 4A
88-1010-5	-	Air Compressor Condensate

Test Parameter	Sample Analysis Results				
	Water	Water	Soil	Condensate	Soil
Lab Number	88-1010-1	88-1010-2	88-1010-3	88-1010-4	88-1010-5
Facility Number	BBL-1	BBL-2	BBL-3	BBL-4	-
Flash Point-D93, °F	-	-	-	-	-
PH, Units	-	-	-	-	-
PCB, ug/g	<1	<1		10	<1
Metals, ppm	**********				
Copper	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA
Cl-Solvents, ppm	**********				
Methylene Chloride	NA	NA	NA	NA	NA
111-Trichloroethane	NA	NA	NA	NA	NA
112-Trichloroethene	NA	NA	NA	NA	NA
Perchloroethylene	NA	NA	NA	NA	NA
Freon-113	NA	NA	NA	NA	NA
112-Trichloroethane	NA	NA	NA	NA	NA
Total Halogens, ppm	NA	NA	NA	NA	NA

Data Reference: PCB-1562

Reviewed by: MWJ Date: 7/8/88

Metals reported as ____ total metals ____ extracted metals. (NA - Not Analyzed)

Flash point indicated as "BP" indicates no flash point at boiling point

K00000398

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

STS Job No. 1151XH Project: Consumers Power Company - Overisel
Date: 3/31/88 Client: Consumers Power Company
Sample Description: Fine sand, trace medium sand and silt - brown (SP)
Sample Location/Identification: 88SB-11 S-3 6'-8'

Sieve Size Number	Weight Retained (gm)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch				
3/8-Inch				
No. 4				
No. 8				
No. 10				
No. 16	0	0	100	
No. 30	0.2	0.1	99.9	
No. 50	59.3	18.0	81.9	
No. 80	-	-	-	
No. 100	250.8	76.2	5.7	
No. 200	11.9	3.6	2.1	
Pan	0.7 (6.2)	2.1		
Total Weight	329.1			

Weight of oven dry soil before washing: 329.1 gm
Weight of oven dry soil after washing: 322.9 gm
Weight loss by wash: 6.2 gm

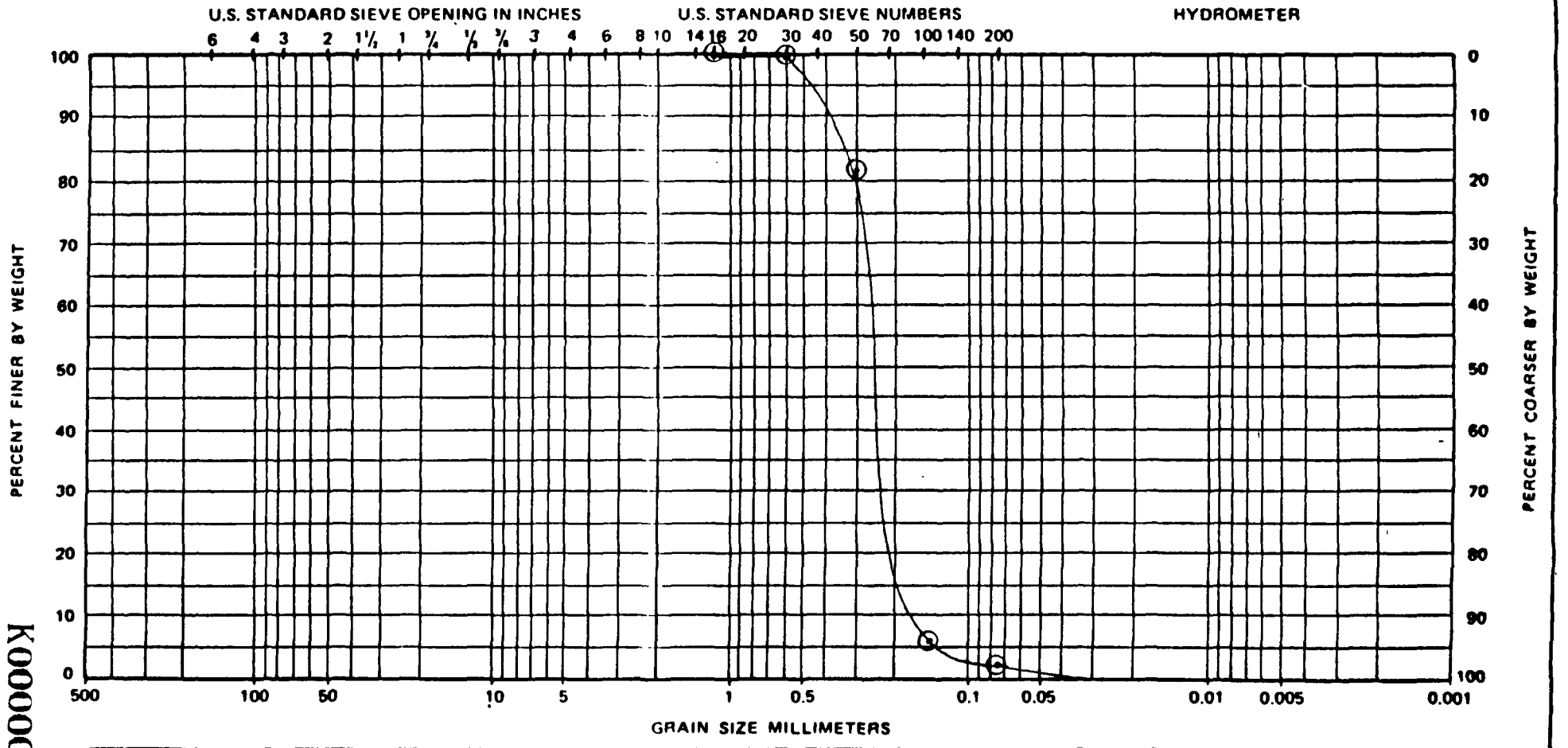
K00000399

Remarks:

Checked by: DDB Technician: CDH

STS Consultants Ltd.

GRADATION CURVES



K00000400

SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
88SB-11		Fine sand, trace medium sand				
S-3		and silt - brown (SP)				
6'-8'						

DRAWN	APPROVED	DATE	JOB NO.
DDB	BBS	3/31/88	1151XH

PROJECT

Consumers Power Company
Overisel Compressor Station
Holland, Michigan

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

STS Job No. 1151XH Project: Consumers Power Company - Overisel
Date: 3/31/88 Client: Consumers Power Company
Sample Description: Fine sand, trace silt - brownish gray (SP)
Sample Location/Identification: 88SB-1A S-11 20-22'

Sieve Size Number	Weight Retained (gm)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch				
3/8-Inch				
No. 4				
No. 8				
No. 10				
No. 16	0	0	100	
No. 30	0.2	0.1	99.9	
No. 50	1.3	0.6	99.3	
No. 80	-	-		
No. 100	168.1	75.8	23.5	
No. 200	48.2	21.8	1.7	
Pan	2.1 (1.6)	1.7		
Total Weight	221.5			

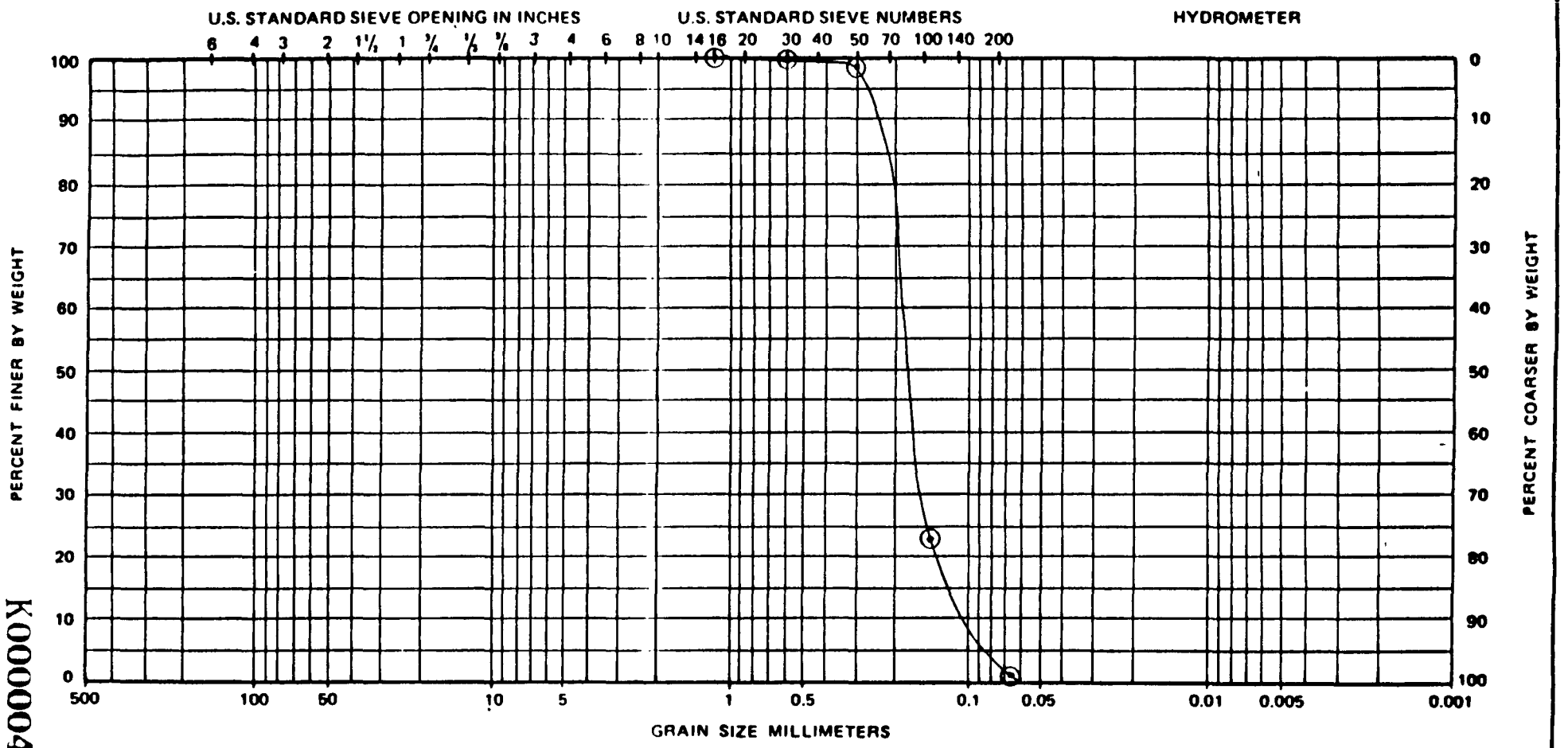
Weight of oven dry soil before washing: 221.5 gm
Weight of oven dry soil after washing: 219.9 gm
Weight loss by wash: 1.6 gm

Remarks: K00000401

Checked by: MLY Technician: DH

STS Consultants Ltd.

GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

K00000402

SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
88SB-1A		Fine sand, trace silt -				
S-11		brownish gray (SP)				
20-22'						

DRAWN	APPROVED	DATE	JOB NO.
DDB	BBS	3/31/88	1151XH

PROJECT

Consumers Power Company
Overisel Compressor Station
Holland, Michigan

STS Consultants Ltd.
Consulting Engineers
3340 Ranger Road
Lansing, Michigan 48906
(517) 321-4964

STS Job No.: 1151XH

LABORATORY PERMEABILITY TEST RESULTS

Project: Consumers Power Company - Overisel

Sample Designation: Boring 88SB-1 S-5 (8'-10')

Sample Description: Fine sand, trace medium sand and silt, brown

Permeability: 3.74×10^{-3} cm/sec.

STS Consultants Ltd.
Consulting Engineers
3340 Ranger Road
Lansing, Michigan 48906
(517) 321-4964

STS Job No.: 1151XH

LABORATORY PERMEABILITY TEST RESULTS

Project: Consumers Power Company - Overisel

Sample Designation: Boring 88SB-11 S-12 (24'-26')

Sample Description: Fine sand, trace silt - gray.

Permeability: 5.73×10^{-4} cm/sec.

APPENDIX C

Boring Location and

Monitoring Well Location Diagram

8-11-88
M405.4
(22)

To G. Dykstra, Overisel gas Comp. station

From HWVoigt, T-260, Jackson

Date August 8, 1988

Subject PCB ANALYSIS RESULTS

CONSUMERS POWER COMPANY

Internal Correspondence

CC

Project No 528817552172, 528817552173
Analysis No 1596

Analyst GL Cattell

RL Moore, JSC 251
BW Rasher, P12-103

The following samples have been analyzed for PCB concentration. The indicated PCB concentration is reported as parts per million by weight as the indicated Aroclor.

Entry	Control Number	Tag Number	PCB ppm	Aroclor 42	54	60	Location
1	882-172	NA	140		✓		Inside 6" pipe going to de-hy. building near Seal #3
2	882-173	NA	94000		✓		Inside 12" wastewater pipe North of Seal #2 in
3							engine room.
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

K00000406

0887-106-48T

8-11-88
M905.4

(23)

To BWRasher, P-12-103

From HWVoigt, T-260 HWV

Date August 8, 1988

CONSUMERS POWER COMPANY

Internal Correspondence

Subject OVERISEL COMPRESSOR STATION MONITORING
WELLS MW-4 AND MW-4A
SAMPLE DATE AUGUST 4, 1988

CC

On August 4, 1988 personnel from the Chemical Division of L&FTS completed groundwater sampling at the Overisel Compressor Station MW-4 and MW-4A monitoring wells. Groundwater samples were returned to L&FTS for determination of PCB concentration.

METHODS

Depth-To-Water - Wetted Tape Method

Sample Collection - Each monitoring well was pumped for 20 gallons, then a water sample collected with a bailer. The wells were then pumped for an additional 60 gallons and a second water sample collected with a bailer.

Pumping was done with the pump hose foot-valve at the depth-to-water level so that the completed well casing volume was exchanged. Bailer samples were collected at screen depth.

PCB Analysis - Method 8080, SW846

RESULTS

Parameter	MW-4	MW-4A
Depth-To-Water (ft TOC)	2.84	2.88
Screen Depth	11.5	19.5
PCB, ug/L as A1254		
20 gal pump volume	1.25	1.20
80 gal pump volume	0.85	0.49
Calculated Well Volumes		
20 gal pump volume	14	7
80 gal pump volume	56	30

K00000407

0888-047-75T

9-23-88
M905.4

(24)

To G. Dykstra, Overisel Gas Comp. Station

From HWVoigt, T-260, Jackson

Date August 22, 1988

Subject PCB ANALYSIS RESULTS

CONSUMERS POWER COMPANY

Internal Correspondence

CC

RL Moore, JSC 251
BW Rosher P12-103

Project No 5288175522 39
Analysis No 1608, 1611
Analyst GL Cattell

The following samples have been analyzed for PCB concentration. The indicated PCB concentration is reported as parts per million by weight as the indicated Aroclor.

Entry	Control Number	Tag Number	PCB ppm	Aroclor 42	54	60	Location
1	882-239-1	NA	10		✓		drain - 6" dehy.
2	-2	NA	39		✓		12" east of seal #2, drain
3	-3	NA	<1				100 gal. of air comp. condensate - H_2O
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

K00000408

0887-106-48T

9-7-88
M905.4

(25)

To G Dykstra, Overisel Comp. Station

From HWVoigt, T-260, Jackson

Date September 6, 1988

Subject PCB ANALYSIS RESULTS

CONSUMERS POWER COMPANY

Internal Correspondence

CC

RL Moore, JSC 251
BW Rasher, P12-103

Project No 5288175523 19
Analysis No 1630

Analyst GL Cattell

The following samples have been analyzed for PCB concentration. The indicated PCB concentration is reported as parts per million by weight as the indicated Aroclor.

Entry	Control Number	Tag Number	PCB ppm	Aroclor 42	54	60	Location
1	882-319-1	NA	130		✓		6" Aux. drain
2	-2	NA	<1				Air compressor condensate
3	-3	NA	3		✓		dehy. drain
4	-4	NA	<2		✓		warehouse drain
5	-5	NA	8		✓		12" drain
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

K00000409

0887-106-48T

9-27-88
M905.4

(26)

To O. Essink, Overisel Comp. Station

From HWVoigt, T-260, Jackson

Date Sept. 23, 1988

Subject PCB ANALYSIS RESULTS

CONSUMERS POWER COMPANY

Internal Correspondence

CC RL Moore, JSC 251
BW Rasher, P12-103

Project No 528817-552-428
Analysis No 1650

Analyst GL Cattell

The following samples have been analyzed for PCB concentration. The indicated PCB concentration is reported as parts per million by weight as the indicated Aroclor.

Entry	Control Number	Tag Number	PCB ppm	Aroclor 42	54	60	Location
1	882-428	NA	250		✓		6" drain line by aux. bldg.
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

K00000410

0887-106-48T

5-2-89
M905.4

04/29/89 (27)

Pg:1

Overisel Compressor Station
PCB Wipe Sampling
Air Compressors I & II 04-25-89

518917-552-731

RECEIVED
APR 25 1989

PCB g/100cm2		SMPL #	COMP #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
2		1	1	MAIN BODY CYLINDER	SQR	10 X 10
8		2	2	MAIN BODY CYLINDER	SQR	10 X 10
4		3	NA	LOW PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
1		4		DISTANCE PIECE (LOOSE)	SQR	12 x 24
1		5		DISTANCE PIECE (ATT'D)	RECT	12 x 24
3		6		HI PRESS CYL	~~SQR~~ CYL	18L x 7.2 dia
16		7		HI PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
29		8		INTAKE ELBOW	CYL	4.0L x 7.9 dia
345		9		LO PRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
93	93	10		HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
na	na	11	1&2	HEXANE		
288	288	12	NA	VALVE COVER PLATE (REP/4)	SQR	5.0 x 5.0
8		13		2ND STAGE CYL HEAD	CYL	2.8L x 5.0 dia
4		14		2ND STAGE PISTON ROD	CYL	9.0L x 5.6 dia
10		15		LO PRESS PISTON & ROD	RECT	6.0 x 16.5
4		16		HI PRESS PISTON	RECT	13.5 x 7.5
8		17		LUBRICATOR GEAR BOX	RECT	10 x 9.5
1		18		INTER-STAGE SEPARATOR	CYL	8.5L x 8.0 dia
		~~19~~		~~LO PRESS PACKING GLAND~~	~~CYL~~	~~4.0L x 6.0 dia~~
12		19		DISCHARGE PIPING	CYL	4.0L x 3.9 dia
8		20		DISCHARGE PIPING	CYL	4.0L x 3.9 dia
3		21		LO PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
na		22		HEXANE		
19		23		DISTANCE PIECE (LOOSE)	RECT	12 x 24
5		24		DISTANCE PIECE (ATT'D)	RECT	12 x 24
64		25		HI PRESS CYL	CYL	1.8L x 7.2 dia
4		26		HI PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
91		27		INTARE ELBOW	CYL	4.0L x 7.9 dia
130		28		LO PRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
32	32	29		HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
12	12	30		VALVE COVER PLATE (REP/4)	SQR	5.0 x 5.0
32	32	31		2ND STAGE CYL HEAD	CYL	2.8L x 5.0 dia
16		32		2ND STAGE PISTON ROD	CYL	9.0L x 5.6 dia
na		33		HEXANE		

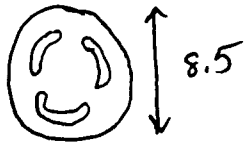
K00000411

Overisel Compressor Station 731 (pg 2)
PCB WIPE SAMPLING
AIR COMPRESSORS I & II 04-25-89

PCB 1/100 cm²	SMPL #	COMP #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
6	34	NA	LoPRESS PISTON & ROD	RECT	6.0 x 16.5
3	35	↓	Hi PRESS PISTON	RECT	13.5 x 7.5
5	36	↓	LUBRICATOR GEAR BOX	RECT	10.0 x 9.5
2	37	↓	INTERSTAGE SEPARATOR	CYL	8.5L x 8.0 dia
88	38	↓	PACKING SPACERS (REP/39)	CYL	2.4L x 3.2 dia
17	39	↓	LoPRESS VALVE (REP/8)	CIR	SEE DRWG #1
11	40	↓	Hi PRESS VALVE (REP/8)	CIR	6.0 dia
3	41	↓	VALVE CHAIR (REP/8)	CIR	9.5 dia
24	* 42	134	AIR DRYER TRAP	CYL	4.0L x 1.4 dia
[illegible]	* 43	14	INSTRUMENT AIR REGULATOR	CYL	4.0L x 3.3 dia
na	44	na	HEXANE		
			COMPRESSOR ENGINE RE-WIPES		
5	* 45	#2	DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
20	* 46	#2	TURBO PRE-LUBE PUMP	↓	4.5L x 2.7 dia
32	* 47	#3	DRESSER CPLG (REP/23)	↓	4.5L x 7.8 dia
60	* 48	#3	TURBO PRE-LUBE PUMP	↓	4.5L x 1.9 dia
19	* 49	#4	ENGINE PRE LUBE REG	↓	4.5L x 3.1 dia
240	* 50	#4	TURBO PRE-LUBE REG	↓	4.5L x 1.9 dia
18	* 51	#4	TURBO LINES (REP/3)	↓	4.5L x 1.9 dia
na	52	2-4	HEXANE		

* INDICATES HIGH PRIORITY ANALYSIS

#1



56.7

K00000412

holes are 4.2 Long x 1.1 across = 4.6 cm² x 3 = -13.9 cm² = 42.8

SAMPLES ARE IDENTIFIED BY NUMBER AT SITE

5-2-89
M905.4

4/29/89 (28)

OVERISEL COMPRESSOR STATION 518917-552-757
PCB WIPE SAMPLES
COMPRESSOR ENGINES 04-28-89

cm2	SMPL #	ENG #	DESCRIPTION		APPX SHAPE	AREA MEASURE, CM
	1	NA	Instrument air regulator	AIR COMPRESSOR PARTS	CYL	4.0L x 3.3dia
	2	3	TURBO PRE-LUBE PUMP		CYL	4.5L x 2.2dia
	3	2	TURBO PRE-LUBE PUMP		CYL	3.5L x 1.9dia
	4	3	DRESSER CPLG (REP/23)		CYL	4.5L x 7.8dia
	5	4	ENGINE PRE-LUBE REGULATOR		CYL	2.8L x 3.0dia
	6	NA	INSTRUMENT AIR DRYER TRAP		CYL	4.5L x 6.0dia
	7	4	ENGINE PRE-LUBE LINES		CYL	2.5L x 1.1dia
	8	4	TURBO PRE LUBE REGULATOR		CYL	1.3L x 2.0dia
	9	NA	HEXANE			

RECEIVED
APR 28 1989
CHEMICAL
DIV

5-4-89
M905.4

(39)

To DT Ketcham, P-25-131

From HWVoigt, T-260, Jackson

Date April 18, 1989

Subject PCB ANALYSIS RESULTS

CONSUMERS POWER COMPANY

Internal Correspondence

CC

BW Rasher P12-103
WJ Wilson P12-308
Dykstra, Overisel

Project No 518917 552 668
Analysis No 1823

Analyst GL Cattell

The following: drain samples have been analyzed for PCB concentration. The indicated PCB concentration is reported as parts per million by weight as the indicated Aroclor.

Entry	Control Number	Tag Number	PCB ppm	Aroclor 42	54	60		ϕ	Sample Description type	Location
1	89-668-1	NA	2			✓	—		water	slop tank — barrel #1
2	-2	NA	1400		✓		—		sludge	slop tank — barrel #7
3	-3	NA	280		✓		—		sludge	slop tank — barrel #8
4										Overisel Station
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

K00000414

0887-106-48T

Slop tank
#1
89-668-1
Overisel Compressor
Station
4/14/89

4/14/89 Sample from #8
89-668-3 Barrel 1/ of Floor Drain collection
Tank
Overisel Compressor
Station
DTKetcham 3495 108.202 2

4/14/89 Sample from #7
Barrel 1/ of Floor Drain
Collection Tank
89-668-2 Overisel Compressor
Station
DT Ketcham

K00000415

7-11-89

(30)

OVERISEL COMPRESSOR STATION 578917-552-711
PCB WIPES
COMPRESSOR ENGINE 04-21-89

RECEIVED
APR 21 1989
CH

µg/100cm²		SMPL #	ENGIN #	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
1	*	1	1	STARTING AIR RECEIVER INLET - ELL	CYL	5.0L x 10.2 dia
4	*	2	1	↓	↓	↓
7		3	1			
1		4	1			
3		5	1	TURBINE PRE-LUBE PUMP	CYL	4.5L x 2.7 dia
<1		6	1	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
1		7	1	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 2.2 dia
10		8	1	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 2.5 dia
6		9	1	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
a		10	1	HEXANE		
13		11	2	TURBINE PRE LUBE PUMP	CYL	4.5L x 2.7 dia
<5		12	2	ENGINE PRE LUBE PUMP	CYL	4.5L x 2.6 dia
2		13	2	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 2.2 dia
6		14	2	ENGINE PRE LUBE REGULATOR	CYL	4.5L x 2.5 dia
99		15	2	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
11	*	16	3	TURBINE PRE-LUBE PUMP	CYL	4.5L x 1.9 dia
9	*	17	3	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
7	*	18	3	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 1.9 dia
8	*	19	3	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 1.8 dia
na	*	20	2-3	HEXANE		
403	*	21	3	AIR INJECTION HEADER - DRESSER CPLG (REP/23)	CYL	4.5L x 7.8 dia
5	*	22	4	TURBINE PRE-LUBE PUMP	CYL	4.5L x 2.7 dia
4	*	23	4	ENGINE PRE-LUBE PUMP	CYL	4.5L x 2.6 dia
66	*	24	4	TURBO PRE-LUBE REGULATOR	CYL	4.5L x 1.9 dia
15	*	25	4	ENGINE PRE-LUBE REGULATOR	CYL	4.5L x 3.1 dia
6	*	26	4	AIR INJECTION HEADER - DRESSER CPL (REP/23)	CYL	4.5L x 7.8 dia
40	*	27	4	TURBO AIR LINES (REP/3)	CYL	4.5L x 1.9 dia
na	*	28	3-4	HEXANE		
3	*	29		GENERATOR STARTER MOTOR	CYL	2.0L x 5.4 dia
5	*	30		SOLENOID ASSY - STARTER MOTOR (REP/9)	CYL	5.0L x 7.5 dia
5	*	31		REGULATOR LINE - STARTER MOTOR (REP/8)	CYL	5.0L x 4.1 dia
na		32		Hexane		

K00000416

* HIGH PRIORITY

7-11-89 (31)

Overisel Compressor Station

4/29/89

u: CB / 100cm2	sample No	Eng. #	Description	approx shape	Area Measure CM
210	1	4	Turbo Prelube Dstoff	Cyl.	1.9 dia x 2.0 L
9 *	2	2	Turbo Prelube Pump	Cyl.	2.5 dia x 2.0 L
24	3	A/C	Lubricator Bowl	Cyl.	1.1 dia x 1.2 L
48	4		" "	"	
73	5		" "	"	
170	6		" "	"	
48	7		" "	"	
24	8		" "	"	
na	9		H spool		—

* Priority

APR 29 1989
29 HWJ

89-763

1838
1839

7-11-89 (33)

OVERISEL COMPRESSOR STATION
PCB WIPE SAMPLING

518917-552-854

05/10/89

S. #	PCB ug/100 cm2	Eng/comp	DESCRIPTION	APPRX SHAPE	MEASURE AREA, CM
1	13	4	TURBO PEE-LUBE S/O	CYL	2.0L x 1.9 dia
2	2	N/A	HIGH PRESS PACKING GLAND	CYL	4.0L x 6.0 dia
3	22	N/A	INTAKE ELBOW	CYL	4.0 L x 7.9 dia
4	14	N/A	LOPRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
5	16	N/A	HI PRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
6	—		HEXANE		
7	39	N/A	VALVE COVER PLATE	SQR	5.0 x 5.0
8	28	N/A	DISCHARGE PIPING	CYL	4.0L x 3.9 dia
9	1	N/A	DISTANCE PIECE	RECT	12 x 24
10	13	N/A	HI PRESS CYL	CYL	1.8L x 7.2 dia
11	160	N/A	INTAKE ELBOW	CYL	4.0L x 7.9 dia
12	10	N/A	LOPRESS UNLOADER VALVES (REP/2)	RECT	4.0 x 5.1
13	20	N/A	HI PRESS UNLOADER VALVES (REP/2)	RECT	3.7 x 5.2
	7	N/A	VALVE COVER PLATES (REP/4)	SQR	5.0 x 5.0
15	43	N/A	2ND STAGE CYL. HEAD	CYL	2.8L x 5.0 dia
16	4	N/A	2ND STAGE CYL ~~HEAD~~ ROD	CYL	9.0L x 5.6 dia
17	—		HEXANE		
18	150	N/A	PACKING SPACERS (REP/39)	CYL	2.4L x 3.2 dia
19	4	N/A	LOPRESS VALVES (REP/8)	CIR	42.8 cm² PREVION
20	2	N/A	HI PRESS VALVES (REP/8)	CIR	6.0 dia
21	12	N/A	LUBRICATOR BOWL	CYL	1.2L x 1.1 dia
22	15				
23	2				
24	95				
25	7				
26	49				
27	—		HEXANE		

RECEIVED
MAY 10 1989
CHEMICAL DIVISION

K00000418

7-11-89 (33)

OVERISEL COMPRESSOR STATION 578917-552-955
PCB WIPE SAMPLING

5/24/89

	PCB µg/100 cm2	DESCRIPTION	APPX SHAPE	AREA MEASURE, CM
1	3	TURBO PRE LUBE S/O	CYL	2.0L x 1.9dia
2	1	INTAKE ELBOW	CYL	4.0L x 7.9dia
3	4	LOPRESS UNLOADER VALVE (REP/2)	RECT	4.0 x 5.1
4	5	HIPRESS UNLOADER VALVE (REP/2)	RECT	3.7 x 5.2
5	10	VALVE COVER PLATE	SQR	5 x 5
6	5	DISCHARGE PIPING	CYL	4.0 x 3.9 dia
7	3	HIPRESS CYL	CYL	1.8 x 7.2 dia
8	39	INTAKE ELBOW	CYL	4.0 x 7.9 dia
9	3	HIPRESS UNLOADER VALVES (REP/2)	RECT	3.7 x 5.2
10	15	2ND STAGE CYL HEAD	CYL	2.8 x 5.0 dia
11	na	HEXANE		
12	13	PACKING SPACERS (REP/39)	CYL	2.4 x 3.2 dia
13	<10	LUBRICATOR BOWL	CYL	1.2 x 1.1 dia
14	<10	↓	↓	↓
	<10			
	<10			
17	na	HEXANE		

PCB # 1856

RECEIVED
MAY 24 1989
CHEMICAL DIVISION

To: G. Dykstra, overisel compressor
From: HW Voigt, Jackson
Date: June 26, 1989
Subject: PCB Results

File # 528917-552-119
Analysis # 1878

Overisel Compressor station
Surface wipes for PCBs
Collected: 06-16-89

Lab control #	Description	PCBs, µg/100cm²
89-1119-1	2nd stage head	4
89-1119-2	intake elbow	2
89-1119-3	packing spaces; representative of 39	10

7-11-89 (35)
07-07-89

Overall Compression Data

— On site analysis reports —

K00000421

SAMPLE IDENTIFICATION LOG

Analysis Number OV1
Analysis Date 4/18/89

Sample Control Number	Sample Date mmddyy	Collection Time hrmin	By xxx	Sample Description	PCB Result mg/kg
ØV-001	4-18-89	9:50 AM	REC	Miscellaneous starting air piping manifold in comp. bldg.	1.1
ØV-002	4-18-89	11:56 AM	REC	Second rinsate. ~~[illegible]~~ same system as ØV-001.	0.5
ØV-003	4-18-89	5:15 PM	REC	Compressor Bldg. air piping. Complete system to west wall vertical value.	4.1

++

Chain-of-Custody Record

Initiated By _____ Relinquished By _____

Accepted By HWD 04-29-89 Relinquished By _____

Accepted By _____ Terminated By _____

K00000422

++

SAMPLE IDENTIFICATION LOG

Analysis Number ØV 2
Analysis Date 4-19-89

Sample Control Number	Sample Date mmddyy	Collection Time hrmin	By xxx	Sample Description	PCB Result mg/kg
ØV-004	4-19-89	9:20AM	REC	Starting Air System in Comp Bldg. all engines and header to West wall. Second flush	4.3
ØV-005	4-19-89	11:48AM	REC	Same as ØV-004. Third flush.	2.0
ØV-006	4-19-89	1:04PM	REC	Same as ØV-004. Fourth flush	1.6
ØV-007	4-19-89	4:15PM	REC	Manifold consisting of old air comp. piping and aftercoolers. First flush.	2.3
ØV-008	4-19-89	5:35PM	REC	Same system as ØV-007. Second flush	RUN ON ØV-3

++

Chain-of-Custody Record

K00000423

Initiated By _____ Relinquished By _____
Accepted By FCW 04-29-89 Relinquished By _____
Accepted By _____ Terminated By _____

++

SAMPLE IDENTIFICATION LOG

Analysis Number QV-3
Analysis Date 4-20-89

Sample Control Number	Sample Date mmddyy	Collection Time hrmin	By xxx	Sample Description	PCB Result mg/kg
ØV-008	4/19		REC	SAME AS QV-007 SECOND FLUSH	2.3
ØV-009	4-20-89	2:20 AM	REC	all piping in Ann. bldg., all yard piping First flush.	10.7

Chain-of-Custody Record

Initiated By [illegible] Relinquished By _____
Accepted By [illegible] 04-29-89 Relinquished By _____
Accepted By _____ Terminated By _____

K00000424

SAMPLE IDENTIFICATION LOG

Analysis Number ØV-4
Analysis Date 4-21-89

Sample Control Number	Sample Date mmddyy	Collection Time hrmin	By xxx	Sample Description	PCB Result mg/kg
ØV-010	4-21-89	9:00AM	REC	Starting air from west wall of engine room through yard & aux. bldg. second flush	14.3
ØV-011	4-21-89	11:10AM	REC	SAME AS Ø-010 THIRD FLUSH	7.5
ØV-012	4-21-89	4:00PM	REC	Distillate Sample - Quadrex clean tanks	0.02
ØV-013	4-21-89	4:35PM	REC	Same as ØV-010. fourth flush.	1.0
ØV-014	4-21-89	5:40PM	REC	Same as ØV-010. fifth flush	ON ØV-5

++

Chain-of-Custody Record

Initiated By [signature] Relinquished By _____
Accepted By [signature] 04-29-89 Relinquished By _____
Accepted By _____ Terminated By _____

++

K00000425

SAMPLE IDENTIFICATION LOG

Analysis Number ØV-5
Analysis Date 4-22-89

Sample Control Number	Sample Date mmddyy	Collection Time hrmin	By xxx	Sample Description	PCB Result mg/kg
ØV-14	4/22	5:40	REC	SAME AS ØV-010 FIFTH FLUSH	1.6 FROM ØV-4
ØV-15	4/22	:00	REC	CLEAN DISTILLATE	0.003

Chain-of-Custody Record

Initiated By _____ Relinquished By _____
Accepted By KWJ 04-29-89 Relinquished By _____
Accepted By _____ Terminated By _____

K00000426

SAMPLE IDENTIFICATION LOG

Analysis Number ØV-006
Analysis Date 4-24-89

Sample Control Number	Sample Date mmddyy	Collection Time hrmin	By xxx	Sample Description	PCB Result mg/kg
ØV-016	4-24-89	2:32 PM	REC	West #1 air receiver - first flush.	123
ØV-017	↓	4:00	RJH	SAME AS 016 SECOND FLUSH	22

++

Chain-of-Custody Record

Initiated By [signature] Relinquished By _____

Accepted By [signature] 04-29-89 Relinquished By _____

Accepted By _____ Terminated By _____

K00000427

++

SAMPLE IDENTIFICATION LOG

Analysis Number ØV-7
Analysis Date 4-25-89

Sample Control Number	Sample Date mmddyy	Collection Time hrmin	By xxx	Sample Description	PCB Result mg/kg
ØV-18	4-25-89	1:00	RJH	SAME AS ØV-17 THIRD FLUSH	23
ØV-19	|	3.15	RJH	SAME AS ØV-18 FORTH FLUSH	53
ØV-20	4-25-89	4:00PM	REC	clean tank sample	0.05
ØV-21	4-25-89	4:25PM	REC	~~Tank~~ Air Receiver #2 - first sample/ second flush.	>770

++

Chain-of-Custody Record

Initiated By [signature] Relinquished By _____
Accepted By [signature] 04-29-89 Relinquished By _____
Accepted By _____ Terminated By _____

++

K00000428

SAMPLE IDENTIFICATION LOG

Analysis Number ØV-8
Analysis Date 4-26-89

Sample Control Number	Sample Date mmddyy	Collection Time hrmin	By xxx	Sample Description	PCB Result mg/kg
ØV-22	4-26-89	8:34	REC	Air Receiver #1 - fifth flush	83
ØV-23	4-26-89	9:35	REC	Air Receiver #1 - sixth flush	5
ØV-24	4-26-89	10:30	RIH	AIR RECIEVER #1 - SEVENTH FLUSH	1.1
ØV-25	4-26-89	2:30	REC	Air Receiver #2 - third flush - second specimen.	140
ØV-26	4-26-89	2:45	REC	Quadrex "dirty tank" specimen.	275
ØV-27	4-26-89	4:00	REC	Air Receiver #2 - fourth flush - third specimen	48
ØV-28	4-26-89		RIH	AIR RECIEVER #2 FIFTH FLUSH fourth specimen	30

Chain-of-Custody Record

Initiated By [signature] Relinquished By _____

Accepted By [signature] 09-29-89 Relinquished By _____

Accepted By _____ Terminated By _____

K00000429

SAMPLE IDENTIFICATION LOG

Analysis Number ØV-9
Analysis Date

Sample Control Number	Sample Date mmddyy	Collection Time hrmin	By xxx	Sample Description	PCB Result mg/kg
ØV-29	4-27-89	8:20	REC	Air Receiver #2 - sixth flush - fifth specimen	24
ØV-30	4-27-89	11.11	REC	Air Receiver #2 - seventh flush - sixth specimen	21
ØV-31	4-27-89	12:00	REC	Air Receiver #2 - eight flush - seventh sample	3.5
ØV-32	4-27-89	2:10	RVH	AIR RECEIVER #3 FIRST SAMPLE	24
ØV-33	4-27-89	3:10	RVH	SAME AS ØV-32 SECOND SAMPLE	68

Chain-of-Custody Record

K00000430

Initiated By _____ Relinquished By _____
Accepted By KWJ 09-29-89 Relinquished By _____
Accepted By _____ Terminated By _____

SAMPLE IDENTIFICATION LOG

Analysis Number ØV-10
Analysis Date 4-2
4-2

Send revised copy w/ parking.

Sample Control Number	Sample Collection Date mmddyy	Time hrmin	By xxx	Sample Description	
ØV-34	4-28-89	[illegible]	RJH	AIR RECIEVER #3 THIRD SAMPLE	
ØV-35	4-28-89	[illegible]:30	RJH	SAME AS OV-34 [redacted] 4th SAMPLE	
ØV-36	4-28-89	3.45	REC	Air Receiver #4 - first sample	
ØV-37	4-29-89	[illegible]:00	RJH	SAME AS 36 SECOND SAMPLE	4.8
ØV-38	4-29-89	[illegible]:40	RJH	SAME AS 37 THIRD SAMPLE	9.3
ØV-39	4-29-89	7:45	REC	Quadrex "dirty tank" sample	210
ØV-40	4-29-89	[illegible]:30	RJH	SAME AS 38 FORTH SAMPLE	1.7
ØV-41	4-29-89	[illegible]:30	RJH	CLEAN DISTALITE	0.28 0.27

12-10-90

++

Chain-of-Custody Record

Initiated By [signature] Relinquished By _____

Accepted By [signature] 04-29-89 Relinquished By _____

Accepted By _____ Terminated By _____

++

K00000431

PRESSOR STATION P.C.B. CLEAN-UP 12-17-90

· CLEAN-UP VERIFICATION SAMPLING —— CC: GD RM HWV

TION OVERISEL

EA AIR LOGS

PLING DATE 06-09-88 REPORT DATE ——

TROL 1BER	PCB mg/kg	SAMPLE DESCRIPTION OR LOCATION	DISTANCE BELOW SURFACE LEVEL
27-26	13	PREVIOUS SAMPLE SITE NUMBER-15	[+2']
-27	22	NUMBER - 1	[+2']
-28	22	-2	[+2']
-29	30	-3	[+2']
-30	22	-4	[+2']
-31	19	-5	[+2']
-32	37	-6	[+2']
-33	14	-7	[+2']
-34	4	-8	[+2']
-35	19	-33	[+2']

K00000432

PRESSOR STATION P.C.B. CLEAN-UP

· CLEAN-UP VERIFICATION SAMPLING —

TION OVERISEL

EA AIR LOGS

PLING DATE 06-09-88 REPORT DATE _____

TROL 1BER	PCB mg/kg	SAMPLE DESCRIPTION OR LOCATION	DISTANCE BELOW SURFACE LEVEL
27-36	9	PREVIOUS SAMPLE SITE NUMBER - 14	[+2']
-37	5	- 9	[+2']
-38	<1	-26	[+2']
-39	1	- 13	[+2']
-40	5	- 12	[+2']
-41	5	- 11	[+2']
-42	2	- 10	[+2']
-43	12	-21	[+2'6"]
-44	16	-23	[+3']
-45	18	- 18	[+3']

K00000433

RESSOR STATION P.C.B. CLEAN-UP

CLEAN-UP VERIFICATION SAMPLING —

ION OVERISEL

A AIR LOGS

-ING DATE 06-09-88 REPORT DATE _____

ROL BER	PCB mg/kg	SAMPLE DESCRIPTION OR LOCATION	DISTANCE BELOW SURFACE LEVEL
7-46	14	PREVIOUS SAMPLE SITE NUMBER-19	[+3']
			K00000434

CONSUMERS POWER COMPANY
MICHIGAN GAS STORAGE COMPANY
PCB DATA FOR COMPRESSOR STATIONS

White Pigeon

1. 1-22-87 report of 1-15-87 soil, sludge, water and glycol samples in and around Plants 1 and 2 (1st wave)

2. 2-26-87 report of 2-4-87 water, air, soil, oil, glycol, wipe, sludge and NGL samples in and around Plants 1 and 2 (2nd wave)

3. 5-15-87 report of (interim results see No. 6 below) (3rd wave)
   a. 4-27-87 Plant 1 Overflow surface soil samples (B1 thru B13, B13A, B13B and B14 thru B37) and soil boring samples (B20 and B21)
   b. 4-28-87 Plant 1 Dry Well soil boring and sludge samples (A1 thru A4)
   c. 4-30-87 Plant 1 Air Drier Vent soil samples (H1 thru H3)
   d. 4-30-87 Plant 1 Air Storage Tank soil samples (G1 thru G6)
   e. 4-30-87 Plant 2 Manholes surface soil samples (D1 thru D8)
   f. 4-29-87 Plant 2 Dry Well soil boring and sludge samples (C1 thru C4)
   g. 4-30-87 Plant 2 Air Drier Vent soil samples (E1 thru E3)
   h. 4-30-87 Plant 2 Air Storage Tank soil samples (F1 thru F6)
   i. 4-15-87 Plants 1 and 2 sludge samples
   j. 4-30-87 Oil Storage Area soil samples (I1 thru I8)

4. 6-15-87 report of 6-11-87 air compressor crank case oil and condensate samples

5. 6-30-87 report of 6-22, 23, 24-87 Plant 1 Overflow soil boring samples (XA thru XF) (4th wave)

6. 7-20-87 report of (completion of 5-15-87 report)
   a. 4-27-87 Plant 1 Overflow surface soil samples (B1 thru B13, B13A, B13B and B14 thru B37)
   b. 4-28-87 Plant 1 Dry Well soil boring and sludge sample (A3)
   c. 4-30-87 Plant 1 Air Storage Tank soil samples (G1 thru G6)
   d. 4-30-87 Plant 2 Manholes surface soil samples (D1 thru D7)
   e. 4-30-87 Plant 2 Air Storage Tank soil samples (F1 thru F6)

7. 8-3-87 report of STS surface soil samples (SA and SB), soil boring samples (87SB-1 thru 87SB-3, 87SB-3A, 87SB-3B, 87SB-4 thru 87SB-23, 87SB-23A thru 87SB-25) and monitoring wells (87MW-1 thru 87MW-3) from 7-7-87 thru 7-22-87 (5th wave)

8. 8-25-87 report of 8-24-87 groundwater levels in monitoring wells 87MW-1 thru 87MW-3

9. 9-9-87 report of 8-3-87 monitoring well groundwater samples and groundwater levels in 87MW-1 thru 87MW-3

79. 9-11-89 report of 6-1-88 soil samples to verify adequate decontamination at Plants 1 and 2

80. 9-18-89 report of 9-12-89 samples from the Plant 1 Compressor Building floor drains

81. 10-17-89 report of surface wipe samples and sludge samples from the Plant 1 Compressor Building floor drains

82. 11-9-89 report of 11-7-89 surface wipe samples from the Plant 1 Compressor Building floor drains

Overisel

1. 6-22-87 report of 6-3-87 water, oil and sludge samples in and around Station

2. 7-20-87 report of 7-1-87 surface water and sediment samples from Rabbit River, Busscner Drain and oil-water separator discharge pit

3. 10-12-87 report of
   a. 9-16-87 Air Logs surface soil samples (1 thru 19) (interim results see No 4 and No 11a below)
   b. 9-16-87 Oil-Water Separator Discharge Area surface soil samples (1 thru 24)
   c. 9-28-87 Oil-Water Separator Discharge Area surface soil samples (25 thru 73) (interim results see No. 8 below)

4. 10-19-87 report of Air Logs surface soil samples (1-19) (completion of 10-12-87 report)

5. 11-17-87 report of 11-3-87 Oil-Water Separator Discharge Area surface soil samples (74 thru 100)

6. 12-3-87 report of 11-23-87 Oil-Water Separator Discharge Area surface soil samples (101 thru 119)

7. 12-3-87 report of 9-16-87 Oil-Water Separator Discharge Area surface soil samples (6, 8, 10 thru 15, 17 and 19) (completion of 10-12-87 report)

8. 12-3-87 report of 9-28-87 Oil-Water Separator Discharge Area surface soil samples (32, 39 thru 41, 45, 46, 51, 52, 66, 69, 71 and 73) (completion of 10-12-87 report)

9. 12-7-87 report of 11-23-87 Oil-Water Separator Discharge Area soil boring samples (A thru D)

10. 2-1-88 report of 1-21-88 Oil-Water Separator Discharge Area surface soil samples (120 thru 131)

11. 2-1-88 report of:
    a. 9-16-87 Air Logs surface soil samples (1 thru 19) (Completion of 10-12-87 report)
    b. 1-21-88 Air Logs surface soil samples (20 thru 49)

12. 3-25-88 report of soil boring samples from 3-4-88 thru 3-17-88 (88MW-1, 2, 2A, 3 and 3A and 88SB-1, 1A, 2 thru 11)

13. 3-28-88 report of 3-25-88 groundwater levels in monitoring wells 88MW-1, 2, 2A, 3 and 3A

14. 4-19-88 report of 3-25-88 groundwater samples collected from Monitoring Wells 88MW-1, 2, 2A, 3 and 3A

15. 6-1-88 report of 5-26-88 soil samples to verify adequate decontamination of Air Logs (Sample Nos 16 thru 25)

16. 6-1-88 report of 5-26-88 soil samples below Emergency Generator Starter Motor Vent

17. 6-1-88 report of 5-26-88 soil sample of onsite backfill material

18. 6-27-88 report of 6-25-88 samples of groundwater collected from Monitoring Wells 88MW-4 and 4A

19. 7-18-88 report of 7-12-88 groundwater samples collected from Monitoring Wells 88MW-4 and 4A

20. 6-29-88 report of 6-21-88 and 6-22-88 samples from the station air system

21. 7-28-88 report on the extent of PCB contamination in the oil-water separator overflow area prepared by STS Consultants, Ltd

22. 8-8-88 report of samples from inside of the wastewater piping

23. 8-8-88 report of 8-4-88 groundwater samples collected from Monitoring Wells 88MW-4 and 4A

24. 8-22-88 report of sample from inside of the Auxiliary Building roof drain pipe

25. 9-6-88 report of samples from inside of drain lines

26. 9-23-88 report of a sample from inside of the roof drain pipe at the Auxiliary Building

27. 4-29-89 report of 4-25-89 surface wipe samples from Air Compressors Nos 1 and 2

28. 4-29-89 report of 4-28-89 surface wipe samples from the compressor engines

29. 4-18-89 report of samples from the floor drain collection tank

30. Report of 4-21-89 surface wipe samples to verify adequate decontamination of air system components

31. Report of 4-29-89 surface wipe samples to verify adequate decontamination of air system components

32. Report of 5-10-89 surface wipe samples to verify adequate decontamination of air system components

33. Report of 5-24-89 surface wipe samples to verify adequate decontamination of air system components

34. 6-26-89 report of 6-16-89 surface wipe samples to verify adequate decontamination of air system components

35. 7-7-89 report of 4-18-89 thru 4-29-89 PCB-Freon samples to verify adequate decontamination of the air system

36. Report of 6-9-88 soil samples to verify adequate decontamination of the Air Logs

Northville

1. 6-22-87 report of 6-5-87 water, oil, soil and sludge samples in and around Station

2. 3-24-88 report of surface soil samples 1 thru 36 collected on 2-19-88 and 3-1-88 around the Air Drier Vent

3. 3-24-88 report of surface soil samples 1 thru 34 collected on 2-19-88 and 3-1-88 around the Air Log Blowdown

4. 3-24-88 report of surface soil samples 1 thru 63 collected on 2-18-88 and 3-1-88 in the Overflow area

5. 7-17-58 report of 9 soil borings from 1958-59 by Raymond

6. 7-8-88 report of STS soil borings 88SB-1 thru 15 collected 6-23-88 thru 6-29-88

7. 7-25-88 report of samples of liquids in the air system

8. 9-22-88 report on the extent of soil contamination in the area of the oil-water separator overflow prepared by STS Consultants, Ltd

9. 9-16-88 report of a 9-14-88 sample of onsite backfill soil

10. 10-3-88 report of 9-28-88 soil samples to verify adequate decontamination of the Air Logs area

11. 10-6-88 report of 10-4-88 soil samples to verify adequate decontamination of the Air Logs area and Air Dryer Vent area

~~TOM~~
~~DEAN~~
~~ART~~
FILE → ?

~~ACS~~ Regulatory - MDNR
~~See Paragraphs 10 and 11~~
~~BWR 7-9-87~~

To File M 905.4

From BWRasher, P-12-103

Date July 9, 1987

Subject GAS COMPRESSOR STATIONS

CC JAY HILL / TOM OLNEY (PAGE #1 & 5) 7/10/87

CONSUMERS POWER COMPANY

Internal Correspondence

BWR 87-97

---

1. This is to summarize my meeting with Mr Tim McGarry on June 25, 1987, in the DNR Waste Management Division, PCB Compliance and Inspection offices in Lansing. The purpose of the meeting was to provide Mr McGarry with an update on the status of our PCB investigation at White Pigeon, Overisel and Northville. In my last meeting with Mr McGarry on May 20, 1987, he requested that I begin filing monthly written status reports so that the DNR would have in their file a flow of documentation from the Company showing that it has progressed in its investigation and cleanup of the gas compressor stations in a logical, systematic and timely manner. This meeting was meant to supplement a written report which is currently being prepared in order to present the sensitive information on a potential release of PCB to surface waters at Overisel in person.

2. I presented the information on Overisel by walking through the June 22, 1987, data report for samples collected June 3, 1987 (attached), the Hamilton East, Michigan, quadrangle and aerial photograph 70GC-16. Mr McGarry responded that this information, and if the Company decided to notify the National Response Center pursuant to the Clean Water Act, may bring attention to all of the gas compressor stations and accelerate our schedule because of a DNR investigation of PCB contamination of the Kalamazoo River by the Allied Paper Corporation and because of, in general, EPA's reaction to PCB discharges to surface waters. The data for Overisel may cause the Company to change priorities in investigating the site. Mr McGarry asked if the oil-water separator discharge has been terminated and, if so, when? In addition, he asked what was done with sludge removed from the oil-water separator when it was cleaned out in the past? Also, he asked what is the distance from the auxiliary building to the fence, from the fence to the oil-water separator, from the oil-water separator to the discharge pipe and from the discharge pipe

K00000439

IC0787-0038A-TP15-TP02

to Busscner drain? Mr McGarry indicated that the Company needs to sample water and sediment in Busscner drain and where Busscner drain flows into the Rabbit River in order to show no impact from the discharge of low-level PCB from the oil-water separator on the Kalamazoo River watershed in order to reduce any excitement in connection with a notification under the Clean Water Act. He suggested that we move very quickly on this and to get back to him with our planned schedule. Mr McGarry asked that we follow up on the PCB contamination in lubricating oil in the No 5 jet compressor.

3. I gave the information on our screening at Northville by walking through the June 22, 1987, data report for samples collected June 5, 1987 (attached), the Salem, Michigan quadrangle and aerial photograph 69GJ-5. Mr McGarry asked if the trane trap has ever been cleaned out? In addition, he asked what is the distance from the auxiliary room to the oil-water separator, from the oil-water separator to the discharge, from the oil-water separator discharge to the fence and from the fence to sump drain?

4. I indicated to Mr McGarry that the Company plans to undertake a geophysical investigation, soil borings and groundwater monitoring at White Pigeon using the services of a contractor commencing July 1, 1987. Data on the extent of contamination should be available by the end of August 1987 so that the Company can begin to look at clean-up options and budget money for undertaking cleanup at the site in the spring of 1988. I indicated that the Company was collecting condensate from air compressors at Plants 1 and 2 and the water was contaminated with less than 1 ppb. In addition, the Plant 1 compressor building floor drain collection tank was scheduled to be pumped out the following Monday on June 29, 1987 and this waste contained 5 ppm PCB.

5. Mr McGarry indicated that he had obtained guidance from EPA Region 5 on the disposal of low-level liquid wastes at the gas compressor stations which I requested. EPA has taken the position that air compressor condensate, air drier condensate, air storage tank condensate, floor

drain collection tank liquids and liquids from other similar systems at the gas compressor stations which have been tested and found to contain 10 ppm PCB or less can be handled as a non-PCB liquid industrial waste subject to the following conditions: that this applies to only gas compressor stations, that EPA is exercising enforcement discretion in not enforcing the anti-dilution rule of 40 CFR 761, that Consumers Power should not take this as a ruling by EPA on clean-up threshold for any contaminated systems which may require remedial action and that Consumers Power continues to aggressively eliminate the sources of discharge, investigate and clean up any contamination found at the gas compressor stations. In the event that an oil-water mixture must be disposed of, and the oil contains more than 10 ppm PCB but the water contains 10 ppm or less PCB, the oil and water can be disposed of separately; the oil as a liquid PCB waste and the water as a non-PCB liquid industrial waste. Mr McGarry indicated that EPA Region 5 declined to provide Consumers Power this guidance in writing because EPA Region 5 program people continue to be irritated from our meeting with Sebastian Patti last November. Although EPA is reluctant to give anything in writing, Mr McGarry will either try to convince them to write a letter or he will write one stating that it's based on conversations with EPA Region 5 program people and that, in any event, the Company may proceed with disposal of liquids from the Plant 1 compressor building floor drain collection tank at White Pigeon on June 29, 1987. Mr McGarry said that the reason for EPA Region 5 exercising enforcement discretion is because that Consumers Power voluntarily came forward with the information about PCB contamination at gas compressor stations, that we have cooperated fully with EPA and DNR and that we are proceeding with an appropriate plan and schedule.

6. Mr McGarry said that as a result of the information presented today, that is discovery of PCB contamination at two more gas compressor stations, he believes the Company needs to develop a written plan for dealing with all seven gas compressor stations. I indicated that the Company has developed a model at White Pigeon which could be applied at the remaining gas

compressor stations. The model consists of screening, immediate remedial action, definition of the problem, cleanup and closure. Mr McGarry asked that I submit in writing a plan and schedule for the seven gas compressor stations. However, he has accepted the concept that we undertake implementation of the plan one station at a time in sequence.

7. Mr McGarry asked that I follow up this meeting with a written status report. He will file an EPA TSCA PCB inspection report for the gas compressor stations after I report back on the final two gas compressor stations in late August. Mr McGarry indicated that he has been briefing Dan Patulski after each time that I meet with him to keep EPA Region 5 informed on our progress. Mr McGarry asked, in general, how often are the compressor building floor drain collection tanks at the gas compressor stations emptied?

8. Mr McGarry feels that Consumers Power is doing a responsible job in investigating the gas compressor stations and that we should continue to take the stations one site at a time and systematically screen, investigate and clean up contamination, if appropriate. The discharge of low-level PCB to Busscner drain from Overisel may change priorities and is a very sensitive matter with the DNR office of environmental enforcement because of action pending on the Kalamazoo River against Allied Paper Corporation. However, Mr McGarry instructed me to continue with the approach and timetable that we have proceeded on so far.

9. On another matter, Mr McGarry indicated that he had been contained by Wayne Schmidt of Booth Newspapers in connection with the gas compressor stations. However, Mr McGarry did not indicate what he told Mr Schmidt beyond the fact that Consumers Power is cooperating with the agency and responding to the problem. In addition, Mr McGarry indicated that Mr Schmidt had reviewed the PEAS file and discovered that Detroit Edison has reported spills of oil and PCB far in excess of Consumers Power and inquired about the difference. Mr McGarry told Mr Schmidt that Consumers Power reported fewer spills than Edison for three reasons, including that Consumers Power has a consent agreement on PCB spills with the USEPA,

Consumers Power reports oil spills in the Cadillac and Grand Rapids districts only at the DNR's request and that Edison is reporting all spills to the PEAS system in retaliation for the DNR's reluctance to give Edison a de minimis quantity for reporting oil spills.

10. Mr McGarry also asked me to furnish the record on a list of four PCB spills that he provided me (attached) and also for all PCB capacitor spills in substations since July 1, 1986, which have been closed out because EPA Region 5 has asked Mr McGarry to do a TSCA PCB follow-up inspection on a major PCB capacitor spill.

11. I also discussed the Plywood Substation oil spill with Mr McGarry and indicated that the Company has cleaned up the oil spill adequately in accordance with our oil spill plan which was filed with the Michigan Water Resources Commission and approved by the executive secretary of the commission and Chief of the DNR Groundwater Quality Division. In addition, I indicated that we do not plan to undertake any additional action at the site because the Company had removed 45 cubic yards of soil and that the 5 ppm PCB detection limit was a reasonable level of analytical effort on the part of the Company. Mr McGarry asked me to send him a copy of the June 18, 1987 letter from Robert Wagner requesting that the Company install four groundwater monitoring wells and initiate monitoring within 60 days. Mr McGarry indicated that some DNR districts are not as busy as others and can, therefore, direct effort on less environmentally sensitive and lower priority matters than other districts. He considers the Plywood Substation spill to be a very low priority matter and does not feel that it is equitable for the DNR to allow, for example, the encapsulation of thousands of parts per million PCB at Bay City on the one hand, and then require Consumers Power to investigate a spill that had been thoroughly cleaned up when the oil was less than 5 ppm PCB on the other hand. Mr McGarry volunteered to work with the Roscommon district staff to either get them to rescind the letter or, failing that, to proceed with a meeting with the district staff that he would attend and attempt to get the DNR to change its position.

12. In a follow-up to my meeting with Mr McGarry, I contacted him on June 30, 1987, to let him know that Busscner drain and the Rabbit River at Overisel will be sampled on July 1, 1987 and results will be available in one week to ten days. Mr McGarry was pleased that we moved so fast on the matter and that he plans to brief the district surface water quality division staff. In addition, I indicated that I am working on a letter which will include the status of White Pigeon, Overisel and Northville, a generic investigation and clean-up plan and a schedule for all seven gas compressor stations and that he should receive this letter some time next week. Mr McGarry stated that he has reviewed the gas compressor station matter with appropriate people in the DNR following my meeting and that they are satisfied that Consumers Power is responding appropriately. Mr McGarry indicated that he has been designated to handle the matter on behalf of the DNR.

Oversel Compressor Station - PCB
Sampling Date 06-03-87 (DSS - BWR)

Control Number	Sample Point Location - Description	Sample Type	PCB 1254	Units
7-843-1	Air Dryer Filter - No sample available	—	—	—
7-843-2	Air Compressor Oil Collection System Oily water (100 ml), Bottom Oil (10 ml)	Oily Water	<1	mg/kg
		Btm Oil	320	mg/kg
-843 3	Floor Drain - Aux Bldg	Water	7.7	ug/L
-843-4	Oil-Water Separator - East Chamber Water and Bottom Sludge	Water	750	ug/L
		Btm Sludge	610	mg/kg
-843-5	Oil-Water Separator Discharge	Water	870	ug/L
7-843-6	Air Storage Tank Condensate Discharge	Water	41	ug/L
7-843-7	#5 Jet Compressor Oil	Oil	19 *	mg/kg
7-843-8	Slop Tank - Compressor Bldg Floor Drain Collection Tank - Water and Sludge	Water	180	ug/L
	K00000445	Sludge	270	mg/kg
	* Detected as Aroclor - 1242 (1248)			

Northville Compressor Station - PCB
Sampling Date 06-05-87 (DJS - BWR)

M-54

Control Number	Sample Point Location - Description	Sample Type	PCB 1254	Units
7 873-1	South Air Compressor Condensate Water (100ml), Top Oil (3ml)	Water	32	ug/L
		Top Oil	54	mg/kg
7-873 2	North Air Compressor Condensate Water (400 ml), Top Oil (400ml)	Water	*	ug/L
	* Sample Extract Spilled - No Sample Complete	Top Oil	120	mg/kg
7 873-3	Aux Room Floor Drain North - No Sample	—	—	—
7-873-4	Trane Trap - Aux Bldg		110	mg/kg
7-873-5	Soil Sample - Ground Below Air Drier Vent Aux Bldg	Soil	85	mg/kg
7-873-6	Aux Pit Drain Pipe 4"	Water	13.6	ug/L
7-873 7	Manhole - Surface Water and Bottom Sludge	Water	730	ug/L
		Btm Sludge	55000	mg/kg
-873 8	Oil - Water Separator - West End Chamber	Water	2500	ug/L
		Sludge	5100	mg/kg

K00000446

Northville Compression Station - PCB
Sampling Date 06-05-87 (DSS - BWR)

Control Number	Sample Point Location - Description	Sample Type	PCB 1254	Units
1-873-9	Soil At Overflow Discharge From Oil-Water Skimmer Surface - S0	Soil	7700	mg/kg
	0-6" - S1	Soil	20000	mg/kg
	6-12" - S2	Soil	4900	mg/kg
	12-18" - S3	Soil	430	mg/kg
1-873-10	Soil At East Fence Downstream From Overflow Surface - S0	Soil	380	mg/kg
	0-6" - S1	Soil	97	mg/kg
	6-12" - S2	Soil	93	mg/kg
	12-18 - S3	Soil	20	mg/kg
1-873-11	Air Storage Tank Drip Log Discharge Yellow Water (850ml), Top Oil (10ml)	Water	25000	ug/L
		Top Oil	8600	mg/kg
1-873-12	Access Conduit - Air Storage Tank (2nd From East)	Water	525	ug/L
1-873-13	North Engine Room - Instrument Air Drip	Water	37000	ug/L
1-873-14	Compression Bldg Floor Drain Collection Tank	Water	4.5	ug/L

K00000447

* Sample Spilled - No Analysis Completed

To File M 905.4

From BWRasher, P-12-103, Jackson

CONSUMERS POWER COMPANY

Date October 6, 1987

Subject PCB CONTAMINATION AT COMPRESSOR STATIONS

Internal Correspondence

CC JPDickey, M-1019
GDDykstra, Overisel
RWHaifley, White Pigeon
DTKetcham, P-25-131
DHPendleton, P-25-125B
ECQuibell, Freedom
RGVibber, Northville
TJWojcik, Muskegon River
TLZobl, Ray

BWR 87-125

This is to let you know the results of my meeting with Mr Timothy J McGarry of the PCB Enforcement and Surveillance Unit in the DNR Waste Management Division. I met with Mr McGarry on September 24, 1987 for the purpose of giving him a status report on the implementation of our Compressor Station PCB Site Review and Action Plan that we committed to in my July 17, 1987 letter.

WHITE PIGEON

I presented results of groundwater monitoring conducted on August 3, 1987 (attached) and of additional soil samples collected for PCB analysis on August 3, 1987 and August 24, 1987 (attached) at the Plant 1 overflow. We discussed the fact that data collected so far shows PCB at levels greater than 50 ppm well below the water table in the area of the Plant 1 overflow. Mr McGarry acknowledged the precedent set at the North Belding Substation site and more recently in a settlement agreement between General Motors and EPA Region 5 for their Bay City Plant, that PCBs in concentrations of 50 ppm or more have been left below the water table at both sites and that long-term groundwater monitoring was agreed to by the parties. With this approach, the Company would need to excavate PCB contamination using steel sheeting down to the water table. Mr McGarry requested that we submit a copy of STS Consultants, Ltd report to him by October 31, 1987.

ST CLAIR

I presented the data from screening at the site on July 2, 1987 (attached). Based on these data, Mr McGarry has agreed that no further action by the Company is required at this facility.

RAY

I presented the data from the July 8, 1987 screening (attached). Based on these data, Mr McGarry agreed that no further action is required at Plant 1. However, Mr McGarry has requested that we verify no release by the former waste water system has occurred at Plant 2.

K00000448

IC1087-0019A-TP12-TP21

MUSKEGON RIVER

I presented the data from the August 4, 1987 screening (attached). Based on these data, Mr McGarry has agreed that the only action required of the Company at this site is that we must dispose of the air dryer system filter at Plant 2 as a PCB waste.

FREEDOM

I presented the data from the August 6, 1987 screening (attached). Based on these data, Mr McGarry requested that we undertake a spot cleanup of soil near the Plant 1 air log discharge, that we follow-up on the PCB detected in the Plant 2 No 3 air compressor lube oil and that we need to verify at both plants that PCB was not released by the former waste water systems.

OVERISEL

Mr McGarry requested that we submit the results of our first wave of sampling at Overisel on or about October 15, 1987.

Mr McGarry has requested that inasmuch as no further action is required at some of the plants, the Company should revise and submit the PCB Site Review and Action Plan Schedule so that sites scheduled to be dealt with later on are moved up to the next available slot vacated by sites where no further action is required.

Consumers Power
POWERING MICHIGAN'S PROGRESS
General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

July 17, 1987

File BWR 87-98
File M 905.4

Mr Tim McGarry, PCB Inspector
Waste Management Division
Department of Natural Resources
PO Box 30028
Lansing, MI 48909

CONSUMERS POWER COMPANY/MICHIGAN GAS STORAGE COMPANY GAS COMPRESSOR STATIONS

This is to summarize the information given to you in our meeting on June 25, 1987, in your offices, regarding the status of our site reviews and action plans for Consumers Power Company and Michigan Gas Storage Company gas compressor stations.

WHITE PIGEON

The Company plans to undertake a geophysical investigation, soil borings and groundwater monitoring at White Pigeon for the purpose of determining and defining the extent of any PCB release at this site. We have hired STS Consultants Ltd of Northbrook, Illinois to provide these services to the Company. The site review commenced on July 1, 1987, and we have a target completion date of August 8, 1987. The results will be used to develop an action plan which will be forwarded for your review and agreement. We have scheduled the agreed upon action plan to begin when weather permits in the spring of 1988.

Liquids being collected from the plant systems containing low-level PCB (less than 10 ppm) have been characterized as non-PCB liquid industrial waste and

are being disposed of at a liquid industrial waste processing facility by a licensed liquid industrial waste hauler.

OVERISEL

The Company has completed the initial screening of the Overisel Gas Compressor Station. The station began operating in October 1959. Pydraul AC is believed to have been used sometime in 1963 to 1965 in two air compressors, located in an auxiliary building, which provide high-pressure air for instrumentation and engine starting of four gas compressors. It is estimated that one 55-gallon drum of Pydraul AC would have been used for lubrication.

Air compressor condensate was drained into auxiliary building floor drains which flow into an oil-water separator which in turn discharges near Busscner Drain, which flows into the Rabbit River, a tributary of the Kalamazoo River. The oil-water separator has been cleaned out approximately once every five years. The last cleaning was about five years ago.

The high-pressure air passes through an air dryer system which was installed after 1965 and is stored in four underground air storage tanks. The air dryer system discharge was formerly routed to the floor drain/oil-water separator. Since 1986, this oil has been collected.

Each air storage tank has a drainage valve which originally was used to discharge liquids to the ground. In 1973, the air storage tank discharge was routed to the compressor building floor drain collection tank. The compressor building floor drains originally were routed to the oil-water separator; however, in 1973, they were modified by routing them to the collection tank. Since 1986, the air storage tank drainage has been collected separately for analysis and appropriate disposal.

Attachment A contains the laboratory analysis results of samples collected June 3, 1987, at key indicator points in the station systems. These data indicate a potential discharge of low-level PCBs. As a result, the Company has undertaken sampling of water and sediments in Busscner Drain and in the

Rabbit River for analysis of PCB. These results are presented in Attachment B.

NORTHVILLE

The initial screening of the Northville Gas Compressor Station has been completed. The station was constructed in 1959 and began operation in late 1959. Pydraul AC was purchased on December 6, 1961 (1 - 55-gallon drum), and again on September 12, 1969 (10 gallons), and used in two air compressors, which were original plant equipment, housed in an auxiliary room. The Pydraul AC was probably stored in a separate storage building. In 1973, the station switched to a synthetic silicone non-PCB product called ES-190 manufactured by CPI Engineering Services Inc. There were no other purchases of Pydraul AC before 1973. ES-190 continues to be used at the site. There is no record of Pydraul AC use anywhere else onsite. The air compressors provide high-pressure air for instrumentation and engine starting for four gas compressors in a compressor building.

Air compressor condensate was discharged into a four-inch line (plugged about one year ago) which connected into a manhole. The manhole was connected to an oil-water separator which discharges to a nearby ditch. The oil-water separator has not been cleaned during its service at the facility. The condensate from the air compressors has been collected for analysis and off-site disposal since March 1987.

An air dryer system, designed to vent to the ground outside of the auxiliary room, was installed sometime after the station was constructed. The air passes into four air storage tanks and condensate from the four tanks accumulates in a common drip log which has a siphon blowdown to the atmosphere and ground inside a conduit. Since March 1987, the liquid blowdown from the four storage tanks has been piped into a waste container for off-site disposal.

Floor drains in the compressor building flow into a collection tank which was installed about 1973. Prior to that, the floor drains flowed into the manhole and oil-water separator system. Rain water was also routed in this system.

After heavy rains, water which did not include oil or sludge has been pumped out to the ground next to the compressor building. PCB was not detected in three samples of water in the floor drain collection tank collected in 1985 when rain water was being emptied. In March 1987, rain water runoff was rerouted to the ground. The floor drain collection tank has been emptied twice since March 1986 by a licensed liquid industrial waste hauler using manifests characterizing the wastes as a noncombustible oily water.

A Trane industrial trap on the discharge side of the air compressors is located in a pit in the auxiliary room and was designed to collect oil prior to the manholes. The trap was filled with silica gel and maintained by replacing the gel. The silica gel has since been removed and is no longer in the trap because the gel was causing a problem when it was inadvertently introduced into air lines causing them to become plugged.

A moisture drip bottle for instrument air in the compressor building was blown to the atmosphere on the north side of the compressor building, but has been blown into a collection container since March 1987.

Attachment C contains the laboratory analysis results of samples collected on June 5, 1987 at key indicator points in the Northville station systems.

GAS COMPRESSOR STATION PCB SITE REVIEW AND ACTION PLAN

Attachment D describes a five-phase generic PCB site review and action plan for Consumers Power Company/Michigan Gas Storage Company gas compressor stations. The phases include: Phase 1, initial screening; Phase 2, immediate remedial actions; Phase 3, define the extent of PCB releases; Phase 4, develop action plan, and Phase 5, implement action plan and site closure. Phases 2 through 5 may not be necessary at all stations. In addition, Attachment E is our current schedule for implementing the site review and action plan at the seven gas compressor stations. Because we do not yet know the extent of contamination at each site, there is a great deal of uncertainty in the schedule for completing Phases 3-5. Should it be necessary to make any change

in schedule as additional information becomes available, we will keep you fully informed.

It is my understanding that you will file a TSCA PCB inspection report on the gas compressor stations with EPA Region 5 following my reporting the initial screening results for all seven gas compressor stations sometime in late August. I will continue to provide you with status reports on an approximately monthly basis, or more frequently if necessary, in order to keep you informed on our progress.

Please contact me at (517) 788-0331 if you have any questions on the matter.

Bruce W Rasher
Environmental Department

BCC DCBishop, M-897B
JPDickey, M-1019
GDykstra, Overisel
RWHaifley, White Pigeon
JMHaught, Northville
PCHittle, P-12-237B
DTKetcham, P-25-131
DHPendleton, P-25-125B
MRPutnam, P-25-125A
WWStille, P-25-141A

K00000454

Quensel Compressor Station - PCB
Sampling Date 06-03-87 (DSS - BWR)

M90.54

Control Number	Sample Point Location - Description	Sample Type	PCB 1254	Units
87-843-1	Air Drier Filter - No sample available	—	—	—
87-843-2	Air Compressor Oil Collection System Oily water (100 ml), Bottom Oil (10 ml)	Oily Water	<1	mg/kg
		Btm Oil	320	mg/kg
87-843-3	Floor Drain - Aux Bldg	Water	7.7	ug/L
87-843-4	Oil-Water Separator - East Chamber Water and Bottom Sludge	Water	750	ug/L
		Btm Sludge	610	mg/kg
87-843-5	Oil-Water Separator Discharge	Water	870	ug/L
87-843-6	Air Storage Tank Condensate Discharge	Water	41	ug/L
87-843-7	#5 Jet Compressor Oil	Oil	19 *	mg/kg
87-843-8	Slop Tank - Compressor Bldg Floor Drain Collection Tank - Water and Sludge	Water	180	ug/L
	K00000455	Sludge	270	mg/kg

* Detected as Aroclor-1242 (1248)

CONSUMERS POWER COMPANY
OVERISEL GAS COMPRESSOR STATION
Laboratory Analytical Results for PCB in Samples of Surface Water and Sediment Collected on July 1, 1987 From Surface Waters in the Area of Consumers Power Company's Overisel Gas Compressor Station

Location	Sample Type	Concentration of PCB A 1254 Left	Mid	Right
Rabbit River at 38th St bridge (upstream of Busscner Drain inflow)	Water	ND[a]	ND	ND
	Sediment	ND	ND	ND
Rabbit River above Hamilton Falls (M-40) (downstream of Busscner Drain inflow)	Water	ND	ND	ND
	Sediment	NS[b]	NS	ND
Busscner Drain at weir (upstream of oil-water separator)	Water	ND	ND	ND
	Sediment	ND	ND	ND
Busscner Drain 15.5 ft downstream of weir (near oil-water separator)	Water	0.11 ug/l	NS	NS
	Sediment	ND	NS	NS
Busscner Drain 125 ft downstream of weir (downstream of oil-water separator)	Water	0.15 ug/l	ND	ND
	Sediment	ND	ND	ND

Oil-water separator discharge pit
Water at pipe 410 ug/l
Sediment E 1400 mg/kg Mid 2400 mg/kg W 250 mg/kg

[a]ND indicates not detected at the following limits of detection

	Water (ug/l)	Sediment (mg/kg)
A 1242	0.065	1
A 1254	0.11	1
A 1260	0.18	1

[b]NS indicates that no sample was collected at this location.

BWR/mlp
7/20/87

K00000456

RP0787-46BWR-EN03

CONSUMERS POWER COMPANY/MICHIGAN GAS STORAGE COMPANY
GAS COMPRESSOR STATIONS

PCB Site Review and Action Plan

Phase I - Initial Screening

1. Site visit and interview station superintendent
2. Review purchase records for Pydraul AC
3. Review plant systems for potential PCB on site and offsite releases
4. Sample key indicator points
5. Analyze samples and report data

Phase II - Immediate Remedial Actions (if necessary)

Determine appropriate immediate remedial actions, such as:

1. Terminate PCB releases
2. Collect, characterize and properly dispose of wastes
3. Remove and properly dispose of liquids and sludges containing PCB
4. Seal systems to prevent refilling

Phase III - Define Extent of PCB Releases (if necessary)

Determine a site specific plan, include some or all of the following:

1. Geophysical investigation (if applicable)
2. Soil borings
3. Groundwater monitoring
4. Sample plant systems
5. Analyze samples and report data

Phase IV - Develop Action Plan (if necessary)

1. Determine action thresholds and standards
2. Compare alternatives and their costs
3. Select cost-effective/environmentally sound action plan methods
4. Acquire Agency approval of selected method

Phase V - Implement Action Plan and Site Closure (if necessary)

BWRasher/7-16-87

CONSUMERS POWER COMPANY/MICHIGAN GAS STORAGE COMPANY
GAS COMPRESSOR STATIONS
PCB SITE REVIEW AND ACTION PLAN SCHEDULE

Phase	White Pigeon	Overisel	Northville	St Clair	Ray	Muskegon River	Freedom
I	November 21, 1986-February 2, 1987	June 3-25, 1987	June 5-25, 1987	July 2-31, 1987	July 2-31, 1987	August 4-31, 1987	August 6-31, 1987
II	January 29-February 5, 1987	By June 29, 1987	March-July 1, 1987	August 1987	August 1987	September 1987	September 1987
III	February 4-August 31, 1987	September-November 1987	March-May 1988	June-August 1988	September-November 1988	March-May 1989	June-August 1989
IV	September-December 1987	January-February 1988	June-July 1988	September-October 1988	December 1988-January 1989	June-July 1989	September-October 1989
V	April-October 1988	June-November 1988	April-September 1989	1990	1990	1990	1990

BWRasher/7-17-87

K00000458

RP0787-25BWR-EN03

BWR
Received 7-22-87
Copy to PC Hittle
M905.4

NATURAL RESOURCES COMMISSION
THOMAS J ANDERSON
MARLENE J. FLUHARTY
GORDON E. GUYER
KERRY KAMMER
O STEWART MYERS
DAVID D. OLSON
RAYMOND POUPORE

STATE OF MICHIGAN

JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING
BOX 30028
LANSING, MI 48909

Gordon E. Guyer, Director

July 15, 1987

Mr. Bruce W. Rasher
Environmental Department
Consumers Power Company
212 West Michigan Avenue
Jackson, Michigan 49201

Dear Mr. Rasher:

In response to Consumers Power's request of disposal alternatives for low level PCB contaminated condensate from company's gas compressor stations, I contacted EPA Region V. It is my understanding from discussion with Dan Patulski that EPA would use enforcement discretion and allow the disposal alternative of PCB contaminated condensate proposed by the company, subject to the following conditions:

1. The condensates PCB concentration is below 10 ppm.

2. The condensate will be disposed of with a licensed Michigan Act 136 liquid industrial waste hauler.

3. Consumers Power will continue to aggressively pursue PCB remediation at the contaminated gas compressor stations, eliminating the sources of PCBs to the condensate.

4. Consumers Power must understand that this letter only applies to the PCB remediation at their gas compressor station and should not be extended to other aspects of company PCB management activities.

Should you need further clarification concerning the above, please contact me.

Sincerely,

Timothy J. McGarry

Timothy J. McGarry
Environmental Quality Analyst
Waste Management Division
517-373-2730

cc: Mr. Dennis Drake, MDNR
Mr. Dan Patulski, EPA

K00000459

R1026
1/86

To File M 905.4

From BWRasher, P-12-103

Date July 9, 1987

Subject GAS COMPRESSOR STATIONS

CC

CONSUMERS POWER COMPANY

Internal Correspondence

BWR 87-97

---

1. This is to summarize my meeting with Mr Tim McGarry on June 25, 1987, in the DNR Waste Management Division, PCB Compliance and Inspection offices in Lansing. The purpose of the meeting was to provide Mr McGarry with an update on the status of our PCB investigation at White Pigeon, Overisel and Northville. In my last meeting with Mr McGarry on May 20, 1987, he requested that I begin filing monthly written status reports so that the DNR would have in their file a flow of documentation from the Company showing that it has progressed in its investigation and cleanup of the gas compressor stations in a logical, systematic and timely manner. This meeting was meant to supplement a written report which is currently being prepared in order to present the sensitive information on a potential release of PCB to surface waters at Overisel in person.

2. I presented the information on Overisel by walking through the June 22, 1987, data report for samples collected June 3, 1987 (attached), the Hamilton East, Michigan, quadrangle and aerial photograph 70GC-16. Mr McGarry responded that this information, and if the Company decided to notify the National Response Center pursuant to the Clean Water Act, may bring attention to all of the gas compressor stations and accelerate our schedule because of a DNR investigation of PCB contamination of the Kalamazoo River by the Allied Paper Corporation and because of, in general, EPA's reaction to PCB discharges to surface waters. The data for Overisel may cause the Company to change priorities in investigating the site. Mr McGarry asked if the oil-water separator discharge has been terminated and, if so, when? In addition, he asked what was done with sludge removed from the oil-water separator when it was cleaned out in the past? Also, he asked what is the distance from the auxiliary building to the fence, from the fence to the oil-water separator, from the oil-water separator to the discharge pipe and from the discharge pipe

to Busscner drain? Mr McGarry indicated that the Company needs to sample water and sediment in Busscner drain and where Busscner drain flows into the Rabbit River in order to show no impact from the discharge of low-level PCB from the oil-water separator on the Kalamazoo River watershed in order to reduce any excitement in connection with a notification under the Clean Water Act. He suggested that we move very quickly on this and to get back to him with our planned schedule. Mr McGarry asked that we follow up on the PCB contamination in lubricating oil in the No 5 jet compressor.

3. I gave the information on our screening at Northville by walking through the June 22, 1987, data report for samples collected June 5, 1987 (attached), the Salem, Michigan quadrangle and aerial photograph 69GJ-5. Mr McGarry asked if the trane trap has ever been cleaned out? In addition, he asked what is the distance from the auxiliary room to the oil-water separator, from the oil-water separator to the discharge, from the oil-water separator discharge to the fence and from the fence to sump drain?

4. I indicated to Mr McGarry that the Company plans to undertake a geophysical investigation, soil borings and groundwater monitoring at White Pigeon using the services of a contractor commencing July 1, 1987. Data on the extent of contamination should be available by the end of August 1987 so that the Company can begin to look at clean-up options and budget money for undertaking cleanup at the site in the spring of 1988. I indicated that the Company was collecting condensate from air compressors at Plants 1 and 2 and the water was contaminated with less than 1 ppb. In addition, the Plant 1 compressor building floor drain collection tank was scheduled to be pumped out the following Monday on June 29, 1987 and this waste contained 5 ppm PCB.

5. Mr McGarry indicated that he had obtained guidance from EPA Region 5 on the disposal of low-level liquid wastes at the gas compressor stations which I requested. EPA has taken the position that air compressor condensate, air drier condensate, air storage tank condensate, floor

drain collection tank liquids and liquids from other similar systems at the gas compressor stations which have been tested and found to contain 10 ppm PCB or less can be handled as a non-PCB liquid industrial waste subject to the following conditions: that this applies to only gas compressor stations, that EPA is exercising enforcement discretion in not enforcing the anti-dilution rule of 40 CFR 761, that Consumers Power should not take this as a ruling by EPA on clean-up threshold for any contaminated systems which may require remedial action and that Consumers Power continues to aggressively eliminate the sources of discharge, investigate and clean up any contamination found at the gas compressor stations. In the event that an oil-water mixture must be disposed of, and the oil contains more than 10 ppm PCB but the water contains 10 ppm or less PCB, the oil and water can be disposed of separately; the oil as a liquid PCB waste and the water as a non-PCB liquid industrial waste. Mr McGarry indicated that EPA Region 5 declined to provide Consumers Power this guidance in writing because EPA Region 5 program people continue to be irritated from our meeting with Sebastian Patti last November. Although EPA is reluctant to give anything in writing, Mr McGarry will either try to convince them to write a letter or he will write one stating that it's based on conversations with EPA Region 5 program people and that, in any event, the Company may proceed with disposal of liquids from the Plant 1 compressor building floor drain collection tank at White Pigeon on June 29, 1987. Mr McGarry said that the reason for EPA Region 5 exercising enforcement discretion is because that Consumers Power voluntarily came forward with the information about PCB contamination at gas compressor stations, that we have cooperated fully with EPA and DNR and that we are proceeding with an appropriate plan and schedule.

6. Mr McGarry said that as a result of the information presented today, that is discovery of PCB contamination at two more gas compressor stations, he believes the Company needs to develop a written plan for dealing with all seven gas compressor stations. I indicated that the Company has developed a model at White Pigeon which could be applied at the remaining gas

compressor stations. The model consists of screening, immediate remedial action, definition of the problem, cleanup and closure. Mr McGarry asked that I submit in writing a plan and schedule for the seven gas compressor stations. However, he has accepted the concept that we undertake implementation of the plan one station at a time in sequence.

7. Mr McGarry asked that I follow up this meeting with a written status report. He will file an EPA TSCA PCB inspection report for the gas compressor stations after I report back on the final two gas compressor stations in late August. Mr McGarry indicated that he has been briefing Dan Patulski after each time that I meet with him to keep EPA Region 5 informed on our progress. Mr McGarry asked, in general, how often are the compressor building floor drain collection tanks at the gas compressor stations emptied?

8. Mr McGarry feels that Consumers Power is doing a responsible job in investigating the gas compressor stations and that we should continue to take the stations one site at a time and systematically screen, investigate and clean up contamination, if appropriate. The discharge of low-level PCB to Busscner drain from Overisel may change priorities and is a very sensitive matter with the DNR office of environmental enforcement because of action pending on the Kalamazoo River against Allied Paper Corporation. However, Mr McGarry instructed me to continue with the approach and timetable that we have proceeded on so far.

9. On another matter, Mr McGarry indicated that he had been contained by Wayne Schmidt of Booth Newspapers in connection with the gas compressor stations. However, Mr McGarry did not indicate what he told Mr Schmidt beyond the fact that Consumers Power is cooperating with the agency and responding to the problem. In addition, Mr McGarry indicated that Mr Schmidt had reviewed the PEAS file and discovered that Detroit Edison has reported spills of oil and PCB far in excess of Consumers Power and inquired about the difference. Mr McGarry told Mr Schmidt that Consumers Power reported fewer spills than Edison for three reasons, including that Consumers Power has a consent agreement on PCB spills with the USEPA,

Consumers Power reports oil spills in the Cadillac and Grand Rapids districts only at the DNR's request and that Edison is reporting all spills to the PEAS system in retaliation for the DNR's reluctance to give Edison a de minimis quantity for reporting oil spills.

10. Mr McGarry also asked me to furnish the record on a list of four PCB spills that he provided me (attached) and also for all PCB capacitor spills in substations since July 1, 1986, which have been closed out because EPA Region 5 has asked Mr McGarry to do a TSCA PCB follow-up inspection on a major PCB capacitor spill.

11. I also discussed the Plywood Substation oil spill with Mr McGarry and indicated that the Company has cleaned up the oil spill adequately in accordance with our oil spill plan which was filed with the Michigan Water Resources Commission and approved by the executive secretary of the commission and Chief of the DNR Groundwater Quality Division. In addition, I indicated that we do not plan to undertake any additional action at the site because the Company had removed 45 cubic yards of soil and that the 5 ppm PCB detection limit was a reasonable level of analytical effort on the part of the Company. Mr McGarry asked me to send him a copy of the June 18, 1987 letter from Robert Wagner requesting that the Company install four groundwater monitoring wells and initiate monitoring within 60 days. Mr McGarry indicated that some DNR districts are not as busy as others and can, therefore, direct effort on less environmentally sensitive and lower priority matters than other districts. He considers the Plywood Substation spill to be a very low priority matter and does not feel that it is equitable for the DNR to allow, for example, the encapsulation of thousands of parts per million PCB at Bay City on the one hand, and then require Consumers Power to investigate a spill that had been thoroughly cleaned up when the oil was less than 5 ppm PCB on the other hand. Mr McGarry volunteered to work with the Roscommon district staff to either get them to rescind the letter or, failing that, to proceed with a meeting with the district staff that he would attend and attempt to get the DNR to change its position.

12. In a follow-up to my meeting with Mr McGarry, I contacted him on June 30, 1987, to let him know that Busscner drain and the Rabbit River at Overisel will be sampled on July 1, 1987 and results will be available in one week to ten days. Mr McGarry was pleased that we moved so fast on the matter and that he plans to brief the district surface water quality division staff. In addition, I indicated that I am working on a letter which will include the status of White Pigeon, Overisel and Northville, a generic investigation and clean-up plan and a schedule for all seven gas compressor stations and that he should receive this letter some time next week. Mr McGarry stated that he has reviewed the gas compressor station matter with appropriate people in the DNR following my meeting and that they are satisfied that Consumers Power is responding appropriately. Mr McGarry indicated that he has been designated to handle the matter on behalf of the DNR.

Overisel Compressor Station - PCB
Sampling Date 06-03-87 (DSS - BWR)

M905.4

Control Number	Sample Point Location - Description	Sample Type	PCB 1254	Unit
87-843-1	Air Drier Filter - No sample available	—	—	—
87-843-2	Air Compressor Oil Collection System Oily water (100ml), Bottom Oil (10ml)	Oily Water	<1	mg/l
		Btm Oil	320	mg/kg
87-843-3	Floor Drain - Aux Bldg	Water	7.7	ug/L
87-843-4	Oil-Water Separator - East Chamber Water and Bottom Sludge	Water	750	ug/L
		Btm Sludge	610	mg/kg
87-843-5	Oil-Water Separator Discharge	Water	870	ug/L
87-843-6	Air Storage Tank Condensate Discharge	Water	41	ug/L
87-843-7	#5 Jet Compressor Oil	Oil	19 *	mg/kg
87-843-8	Slop Tank - Compressor Bldg Floor Drain Collection Tank - Water and Sludge	Water	180	ug/L
	K00000466	Sludge	270	mg/kg
	* Detected as Aroclor-1242 (1248)			

To	DCBishop, M-897D JPDickey, M-1019 RWHaifley, White Pigeon PCHittle, P-12-237B	DTKetcham, P-25-131 DHPendleton, P-25-125B MRPutnam, P-12-125A WWStille, P-25-141A
From	BWRasher, P-12-103, Jackson	CONSUMERS POWER COMPANY
Date	March 16, 1987	
Subject	GAS COMPRESSOR STATIONS	Internal Correspondence
CC		BWR 87-40 M 905.4

1. This is to let you know the results of my meeting with the Michigan Department of Natural Resources on March 9, 1987 in connection with the White Pigeon Compressor Station and the other gas compressor stations. I met with Tim McGarry and his supervisor, Mindy Koch, of the Hazardous Waste Division. The purpose of the meeting was for me to report back to the DNR on the status of the near-term actions and results of sampling at the White Pigeon Compressor Station and the results of screening for potential PCB contamination at the remaining six gas compressor stations. Attached is the agenda that I used in the meeting.

2. I reported that all of the near-term actions listed in the investigation and remedial action plan for PCB contamination at the White Pigeon Compressor Station dated January 29, 1987 attached had been completed including: a) removal and manifesting for disposal by incineration at SCA in Chicago of the sludges and water contained in the Plant 1 manhole, oil skimmer and dry well and the Plant 2 manholes and dry well (manifests attached), b) roof drain runoff from the Compressor and Auxiliary Buildings at Plants 1 and 2 were rerouted away from the waste water treatment system, c) condensate from the air compressors in the Auxiliary Buildings at Plants 1 and 2 were rerouted from the waste water treatment system and are now being collected in waste barrels for appropriate characterization and disposal, and d) sampling and analysis for PCB contamination at a number of locations.

3. I walked through the results of the first wave of sampling at the station using the January 22, 1987 data report attached and Drawing Numbers M-G1003 and M-G2003 and Aerial Photograph 68GD-6 from a January 27, 1969 flyover.

4. In addition, I walked through the results of sampling undertaken on February 4, 1987 using the attached data report.

5. The summary of the current status given to the DNR included that we had removed all potentially contaminated liquid from the waste water treatment system, the roof drain runoff was rerouted away from the system so as to not generate additional contaminated liquid waste, the air compressor condensate at both plants is being collected and appropriately managed, the points of the waste water treatment system open to precipitation have been covered with plastic sheeting and that in general we believe we have gone a long way in dealing with contamination at the site.

6. I explained that the Company believes the next appropriate step is to undertake a third wave of sampling for the purpose of collecting additional information to define the extent of contamination so that a clean-up plan can be developed. I walked through the sampling listed in the investigation and clean-up plan dated February 23, 1987 attached. I indicated that after this information was collected, the Company would prepare a clean-up plan.

7. We briefly discussed clean-up standards for equipment and surfaces and Mr McGarry indicated that no cleanup would be required for any equipment or surfaces which have discharges of less than one part per billion PCB. Presumably, equipment or surfaces that have no discharge that are contaminated may not need to be decontaminated. In addition, I brought to the DNR's attention 40 CFR 761.30(i) provisions for use of PCB in compressors and in the liquids of natural gas pipelines. PCBs may be used indefinitely in the compressors and in the liquids of natural gas pipelines at a concentration level of less than 50 parts per million provided that they are marked in accordance with Section 751.45(a).

8. I reported to the DNR the results of our screening of the remaining six gas compressor stations by walking through the attached outline narrative dated February 24, 1987.

9. In response to a request from Mr McGarry in a telephone conversation on March 4, 1987, I brought with me copies of correspondence in our files from the 1981 program to investigate the potential of PCB contamination of natural gas pipelines. I turned over copies of three letters to the DNR including a March 5, 1981 letter from R C Bonner to Mr John Seitz reporting the results of PCB sampling and analysis at all seven gas compressor stations undertaken in 1981, a March 5, 1981 letter from R C Bonner to Mr John Seitz indicating that Consumers Power and Michigan Gas Storage have never used lubricating oils formulated with PCB compound in their gas pipeline compressors, and a May 20, 1981 letter from Karl Bremer to R C Bonner reporting the analysis results of samples collected by EPA at Overisel in 1981, all of which are attached. In addition, I have attached the remainder of what is in the file including an October 15, 1981 letter from R C Bonner to Ms Carolyn Hesse with a completed survey on the potential for PCB contamination of gas pipelines which after discussion with John Dickey prior to the meeting was not turned over to DNR even though the information is available to the DNR from EPA files because the letter was not responsive to the request from Mr McGarry for any information of an analytical nature in connection with contamination at the gas compressor station. I suggest that you read the answers to the questionnaire with particular emphasis on the answer to Question No 8.

10. Based on what we know about the gas compressor stations from the current screening results and from historical information from 1981, I indicated that the Company has no information indicating that the natural gas pipeline system at any of these stations are contaminated.

11. I explained the Company's plans for undertaking additional sampling at the White Pigeon Compressor Station and screening of the remaining six gas compressor stations. The third wave of sampling at White Pigeon will start on April 15, 1987 and a report will be available to me by May 15, 1987 which I may be able to furnish to the DNR within a few days of that date. The schedule for determining if there is contamination present at any potential points of release at the remaining six gas compressor

stations will be in accordance with the priority of Overisel and Northville by June 30, 1987, two more by July 30, 1987 and the remaining two by August 30, 1987. I explained that this schedule was necessary because of a number of other commitments made to EPA and DNR on other matters including closure of the Central Storage Site and a number of hydrocarbon release investigations and remedial action efforts.

12. Mr McGarry reacted to the information on current status, our plans for how to proceed and schedule by indicating that he agrees with the logic of our sequence and with the substance of the steps we plan to undertake and that he does not have a problem with the schedule. Ms Koch did indicate that she cannot guarantee EPA will be satisfied with the schedule and that Consumers Power is playing the odds that EPA will buy into our approach and not ask Consumers Power to accelerate its program using the threat of penalties for violations as leverage. Mr McGarry indicated that for his inspection of ANR in Hamilton on March 2, 1987, he expects data back from the contract laboratory used by the PCB Compliance Inspection Program to be only two weeks and that therefore, while the Company's schedule may be consistent with turnaround time for the DNR laboratory, it exceeds the turnaround time EPA is normally accustomed to from the contract laboratory that they use.

13. Mr McGarry wants to handle this process as a formal TSCA inspection so that the DNR can receive credit from EPA under their contract funding formula. Therefore, he asked me to sign three forms including a notice of inspection, a TSCA inspection confidentiality notice and a receipt for samples and documents, attached, which I responded that I did not want to sign the forms until I had an opportunity to read them and review them with the Company's Management and legal counsel. Mr McGarry indicated that if the Company refuses to sign the forms the DNR will make a report to EPA anyway and simply indicate that the Company was given the forms but did not sign them. In addition to the forms, DNR will file a formal TSCA inspection report within 30 days which will consist entirely of information collected by Consumers Power and turned over to the DNR. At this time, the DNR has no plans to inspect any of our stations.

Mr McGarry indicated that he will give us an opportunity to review the draft inspection report to assure that it is factually complete and correct. He has asked that we provide a briefing memo giving our best information for each station on whether or not PCB lubricating oil was used at the station and whether or not there are any potential points of release of contamination from the station. I have drafted briefing memos for each station which are attached.

14. Mr McGarry also had three questions regarding the White Pigeon Compressor Station. The questions and my understanding of the correct answers are as follows:

    a. What was done with the lubricating oil used in the Auxiliary Building air compressors when the parts requiring lubrication were replaced with teflon-coated parts?

       Answer: Lubricating oil was injected into the packing case and onto the pistons of the air compressors in a dropwise manner of only about one drop every twenty seconds and therefore there was no excess oil to dispose of when lubrication was no longer necessary.

    b. How much lubricant is used in the Ingersoll-Rand air starters?

       Answer: We estimate approximately one quart or less per year per engine is used because the lubrication is applied by a mist of only a few drops per start and on the average there is only one start every ten days.

    c. How are hydrocarbons collected from the gas line?

       Answer: Gas scrubbers operating on the principle of a centrifugal swirl accumulates the oil. We do not use oil scrubbers because our compressors are considered min lube or nonlube, that is, no lube oil is injected into the compressors in order to reduce pipeline fouling which results with reduced pipeline efficiency.

I plan to respond to these questions in my next meeting with the DNR.

15. Mr McGarry asked if any of the surface contamination at White Pigeon Compressor Station was located such that the public could come into contact with it. I responded that the White Pigeon Compressor Station is located in a rural area which is sparsely populated and that the station has a locked fence around it. Twenty-four hour security at the station was discontinued a few years ago. All of the points of surface contamination identified to date with the exception of the overflow from the dry well at Plant 1, are within the station fence. All surface contamination points are on Company property. It is unlikely that the public would routinely if at all come into contact with the single point of surface contamination outside the fence. However, Mr McGarry has suggested that because EPA seems to be most concerned about the potential for public contact with the gas compressor station contamination site, that the Company barricade the one spot located outside the fence and that this location further be covered with plastic sheeting. I indicated that the Company probably would have no problem in implementing this suggestion.

16. Although not covered in the meeting, we need to take steps to discontinue the discharge of PCB-contaminated liquids from the air dryer vents and the air storage tanks from both plants. These liquid wastes should be collected in an appropriate waste barrel and handled in accordance with PCB requirements.

Michigan Department of Natural Resources

Consumers Power Company/Michigan Gas Storage Company

Monday, March 9, 1987, 1:30 PM

Gas Compressor Stations

Agenda

A. White Pigeon

1. Current Status

a. Near-term actions
b. February 4, 1987 sampling/analysis results

2. Investigation and Cleanup Plan

a. Additional preliminary sampling
b. Plan development

B. Remaining Gas Compressor Stations

a. Results of purchasing records review
b. Results of 1981 investigation

C. Schedule

BWR/3-9-87

K00000473

MI0387-0010A-EN04

White Pigeon Compressor Station

Investigation and Remedial Action Plan for PCB Contamination

1. Determine Legal and Regulatory Compliance Requirements

2. Near-term Actions

   a. Develop statement to be used in the event of an inquiry from employees, public or media

   b. DNR Notification and Review of Investigation and Remedial Action Plan

   c. Remove sludge and water from oil-water separator and manhole oil skimmer at Plant 1 and the 2 manhole oil skimmers at Plant 2

   d. Reroute roof drains from Compressor and Auxiliary Buildings at Plants 1 and 2

   e. Sample and analyze for PCB contamination

      1) Drinking water wells at Plants 1 and 2

      1A) Sample air for PCB in Auxiliary Buildings at Plants 1 and 2

      2) Air storage tank blowdown and air drier condensate and soil below at Plants 1 and 2

3) Plant 2 dry well

4) Storage Building floor drains and dry well

5) Other potential sources such Ingersoll air starters at Plant 1 and hydraulic oil in compressor cooling systems at Plants 1 and 2

6) Auxiliary Building air compressor condensate and floor drains at Plant 2

7) Sample Auxiliary Building air compressor condensate at point of entry to manhole oil skimmers at Plants 1 and 2

8) Sample water and sludge in Compressor Building floor drain collection tanks at Plants 1 and 2

9) Sample pipeline condensate (gas drips) collection tanks for Plants 1 and 2 at the bottom

10) Inventory chemcials stored/used at the site

f. Reroute Auxiliary Building air compressor condensate, air drier condensate and air storage tank blowdown at Plants 1 and 2

g. Investigate dry well between oil-water separator and discharge at Plant 1

3. Develop Remedial Action Plan

a. Sampling to define extent of contamination at Plant 1 discharge

b. Removal of PCB contamination in soil at Plant 1 discharge

c. Removal of PCB contamination from oil-water separator, manhole oil skimmer, Auxiliary Building floor drains and all connecting piping at Plant 1

d. Removal of PCB contamination in manhole oil skimmers and connecting piping and, if necessary, in Auxiliary Building floor drains and connecting piping at Plant 2

e. If necessary, define the extent of contamination associated with Plant 2 dry well and Storage Building dry well

f. Removal of PCB contamination, if necessary, associated with Plant 2 dry well

g. If necessary, removal of PCB contamination from air storage tank, air drier system and soil at Plants 1 and 2

4. Implement Investigation and Remedial Action Plan, Sample to Verify Adequate Cleanup and Close-out with DNR

BWR/1-29-87

Consumers Power Company Gas Compressor Station PCB Contamination

The Company will review Potential PCB Contamination at Overisel, Muskegon River, St Clair, Ray, Northville and Freedom Compressor Stations after the process at White Pigeon is substantially complete.

a. Review purchasing records and oil use patterns

b. If necessary, undertake sampling for PCB contamination one at a time in accordance with resources available

BWR/1-29-87

file

Consumers Power Company

R. C. Bonner
Executive Manager,
Production & Transmission

General Offices: 1945 West Parnall Road, Jackson, Michigan 49201 • Area Code 517 788-1643

March 5, 1981

Mr. John Seitz
Environmental Protection Agency
401 M Street, SW (EN 342)
Washington, D. C. 20460

I am pleased to inform you that condensate and other liquid samples taken from the seven locations specified on the Consumers Power Co and Michigan Gas Storage Co gas transmission system do not contain detectable quantities of PCB. The samples were taken and analyzed in accordance with the instructions provided to Interstate Natural Gas Association of America by your office. All analyses were performed by the CP Co Laboratory in Jackson, Michigan.

A table indicating sample location, type and results (detection limit) is included as a part of this letter.

RCB:cp

CC: LJOgden, INGAA
MJKidd, Michigan Public Service Commission

bcc: WWStille
JDShumate
MDGwinn
PCHittle

K00000478

K00000479

PCB ANALYSIS
Transmission System Results

Identification Number	Tag No.	Location	Type	Detection Limit	Concentration
11-2-1-2/16/81-C	01459	Freedom Condensate Tank	Condensate	5 ug/g	[illegible]
11-7-2-2/18/81-C	04542	Muskegon River Kalkaska Inlet	Condensate	5 ug/g	[illegible]
11-3-3-2/19/81-C	04536	White Pigeon, Plant 2, Scrubber Dump Collection Tank	Condensate	5 ug/g	[illegible]
11-1-4-2/19/81-C	04453	Overisel Inlet Scrubber	Water	0.1 ug/ml	[illegible]
11-1-5-2/19/81-C	04526	Overisel Contact Tower	TEG*	5 ug/g	[illegible]
11-5-6-2/24/81-C	04452	St Clair Station Sludge Tank	Water	0.1 ug/ml	[illegible]
11-6-7-2/24/81-C	04451	Ray Field Scrubber Tank	Water	0.1 ug/ml	[illegible]
11-6-8-2/24/81-C	04239	Ray - Macomb Crossover Tank	Condensate	5 ug/g	[illegible]
11-4-9-2/25/81-C	04500	Northville Main Blowdown Tank	Water	0.1 ug/ml	[illegible]

*triethylene glycol

3/5/81

cc

MAY 22 1981

cc to WWS
file orig PCB

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
230 SOUTH DEARBORN ST
CHICAGO, ILLINOIS 60604

REPLY TO ATTENTION OF

5AHTM

MAY 20 1981

Mr. R. C. Bonner, Executive Manager,
Production and Transmission
Consumers Power Company
1945 West Parnall Road
Jackson, Michigan 49201

Dear Mr. Bonner:

On February 5, 1981, samples were collected by United States Environmental Protection Agency personnel to test for the presence of PCBs in your gas distribution system. These samples were analyzed by U.S. EPA's Central Regional Laboratory following accepted laboratory procedures.

The location of the sampling site, sample type and results follow:

SITE	SAMPLE TYPE	RESULTS (ppm)
Overisel Compressor Station Hamilton, MI	Engine #1 Crankcase lube oil	N.D. (< 5) *
	Reactor Turbine Gear Box Lube oil	N.D. (<15)
	Waste oil storage	N.D. (< 5)

* Not detected at the detection limit stated in parentheses.

Thank you for your cooperation in this investigation. If you have any questions regarding this data or need additional information, please feel free to contact me or Ms. Carolyn Hesse, of my staff, at the above address or at telephone number (312)353-2291.

Sincerely yours,

Karl E. Bremer

Karl E. Bremer, Acting Chief
Toxic Materials Branch

K00000480

To GTBohn, T-258

From HWVoigt, T-222

Date March 3, 1981

Subject ANALYSIS OF COMPRESSOR STATION LIQUIDS FOR PCB CONTAMINATION

Consumers Power Company

Internal Correspondence

ENGRES-CL1-HWV10

cc

As part of the investigation into the possible polychlorinated biphenyl (PCB) contamination of natural gas streams the following compressor station liquids were collected and analyzed for PCB concentration.

Samples were collected by Consumers Power Company (CPCo) Engineering and Research Laboratory (E&RL) personnel. Samples were analyzed for PCB concentration at E&RL. No samples or split samples were collected for the Environmental Protection Agency (EPA).

It must be noted that, all samples collected represent liquid coming from the storage fields and is knocked out before reaching the compressor units. No liquid is available for sampling down-stream of the compressor units at the compressor station. Down-stream liquid would be available at the "city-gates."

SUMMARY OF RESULTS

Water Samples

Compressor Station	Sample Description	Tag Number	PCB * ug/ml
Overisel	Inlet Scrubber	04453	<0.1
St. Clair	Station Sludge Tank	04452	<0.1
Ray	Field Scrubber Tank	04451	<0.1
Northville	Main Blow Down Tank	04500	<0.1

Hydorcarbon Samples

Compressor Station	Sample Description	Tag Number	PCB * ug/g
X Freedom	Condenate Tank Dip Sample	01459	< 5

K00000481

Hydrocarbon Samples (Contd)

Compressor Station	Sample Description	Tag Number	PCB * ug/g
Muskegon River	Kalkaska Inlet	04542	< 5
White Pigeon	Plant #2 Scrubber Dump Collection Tank	04536	< 5
Ray	Macomb Crossover Tank	04239	< 5
Overisel	TEG Contact Tower	04526	< 5

* Calculated as Aroclor-1242. Aroclor-1254 and Aroclor-1260 analysis for but not detected.

SUMMARY OF ANALYTICAL METHOD

Water samples - The water sample (900ml) was extracted three times with 60-ml portions of methylene chloride+hexane (15 + 85) mixed solvent. The combined extract was dried and concentrated to 10.0 ml. The concentrated extract was treated with fuming sulfuric acid, followed with a florisil column clean up. The first 1.5 ml column elution volume was collected and treated with elemental mercury and a portion taken for quantitative gas chromatography-electron capture detector analysis.

Hydrocarbon samples - The hydrocarbon condensate sample, diluted with hexane, was treated with fuming sulfuric acid, florisil column clean up and elemental mercury clean up prior to quantitative gas chromatography analysis.

The pretreatment provide sample analyst that were free of interfering componets that would otherwise interfere with the recognization and quantitative determination of an Aroclor mixture. Both duplicate samples and samples spiked with known amounts of Aroclor-1242 were analyzed. Analytical precautions normally dictated in trace organic analysis were abserved.

To GTBohn, T-258

From HWVoigt, T-222

Date February 16, 1981

Subject ANALYSIS OF OVERISEL COMPRESSOR STATION LUBE OILS FOR PCB CONTAMINATION

Consumers Power Company

INTERNAL CORRESPONDENCE

ENGRES-CL1-HWV-09

CC

On February 5, 1981, as part of the investigation into the possible polychlorinated biphenyl (PCB) contamination of natural gas streams, the Environmental Protection Agency (EPA - Chicago office) sampled two lube oils and one waste oil at the Consumers Power Company (CPCo) Overisel Compressor Station, Overisel, Michigan.

Samples were collected in duplicate by EPA personnel, with CPCo receiving one set and EPA retaining the other. Sampling was witnessed by the Compressor Station Supervisor and CPCo Engineering and Research Laboratory - Chemical Division personnel.

SUMMARY OF RESULTS

EPA Number	CPCo Number	Sample Description	PCB, ug/g*
81TS25-D03	3102	Engine # 1, Crankcase	< 5
81TS25-D02	3103	Reactor Turbine Gear Box	33
81TS25-D01	3104	Waste Oil Storage	< 5

* Calculated as Aroclor - 1242. Aroclor - 1254 and Aroclor - 1260 analyzed for, but not detected.

SUMMARY OF ANALYTICAL METHOD:

The oil samples, diluted with hexane, were treated with fuming sulfuric acid, followed with a florisil column clean up procedure prior to quantitative gas chromatography (electron capture detector) analyses.

The pretreatment provided sample analyte that were free of interfering components that would otherwise interfere with the recognization and quantitative determination of a Aroclor mixture. Both duplicate samples and samples spiked with known amounts of Aroclor - 1242 were analyzed.

Analytical precautions normally dictated in trace organic analysis were observed.

From GTBohn - 2:30 pm - Tues, Feb 10, 1981

The lubricating oil, PEGASUS 485 and the waste oil samples taken from Overisel Compressor Station definitely do not contain PCBs.

The turbine lube oil, Pyrogard 53 is uncertain at this time - our analysis is not finished.

We determined this discovery by what is referred to as "high resolution capillary column gas chromatography." What that means is it resolves the peaks seen by the conventional method into several components. We were able to separate from that the PCB-contributors versus non-PCB-contributors. The lube and waste oils are very definitely clean. They are conducting this analysis on the turbine oil but not done yet.

Before going to the field to sample the ~~Distribution~~ TRANSMISS system, they rinsed all sample bombs with Hexane and then analyzed the washings to see if they were clean. Found what appears to be large quantities of PCB in the sample bombs. It may be other stuff instead of PCB. Has similar characteristics but may not be PCB. Thought you should know that something is in the pressure vessels that could interfere with testing for PCBs.

(Bombs had [illegible] been washed w/ detergent OAKITE)

Note: have Gene Bohn call Denver Lab
DEAN Hill EPA

K00000484

CONSUMERS POWER COMPANY
Overisel Compressor Station

A review of purchase records has indicated that PYDRAUL AC was purchased and used from about 1963 to 1965 in two air compressors which provide high-pressure air for instrumentation and engine starting. Condensate from the air compressors discharge to the waste water treatment system and the effluent from the system discharges to the ground outside the station fence but on Company property. The site is located in a rural area and there is limited public access.

BWR
3/13/87

K00000485

IC0387-0153A-TP05-TP13

Consumers Power Company

COPY

General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

October 20, 1987

BWR 87-128
M905.4

Mr Timothy J McGarry
Waste Management Division
Department of Natural Resources
PO Box 30028
Lansing, MI 48909

OVERISEL COMPRESSOR STATION

Dear Mr McGarry:

This is in response to your request in our September 24, 1987 meeting to provide the data for the first wave of sampling and PCB analysis at the Overisel Compressor Station. Attached are PCB analyses of samples collected at the air logs on September 16, 1987 and at the oil-water separator discharge on September 16 and 28, 1987.

I plan to respond to the remaining open items from our September 24, 1987 meeting after I have more information. I am going to visit Freedom and Ray Compressor Stations on Tuesday, October 27, 1987 for the purpose of defining what additional sampling if any may be needed to verify no release of PCB contamination to the retired wastewater handling systems at these facilities. You are welcome to join me.

Sincerely,

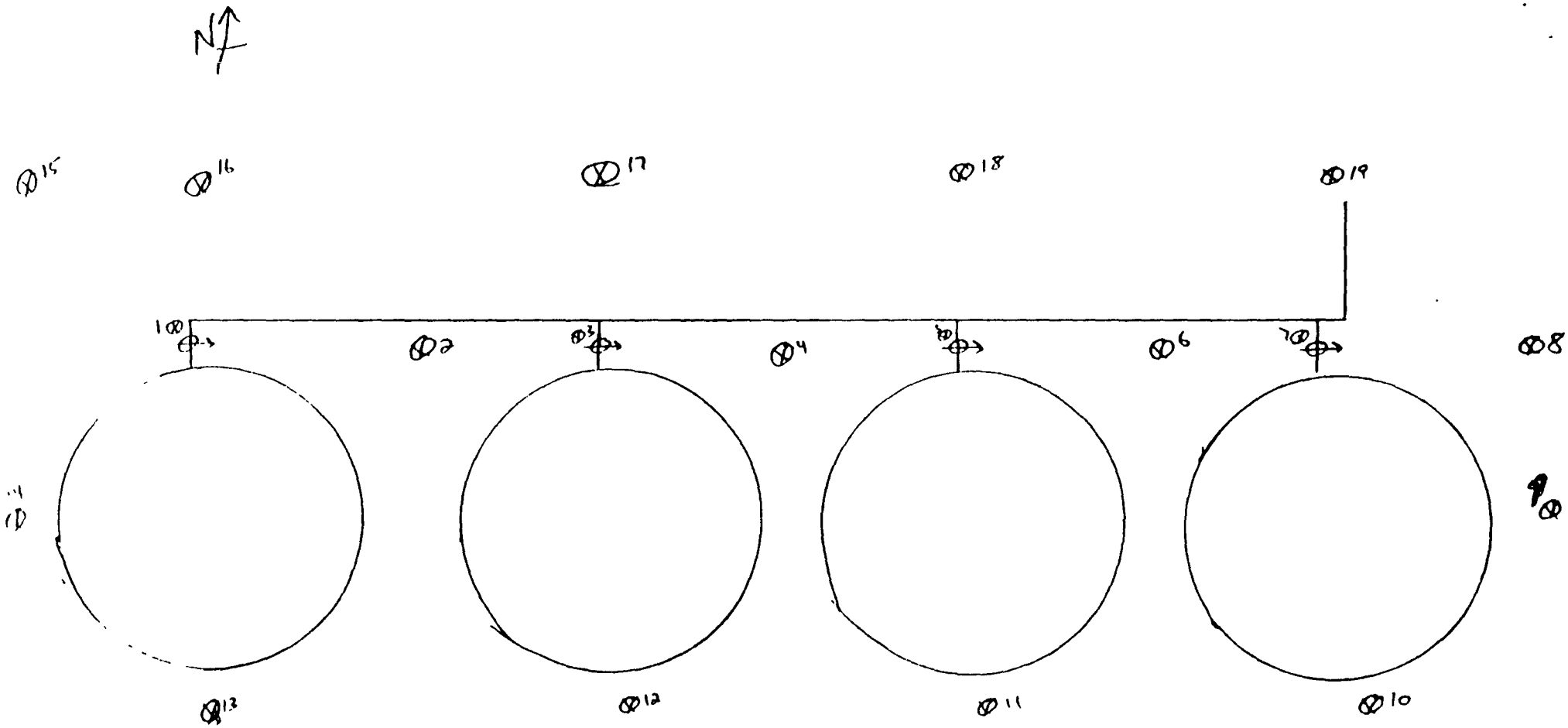
Bruce W Rasher
Environmental Department

CC JPDickey, M-1019
GDDykstra, Overisel
DTKetcham, P-25-131
DHPendleton, P-25-125B
ECQuibell, Freedom
TLZobl, Ray

K00000486

OC1087-26BWR-EN03

Overisel air logs



K00000487

OVERISEL COMPRESSOR STATION

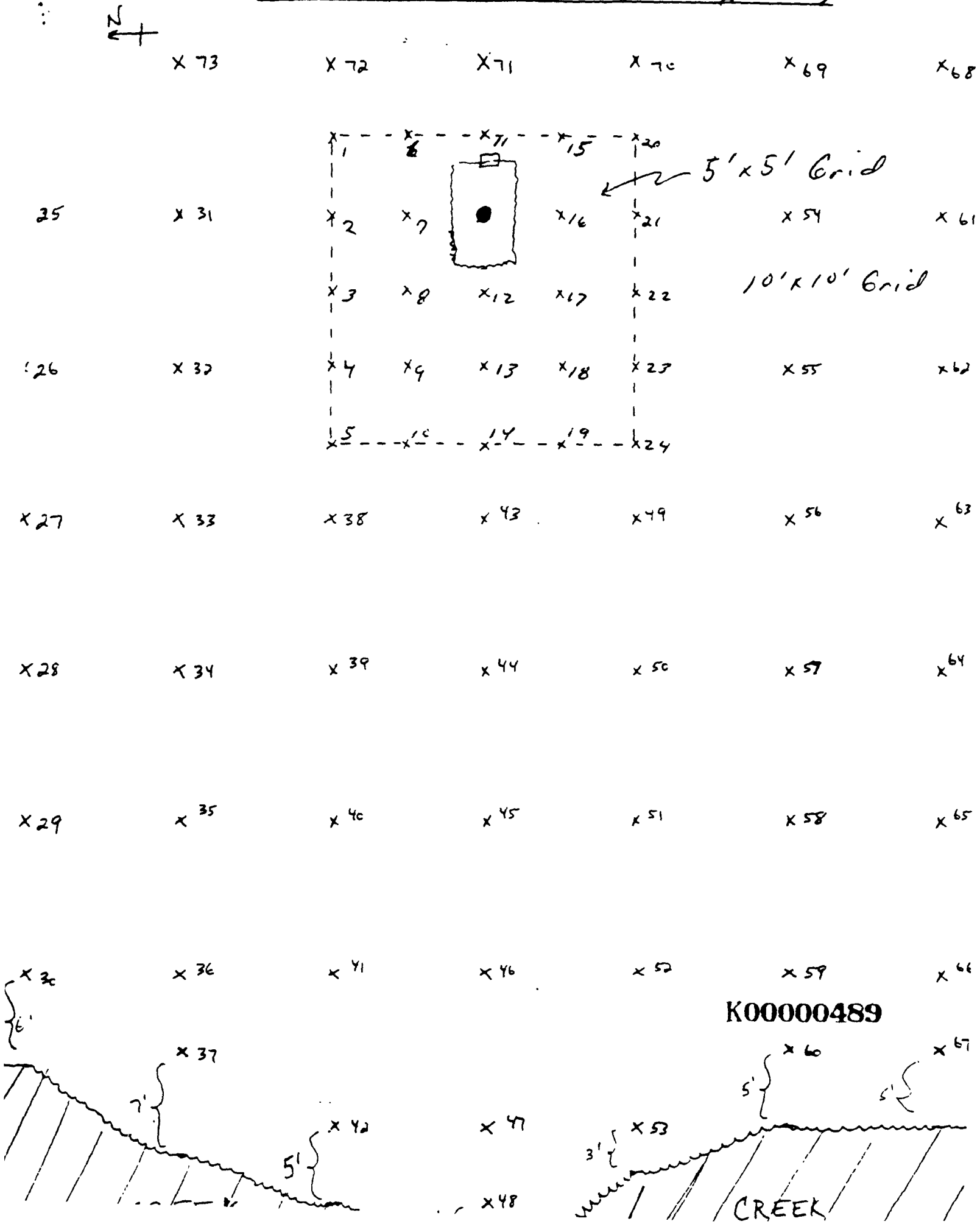
Area - Air Logs
Sampling Date - 09-16-87
Project # 528717781-492

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872492B 1	17	37
2	4	24
3	10	31
4	13	23
5	18	11
6	10	23
7	7	25
8	8	14
9	18	17
10	15	1
11	36	3
12	16	3
13	9	3
14	14	38
15	8	14
16	6	17
17	6	11
18	8	22
19	9	27

K00000488

Overisel Gas Comp. Station Soil Sampling Grid

(Expanded Grid for Oil/Water Sep. Discharge Point)



K00000489

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-16-87
Project # 528717781-492

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872492A-1	1	
2	8	
3	9	
4	25	
5	120	
6	2	
7	530	7
8	3500	
9	490	4
10	660	
11	9	
12	1200 ~~750*~~	
13	200 ~~760*~~	
14	230 ~~200*~~	
15	31	
16	4400	14
17	2700	
18	3400	1100
19	260 *	
20	57	K00000490
21	100	

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-16-87
Project # 528717 781-492

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872492A-22	860	
23	1800	
24	150	
		K00000491

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project # 528717-781-502

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502-A 25	5	
26	2	
27	6	<1
28	1	
29	2	
30	<1	<1
31	12	<1
32	17	
33	13	<1
34	9	
35	1	
36	<1	
37	<1	<1
38	800	1
39	10	
40	9	
41	1	
42	<1	<1
43	3900	83
44	520	2
45	11	

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project #

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502A - 46	1	
47	1	<1
48	1	<1
49	450	3
50	3100	6
51	67	
52	5	
53	3	<4**
54	38	2
55	110	3
56	830	15
57	820	12
58	140	2
59	9	
60	9	<1
61	5	
62	62	<1
63	530	8
64	310	4
65	5	<1
66	1	<1

K00000493

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project # 528717 781-502

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502A-67	1	
68	1	
69	3	
70	3	
71	17	
72	1	
73	3	

K00000494

CONSUMERS POWER COMPANY
OVERISEL GAS COMPRESSOR STATION
Laboratory Analytical Results for PCB in Samples of Surface Water and Sediment Collected on July 1, 1987 From Surface Waters in the Area of Consumers Power Company's Overisel Gas Compressor Station

Location	Sample Type	Concentration of PCB A 1254 Left	Mid	Right
Rabbit River at 38th St bridge (upstream of Busscner Drain inflow)	Water	ND[a]	ND	ND
	Sediment	ND	ND	ND
Rabbit River above Hamilton Falls (M-40) (downstream of Busscner Drain inflow)	Water	ND	ND	ND
	Sediment	NS[b]	NS	ND
Busscner Drain at weir (upstream of oil-water separator)	Water	ND	ND	ND
	Sediment	ND	ND	ND
Busscner Drain 15.5 ft downstream of weir (near oil-water separator)	Water	0.11 ug/l	NS	NS
	Sediment	ND	NS	NS
Busscner Drain 125 ft downstream of weir (downstream of oil-water separator)	Water	0.15 ug/l	ND	ND
	Sediment	ND	ND	ND

Oil-water separator discharge pit
Water at pipe 410 ug/l
Sediment E 1400 mg/kg Mid 2400 mg/kg W 250 mg/kg

[a]ND indicates not detected at the following limits of detection

	Water (ug/l)	Sediment (mg/kg)
A 1242	0.065	1
A 1254	0.11	1
A 1260	0.18	1

[b]NS indicates that no sample was collected at this location.

BWR/mlp
7/20/87

K00000495

To GDDykstra, Overisel
RLMoore, JSC-251

From BWRasher, P-12-103

Date April 13, 1988

Subject DISPOSITION OF WASTE BARRELS FROM STS DRILLING INVESTIGATION

CC WJWilson, P-12-308

CONSUMERS POWER COMPANY

Internal Correspondence

BWR 88-58
M905.4

Following are my recommendations for dispositioning waste barrels from the STS drilling investigation based on the drum inventory provided by you.

Soil

For drums containing soil tested and found to contain 50 ppm or more PCB, the waste must be disposed of in an EPA-approved chemical waste landfill:

Drum No	Soil Boring No	PCB (ppm)
2	88SB-7	570
3	88SB-8	530
7	88SB-1	3400
8	88SB-3	3500
9	88SB-5	3900
10	88SB-6	4400
11	88SB-1A & 5	3900
12	88SB-4	1800
?	88SB-11	5400
?	88SB-2	3100

For drums containing soil tested and found to contain 10 ppm or more PCB up to but not including 50 ppm PCB, the waste may be disposed of either in a Michigan-licensed Type II sanitary landfill or a chemical waste landfill:

Drum No	Soil Boring No	PCB (ppm)
1	88SB-9	15

For drums containing soil tested and found to contain less than 10 ppm PCB, the soil may be reused on site:

Drum No	Soil Boring No	PCB (ppm)
4	88MW-2 and 2A	3
5	88MW-3A	1
6	88SB-10	2
?	88MW-1	<1

K00000496

IC0488-26BWR-EN03

Combustible PCB Wastes

The four waste drums containing combustible paper and plastic PCB wastes must be disposed of at an EPA-approved incinerator.

Liquid Wastes

For liquid wastes, you may either transfer from the drums to your slop tank for batch analysis and dispositioning or sample/analyze each drum and disposition according to those results. In this instance, liquids tested and found to contain 10 ppm or more PCB must be disposed of at an EPA-approved incinerator. Liquids tested and found to contain less than 10 ppm PCB may be handled as a liquid industrial waste and processed by a licensed facility.

--12-88

Overfill waste barrels

Soil

A · 50 ppm PCB or more — chemical waste landfill } can combine

B · 10 — 49 ppm PCB — Type II sanitary landfill

C · Less than 10 ppm PCB — on site reuse

Drum #

A	B	C
7 (88 SB-1)	1 (88 SB-9)	6 (88 SB-10)
11 (88SB-1A & drum 5)		4 (88 MW-2 and 2A)
8 (88SB-3)		5 (88 MW-3)
12 (88 SB-4)		88MW-1
9 (88 SB-5)		
10 (88 SB-6)		
2 (88 SB-7)		
3 (88 SB-8)		
88SB-11		
88SB-2		

What drum was 88SB-7 placed into? 88MW-11?

Liquids

- Transfer into slop tank (batch analysis)
- Sample individual drums — below 10 ppm liquid industrial waste, 10 ppm or more PCB waste

K00000498

TRANSMITTAL

Date 3/22/88

TO: BRUCE KASHER

FROM: BOB MOORE

- [ ] Note and File
- [ ] Note and Return to Me
- [ ] Return With More Details
- [ ] Note and See Me About This
- [ ] Please Answer
- [ ] For Your Approval
- [ ] Prepare Reply for My Signature
- [ ] Take Appropriate Action
- [ ] Per Your Request
- [ ] Signature
- [x] For Your Information
- [ ] Investigate and Report
- [ ] Per Our Conversation

Comments

THESE ARE THE PRELIMINARY RESULTS TAKEN AT THE OUTFALL AREA AT OVERISEL COMP. STA.

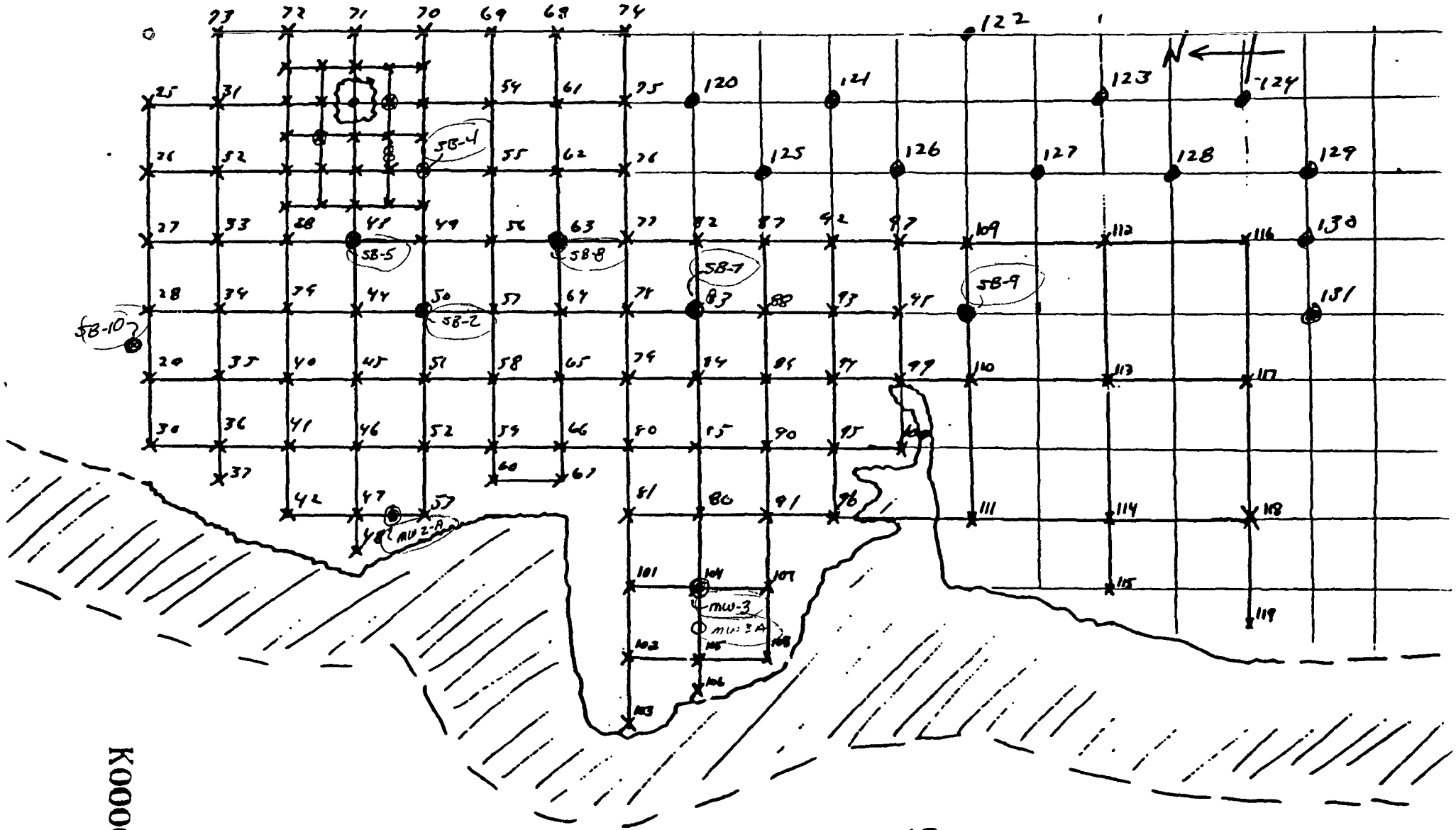
THE LAST PAGE IS A LIST OF BARRELS USED AND STORED ON SITE.

Form 407 1000M 5-82

K00000499

mw-1

Overisel Gas Comp. Station Soil Sampling - Composite Grid - Oil/Water Sep. Discharge Point

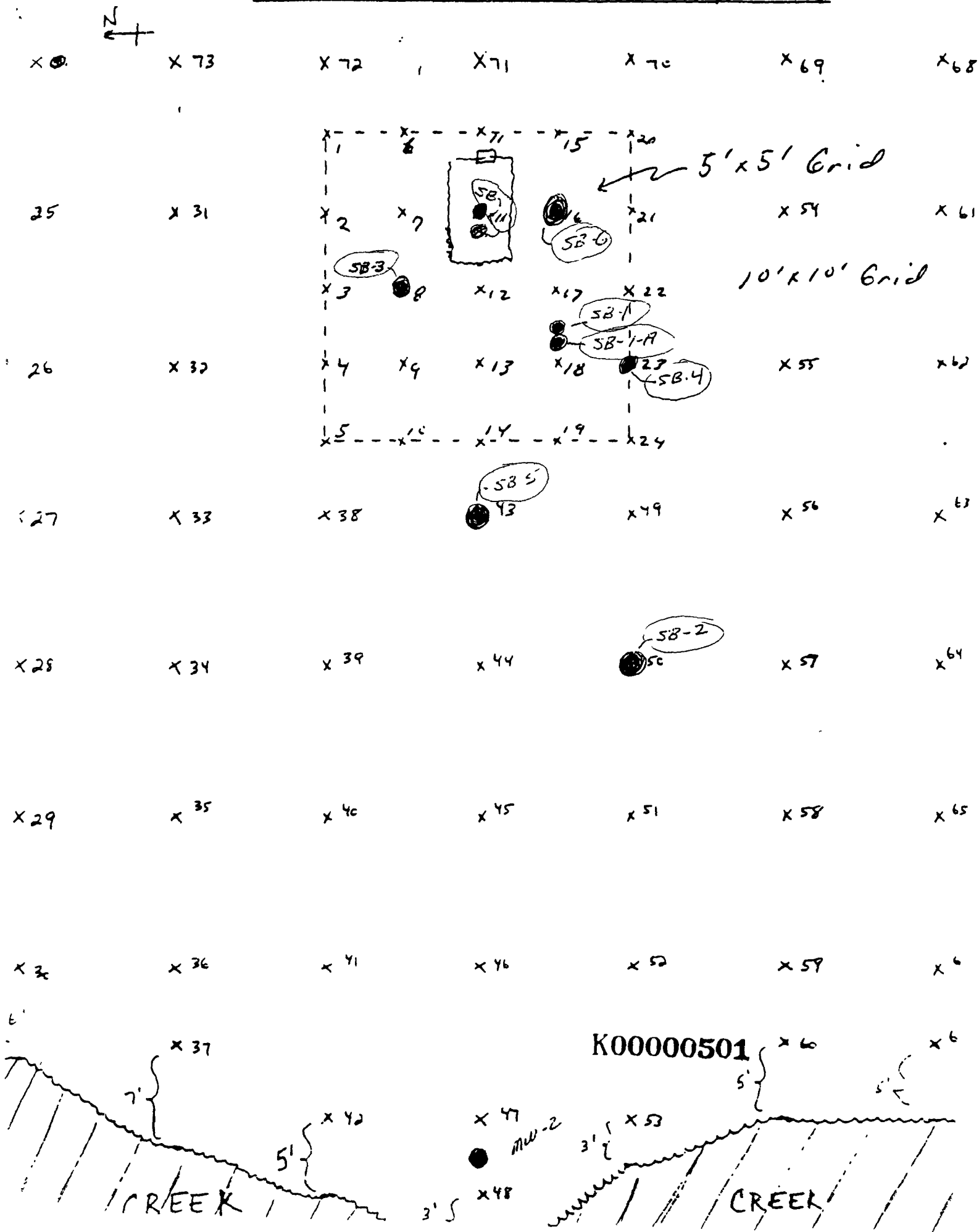


Jan 21, 1988 point #120 → 131

K000000500

Wrisel Gas Comp. Station Soil Sampling - 012301 - GLC13 [illegible]

(Expanded Grid for 0.1 Water Sep Discharge Point)



K00000501

OVERISEL COMPRESSOR STATION

OVERFLOW DISCHARGE AREA
SAMPLE ANALYSES

SB-1 35'S - 17.5' W.
C.P.Co GRID # 17.5

1 -	0 - 2'	1 PPM
		WATER TABLE
2 -	2'-4'	< 1 PPM
3 -	4'-6'	1
4 -	6-8'	< 1
5 -	8'-10'	< 1
6 -	10'-12'	< 1
7 -	12'-14'	2
8 -	14'-16'	< 1
9 -	16'-18'	28
10 -	18'-20'	16

17 - [illegible]
18 - [illegible]

SB-1A 35'S - 18.5' W
C.P.Co GRID # 17.8 APPROX.

1 -	20'-22'	< 1 PPM
2 -	24'-26'	< 1
3 -	28'-30'	< 1

1 - [illegible]

SB-2 40'S. - 40' W
C.P.Co. GRID # 50

5 -	8'-10'	< 1 PPM
7 -	12'-14'	5
8 -	14'-16'	< 1
9 -	16-18'	1
10 -	18'-20'	7

5 - [illegible]

SB-3 25'S - 15' W
C.P.Co GRID # 8

1 -	0'-2'	2 PPM
2 -	2'-4'	< 1
3 -	4'-6'	< 1
4 -	6'-8'	< 1
5 -	8'-10'	< 1
6 -	10'-12'	< 1
7 -	12'-14'	< 1
8 -	14'-16'	< 1
9 -	16'-18'	1
10 -	18'-20'	1
11 -	20'-22'	2

SB-4 40'S - 20' W
C.P.Co GRID # 23

1 -	0'-2'	82 PPM
2 -	2'-4'	< 1
3 -	4'-6'	2
4 -	6'-8'	1
5 -	8'-10'	< 1
6 -	10'-12'	< 1
7 -	12'-14'	1
8 -	14'-16'	1
9 -	16'-18'	1
10 -	18'-20'	< 1
11 -	20'-22'	8

23 - [illegible]

SB-5 30'S - 30' W
C.P.Co. GRID # 43

1 -	0'-2'	< 1 PPM
2 -	2'-4'	< 1
3 -	4'-6'	< 1
4 -	6'-8'	< 1
5 -	8'-10'	< 1

43 - [illegible]

K00000502

SB-6 35'S - 10'W
CPCo. GRID # 16 APPROX.

1-	0'-2'	1	PPM
2-	2'-4'	<1	
3-	4'-6'	<1	
4-	6'-8'	1	
5-	8'-10'	<1	
8-	14'-16'	<1	
11-	20'-22'	<1	

SB-7 80'S - 40'W
CPCo GRID # 83

1-	0'-2'	3	PPM
2-	2'-4'	<1	
3-	4'-6'	<1	
4-	6'-8'	<1	
5-	8'-10'	<1	
6-	10'-12'	<1	
7-	12'-14'	<1	
8-	14'-16'	<1	
9-	16'-18'	1	
10-	18'-20	4	
11-	20'-22'	<1	
WASH WATER 20'		<1	

SB-8 60'S - 30'W
CPCo. GRID # 63

1-			
2-			
3-	4'-6'	3	PPM
4-	6'-8'	<1	
5-	8'-10'	<1	
6-	10'-12'	<1	
7-	12'-14'	2	
8-	14'-16'	<1	
9-	16'-18'	<1	
10-	18'-20'	<1	
11-	20'-22'	<1	
12-	22'-24'	<1	

SB-9 120'S - 40'W
CPCo GRID # 109.5

1-			
2-			
3-	4'-6'	<1	PPM
4-	6-8'	<1	
5-	8'-10'	<1	
6-	10'-12'	<1	
7-	12'-14'	<1	
8-	14'-16'	<1	
9-	16'-18'	<1	
10-	18'-20'	<1	
11-	20'-22'	<1	
12-	22'-24'	<1	
DRILLING MUD 22'		<1	PPM

SB-10 -3' N - 45' W
C.P.Co. GRID # 28.5 APPROX.

1-	0'-2'	<1	PPM
2-	2'-4'	<1	
3-	4'-6'	<1	
4-	6'-8'	<1	
5-	8'-10'	<1	
6-	10'-12'	<1	
7-	12'-14'	<1	
8-	14'-16'	<1	
9-	16'-18'	<1	
10-	18'-20'	<1	
11-	20'-22'	<1	
12-	22'-24'	<1	

28- 1
29- .2

DRILLING MUD 22' <1 PPM

SB-11 30' S - 10' W
CPCo GRID # 11.5

1-	0'-2'	5400	PPM
2-	2'-4'	1	
3-	4'-6'	<1	
4-	6'-8'	<1	
5-	8'-10'	<1	
6-	10'-12'	78	
7-	12'-14'	<1	
8-	14'-16'	<1	
9-	16'-18'	<1	
10-	18'-20'	<1	
11-	20'-22'	<1	
12-	22'-24'	<1	
13-	24'-26'	<1	
14-	26'-28'	<1	

← DRILLING MUD 18'-20' 36 PPM
24' 10
28' 6

47- 1/<1
48- 1/<1
53- 3/<4

104- 1/<1
105- 1/1

MW-1
13'6" WATER TABLE
15'-17' <1 PPM
17'-19' <1 PPM

MW-2-A
35' S - 70' W
16'-18' <1 PPM
18'-20' <1 PPM
WASH WATER <1 PPM

MW-3
80' S - 80' W
6'-8' <1 PPM
8'-10' <1 PPM

K00000504

Drum I.D. & Contents

Soil Drums	Liquid Drums	Paper + Plastics Con	Paper Plastic Non-Con
1. 88SB-9 0-16'	1. 88SB-9 Drill Mud 16-24'	4M	1
2. 88SB-7 0-22'	2. 88SB-8 Drill Mud 18-24'		
3 88SB-8 0-18'	3. 88SB-11 Drill Mud 14-30'		
4 88MW-2 0-10' 88MW-2A 0-20'	4. Outfall Pond Water		
5. 88 MW-3A 0-20'	5. Outfall Pond Water		
6 88 SB-10 0-22'	6. Outfall Pond Water		
7 88 SB-1 0-20'	7. Spoon Wash Con Liquid		
8 88SB-3 0-18'	8 88SB-10 Drilling Mud		
9. 88 SB-5 14-18'	9. 88SB-1A Drilling Mud 20-30'		
10. 88SB-6 0-24'	10. 88SB-3 Drill Mud		
11. 88SB-1A 0-30' 88SB-5 0-14'	11. Spoon Wash Con Liquid		
12. 88SB-4 0-22'	12. Personal Decon Con Liquid		
	13. Personal Decon Con Liquid		

K00000505

File

STS Consultants Ltd.
Consulting Engineers

Subsurface Exploration at the Overisel Compressor Station Hamilton, Michigan

Consumers Power Company

July 1988

REPORT

K00000506

7-29-88
M905.4

(21)

STS Consultants Ltd.
Consulting Engineers

3340 Ranger Road
Lansing, Michigan 48906
(517) 321-4964

July 28, 1988

Mr. Bruce W. Rasher
Consumers Power Company
1945 West Parnall Road
Jackson, MI 49201

RE: Subsurface Exploration at the Overisel Compressor Station, Hamilton, Michigan
Consumers Power Company, P.O. No. CP13-5422

Dear Mr. Rasher:

STS Consultants, Ltd. is pleased to enclose three copies of the final report for the above referenced project. Included in this document is a description of the problem, the explorations performed, and our conclusions.

If you have any questions, please do not hesitate to call.

Sincerely,

STS CONSULTANTS, LTD.

Dianne D. Borrello
Dianne D. Borrello, E.I.T.
Assistant Project Engineer

Bernard B. Sheff/CAB
Bernard B. Sheff. P.E.
Senior Project Engineer

Timothy Dahlstrand/LCH
Timothy K. Dahlstrand, P.E., C.P.G.S.
Vice President

DDB/cab DDB3 #12

STS Project No. 1151XH

K00000507

Report

Project

Subsurface Exploration at the
Overisel Compressor Station
Hamilton, Michigan

Client

Consumers Power Company
1945 West Parnall Road
Jackson, Michigan 49201

Project # 1151XH

Date July 28, 1988

STS Consultants Ltd.
Consulting Engineers
3340 Ranger Road
Lansing, Michigan 48906
(517) 321-4964

K00000508

TABLE OF CONTENTS

	Page No.
PROJECT OVERVIEW	1
FIELD PROCEDURES	2
Drilling and Sampling	2
Equipment Decontamination	4
Surveying	4
Water Sampling	4
LABORATORY TESTING PROCEDURES	5
SOIL AND GROUNDWATER CONDITIONS	6
Regional Geology	6
Site Geology	6
Hydrogeology	6
EXPLORATION RESULTS	9
Analytical Results	9
Excavation Volumes	14
Recommendations	14
GENERAL QUALIFICATIONS	15
REFERENCES	16

TABLES

Table 1 - Groundwater Elevations	8
Table 2 - Estimated Excavation Volumes	14

FIGURES

Figure 1 - PCB Contour, Surface Concentration	10
Figure 2 - PCB Contour, Concentration at 1 foot Depth	11
Figure 3 - Envelope of PCB Detections	13

TABLE OF CONTENTS, CONTINUED

APPENDICES

Appendix A - Soil Boring Logs
Well Installation Diagrams
Standard Method ASTM D-1586
Unified Soil Classification System
Field and Laboratory Procedures

Appendix B - Consumer Power Company Analytical Data
Grain Size Analysis
Permeability Analysis

Appendix C - Boring Location and Monitoring Well Location Diagram

PROJECT OVERVIEW

The Overisel Compressor Station is located in Section 27 of Overisel Township, Michigan. Within the facility, air compressors are periodically operated. The discharge from the air compressors passed through floor drains to an oil/water separator and then discharged to the ground surface in the area known as the discharge pit. The discharge pit is located in the low lying area adjacent to Busscner Drain on the east bank. This drain discharges to the Little Rabbit River which in turn connects to the Kalamazoo River and Lake Michigan. The owner has identified that the condensate discharge is the source of the PCB contamination.

The Compressor Station began operation in October, 1959.

The chemical source of the PCB contamination is believed to be a Monsanto oil product, Pydraul A.C., supplied by Mobil Co. and used in the air compressors from 1963 until approximately 1965. According to Monsanto, Pydraul A.C. is 57% PCB (Aroclor 1254) in combination with either mineral oil or phosphate ester oil with a specific gravity believed to range between 1.09 to 1.18. After 1965, until January, 1986, Pyroguard 53 was used for lubrication. This is a phosphate ester oil which does not contain PCBs; however, it is again heavier than water. In February 1987, all condensate discharge was terminated. Other discharges into the effluent system included water softener overflows and rainwater. Available records suggest that a maximum of one 55 gallon drum of Pydraul A.C. may have been used at this site.

The purpose of this report is to describe the field explorations performed to determined the horizontal and vertical extent of PCB contamination of which, the STS exploration was limited to the outfall area. The work was performed under Consumers Power Company Purchase Order No. CP-13-5422.

FIELD PROCEDURES

The field exploration procedures for this project were divided into two segments, drilling and surveying. Prior to the initiation of any field work, a site safety plan was developed by STS for on-site STS personnel. Since we anticipated that personnel would be exposed to PCBs on the ground surface as well as during the drilling operations, personnel protection was provided in the form of Saranex suits, protective inner and outer gloves, over-boots, and particulate respirators. A site safety engineer was assigned to the project to observe any changed conditions or conditions which could impact personnel health and safety which may arise. Personnel assigned to this project participate in the STS Consultants' health screening program.

Drilling and Sampling

Using information previously compiled by Consumers Power Company, a drilling, sampling, and monitoring well installation program was initiated. Drilling was performed with a two man drill crew supervised by a field engineer. An all-terrain CME-45 drill rig was used to perform a total of eighteen (18) soil borings to collect discrete soil samples and to enable the installation of monitoring wells in five of the borings. The borings were advanced using hollow stem augers to depths ranging from 10 to 20 feet. In most cases, the hollow stem augers could not be advanced deeper than 18 feet due to the common problem of unbalanced water pressure, causing sand to move up inside the auger. Therefore, in the deeper borings, 24 to 30 feet deep, hollow stem augers were advanced to depths ranging from 14 to 20 feet and the remainder of the borehole was advanced using rotary drilling methods. In this technique, a rotary bit is advanced and bentonite mud is used to remove the soil cuttings and to hold the borehole open. In boring 88SB-7, potable water rather than bentonite mud was added inside the auger from 18 to 20 feet. Samples of the drilling fluid were collected at approximately 5 foot intervals to monitor for PCB contamination in the fluid.

Soil samples were obtained using the split barrel sampling procedure, in general accordance with ASTM specification D-1586. A brief description of this procedure is included in Appendix A. A clear plastic liner insert was placed into the split spoon and the recovered soil sample was retained in that liner. The soils were visually classified by the field engineer. The liner was sealed, and then marked for vertical orientation and sample location. The bottom 3 inches of each sample was delivered to Consumers Power Company for PCB analysis. The remainder of the sample was stored on site. All boreholes were grouted with bentonite/cement grout to the surface upon completion.

Seven monitoring wells were also installed at the site. The monitoring wells were constructed of 2 inch diameter galvanized steel stand pipe with 5 foot stainless steel screens. The well screen was placed into the water table, approximately 5 to 8 feet in monitoring wells 88MW-1, 88MW-2, 88MW-3, 88MW-4 and 18 to 20 feet in monitoring wells 88MW-2A, 88MW-3A and MW-4A. The shallow monitoring wells were installed utilizing the hollow stem augers. The deeper wells were installed with rotary methods using potable water. A bentonite pellet seal was placed above the well screen. The remaining borehole annulus was grouted to the surface and a locking protector pipe installed. The wells were not developed.

Upon completion of the drilling operations, select soil samples were returned to the STS office in Lansing, Michigan for further examination by an engineer. This examination noted color, major and minor soil components, degree of saturation, presence of organics, and whether the material appeared to be natural or fill. All soils were classified on the basis of texture and plasticity, and grouped in accordance with the Unified Soil Classification System. A brief explanation of the Unified Soil Classification System is enclosed in Appendix A. Estimated group symbols, according to this system of classification, are shown in parentheses following the soil descriptions on the soil boring logs. Boring logs and well installation diagrams are enclosed in Appendix A. Stratification lines indicated on the boring logs are approximate; in-situ, the transition between soil types in both the vertical and horizontal directions may be gradual.

Equipment Decontamination

During drilling and sampling, care was taken to minimize the possibility of PCB contamination between samples and between borehole locations. Between samples, the split spoon sampler was washed with soap and water to remove any residual soil. The sampler was then rinsed with water, hexane, and finally, water. The new plastic liners were stored off site until they were needed. This sampler decontamination procedure has been successfully used on other PCB exploration projects.

Between boreholes, drilling augers, drill rods and drilling equipment were cleaned with a portable power washer. Soil was removed from drilling equipment with brushes, as needed.

Surveying

The locations and elevations of all borings, wells, and sampling points were determined by STS field crews. The well elevations are referenced to the plant datum, utilizing the base line monument located northwest of the auxiliary building on the ground along the west fence, as shown on the enclosed drawing. The recorded elevation of this benchmark is 115.30 feet (Consumers Power Co., Overisel site datum). Boring and well locations are referenced to plant features and coordinated with the grid indicated on the drawing enclosed in Appendix C.

Water Sampling

On March 25, 1988, Consumers Power Company personnel obtained groundwater samples from MW-1, MW-2, MW-2A, MW-3 and MW-3A. Prior to sampling, two (2) gallons of water were removed from each well with a bailer. Monitoring wells 88MW-4 and 88MW-4A were sampled on June 25, 1988 and July 12, 1988. The wells were not developed prior to sampling on June 25, 1988. On July 12, 1988, the wells were pumped to a constant specific conductance and ph and a total of 20 gallons of water was removed from each well prior to sampling. Samples were returned to Consumers Power Company for analysis.

LABORATORY TESTING PROCEDURES

All PCB analyses for this project were performed by the laboratories of Consumers Power Company using Gas Chromatography - Electron Capture Detector (GC-ECD) techniques. On soil samples, the analytical detection limit was 1 mg/kg. For water samples, the detection limit was 0.53 ppb (EPA Method 608).

A limited soil testing program was performed by STS Consultants which consisted of permeability analysis on two samples and grain size analysis on two samples. In summary, the vertical soil permeability was found to be 3.7×10^{-3} cm/sec. for sample 88SB-1, S-5 (8-10 feet) and 5.7×10^{-4} cm/sec. for sample 88SB-11, S-12 (24-26 feet).

Copies of all laboratory data results are enclosed in Appendix B.

SOIL AND GROUNDWATER CONDITIONS

Regional Geology

The regional subsurface conditions of the Overisel Compressor Station are predominantly the result of the Wisconsinan Age glaciation from the Lake Michigan Ice Lobe. Surficially, glacial lake deposits of fine to coarse sand are the predominant soil with localized sand and gravel deposits associated with kame fields and outwash deposits. To the north is a clay rich till ridge, the "Covert Ridge", which is part of the Lake Border Moranic System. Shale bedrock of the Mississippian Coldwater formation is found at depths from 100 to 150 feet in the vicinity of the Overisel Compressor Station (Reference 1).

Site Geology

STS performed a total of eighteen (18) borings at the Overisel Compressor Station to depths up to 30 feet. Soils encountered were fine sands with trace amounts of medium sand, silt, and gravel, which grade to fine sands with trace amounts of silt at depth.

Hydrogeology

During the drilling and sampling operations, STS personnel noted the depth of the groundwater table. These field observations are noted on the enclosed boring logs. A groundwater table was encountered in all borings at a shallow depth, generally within several feet of the ground surface.

As previously stated, seven (7) monitoring wells were installed, three of which 88MW-1, 88MW-2, and 88MW-3 were used to estimate horizontal groundwater flow direction. The two additional wells, 88MW-2A and 88MW-3A, were utilized in conjunction with 88MW-2 and 88MW-3, respectively, to estimate vertical gradients of groundwater flow. Depth to groundwater was measured in each well and the groundwater

elevation was determined. Table 1 summarizes the groundwater elevations. The groundwater contours on the enclosed drawing, located in Appendix C, show a gradient of approximately 0.013 feet/feet to the southwest. The groundwater contours remain essentially the same for other monitoring dates.

In a vertical direction, groundwater flow gradients vary between +0.08 in the 88MW-3 and 88MW-3A pair to +0.03 in the 88MW-2 and 88MW-2A pair. These gradients are very small and approaching the limit of accuracy of the measurement technique. However, the presence of the vertical upward gradients suggest the Busscner Drain is a discharge area. It is possible that gradient reversals could occur during flood conditions.

The rate of groundwater flow can be estimated using the average hydraulic conductivity, hydraulic gradient and porosity. Based on the March 17, 1988 gradient, an average hydraulic conductivity of 6 ft/day (2.12×10^{-3} cm/sec), and an assumed porosity of 30%, the estimated horizontal groundwater velocity is approximately 96 feet per year. However, it should be recognized that this rate can vary with water surface fluctuations and changes of season.

TABLE 1
Groundwater Elevations

	Elevation*		3-17-88		3-25-88		7-12-88	
Monitoring Well	Top of Stand Pipe	Ground Surface	Depth to Water, ft.	Elevation of Groundwater	Depth to Water, ft.	Elevation of Groundwater	Depth to Water, ft.	Elevation of Groundwater
88MW-1	116.80	114.35	13.54	103.26	13.66	103.14	---	---
88MW-2	105.02	103.00	2.98	102.04	3.01	102.01	---	---
88MW-2A	105.33	103.50	2.92	102.41	3.00	102.33	---	---
88MW-3	104.43	102.34	2.98	101.45	2.95	101.48	---	---
88MW-3A	104.08	101.88	1.83	102.25	1.87	102.25	---	---
88MW-4	104.11	101.60	---	---	---	---	2.71	101.40
88MW-4A	104.30	101.56	---	---	---	---	2.75	101.55

K00000518

EXPLORATION RESULTS

The intent of the field explorations performed was to estimate the vertical and horizontal extent of PCB contamination in the area of the outfall discharge pipe. The following paragraphs discuss our findings.

The outfall at the Overisel Compressor Station consists of a 12 inch diameter concrete pipe discharge to the ground surface. It was designed to serve as an overflow for the oil/water separator system. At the discharge, an erosion pit has formed over the years and contains standing water.

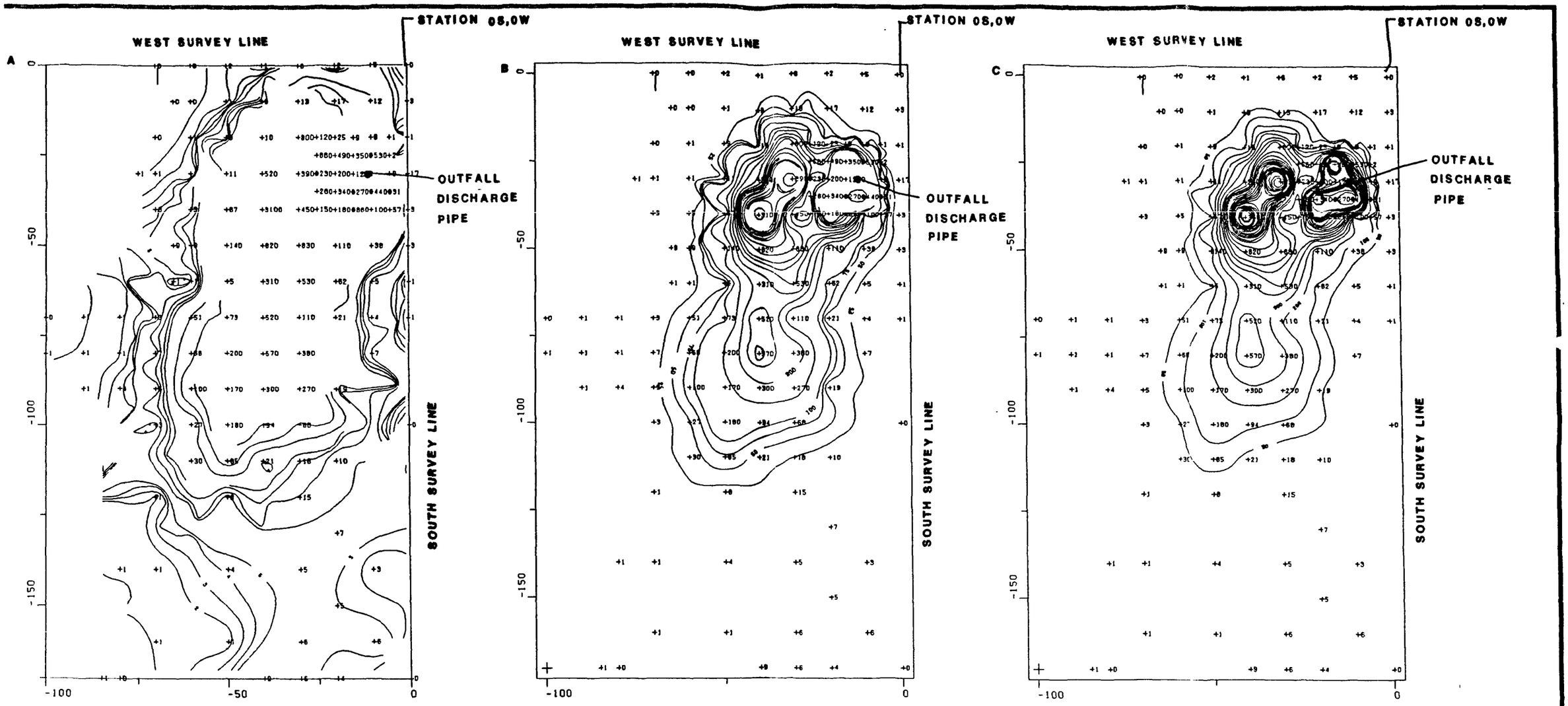
Consumers Power Company conducted an initial exploration for PCB contamination. The exploration included obtaining 131 surface samples and 87 samples from a depth of one foot and analyzing the samples for the presence of PCB.

To obtain more information on PCB distribution, eighteen (18) borings were laid out and performed by STS. The borings were extended as deep as 30 feet. A continuous sampling procedure was utilized in which soils were collected in two foot sections. In general, PCB analysis was performed on the bottom three inch portion of each sample interval. A total of 144 PCB analyses were completed on the soil samples. All Consumers Power Company data, including the initial exploration results, is enclosed in Appendix B.

Analytical Results

In order to organize and present the PCB data, contour maps of PCB concentrations versus depth were prepared for the surface and 1 foot sampling depth shown in Figures 1 and 2. This data suggests the following:

- Figure 1 (surface samples) show that when contoured at 1 ppm, the lateral extent of PCB is not completely defined. However, at limits of 25 ppm and 50 ppm, the zones of surface PCB contamination are defined.



CONTOUR INTERVALS

A - 1 PPM FOR CONCENTRATIONS OF 1 PPM TO 5 PPM
5 PPM FOR CONCENTRATIONS OF 10 PPM TO 25 PPM
25 PPM FOR CONCENTRATIONS OF 25 PPM TO 100 PPM

B - 25 PPM FOR CONCENTRATIONS OF 25PPM TO 100 PPM
100 PPM FOR CONCENTRATIONS OF 100 PPM TO 4000 PPM

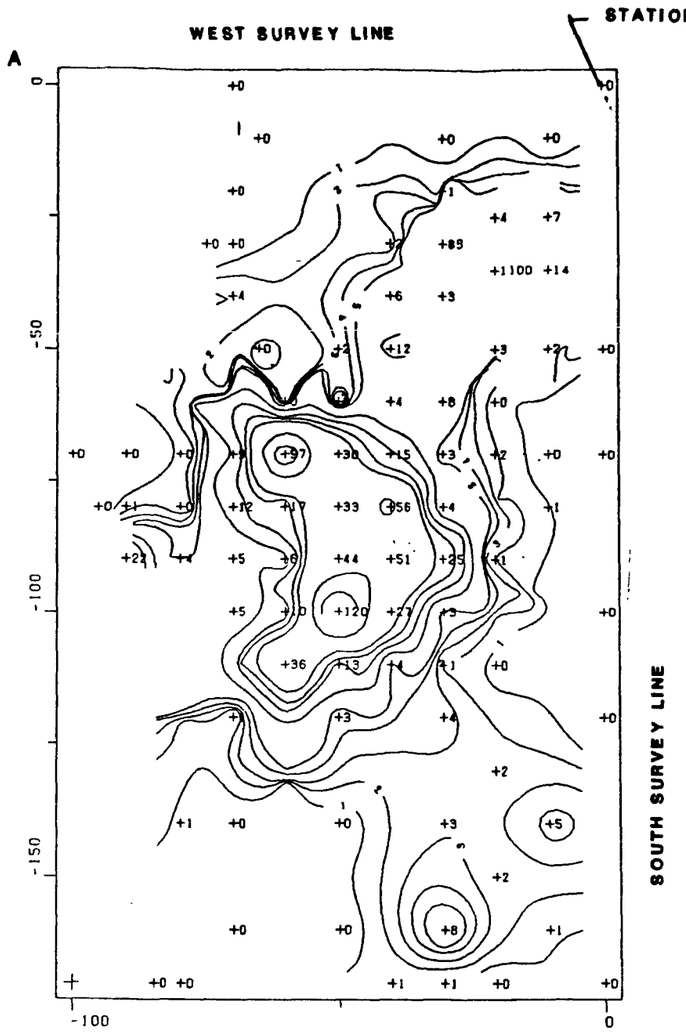
C - 50 PPM FOR CONCENTRATIONS OF 50 PPM TO 100 PPM
100 PPM FOR CONCENTRATIONS OF 100 PPM TO 4000 PPM

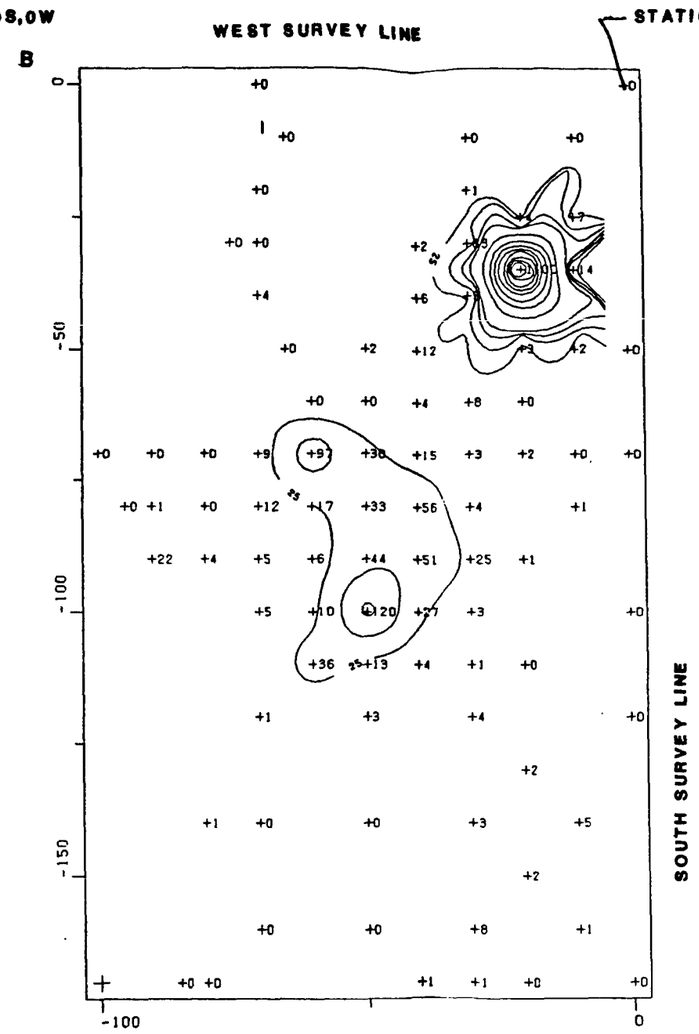
STS Consultants Ltd.
Consulting Engineers

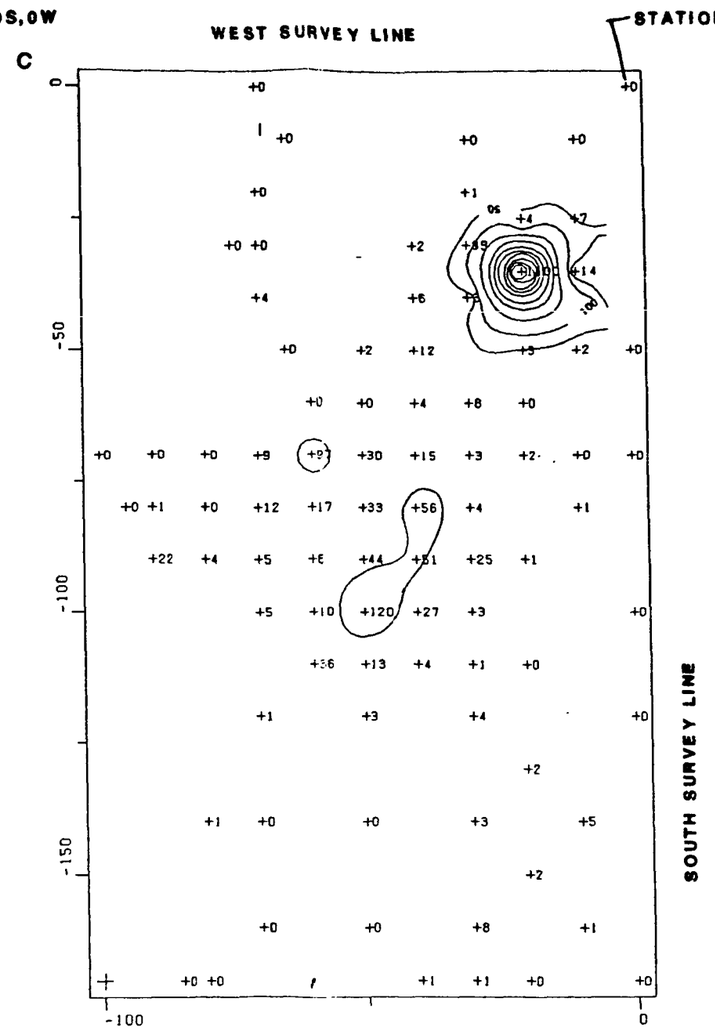
PCB CONTOUR
SURFACE CONCENTRATION
OVERISEL GAS COMPRESSOR STATION
HAMILTON, MICHIGAN
CONSUMERS POWER CO.

DRAWN BY	DATE	SCALE	STS PROJECT NO
DLG	4/14/88	1"=28'	1151XH
CHECKED BY	DATE	SHEET NO	STS FILE NO
BBS	4/18/88	1	

K00000520







CONTOUR INTERVALS

A - 1 PPM FOR CONCENTRATIONS OF 1 PPM TO 5 PPM
5 PPM FOR CONCENTRATIONS OF 10 PPM TO 25 PPM
25 PPM FOR CONCENTRATIONS OF 25 PPM TO 100 PPM

B - 25 PPM FOR CONCENTRATIONS OF 25 PPM TO 100 PPM
100 PPM FOR CONCENTRATIONS OF 100 PPM TO 4000 PPM

C - 50 PPM FOR CONCENTRATIONS OF 50 PPM TO 100 PPM
100 PPM FOR CONCENTRATIONS OF 100 PPM TO 4000 PPM

STS Consultants Ltd.
Consulting Engineers

PCB CONTOUR
CONCENTATION AT 1 FOOT DEPTH
OVERISEL GAS COMPRESSOR STATION
HAMILTON, MICHIGAN
CONSUMERS POWER CO.

DRAWN BY	DATE	SCALE	STS PROJECT NO
DLG	4/14/88	1"=20'	1151XH
CHECKED BY	DATE	SHEET NO.	STS FILE NO.
BBS	4/18/88	2	

K00000521

- The principal concentrations of surface PCB are in the immediate vicinity of outfall pit with a tongue extending south and slightly west to a very slight topographic depression.

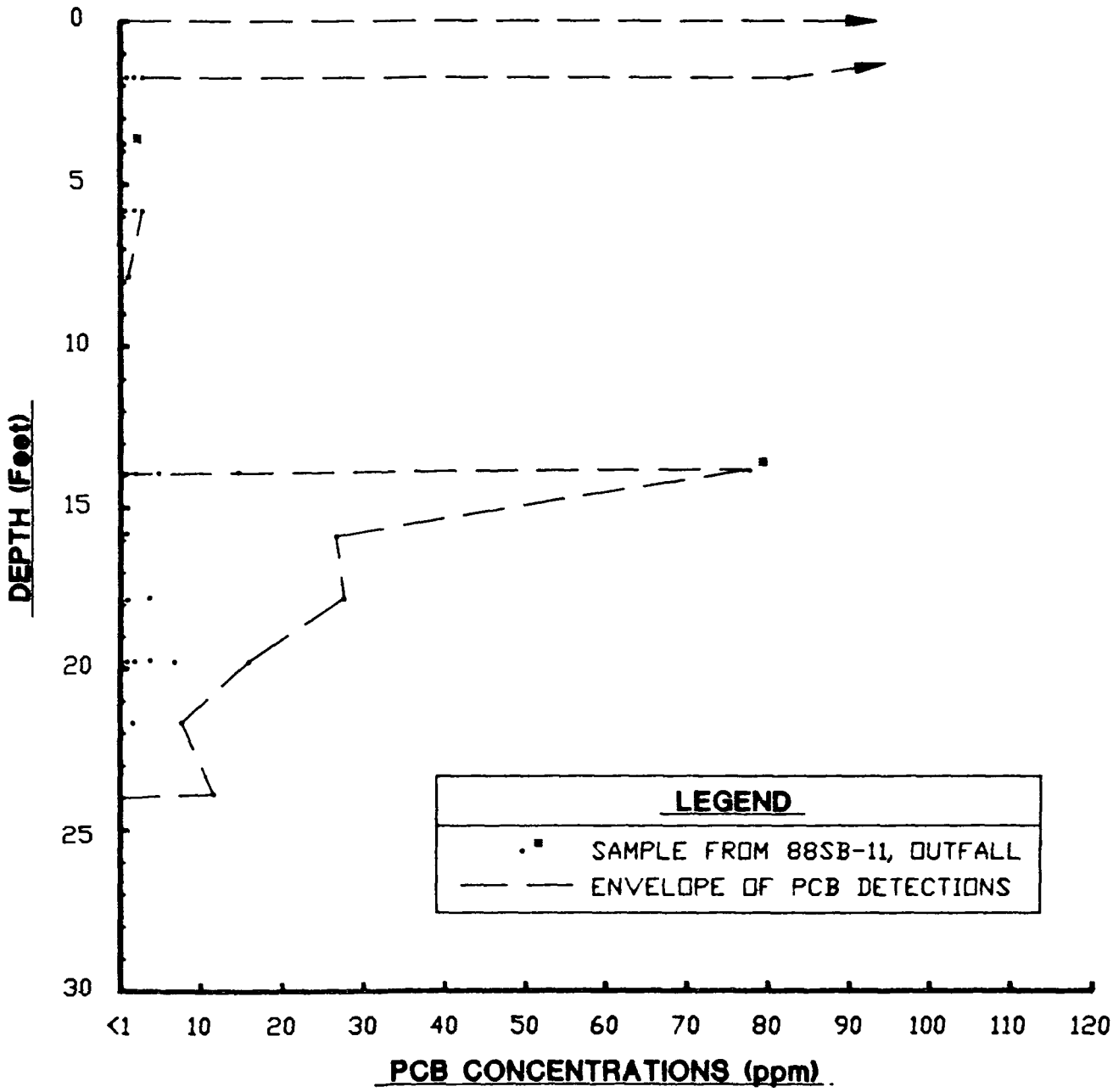
- Figure 2 (1 foot samples) nearly closes on the 1 ppm contour. The 25 ppm and 50 ppm contours close in small areas.

- The principal 1 foot deep PCB concentrations are in the immediate vicinity of the outfall pit and an area about 50 feet to the southeast.

The envelop of PCB detections (based on 11 soil borings and 7 wells) with depth is shown in Figure 3. This figure shows the surface concentration of PCB extending as deep as 2 feet with, in general, a decrease in concentration and occurrence. A second zone of PCB detects is in the 6 to 8 foot depth range, but their concentrations do not exceed 3 ppm. A broader zone of PCB is in the 14 to 24 foot zone. The PCB concentrations are mostly below 10 ppm, but go as high as 78 ppm (from directly below the outfall). Between these zones, PCB was not detected in soil samples (to a detection limit of 1 ppm).

Water samples from the seven monitoring wells were analyzed. PCB was not detected in monitoring wells 88MW-1, 88MW-2, 88MW-2A, 88MW-3 and 88MW-3A, to a detection limit of 0.53 ppb. The first set of water samples taken from monitoring wells 88MW-4 and 88MW-4A on June 25, 1988 were considered to be unreliable since the wells were not developed prior to sampling. The second set of water samples taken on July 12, 1988 were found to contain 1.9 ppb and 0.83 ppb PCB (Alochlor 1254) in monitoring wells MW-4 and MW-4A, respectively.

The soil sampling and analysis completed to date has defined the surface PCB contamination to a 25 ppm boundary. With depth the lateral extent of PCB contamination is limited. An outer limit is approximately defined by 88SB-9, 88MW-3A, 88MW-2A, 88SB-10 and the outfall area.



K00000523

STS Consultants Ltd.
Consulting Engineers

ENVELOPE OF PCB DETECTIONS
OVERISEL GAS COMPRESSOR STATION
HAMILTON, MICHIGAN
CONSUMERS POWER COMPANY

DRAWN BY	CJD	7\88
CHECKED BY	TKD	7\88
APPROVED BY	BBS	7\88
SCALE NTS	FIGURE NO. 3	
STS DRAWING NO. 1151XHGR		

Excavation Volumes

Based on the surface and 1 foot sample depth data, we have developed estimates of soil volumes to be excavated for cleanup levels of 1 ppm, 25 ppm, and 50 ppm. It should be recognized that data gaps exist in the PCB data for a 1 ppm limit. Our volume calculations assume the maximum excavation depth to be about 2 feet deep (or to the water table). Volumes have been computed as in-place, expanded to truck volumes and then a 15% contingency has been added.

TABLE 2
Estimated Excavation Volumes
Surface and 1 Foot Deep PCB Contamination

Cleanup Level	Estimated Truck Volume yd^3	Contingency	Estimated Total yd^3
50 ppm	160	15%	184
25 ppm	200	15%	230
10 ppm	260	15%	300*
1 ppm	520	15%	600*

* Value is a rough estimate, lateral extent of PCB at 1 ppm has not been completely defined.

Recommendations

It is suggested that monitoring wells MW-4 and MW4A be redeveloped and resampled to document the presence of PCB in the groundwater. If PCB contamination in the groundwater is confirmed in monitoring wells MW-4 and MW-4A, it is recommended that another set of monitoring wells be placed further down gradient.

GENERAL QUALIFICATIONS

The analysis contained in this report presents the initial exploration of PCB contamination at the Overisel Compressor Station. Data used for this report was obtained by STS, and data was also provided to STS by Consumers Power Company. As identified in the report, some data gaps exist, which may necessitate further study. This report represents our judgment and opinions. No warranty, either expressed or implied, is contained herein.

REFERENCES

1. Moaghan, G.W. and Larson, G.J., "The Glacial Geology of Kalamazoo County, Michigan", Department of Geological Sciences, Michigan State University (In Press), 1984.

K00000526

K00000527

APPENDIX A

Soil Boring Logs

Well Installation Diagrams

Standard Method ASTM D-1586

Unified Soil Classification System

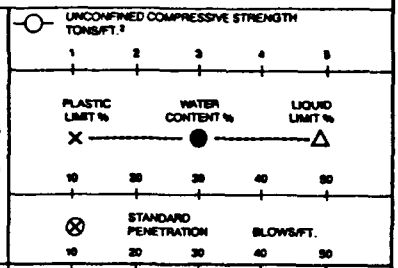
Field and Laboratory Procedures

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88MW-1
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
					SURFACE ELEVATION 114.4'	
					Drilled without sampling to 15.0'	
2.5'						
5.0'						
7.5'						
10.0'						
12.5'						
15.0'						
	1	PL			Fine sand, trace medium sand and silt-brown-loose to medium dense-saturated. (SP)	<1
17.5'	2	PL				<1
20.0'						
					END OF BORING Boring advanced to 20.0' using hollow stem auger. Monitoring Well installed. See enclosed Well Installation Diagram.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL 13.5' WS OR WD WD	BORING STARTED 03-04-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-04-88	DRAWN BY DH	SHEET NO. 1 OF 1
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO. 1151XH

BL:3-0687

K00000529

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88MW-2
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

SURFACE ELEVATION: 103.0'

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg	UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² (1 2 3 4 5)	PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50)	STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)
						Drilled without sampling to 7.0'.				
2.5'										
5.0'										
7.5'		1	PL			Fine sand, trace medium sand, silt and gravel-gray to dark gray-medium dense-saturated. (SP)	<1			17
10.0'		2	PL				<1			13
11.0'						END OF BORING Boring advanced to 11.0' using hollow stem auger. Monitoring Well installed. See enclosed Well Installation Diagram.				

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL 3.0' WD (WS OR WD)	BORING STARTED 03-07-88	STS OFFICE Lansing, MI	
WL (BCR / ACR)	BORING COMPLETED 03-07-88	DRAWN BY DH	SHEET NO. 1 OF 1
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO. 1151XH

BL:3-0687

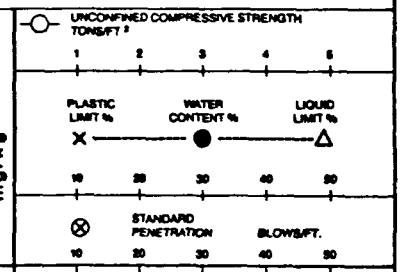
K00000530

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88MW-2A
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 103.5'	
						Drilled without sampling to 16.0'.	
2.5'							
5.0'							
15.0'							
		1	PL			Fine sand, trace medium sand and silt-grayish brown-medium dense to dense-saturated. (SP)	<1
17.5'							
		2	PL				<1
20.0'							
21.0'							
						END OF BORING Boring advanced to 21.0' using hollow stem auger. Monitoring Well installed. See enclosed Well Installation Diagram.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL 3.0' WD (WS OR WD)	BORING STARTED 03-11-88	STS OFFICE Lansing, MI	
WL (BCR / ACR)	BORING COMPLETED 03-11-88	DRAWN BY DH	SHEET NO. 1 OF 1
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO. 1151XH

BL.3-0687

K00000531

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88MW-3
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

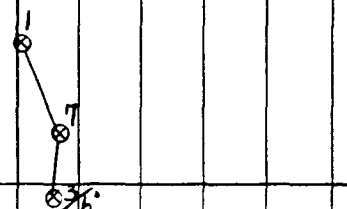
Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 102.3'	
						Drilled without sampling to 6.0'.	
2.5'							
5.0'							
		1	PL			Fine sand, trace medium sand and silt-brown-very loose to loose-saturated. (SP)	<1
7.5'							
		2	PL				
10.0'		2A	PL			Fine sand, trace silt-light brown-loose-saturated. (SP)	<1

END OF BORING

Boring advanced to 10.0' using hollow stem auger.

Monitoring Well installed. See enclosed Well Installation Diagram.



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	BORING STARTED	STS OFFICE	
3.0' WD (WS OR WD)	03-14-88	Lansing, MI	
WL BCR ACR	BORING COMPLETED	DRAWN BY	SHEET NO. OF
	03-14-88	DH	1 1
WL	RIG FOREMAN	APP'D BY	STS JOB NO.
	RC CME-45	BBS	1151XH

BL:3-0887

K00000532

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88MW-3A
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50) / STANDARD PENETRATION BLOWS/FT (10 20 30 40 50)
						SURFACE ELEVATION 101.9'		
						Drilled without sampling to 16.0'.		
2.5'								
5.0'								
15.0'								
17.5'		1	PL			Fine sand, trace silt-grayish brown-very loose to loose-saturated. (SP)	<1	5
20.0'		2	PL				<1	24"
						END OF BORING Boring advanced to 20.0' using hollow stem auger. Monitoring Well installed. See enclosed Well Installation Diagram.		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

WL 2.0' WD (WS OR WD)	BORING STARTED 03-16-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-16-88	DRAWN BY DH	SHEET NO 1 OF 1
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO 1151XH

BL:3-0687

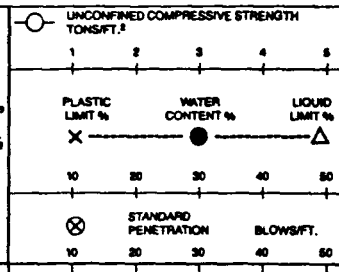
K00000533

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88MW-4
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 101.60'	
						Drilled to 5.0 feet without sampling.	
2.5							
5.0							
		1	PL			Fine sand-brown-loose-saturated. (SP)	<1
						Grading to brownish gray at 6.5'. Dark gray staining from 5 to 6.5'.	
7.5		2	PL				<1
		3	PL				<1
10.0							
						END OF BORING Boring advanced to 10.0 feet using hollow stem augers. Monitoring well installed. See enclosed well installation diagram.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL 3.0 WD WS OR WD	BORING STARTED 6-22-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 6-22-88	DRAWN BY MS	SHEET NO. 1 OF 1
WL	RIG FOREMAN JW 80	APP'D BY BBS	STS JOB NO. 1151XH

BL:3-068⁷

K00000534

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88MW-4A
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5)	PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50)	STANDARD PENETRATION BLOWS/FT (10 20 30 40 50)
						SURFACE ELEVATION 101.56				
						Drilled without sampling to 15.0'.				
2.5										
5.0										
7.5										
10.0										
12.5										
15.0										
		1	PL			Fine sand-brownish gray-very loose to loose-saturated. (SP)	<1	5		
17.5		2	PL				<1	5		
		3	PL				<1	2		
19.5										
						END OF BORING Boring advanced to 15.0 feet using hollow stem augers. Boring advanced from 15.0 to 20.0 feet using rotary wash methods. Monitoring well installed. See enclosed well installation diagram.				

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

WL 3.0 WD WS OR WD	BORING STARTED 6-22-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 6-22-88	DRAWN BY MS	SHEET NO OF
WL	RIG FOREMAN JW 80	APP'D BY BBS	STS JOB NO 115TXH

BL3-0687

K00000535

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-1
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5) / PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % △ (10 20 30 40 50) / STANDARD PENETRATION BLOWS/FT. ⊗ (10 20 30 40 50)
					SURFACE ELEVATION 103.2'		
	1	PL			Medium to fine sandy topsoil, little organics-brown-very loose to loose-moist. (Topsoil: SP)		⊗ 1/6"
	1A	PL			Fine sand, trace medium sand and silt-dark brown-loose to medium dense-moist. (SP) Grading to saturated at 2.0'.	1	⊗ 6
2.5'	2	PL				<1	⊗ 6
					Grading to grayish brown at 4.0'.		
5.0'	3	PL				1	⊗ 4
7.5'	4	PL				<1*	⊗ 4
	5	PL				<1	⊗ 11
10.0'							
	6	PL			Fine sand, trace silt-gray to grayish brown-medium dense to dense-saturated. (SP)	<1	⊗ 13
12.5'	7	PL				2	⊗ 13
15.0'	8	PL				<1	⊗ 26
17.5'	9	PL				28	⊗ 25
	10	PL				16	⊗ 31
20.0'							
					END OF BORING * Result less than 1 but detected. Boring advanced to 18.0' using hollow stem auger. Borehole backfilled with bentonite grout.		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES· IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL 2.0' WS — WS OR WD	BORING STARTED 03-04-88	STS OFFICE Lansing, MI	
WL — BCR — ACR	BORING COMPLETED 03-04-88	DRAWN BY DH	SHEET NO. 1 OF 1
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO. 1151XH

BL:3-0687

K00000536

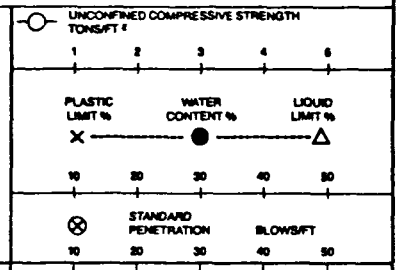
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-1A
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 103.2'	
						Drilled without sampling to 20.0'.	
2.5'							
5.0'							
7.5'							
20.0'							
		1	PL			Fine sand, trace silt-brownish gray-medium dense to dense-saturated. (SP)	<1
22.5'		2	PL				<1
25.0'		3	PL				<1
		4	PL				<1
27.5'		5	PL				<1
30.0'							
						END OF BORING Boring advanced to 20.0' using hollow stem auger. Boring advanced from 20.0' to 28.0' using washed drilling techniques. Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

WL 2.0' WS — WS OR WD	BORING STARTED 03-08-88	STS OFFICE Lansing, MI	
WL — BCR — ACR	BORING COMPLETED 03-08-88	DRAWN BY DH	SHEET NO. 1 OF 1
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO. 1151XH

BL:3-0687

K00000537

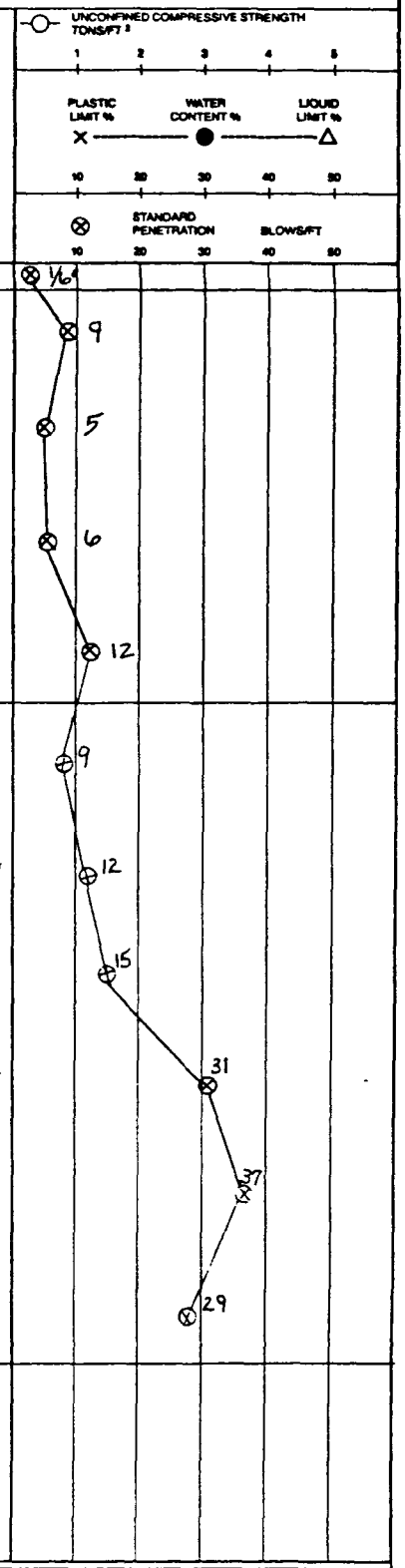
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-2
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 103.6'	
		1	PL			Fine sandy topsoil, trace medium sand and organics-dark brown-very loose-moist. (Topsoil: SP)	
		1A	PL			Fine sand, trace medium sand and silt-light brown to grayish brown-loose to medium dense-moist. (SP)	1
2.5'		2	PL				<1
						Grading to saturated at 4.0'. Grading to trace gravel from 4.0' to 6.0'.	
5.0'		3	PL				<1
7.5'		4	PL				<1
		5	PL			Fine sand, trace silt, light brown-loose to dense-saturated. (SP)	<1
10.0'		6	PL				<1*
						Grading to gray at 12.0'.	
12.5'		7	PL				5
15.0'		8	PL				<1*
		9	PL				1
17.5'		10	PL				7
20.0'							
						END OF BORING * Results less than 1 but detected. Boring advanced to 18.0' using hollow stem auger. Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

WL 4.0' WS (WS OR WD)	BORING STARTED 03-07-88	STS OFFICE Lansing, MI	
WL (BCR / ACR)	BORING COMPLETED 03-07-88	DRAWN BY DH	SHEET NO 1 OF 1
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO 1151XH

BL.3-0687

K00000538

STS Consultants Ltd.

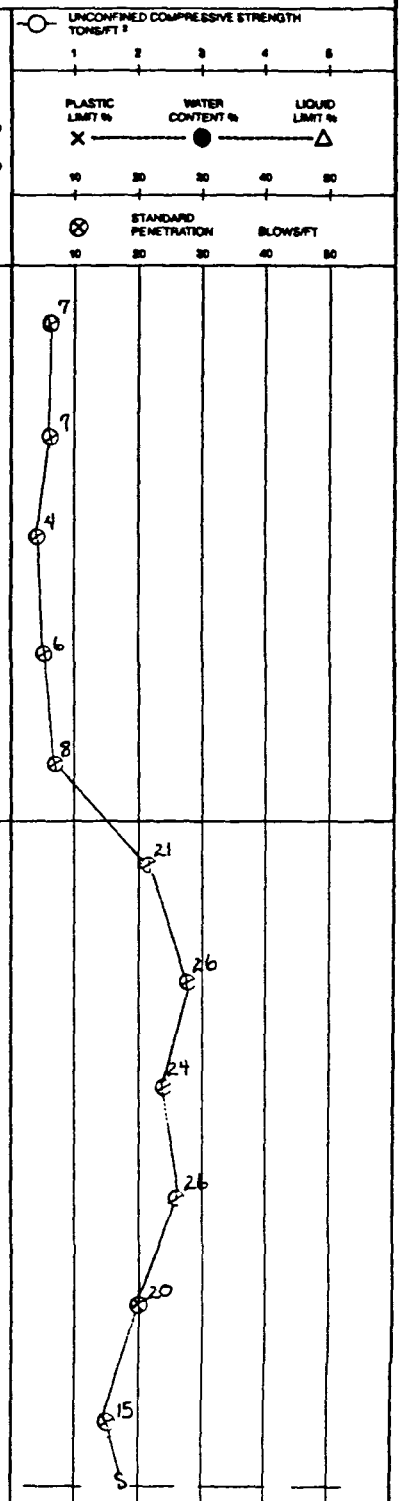
OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-3
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

SURFACE ELEVATION 103.4'

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
	1	PL			Fine sand, trace medium sand and silt-brown-loose-moist. (SP)	2
2.5'	2	PL			Grading to saturated at 4.0'.	<1
5.0'	3	PL				1
7.5'	4	PL				<1
	5	PL				<1
10.0'	6	PL			Fine sand, trace silt-brownish gray-medium dense to very dense-saturated. (SP) Black staining at 10.0' to 12.0'. Grading to trace gravel from 12.0' to 14.0'.	<1
12.5'	7	PL			Black staining at 14.0' to 20.0'.	<1
15.0'	8	PL				<1
17.5'	9	PL				1
20.0'	10	PL				1
22.0'	11	PL				2



CONTINUED ON NEXT PAGE

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

STS JOB NO 1151XH

BL-4-0687

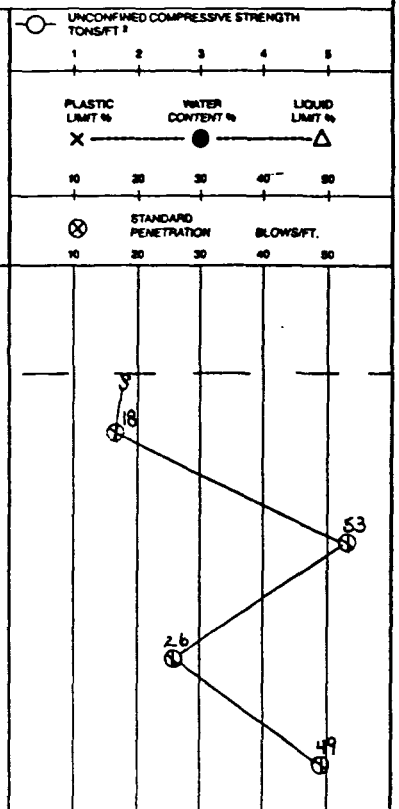
K00000539

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-3
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 103.4'	
						CONTINUED FROM PREVIOUS PAGE	
22.0'							
22.5'		12	PL			Fine sand, trace silt-brownish gray-medium dense to very dense-saturated. (SP)	<1
25.0'		13	PL				<1
27.5'		14	PL				<1
		15	PL				<1
30.0'							
						END OF BORING Boring advanced to 18.0' using hollow stem auger. Boring advanced from 18.0' to 30.0' using washed drilling techniques. Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS OR WD	BORING STARTED	STS OFFICE	
4.0' WS		03-10-88	Lansing, MI	
WL BCR	ACR	BORING COMPLETED	DRAWN BY	SHEET NO. OF
		03-10-88	DH	2 2
WL		RIG FOREMAN	APP'D BY	STS JOB NO.
		RC CME-45	BBS	1151XH

BL:3-0687

K00000540

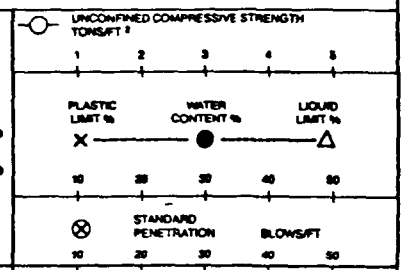
STS Consultants Ltd.

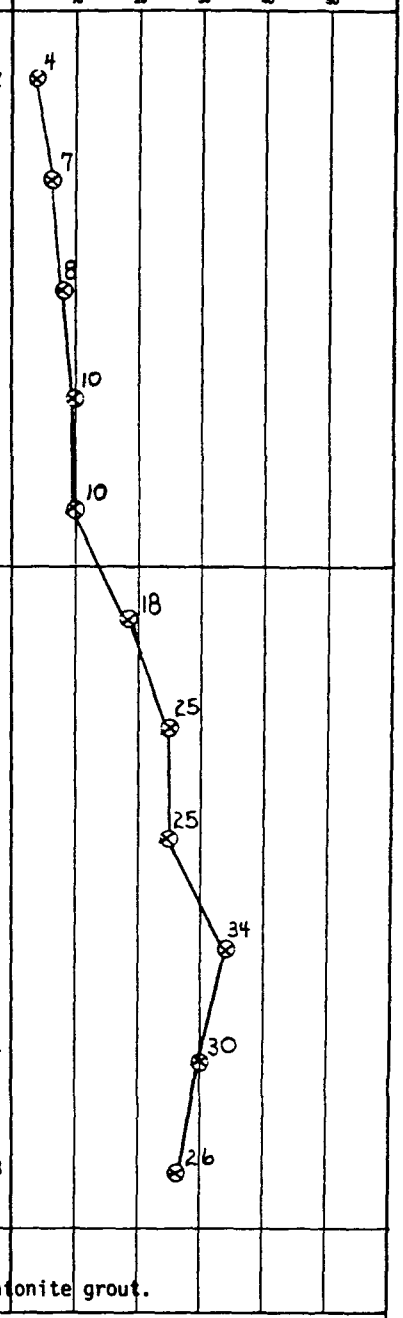
OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-4
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

SURFACE ELEVATION 103.4'

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
		1	PL			Fine sand, trace medium sand and silt-brown-loose to medium dense-moist. (SP)	82
2.5'		2	PL			Grading to saturated at 2.0'. Trace gravel at 2.0' to 6.0'.	<1
5.0'		3	PL				2
7.5'		4	PL				1
		5	PL			Black staining from 8.0' to 10.0'.	<1
10.0'		6	PL			Fine sand, trace silt-brownish gray-medium dense to dense-saturated. (SP)	<1
12.5'		7	PL			Black staining from 12.0' to 14.0'.	1
15.0'		8	PL				1
17.5'		9	PL				1
20.0'		10	PL				<1*
22.0'		11	PL				8
						END OF BORING * Results less than 1 but detected. Borehole advanced to 20.0' using hollow stem auger. Borehole backfilled with bentonite grout.	





THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL

WL	WS OR WD	BORING STARTED	STS OFFICE	
2.0' WS		03-09-88	Lansing, MI	
WL BCR	ACR	BORING COMPLETED	DRAWN BY	SHEET NO OF
		03-09-88	DH	1 1
WL		RIG FOREMAN	APP'D BY	STS JOB NO
		RC CME-45	BBS	1151XH

BL 3-0687

K00000541

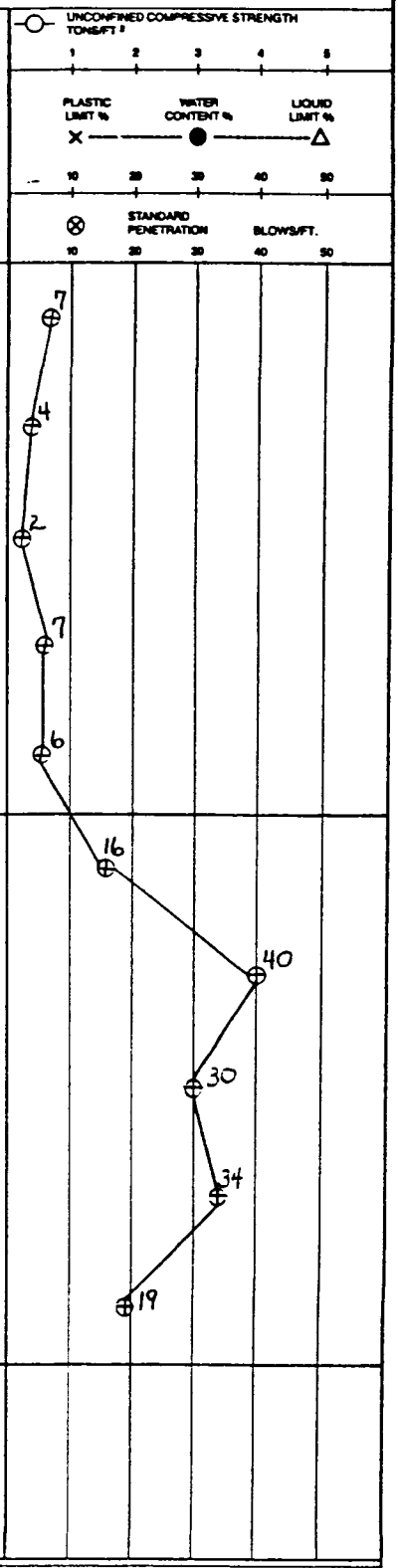
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-5
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

SURFACE ELEVATION: 103.4'

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
		1	PL			Fine sand, trace medium sand and silt-dark brown-very loose-moist. (SP)	<1
2.5'		2	PL			Grading to saturated at 2.0'.	<1
5.0'		3	SS			Dark staining at 5.0'.	<1
7.5'		4	PL				<1
10.0'		5	PL				<1
		6	PL			Fine sand, trace silt-brownish gray-medium dense to dense-saturated. (SP) Black staining from 11.0' to 14.0'.	<1
12.5'		7	PL				15
15.0'		8	PL			Grading to gray at 16.0'.	27
17.5'		9	PL				4
20.0'		10	PL				2
						END OF BORING Boring advanced to 18.0' using hollow stem auger. Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS OR WD	BORING STARTED	STS OFFICE	
2.0'	WS	03-08-88	Lansing, MI	
WL BCR	ACR	BORING COMPLETED	DRAWN BY	SHEET NO. OF
		03-08-88	DH	1 1
WL		RIG FOREMAN	APP'D BY	STS JOB NO.
		RC CME-45	BBS	1151XH

BL:3-0687

K00000542

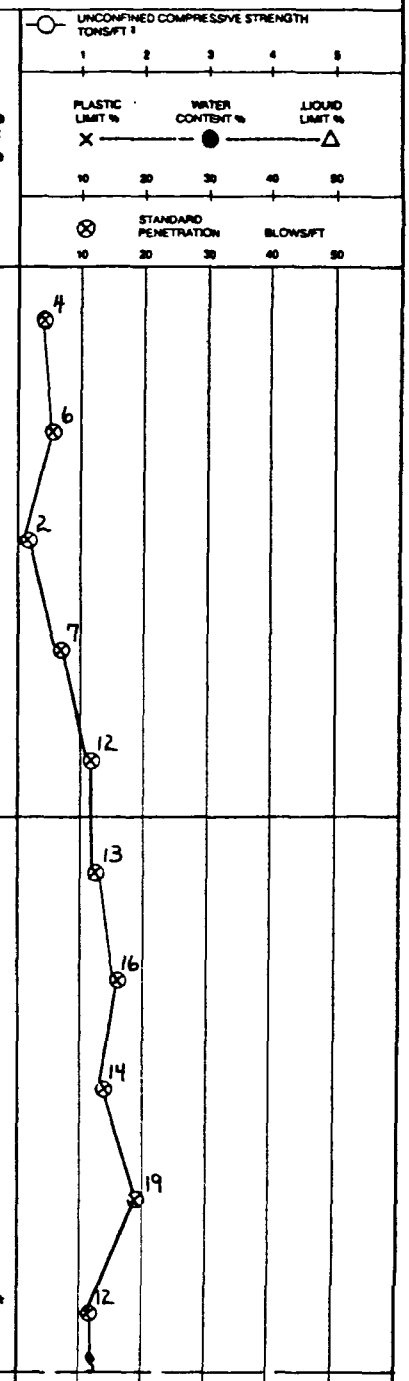
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-6
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 103.6'	
		1	PL			Fine sand, trace medium sand and silt-brown-very loose to medium dense-moist. (SP) Grading to saturated at 0.5'.	1
2.5'		2	PL				<1
						Dark staining at 4.0' to 6.0'.	
5.0'		3	PL				<1
		4	PL				1
7.5'							
		5	PL				<1
10.0'							
		6	PL			Fine sand, trace silt-brownish gray-medium dense-saturated. (SP)	<1
12.5'		7	PL				<1
15.0'		8	PL				<1
		9	PL				1
17.5'							
		10	PL				<1*
20.0'							



CONTINUED ON NEXT PAGE

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL.

STS JOB NO 1151XH

SHEET NO 1 OF 2

BL 4-0887

K00000543

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-6
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

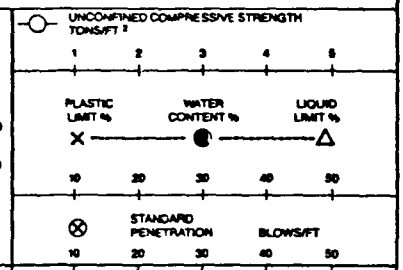
DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
					SURFACE ELEVATION 103.6'	
					CONTINUED FROM PREVIOUS PAGE	
20.0'						
	11	PL			Fine sand, trace silt-brownish gray-medium dense-saturated. (SP)	<1
22.5'						
	12	PL				12
24.0'						
					END OF BORING	

* Results less than 1 but detected.

Boring advanced to 16.0' using hollow stem auger.

Boring advanced from 16.0' to 22.0' using washed drilling techniques.

Borehole backfilled with bentonite grout.



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL

WL 0.5' WS WS OR WD	BORING STARTED 03-09-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-09-88	DRAWN BY DH	SHEET NO 2 OF 2
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO 1151XH

BL:3-0687

K00000544

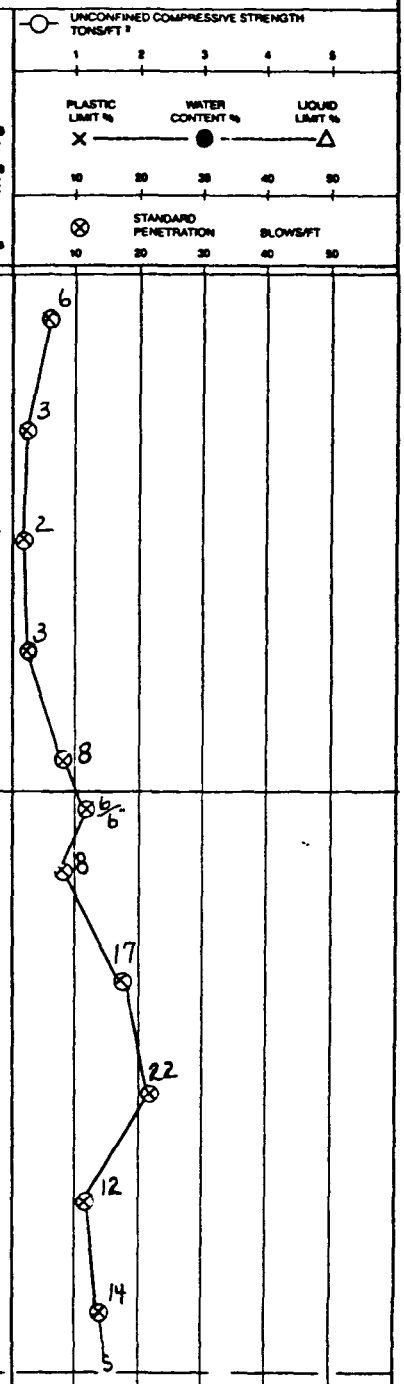
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-7
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 102.5'	
		1A	PL			Fine sandy topsoil, trace medium sand, silt and organics-dark brown-very loose-moist. (Topsoil:SP)	
						Fine sand, trace medium sand and silt-dark brown-loose to very loose-moist. (SP) Grading to saturated at 1.5'.	3
2.5'		2	PL				<1
5.0'		3	PL				<1*
						Grading to grayish brown at 6.0'.	
7.5'		4	PL				<1
		5	PL				
10.0'		5A	PL			Fine sand, trace silt-brownish gray-loose to medium dense-saturated. (SP)	<1
		6	PL				<1
12.5'		7	PL				<1
15.0'		8	PL				<1
		9	PL				1
17.5'						Grading to gray at 17.5'.	
		10	PL				4
20.0'							
						CONTINUED ON NEXT PAGE	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL.

STS JOB NO 1151XH SHEET NO 1 OF 2

BL 4-0867

K00000545

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-7
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50) / STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)
						SURFACE ELEVATION 102.5'		
						CONTINUED FROM PREVIOUS PAGE		
20.0'								
		11	PL			Fine sand, trace silt-brownish gray-loose to medium dense-saturated. (SP) Grading to gray at 17.5'.	<1	S 15
22.0'								
						END OF BORING		
						* Results less than 1 but detected.		
						Boring advanced to 18.0' using hollow stem auger.		
						Boring advanced from 18.0' to 20.0' using washed drilling techniques.		
						Borehole backfilled with bentonite grout.		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	BORING STARTED	STS OFFICE	
1.5' WS (WS OR WD)	03-11-88	Lansing, MI	
WL BCR ACR	BORING COMPLETED	DRAWN BY	SHEET NO. OF
	03-11-88	DH	2 2
WL	RIG FOREMAN	APP'D BY	STS JOB NO.
	RC CME-45	BBS	1151XH

BL:3-0687

K00000546

STS Consultants Ltd.

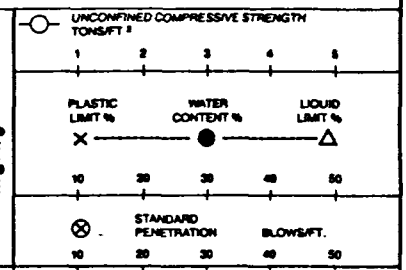
OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-8
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

SURFACE ELEVATION 103.0'

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
		1A	PL			Fine sandy topsoil, trace medium sand and silt-dark brown-very loose-moist. (Topsoil:SP)	<1
						Fine sand, trace medium sand and silt-brown-loose-moist. (SP)	
2.5'						Grading to saturated at 2.0'.	
		2	PL				2
5.0'		3	PL				3
						Black staining from 6.0' to 8.0'.	
7.5'		4	PL				<1
		5	PL				
10.0'		5A	PL			Fine sand, trace silt-brownish gray-medium dense to very dense-saturated. (SP)	<1
		6	PL				<1
12.5'		7	PL				2
15.0'		8	PL				<1
17.5'		9	PL				<1
20.0'		10	PL				<1
						CONTINUED ON NEXT PAGE	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL.

STS JOB NO 1151XH

SHEET NO 1 OF 2

BL 4-0887

K00000547

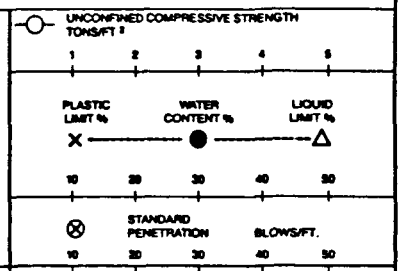
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-8
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	ARQCLOR 1254 mg/kg
					SURFACE ELEVATION 103.0'	
20.0'					CONTINUED FROM PREVIOUS PAGE	
	11	PL			Fine sand, trace silt-brownish gray-medium dense to very dense-saturated. (SP)	<1
22.5'	12	PL				<1
24.0'					END OF BORING Boring advanced to 18.0' using hollow stem auger. Boring advanced from 18.0' to 22.0' using washed drilling techniques. Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL 2.0' WS WS OR WD	BORING STARTED 03-14-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-15-88	DRAWN BY DH	SHEET NO. 2 OF 2
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO. 1151XH

BL:3-0687

K00000548

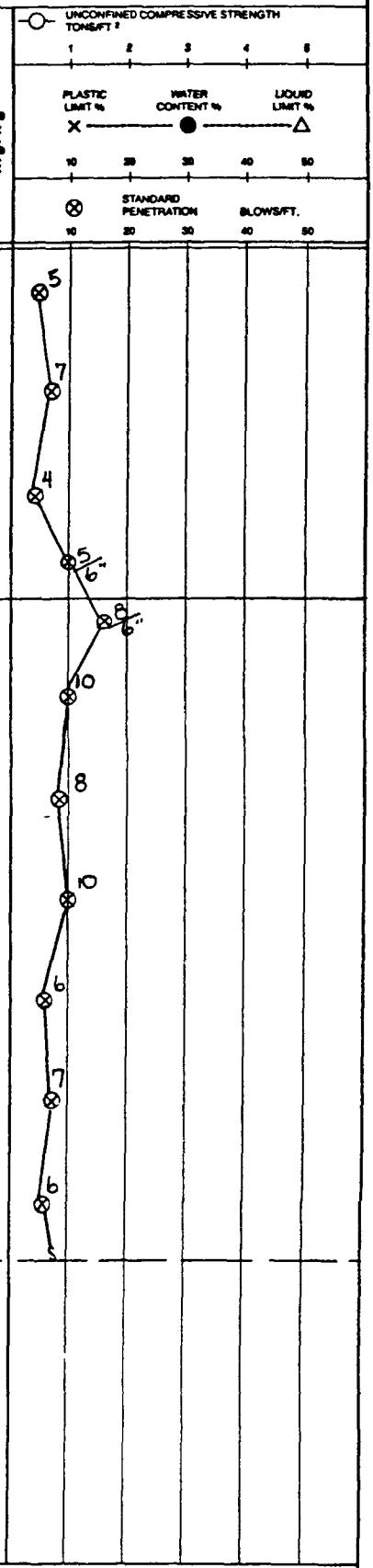
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-9
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

SURFACE ELEVATION 102.2'

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
		1A	PL			Fine sandy topsoil, trace medium sand, silt and organics-dark brown-very loose-moist. (Topsoil: SP)	<1
						Fine sand, trace medium sand and silt-brown-loose to medium dense-moist. (SP)	
2.5'		2	PL			Grading to saturated at 3.0'.	<1
5.0'		3	PL				<1
		4	PL				
7.5'		4A	PL			Fine sand, trace silt-grayish brown-loose to very dense-saturated. (SP)	<1
		5	PL				<1
10.0'		6	PL				<1
12.5'		7	PL				<1
15.0'		8	PL				<1
		9	PL				<1
17.5'		10	PL				<1
20.0'							
						CONTINUED ON NEXT PAGE	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL.

STS JOB NO 1151XH

SHEET NO 1 OF 2

BL 4-0887

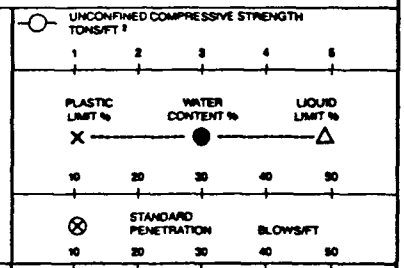
K00000549

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-9
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION: Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 102.2'	
						CONTINUED FROM PREVIOUS PAGE	
20.0'							
		11	PL			Fine sand, trace silt-grayish brown-loose to very dense-saturated. (SP)	<1
22.5'							
		12	PL				<1
24.0'							
						END OF BORING Boring advanced to 16.0' using hollow stem auger. Boring advanced from 16.0' to 22.0' using washed drilling techniques. Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

WL 3.0' WS WS OR WD	BORING STARTED 03-15-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-15-88	DRAWN BY DH	SHEET NO 2 OF 2
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO. 1151XH

BL:3-0687

K00000550

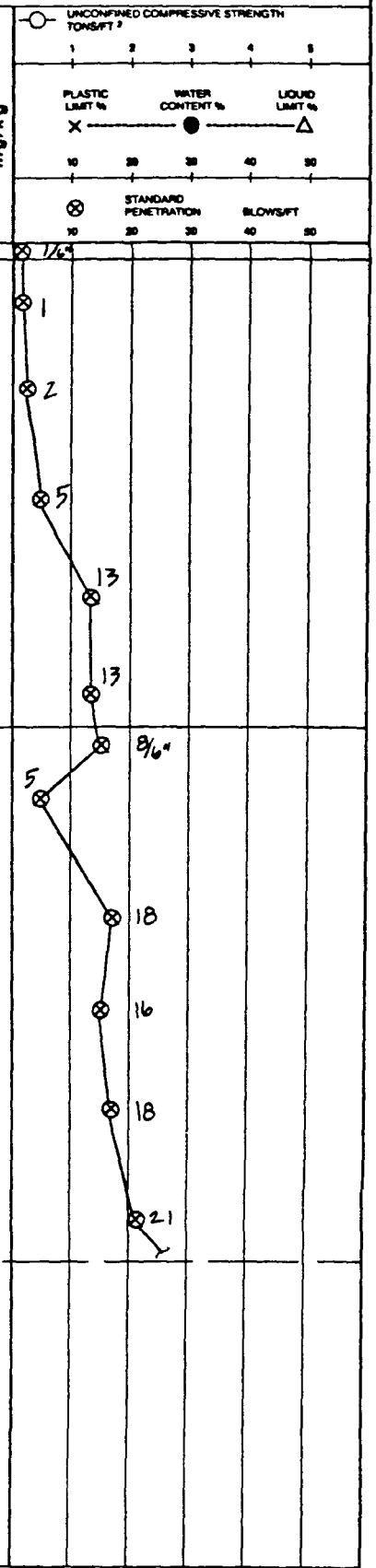
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-10
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 103.3'	
		1	PL			Fine sandy topsoil, trace medium sand, silt and organics-dark brown-very loose-moist. (Topsoil: SP)	
		1A	PL			Fine sand, trace silt and gravel-dark brown to grayish brown-very loose to medium dense-moist. (SP) Grading to saturated at 2.0'.	<1
2.5'		2	PL				<1
5.0'		3	PL				<1
7.5'		4	PL				<1
		5	PL				
10.0'		5A	PL			Fine sand, trace silt-brownish gray-loose to very dense-saturated. (SP)	<1
		6	PL			Grading to gray at 12.0'.	<1
12.5'		7	PL				<1
15.0'		8	PL				<1
17.5'		9	PL				<1
		10	PL				<1
20.0'						CONTINUED ON NEXT PAGE	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL.

STS JOB NO 1151XH SHEET NO 1 OF 2

BL 4-0867

K00000551

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-10
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50) / STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)
						SURFACE ELEVATION 103.8'		
						CONTINUED FROM PREVIOUS PAGE		
20.0'								
		11	PL			Fine sand, trace silt-brownish gray-loose to very dense-saturated. (SP) Grading to gray at 12.0'.	<1	35
22.5'								
		12	PL				<1	55
24.0'								
						END OF BORING Boring advanced to 16.0' using hollow stem auger. Boring advanced from 16.0' to 22.0' using washed drilling techniques. Borehole backfilled with bentonite grout.		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL 2.0' WS (WS OR WD)	BORING STARTED 03-16-88	STS OFFICE Lansing, MI	
WL BCR ACR	BORING COMPLETED 03-16-88	DRAWN BY DH	SHEET NO. 2 OF 2
WL	RIG FOREMAN RC CME-45	APP'D BY BBS	STS JOB NO. 1151XH

3L:3-0687

K00000552

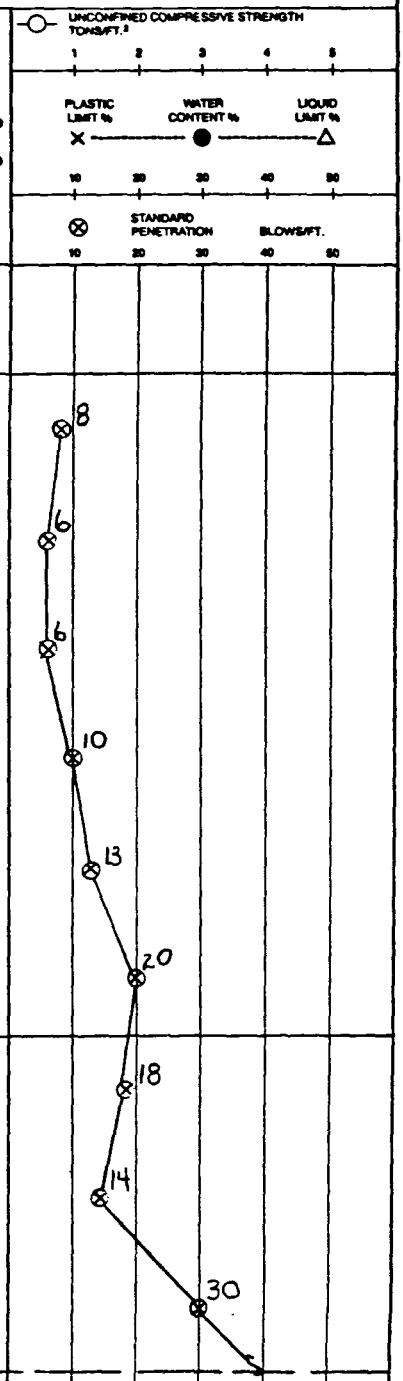
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-11
PROJECT NAME	ARCHITECT-ENGINEER
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
					SURFACE ELEVATION 104.0' Platform Elevation	
					Driller's Observation: Boring advanced from platform constructed over outfall pond. Standing water at 1.3' below platform. Ground surface 2.0' below platform.	
2.5'	1	PL			Fine sand, trace medium sand and silt-black-loose to medium dense-saturated. (SP) Black staining from 2.0' to 4.0'.	5400
					Grading to trace gravel from 4.0' to 6.0'.	
5.0'	2	PL			Grading to brown at 5.0'.	1
7.5	3	PL				<1*
	4	PL				<1*
10.0'	5	PL				<1
12.5'	6	PL				78
15.0'	7	PL			Fine sand, trace silt-grayish brown-medium dense to very dense-saturated. (SP) Black staining from 14.0' to 16.0'.	<1
17.5'	8	PL				<1
20.0'	9	PL				<1
					CONTINUED ON NEXT PAGE	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

STS JOB NO 1151XH

SHEET NO. 1 OF 2

BL-4-0867

K00000553

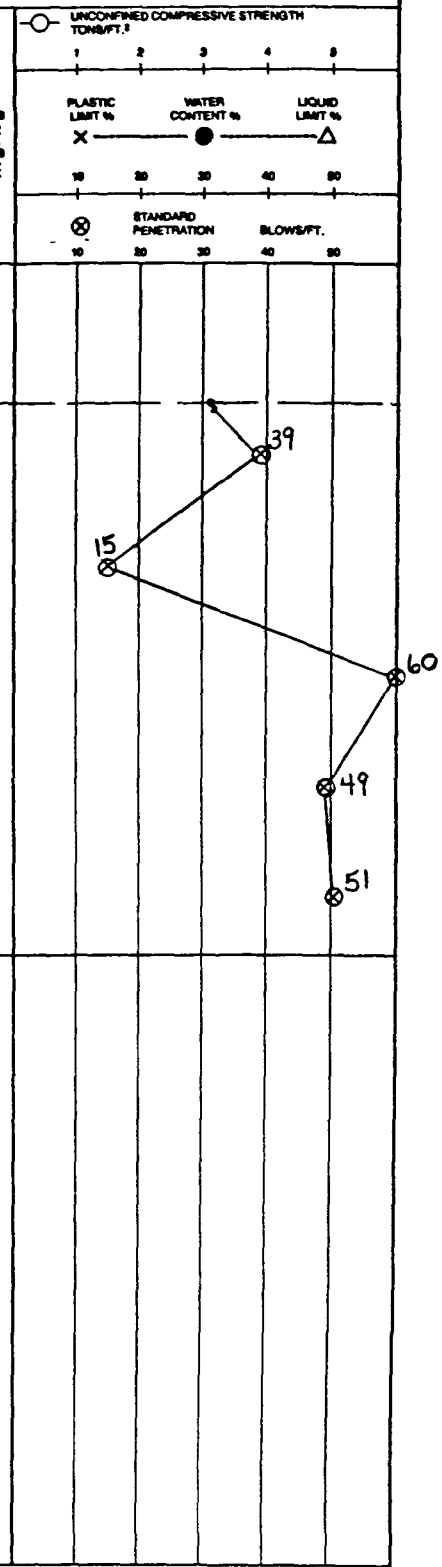
STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
Consumers Power Company	88SB-11
PROJECT NAME	**ARCHITECT-ENGINEER**
Overisel Gas Compressor Station	

SITE LOCATION

Overisel, Michigan

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	AROCLOR 1254 mg/kg
						SURFACE ELEVATION 104.0' Platform Elevation	
20.0'						CONTINUED FROM PREVIOUS PAGE	
		10	PL			Fine sand, trace silt-grayish brown-medium dense to very dense-saturated. (SP)	<1
22.5'		11	PL				<1
						Grading to gray at 24.0'.	
25.0'		12	PL				<1
27.5'		13	PL				<1
		14	PL				<1
30.0'							
						END OF BORING	
						* Results less than 1 but detected.	
						Boring advanced to 14.0' using hollow stem auger.	
						Boring advanced from 14.0' to 28.0' using washed drilling techniques.	
						Borehole backfilled with bentonite grout.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

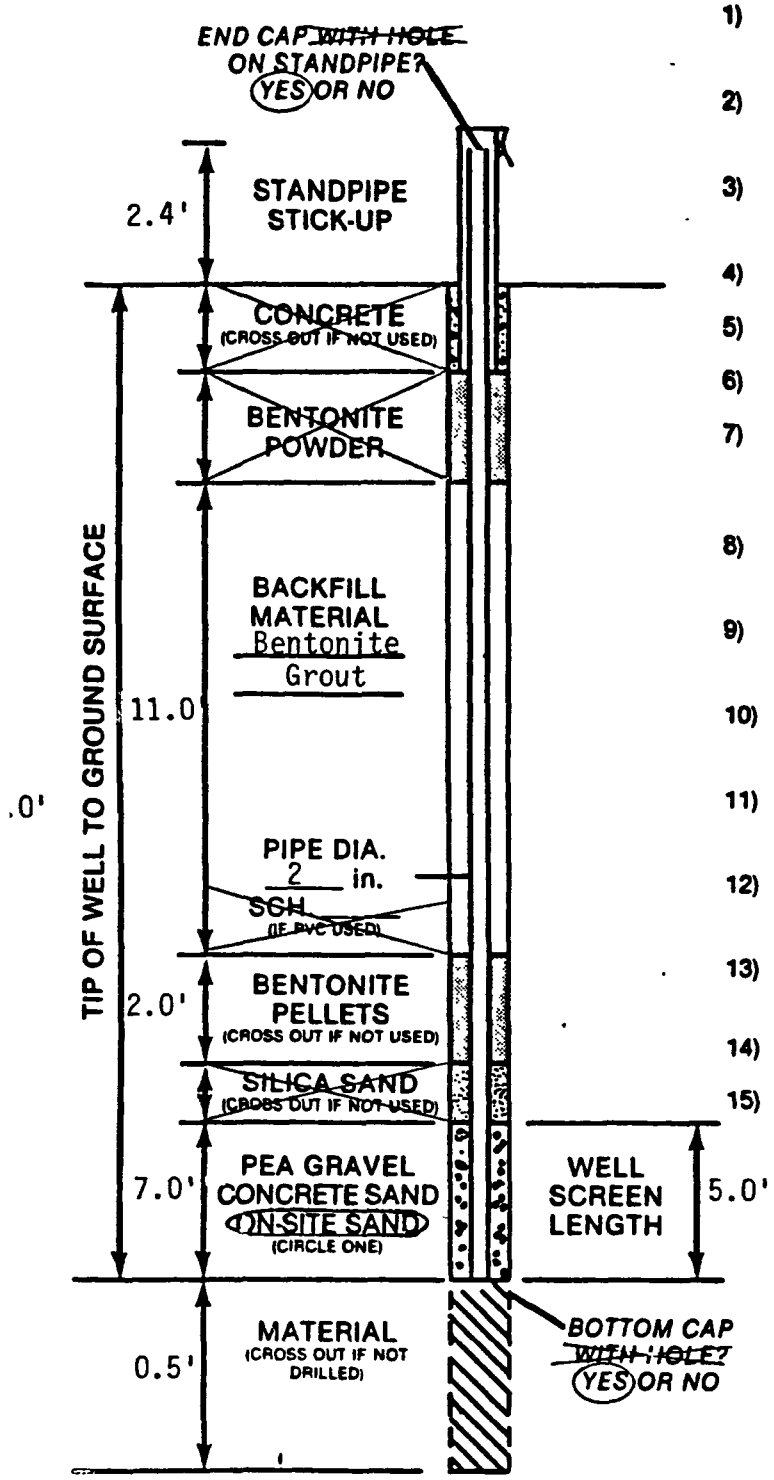
WL	WS OR WD	BORING STARTED	STS OFFICE	
	1.3'	03-16-88	Lansing, MI	
WL BCR	ACR	BORING COMPLETED	DRAWN BY	SHEET NO. OF
		03-17-88	DH	2 2
WL		RIG FOREMAN	APP'D BY	STS JOB NO.
		RC CME-45	BBS	1151XH

BL:3-0687

K00000554

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE # 10 slot

5) INSTALLED PROTECTOR PIPE ? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED? NO
SOLID AUGER, HOLLOW STEM AUGER, WATER, REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED? NOT DEVELOPED
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE 3-17-88, 13.54' Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

Well No. 88MW-1 DATE INSTALLED 03-04-88 DRILL RIG CME-45

DRILLER Dick Carlson DRILL CREW Mike McConnel

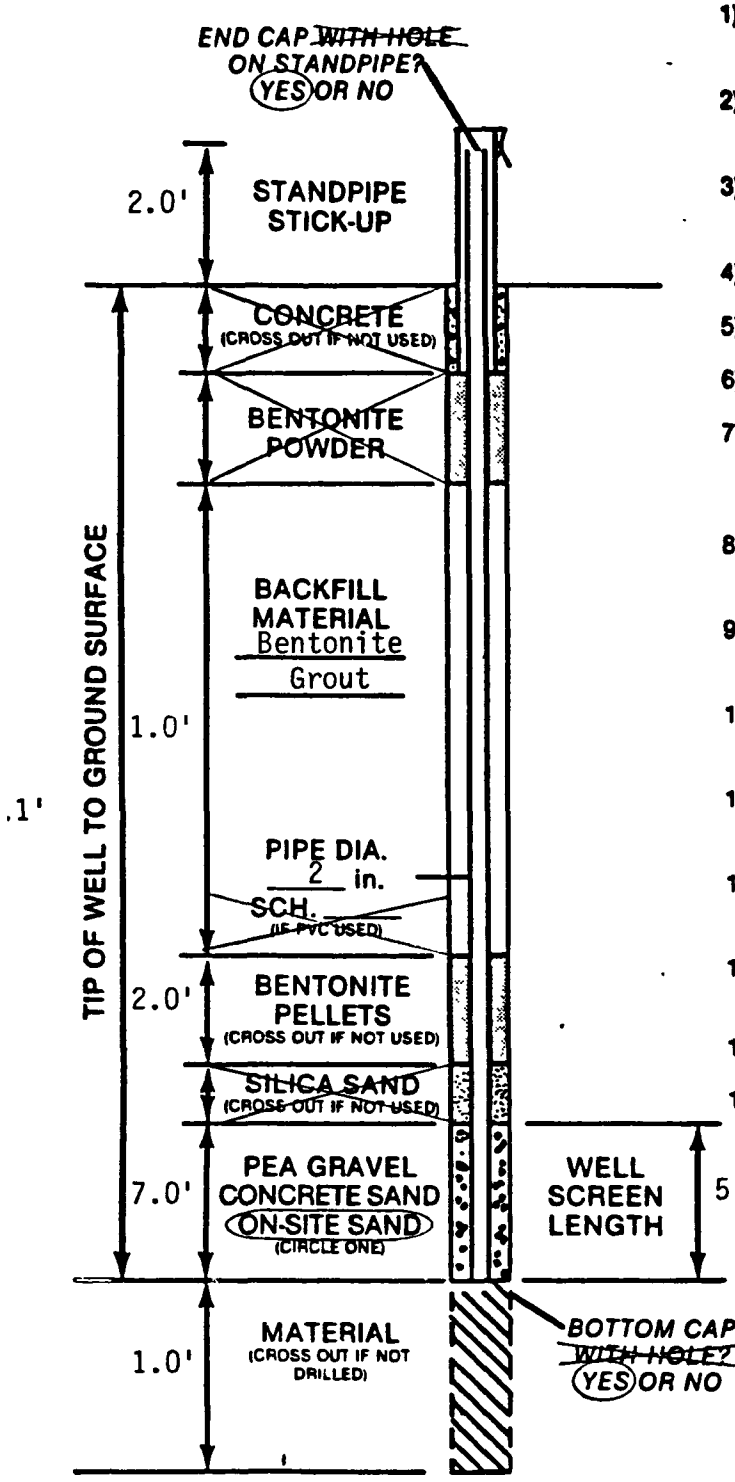
JOB/CLIENT Overisel Gas Compressor Station/CPCO STS JOB No. 1151XH

FW: 1-983

K00000555

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE # 10 slot

5) INSTALLED PROTECTOR PIPE ? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED? NO
SOLID AUGER, HOLLOW STEM AUGER, WATER, REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED? NOT DEVELOPED
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE 3-17-88, 2.98' Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

Well No. 88MW-2 DATE INSTALLED 03-07-88 DRILL RIG CME-45

DRILLER Dick Carlson DRILL CREW Mike McConnel

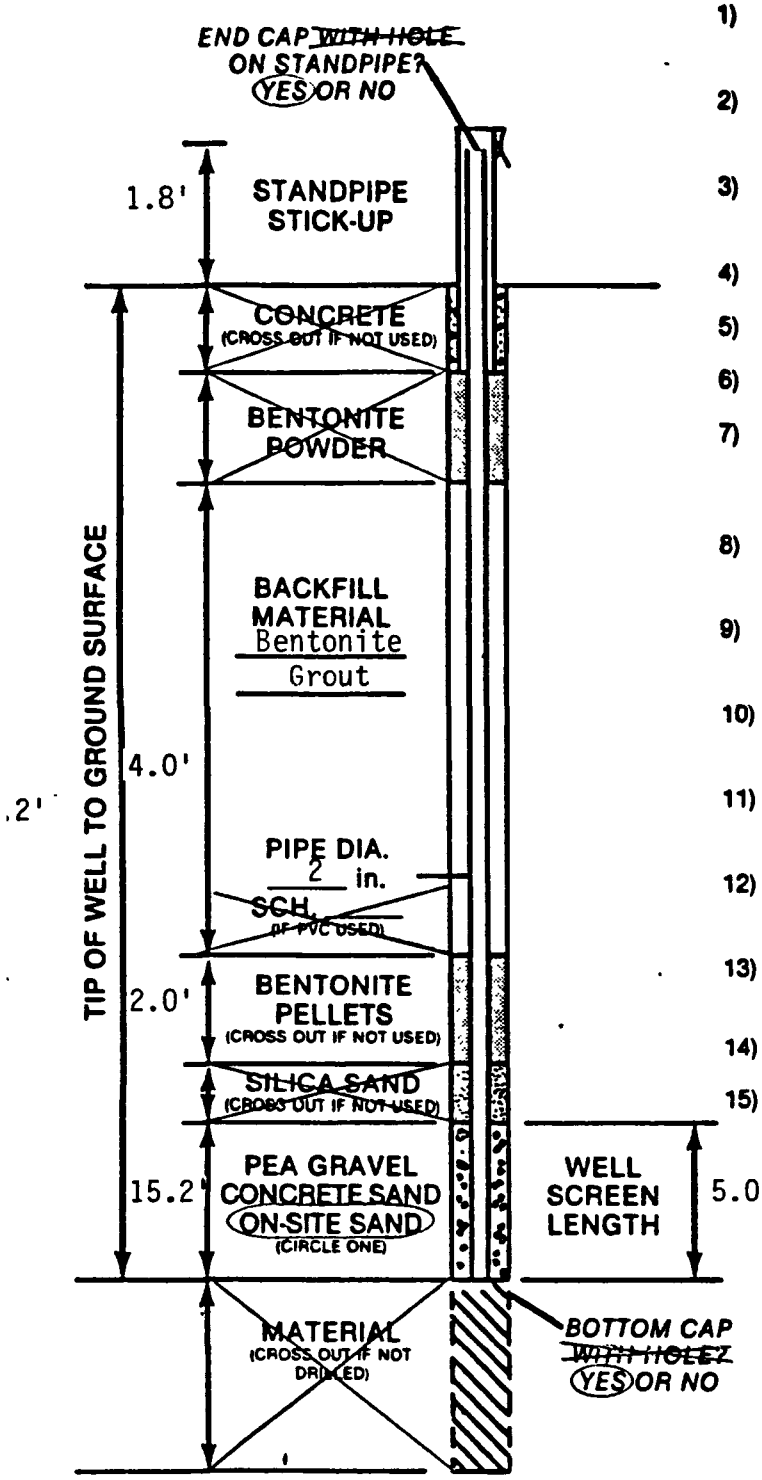
JOB/CLIENT Overisel Gas Compressor Station/CPCO STS JOB No. 1151XH

FW: 1-983

K00000556

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, (GALVANIZED), STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, (THREADED), OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, (STAINLESS), OTHER _____

4) SCREEN SIZE # 10 slot

5) INSTALLED PROTECTOR PIPE ? (YES) OR NO

6) WAS SOLVENT USED? YES OR (NO)

7) WAS DRILLING MUD USED? YES
SOLID AUGER, (HOLLOW STEM AUGER), (WATER), REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR (NO)

9) HOW WAS WELL DEVELOPED? NOT DEVELOPED
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE 3-18-88, 2.92' Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

Well No. 88MW-2A DATE INSTALLED 03-11-88 DRILL RIG CME-45

DRILLER Dick Carlson DRILL CREW Mike McConnel

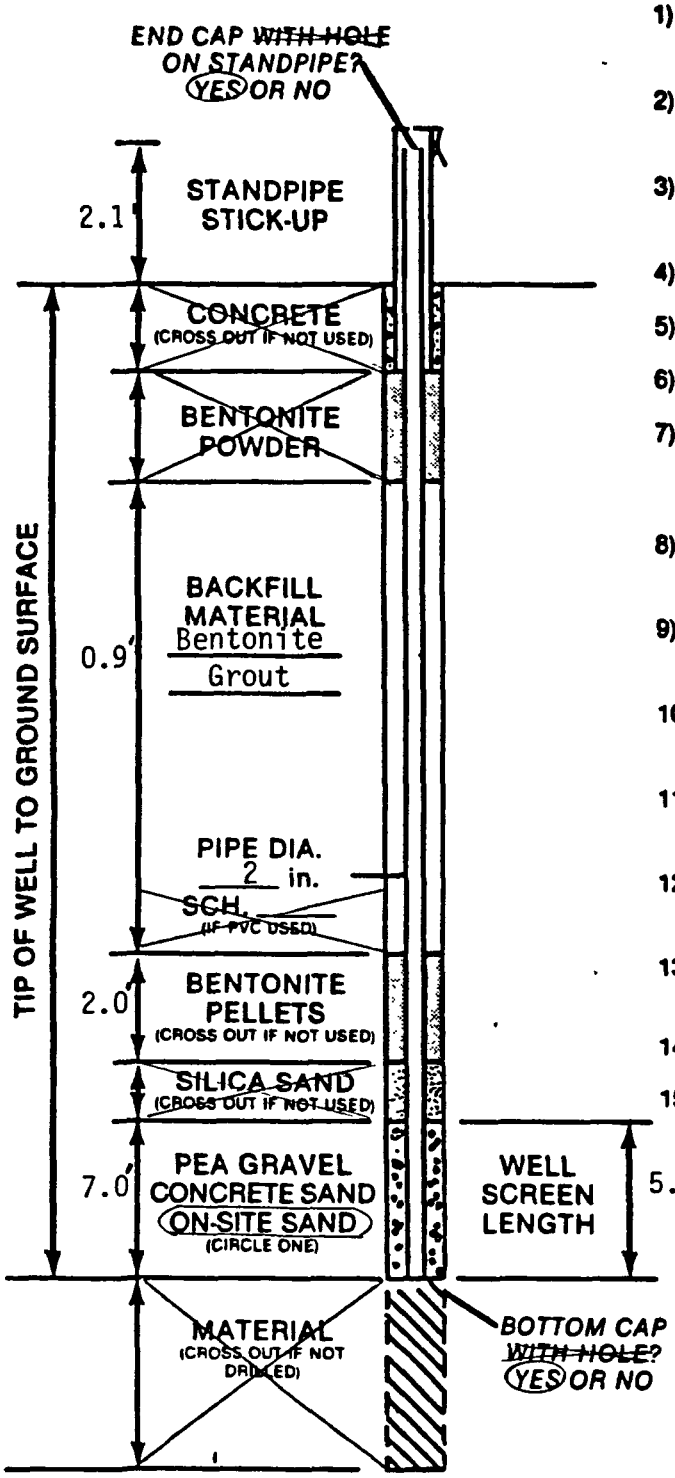
JOB/CLIENT Overisel Gas Compressor Station/CPCO STS JOB No. 1151XH

FW: 1-983

K00000557

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE _____

5) INSTALLED PROTECTOR PIPE? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED?
SOLID AUGER, HOLLOW STEM AUGER, WATER, REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED? NOT DEVELOPED
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE 3-17-88, 101.45 Ft. FROM T. ST. PIPE

DATE _____, _____ Ft. FROM T. ST. PIPE

DATE _____, _____ Ft. FROM T. ST. PIPE

DATE _____, _____ Ft. FROM T. ST. PIPE

Well No. 88MW-3 DATE INSTALLED 03-14-88 DRILL RIG CME-45

DRILLER Dick Carlson DRILL CREW Mike McConnel

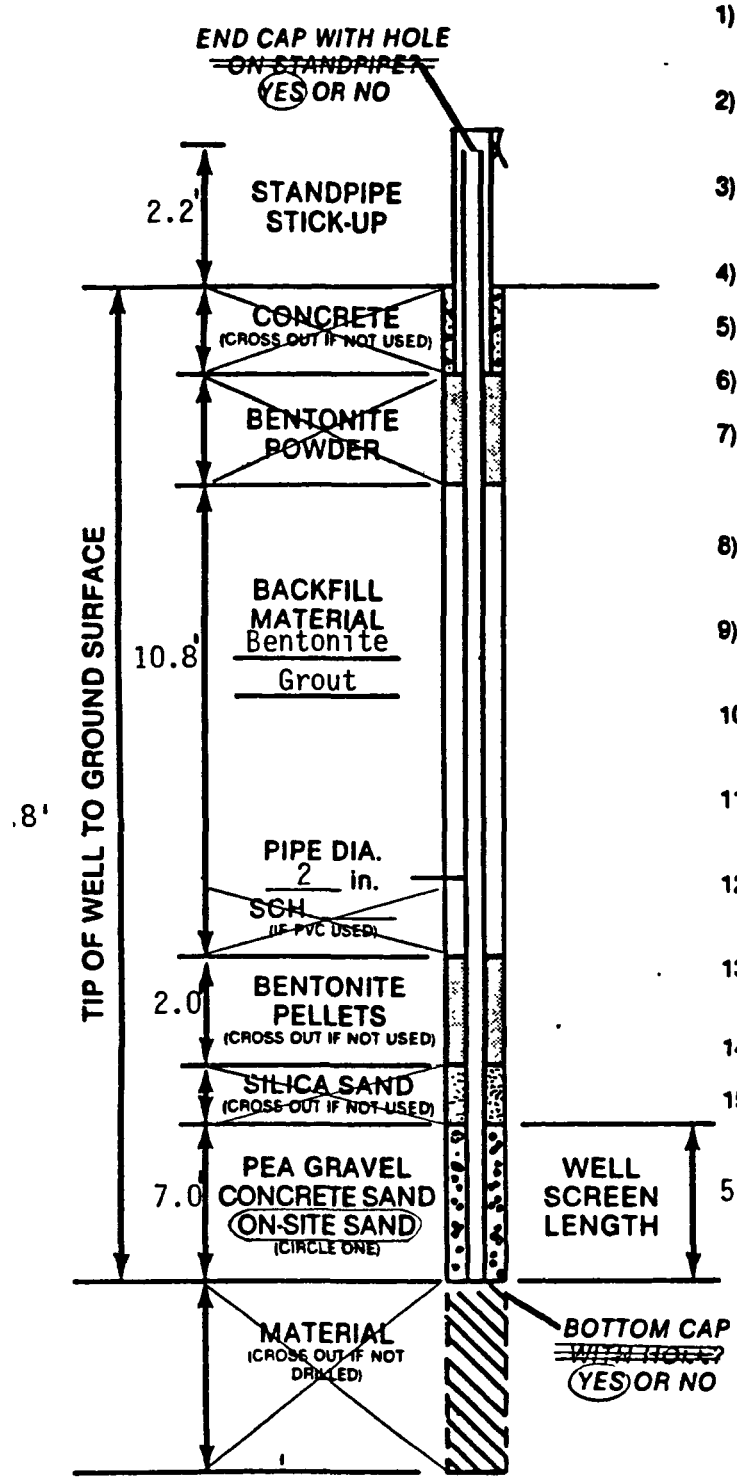
JOB/CLIENT Overisel Gas Compressor Station/CPCO STS JOB No. 1151XH

FW: 1-983

K00000558

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE # 10 slot

5) INSTALLED PROTECTOR PIPE? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED? YES
SOLID AUGER, HOLLOW STEM AUGER, WATER, REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED? NOT DEVELOPED
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE 3-17-88, 102.25 Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

Well No. 88MW-3A DATE INSTALLED 03-16-88 DRILL RIG CME-45

DRILLER Dick Carlson DRILL CREW Mike McConnel

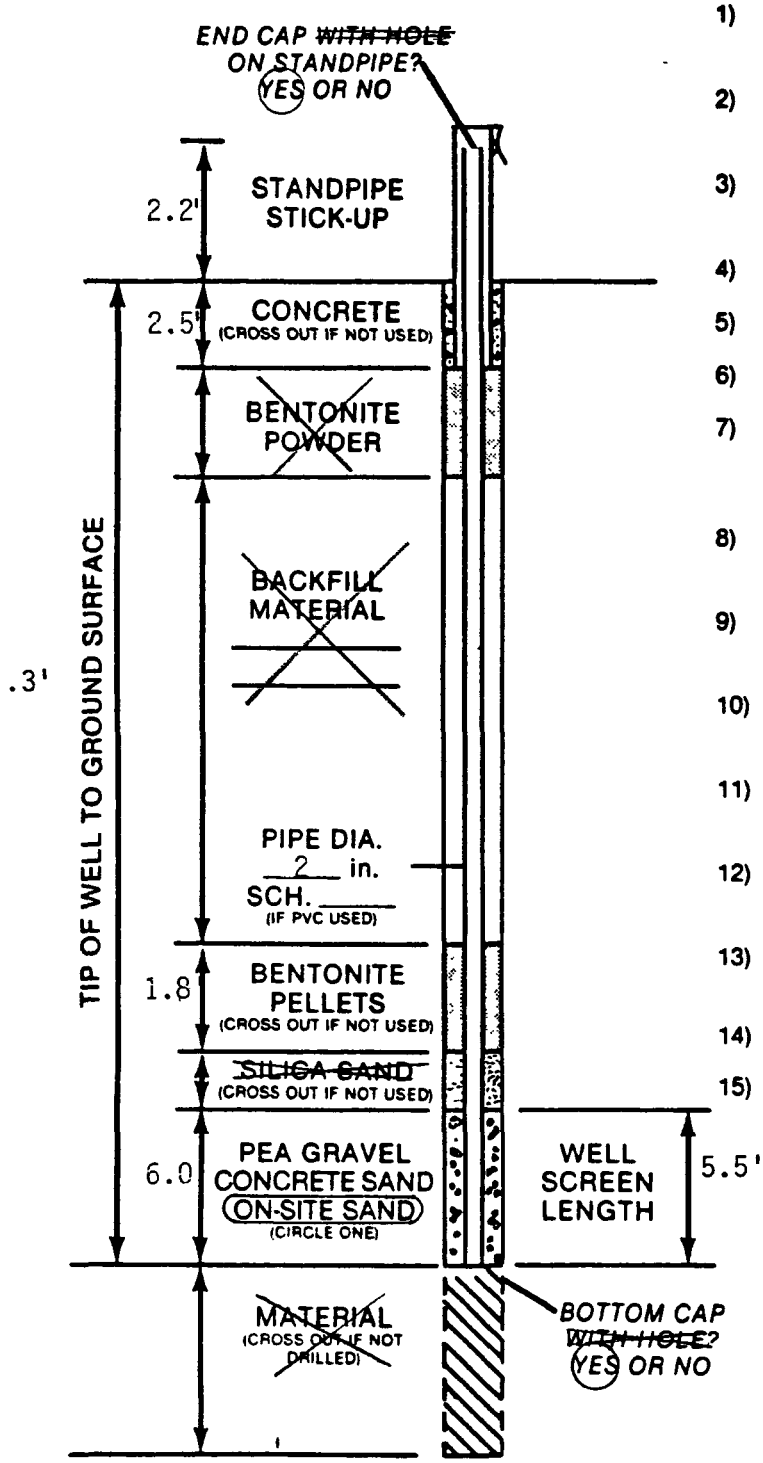
JOB/CLIENT Overisel Gas Compressor Station/CPCO STS JOB No. 1151XH

FW: 1-983

K00000559

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE #10 slot

5) INSTALLED PROTECTOR PIPE ? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED? no
SOLID AUGER, HOLLOW STEM AUGER,
WATER, REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED?
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

Well No. 88MW-4 DATE INSTALLED 6-22-88 DRILL RIG 80

DRILLER John Wright DRILL CREW Robert Epps

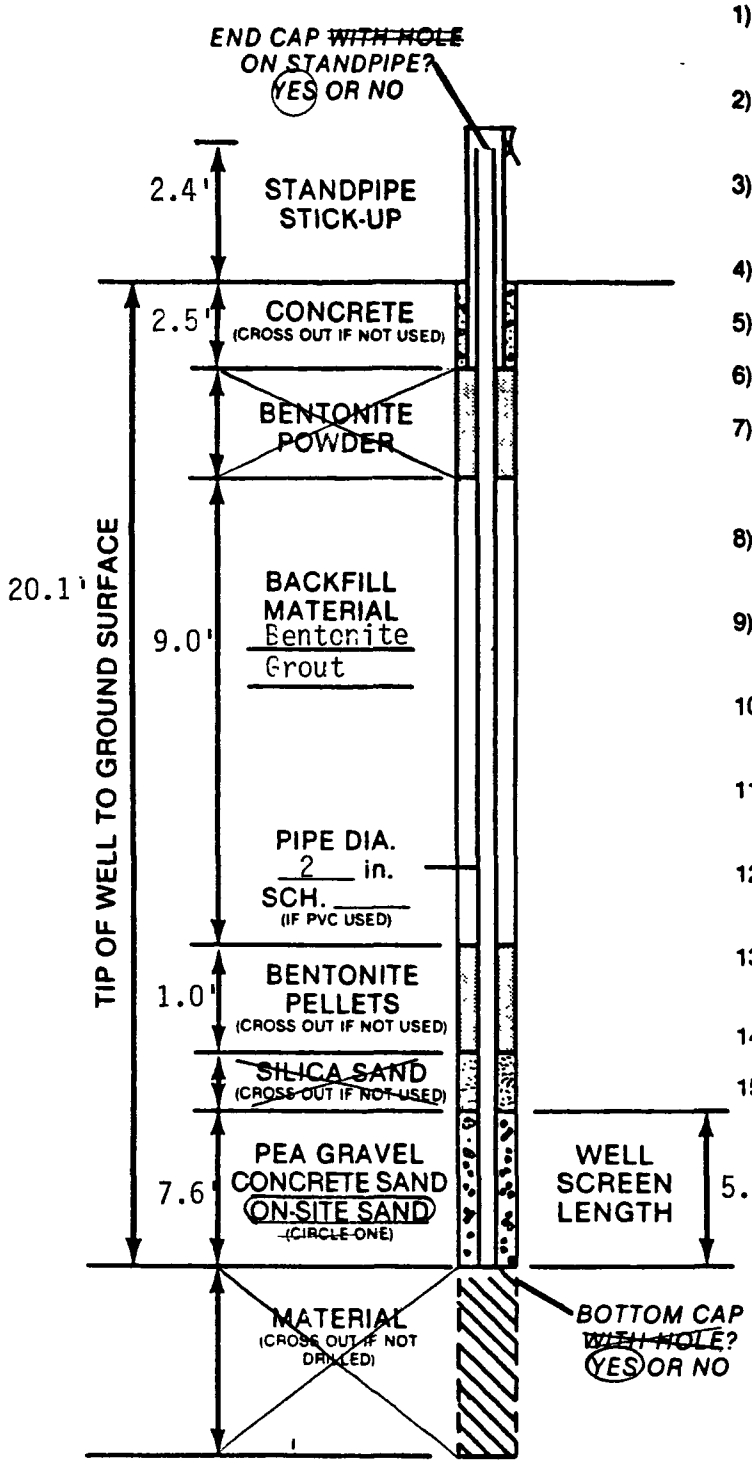
JOB/CLIENT Consumers Power Company STS JOB No. 1151XH

FW: 1-983

K00000560

STS Consultants Ltd.

FIELD WELL INSTALLATION DIAGRAM



1) TYPE OF PIPE?
PVC, GALVANIZED, STAINLESS, OTHER _____

2) TYPE OF PIPE JOINTS?
BELLED, COUPLINGS, THREADED, OTHER _____

3) TYPE OF WELL SCREEN
PVC, GALVANIZED, STAINLESS, OTHER _____

4) SCREEN SIZE #10 slot

5) INSTALLED PROTECTOR PIPE ? YES OR NO

6) WAS SOLVENT USED? YES OR NO

7) WAS DRILLING MUD USED? yes
SOLID AUGER, HOLLOW STEM AUGER, WATER, REVERT, BENTONITE

8) DID STANDPIPE COME UP WHEN CASING WAS PULLED?
YES OR NO

9) HOW WAS WELL DEVELOPED?
BAILING, PUMPING, SURGING, COMPRESSED AIR

10) TIME SPENT FOR WELL DEVELOPMENT?
5 min., 15 min., 30 min., OTHER _____

11) APPROXIMATE WATER VOLUME REMOVED OR ADDED?
5 gal., 10 gal., 15 gal., OTHER _____

12) WATER CLARITY BEFORE DEVELOPMENT?
CLEAR, TURBID, OPAQUE

13) WATER CLARITY AFTER DEVELOPMENT?
CLEAR, TURBID, OPAQUE

14) DID THE WATER SMELL? YES OR NO

15) WATER LEVEL SUMMARY

1) DEPTH FROM T. STANDPIPE AFTER DEVELOPMENT?
_____ Ft. or DRY

2) OTHER MEASUREMENTS:

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

DATE _____, _____ Ft. FROM T, ST. PIPE

Well No. 88MW-4A DATE INSTALLED 6-22-88 DRILL RIG 80

DRILLER John Wright DRILL CREW Robert Epps

JOB/CLIENT Consumers Power Company STS JOB No. 1151XH

FW: 1-983

K00000561

AMERICAN SOCIETY FOR TESTING AND MATERIALS

Standard Method for

PENETRATION TEST AND SPLIT-BARREL SAMPLING OF SOILS[1]

This standard is issued under the fixed designation D 1586; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This method has been approved for use by agencies of the Department of Defense and for listing in the DOD Index of Specifications and Standards.

1. Scope

1.1 This method describes the procedure, generally known as the Standard Penetration Test (SPT), for driving a split-barrel sampler to obtain a representative soil sample and a measure of the resistance of the soil to penetration of the sampler.

1.2 This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. For a specific precautionary statement, see 5.4.1

1.3 The values stated in inch-pound units are to be regarded as the standard.

2. Applicable Documents

2.1 ASTM Standards:

D2487 Test Method for Classification of Soils for Engineering Purposes[2]

D2488 Practice for Description and Identification of Soils (Visual-Manual Procedure)[2]

D4220 Practices for Preserving and Transporting Soil Samples[2]

3. Descriptions of Terms Specific to This Standard

3.1 anvil—that portion of the drive-weight assembly which the hammer strikes and through which the hammer energy passses into the drill rods.

3.2 cathead—the rotating drum or windlass in the rope-cathead lift system around which the operator wraps a rope to lift and drop the hammer by successively tightening and loosening the rope turns around the drum.

3.3 drill rods—rods used to transmit downward force and torque to the drill bit while drilling a borehole.

3.4 drive-weight assembly—a device consisting of the hammer, hammer fall guide, the anvil, and any hammer drop system.

3.5 hammer—that portion of the drive-weight assembly consisting of the 140 ± 2 lb (63.5 ± 1 kg) impact weight which is successively lifted and dropped to provide the energy that accomplishes the sampling and penetration.

3.6 hammer drop system—that portion of the drive-weight assembly by which the operator accomplishes the lifting and dropping of the hammer to produce the blow.

3.7 hammer fall guide—that part of the drive-weight assembly used to guide the fall of the hammer.

3.8 N-value—the blowcount representation of the penetration resistance of the soil. The N-value, reported in blows per foot, equals the sum of the number of blows required to drive the sampler over the depth interval of 6 to 18 in. (150 to 450 mm) (see 7.3).

3.9 ΔN—the number of blows obtained from each of the 6-in. (150-mm) intervals of sampler penetration (see 7.3).

3.10 number of rope turns—the total contact angle between the rope and the cathead at the beginning of the operator's rope slackening to drop the hammer, divided by 360° (see Fig. 1).

3.11 sampling rods—rods that connect the drive-weight assembly to the sampler. Drill rods are often used for this purpose.

3.12 SPT—abbreviation for Standard Penetration Test, a term by which engineers commonly refer to this method.

4. Significance and Use

4.1 This method provides a soil sample for identification purposes and for laboratory tests appropriate for soil obtained from a sampler that may produce large shear strain disturbance in the sample.

4.2 This method is used extensively in a great variety of geotechnical exploration projects. Many local correlations and widely published correlations which relate SPT blowcount, or N-value, and the engineering behavior of earthworks and foundations are available.

---

[1]This method is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.02 on Sampling and Related Field Testing for Soil Investigations.

Current edition approved Sept. 11, 1984. Published November 1984. Originally published as D1586—58T. Last previous edition D1586—67 (1974).

[2]Annual Book of ASTM Standards, Vol 04.08.

K00000562

so that the advance of the sampler under the impact of the hammer can be easily observed for each 6-in. (0.15-m) increment.

7.2 Drive the sampler with blows from the 140-lb (63.5-kg) hammer and count the number of blows applied in each 6-in. (0.15-m) increment until one of the following occurs:

7.2.1 A total of 50 blows have been applied during any one of the three 6-in. (0.15-m) increments described in 7.1.4.

7.2.2 A total of 100 blows have been applied.

7.2.3 There is no observed advance of the sampler during the applicaion of 10 successive blows of the hammer.

7.2.4 The sampler is advanced the complete 18 in. (0.45 m) without the limiting blow counts occurring as described in 7.2.1, 7.2.2, or 7.2.3.

7.3 Record the number of blows required to effect each 6 in. (0.15 m) of penetration or fraction thereof. The first 6 in. is considered to be a seating drive. The sum of the number of blows required for the second and third 6 in. of penetration is termed the "standard penetration resistance", or the "N-value". If the sampler is driven less than 18 in. (0.45 m), as permitted in 7.2.1, 7.2.2, or 7.2.3, the number of blows per each complete 6-in. (0.15-m) increment and per each partial increment shall be recorded on the boring log. For partial increments, the depth of penetration shall be reported to the nearest 1 in. (25 mm), in addition to the number of blows. If the sampler advances below the bottom of the boring under the static weight of the drill rods or the weight of the drill rods plus the static weight of the hammer, this information should be noted on the boring log.

7.4 The raising and dropping of the 140-lb (63.5-kg) hammer shall be accomplished using either of the following two methods:

7.4.1 By using a trip, automatic, or semi-automatic hammer drop system which lifts the 140-lb (63.5-kg) hammer and allows it to drop 30 ± 1.0 in. (0.76 m ± 25 mm) unimpeded.

7.4.2 By using a cathead to pull a rope attached to the hammer. When the cathead and rope method is used the system and operation shall conform to the following:

7.4.2.1 The cathead shall be essentially free of rust, oil, or grease and have a diameter in the range of 6 to 10 in. (150 to 250 mm).

7.4.2.2 The cathead should be operated at a minimum speed of rotation of 100 RPM, or the approximate speed of rotation shall be reported on the boring log.

7.4.2.3 No more than 2¼ rope turns on the cathead may be used during the performance of the penetration test, as shown in Fig. 1.

NOTE 4—The operator should generally use either 1¾ of 2¼ rope turns, depending upon whether or not the rope comes off the top (1¾ turns) or the bottom (2¼ turns) of the cathead. It is generally known and accepted that 2¾ or more rope turns considerably impedes the fall of the hammer and should not be used to perform the test. The cathead rope should be maintained in a relatively dry, clean, and unfrayed condition.

7.4.2.4 For each hammer blow, a 30-in. (0.76-m) lift and drop shall be employed by the operator. The operation of pulling and throwing the rope shall be performed rhythmically without holding the rope at the top of the stroke.

7.5 Bring the sampler to the surface and open. Record the percent recovery or the length of sample recovered. Describe the soil samples recovered as to composition, color, stratification, and condition, then place one or more representative portions of the sample into sealable moisture-proof containers (jars) without ramming or distorting any apparent stratification. Seal each container to prevent evaporation of soil moisture. Affix labels to the containers bearing job designation, boring number, sample depth, and the blow count per 6-in. (0.15-m) increment. Protect the samples against extreme temperature changes. If there is a soil change within the sampler, make a jar for each stratum and note its location in the sampler barrel.

8. Report

8.1 Drilling information shall be recorded in the field and shall include the following:

8.1.1 Name and location of job,

8.1.2 Names of crew,

8.1.3 Type and make of drilling machine,

8.1.4 Weather conditions,

8.1.5 Date and time of start and finish of boring,

8.1.6 Boring number and location (station and coordinates, if available and applicable),

8.1.7 Surface elevation, if available,

8.1.8 Method of advancing and cleaning the boring,

8.1.9 Method of keeping boring open,

8.1.10 Depth of water surface and drilling depth at the time of a noted loss of drilling fluid, and time and date when reading or notation was made,

8.1.11 Location of strata changes,

8.1.12 Size of casing, depth of cased portion of boring,

8.1.13 Equipment and method of driving sampler,

8.1.14 Type of sampler and length and inside diameter of barrel (note use of liners),

8.1.15 Size, type, and section length of the sampling rods, and

8.1.16 Remarks.

8.2 Data obtained for each sample shall be recorded in the field and shall include the following:

8.2.1 Sample depth and, if utilized, the sample number,

8.2.2 Description of soil,

8.2.3 Strata changes within sample,

8.2.4 Sampler penetration and recovery lengths, and

8.2.5 Number of blows per 6-in. (0.15-m) or partial increment.

9. Precision and Bias

9.1 Variations in N-values of 100% or more have been observed when using different standard penetration test apparatus and drillers for adjacent borings in the same soil formation. Current opinion, based on field experience, indicates that when using the same apparatus and driller, N-values in the same soil can be reproduced with a coefficient of variation of about 10%.

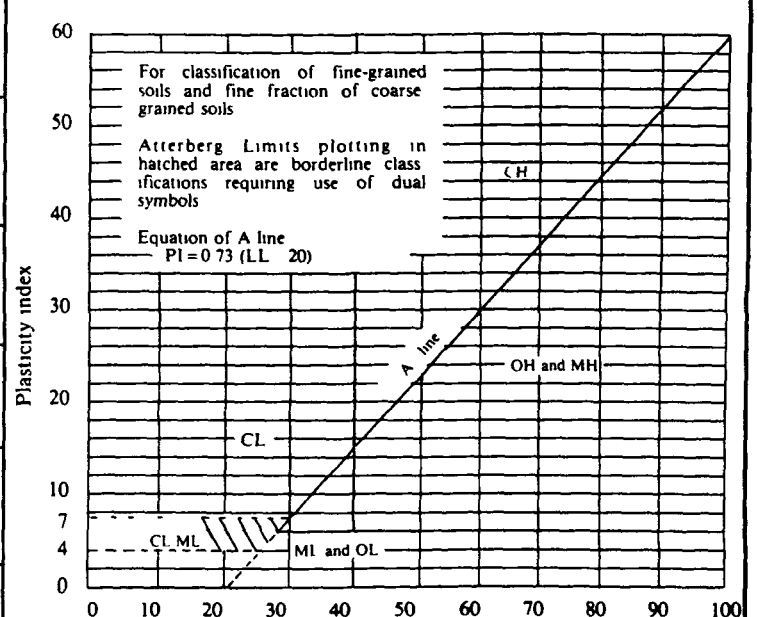
9.2 The use of faulty equipment, such as an extremely massive or damaged anvil, a rusty cathead, a low speed cathead, an old, oily rope, or massive or poorly lubricated rope sheaves can significantly contribute to differences in N-values obtained between operator-drill rig systems.

9.3 The variability in N-values produced by different drill rigs and operators may be reduced by measuring that part of the hammer energy delivered into the drill rods from the sampler and adjustng N on the basis of comparative energies. A method for energy measurement and N-value adjustment is currently under development.

K00000563

UNIFIED SOIL CLASSIFICATION

Major Divisions			Group symbols	Typical names	Laboratory classification criteria		
Coarse-grained soils (More than half of material is *larger* than No 200 sieve size)	Gravels (More than half of coarse fraction larger than No 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-grades gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain size curve Depending on percentage of fines (fraction smaller than No 200 sieve size), coarse grained soils are classified as follows Less than 5 per cent GW, GP, SW, SP More than 12 per cent GM, GC, SM, SC 5 to 12 per cent *Borderline* cases requiring dual symbols	$C_U = \frac{D_{60}}{D_{10}}$ greater than 6, $C_C = \frac{(D_{30})^2}{D_{10} x D_{60}}$ between 1 and 3	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		Gravels with fines (Appreciable amount of fines)	GM d u	Silty gravels, gravel-sand silt mixtures		Atterberg limits below "A" line or P I less than 4	Above "A" line with P I between 4 and 7 are *borderline* cases requiring use of dual symbols
			GC	Clayey gravels, gravel sand-clay mixtures		Atterberg limits above "A" line with P I greater than 7	
	Sands (More than half of coarse fraction is smaller than No 4 sieve size)	Clean sands (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines		$C_U = \frac{D_{60}}{D_{10}}$ greater than 4, $C_C = \frac{(D_{30})^2}{D_{10} x D_{60}}$ between 1 and 3	
			SP	Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM d u	Silty sands, sand silt mixtures		Atterberg limits below "A" line or P I less than 4	Limits plotting in hatched zone with P I between 4 and 7 are *borderline* cases requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterberg limits above "A" line with P I greater than 7	
Fine-grained soils (More than half of material is *smaller* than No 200 sieve)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity			
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL	Organic silts and organic silty clays of low plasticity			
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous 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			



K00000564

Liquid Limit

Plasticity Chart

SUBSURFACE EXPLORATION PROCEDURES

Hand-Auger Drilling (HA)

In this procedure, a sampling device is driven into the soil by repeated blows of a sledge hammer. When the sampler is driven to the desired sample depth, the soil sample is retrieved. The hole is then advanced by manually turning the hand auger until the next sampling depth increment is reached. The hand auger drilling between sampling intervals also helps to clean and enlarge the bore hole in preparation for obtaining the next sample.

Power Auger Drilling (PA)

In this type of drilling procedure, continuous flight augers are used to advance the bore holes. They are turned and hydraulically advanced by a truck or track-mounted unit as site accessiblility dictates. In auger drilling, casing and drilling mud are not required to maintain open bore holes.

Hollow Stem Auger Drilling (HS)

In this drilling procedure, continuous flight augers having an open stem are used to advance the bore holes. The open stem allows the sampling tool to be used without removing the augers from the bore hole. Hollow stem augers thus provide support to the sides of the bore hole during the sampling operations.

Rotary Drilling (RB)

In employing rotary drilling methods, various cutting bits are used to advance the bore holes. In this process, surface casing and/or drilling fluids are used to maintain open bore holes.

Diamond Core Drilling (DB)

Diamond core drilling is used to sample cemented formations. In this procedure, a double tube (triple tube) core barrel with a diamond bit cuts an annular space around a cylindrical prism of the material sampled. The sample is retrieved by a catcher just above the bit. Samples recovered by this procedure are placed in sturdy containers in sequential order.

LABORATORY PROCEDURES

Water Content (Wc)

The water content of a soil is the ratio of the weight of water in a given soil mass to the weight of the dry soil. Water content is generally expressed as a percentage.

Hand Penetrometer (Qp)

In the hand penetrometer test, the unconfined compressive strength of a soil is determined, to a maximum value of 4.5 tons per square foot (tsf), by measuring the resistance of the soil sample to penetration by a small, spring-calibrated cylinder. The hand penetrometer test has been carefully correlated with unconfined compressive strength tests, and thereby provides a useful and a relatively simple testing procedure in which soil strength can be quickly and easily estimated.

Unconfined Compression Tests (Qu)

In the unconfined compression strength test, an undisturbed prism of soil is loaded axially until failure or until 20% strain has been reached, whichever occurs first.

Dry Density (γ_D)

The dry density is the quantity used as a measure of the amount of solids in a unit volume of soil aggregate. Use of this value is often made when measuring the degree of compaction of a soil.

Classification of Samples

In conjunction with the sample testing program, all soil samples are examined in our laboratory and classified on the basis of their texture and plasticity in accordance with the Unified Soil Classification System (USCS). The soil descriptions on the boring logs are in conformance with this system and the estimated group symbols according to this system are included in parentheses following the soil descriptions on the boring logs. Included on a separate sheet entitled "General Notes" is a brief explanation of this system of soil classification.

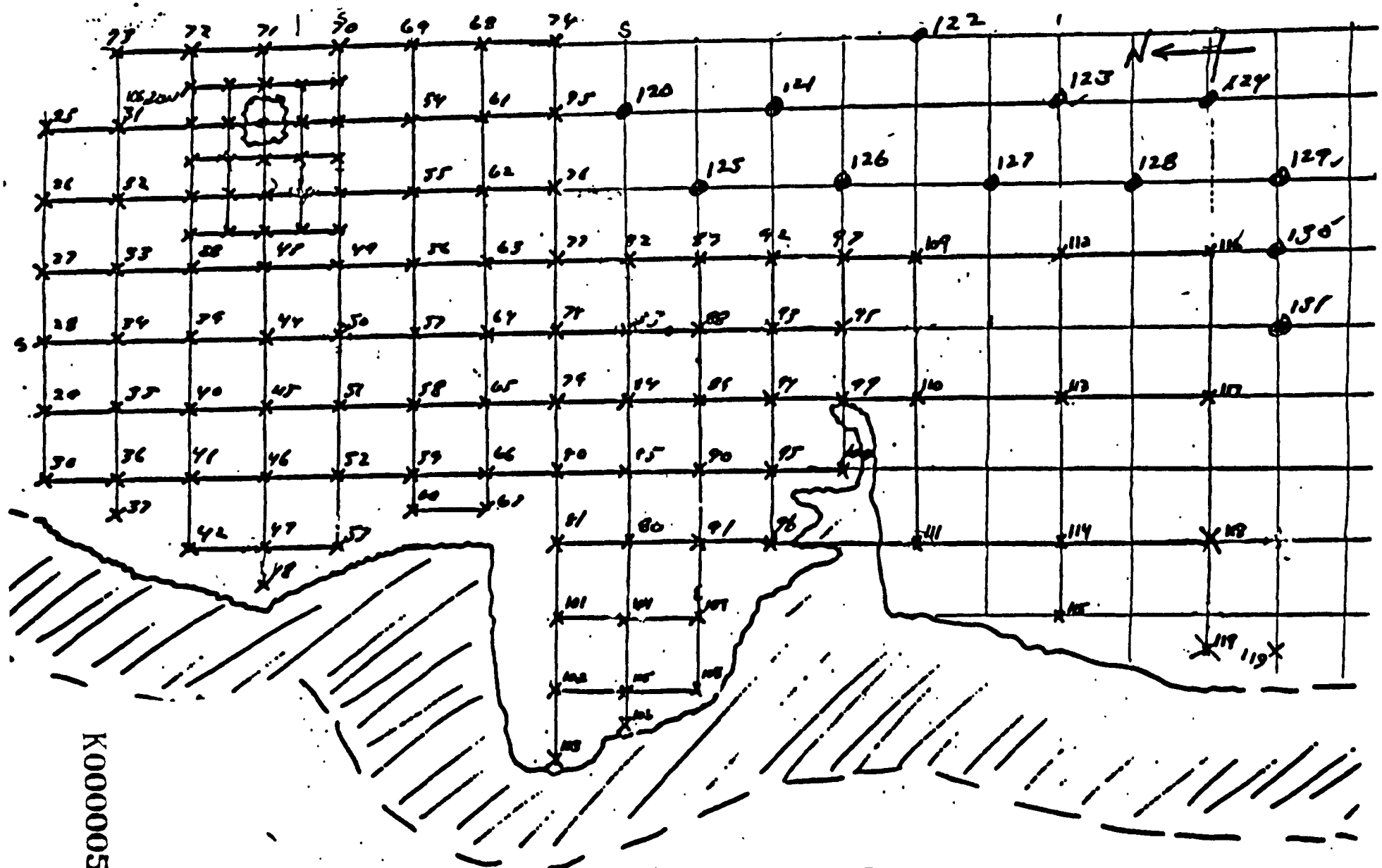
APPENDIX B

Consumers Power Company Analytical Data

Grain Size Analysis

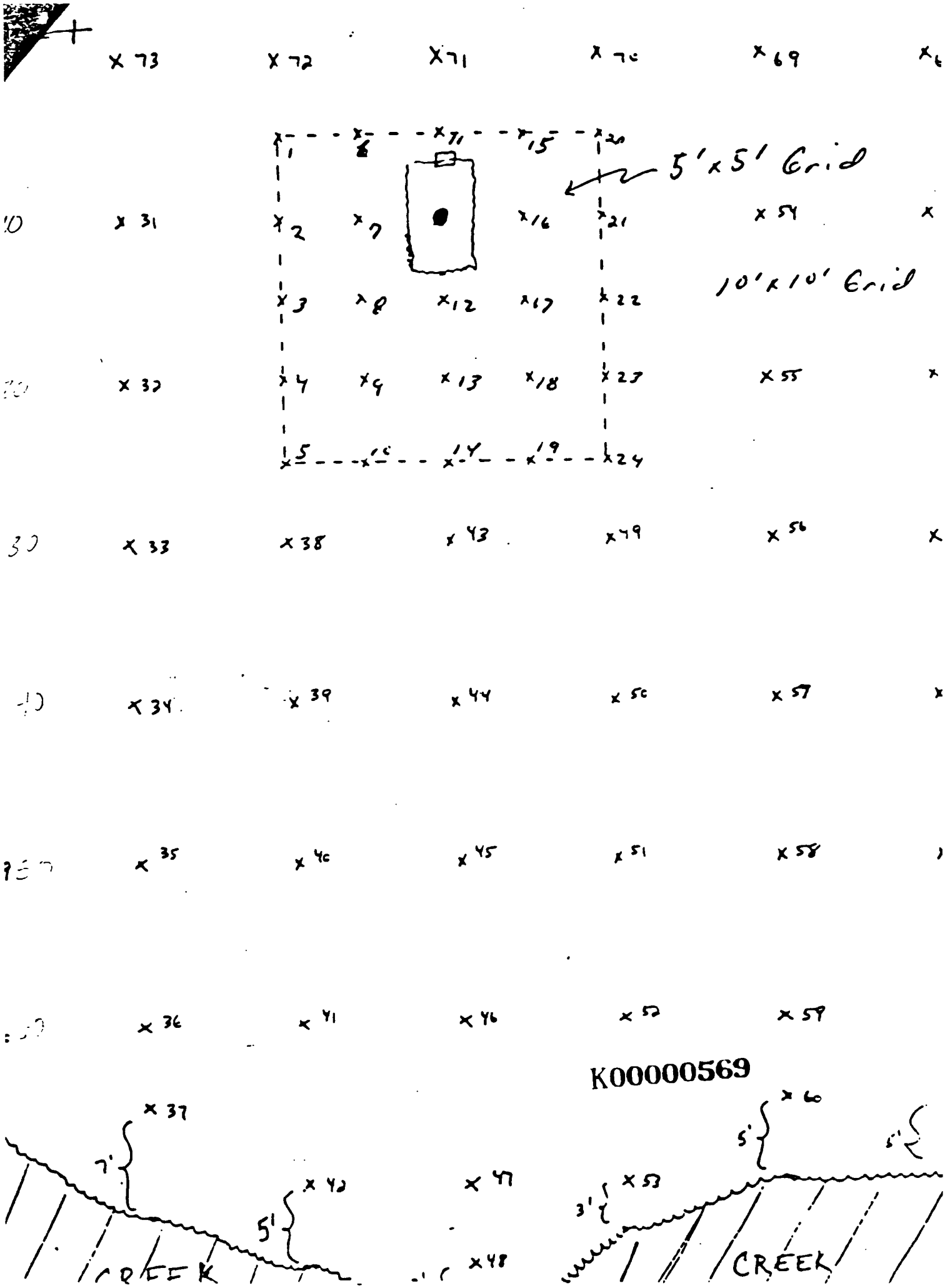
Permeability Analysis

Overisel Gas Comp. Station Soil Sampling - Composite Grid - Oil/Water Sep. Discharge Point



Jan 21, 1988 point #120 → 131

K000000568



K00000569

Overisel Compressor Station

Area - Overflow Discharge
Sampling Date - 09-16-87
Project # 528717781-492

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872492A-1	1	
2	8	
3	9	
4	25	
5	120	
6	2	
7	530	7
8	3500	
9	490	4
10	660	
11	9	
12	1200 ~~750*~~	
13	200 ~~760*~~	
14	230 ~~200*~~	
15	31	
16	4400	14
17	2700	
18	3400	1100
19	260 *	K00000570
20	57	

Overhead Compressor Station

Area - Overflow Discharge
Sampling Date - 09-16-87
Project # 528717 781-492

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872492A-22	860	
23	1800	
24	150	

K00000571

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project # 528717-781-502

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502-A 25	5	
26	2	
27	6	<1
28	1	
29	2	
30	<1	<1
31	12	<1
32	17	
33	13	<1
34	9	
35	1	
36	<1	
37	<1	<1
38	800	1
39	10	
40	9	
41	1	
42	<1	<1
43	3900	83
44	520	2
45	11	

K00000572

Overhead Compressor Station

Area - Overflow Discharge
Sampling Date - 09-28-87
Project #

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502A-46	1	
47	1	<1
48	1	<1
49	450	3
50	3100	6
51	67	
52	5	
53	3	<4**
54	38	2
55	110	3
56	830	15
57	820	12
58	140	2
59	9	
60	9	<1
61	5	
62	62	<1
63	530	8
64	310	4
65	5	<1
66	1	<1

K00000573

OVERISEL COMPRESSOR STATION

Area - Overflow Discharge
Sampling Date - 09-28-87
Project # 528717 781-502

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872502A-67	1	
68	1	
69	3	
70	3	
71	17	
72	1	
73	3	
		K00000574

Overhead Compressor Station

Oil-Water Separator Discharge

Sample Date 11-03-87 Project 872-690

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872-690- 74	1	<1
75	4	<1
76	21	2
77	110	3
78	>520 *	15
79	73	30
80	51	97
81	3	9
82	>380 *	4
83	>570 *	56
84	>200 *	33
85	68	17
86	7	12
87	>270 *	25
88	>300 *	51
89	>170 *	44
90	100	6
91	5	5
92	68	3
93	94	27

K00000575

LEGEND

—×———×—	Fence
88 SB-8 ⊕	Soil Boring Location
88 MW-2 ⊕	Monitoring Well Location
BENCHMARK: ⊕	Benchmark Location
20 W ———	West Line Of Sampling Grid
20 S ———	South Line Of Sampling Grid
▬▬102.0▬▬	Groundwater Contour

STS Consultants Ltd.
Consulting Engineers

SOIL BORING AND MONITORING WELL LOCATIONS

OVERISEL GAS COMPRESSOR STATION

PCB CONTAMINANT SURVEY

CONSUMERS POWER COMPANY

DATE	BY

DRAWN BY	DATE	SCALE	STS PROJECT NO.
CJD	4/88	1"=20'	1151XH
CHECKED BY	DATE	SHEET NO.	STS FILE NO.
DDB	4/88	1	1151XH

K00000576

LEGEND

—×———×—	Fence
88 SB-8 ⊕	Soil Boring Location
88 MW-2 ⊕	Monitoring Well Location
BENCHMARK ⊕	Benchmark Location
20 W ———	West Line Of Sampling Grid
20 S ———	South Line Of Sampling Grid
▬▬102.0▬▬	Groundwater Contour

STS Consultants Ltd.
Consulting Engineers

SOIL BORING AND MONITORING WELL LOCATIONS

OVERISEL GAS COMPRESSOR STATION

PCB CONTAMINANT SURVEY

CONSUMERS POWER COMPANY

DATE	BY

DRAWN BY	DATE	SCALE	STS PROJECT NO.
CJD	4/88	1"=20'	1151XH
CHECKED BY	DATE	SHEET NO.	STS FILE NO.
DDB	4/88	1	1151XH

K00000577

OVERISEL COMPRESSOR STATION

Oil-Water Separator Discharge

Sample Date 11-03-87 - Project 872-690

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872-690- 94	> 180 *	120
95	27	10
96	3	5
97	18	1
98	21	4
99	85	13
100	30	36
		K00000578

OVERISEL COMPRESSOR STATION

Oil-Water Separator Discharge

Sample Date 11-23-87 Project 872-829

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
872-829A-101	1	<1
102	1	<1
103	<1	<1
104	1	<1
105	1	1
106	1	<1
107	4	4
108	1	22
109	15	4
110	8	3
111	1	1
112	5	3
113	4	<1
114	1	<1
115	1	1
116	6	8
117	1	<1
118	1	<1
119	1	<1

Expanded Sample Grid - 11-23-87

K00000579

COMPRESSOR STATION

3-1-88
MWS,4

Area - Overfill
Sampling Date - 01-21-88
Project # 88-135
Report Date - Feb 01, 1988

Sample Point Number	Surface Soil PCB mg/kg	12" Depth Soil PCB mg/kg
88-135 # 120	7	1
121	6	<1
122	11	<1
123	3	5
124	6	1
125	19	1
126	10	<1
127	8	2
128	5	2
129	4	<1
130	6	1
131	9	1
		K00000580

CATION Overisel

oject Number 518817 552-383 Report Date

orehole ID 88mw-1

mple Date 03 04 88 Collected By DSTS

ceived Date 030488 Analysis Number

MAR 20

ontrol umber	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
38383-11	mw-1	1	15-17		<1
12		2	17-19		<1

K00000581

DCATIDN Overisel

roject Number 518817552-383 Report Date

orehole ID 88 mw-2

ample Date 030788 Collected By STS

eceived Date 030788 Analysis Number 1477

ontrol lumber	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/l-g
8383-13	mw-2	1	7-9		<1
14		2	9-11		<1

K00000582

OCATION Diversel

roject Number 518817 552-383 Report Date

orehole ID mw 2A

ample Date 031088 Collected By STS

eceived Date 031188 Analysis Number 1482

ontrol Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
58383-83	mw2A	1	16-18		<1
84		2	18-20		<1
85		wash water	unk		<1

K00000583

OCATION Overisel

roject Number 518817552-383 Report Date

orehole ID 88mw-3

ample Date 031488 Collected By STS

eceived Date 031488 Analysis Number 1484

ontrol umber	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/l-g
88383-98	mw3	1	6-8		<1
99	mw3	2	8-10		<1
				K00000584	

LOCATION Overise 1

Project Number 518817552-383 Report Date

Borehole ID 88MW-3A

Sample Date 031688 Collected By STS

Received Date 031788 Analysis Number 1487

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
38383-138	MW3A	1	16-18		<1
139		2	18-20		<1
140		wash water	20		<1

K00000585

OCATION Overisel

roject Number 518817552-383 Report Date

orehole ID 88SB-1

ample Date 030488 Collected By STS

eceived Date 030488 Analysis Number 1476

ontrol umber	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-1	SB-1	1	0-2		1
2		2	2-4		<1
3		3	4-6		1
4		4	6-8		<1 *
5		5	8-10		<1
6		6	10-12		<1
7		7	12-14		2
8		8	14-16		<1
9		9	16-18		28
10		10	18-20		16

K00000586

* Result <1 But Detectable

OCATION Overisel

roject Number 518817 552-383 Report Date

orehole ID 88 SB-1A

ample Date 030888 Collected By STS

eceived Date 030888 Analysis Number 1478/1479

ontrol lumber	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-25	SB-1A	1	20-22		<1
26		2	22-24		<1
27		3	24-26		<1
28		4	26-28		<1
29		5	28-30		<1
30		Mud	25		8
31		mud	28		12
54	SB-1A	mud	28		16
	(030988)				
				K00000587	

OCATION Overisel

roject Number 5188/7552-383 Report Date

orehole ID 88 SB-2

ample Date 03 07 88 Collected By STS

eceived Date 03 08 88 Analysis Number 1478/1479

ontrol umber	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-15	SB-2	1	0-2		1
16		2	2-4		<1
17		3	4-6		<1
18		4	6-8		<1
19		5	8-10		<1
20		6	10-12		<1*
21		7	12-14		5
22		8	14-16		<1*
23		9	16-18		1
24		10	18-20		7

* Result <1 But Detectable

K00000588

OCATION Overisel

roject Number 518817552-383 Report Date

orehole ID 885B-3

ample Date 030988 Collected By STS

eceived Date 031088 Analysis Number 1480/1481/1482

ontrol lumber	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-55	SB-3	1	0-2		2
56		2	2-4		<1
57		3	4-6		1
58		4	6-8		<1
59		5	8-10		<1
60		6	10-12		<1
61		7	12-14		<1
62		8	14-16		<1
63		9	16-18		1
64		10	18-20		1
65		11	20-22		2
77		12	22-24		<1
78		13	24-26		<1
79		14	26-28		<1
80		15	28-30		<1
81		mud	18		1
82		mud	28		1
				K00000589	

OCATION Overisel

roject Number 518817 552-383 Report Date

orehole ID 88SB-4

ample Date 030988 Collected By STS

eceived Date 031088 Analysis Number 1480/1481/1482

ontrol umber	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
38383-66	SB-4	1	0-2		82
67		2	2-4		<1
68		3	4-6		2
69		4	6-8		1
70		5	8-10		<1
71		6	10-12		<1
72		7	12-14		1
73		8	14-16		1
74		9	16-18		1
75		10	18-20		<1*
76		11	20-22		8

* Result <1 But Detected

K00000590

)CATION Overisel

oject Number 518817552-383 Report Date

orehole ID 88SB-5

ample Date 030888 Collected By STS

eceived Date 030988 Analysis Number 1479/1480

ontrol umber	Borehole Number	Sample Number	Depth (ft)	Sample Section	PCB mg/kg
38383-32	SB-5	1	0-2		<1
33		2	2-4		<1
34		3	4-6		<1
35		4	6-8		<1
36		5	8-10		<1
37		6	10-12		<1
38		7	12-14		15
39		8	14-16		27
40		9	16-18		4
41		10	18-20		2
				K00000591	

LOCATION Overise 1

Project Number 518817552383 Report Date

Borehole ID 88SB-6

Sample Date 030988 Collected By STS

Received Date 030988 Analysis Number 1479/1480

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-42	SB-6	1	0-2		1
43		2	2-4		<1
44		3	4-6		<1
45		4	6-8		1
46		5	8-10		<1
47		6	10-12		<1
48		7	12-14		<1
49		8	14-16		<1
50		9	16-18		1
51		10	18-20		<1*
52		11	20-22		<1
53		12	22-24		12
				K00000592	

LOCATION Overisel

Project Number 518817552-383 Report Date

Borehole ID 88SB-7

Sample Date 03/08/88 Collected By STS

Received Date 03/11/88 Analysis Number 1482

Control Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88383-86	SB7	1	0-2		3
87		2	2-4		<1
88		3	4-6		<1*
89		4	6-8		<1
90		5	8-10		<1
91		6	10-12		<1
92		7	12-14		<1
93		8	14-16		<1
94		9	16-18		1
95		10	18-20		4
96		11	20-22		<1
97		wash water	20		<1
		Sediment	20		2

K00000593

* Result <1 But Detected

DCATION Overisel

roject Number 518817552-383 Report Date

orehole ID 88SB-8

ample Date 031488, 031588 Collected By SJS

eceived Date 031588 Analysis Number 1484, 1482

ontrol lumber	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
38383-100	SB8	1	0-2		<1
101		2	2-4		<1
102		3	4-6		3
103		4	6-8		<1
104		5	8-10		<1
105		6	10-12		<1
106		7	12-14		2
107		8	14-16		<1
108		9	16-18		<1
109		10	18-20		<1
110		11	20-22		<1
111		12	22-24		<1
				K00000594	

OCATION Overisel

roject Number 518817 552-383 Report Date

orehole ID 88 SB-9

ample Date 031488, 031588 Collected By STS

eceived Date 031588 Analysis Number 1484, 1487

ontrol umber	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
88-383-112	SB9	1	0-2		<1
113		2	2-4		<1
114		3	4-6		<1
115		4	6-8		<1
116		5	8-10		<1
117		6	10-12		<1
118		7	12-14		<1
119		8	14-16		<1
120		9	16-18		<1
121		10	18-20		<1
122		11	20-22		<1
123		12	22-24		<1
124		mud	22		<1
				K00000595	

OCATION Overisel

roject Number 518817552-383 Report Date

orehole ID 88SB-10

ample Date 031688 Collected By STS

eceived Date 031688 Analysis Number 1485, 1487

ontrol umber	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
38-383-125	SB10	1	0-2		<1
126		2	2-4		<1
127		3	4-6		<1
128		4	6-8		<1
129		5	8-10		<1
130		6	10-12		<1
131		7	12-14		<1
132		8	14-16		<1
133		9	16-18		<1
134		10	18-20		<1
135		11	20-22		<1
136		12	22-24		<1
137		MUD	22		<1
				K00000596	

OCATION Overisel

roject Number 518817552-383 Report Date

orehole ID 88SB-11

ample Date 031688, 031788 Collected By SJS

eceived Date 031788 Analysis Number 1487, 1488

ontrol Number	Borehole Number	Sample Number	Depth (ft)	Sample Section	FCE mg/kg
98383-141	SB-11	1	2-4		5400
142		2	4-6		1
143		3	6-8		<1*
144		4	8-10		<1*
145		5	10-12		<1
146		6	12-14		78
147		7	14-16		<1
148		8	16-18		<1
149		9	18-20		<1
150		10	20-22		<1
151		11	22-24		<1
152		12	24-26		<1
153		13	26-28		<1
154		14	28-30		<1
155		mud	18-20		36
156		mud	24		10
157		mud	28		6
				K00000597	

* Result <1 But Detected

7-19-88
M905.4

To BW Rasher, P12-103

From HW Voigt, T-260

Date July 18, 1988

Subject OVERISEL COMPRESSOR STATION -

Monitoring Well MW-4 and MW-4A PCB Results

cc

File Index #
528817-552-082

On July 12, 1988 personnel from the Chemical Division of L&FTS completed Depth-To-Water (DWL) measurements and collected groundwater samples from MW - 4 and MW - 4A monitoring well installations at the Overisel Compressor Station. Water samples were analyzed for PCB concentration.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - The monitoring wells were pumped to a constant specific conductance and pH reading (20 gallons at one gallon per minute) and the water sample collected with a clean bailer. MW - 4 stabilized at a specific conductance of 390 umhos/cm and a pH of 7.5. MW - 4A stabilized at a specific conductance of 410 umhos/cm and a pH of 7.5.

PCB Analysis - EPA Method 608.

RESULTS

Control Number	Monitoring Well ID	Depth-To-Water (ft)	PCB * A1254 ug/L
88082-1	MW - 4	2.71	1.90
88082-2	MW - 4A	2.75	0.83
88082-3	Field Blank		<0.53
88082-4	Method Blank		<0.53

* Sample detection limit <0.53 ug/L, PCB as A-1254

hwv

K00000598

7-13-88

To GDDykstra, Overisel Compressor Station

From HWVoigt, T-260, Jackson

Date July 8, 1988

Subject WASTE MATERIAL ANALYSIS REPORT

CONSUMERS POWER COMPANY

Internal Correspondence

CC BWRasher, P-12-103 PSZombo, P-11-203 WJWilson, P-12-308

File Index: 528817-510-010

The following waste material/oil samples were received by the Chemical Division of L&FTS for characterization of physical and chemical properties.

Facility Name

Overisel Compressor Station

Sample Date: 06-24-88 Received Date: 06-24-88

Lab Number	Facility Number	Sample Origin and Physical Appearance
88-1010-1	BBL-1	Water - MW4 & 4A
88-1010-2	BBL-2	Water - MW4 & 4A
88-1010-3	BBL-3	Soil - MW4 & 4A
88-1010-4	BBL-4	Soil - MW4 & 4A
88-1010-5	-	Air Compressor Condensate

Test Parameter	Sample Analysis Results				
	Water	Water	Soil	Condensate	Soil
Lab Number	88-1010-1	88-1010-2	88-1010-3	88-1010-4	88-1010-5
Facility Number	BBL-1	BBL-2	BBL-3	BBL-4	-
Flash Point-D93, °F	-	-	-	-	-
PH, Units	-	-	-	-	-
PCB, ug/g	<1	<1		10	<1
Metals, ppm	**********				
Copper	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA
Cl-Solvents, ppm	**********				
Methylene Chloride	NA	NA	NA	NA	NA
111-Trichloroethane	NA	NA	NA	NA	NA
112-Trichloroethene	NA	NA	NA	NA	NA
Perchloroethylene	NA	NA	NA	NA	NA
Freon-113	NA	NA	NA	NA	NA
112-Trichloroethane	NA	NA	NA	NA	NA
Total Halogens, ppm	NA	NA	NA	NA	NA

Data Reference: PCB-1562

K00000599

Reviewed by: MWJ Date: 7/8/88

Metals reported as _____ total metals _____ extracted metals. (NA - Not Analyzed)

Flash point indicated as "BP" indicates no flash point at boiling point

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

TS Job No. 1151XH Project: Consumers Power Company - Overisel
ate: 3/31/88 Client: Consumers Power Company
ample Description: Fine sand, trace medium sand and silt - brown (SP)
ample Location/Identification: 88SB-11 S-3 6'-8'

Sieve Size Number	Weight Retained (gm)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch				
3/8-Inch				
No. 4				
No. 8				
No. 10				
No. 16	0	0	100	
No. 30	0.2	0.1	99.9	
No. 50	59.3	18.0	81.9	
No. 80	-	-	-	
No. 100	250.8	76.2	5.7	
No. 200	11.9	3.6	2.1	
Pan	0.7 (6.2)	2.1		
Total Weight	329.1			

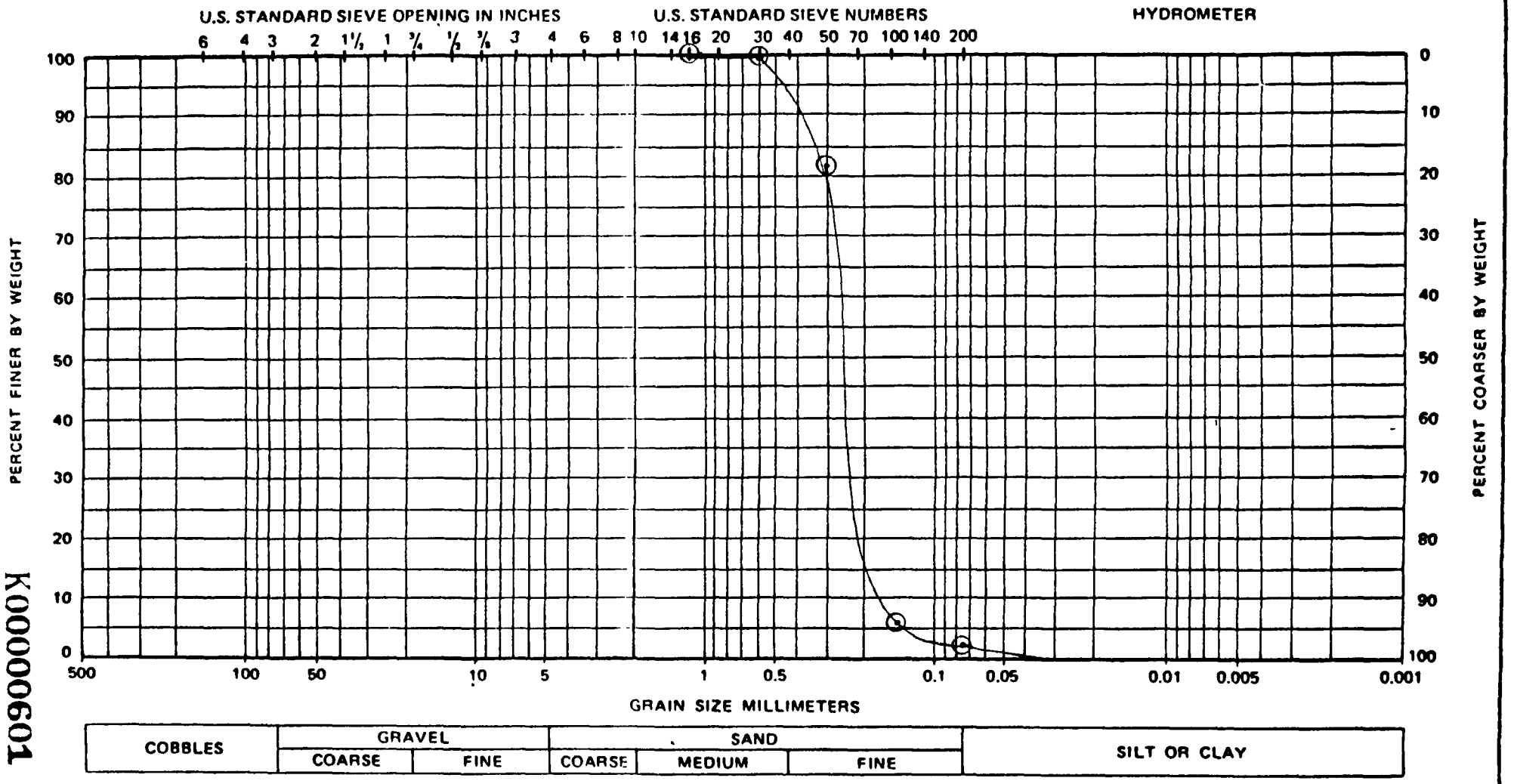
Weight of oven dry soil before washing: 329.1 gm
Weight of oven dry soil after washing: 322.9 gm
Weight loss by wash: 6.2 gm

emarks: K00000600

hecked by: DDB Technician: CDH

STS Consultants Ltd.

GRADATION CURVES



K00000601

SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
88SB-11		Fine sand, trace medium sand				
S-3		and silt - brown (SP)				
6'-8'						

DRAWN	APPROVED	DATE	JOB NO.
DDB	BBS	3/31/88	1151XH

PROJECT

Consumers Power Company
Overisel Compressor Station
Holland, Michigan

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

TS Job No. 1151XH Project: Consumers Power Company - Overisel

ate: 3/31/88 Client: Consumers Power Company

ample Description: Fine sand, trace silt - brownish gray (SP)

ample Location/Identification: 88SB-1A S-11 20-22'

Sieve Size Number	Weight Retained (gm)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch				
3/8-Inch				
No. 4				
No. 8				
No. 10				
No. 16	0	0	100	
No. 30	0.2	0.1	99.9	
No. 50	1.3	0.6	99.3	
No. 80	-	-		
No. 100	168.1	75.8	23.5	
No. 200	48.2	21.8	1.7	
Pan	2.1 (1.6)	1.7		
Total Weight	221.5			

Weight of oven dry soil before washing: 221.5 gm

Weight of oven dry soil after washing: 219.9 gm

Weight loss by wash: 1.6 gm

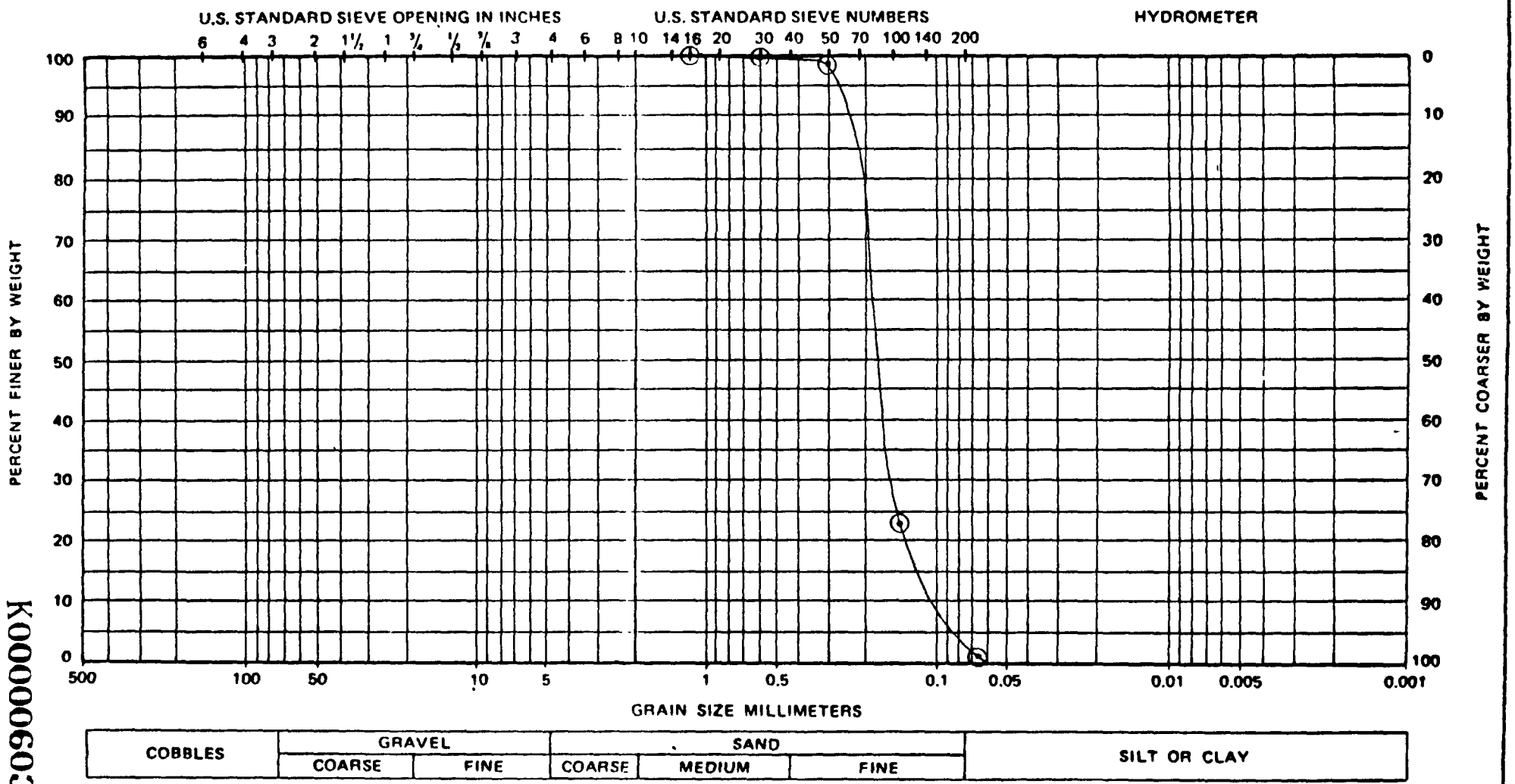
emarks:

K00000602

hecked by: MLV Technician: DH

STS Consultants Ltd.

GRADATION CURVES



K00000603

SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
88SB-1A		Fine sand, trace silt -				
S-11		brownish gray (SP)				
20-22'						

DRAWN	APPROVED	DATE	JOB NO.
DDB	BBS	3/31/88	1151XH

PROJECT

Consumers Power Company
Overisel Compressor Station
Holland, Michigan

STS Consultants Ltd.
Consulting Engineers

3340 Ranger Road
Lansing, Michigan 48906
(517) 321-4964

STS Job No.: 1151XH

LABORATORY PERMEABILITY TEST RESULTS

Project: Consumers Power Company - Overisel

Sample Designation: Boring 88SB-1 S-5 (8'-10')

Sample Description: Fine sand, trace medium sand and silt, brown

Permeability: 3.74×10^{-3} cm/sec.

STS Consultants Ltd.
Consulting Engineers

3340 Ranger Road
Lansing, Michigan 48906
(517) 321-4964

STS Job No.: 1151XH

LABORATORY PERMEABILITY TEST RESULTS

Project: Consumers Power Company - Overisel

Sample Designation: Boring 88SB-11 S-12 (24'-26')

Sample Description: Fine sand, trace silt - gray.

Permeability: 5.73×10^{-4} cm/sec.

APPENDIX C

Boring Location and

Monitoring Well Location Diagram

LEGEND

—×———×—	Fence
88 SB-8 ⊕	Soil Boring Location
88 MW-2 ⊕	Monitoring Well Location
BENCHMARK ⊕	Benchmark Location
20 W ———	West Line Of Sampling Grid
20 S ———	South Line Of Sampling Grid
▬▬102.0▬▬	Groundwater Contour

K00000607

STS Consultants Ltd.
Consulting Engineers

SOIL BORING AND MONITORING WELL LOCATIONS

OVERISEL GAS COMPRESSOR STATION

PCB CONTAMINANT SURVEY

CONSUMERS POWER COMPANY

	DATE	BY

DRAWN BY	DATE	SCALE	STS PROJECT NO.
CJD	4/88	1"=20'	1151XH
CHECKED BY	DATE	SHEET NO.	STS FILE NO.
DDB	4/88	1	1151XH

7-29-88
M905.4

MEMO

TO: Bruce Rasher, Consumers Power Company

FROM: Dianne Borrello, STS Consultants DB

RE: PCB Survey, Overisel Compressor Station

DATE: July 28, 1988

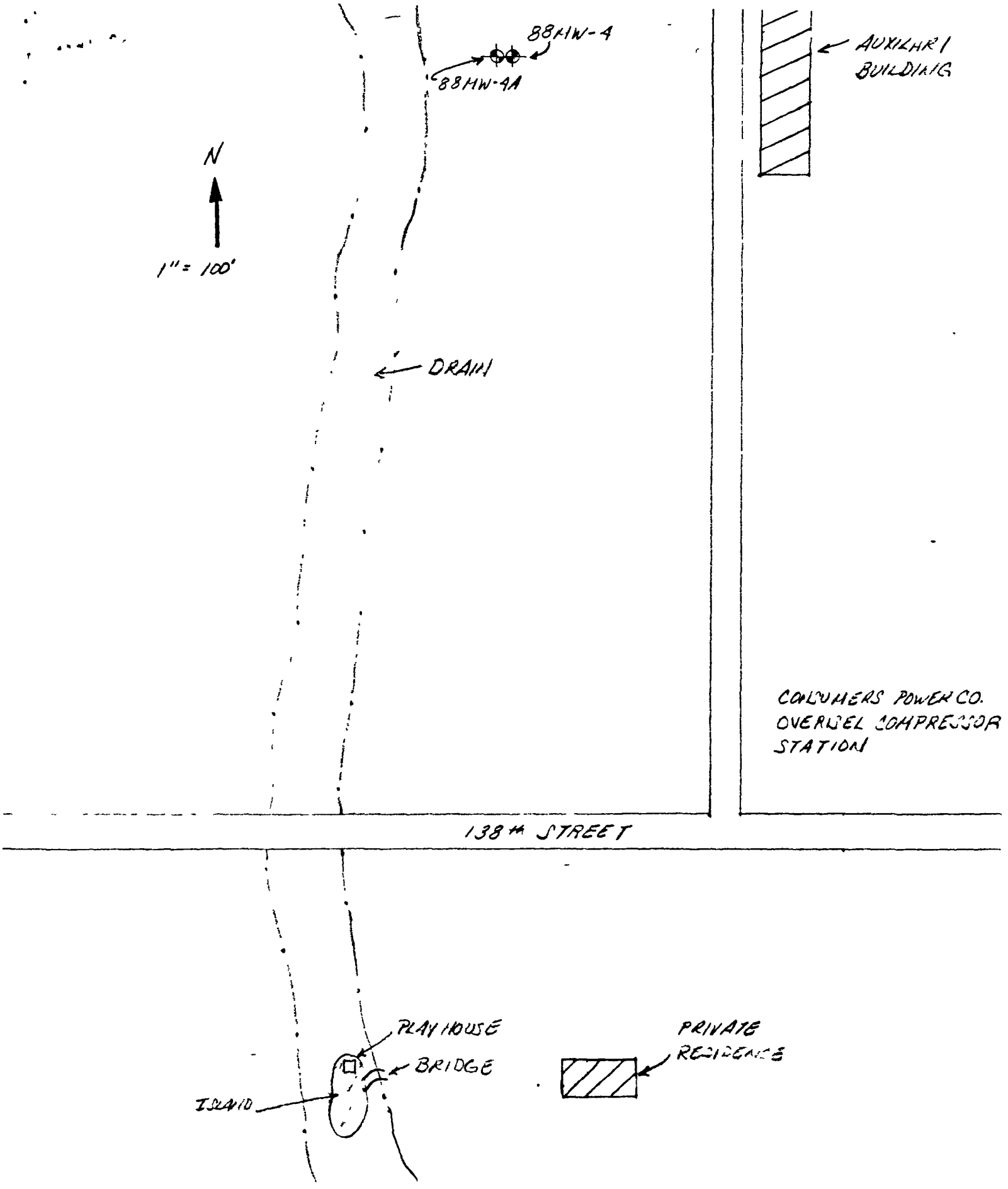
This memo is in response to the discovery of PCB in the groundwater in monitoring wells 88MW-4 and 88MW-4A at the Consumers Power Overisel Compressor Station. In light of this information, the private residence located approximately 800 feet downstream of the compressor station along the Busscner Drain should be brought to your attention. This residence is down gradient of the PCB spill area. A rough sketch of this residence and its relative position to the compressor station is attached.

It is reasonable to assume that this residence draws its water from a groundwater well. Also, it appears a channel has been cut on the property to form a small island in the drain. A walking bridge connects the property to the island. On this island. there is what apears to be a playhouse. We suggest further examination of the possibility of PCB impacts at this property.

If you have any questions, please contact me at (517) 321-4964.

DDB/lch

cc: Timothy Dahlstrand


88MW-4
88MW-4A
AUXILIARY BUILDING
N
1" = 100'
DRAIN
COLUMBIA POWER CO.
OVERISEL COMPRESSOR STATION
138th STREET
PLAY HOUSE
BRIDGE
ISLAND
PRIVATE RESIDENCE

K00000609

To	RECollings, JSC-264 JPDickey, M-1019 GDDykstra, Overisel DTKetcham, P-25-131 RLMoore, JSC-251	DHPendleton, P-25-125B ECQuibell, Freedom WWStille, P-25-141A RGVibber, Northville WHVoigt, T-260	GWWallace, White Pigeon TLZobl, St. Clair PSZombo, P-11-302
From	BWRasher, P-12-103		CONSUMERS POWER COMPANY
Date	November 10, 1988		
Subject	PCB ACTION PLAN STATUS		Internal Correspondence
CC			BWR88-150 M905.4

Attached is a status report of the PCB Site Review and Action Plan implementation as of November 10, 1988.

K00000610

IC1188-0271A-EN03

ACTION	STATUS
2. Overisel	
a. Define extent of PCB releases by April 30, 1988.	Air Logs - PCB contamination of soil resulting from the discharge of condensate from the air logs was defined by February 1, 1988. Oil-Water Separator Overflow - PCB contamination in the overflow area was defined in an April 22, 1988 draft report by STS Consultants. The final report was provided on 7-28-88 following installation of additional groundwater monitoring wells on June 21, 1988. Air System - The extent of PCB contamination in the air system was determined by June 29, 1988.
b. Develop action plan by May 31, 1988.	Soil - Conceptual agreement on cleanup to decontamination standards specified in the April 12, 1987 EPA PCB Spill Cleanup Policy was reached with the DNR in a March 15, 1988 meeting. ° Air Logs - The scope of removal of PCB-contaminated soil was finalized by May 3, 1988. ° Oil-Water Separator Overflow - The scope of removal of PCB-contaminated soil was finalized by May 19, 1988. A written PCB action plan addressing decontamination of soil and the removal of the wastewater system was submitted to the DNR on 8-8-88. No comments were received. Wastewater System - The DNR agreed with the option to remove/dispose of the wastewater system in the March 15, 1988 meeting. A decision to remove/dispose was made on June 2, 1988 because it was judged more cost-effective than attempting to decontaminate and abandon in place. A plan to remove the system was developed by June 24, 1988. A written PCB action plan addressing decontamination of soil and the removal of the wastewater system was submitted to the DNR on 8-8-88. No comments were received. Air System - On June 15, 1988, Management decided to proceed with decontamination of the air system to below 50 ppm PCB this year notwithstanding that we don't know what cleanup standard EPA will ultimately require. The decision was reaffirmed on 10-13-88 after a review of the performance by Quadrex for other companies. Proceeding may avoid the potential for EPA enforcement action or substantially reduce the amount of a penalty. In addition, EPA may accept our level of cleanup if it is already completed when their policy is finalized and applied to the industry. However, there is a chance that we may have to clean the system twice if EPA requires cleanup to a more stringent standard at a later date. Since then, we have learned that a 4 ppm PCB standard, as defined by the surrogate sampling method developed by the decontamination contractor Quadrex, will be imposed by EPA on Texas Eastern, Northwest Pipeline and Panhandle Eastern (pending) in their consent

K00000611

ACTION	STATUS
	decrees. The 4 ppm PCB decontamination standard is also specified in a nationwide permit for PCB destruction issued to Quadrex by EPA on 7-19-88.
	The actions for the air system are still under development. A bid package was mailed to two PCB decontamination contractors on July 15, 1988 requesting cost estimates for detailed specifications by August 1, 1988. On 9-19-88, E2S Emtech responded without a numerical cost estimate. Quadrex submitted a bid on 8-5-88 of $137,097 for both White Pigeon and Overisel combined. The scope was further refined after an additional site review on 10-27-88.
c. Complete action plan and site closure by November 30, 1988.	Soil ° Air Logs - Soil removal near the air logs was completed and verified by sampling by June 24, 1988. ° Oil-Water Separator Overflow - Soil removal in the oil-water separator overflow area was completed by 8-17-88 and backfilled by 8-31-88. Wastewater System - Removal was completed by 8-17-88. As of 11-10-88, 966 tons (840 yards) in 56 shipments of PCB soil decontamination and wastewater system removal waste was manifested and accepted at an EPA-approved chemical waste landfill in New York. Air System ° Actions will commence upon completion of the replacement of air compressors so as to prevent recontamination from PCB-contaminated condensates upstream in existing air compressors. ° Completion will be in 1989.
3. Northville	
a. Define extent of PCB releases by May 31, 1988.	Air Logs - PCB contamination of soil resulting from the discharge of condensate from the air logs was defined by March 24, 1988. Air Dryer Vent - PCB contamination of soil resulting from air dryer vent discharges was defined by March 24, 1988. Oil-Water Separator Overflow - Surface contamination was defined by March 24, 1988. STS Consultants was retained on July 5, 1988 to define deeper contamination. The field investigation was completed on June 29, 1988 and a final report was provided to us on 9-22-88. Air System - The air system was characterized on July 12, 1988 and sampled on July 14, 1988.

K00000612

To File M905.4

From BWRasher, P-12-103

Date March 29, 1988

Subject MARCH 15, 1988 MEETING WITH DNR ON COMPRESSOR STATIONS

CC

CONSUMERS POWER COMPANY

Internal Correspondence

File BWR 88-46

On March 15, 1988, I met with Mr Timothy J McGarry and Mr Philip Schrantz of the DNR Waste Management Division, PCB Compliance and Enforcement, to discuss preliminary action thresholds and decontamination standards in the PCB action plan for White Pigeon Compressor Station.

PROGRAM

1. The DNR and EPA (Mr Dan Patulski, who has since departed the program) have reviewed my February 8, 1988 status report and continue to be satisfied with the Company's plan. There was no mention of the schedule changes.

2. No enforcement action is planned by EPA at this time because the Company was forthcoming about the contamination and made a voluntary commitment to a plan.

3. Mr McGarry will check with Mr Terry Bonnace (Mr Patulski's replacement who works for Mr John Connell) on how EPA will handle the matter. Options include issuing an inspection report and letter indicating that no follow-up is necessary or a consent decree. (We may want a consent decree for MPSC accounting purposes.) Mr McGarry has yet to submit an inspection report to EPA but has passed on my progress reports.

4. Either both Mr McGarry and Mr Schrantz, or Mr McGarry or Mr Schrantz, will be leaving the DNR PCB Program in about one month. If one of them goes, it is more likely to be Mr McGarry. Mr McGarry was assigned to work with the Company on the compressor stations. If he leaves, he has advised that we work directly with Mr John Bohunsky.

ROUTING

PCB ACTION PLAN

GENERAL

1. I walked through the action plan components (attached). There were no suggested changes or additions.

2. Mr McGarry suggested that I acquire copies of ANR action plans from Mr Delno Malzahn to learn more from their experience. This information is also available in the DNR file via an FOIA request.

K00000613

IC0388-0170A-TP13-TP15

ACTION THRESHOLDS AND DECONTAMINATION STANDARDS

Soil

1. Mr McGarry has encouraged the Company to propose levels rather than seek assistance from the State.

2. The action threshold for soil should be any detectable level because of the dilution clause in 40 CFR 761.

3. Mr McGarry has accepted my proposal to apply the EPA PCB spill clean-up policy decontamination standards of 25 ppm PCB in restricted access areas and 10 ppm PCB in nonrestricted access areas (attached). Mr McGarry also feels that EPA will accept this because these are the only Federal numbers available and, as a result, EPA is applying them even to old spills. The DNR may not accept the distinction between restricted and nonrestricted access areas, and may also ask to reduce all locations to 10 ppm PCB or even 5 ppm PCB.

4. EPA has jurisdiction over all components. The State has no jurisdiction over the use of PCB, but feels it does have jurisdiction over releases of PCB to the environment (soil).

5. Mr Thomas Work will review the decontamination standards for soil for the DNR.

6. I walked through the low-level PCB contamination in groundwater indicated by the February 15, 1988 data (attached). I indicated that we have not ruled out cross-contamination as the probable cause for detecting PCB at low levels in the upgradient well and one of the downgradient wells.

7. Mr McGarry indicated that the North Belding Substation site and the CPC-Bay City GM precedence for leaving PCBs at concentrations of 50 ppm or more below the water table, with long-term monitoring at Belding and containment at CPC, provide the opportunity to do the same at White Pigeon.

8. I need to send information on Belding to Mr McGarry in order to document.

Air System

1. Mr McGarry encouraged us to propose the use of decontamination standards in the EPA PCB spill clean-up policy. In the absence of any action thresholds, he recommended that we use the decontamination standards to trigger action.

2. I explained the concept of controlled use/monitoring in which we would identify all drips (attached); sample, clean out and dispose of any materials found at concentrations of 50 ppm or more PCB as a PCB waste; monitor over time; and deal with any contaminated piping when the plant is decommissioned. Mr McGarry accepted the proposal on a preliminary basis.

3. We need to find out the life expectancy of the station.

Waste Water System

1. Mr McGarry encouraged us to propose the decontamination standards in the EPA PCB spill clean-up policy.

2. We discussed the following options:

   a. Remove-dispose

   b. Remove-dispose/replace

   c. Encapsulate/abandon in place

   d. Solvent flushing

   e. Pipe within a pipe

   f. Pigging

3. Mr McGarry indicated that any of these options are acceptable, provided that we have no detectable levels of PCB in water should we choose to reuse the system for disposal of rainwater from the station buildings. Mr McGarry indicated that we would not be able to permit PCB at detectable levels in an NPDES permit at the site.

OTHER

1. Mr McGarry indicated that the Great Lakes Gas Transmission Company, Otisville Station, turbine heat transfer system fluid was sampled and PCBs were not detected at 1 ppm. Mr McGarry indicated that he believes the Great Lakes Gas Transmission Company system has experienced PCB contamination in natural gas condensate only in Minnesota near the Canadian border.

2. Mr McGarry indicated that ANR Pipeline has contamination of the compressed air systems, but that Pydraul was not used in gas compressors. He is not aware of any contamination of natural gas condensate in the ANR Pipeline system.

3. Mr McGarry indicated that he is not aware of any contamination of any natural gas condensate in the State of Michigan.

CONSUMERS POWER COMPANY
MICHIGAN GAS STORAGE COMPANY
PCB Contamination at Compressor Stations

Action Plan

1. Action thresholds and standards
2. Description of systems
3. Data on PCB contamination
4. List systems which exceed action thresholds and standards
5. For these systems, list alternative remedial action and cost
6. Recommend alternative

BWR/2-26-88

K00000616

MI0288-0045A-EN05

PCB SITE REVIEW AND ACTION PLAN STATUS

Station	I Initial Screening	II Immediate Remedial Actions	III Define Extent of PCB Releases	IV Develop Action Plan	V Implement Action Plan
White Pigeon	11/86 2/87	2/87	12/87	6/88	10/88
Overisel	6/87	6/87	4/88	6/88	11/88
Northville	6/87	7/87	7/88	10/88	9/89
St Clair	7/87	8/87			
Ray 2	7/87	8/87	8/88	10/88	90
Muskegon River	8/87	9/87			
Freedom	8/87	9/87	11/88	1/89	90

- Scheduled

- Completed

- No Further Action Required

BWR / 5-18-88

K00000617

Consumers Power
POWERING MICHIGAN'S PROGRESS
General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

February 4, 1988

BWR 88-17
M905.4

Mr Timothy J McGarry
PCB Inspector
Waste Management Division
Michigan Dept of Natural Resources
PO Box 30028
Lansing, MI 48909

PCB USE AND OWNERSHIP SURVEYS

Dear Mr McGarry

Enclosed are completed PCB Use and Ownership Surveys for Consumers Power Company's White Pigeon, Overisel, Northville, St Clair and Ray Compressor Stations and Michigan Gas Storage Company's Freedom and Muskegon River Compressor Stations. We note that the authority the Department has cited for collecting this information appears to be preempted by the Federal Toxic Substances Control Act. However, the Company desires to cooperate with you as much as possible, and is, therefore, providing the information in full.

It is my understanding from our January 21, 1988 telephone conversation that the Department's request is limited to the Company's seven gas compressor stations. However, survey forms were received only at the White Pigeon and Freedom Compressor Stations and, therefore, one was copied and distributed to the others. Addresses for the seven stations are attached for your information. In addition, the forms that were mailed to Consumers Power Company, 1945 W Parnall Rd, Jackson, MI 49201, our Corporate general offices, and Michigan Gas Storage Company, Marion Production Office, PO Box F, Partridge Rd, Marion, MI 49665, which is a gas production facility, were not completed because there are no gas compression facilities at these addresses.

As you know, the Company is implementing a PCB site review and action plan at the seven compressor stations which is outlined in my July 17, 1987 letter to you. Accordingly, we have responded to Questions No 6b and No 7b by listing those equipment items into which direct additions of PCB lubricating oil were made in the past even if the present PCB concentration is under 50 ppm PCB. Systems or soil downstream of such equipment items were listed if the present PCB concentration is 50 ppm or more PCB.

K00000618

OC0288-15BWR-EN03

Should you have any questions on the surveys, please contact Bruce Rasher at (517) 788-0331.

Sincerely

Bruce W Rasher
Environmental Department

CC JPDickey, M-1019
GDDykstra, Overisel
DTKetcham, P-25-131
ECQuibell, Freedom
RGVibber, Northville
GWWallace, White Pigeon
TJWojcik, Muskegon River
TLZobl, St Clair

Mr Timothy J McGarry
February 4, 1988
Attachment

CONSUMERS POWER COMPANY

White Pigeon Compressor Station
68536 A Rd
White Pigeon, MI 49099

Overisel Compressor Station
4131 138th Avenue, Rt 1
Hamilton, MI 49419

Northville Compressor Station
9440 Napier Rd
Northville, MI 48167

St Clair Compressor Station
10021 Marine City Hwy
PO Box 520
New Baltimore, MI 48047

Ray Compressor Station
10021 Marine City Hwy
PO Box 520
New Baltimore, MI 48047

MICHIGAN GAS STORAGE COMPANY

Freedom Compressor Station
12201 Pleasant Lake Rd, Rt 1
Manchester, MI 48158

Muskegon River Compressor Station
8613 Pine Rd
Marion, MI 49665

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
PCB USE AND OWNERSHIP SURVEY
SECTION I

GENERAL INFORMATION: Please complete the following information to the best of your ability.

MAILING INSTRUCTIONS: When you have completed Sections I and II detach pages 3-6 and return them in the envelope provided no late than February 5, 1987. Thank you for your cooperation.

Facility Name OVERISEL COMPRESSOR STATION

Any Recent Previous Name(s) —

Facility Location in Michigan
Street Address 4131 138th AVE.
City and Zip HAMILTON 49419

Telephone (616) 751-4391

PCB Contact Person(s):
Name: GLENN D. DYKSTRA tel. 751-4391
Name: tel.

Facility Description:
Size:
Approximate square feet 15 ACRES
Approximate number of employees 12

Function of Facility: Briefly describe the function of your facility.

For example: ABC Corporation manufacturers automobile engine components.

Facility Function:
NATURAL GAS COMPRESSOR STATION
STORE GAS IN SUMMER FOR WINTER DELIVERY.

For office use only:
Sic Code

___ Metals	___ Disp.
___ Elec. UT	___ Gen. Manu.
___ Chem	___ Com. Bld.
___ Govt. Fac.	___ Scrap/Sal.
___ FF	___ Other
___ Elec. Equip.	

K00000621

4c) Method Used to Determine PCB Content — # of Transformers Method used on:

A) Testing — 3

B) Nameplate Information — _____

C) Presumed PCB Contaminated (only know that the transformer is liquid filled--but don't know the PCB concentration) — _____

D) Manufacturer information — _____

E) Other (please list) — _____

_____

_____

_____

Total: 3
(should equal the total # of transformers reported in 2a)

5) Enter the number of capacitors which contain PCBs.
**Please Note: Capacitors are closed units which cannot be tested. Liquid filled capacitors manufactured before or during 1979 should be considered PCB capacitors. Enter this number in the space provided. If you do not know the date of manufacture, then list the liquid filled capacitor as a PCB capacitor.

Enter number here. If none then enter "0" 0

6a) Do you own or operate any systems other than transformers or capacitors which now contain or once contained PCBs? Examples include high temperature hydraulic systems, heat transfer systems, vacuum systems, etc.

Please answer YES or NO here: YES ✓ NO ___

6b) If you answered YES to 6a, please list the type of system, liquid capacity of system, and PCB content (if known) below. An example is provided on the last page of this questionnaire.

Type of System	Systems Liquid Capacity	PCB Concentration		
1. Air compressor (South)	2 QTS. } Collection System	<1	PPM	Oily water
2. Air compressor (North)	2 qts } Collection System	320	"	BTM oil.
3. Slop Tank (compressor bld.)	(Sludge) 3000 GAL (water)	210	"	
		.018	"	
4. #5 det compressor oil	300 GAL.	19	"	
5. Oil water seperator	Est. 150 GAL	610	"	Bottom sludge
		.180	"	Water

K00000622

NATURAL RESOURCES COMMISSION
THOMAS J. ANDERSON
MARLENE J. FLUHARTY
KERRY KAMMER
O. STEWART MYERS
DAVID D. OLSON
RAYMOND POUPORE

STATE OF MICHIGAN

JAN 18 '88
RJN

JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

GORDON E. GUYER, Director

January 12, 1988

PCB USE AND OWNERSHIP SURVEY

Gentlemen:

In order to effectively and efficiently meet our responsibility under Michigan's Toxic Substance Control Act (Act 60, P.A. 1976), it is necessary for the Department of Natural Resources to maintain accurate information relating to the use and distribution of PCBs (polychlorinated biphenyls) in the State.

The enclosed questionnaire has been developed, under the Authority of Act 60, to update the current list of PCB users in Michigan. I request that you complete this questionnaire and return it in the enclosed envelope no later than February 6, 1988. Not only will the information be of importance to DNR, but also should help you to comply or maintain compliance with Act 60, and Federal regulations (PL 94-469, enacted in 1976), which regulate the sale, manufacture, use, and storage of PCBs. I cannot overstate the importance of this information. Thus, lack of an adequate and timely response to this questionnaire may result in further follow-up contact by our Department.

Included with this questionnaire are lists of trade names under which PCB's have been sold and common products which may have contained PCBs at one time. This information should assist you in completing this questionnaire. If you need assistance in completing this questionnaire, feel free to contact the following DNR district offices at these telephone numbers:

Detroit	(313) 344-4760
Lansing	(517) 322-1300
Plainwell	(616) 685-9886

As a further help to you, DNR considers PCBs to be industrial chemicals which have been identified as persistent environmental contaminants. Measurable concentrations of PCBs have been found in soils, water, fish, milk, animal feed, and human tissue. Researchers have linked PCBs to reproductive problems, gastric disorders, skin lesions, and cancerous tumors.

PCBs were mainly sold for use as insulating fluids in electrical transformers and capacitors. Production of PCB products was halted in the U.S. due to mounting public concern over their harmful environmental effects. However, electrical equipment once filled with PCB's are still in service.

Again, your complete and timely response to our survey would be most appreciated. Thank you for your cooperation in this matter.

Sincerely,

Gordon E. Guyer
Director
517-373-2329

K00000623

R1026-1
1/86

MICHIGAN ACT 60 PCB SURVEY

The first part of this survey provides information on some of the more common uses and names of PCBs and PCB products. Section I of the survey itself asks for general information on your facility. Finally Section II asks for specific information on the PCB content of any liquid filled electrical equipment or other PCB material your facility may have.

PCB Use, Trade Names, and Manufacturers

As stated before, PCBs were primarily used in transformers and capacitors as dielectric fluid. Many of the PCBs previously marketed in the United States are still in service in these applications. Information on the more common uses of PCBs and some of the trade names under which PCBs have been marketed are listed below. If you are unable to determine if an item, product, or material contains PCBs, contact the manufacturer for further information.

PCB Uses

Sale of PCB products for many of these uses was voluntarily discontinued in 1971 by the sole U.S. manufacturer. However, many PCB products in these categories may still be in service. Some of these products are listed below:

(1) Dielectric fluid for transformers and capacitors.
(2) Heat transfer media.
(3) Industrial fluids for:
- hydraulic systems
- vacuum pumps
- lubricating oils
- cutting oils.

(4) Plasticizers for:
- surface coatings
- testile coatings
- wire and cable coatings
- printing pastes and inks
- copying paper (pressure-sensitive, colored, thermographic, xerographic)
- plastics
- rubber products
- glues and adhesives
- sealants for joints

(5) Investment casting waxes

PCB Trade Names and Manufacturers

NOTE: Some non-PCB products may have been, or still may be, marketed under the same or similar names.

GENERAL:

Askeral--Generic term
Colphen--Bayer, Germany
Inclor--Caffero, Italy
Phenochlor--Prodelec, France
Santotherm--Mitsubishi, Japan
Aroclor--monsanto, U.S.A.
Deachlorodiphenyl--Caffaro, Italy
Kennechlor--Kaengafuchi, Japan
Pyralene--Prodelec, France

PLASTICIZERS:

Aroclor--Monsanto
Montar--Monsanto

HEAT TRANSFER FLUIDS:

Therminol FR-0--Monsanto
Therminol FR-2--Monsanto
Therminol FR-1--Monsanto
Therminol FR-3--Monsanto

TRANSFORMER AND CAPACITOR FLUIDS:

Abestol--American Corp.
Clorextol--Allis Chalmers
Dykanol--Cornell Dubilier
Hyvol--Aerovox
MCS 1489--Monsanto
Pyranol--General Electric
Capacitor 21--Monsanto
Diachlor--Sanfamo Electric
Flemex--McGraw Edision
Inerteen--Westinghouse Electric
Noflamol--Wagner Electric
Saf-T-Kuhl--Kuhlman Electric

HYDRAULICS/LUBRICANTS:

Santorac 1--Monsanto
Turbinol 153--Monsanto
Pydraul 135--Monsanto
Pydraul 230--Monsanto
Pydraul 540 A--Monsanto
Santorac 2--Monsanto
Pydraul A-22--Monsanto
Pydraul 150--Monsanto
Pydraul 312--Monsanto

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
PCB USE AND OWNERSHIP SURVEY
SECTION I

GENERAL INFORMATION: Please complete the following information to the best of your ability.

MAILING INSTRUCTIONS: When you have completed Sections I and II detach pages 3-6 and return them in the envelope provided no late than February 5, 1987. Thank you for your cooperation.

Facility Name _____

_____

Any Recent Previous Name(s) _____

_____

Facility Location in Michigan
Street Address _____
City and Zip _____

Telephone ( ) _ _ _ - _ _ _ _

PCB Contact Person(s):
Name: _____ tel. _____
Name: _____ tel. _____

Facility Description:
Size:
Approximate square feet _____
Approximate number of employees _____

Function of Facility: Briefly describe the function of your facility.

For example: ABC Corporation manufacturers automobile engine components.

Facility Function:

_____

_____

_____

For office use only:
Sic Code_____

____ Metals
____ Elec. UT
____ Chem
____ Govt. Fac.
____ FF
____ Elec. Equip.

____ Disp.
____ Gen. Manu.
____ Com. Bld.
____ Scrap/Sal.
____ Other

K00000626

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
PCB USE AND OWNERSHIP SURVEY
SECTION II

PCB INFORMATION: Please answer the following question to the best of your ability.

1) Do you own any liquid filled electrical equipment? Answer yes to this question if you have ANY liquid filled transformers or capacitors. If you are not sure whether your electrical equipment is liquid filled then check with the manufacturer. If you have NO liquid filled electrical equipment, than answer NO and move on to question 6.

Answer YES or NO here: YES ___ NO ___

2a) Enter the number of liquid filled transformers you own here: _____

2b) Enter the number of liquid filled capacitors you own here: _____

3) Does any of your electrical equipment contain PCBs at a concentration greater than or equal to 50 parts per million?

**Please note: If any of your electrical equipment contains PCBs in a concentration greater than or equal to 50 ppm or if you do not know if your liquid filled electric equipment contains PCBs, then you must answer YES to this question. If none of your equipment contains PCBs at a concentration greater than or equal to 50 ppm, then answer NO to this question.

Answer YES or NO here: YES____ NO____

4a) Enter the number of transformers which have a concentration of PCBs greater than 50 ppm but less than 500 ppm.

**Please note: If you do not know the PCB content of a liquid filled transformer then you must list it in this category.

Enter number here. If none then enter "0" ____

4b) Enter the number of transformers which have a concentration of PCBs greater than or equal to 500 ppm.

Enter number here. If none then enter "0" ____

4c) Please identify how you determined the presence and concentration of PCBs (if any) in your liquid filled transformers. Use the options listed below. Next to each option enter the number of transformers whose PCB content was determined by that option. Even if your liquid filled transformers contain no PCBs you must indicate how the was determined. An example is provided on the last page of this questionnaire.

4c) Method Used to Determine PCB Content — # of Transformers Method used on:

A) Testing _____

B) Nameplate Information _____

C) Presumed PCB Contaminated (only know that the transformer is liquid filled--but don't know the PCB concentration) _____

D) Manufacturer information _____

E) Other (please list) _____

_____

_____

_____ _____

Total: _____
(should equal the total # of transformers reported in 2a)

5) Enter the number of capacitors which contain PCBs.
**Please Note: Capacitors are closed units which cannot be tested. Liquid filled capacitors manufactured before or during 1979 should be considered PCB capacitors. Enter this number in the space provided. If you do not know the date of manufacture, then list the liquid filled capacitor as a PCB capacitor.

Enter number here. If none then enter "0"____

6a) Do you own or operate any systems other than transformers or capacitors which now contain or once contained PCBs? Examples include high temperature hydraulic systems, heat transfer systems, vacuum systems, etc.

Please answer YES or NO here: YES____ NO____

6b) If you answered YES to 6a, please list the type of system, liquid capacity of system, and PCB content (if known) below. An example is provided on the last page of this questionnaire.

Type of System	Systems Liquid Capacity	PCB Concentration
1.		
2.		
3.		
4.		

K00000628

7a) Do you own any products, items, or materials other than the electrical equipment or the systems noted above which contain a concentration of PCBs greater than 50 ppm? Examples include drums of transformer oil, PCB contaminated soil, etc.

Please answer YES or NO here: YES____ NO____

7b) If you answered YES to question 7a, please list the items and their PCB contents below.

Type of Item, Material, or Product	PCB Concentration
1.	
2.	
3.	
4.	

EXAMPLES:

Example 4c) Assume you have 7 liquid filled transformers as reported in question 2a.

-2 of the transformers say on the nameplate that they contain "Askeral." As seen in the attached information, this is a generic term for PCB fluid. You would mark a "2" in the space next to the name plate information choice.

-1 of the transformers you have had tested for PCB content. You would mark a "1" next to the "tested for PCB" choice.

-3 of the transformers were bought in 1986 and you have a letter from the manufacturer that assures you that these transformers contain no PCBs. You would mark a "3" next to the "manufacturers information" choice.

-1 of the transformers you know nothing about except that it is liquid filled. This transformer you must presume to be PCB contaminated (50-500 ppm PCB). You would mark a "1" next to the "presumed PCB contaminated" choice.

A) Testing	1
B) Nameplate Information	2
C) Presumed PCB Contaminated (only know that the transformer is liquid filled but don't know PCB content if any)	1
D) Manufacturer Information	3
E) Other (please list)	0
_____	
_____	
_____	
	_____

Should equal the total # reported in 2A: Total = 7

Example 6b) Assume that your facility owns a diffusion pump vacuum system which contains 3.0 gallons of PCB oil. The oil has a PCB concentration of 107,693 ppm PCB.

Type of System	Systems Liquid Capacity	PCB Concentration
Vacuum System	3.0 gallons	107,693 ppm

AAPP

To GDDykstra, Overisel
DHPendleton/DTKetcham, P-25-131
WHVoigt, T-260

From BWRasher, P-12-103

Date March 31, 1989

Subject OVERISEL POST-CLOSURE GROUNDWATER MONITORING PROGRAM

CC

CONSUMERS POWER COMPANY

Internal Correspondence

~~BWR 89-75~~
M905.4

Attached is the program for implementation in 1989.

K00000631

IC0389-63BWR-EN03

CONSUMERS POWER COMPANY
OVERISEL COMPRESSOR STATION

POST-CLOSURE GROUNDWATER MONITORING PROGRAM

1.0 PURPOSE
To specify the requirements, responsibilities and methods for assuring implementation of the post-closure groundwater monitoring agreement with the Michigan Department of Natural Resources at the Overisel Compressor Station.

2.0 SCOPE
This program is applicable to the Gas Production & Transmission, Laboratory & Field Technical Services - Chemical Division and Environmental Departments for the acquisition and reporting of groundwater data at the Overisel Compressor Station.

3.0 DEFINITIONS
None

4.0 REFERENCE DOCUMENTS

4.1 PCB Action Plan for Overisel Compressor Station filed with the Michigan Department of Natural Resources on August 8, 1988 (August 8, 1988 letter from Bruce Rasher to Timothy J McGarry, Files BWR 88-112 and M905.4)

5.0 REQUIREMENTS AND RESPONSIBILITIES

5.1 GAS PRODUCTION & TRANSMISSION

5.1.1 The Gas Production & Transmission Department shall be responsible for assuring implementation of the post-closure groundwater monitoring agreement with the Michigan Department of Natural Resources at the Overisel Compressor Station.

5.1.2 The Gas Production & Transmission Department shall each year budget and provide the Laboratory & Field Technical Services - Chemical Division with an area/function number or other suitable account number for charges in connection with acquisition of data.

5.2 LABORATORY & FIELD TECHNICAL SERVICES - CHEMICAL DIVISION
The Laboratory & Field Technical Services - Chemical Division shall be responsible for the acquisition of groundwater data in accordance with the following requirements:

5.2.1 Monitoring Points
Monitoring shall be conducted with the seven groundwater monitoring wells located at Overisel Compressor Station: 88MW-1, 2, 2A, 3, 3A, 4 and 4A (Figure 1).

5.2.2 Sample Collection Methods

5.2.2.1 Groundwater Elevation Measurement Method
Groundwater elevations shall be determined prior to sample collection using depth-to-water measurements in the monitoring wells, replicated for agreement (ie, a minimum of two sets of measurements), by the wetted-tape method (to the nearest 0.01 ft) using the following surveyed top-of-casing elevations:

Monitoring Well	Top-of-Casing Elevation (ft)	Well Depth (ft)*
88MW-1	116.80	21.78
88MW-2	105.02	12.04
88MW-2A	105.33	23.15
88MW-3	104.43	11.50
88MW-3A	104.08	18.37
88MW-4	104.11	11.7
88MW-4A	104.30	20.2

Distance from top-of-casing to bottom of well screen

5.2.2.2 Groundwater Sample Collection Method
After measurement of groundwater elevation and prior to sample collection, the monitoring wells shall be evacuated. Representative samples of groundwater shall be collected at screen depth with a bailer and line constructed of appropriate materials which shall be cleaned prior to each use in order to prevent cross-contamination. (Care shall be given to avoid introducing any level of contaminant into the wells.) A sample shall be considered representative for the purpose of collection after a volume of water equal to a minimum of five times the storage capacity of the well is evacuated and pH and specific conductance (measured at frequent intervals) stabilize (ie, within ±10 percent).

5.2.3 Parameters

5.2.3.1 The concentration of PCB in groundwater shall be measured.

5.2.3.2 The direction of groundwater flow shall be indicated by plotting contours of the measured groundwater elevations on a scale drawing of the station.

5.2.4 Sample Handling and Preparation
Sample volume, containers, preservative, holding time and preparation shall be in accordance with appropriate standards to assure representative samples. Samples shall be properly labeled and catalogued.

5.2.5 Analytical Methods, Instruments and Detection Limit
Appropriate analytical methods and instruments shall be used to achieve the detection limit stated for the analytical method.

5.2.6 Analytical Quality Control
Appropriate analytical quality control techniques shall be used to assure the precision and accuracy of the data.

5.2.7 Monitoring Frequency and Duration
Monitoring shall be conducted during the month of August each year through the year 1997.

5.2.8 Schedule and Reports
Monitoring shall be conducted within the first five (5) business days of the month. Written notification of the date samples were collected and any problems as they may affect the data shall be provided by Laboratory & Field Technical Services - Chemical Division to the Environmental Department within three (3) business days of when the monitoring was done. A written report of field notes, sample preparation and handling, analytical methods and instruments, analytical results and quality control data shall be provided by Laboratory & Field Technical Services - Chemical Division to the Environmental Department within three (3) weeks of the date samples were collected.

5.3 ENVIRONMENTAL DEPARTMENT
The Environmental Department shall be responsible for management of data acquisition and regulatory agency reporting in accordance with the following:

5.3.1 Program Management
The Environmental Department shall assure that this program is properly implemented and perform a technical review of monitoring reports. The program shall be evaluated on an annual basis using the monitoring data to assure that any changed conditions at the station can be detected.

5.3.2 Reporting
The Environmental Department shall submit a report of the concentration of PCB in the samples to the Michigan Department of Natural Resources within five (5) weeks of the date of monitoring. Copies of the reports shall be furnished to the Station Superintendent and Gas Production & Transmission Department-GO.

Consumers Power Company/Michigan Gas Storage Company

Compressor Stations

PCB Site Review and Action Plan

Status

August 1989

A. Object

The purpose of this report is to update representatives of the Michigan Department of Natural Resources (DNR) on the status of the Company's PCB Site Review and Action Plan for compressor stations.

B. Scope

1. Background

In February 1987, Consumers Power Company notified representatives of the DNR that it had used a lubricant containing the banned substance, polychlorinated biphenyl (PCB), in some of the air compressors at its White Pigeon Compressor Station, prior to the effective date of the regulation of PCB under the Toxic Substances Control Act (TSCA). New information came to light indicating that some of the PCB was released to the environment. As a result, the Company voluntarily developed and implemented a four-year program to locate and remove PCB at all seven Consumers Power Company/Michigan Gas Storage Company compressor stations, called the PCB Site Review and Action Plan.

The Company's compressor stations function to increase the pressure of natural gas transported throughout the State of Michigan via high-pressure transmission pipelines by pumping it with large compressors. In a typical gas compressor station, air compressors, which should not be confused with the gas compressors, make high-pressure air for safely starting the gas compressors, instrumentation and control, and utility purposes, such as pneumatic tools and sandblasting. The PCB lubricant was used in the air compressors only, and not in the gas compressors as was the practice by other pipeline companies, because of PCB's explosion-proof characteristics.

2. The Plan

The PCB Site Review and Action Plan is divided into five phases:

K00000635

a. Phase I - Initial Screening

1. Site visit and interview station superintendent

2. Review purchase records for use of Pydraul AC (a Monsanto product distributed by Mobil Oil Co which was formulated with about 57% PCB Aroclor 1254)

3. Review plant systems for potential PCB onsite and offsite releases

4. Sample key indicator points

5. Analyze samples and report data to DNR

b. Phase II - Immediate Remedial Actions (if necessary)

Determine appropriate remedial actions, such as:

1. Isolate any PCB remaining in the system from the environment

2. Collect, characterize and properly dispose of wastes

3. Remove and properly dispose of liquids and sludges containing PCB

4. Seal systems to prevent refilling

c. Phase III - Define Extent of Prior Releases (if necessary)

Determine a site-specific plan; include some or all of the following:

1. Geophysical investigation (if applicable)

2. Soil borings

3. Sample plant systems

4. Analyze and report data

d. Phase IV - Develop Action Plan (if necessary)

1. Determine action thresholds and standards

2. Compare alternatives and their costs

3. Select cost-effective/environmentally sound action plan methods

4. Acquire Agency approval of selected method

e. Phase V - Implement Action Plan and Site Closure (if necessary)

The Company commenced implementation of the Plan in 1987; completion is scheduled for the end of 1990 (see the attached PCB Site Review and Action Plan Schedule).

C. Findings

Refer to the attached PCB Site Review and Action Plan Schedule for a summary of the completion dates discussed under this section.

1. Initial Screening

Initial screening was completed at all seven stations by August 1987. Following are the findings of the initial screening:

a. Through a combination of purchase records and sampling data, we found that PCB was apparently used for a short period during the 1960s in the air compressors of four out of the seven compressor stations:

Consumers Power Company

White Pigeon

Overisel

Northville

Michigan Gas Storage Company

Freedom

PCB was not purchased or used at:

Consumers Power Company

St Clair

Ray

Michigan Gas Storage Company

Muskegon River

The Company has completed the Plan as far as these three stations, St Clair, Ray and Muskegon River, are concerned.

b. In addition, let me stress at this point that we have not found any evidence of PCB contamination of the natural gas system that some other pipeline companies in other parts of the U.S. have experienced.

c. Our initial sampling data indicated that releases from the air systems had occurred to the surrounding soils from air receiver tanks, air dryer vents and from wastewater system discharges such as oil-water separators and dry wells. However, these were believed at that time to be confined to the station property, and access to the public is restricted by fencing.

2. Immediate Remedial Actions

By September 1987, immediate remedial actions were completed where required at White Pigeon, Overisel, Northville and Freedom. Following is a summary of the actions taken:

a. The use of house air for respiratory air supply and sandblasting was terminated.

b. All PCB releases to the environment were terminated by capturing and containerizing the discharges of condensate from air compressors, air receiver tanks, air dryer vents and other miscellaneous points.

c. The wastewater systems were drained and sealed to prevent refilling and the wastes were disposed of in accordance with PCB requirements.

3. Define Extent of Prior PCB Releases

Efforts to define the extent of PCB contamination at the four stations were completed by December 1988. In summary, following is what we found:

a. The comprehensive investigations have shown that PCB releases were confined to the station properties, except for a minor amount of contamination just outside of the fence of Northville. (The adjacent property, Maybury State Park, is owned by the State of Michigan and is not easily accessible to the public.)

b. Despite the presence of PCB at concentrations exceeding the Federal limit of 50 ppm PCB in soils at each station, there is no indication of groundwater contamination, except at Overisel where very low levels (a maximum of 17 ppb PCB in the first sampling and 1.25 ppb PCB after the well was pumped) were found but are believed to be an artifact of contamination introduced by the monitoring well installation process due to drilling through contaminated soil. The Company is committed to a 10-year, annual groundwater monitoring program at both White Pigeon and Overisel to monitor any potential future changes in the groundwater. Results of 1989 monitoring at White Pigeon continue to show no detectable levels of PCB in groundwater; results for Overisel will be available in September 1989.

c. PCB contamination was found throughout some portions of the air systems, including air compressors, air receivers, air dryers and associated piping.

d. Using the data collected, we were able to accurately estimate the scope of cleanup activities required at each station.

4. Develop Action Plan

Action plans addressing the decontamination of soil and wastewater systems were submitted to the DNR for each station by March 1989. Action plans covering the decontamination of air systems at White Pigeon and Overisel were submitted by March 1989. The plans for the Northville and Freedom air systems are due by April 1990.

a. Action thresholds and decontamination standards were determined for soil and the wastewater and air systems. For soil, we adopted the standards of 25 ppm PCB for restricted access areas and 10 ppm PCB for non-restricted access areas contained in the 1987 Environmental Protection Agency (EPA)

PCB Spill Cleanup Policy. The decontamination standard for the wastewater systems was also based on the Policy and the DNR's July 1987 guidance letter applicable to disposal of liquids with less than 10 ppm PCB. The decontamination standard for the air systems was based on the 4 ppm PCB performance standard contained in the permit issued by EPA to the decontamination contractor, Quadrex.

b. A number of decontamination methods, their efficacy and costs, were compared prior to selection of the methods recommended in the action plans submitted to the DNR. For soil, we decided to remove for disposal in an EPA-approved chemical waste landfill. Wastewater systems were also for the most part removed for disposal except, for the portions of piping which were running under the control rooms containing equipment located in the auxiliary buildings. These needed to be decontaminated because removal was not economically feasible. Decontamination of the air systems is to be accomplished using the Freon removal technique for which Quadrex holds its EPA permit.

5. Implement Action Plans and Site Closure

Decontamination of soil and wastewater systems was been completed at each station by August 1989, except that removal of a small remaining portion of the wastewater system at Northville will not be finished until October 1989. Decontamination of the air systems at White Pigeon and Overisel was completed by June 1989. Air systems at Northville and Freedom are scheduled to be decontaminated by June 1990. In all cases, the required decontamination standards have been met as verified by post-decontamination sampling. These data are included in the attached Appendix A.

Representatives of the DNR conducted an inspection at White Pigeon on May 5, 1989. In addition, a representative of the EPA conducted an inspection of the contractor, Quadrex, performing decontamination of the air systems at White Pigeon on May 26, 1989. No violations of the requirements under TSCA were found in either inspection.

D. Recommendations

The Company has successfully addressed areas of concern at its compressor stations by voluntarily carrying out a five phase PCB site review and action plan. As a result, we recommend continuation of the implementation of the plan through to its conclusion by following the scope and schedule

discussed above and submitted to the DNR in the written action plans.

The specific items to be completed include:

1. Develop and submit the action plans for decontamination of air systems at Northville and Freedom by April 1990.

2. Complete the removal of the wastewater system at Northville by October 1989.

3. Decontaminate the air systems at Northville and Freedom by June 1990.

4. The annual groundwater monitoring should be conducted at White Pigeon and Overisel as planned.

BWR/8-8-89

K0000642

CONSUMERS POWER COMPANY (CPCo) / MICHIGAN GAS STORAGE COMPANY (MGSCo)
COMPRESSOR STATIONS
PCB SITE REVIEW AND ACTION PLAN SCHEDULE
COMPLETION DATES

	Phase	CPCo White Pigeon Plant 1	CPCo White Pigeon Plant 2	CPCo Overisel	CPCo Northville	MGSCo Freedom Plant 1	MGSCo Freedom Plant 2	CPCo Ray	CPCo St Clair	MGSCo Muskegon River
I	Initial Screening	Feb 87	Feb 87	Jun 87	Jun 87	Aug 87	Aug 87	Jul 87	Jul 87	Aug 87
II	Immediate Remedial Actions	Feb 87	Feb 87	Jun 87	Jul 87	Sep 87	Sep 87	Aug 87	Aug 87	Sep 87
III	Define PCB Releases	Dec 87	Dec 87	Jul 88	Sep 88	Sep 88	Dec 88	Sep 88	NA	NA
IV	Develop Action Plan									
	Soil and Wastewater System	Jul 88	Jul 88	Aug 88	Sep 88	Mar 89	Mar 89	NA	NA	NA
	Air System	Mar 89	Mar 89	Mar 89	*Apr 90	*Apr 90	*Apr 90	NA	NA	NA
V	Implement Action Plan									
	Soil	Sep 88	Sep 88	Aug 88	Nov 88	Dec 88	May 89	NA	NA	NA
	Wastewater System	~~Aug~~ NV 89	Apr 89	Aug 88	~~Apr 89~~ May 90	NA	NA	NA	NA	NA
	Air Compressors	Mar 89	Dec 88	~~May~~ Jun 89	*Apr 90	*Apr 90	*Apr 90	NA	NA	NA
	Air System	Jun 89	May 89	Apr 89	*Jun 90	*Jun 90	*Jun 90	NA	NA	NA
	Closure	~~Aug~~ NV 89	May 89	~~May~~ Jun 89	*Jun 90	*Jun 90	*Jun 90	Sep 89	Aug 87	Sep 87
	Monitoring	*Thru 97	*Thru 97	*Thru 97	NA	NA	NA	NA	NA	NA

* Indicates actions pending as of 8-8-89 status report.

BWR/8-8-89
11-10-89

To: John Dickey, M-1019
Paul Hittle
Don Pendleton, P25-125B

From: Bruce Rasher

Date: 6-29-89

Re: Compressor Stations - PCB

CONSUMERS
POWER
COMPANY

Internal
Correspondence

BWR 89-117
M905.4

This is to let you know that EPA has issued its long-awaited opinion on the use of PCBs (at concentrations of 50 ppm or greater) in the air systems of compressor stations, finding that it is an unauthorized use. (See the attached June 13, 1989 letter from Victor J Kimm, Acting Assistant Administrator for Pesticides and Toxic Substances, EPA, to Ted Kinne of INGAA.) However, EPA also has taken the position that these systems may be reused if first decontaminated in accordance with the PCB Spill Cleanup Policy. This is favorable to the Company because we had proceeded with a voluntary cleanup (in order to reduce the risk of enforcement action), in the absence of a written position from the Agency, based on the Policy which EPA has now stated applies in this instance.

EPA intends to publish a cleanup policy specifically addressing this type of equipment. But it is unlikely to be more stringent than the standards used by Consumers to date. Therefore, no changes to the action plans submitted to the DNR are recommended as a result of this Agency interpretation at this time.

regulations. See 40 CFR 761.20(c)(5), published in 53 FR 24206 (June 27, 1988). However, if the PCBs are not cleaned up in accordance with EPA policies, the contamination constitutes a continuing unauthorized use of PCBs.

Once the spill is cleaned up to EPA-specified levels, the pipes and receiving tanks are authorized for use under 40 CFR 761.20(c)(5). That section states:

> Equipment, structures, or other materials that were contaminated with PCBs because of spills from or proximity to a PCB Item greater than 50 ppm, and which are not otherwise authorized for use or distribution in commerce under this part, may be distributed in commerce, provided that these materials were decontaminated in accordance with applicable EPA PCB spill cleanup policies in effect at the time of the decontamination, or if not previously decontaminated, the time of the distribution in commerce.

Here, the piping and tanks are the equipment contaminated by a spill from an item (the air compressor) greater than 50 ppm. Once decontaminated in accordance with the applicable policies, the equipment can be legally used.

If the initial spill of PCBs into the pipes and tanks is not cleaned up after discovery, however, the continued use of the contaminated equipment will be considered an unauthorized use of PCBs in the ancillary pipes and tanks. TSCA prohibits non-totally enclosed uses of PCBs unless specifically authorized by EPA. Such use violates TSCA because it is neither totally enclosed nor authorized.

EPA emphasizes that the regulatory provision applicable here (40 CFR 761.20(c)(5)) is triggered both by a "spill" and by contamination that results from <u>proximity to</u> a PCB Item with PCB concentrations greater than 50 ppm. The PCB contamination in the ancillary equipment resulted from either a spill from the air compressors, or, from the proximity of the ancillary equipment to the air compressors. The evidence of greater than 50 ppm PCBs in the ancillary equipment is sufficient for one to find that the air compressors were contaminated at greater than 50 ppm when the contamination of the ancillary equipment occurred.

There is no published policy for the cleanup of air compressor pipes and tanks. Thus, the Agency will issue a new policy for cleanup of air compressor pipes and tanks which will address the peculiarities of the equipment. Until EPA issues this policy, the EPA regional offices will dictate the level of cleanup required for such systems.

EPA wishes to emphasize that environmental contamination associated with PCBs in these air compressor systems may, under certain circumstances, constitute illegal disposal of PCBs. The cleanup of the contamination in the piping and tanks would not discharge any independent liability for PCB spills causing environmental contamination at the compressor stations.

If you have any further questions or concerns, please contact John H. Smith of my staff at 382-3935.

Sincerely yours,

Victor J. Kimm
Acting Assistant Administrator
for Pesticides
and Toxic Substances

To	GDDykstra, Overisel DTKetcham, P-25-131 DHPendleton, P-25-125B	ECQuibell, Freedom RGVibber, Northville GMWallace, White Pigeon
From	BWRasher, P-12-103	CONSUMERS POWER COMPANY
Date	January 25, 1989	
Subject	DISPOSITION OF DRAIN LINES	Internal Correspondence ~~BWR-89-22~~ M905.4
CC	JPDickey, M-1019	

This is to summarize my recommendations of how wastewater drain lines may be dispositioned as you continue the PCB actions at your stations.

Drain lines tested and found to contain less than 10 ppm PCB may be reused to convey wastes to a floor drain collection tank. The tank contents shall be characterized (including PCB) for proper disposal.

Drain lines tested and found to contain from 10 ppm or more up to and including 25 ppm PCB may either be:

1. reused to convey wastes to a floor drain collection tank if decontaminated to less than 4 ppm PCB, and if the tank contents are characterized (including PCB) for proper disposal;

2. plugged and abandoned in place; or

3. removed and properly disposed of.

Drain lines tested and found to contain more than 25 ppm PCB must either be:

1. decontaminated to less than 4 ppm PCB,

2. decontaminated to 25 ppm or less PCB and plugged and abandoned, or

3. removed and properly disposed of.

These recommendations are based on the: (1) EPA PCB rules; (2) April 1987 EPA PCB Spill Cleanup Policy; (3) July 15, 1987 letter from DNR giving PCB liquid management guidelines; (4) July 5, 1988 permit issued by EPA to Quadrex for PCB decontamination; and (5) conversations with other pipeline companies. In the absence of specific guidelines from the agency, you need to be aware that there is a risk of the agency requiring additional actions or taking enforcement action in the future if conditions should change.

K00000646

IC0189-0074A-EN02

12-13-88
1-10-89 mtg

Gary Wallace

Reuse / Abandonment of Drain Pipe

Can the following be reused to convey clean condensate to a clean collection tank? floor drain

Plant 1

drinking fountain 2" drain line (33) 1 ppm (30 ft left, sampled 1"-2" into pipe straight run/no dips

shop drain 3" 6 ppm (33) sampled 1"-2" into pipe (50 ft left, straight run/no dips)

Plant 2

floor drain by 1 & 2 10 ppm (44) sampled 1"-2" into pipe (50-60 ft left (w/ 4 other drains) straight run/no dips,

25 ppm or less

15 ft N/O corner (SW side 8" Compressor Bldg (41) 8 ppm - abandoned approx 120 ft)

3 & 4 air compressors 10 ft left (30) 6 ppm

12-14-88 John Dickey

Risk EPA will say we are running waste thru contaminated pipe. We don't know if there are any pockets (concentrations decreased in straight line)

Need to look at cost of replacement and decontamination

* 4 ppm cleanup std in Quadrex permit

K00000647

To	GDDykstra, Overisel ECQuibell, Freedom	RGVibber, Northville GMWallace, White Pigeon	
From	BWRasher, P-12-103, Jackson		CONSUMERS POWER COMPANY
Date	January 11, 1989		
Subject	MANAGEMENT OF AIR SYSTEM CONDENSATE		Internal Correspondence
CC	JPDickey, M-1019 DTKetcham, P-12-225 RARogers, P-11-303	DLSitko, JSC-309 WHVoigt, T-260 WJWilson, P-12-308	BWR-89-13 M905.4

This is to summarize my recommendations on management of air system condensate applicable until decontamination and/or replacement has been completed. In order to comply with the temporary storage limit of 30 days for PCB liquid waste (40 CFR 761.65(c)(1)), I recommend that you characterize the contents of waste drums used to collect air system condensate within 30 days of the date you begin filling a drum. The smaller, approved waste containers may be used if only relatively small quantities of condensate are generated each month.

In addition, I recommend that you store the waste containers awaiting laboratory test results in your designated hazardous waste storage area. The waste containers and the storage area both should be labeled.

Drums tested and found to contain 10 parts per million or more, but less than 500 parts per million PCB, may be stored in labeled containers in your designated hazardous waste storage area for up to 6 months (prior to shipment to the central storage site for disposal within the one-year deadline) (40 CFR 761.65(a)). Should you decide to store drums containing liquids with 10 parts per million or more, but less than 500 parts per million PCB in your designated hazardous waste storage area, the waste container would also need to bear the notation that the contents of the drum are less than 500 parts per million PCB.

Your hazardous waste storage area should meet the requirements for long-term storage of PCB waste.

Drums tested and found to contain 500 parts per million or more PCB must be shipped for disposal within 30 days from the date that you begin filling the drum.

Drums tested and found to contain less than 10 parts per million PCB are a liquid industrial waste which may be stored indefinitely and need not be stored in your designated hazardous waste storage area.

K00000648

IC0189-31BWR-EN03

1-6-89

Crankcase leakage/residual oil

Condensate will not be "oil-free."

1/12/89

PBL

Re: Air Compressor Condensate Discharge at Compressor Station

① For White Pigeon, Overisel, Northville and Freedom:
need to send memo to PBL asking if a permit or exemption to discharge condensate is required.
(Describe new air compressors (and those not being replaced) w/ respect to lubricated or teflon parts.)
Explain that condensate is collected/characterised for PCB/disposed as PCB or liquid industrial waste.

② For Bay, St. Clair and Muskegon River:
need to send PBL memo stating that investigation complete and no PCB found. Give what info I have on air compressors (lubricated or teflon parts) and where condensate is currently discharged. PBL to f u on if a permit or exemption is required.

K00000649

1-6-89
1-10-89 mtg

PBL

Re: Air Compressor Condensate Discharge at Compressor Station

1. For White Pigeon, Overisel, Northville and Freedom:
need to send memo to PBL asking if a permit or exemption to discharge condensate is required. (Describe new air compressors (and those not being replaced) w/ respect to lubricated or teflon parts.) Explain that condensate is collected/characterised for PCB/disposed as PCB or liquid industrial waste.

2. For Ray, St. Clair and Muskegon River:
need to send PBL memo stating that investigation complete and no PCB found. Give what info I have on air compressors (lubricated or teflon parts) and where condensate is currently discharged. PBL to f u on if a permit or exemption is required.

Wallace
Dykstra
Quibell

-10-89

teflon/lubricated piston (oil/oilless)

ie cannot make case for oil/grease in compressor condensate even / teflon and non-lube type

All have crankcase oil w/ slight (minimal) possibility of oil getting by wiper packing and into air stream

Gary Wallace
1-16-89

K00000650

1-16-89

Gary Wallace

Re: Discharges

- Air compressor condensate and air system condensates → Compressor Bldg floor drain collection tank

- Water softener regeneration waste – no longer generated

- Only roof drain water is discharged to the ground thru dry wells

- No discharges to ground at site

K00000651

MRP

Consumers Power
POWERING MICHIGAN'S PROGRESS
General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

August 29, 1989

BWR 89-155
M905.4

Mr John M Bohunsky, PE
Supervisor, Region III
Waste Management Division
Department of Natural Resources
Secondary Complex, General Office Building
PO Box 30028
Lansing, MI 48909

RE: OVERISEL COMPRESSOR STATION - 1989 GROUNDWATER MONITORING REPORT

Dear Mr Bohunsky

In the PCB Action Plan for Consumers Power Company's Overisel Compressor Station, filed on August 8, 1988, Consumers stated its plans to undertake a long-term, annual groundwater monitoring program at the site. The program commenced in March of 1988 utilizing the existing seven monitoring wells and is intended to assure detection of any changes in conditions at the site. The duration will be at least ten years, but will be evaluated on an annual basis using the data obtained from monitoring.

This is to report the results of monitoring conducted on August 7, 1989. As shown in the attached table, PCB was not detected (at an analytical detection limit of 0.06 ppb) in five of the seven monitoring wells at the site. Monitoring Wells 88MW-4 and 88MW-4A continue to show extremely low levels of PCB. The probable cause of these readings is cross-contamination introduced as an artifact of the monitoring well installation process. In addition, the direction of groundwater flow continues to be to the southwest.

Please contact me at (517) 788-0331 if you have any questions about these data.

Sincerely

Bruce Rasher
Environmental Department

CC JPDickey, M-1019
GDDykstra, Overisel
DTKetcham, P-25-131

K00000652

OC0889-74BWR-EN03

CONSUMERS POWER COMPANY

OVERISEL COMPRESSOR STATION

1989 GROUNDWATER MONITORING REPORT

Results of groundwater elevation measurements and the concentration of PCB in samples of groundwater collected on August 7, 1989, from seven monitoring wells located at Consumers Power Company's Overisel Compressor Station

Monitoring Well	Groundwater Elevation (Ft)	PCB (ppb)
88MW-1	102.88	ND
88MW-2	101.80	ND
88MW-2A	102.06	ND
88MW-3	100.95	ND
88MW-3A	101.91	ND
88MW-4	101.86	0.39
88MW-4A	101.95	0.08

ND indicates not detected at 0.06 ppb PCB

BWRasher/8-30-89

K00000653

8-28-89

To BW Rasher, P12-103

From HW Voigt, T-260 HWV

Date August 23, 1989

Subject OVERISEL COMPRESSOR STATION -

Monitoring Well Samples
PCB Results
Sampling Date - August 07, 1989

CONSUMERS POWER COMPANY

Internal Correspondence

CC

File Index # 528917-552-480

==========

On August 07, 1989 personnel from the Chemistry Department of Energy Supply Technical Services (ESTS) completed Depth-To-Water (DWL) measurements and groundwater sample collection from seven (7) monitoring well installations at the Overisel Compressor Station. Samples were returned to ESTS for PCB analysis.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - The monitoring wells were pumped at a rate of 1 gallon per minute to a constant pH and specific conductance readings with a suction pump fitted with a rubber hose and a screened foot valve. During pumping the screened foot valve was positioned 1 foot below the DWL so that the completed well volume was evacuated. Measurements of pH and specific conductance were taken at intervals corresponding to approximately one pumped casing volume for a minimum of five casing volumes. After the required pump volume was removed, a 1-quart water sample was collected at screen depth with a clean bailer. Samples were iced and returned to ESTS Chemistry Department for analysis.

Sample Handling - Sample handling was in accordance with the SW-846 recommendations for organic analytes.

pH and Specific Conductance - ESTS Procedure - CHEM-74

PCB Analysis - Samples were analyzed in accordance with Method 8080, SW-846, Organochlorine Pesticides and PCB.

MONITORING WELL DAMAGE REPORT

At 88MW-3 and 88MW-3A the above ground section of casing (2-foot section) unscrewed and came off while attempting to remove the casing caps. The sections were re-fitted after the casing caps were removed. All monitoring well casing cap had heavy rust accumulation at the casing cap - casing pipe interface. Casing cap do not have vent holes.

K00000654

RESULTS

Table 1 - PCB Analysis Results

Table 2 - Depth-To-Water Measurements

Table 3 - Field Parameter: Constant pH and Specific Conductance Readings and Pre-Sample Pump Volumes

Figure 1 - Groundwater Contour Map

K00000655

TABLE 1 PCB ANALYSIS RESULTS

Overisel Compressor Station
Sampling Date: August 07, 1989

Control Number	Monitoring Well ID	PCB, ug/L As PCB-1254	MDL ug/L
891480-1	88MW-1	ND	0.06
891480-2	88MW-2	ND	0.06
891480-3	88MW-2A	ND	0.06
891480-4	88MW-3	ND	0.06
891480-5	88MW-3A	ND	0.06
891480-6	88MW-4	0.39	0.06
891480-7	88MW-4A	0.08	0.06
891480-8	Field Blank	ND	0.06

MDL = Method Detection Limit

Method Detection Limit is based on 10-mL final extraction volume of a 950 mL water sample and a analyte practical quantitation limit of 0.06 ug/mL for PCB-1254.

K00000656

TABLE 2 STATIC WATER ELVATIONS

Overisel Compressor Station
Sampling Date: August 07, 1989

Monitoring Well ID	Elevation Top-Of-Casing (ft)	Depth-To Water (ft)	Static Water Elevation (ft)
88MW-1	116.80	13.92	102.88
88MW-2	105.02	13.22	101.80
88MW-2A	105.33	13.27	102.06
88MW-3	104.43	13.48	100.95
88MW-3A	104.08	12.17	101.91
88MW-4	104.11	12.25	101.86
88MW-4A	104.30	2.35	101.95

K00000657

TABLE 3 MONITORING WELL SAMPLING FIELD PARAMETERS

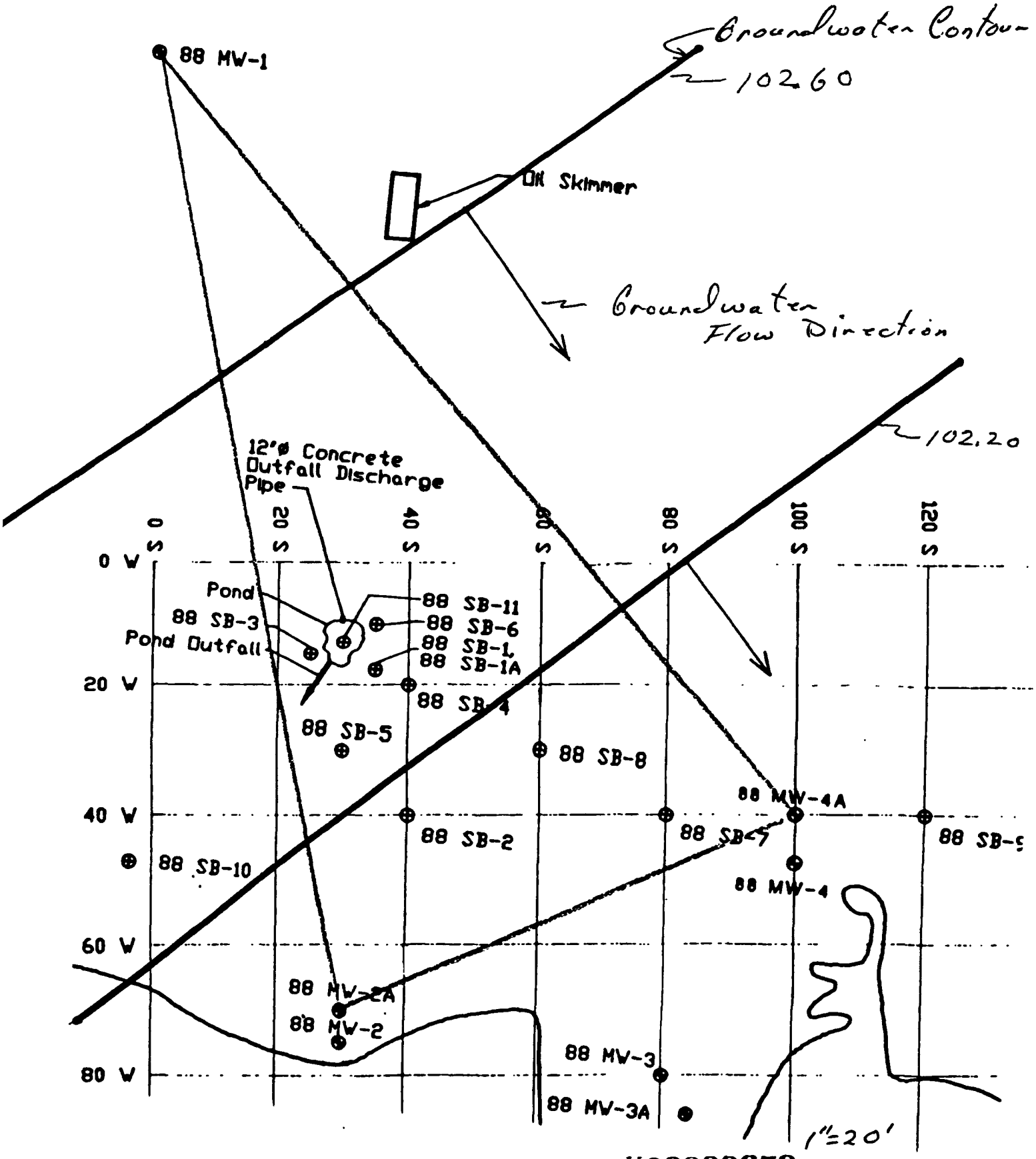
Overisel Compressor Station
Sampling Date: August 07, 1989

MW ID	SCRN Depth (ft)	DWL (ft)	Well Volume (gal)	Pump Volume (gal)	Final pH (SU)	Final Specific Conductance (umho/cm)
88MW-1	21.78	13.92	1.26	7.5	6.9	370
88MW-2	12.04	3.22	1.41	7.5	7.3	360
88MW-2A	23.15	3.27	3.18	17.0	7.6	350
88MW-3	11.50	3.38	1.28	7.5	7.0	430
88MW-3A	18.37	2.17	2.59	13.5	7.2	680
88MW-4	11.70	2.25	1.51	8.5	6.9	370
88MW-4A	20.20	2.35	2.86	15.0	7.0	350

K00000658

FIGURE 1 GROUNDWATER CONTOUR MAP

Overisel Compressor Station
Sampling Date: August 07, 1989



K00000659

APPENDIX A-1 FIELD NOTES

MONITORING WELL DEPTH-TO-WATER MEASUREMENTS

Site Location: Oversel Compressor Station

Date: Aug 07, 1989 Project Number: 528917552-480

Leader: HW U0167 Helper: MB Brown

Monitoring Well ID 88-	Time	TRIAL - 1 Top-Of Casing	TRIAL - 1 Wetted Tape (ft)	TRIAL - 1 Depth-To-Water (ft)	TRIAL - 2 Top-Of Casing (ft)	TRIAL - 2 Wetted Tape (ft)	TRIAL - 2 Depth-To-Water (ft)
MW 4A	1050	3.00	0.65	2.35	4.00	1.65	2.35
4	1055	3.00	0.75	2.25	4.00	1.75	2.25
3A	1100	3.00	0.83	2.17	4.00	1.83	2.17
3	1105	4.00	0.52	3.48	5.00	1.52	3.48
2A	1110	4.00	0.72	3.28	5.00	1.73	3.27
2	1115	4.00	0.78	3.22	5.00	1.78	3.22
1	1340	15.00	1.08	13.92	16.00	2.08	13.92

Remarks ~~MW-1 Cannot get casing cap off~~

MW3 & MW3A 2-foot above ground casing came off while removing cap - refitted

MW2 DWL taken at highest side of casing

MW1 Casing cap ~~off~~ removed for sampling

no vent hole in casing caps

K00000661

All Measurements are recorded to the nearest 0.01 ft

Reviewed By HWJ Date 080789

MONITORING WELL SAMPLING LOG

Site Location: Duenwel Compression Station

Date: Aug 07 1989 Project Number: 528917552-480

Leader: HW Voigt Helper: MG Brown

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88 MW-1	21.78	13.92	7.86	1.26	6.30	7.5
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1345	1	1.5	7.2	350	
		2	1.5	7.0	380	
		3	1.5	7.0	380	
		4	1.5	6.9	370	
		5	1.5	6.9	370	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88MW-2	12.04	3.22	8.82	1.41	7.05	7.5
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1300	1	1.5	7.3	360	
		2	1.5	7.3	360	
		3	1.5	7.3	360	
		4	1.5	7.3	360	
		5	1.5	7.3	360	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88MW-2A	23.15	3.27	19.88	3.18	15.90	17.0
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1245	1	3.0	8.5	250	
		2	3.5	7.8	350	
		3	3.5	7.6	350	
		4	3.5	7.6	350	
		5	3.5	7.6	350	

K00000662

MONITORING WELL SAMPLING LOG

Site Location: Overisel Compressor Station

Date: Aug 02, 1989 Project Number: 52897552-480

Leader: HW Voigt Helper: MG Brown

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88mw-3	11.50	3.48	8.02	1.28	6.40	7.5
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1235	1	1.5	6.9	440	
		2	1.5	7.0	450	
		3	1.5	7.1	430	
		4	1.5	7.0	430	
		5	1.5	7.0	430	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88mw-3A	18.37	2.17	16.20	2.59	12.95	13.5
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1215	1	3.0	7.2	600	
		2	3.0	7.2	700	
		3	2.5	7.2	680	
		4	2.5	7.2	680	
		5	2.5	7.2	680	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88mw-4	11.70	2.25	9.45	1.51	7.55	8.5
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1155	1	2.0	6.8	350	
		2	2.0	6.9	350	
		3	1.5	6.9	370	
		4	1.5	6.9	370	
		5	1.5	6.9	370	

K00000663

MONITORING WELL SAMPLING LOG

Site Location: Overisel Compressor Station

Date: Aug 07, 1988 Project Number: 528917552-480

Leader: HW Voigt Helper: MG Brown

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88mw-4A	20.20	2.35	17.85	2.86	14.30	15.0
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1125	1	3	7.0	280	
		2	3	6.8	350	
		3	3	6.9	350	
		4	3	7.0	350	
		5	3	7.0	350	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
na						
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
na						
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	

K00000664

MONITORING WELL SAMPLING EQUIPMENT LOG

Site Location: Overisel Compressor Station

Date: Aug 02, 1989 Project Number: 528917552-480

Leader: HW Voigt Helper: M G Brown

++

CALIBRATION SOLUTIONS - pH BUFFER SOLUTIONS

pH Buffer	Source	Lot Number
4.0	Fisher	890181 -24
7.0	↓	890146 -24
10.0	↓	883853 -24

CALIBRATION SOLUTIONS - SPECIFIC CONDUCTANCE SOLUTIONS

umho/cm	Source	Lot Number
46.7	Myron	442 - 30
447	↓	442 - 300
1410	↓	442 - 1000

++

FIELD EQUIPMENT CALIBRATION

pH Meter

Meter ID Metrohm E 588 S/N 189-191

pH Buffer	Start Of Day Check pH	Start Of Day Check Time	End Of Day Check pH	End Of Day Check Time
4.0	4.0	1110	4.01	1415
7.0	7.0	↓	7.00	↓
10.0	10.0	↓	9.95	↓

Specific Conductance Meter

Meter ID Myron S/N 1060347

umho/cm	Start Of Day Check umho/cm	Start Of Day Check Time	End Of Day Check umho/cm	End Of Day Check Time
447	40	1115	40	1415
447	450	↓	450	↓
1410	1400	↓	1450	↓

++

K00000665

To BW Rasher, P12-103

From HW Voigt, T-260 HWV

Date August 9, 1989

Subject OVERISEL COMPRESSOR STATION
NOTIFICATION OF GROUNDWATER MONITORING

CONSUMERS POWER COMPANY

Internal Correspondence

CC

File Index # 528917-552-480

==========

On August 7, 1989 personnel from the Chemistry Department of Energy Supply Technical Services (ESTS) completed groundwater elevation measurements and groundwater sample collection for seven (7) groundwater monitoring wells located at the Overisel Compressor Station. Groundwater samples were returned to ESTS for analysis of PCB concentration.

STATIC WATER ELEVATIONS

Monitoring Well ID	Top-of-Casing Elevation (ft)	Depth-To-Water Level (ft)	Static Water Elevation (ft)
88MW-1	116.80	13.92	102.88
88MW-2	105.02	3.22	101.80
88MW-2A	105.33	3.27	102.06
88MW-3	104.43	3.48	100.95
88MW-3A	104.08	2.17	101.91
88MW-4	104.11	2.25	101.86
88MW-4A	104.30	2.35	101.95

SITE NOTES

1 - All monitoring well casing threaded-caps had rust accumulation at the casing-cap interface. All casing threaded-caps were difficult to removed.

2 - At 88MW-3 and 88MW-3A, the above ground section of casing (2-foot section) unscrewed and came off while attempting to remove the casing cap. The sections were re-fitted after the casing caps were removed.

3 - At 88MW-2 the monitoring well casing is not vertical. Top-of-casing was taken to be the highest side.

4 - All monitoring well casing threaded-caps do not have a vent-holes. With the rust accumulation noticed, the monitoring wells may not be a atmospheric pressure.

K00000666

hwv

APPENDIX A-2 ANALYTICAL WORKSHEETS

PCB - WATER SAMPLE

Project Number 528917552-480

SAMPLE CONTROL NUMBER
SAMPLE IDENTIFICATION

Date 08 08 89

Analyst HWU

PROJECT NAME Overisel Compressor Station

Control Number	Sample Identification	Remarks
891480-1	88mw-1	
2	88mw-2	
3	88mw-2A	
4	88mw-3	
5	88mw-3A	
6	88mw-4	
7	88mw-4A	
8	Field Blank	
9	88mw-4A	2nd sample
	DWL Log	
	Pump Log	
	Equip Log	
		K00000668

PCB - WATER SAMPLE

Project Number 528917552-480

CALIBRATION STANDARDS PREPARATION

Date 08-11-85

Analyst HWJ

Material Name Aroclor 1254

Material Source Altech

Material Lot Number PE014 Material Stock Number PE014

Purity or Concentration >98% Units % wt

Stock Preparation By Weight ✓ Stock Preparation As Received ___

Balance ID 3744-00063

Final Wt 0.01153
Tare Wt 0.00000
Sample Wt 0.01153

Dilution Solvent nC6

Dilution Volume 100mL

Initial Stock Concentration 115.3 ug/mL

Working Dilutions Of Stock Concentration

Dilution Solvent nC6

A = Initial Stock Concentration Of 115.3 ug/mL

B = Dilute A By 1 To 100 = 115.3 x 1 / 100 = 1.153

C = Dilute B By 10 To 50 = 1.153 x 10 / 50 = 0.230

D = Dilute B By 5 To 50 = 1.153 x 5 / 50 = 0.115

E = Dilute B By 6 To 100 = 1.153 x 6 / 100 = 0.069

F = Dilute B By 1 To 100 = 1.153 x 1 / 100 = 0.011

G = Dilute B By 0.5 To 100 = 1.153 x 0.5 / 100 = 0.006

Standard ID	Final Concentration	
S54-1	1.153 ug/mL	B
S54-2	0.230	C
S54-3	0.115	D
S54-4	0.069	E
S54-5	0.011	F
S54-6	0.006	G

K00000669

PCB - WATER SAMPLE

QC CONCENTRATE PREPARATION

Project Number 528917552-480

Date 08-11-85

Analyst HWD

Material Name Aroclor 1254

Material Source Supelco

Material Lot Number 31958 Material Stock Number 4-8825

Purity or Concentration 200 Units ug/mL

Stock Preparation By Weight ___ Stock Preparation As Received ✓

Balance ID na

Final Wt na
Tare Wt na
Sample Wt na

Dilution Solvent na

Dilution Volume na

Initial Stock Concentration ~~200 ug/mL~~ na

Working Dilutions Of Stock Concentration

Dilution Solvent Acetone

A = Initial Stock Concentration Of 200 ug/mL

B = Dilute A By 0.5 To 100 = 200 x 0.5 / 100 = 1.00

C = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

D = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

E = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

F = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

G = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

QC Conc. ID	Final Concentration	
QC1	1.00 ug/mL	B
		K00000670

PCB - WATER SAMPLE

EXTRACTION WORKSHEET

Project Number 528912552-480

Date 08-14-89

Analyst GLC / HWU

Extraction Solvent MeCl2

Exchange Solvent nC6

Extraction Method: Separatory Funnel ✓

Continous Liquid - Liquid Extractor ____

Extraction Number	Control Number 891480	Sample Volume (mL)	Final Volume (mL)	Remarks
1-1	mw-1	950	10	
1-2	mw-2	950	10	
1-3	mw-2A	950	10	
1-4	mw-3	950	10	
1-5	mw-3A	950	10	
1-6	mB	1000	10	method Blank

K00000671

PCB - WATER SAMPLE

EXTRACTION WORKSHEET

Project Number 528917552-480

Date 08-15-89

Analyst HWU/GCC

Extraction Solvent $MeCl_2$

Exchange Solvent nC_6

Extraction Method: Separatory Funnel ✓

Continous Liquid - Liquid Extractor ___

Extraction Number	Control Number 891480	Sample Volume (mL)	Final Volume (mL)	Remarks
2-1	MW-4	950	10	
2-2	MW-4A	950	10	
2-3	FB	950	10	Field Blank
2-4	MW4AS	1000	10	QC Spike
2-5	THS	1000	10	QC Standard
2-6	MB	1000	10	method Blank

K00000672

PCB - WATER SAMPLE

Project Number 528917552-480

INITIAL CALIBRATION RUN
CALIBRATION CHECK RUN

Date 08-20-89

Analyst HWJ

PCB A1254

INITIAL CALIBRATION

Standard ID	Standard Conc	Found	Acceptance Criterion
S54-1	1.153	0.996	1.153 +/- 0.115
S54-2	0.230	0.225	0.230 +/- 0.023
S54-3	0.115	0.107	0.115 +/- ~~0.00~~ 0.012
S54-4	0.069	0.065	0.069 +/- 0.007
S54-5	0.011	0.010	0.011 +/- 0.001
S54-6	0.006	0.006	0.006 +/- 0.001

MIDDLE - OF - RUN CALIBRATION CHECK

Standard ID	Standard Conc	Found	Acceptance Criterion
na	na	na	na +/-
			+/-
			+/-
			+/-
			+/-
			+/-

END - OF - RUN CALIBRATION CHECK

K00000673

Standard ID	Standard Conc	Found	Acceptance Criterion
S54-1	1.153	1.015	1.153 +/- 0.173
S54-2	0.230	0.232	0.230 +/- 0.035
S54-3	0.115	0.110	0.115 +/- 0.017
S54-4	0.069	0.065	0.069 +/- 0.010
S54-5	0.011	0.013	0.011 +/- 0.002
S54-6	0.006	0.007	0.006 +/- 0.002

PCB - WATER SAMPLE

SAMPLE LIST

Project Number 528917552-480

Date 08-28-89

Analyst HWU

Btl #	Control Number 891480	Concentration Calculated As PCB- 1254 Units ug/mL	Sample Dilution Fractor	Final Conc Calculated As PCB- 1254 Units ug/L
06	S54-1	0.996	na	na
07	S54-2	0.225		
08	S54-3	0.107		
09	S54-4	0.065		
10	S54-5	0.010		
11	S54-6	0.006		
12	mw-1	<0.006	na	<0.06
13	mw-2	<0.006		<0.06
14	mw-2A	<0.006		<0.06
15	mw-3	<0.006		<0.06
16	mw-3A	<0.006		<0.06
17	mB-1	<0.006		<0.06
18	mw-4	0.037		0.39
19	mw-4A	0.008		0.08
20	mB-2	<0.006		<0.06
21	FB	<0.006		<0.06
22	mw-4AS	0.280		2.80
23	THS	0.181		1.81
24	S54-1	1.015	na	na
25	S54-2	0.232		
26	S54-3	0.110		
27	S54-4	0.065		
28	S54-5	0.013		
29	S54-6	0.007		

K00000674

PCB - WATER SAMPLE

QC

Project Number 528917552480

Date 08-14-89 & 08-20-89

Analyst HWV

QC SPIKE PREPARATION

Spike Material A1254

Control Number 891480	Sample Matrix	Initial Sample Volume, L	Spike Conc In Sample ug/L	QC Concentrate Added QC ID 891480	mL Added
MW-4AS	MW-4A	1L *	3	QC1	3.0mL
TMS	TM Standard	1L	2	na	na
		* Adj	to 1L		

QC PERCENT RECOVERY

Spike Material A1254

Control Number 891480	Conc Added ug/L	Conc Found ug/L	Actual Percent Recovery %	Acceptance Criteria Range For Percent Recovery %
MW-4AS	3.08	2.80	91	D - 700
TMS	2.0	1.81	91	D - 500

METHOD BLANKS

K00000675

Control Number 891480	Sample Name	Final Concentration Found As A1254 ug/L
MB-1	MB-1	<0.06
MB-2	MB-2	<0.06

PCB - WATER SAMPLE

INSTRUMENT CONDITIONS

Project Number 5289/7552-480

Date 08-20-89

Analyst HWU

Gas Chromatograph Model HP 5730

Number 3741-60367

Detector ECD - Ni63 S/N H2464

Column: Phase 3% OV1

Support 100/120 Supelcoport

Column Material Glass

Length 6' od 1/4" id 4mm

Oven Temperature Profile:

Initial Temp 200 Initial Time 0

Program Rate 0 C/mim

Final Temp 200 Final Time 00

Carrier Gas P5 Flow Rate 50mL/min

Detector Temp 300 Injector Temp 300

Auto - Sampler Model HP 7672A

Injection Volume 4.0 uL

Calibration Date Aug 20, 1989

K00000676

To: JPDickey, M-1019
DHPendleton, P11-218B

From: BWRasher, P12-103

Date: March 20, 1990

Re: Reuse of PCB Items

CONSUMERS
POWER
COMPANY

Internal
Correspondence

BWR 90-36
M905.4

In 1989, Consumers contracted with Quadrex HPS Inc to remove PCBs from the air systems at White Pigeon and Overisel Compressor Stations. Removal was undertaken by Quadrex in accordance with their alternate disposal approval granted by the US EPA. Quadrex is scheduled to decontaminate the air systems at Northville and Freedom in 1990.

In the attached letter from the US EPA to Quadrex dated November 14, 1989, the US EPA has affirmed in writing two points which are of importance to Consumers. First, there are no restrictions on the use of equipment which has been decontaminated in accordance with the approval issued by EPA to Quadrex under 40 CFR 761.60(e). Second, that authorized reuse after approved alternate disposal cannot be invalidated by subsequent EPA policy. The letter also states that once cleaned, the equipment would be subject to the PCB regulations if it again comes into contact with PCBs.

As a result, I recommend that Consumers continue its position that PCB removal in accordance with the Quadrex approval will allow the reuse of equipment, provided the equipment does not again come into contact with PCBs.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 14 1989

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Mr. Norman D. Dudey
President
Quadrex HPS Inc.
1940 N.W. 67th Place
Gainesville, Florida 32606-1649

NOV. 27 RECD

Dear Mr. Dudey:

This is in response to your letter of September 1, 1989, requesting clarification of EPA's June 13, 1989 letter from Victor J. Kimm of EPA to Theodore Kinne of the Interstate Natural Gas Association of America (INGAA).

To clarify your questions, the following background information is provided. EPA's PCB regulations generally deal with two separate areas: use and disposal. The June 13, 1989 letter to INGAA explained EPA's rule authorizing use of contaminated equipment under 40 CFR 761.20(c)(5). However, in contrast, on July 18, 1988, EPA issued to Quadrex HPS Inc. under 40 CFR 761.60(e) an alternative technology approval to dispose of PCBs, which includes the use of Freon to rinse natural gas pipe line air compressor systems. Therefore, EPA's June 13, 1989 letter to INGAA regarding use regulations does not invalidate your approval to rinse natural gas pipeline air compressor systems as an alternative method of disposal.

The alternative disposal approval issued to Quadrex HPS Inc. under 40 CFR 761.60(e) means that Quadrex's process achieves a level of performance "equivalent to incineration." Thus equipment, once PCBs are removed to or below the levels stated in the approval, become non-PCB. Non-PCB equipment is unregulated. Therefore, such equipment may be reused. Such equipment may become regulated under the PCB regulations if it again comes into contact with regulated PCBs.

You raise the following three questions in your letter:

1. EPA has stated that if, after discovery of contamination in pipes and tanks connected to an air compressor, the equipment is cleaned up according to EPA-approved spill cleanup policies, the use of the pipes and tanks would be authorized by the PCB regulations. What constitutes discovery?

K00000678

To: GDDykstra, Overisel

From: BWRasher, P12-103

Date: 12-1-89

Re: Overisel Air System
PCB Monitoring

XC: JPDickey, M-1019
DTKetcham, P25-131
MRPutnam, P12-125A

CONSUMERS
POWER
COMPANY

Internal
Correspondence

BWR 89-213
M905.4

As we discussed today, I agree that you are not required to conduct PCB monitoring in the air system at Overisel Compressor Station because all segments of the air system found previously to contain PCB-contaminated condensates were decontaminated by the contractor Quadrex in 1989. PCB liquids were not found in the instrument air system downstream of the air dryer. In addition, Consumers was not asked by the agency to monitor the air system at this facility.

K00000679

WORK TXT \PCB\OAIR

12-17-90

To	BWRasher, P12-103	
From	RECollings, JSC-264	CONSUMERS POWER COMPANY
Date	December 14, 1990	
Subject	COMPLETION OF PCB CLEANUP AT OVERISEL COMPRESSOR STATION	Internal Correspondence
CC	DTKetcham, P11-210 OJEssink, Overisel	FDS-926-90

This letter is intended to verify completion of the PCB cleanup at Overisel Compressor Station. Attached is a summary of data which indicates that the soil, waste water system and air system were decontaminated in accordance with the PCB Action Plan.

K00000680

IC1290-0039A-GP03

CONSUMERS POWER COMPANY
OVERISEL COMPRESSOR STATION
PCB DECONTAMINATION VERIFICATION DATA

Soils

The scope of soil removal in the area of the air logs was finalized early in 1988. Soil removal was completed down to the decontamination standard and verified by sampling by June 24, 1988.

The scope of soil removal in the area of the oil-water separator overflow was finalized in early 1988. Soil removal was completed down to the decontamination standard and verified by sampling by June 29, 1988. PCB Action Plan Sections 1, 2, 3, 5, 6, 7, 8, 9, 11 and 12 show test results for the oil separator overflow area. Action Plan Sections 3, 4, 10, 15, 16, 17, 20 and 36 show test results for the air log and generator vent areas.

Wastewater System

The decision was made early in the project to remove contaminated waste water piping rather than clean. Attached Sketch "SK1-90" shows the lines and equipment that were removed. The following listed analysis results show that the lines were removed until their contamination levels reached acceptable limits.

1. 6" Auxiliary Building Drain Line - Was removed completely to point of origin because contamination levels never reached acceptable level.

2. Compressor Building Drain System (Point "A" on Sketch SK1-90) - Was removed to a point at the northwest corner of the compressor building (see Action Plan Section 25, Analysis Control 882-319-5).

3. Warehouse Drain System (Point "A" on Sketch SK1-90) - Was removed to a point near the warehouse (see Action Plan Section 25, Analysis Control 882-319-4).

4. Dehydration Area Drain System (Point "B" on Sketch SK1-90) - Was removed to a point near the warehouse (see Action Plan Section 25, Analysis Control 882-319-3).

5. The compressor building floor drain collection tank was also completely removed and replaced.

Waste water contaminated piping removal was completed on September 9, 1988.

Air System

On June 21 and 22, 1988 samples were taken from the air systems to determine the extent of contamination (see Action Plan Section 20). The analysis results shown in Section 20 indicated that the air compressors, air receivers,

starting air system and a portion of the instrument air system was contaminated. The following plan was implemented for system cleanup.

1. The old air compressors were removed and replaced with new compressors.

2. The air receivers were separated from the system and individually cleaned. For PCB levels prior to cleaning, see Action Plan Section 20, Sample Control 88-946-5 and 9.

   For PCB levels after cleaning, see Action Plan as indicated below:

   a. Air Receiver 1 - Action Plan Section 35, Analysis ØV-8, Sample Control ØV-24.
   b. Air Receiver 2 - Action Plan Section 35, Analysis ØV-9, Sample Control ØV-31.
   c. Air Receiver 3 - Action Plan Section 35, Analysis ØV-10, Sample Control ØV-35.
   d. Air Receiver 4 - Action Plan Section 35, Analysis ØV-10, Sample Control ØV-40.

3. Next, the major piping systems were stripped of contaminated components that could/would be cleaned in the remote parts cleaning cabinet. Then the piping systems were divided into two areas.

   a. Piping System 1 consisted of all contaminated piping in the yard area and auxiliary building (reference Action Plan Section 20, Sample Control 88-946-1, 2, 3, 4, 5, 6 and 9). This piping was manifolded and flushed as one system. Analysis results showing decontamination levels are shown in Action Plan Section 35, Analysis ØV-4, Sample Control ØV-13 and Analysis ØV-5, Sample Control ØV-14.

   b. Piping System 2 consisted of all contaminated piping inside the compressor building (reference Action Plan Section 20, Sample Control 88-946-10, 12, 18 and 23). This piping was manifolded and flushed as one system. The PCB levels after cleaning are shown in Action Plan Section 35, Analysis ØV-2, Sample Control ØV-006.

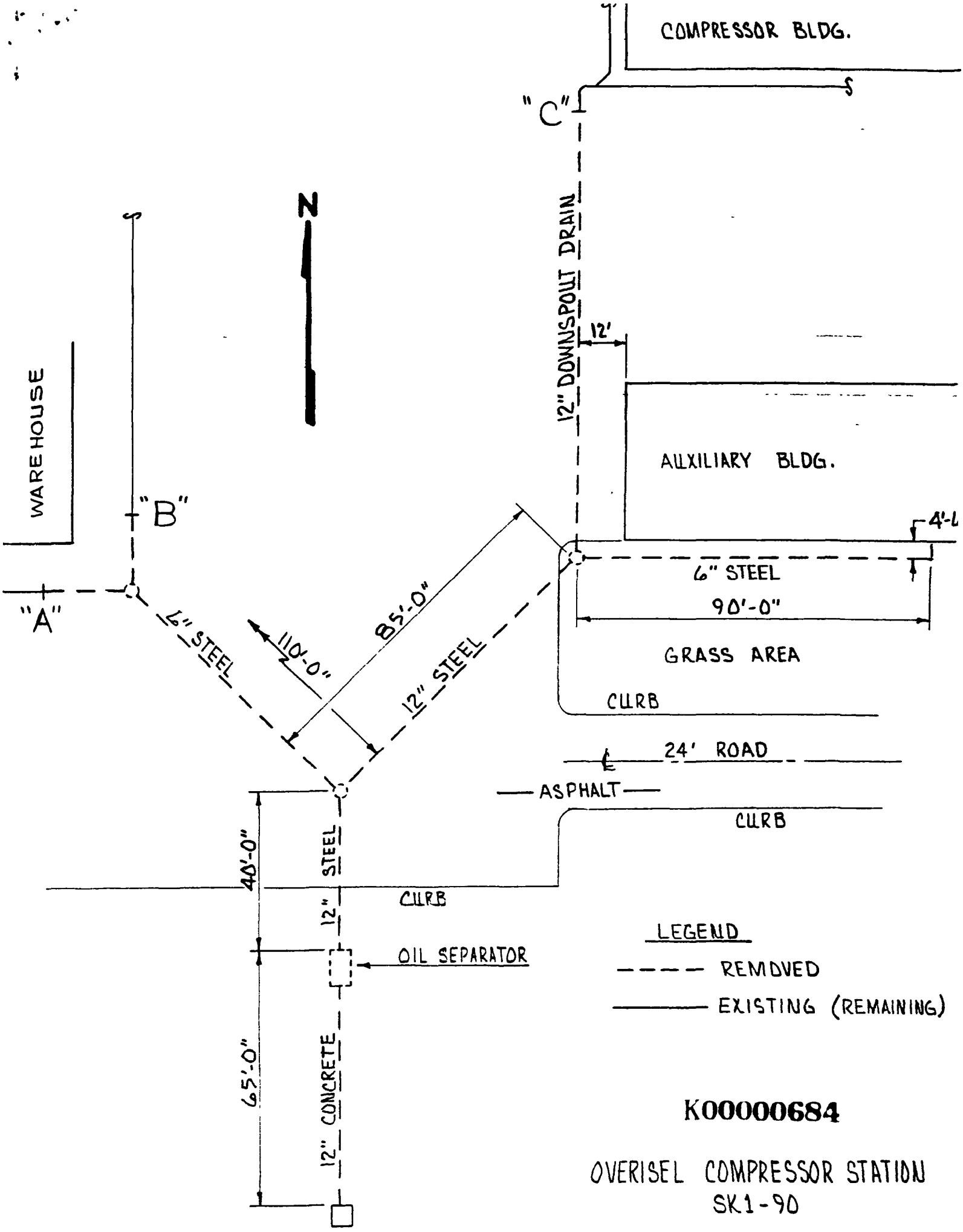
4. Small piping lengths that were removed to facilitate cleaning of the major systems were then manifolded together and flushed clean. PCB results are shown in Action Plan Section 35, Analysis ØV-1, Sample Control ØV-002.

5. The last piping system consisted of the old air compressor aftercoolers and miscellaneous small pipes. These components were manifolded together and flushed. The PCB result is shown in Action Plan Section 35, Analysis ØV-3, Sample Control ØV-008.

6. The components listed in Action Plan Section 27, 28, 30, 31, 32, 33 and 34 are air system parts that could not be cleaned in place, also the disassembled "old" air compressors parts, etc. Many of the components appear in more than one section. This indicates repeat cleanings and testing on

the same part. If a piece/part could not be decontaminated to the required level within a reasonable number of tries, then the piece/part was discarded and replaced.

RECollings
12/10/90



K00000684

OVERISEL COMPRESSOR STATION
SK1-90

8-28-90

To	BWRasher, P12-103	CONSUMERS POWER COMPANY
From	HWVoigt, T-260 HWV	
Date	August 27, 1990	Internal Correspondence
Subject	OVERISEL COMPRESSOR STATION - Monitoring Well Samples PCB Results Sampling Date - August 06, 1990	
CC		File Index # 529017-552-515

On August 06, 1990 personnel from the Chemistry Department of Energy Supply Technical Services (ESTS) completed Depth-To-Water (DWL) measurements and groundwater sample collection from seven (7) monitoring well installations at the Overisel Compressor Station. Samples were returned to ESTS for PCB analysis.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - The monitoring wells were pumped at a rate of 1 gallon per minute to a constant pH and specific conductance readings with a suction pump fitted with a rubber hose and a screened foot valve. During pumping the screened foot valve was positioned 1 foot below the DWL so that the completed well volume was evacuated. Measurements of pH and specific conductance were taken at intervals corresponding to approximately one pumped casing volume for a minimum of five casing volumes. After the required pump volume was removed, a 1-quart water sample was collected at screen depth with a clean bailer. Samples were iced and returned to ESTS Chemistry Department for analysis.

Sample Handling - Sample handling was in accordance with the SW-846 recommendations for organic analytes.

pH and Specific Conductance - ESTS Procedure - CHEM-74

PCB Analysis - Samples were analyzed in accordance with SW-846, Method 8080, Organochlorine Pesticides and PCB.

K00000685

RESULTS

Table 1 - PCB Analysis Results

Table 2 - Depth-To-Water Measurements

Table 3 - Field Parameter: Constant pH and Specific Conductance Readings and Pre-Sample Pump Volumes

Figure 1 - Groundwater Contour Map

K00000686

TABLE 1 PCB ANALYSIS RESULTS

Overisel Compressor Station
Sampling Date: August 06, 1990

Control Number	Monitoring Well ID	PCB, ug/L As PCB-1254	MDL ug/L
901515-1	OV-88MW-1	ND	0.06
901515-2	OV-88MW-2	ND	0.06
901515-3	OV-88MW-2A	ND	0.06
901515-4	OV-88MW-3	ND	0.06
901515-5	OV-88MW-3A	ND	0.06
901515-6	OV-88MW-4	0.12	0.06
901515-7	OV-88MW-4A	ND	0.06
901515-8	Field Blank	ND	0.06

MDL = Method Detection Limit

Method Detection Limit is based on 10-mL final extraction volume of a 950 mL water sample and a analyte practical quantitation limit of 0.006 ug/mL for PCB-1254.

K00000687

TABLE 2 STATIC WATER ELEVATION

Overisel Compressor Station
Sampling Date: August 06, 1990

Monitoring Well ID	Elevation Top-Of-Casing (ft)	Depth-To Water (ft)	Static Water Elevation (ft)
88MW-1	116.80	14.14	102.66
88MW-2	105.02	3.37	101.65
88MW-2A	105.33	3.43	101.90
88MW-3	104.43	3.63	100.80
88MW-3A	104.08	2.34	101.74
88MW-4	104.11	2.40	101.71
88MW-4A	104.30	2.35	101.77

K00000688

TABLE 3 MONITORING WELL SAMPLING FIELD PARAMETERS

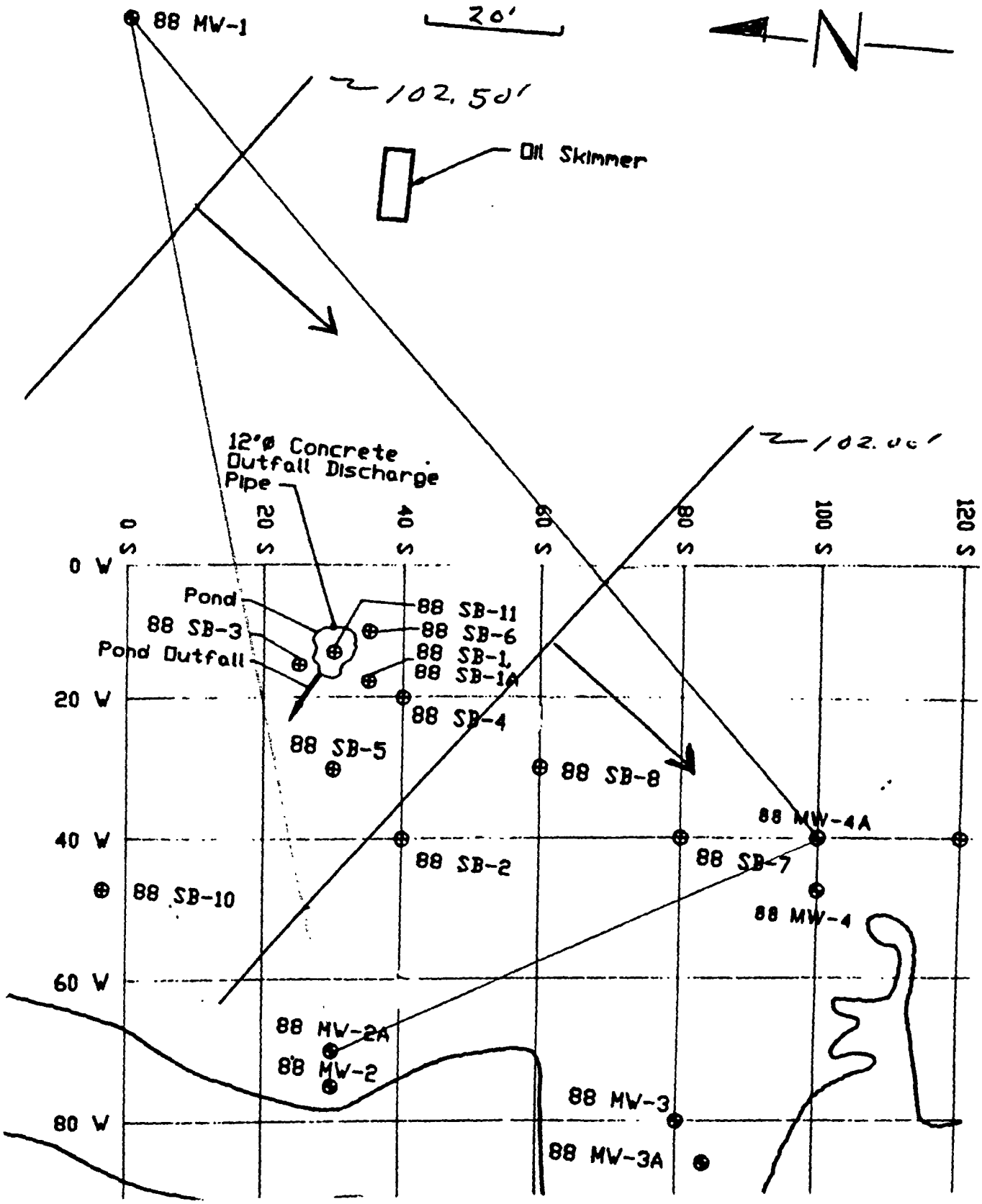
Overisel Compressor Station
Sampling Date: August 06, 1990

MW ID	SCRN Depth (ft)	DWL (ft)	Well Volume (gal)	Pump Volume (gal)	Final pH (SU)	Final Specific Conductance (umho/cm)
88MW-1	21.90	14.14	1.24	7.0	7.8	380
88MW-2	12.00	3.37	1.38	7.0	8.0	420
88MW-2A	23.14	3.43	3.15	16.0	8.0	430
88MW-3	11.67	3.63	1.29	7.0	7.9	510
88MW-3A	20.23	2.34	2.86	15.0	7.9	910
88MW-4	11.79	2.40	1.50	8.0	7.9	440
88MW-4A	21.80	2.53	3.08	16.0	7.9	430

K00000689

FIGURE 1 GROUNDWATER CONTOUR MAP

Overisel Compressor Station
Sampling Date: August 06, 1990



K00000690

APPENDIX A-1 FIELD NOTES

MONITORING WELL DEPTH-TO-WATER MEASUREMENTS

Site Location: Overisel Compressor Station

Date: August 6, 1990 Project Number: 90-1515

Leader: K Heap Helper: D Silvius

Monitoring Well ID	Time	TRIAL - 1 Top-Of Casing	TRIAL - 1 Wetted Tape (ft)	TRIAL - 1 Depth-To-Water (ft)	TRIAL - 2 Top-Of Casing (ft)	TRIAL - 2 Wetted Tape (ft)	TRIAL - 2 Depth-To-Water (ft)
88MW-1	1020	16.00	1.86	14.14	17.00	2.86	14.14 ~~21.90~~
88MW-2	1025	4.00	0.63	3.37	5.00	1.63	3.37 ~~12.00~~
88MW-2A	1027	4.00	0.57	3.43	5.00	1.57	3.43 ~~23.14~~
88MW-3	1030	4.00	0.37	3.63	5.00	1.37	3.63 ~~11.67~~
88MW-3A	1032	4.00	1.66	2.34	5.00	2.66	2.34 ~~20.23~~
88MW-4	1034	3.00	0.60	2.40	4.00	1.60	2.40 ~~11.79~~
88MW-4A	1036	3.00	0.47	2.53	4.00	1.47	2.53 ~~21.80~~

Remarks

K00000692

All Measurements are recorded to the nearest 0.01 ft

Reviewed By [illegible] Date 08-07-90

MONITORING WELL SCREEN DEPTHS AND CALCULATED PUMP VOLUMES

Site Location: Overisel C.S.

Date: Aug 6, 1990 Project Number: 90-1515

Leader: JL Hear Helper: D Silvius

MW ID	Screen Depth (ft)	DTW (ft)	Casing Volume (gal)	5 X Volume (gal)	
88MW-1	21.90	14.14	1.24	6.20	
88MW-2	12.00	3.37	1.38	6.90	
88MW-2A	23.14	3.43	3.15	15.75	
88MW-3	11.67	3.63	1.29	6.45	
88MW-3A	20.23	2.34	2.86	14.30	
88MW-4	11.79	2.40	1.50	7.50	
88MW-4A	21.80	2.53	3.08	15.40	

$$\text{Casing Volume (gal)} = \left(\text{Screen Depth (ft)} - \text{Depth To Water (ft)}\right) \times 0.16$$

Pump Volume (gal) = 5 x Casing Volume(gal)

K00000693

MONITORING WELL SAMPLING LOG

Site Location: Ovensel C.S.

Date: Aug 6, 1990 Project Number: 90-1515

Leader: JK Heap Helper: D Silvius

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	21.90	14.14	7.76	1.24	6.20	7.0
88MW-1	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1130	1	2.0	8.2	380	2.0
	1133	2	1.0	8.0	380	3.0
	1135	3	1.0	7.9	380	4.0
	1137	4	1.0	7.8	380	5.0
	1141	5	2.0	7.8	380	7.0

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	12.00	3.37	8.63	1.38	6.90	7.0
88MW-2	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1202	1	2.0	8.1	420	2.0
	1204	2	1.0	8.0	420	3.0
	1206	3	1.0	8.0	420	4.0
	1208	4	1.0	8.0	420	5.0
	1210	5	2.0	8.0	420	7.0

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	23.14	3.43	19.71	3.15	15.75	16.0
88MW-2A	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1213	1	3.0	8.1	410	3.0
	1216	2	3.0	8.1	420	6.0
	1219	3	3.0	8.0	430	9.0
	1222	4	3.0	8.0	430	12.0
	1225	5	4.0	8.0	430	16.0

MONITORING WELL SAMPLING LOG

Site Location: Oversel C.S.

Date: Aug 6, 1990 Project Number: 90-1515

Leader: K Heap Helper: D Silvius

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	11.67	3.63	8.04	1.29	6.45	7.0
88 MW -3	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1238	1	2.0	8.4	500	2.0
	1240	2	1.0	8.1	510	3.0
	1241	3	1.0	8.1	510	4.0
	1243	4	1.0	8.0	510	5.0
	1245	5	2.0	7.9	510	7.0

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	20.23	2.34	17.89	2.86	14.30	15.0
88MW -3A	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1248	1	3.0	7.6	900	3.0
	1251	2	3.0	7.8	910	6.0
	1254	3	3.0	7.9	910	9.0
	1257	4	3.0	7.9	910	12.0
	1300	5	3.0	7.9	910	15.0

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	11.79	2.40	9.39	1.50	7.50	8.0
88MW -4	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1311	1	2.0	8.2	440	2.0
	1313	2	2.0	8.1	430	4.0
	1314	3	1.0	8.0	440	5.0
	1315	4	1.0	7.9	440	6.0
	1316	5	2.0	7.9	440	8.0

K00000695

MONITORING WELL SAMPLING LOG

Site Location: Overisel C.S.

Date: Aug 6, 1990 Project Number: 90-1515

Leader: JCHEAP Helper: D SILVIUS

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	21.80	2.53	19.27	3.08	15.40	16.0
88HW-4A	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1319	1	3.0	8.0	410	3.0
	1321	2	3.0	8.1	430	6.0
	1324	3	3.0	8.0	430	9.0
	1326	4	3.0	7.9	430	12.0
	1329	5	4.0	7.9	430	16.0

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	

K00000696

MONITORING WELL SAMPLING EQUIPMENT LOG

Site Location: Overnsel C-S.

Date: Aug 6, 1990 Project Number: 90-1515

Leader: JKHEAP Helper: D SILVIUS

++

CALIBRATION SOLUTIONS - pH BUFFER SOLUTIONS

pH Buffer	Source	Lot Number
10.0	FISHER	890046-24
7.0	↓	890040-24
4.0		890053-24

CALIBRATION SOLUTIONS - SPECIFIC CONDUCTANCE SOLUTIONS

umho/cm	Source	Lot Number
47	MYRON L	050800-.03
447	↓	030480-.3
733		012090-.5
2070		010590-1.5

++

FIELD EQUIPMENT CALIBRATION

pH Meter METROHM

Meter ID ~~3744-00065~~ S/N 3744-00065

pH Buffer	Start Of Day Check pH	Start Of Day Check Time	End Of Day Check pH	End Of Day Check Time
10.00	10.00	1105	10.00	1335
7.00	7.00	↓	7.00	↓
4.00	4.00		4.10	

Specific Conductance Meter

Meter ID MYRON L S/N 0500611

umho/cm	Start Of Day Check umho/cm	Start Of Day Check Time	End Of Day Check umho/cm	End Of Day Check Time
47	47	1112	47	1340
447	450	↓	450	↓
733	750		730	
2070	2000		2050	

++

K00000697

APPENDIX A-2 ANALYTICAL WORKSHEETS

PCB - WATER SAMPLE

EXTRACTION WORKSHEET

Project Number 90-1515

Date 08-16-90

Analyst slc/hwd

Extraction Solvent $MeCl_2$

Exchange Solvent nC6

Extraction Method: Separatory Funnel ✓

Continous Liquid - Liquid Extractor ___

Extraction Number	Control Number 90-1515	Sample Volume (mL)	Final Volume (mL)	Remarks OU-88-
1-1	-1	950	10	mw-1
1-2	-2			mw-2
1-3	-3			mw-2A
1-4	-4			mw-3
1-5	-5			mw-3A
1-6	-6			mw-4
1-7	-7			mw-4A
1-8	-8			Field Blank
1-9	-9	1000		Method Blank
1-10	-10	1000		5ppb QC
				K00000699

90-1515

PCB - WATER SAMPLE

Project Number ~~90-981~~

CALIBRATION STANDARDS PREPARATION

Date ~~05-18-90~~ 08-23-9

Analyst HWJ HWJ

Material Name Aroclor-1254

Material Source Supelco

Material Lot Number LA22953 Material Stock Number 4-4808

Purity or Concentration 1000 Units ug/mL

Stock Preparation By Weight ___ Stock Preparation As Received ✓

Balance ID na

Final Wt ___

Tare Wt ___

Sample Wt ___

Dilution Solvent ___

Dilution Volume ___

Initial Stock Concentration nc

Working Dilutions Of Stock Concentration

Dilution Solvent nC6

A = Initial Stock Concentration Of 1000 ug/mL

B = Dilute A By 1 To 100 = 1000 × 1 / 100 = 10

C = Dilute B By 10 To 100 = 10 × 10 / 100 = 1.00

D = Dilute C By 10 To 50 = 1.00 × 10 / 50 = 0.200

E = Dilute C By 5 To 100 = 1.00 × 5 / 100 = 0.050

F = Dilute C By 1 To 100 = 1.00 × 1 / 100 = 0.010

G = Dilute ___ By ___ To ___ = ___ × ___ / ___ = ___

Standard ID	Final Concentration
D = Std 1	0.200 ug/mL
E = Std 2	0.050
F = Std 3	0.010

K00000700

PCB - WATER SAMPLE

INITIAL CALIBRATION RUN
CALIBRATION CHECK RUN

Project Number 90-1515

Date 08-23-90

Analyst HWJ

INITIAL CALIBRATION

Standard ID 90-1515	Standard Conc	Found	Acceptance Criterion
std-1	0.200	0.210	0.200 +/- 0.020
std-2	0.050	0.052	0.050 +/- 0.005
std-3	0.010	0.011	0.010 +/- 0.001
			+/-
			+/-
			+/-

MIDDLE - OF - RUN CALIBRATION CHECK

Standard ID na	Standard Conc	Found	Acceptance Criterion
			+/-
			+/-
			+/-
			+/-
			+/-
			+/-

END - OF - RUN CALIBRATION CHECK

Standard ID 90-1515	Standard Conc	Found	Acceptance Criterion
std-2	0.050	0.054	0.050 +/- 0.008
std-3	0.010	0.012	0.010 +/- 0.002
			+/-
			+/-
			+/-
			+/-

K00000701

PCB - WATER SAMPLE

SAMPLE LIST

Project Number 90-1515

Date 08-23-90

Analyst HWJ

Btl #	Control Number 90-1515	Conentration Calculated As PCB-~~1242~~ 1254 Units ug/mL	Sample Dilution Fractor	Final Conc Calculated As PCB-~~1242~~ 1254 Units ug/L
01	Std-1	0.210		
02	Std-2	0.052		
03	Std-3	0.011		
04	Hex	<0.006		
05	-1	<0.006		<0.06
06	-2	<0.006		<0.06
07	-3	<0.006		<0.06
08	-4	<0.006		<0.06
09	-5	<0.006		<0.06
10	-6	0.011		0.12
11	-7	<0.006		<0.06
12	-8	<0.006		<0.06
13	-9	<0.006		<0.06
14	-10	0.044	1/10	4.4
15	Std-2	0.054		
16	Std-3	0.012		
17	Hex	<0.006		
18				
19				
				K00000702

PCB - WATER SAMPLE

QC

Project Number 90-1515

Date 08-23-90

Analyst HWJ

QC SPIKE PREPARATION

Spike Material TH Standard

Control Number	Sample Matrix	Initial Sample Volume, L	Spike Conc In Sample ug/L	QC Concentrate Added QC ID	mL Added
na					

QC PERCENT RECOVERY

Spike Material TH Standard

Control Number	Conc Added ug/L	Conc Found ug/L	Actual Percent Recovery %	Acceptance Criteria Range For Percent Recovery %
90-1515				
QC	5ug/L	4.4	88	D-340
				D= detected

METHOD BLANKS

Control Number	Sample Name	Final Concentration Found As A1254 ug/L
90-1515		
-9	m Blank	< 0.06

K00000703

PCB - WATER SAMPLE

INSTRUMENT CONDITIONS

Project Number 90-1515

Date 08-23-90

Analyst HWJ

Gas Chromatograph Model HP 5890

Number 3744-0058

Detector Ni-63 S/N 23919

Column: Phase 3% SP 2100

Support Supelcoport

Column Material glass

Length 6' od 1/4" id 4mm

Oven Temperature Profile:

Initial Temp 200 Initial Time 0

Program Rate 0 C/mim

Final Temp 200 Final Time 00

Carrier Gas P5 Flow Rate 48mL/min

Detector Temp 300 Injector Temp 280

Auto - Sampler Model HP 7673A

Injection Volume 4uL

Calibration Date 08-23-90

K00000704

MRP

Consumers Power
POWERING MICHIGAN'S PROGRESS
General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550
Writer's direct dial (517) 788-0331

BWR 90-132
M905.4

August 30, 1990

Ms Wanda Neal
Waste Management Division
Department of Natural Resources
Secondary Complex
PO Box 30028
Lansing, MI 48909

Re: Overisel Compressor Station
1990 Groundwater Monitoring Report

Dear Ms Neal:

In the PCB Action Plan for Consumers Power Company's Overisel Compressor Station, filed on August 8, 1988, Consumers stated its plans to undertake a long-term annual groundwater monitoring program at the site. The program commenced in March of 1988 utilizing the existing seven monitoring wells and is intended to assure detection of any changes in condition at the site. The duration will be at least 10 years, but will be evaluated on an annual basis using the data obtained from monitoring.

This is to report the results of monitoring conducted on August 6, 1990. As shown in the attached table, PCB was not detected (with an analytical detection limit of 0.06 ug/L) in 6 of the 7 monitoring wells at the site. Monitoring well 88MW-4 continues to show an extremely low level of PCB. The probable cause of this reading is cross-contamination introduced as an artifact of the monitoring well installation process. The direction of groundwater flow was southwest.

Please contact me if you have any question concerning this matter.

Sincerely,

Bruce Rasher
Environmental Department

K00000705

XC: JPDickey, M-1019
DTKetcham, P25-131
Overisel Compressor Station

K00000706

Consumers Power Company
Overisel Compressor Station
PCB Action Plan
1990 Groundwater Monitoring Report

Results of groundwater elevation measurements and the concentration of PCB in samples of groundwater collected on August 6, 1990 from monitoring wells located at Consumers Power Company' Overisel Compressor Station

Monitoring Well	Groundwater Elevation (ft)	PCB (ug/L)
88MW-1	102.66	ND
88MW-2	101.65	ND
88MW-2A	101.90	ND
88MW-3	100.80	ND
88MW-3A	101.74	ND
88MW-4	101.71	0.12
88MW-4A	101.77	ND
Blank		ND

ND indicates not detected with an analytical detection limit of 0.06 ug/L PCB

BWR/8-30-90

File M905.4

Consumers Power
POWERING MICHIGAN'S PROGRESS

General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

Writer's direct dial (517) 788-0331

December 17, 1990

BWR90210
M905.4

Ms. Wanda Neal
Environmental Quality Analyst
Waste Management Division
Department of Natural Resources
PO Box 30028
Lansing, MI 48909

Re: Consumers Power Company
Overisel Compressor Station
PCB Action Plan

Dear Ms. Neal:

This is to let you know that Consumers Power Company has completed all of the actions set forth in the PCB Action Plan for Overisel Compressor Station. Attached are three copies of a final summary of PCB decontamination verification data and supporting data Item No 36 of Appendix A to the plan. It is my understanding that at least one copy of this update will be passed on to a representative of the US Environmental Protection Agency Region 5 by the Department.

Please contact me if you have any questions regarding this matter.

Sincerely,

Bruce W. Rasher

Bruce Rasher
Environmental Department

CONSUMERS POWER COMPANY
OVERISEL COMPRESSOR STATION
PCB DECONTAMINATION VERIFICATION DATA

Soils

The scope of soil removal in the area of the air logs was finalized early in 1988. Soil removal was completed down to the decontamination standard and verified by sampling by June 24, 1988.

The scope of soil removal in the area of the oil-water separator overflow was finalized in early 1988. Soil removal was completed down to the decontamination standard and verified by sampling by June 29, 1988. PCB Action Plan Sections 1, 2, 3, 5, 6, 7, 8, 9, 11 and 12 show test results for the oil separator overflow area. Action Plan Sections 3, 4, 10, 15, 16, 17, 20 and 36 show test results for the air log and generator vent areas.

Wastewater System

The decision was made early in the project to remove contaminated waste water piping rather than clean. Attached Sketch "SK1-90" shows the lines and equipment that were removed. The following listed analysis results show that the lines were removed until their contamination levels reached acceptable limits.

1. 6" Auxiliary Building Drain Line - Was removed completely to point of origin because contamination levels never reached acceptable level.

2. Compressor Building Drain System (Point "A" on Sketch SK1-90) - Was removed to a point at the northwest corner of the compressor building (see Action Plan Section 25, Analysis Control 882-319-5).

3. Warehouse Drain System (Point "A" on Sketch SK1-90) - Was removed to a point near the warehouse (see Action Plan Section 25, Analysis Control 882-319-4).

4. Dehydration Area Drain System (Point "B" on Sketch SK1-90) - Was removed to a point near the warehouse (see Action Plan Section 25, Analysis Control 882-319-3).

5. The compressor building floor drain collection tank was also completely removed and replaced.

Waste water contaminated piping removal was completed on September 9, 1988.

Air System

On June 21 and 22, 1988 samples were taken from the air systems to determine the extent of contamination (see Action Plan Section 20). The analysis results shown in Section 20 indicated that the air compressors, air receivers,

Consumers Power
POWERING MICHIGAN'S PROGRESS
General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

August 8, 1988

BWR 88-112
M905.4

Mr. John M. Bohunsky, P.E.
Supervisor, Region III
Waste Management Division
Department of Natural Resources
Secondary Complex, General Office Building
PO Box 30028
Lansing, MI 48909

RE OVERISEL COMPRESSOR STATION
PCB ACTION PLAN

Dear Mr. Bohunsky:

Enclosed are three copies of the PCB Action Plan for Consumers Power Company's Overisel Compressor Station. This portion of the plan deals with decontamination of soil and the wastewater system. Actions for the air system are currently being prepared and will be submitted in the near future.

The plan consists of action thresholds and decontamination standards, a description of station systems, data on PCB contamination, alternative actions for systems exceeding action thresholds and the Company's planned actions including schedule and PCB health and safety procedures.

Following is an update on the status of development and implementation of the plan.

Soil
The scope of soil removal (estimated 39 cubic yards) in the area of the air logs was finalized by May 3, 1988. Soil removal was completed down to the decontamination standard and verified by sampling by June 24, 1988. The excavation will be held open to allow access for decontamination of the interior of the air logs later this year. As of July 17, 1988, 44 tons (30 cubic yards) of PCB-contaminated soil had been manifested in three shipments and accepted at an EPA-approved chemical waste landfill in New York.

The scope of soil removal (estimated 488 cubic yards) in the area of the oil-water separator overflow was finalized by May 19, 1988. Soil removal commenced on July 25, 1988 and is scheduled to be completed by August 19, 1988 and backfilled by September 2, 1988.

Wastewater System
A decision to remove and dispose of the wastewater system in an EPA-approved

chemical waste landfill as a PCB waste was made because it was judged more cost-effective than attempting to decontaminate and reuse or abandon the system in place. Removal is scheduled to commence on or about August 1, 1988 and to be completed by September 2, 1988.

Air System

The actions for the air system are still under development. A bid package was mailed to two decontamination contractors on July 15, 1988 requesting cost estimates for detailed specifications by August 1, 1988. The estimated costs for decontamination from the bids and for replacement of selected segments of the system, will be compared to determine what combination of decontamination and replacement will provide for the most cost-effective actions to meet the decontamination standard. Actions will commence upon completion of replacement of the air compressors, which is expected by October 8, 1988, so as to prevent recontaminating the cleaned or replaced segments by PCB-contaminated condensates from existing air compressors upstream in the system.

Should you have any questions on this matter, contact me at (517) 788-0331.

Sincerely,

Bruce W. Rasher
Environmental Department

Enclosures
BWR/vp

OC0888-0045A-EN03

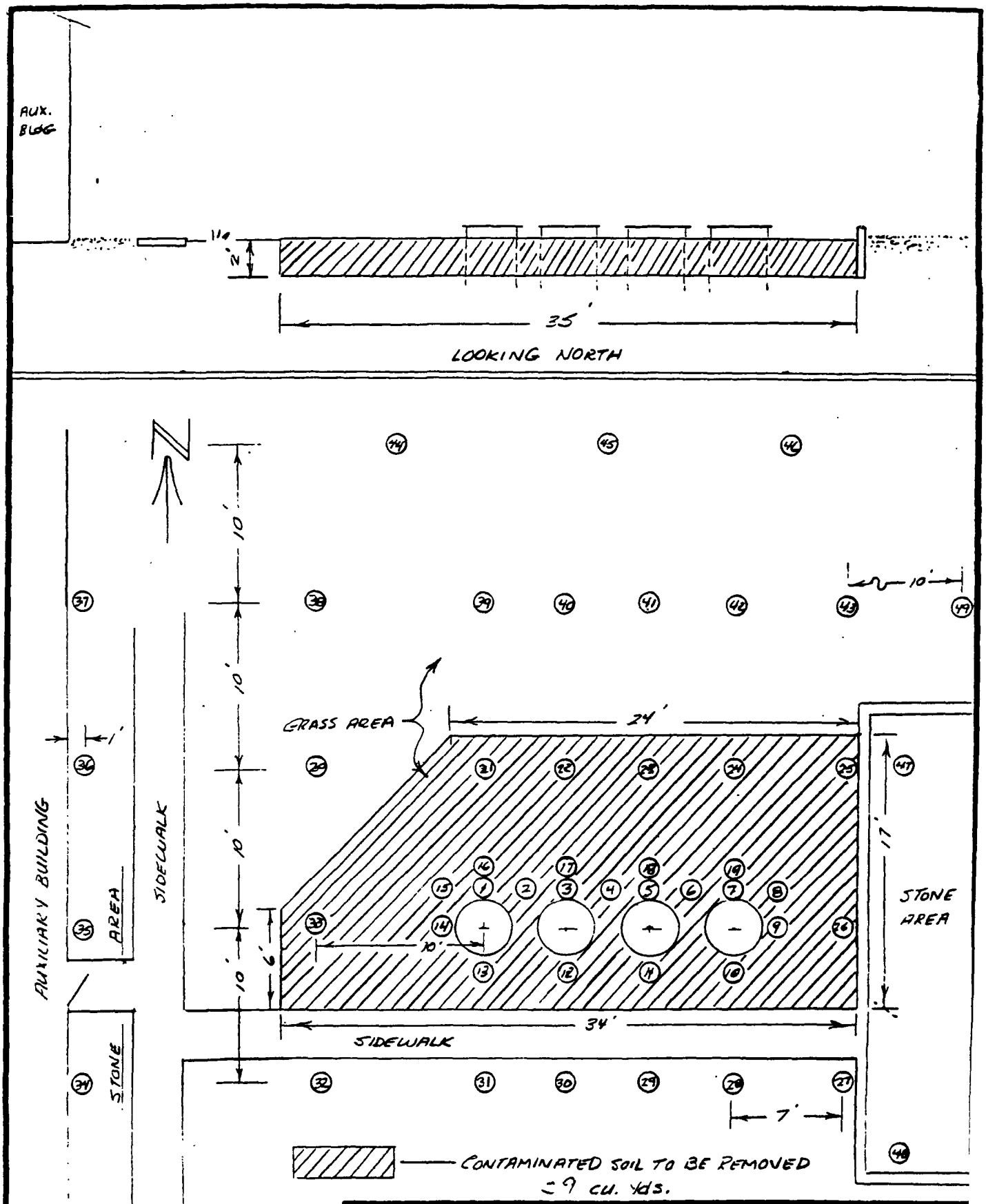
L00258236
K00000711

CONSUMERS POWER COMPANY
Overisel Compressor Station
PCB Action Plan

Summary of actions for PCB releases to soil from various systems

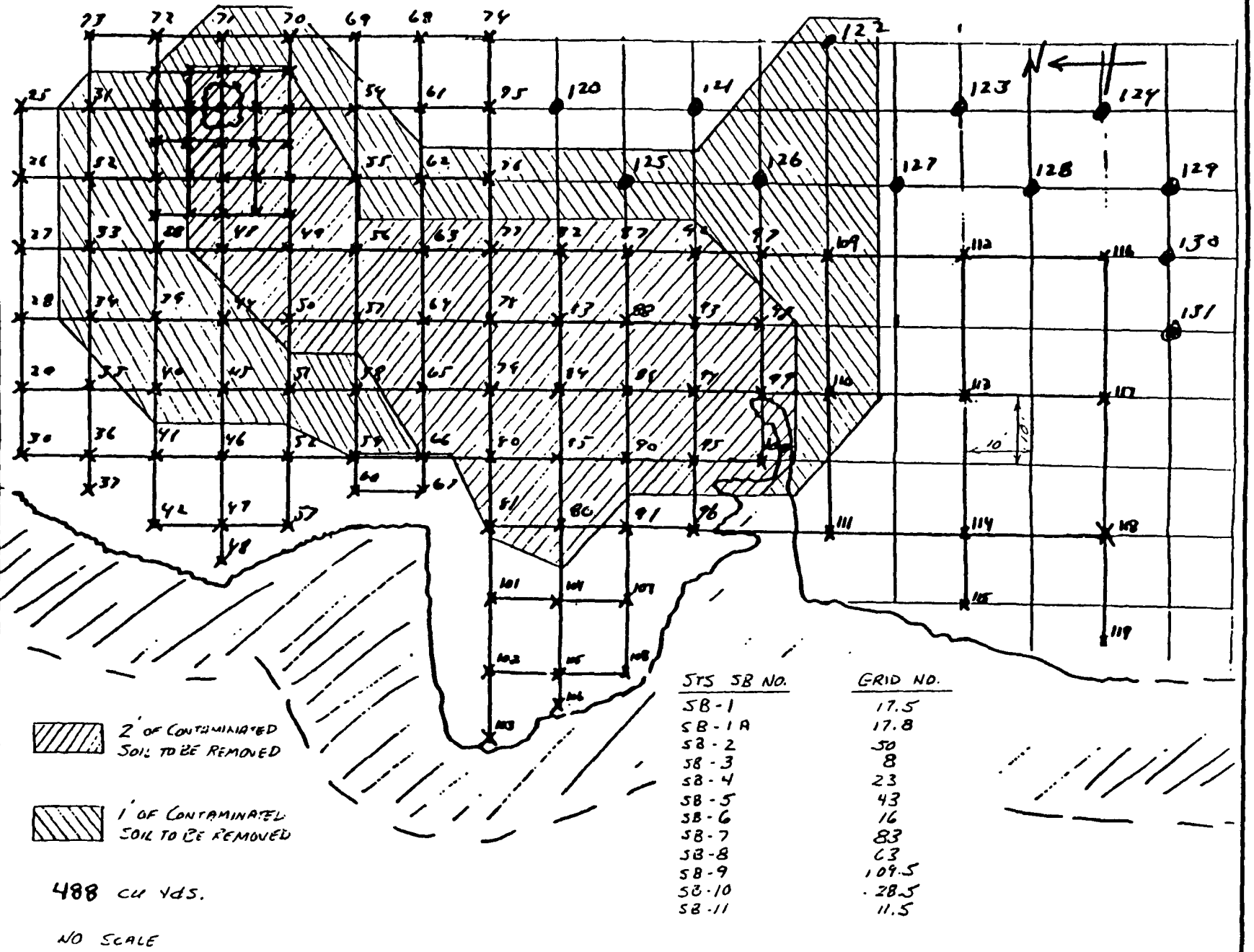
Location	Soil Exceeding Action Threshold: Area (ft^2)	Depth (ft)	Volume (yd^3)	Restricted/ Nonrestricted Access Area	Decontamination Standard (ppm PCB)	Decontamination Method
Air Receiver Tank Drain	528	2	39	Restricted	25	Removal by hand shovel
Overflow	6,627	1	246	Nonrestricted	10	Removal by clam in tiers down to water table
	3,263	2	242			
			488			
Total			527			

L00258237
K00000712



OVERISEL COMPRESSOR STATION			
W.O. 3495	FILE NO.	AREA - AIR LOGS	5-3-88
CONSUMERS POWER CO. GAS P.&T. ENGINEERING		DR. RLM / CK. RLM / APP.	NO. 1 OF 3

K00000713 L00258238



STS SB NO.	GRID NO.
SB-1	17.5
SB-1A	17.8
SB-2	50
SB-3	8
SB-4	23
SB-5	43
SB-6	16
SB-7	83
SB-8	63
SB-9	109.5
SB-10	28.5
SB-11	11.5

W.O. 3495

FILE NO.

CONSUMERS POWER CO.
GAS P.&T. ENGINEERING

DR. RLM | CK. RLM | APP.

OVERISEL COMPRESSOR STATION

OUT FALL AREA

5-19-88

NO. 1 OF 10

K000000714 L002258239

~~PCA~~
BWR

Consumers Power

POWERING MICHIGAN'S PROGRESS

Writer's direct dial (517) 788-0331
General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

August 22, 1991

M90518.3

Ms Wanda Neal
Waste Management Division
Department of Natural Resources
Secondary Complex
PO Box 30028
Lansing MI 48909

Re: Overisel Compressor Station
1991 Groundwater Monitoring Report

Dear Ms Neal:

In the PCB Action Plan for Consumers Power Company's Overisel Compressor Station filed with the DNR on August 8, 1988, Consumers stated its plans to undertake a long-term, annual groundwater monitoring program at the site. The program commenced in March of 1988 utilizing the existing six monitoring wells and is intended to assure detection of any changes in conditions at the site. The duration will be at least 10 years, but will be evaluated on an annual basis using the data obtained from the monitoring.

This is to report the results of the monitoring for 1991 conducted on August 6, 1991. As shown in the attached report, PCB was not detected in any of the wells at 0.1 ug/L. The direction of groundwater flow was to the southeast.

Please contact me if you have any questions regarding this matter.

Sincerely,

Bruce Rasher
Environmental & Technical Services

XC: JPDickey
DTKetcham
Overisel Compressor Station

K00000715

To	BWRasher, P12-103	CONSUMERS POWER COMPANY
From	HWVoigt, T-260	
Date	August 22, 1991	Internal Correspondence
Subject	OVERISEL COMPRESSOR STATION - Monitoring Well Samples PCB Results - Sampling Date - August 06, 1991	
CC		File Index # 529117-552-357

On August 06, 1991 personnel from the Chemistry Department of Environmental and Technical Services (E&TS) completed Depth-To-Water (DWL) measurements and groundwater sample collection from seven (7) monitoring well installations at the Overisel Compressor Station. Samples were returned to E&TS for PCB analysis.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - The monitoring wells were pumped at a rate of 1 gallon per minute to a constant pH and specific conductance readings with a suction pump fitted with a rubber hose and a screened foot valve. During pumping the screened foot valve was positioned 1 foot below the DWL so that the completed well volume was evacuated. Measurements of pH and specific conductance were taken at intervals corresponding to approximately one pumped casing volume for a minimum of five casing volumes. After the required pump volume was removed, a 1-quart water sample was collected at screen depth with a clean bailer. Samples were iced and returned to E&TS Chemistry Department for analysis.

Sample Handling - Sample handling was in accordance with the SW-846 recommendations for organic analytes.

pH and Specific Conductance - E&TS Procedure - CHEM-74

PCB Analysis - Samples were analyzed in accordance with SW-846, Method 8080, Organochlorine Pesticides and PCB, (PCB only).

K00000716

RESULTS

Table 1 - PCB Analysis Results

Table 2 - Depth-To-Water Measurements

Table 3 - Field Parameter: Constant pH and Specific Conductance Readings and Pre-Sample Pump Volumes

Figure 1 - Groundwater Contour Map

K00000717

TABLE 1. PCB ANALYSIS RESULTS

Overisel Compressor Station
Sampling Date: August 06, 1991

Control Number	Monitoring Well ID	PCB, ug/L As PCB-1254	MDL ug/L
901357-1	OV-88MW-1	ND	0.1
901357-2	OV-88MW-2	ND	0.1
901357-3	OV-88MW-2A	ND	0.1
901357-4	OV-88MW-3	ND	0.1
901357-5	OV-88MW-3A	ND	0.1
901357-6	OV-88MW-4	ND	0.1
901357-7	OV-88MW-4A	ND	0.1
901357-8	Field Blank	ND	0.1

MDL = Method Detection Limit

Method Detection Limit is based on 10-mL final extraction volume of a 950 mL water sample and a analyte practical quantitation limit of 0.01 ug/mL for PCB-1254 standard.

K00000718

TABLE 2. STATIC WATER ELEVATION

Overisel Compressor Station
Sampling Date: August 06, 1991

Monitoring Well ID	Elevation Top-Of-Casing (ft)	Depth-To Water (ft)	Static Water Elevation (ft)
88MW-1	116.80	14.44	102.36
88MW-2	105.02	3.62	101.40
88MW-2A	105.33	3.68	101.65
88MW-3	104.43	3.76	100.67
88MW-3A	104.08	2.61	101.47
88MW-4	104.11	2.68	101.43
88MW-4A	104.30	2.81	101.49

K00000719

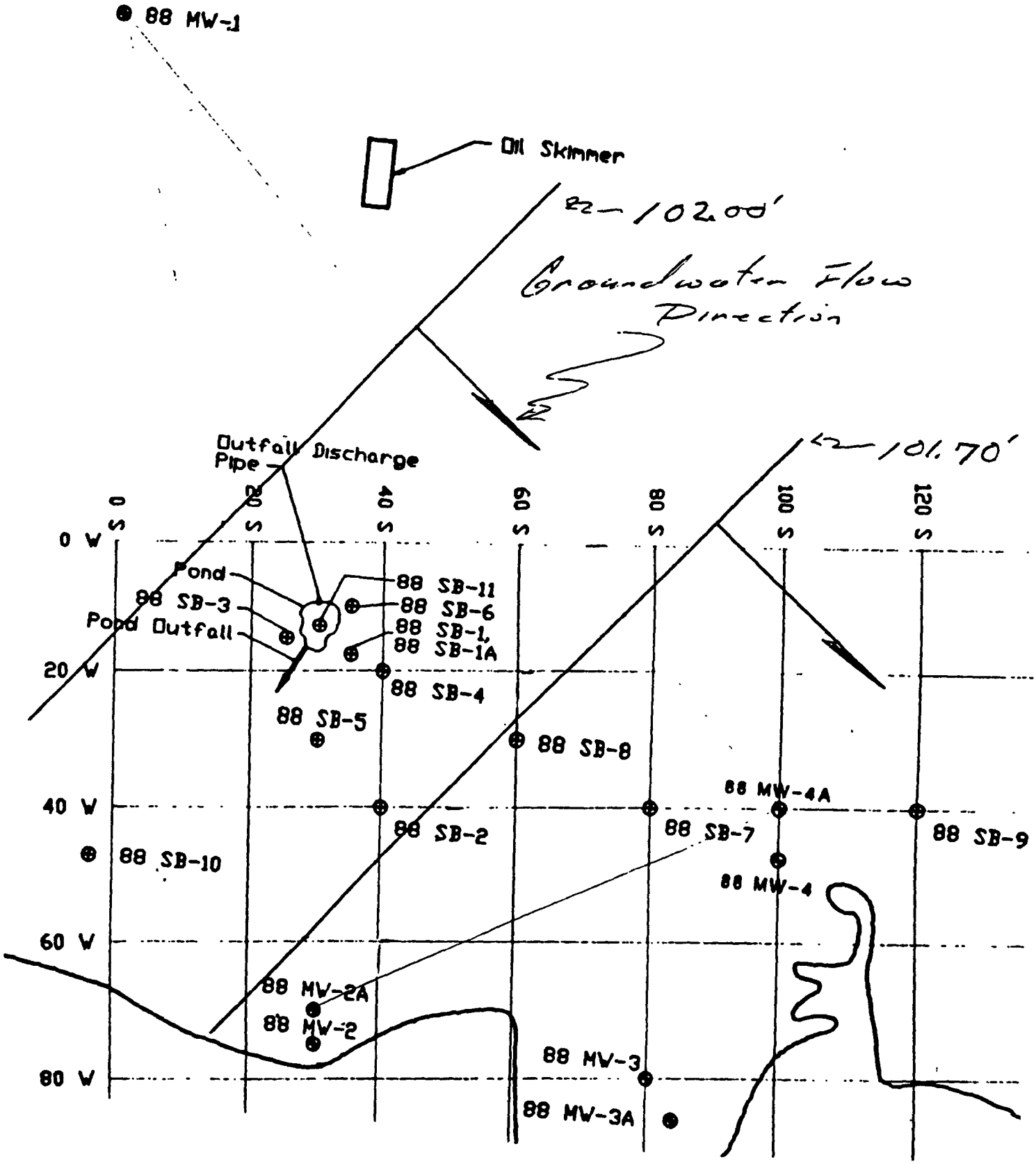
TABLE 3. MONITORING WELL SAMPLING FIELD PARAMETERS

Overisel Compressor Station
Sampling Date: August 06, 1991

MW ID	SCRN Depth (ft)	DWL (ft)	Well Volume (gal)	Pump Volume (gal)	Final pH (SU)	Final Specific Conductance (umho/cm)
88MW-1	21.90	14.44	1.24	6.0	7.45	600
88MW-2	12.00	3.62	1.38	7.0	7.70	475
88MW-2A	23.14	3.68	3.15	16.0	7.75	465
88MW-3	11.67	3.76	1.29	7.0	7.85	510
88MW-3A	20.23	2.61	2.86	14.5	7.90	810
88MW-4	11.79	2.68	1.50	8.0	7.85	435
88MW-4A	21.80	2.81	3.08	16.0	7.90	450

FIGURE 1. GROUNDWATER CONTOUR MAP

Overisel Compressor Station
Sampling Date: August 06, 1991



K00000721

APPENDIX A-1 FIELD NOTES

MONITORING WELL SAMPLING EQUIPMENT LOG

Site Location: Overisel Comp Sta

Date: 08-06-91 Project Number:

Leader: JKH Helper: RL

++

CALIBRATION SOLUTIONS - pH BUFFER SOLUTIONS

pH Buffer	Source	Lot Number
4.0	FISHER	900094-24
7.0	↓	900359-24
10.0	↓	900236-24

CALIBRATION SOLUTIONS - SPECIFIC CONDUCTANCE SOLUTIONS

umho/cm	Source	Lot Number
47	HYRON L COMPANY	013190-.03
447	↓	051400-.B
733	↓	082290-.5
1410	↓	011190-1

++

FIELD EQUIPMENT CALIBRATION

pH Meter

Meter ID METROHM E-488 S/N 3744-00065

pH Buffer	Start Of Day Check pH	Start Of Day Check Time	End Of Day Check pH	End Of Day Check Time
4.0	4.0	1045	4.2	1315
7.0	7.0	↓	7.0	↓
10.0	10.0		10.1	

Specific Conductance Meter

Meter ID S/N

umho/cm	Start Of Day Check umho/cm	Start Of Day Check Time	End Of Day Check umho/cm	End Of Day Check Time
47	47	1050	48	1315
447	450	↓	445	↓
733	725	↓	725	↓
1410	1400		1400	

++

K00000723

MONITORING WELL SAMPLING LOG

Site Location: Overisel

Date: 08-06-91 Project Number:

Leader: JHEAP Helper: RL

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	21.90	2.81	19.09	3.1	15.5	16
88 MW -4A	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1228	1	4.0	7.75	440	
	1231	2	3.0	7.85	445	
	1234	3	3.0	7.90	450	
	1238	4	3.0	7.90	450	
	1243	5	3.0	7.90	450	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	

K00000724

MONITORING WELL SAMPLING LOG

Site Location: Ovensel

Date: 08-06-91 Project Number:

Leader: JKHEAP Helper: RL

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	11.76	3.76	8.0	1.3	6.5	7.0
88 MW -3 + DUPL	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1148	1	2.0	7.60	500	
	1150	2	1.0	7.85	500	
	1152	3	1.0	7.85	510	
	1154	4	1.0	7.85	510	
	1155	5	2.0	7.85	510	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	20.85	2.61	18.24	2.9	14.5	15.0
88 MW -3A	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1158	1	3.0	7.90	800	
	1201	2	3.0	7.85	810	
	1204	3	3.0	7.90	810	
	1207	4	3.0	7.95	810	
	1210	5	3.0	7.90	810	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	11.95	2.68	9.27	1.5	7.5	8.0
88 MW -4	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1220	1	2.0	7.3	430	
	1222	2	1.0	7.75	430	
	1223	3	1.0	7.80	430	
	1225	4	2.0	7.85	435	
	1226	5	2.0	7.85	435	

K00000725

MONITORING WELL SAMPLING LOG

Site Location: Ouensel

Date: 08-06-91 Project Number:

Leader: JC Heap Helper: RL

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	21.78	14.44	7.34	1.2	6.0	6.0
88 MW -1	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1300	1	2.0	7.25	600	
	1303	2	1.0	7.35	600	
	1306	3	1.0	7.40	575	
	1308	4	1.0	7.40	600	
	1310	5	1.0	7.45	600	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	12.15	3.62	8.53	1.4	7.0	7.0
88 MW -2	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1123 ~~1110~~	1	2.0	7.65	475	
	1124	2	1.0	7.65	470	
	1126	3	1.0	7.70	475	
	1128	4	1.0	7.70	475	
	1130	5	2.0	7.70	475	
		~~6~~				

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	23.10	3.68	19.42	3.1	15.5	16.0
88 MW -2A	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1110	1	3.0	7.85	435	
	1113	2	3.0	7.85	460	
	1116	3	4.0	7.75	465	
	1119	4	3.0	7.75	465	
	1122	5	3.0	7.75	465	

K00000726

MONITORING WELL DEPTH-TO-WATER MEASUREMENTS

Site Location: Oversel

Date: 05-06-91 Project Number:

Leader: JKHEAP Helper: RL

		TRIAL - 1			TRIAL - 2		
Monitoring Well ID	Time	Top-Of Casing	Wetted Tape (ft)	Depth-To-Water (ft)	Top-Of Casing (ft)	Wetted Tape (ft)	Depth-To-Water (ft)
88MW-1	1255	15.00	0.56	14.44	16.00	1.56	14.44
88MW-2	1045	5.00	1.38	3.62	6.00	2.38	3.62
88MW-2A	1047	5.00	1.32	3.68	6.00	2.32	3.68
88MW-3	1140	5.00	1.24	3.76	6.00	2.24	3.76
88MW-3A	1143	~~5.00~~ 4.00	1.39	2.61	5.00	~~2.42~~ 2.39	2.61
88MW-4	1216	4.00	1.32	2.68	5.00	2.32	2.68
88MW-4A	1218	4.00	1.19	2.81	5.00	2.19	2.81

Remarks

K00000727

All Measurements are recorded to the nearest 0.01 ft

Reviewed By Date

APPENDIX A-2 ANALYTICAL WORKSHEETS

PCB - WATER SAMPLE

Project Number 91-1357

Date 08-07-91

Analyst HWJ - JKH

SAMPLE CONTROL NUMBER
SAMPLE IDENTIFICATION

PROJECT NAME Overisel mw

Control Number	Sample Identification	Remarks
91-1357-1	mw-1	
-2	mw-2	
-3	mw-2A	
-4	mw-3	
-5	mw-3 (2nd)	For spike QC
-6	mw-3A	
-7	mw-4	
-8	mw-4A	
-9	Field Blank	
		K00000729

PCB - WATER SAMPLE

QC CONCENTRATE PREPARATION

Project Number 91-1357

Date 08-08-91

Analyst KWJ

Material Name Aroclor 1254

Material Source Supelco

Material Lot Number LA23087 Material Stock Number 4-8707

Purity or Concentration 200 Units ug/mL

Stock Preparation By Weight ____ Stock Preparation As Received ✓

Balance ID _____

Final Wt _____
Tare Wt _____
Sample Wt _____

Dilution Solvent _____

Dilution Volume _____

Initial Stock Concentration _____

Working Dilutions Of Stock Concentration

Dilution Solvent Methanol

A = Initial Stock Concentration Of 200 ug/mL

B = Dilute A By 1 To 100 = 200 x 1 / 100 = 2.0

C = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

D = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

E = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

F = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

G = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

QC Conc. ID	Final Concentration	Remarks
QC-B	2ug/mL	
		K00000730

K00000730

PCB - WATER SAMPLE

Project Number 91-1357

CALIBRATION STANDARDS PREPARATION.

Date 08-08-91

Analyst HWJ

Material Name Aroclor 1254

Material Source Supelco

Material Lot Number LA22952 Material Stock Number 4-4808

Purity or Concentration 1000 Units ug/mL

Stock Preparation By Weight ____ Stock Preparation As Received ✓

Balance ID _____

Final Wt _____
Tare Wt _____
Sample Wt _____

Dilution Solvent _____

Dilution Volume _____

Initial Stock Concentration _____

Working Dilutions Of Stock Concentration

Dilution Solvent nC6

A = Initial Stock Concentration Of 1000 ug/mL

B = Dilute A By 1 To 250 = 1000 x 1/250 = 4

C = Dilute B By 1 To 10 = 4 x 1/10 = 0.40

D = Dilute B By 1 To 25 = 4 x 1/25 = 0.16

E = Dilute B By 0.5 To 25 = 4 x 0.5/25 = 0.08

F = Dilute B By 0.5 To 200 = 4 x 0.5/200 = 0.01

G = Dilute ___ By ___ To ___ = ___ x ___ / ___ = ___

Standard ID	Final Concentration	Remarks
Std-1	0.01 ug/mL	from F
Std-2	0.08 ug/mL	E
Std-3	0.16 ug/mL	D
Std-4	0.40 ug/mL	C
		K00000731

PCB - WATER SAMPLE

EXTRACTION WORKSHEET

Project Number 91-1357

Date 08-13-91

Analyst JKH - HWJ

Extraction Solvent MeCl2

Exchange Solvent nC6

Extraction Method: Separatory Funnel ✓

Continous Liquid - Liquid Extractor ___

Extraction Number 91-1357	Control Number	Sample Volume (mL)	Final Volume (mL)	Remarks
-1	-1	955	10	mw-1
-2	-2	958	10	mw-2
-3	-3	950	10	mw-2A
-4	-4	950	10	mw-3
-5	-5	955	10	mw-3 - QC
-6	-6	950	10	mw-3A
-7	-7	958	10	mw-4
-8	-8	950	10	mw-4A
-9	-9	950	10	Field Blank
-10	-10	1000	10	method Blank
-				
				K00000732

PCB - WATER SAMPLE

INSTRUMENT CONDITIONS

Project Number 91-1357

Date 08-15-91

Analyst HWJ

Gas Chromatograph Model HP 5730

Number 3741-LQ 365

Detector Ni-63 S/N H3049

Column: Phase 3% SP2100

Support Supelcoport

Column Material glass

Length 6' od 1/4" id 4mm

Oven Temperature Profile:

Initial Temp 200 Initial Time 0

Program Rate 0 C/mim

Final Temp 200 Final Time ∞

Carrier Gas P 5 Flow Rate 52ml/min

Detector Temp 300 Injector Temp 300

Auto - Sampler Model HP 7672A

Injection Volume 4ul

Calibration Date 08-15-91

K00000733

PCB - WATER SAMPLE

SAMPLE LIST

Project Number 91-1357

Date 08-15-91

Analyst HWU

Btl #	Control Number	Concentration Calculated As PCB-1254 Units ug/mL	Sample Dilution Fractor	Final Conc Calculated As PCB-1254 Units ug/L
05	Std-1	0.01	na	na
06	Std-2	0.09		
07	Std-3	0.16		
08	Std-4	0.41		
09	-10	<0.01		<0.1
10	-09	<0.01		<0.1
11	-01	<0.01		<0.1
12	-02	<0.01		<0.1
13	-03	<0.01		<0.1
14	-04	<0.01		<0.1
15	-06	<0.01		<0.1
16	-07	<0.01		<0.1
17	-08	<0.01		<0.1
18	-5	0.253		~~2.64~~ 2.65
19	std-2	0.07		na
20	std-3	0.15		
21	std-4	0.40		
22				
				K00000734

PCB - WATER SAMPLE

INITIAL CALIBRATION RUN
CALIBRATION CHECK RUN

PCB A-1254

Project Number 91-1357

Date 08-15-91

Analyst HCW

INITIAL CALIBRATION

Standard ID	Standard Conc	Found	Acceptance Criterion
Std-1	0.01	0.01	0.01 +/- 0.001
Std-2	0.08	0.09	0.08 +/- 0.008
Std-3	0.16	0.16	0.16 +/- 0.016
Std-4	0.40	0.41	0.40 +/- 0.040
			+/-
			+/-

MIDDLE - OF - RUN CALIBRATION CHECK

Standard ID	Standard Conc	Found	Acceptance Criterion
na			+/-
			+/-
			+/-
			+/-
			+/-
			+/-

END - OF - RUN CALIBRATION CHECK

Standard ID	Standard Conc	Found	Acceptance Criterion
Std-2	0.08	0.07	0.08 +/- 0.012
Std-3	0.16	0.15	0.16 +/- 0.024
Std-4	0.40	0.40	0.40 +/- 0.060
			+/-
			K00000735 +/-
			+/-

PCB - WATER SAMPLE

QC

Project Number 91-1357

Date 08-08-91

Analyst HWJ

QC SPIKE PREPARATION

Spike Material A-1254

Control Number	Sample Matrix	Initial Sample Volume, L	Spike Conc In Sample ug/L	QC Concentrate Added QC ID	mL Added
91-1357-5	MW-3	0955	2ug/L	QC-B	2mL

QC PERCENT RECOVERY 08-16-91

Spike Material A-1254

Control Number 91-1357-	Conc Added ug/L	Conc Found ug/L	Actual Percent Recovery %	Acceptance Criteria Range For Percent Recovery %
5	4.19	2.65	63	D - 400%

METHOD BLANKS

Control Number 91-1357	Sample Name	Final Concentration Found As 1254 ug/L	K00000736
-9	Field	<0.01	
10	method	<0.01	

Consumers Power
POWERING MICHIGAN'S PROGRESS
General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

Writer's Direct Dial (517) 788-0331

August 25, 1992

Ms Wanda Neal
Waste Management Division
Department of Natural Resources
Secondary Complex
PO Box 30028
Lansing, MI 48909

M90518.3

OVERISEL COMPRESSOR STATION -
1992 GROUNDWATER MONITORING REPORT

Dear Ms Neal

In the PCB Action Plan for Consumers Power Company's Overisel Compressor Station filed with the DNR on August 8, 1988, Consumers Power stated its plans to undertake a long-term, annual groundwater monitoring program at the site. The program commenced in March of 1988 utilizing the existing six monitoring wells and is intended to assure detection of any changes in conditions at the site. The duration will be at least 10 years, but will be evaluated on an annual basis using the data obtained from the monitoring.

This is to report the results of the monitoring for 1992 conducted on August 5, 1992. As shown in the attached report, PCB was not detected in any of the wells at 0.1 ug/L. The direction of groundwater flow was to the southeast.

Please contact me if you have any questions regarding this matter.

Sincerely

Bruce W. Rasher/trd

Bruce W Rasher
Contaminated Sites Section Head
Environmental and Technical Services Department

CC JPDickey, M-1046
DTKetcham, P-11-210
Overisel Compressor Station

K00000737

0892-067.BWR/TRD

File Overisel Groundwater Monitoring

8-20-92

To	BWRasher, P-24-300	CONSUMERS POWER COMPANY
From	HWVoigt, T-260	
Date	August 19, 1992	Internal Correspondence
Subject	OVERISEL COMPRESSOR STATION - - Monitoring Well Groundwater Samples - PCB Results - Sampling Date - August 05, 1992	
CC		File Index # 529217-552-343

On August 05, 1992 personnel from the Chemistry & Material Services Department (C&MS) of Environmental and Technical Services completed Depth-To-Water (DWL) measurements and groundwater sample collection from seven (7) monitoring well installations at the Overisel Compressor Station. All samples were returned to C&MS for determination of PCB.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - The monitoring wells were pumped at a rate of 1 gallon per minute to a constant pH and specific conductance readings with a suction pump fitted with a rubber hose and a screened foot valve. During pumping the screened foot valve was positioned 1 foot below the DWL so that the completed well volume was evacuated. Measurements of pH and specific conductance were taken at intervals corresponding to approximately one pumped casing volume for a minimum of five casing volumes. After the required pump volume was removed, a 1-quart water sample was collected at screen depth with a clean bailer. Samples were iced and returned to C&MS for analysis.

Sample Handling - Sample handling was in accordance with the SW-846 recommendations for organic analytes.

pH and Specific Conductance - E&TS Procedure - CHEM-74

PCB Analysis - Method 8080, Organchlorine Pesticides and PCB (PCB Only). SW-846, Test Methods For Evaluating Solid Waste - Physical / Chemical Methods, USEPA, 3rd Edition, September 1986.

K00000738

RESULTS

Table 1 - PCB Analysis Results

Table 2 - Depth-To-Water Measurements

Table 3 - Field Parameter: Constant pH and Specific Conductance Readings and Pre-Sample Pump Volumes

Figure 1 - Groundwater Contour Map

K00000739

TABLE 1. PCB ANALYSIS RESULTS

Overisel Compressor Station
Sampling Date: August 05, 1992

Control Number	Monitoring Well ID	PCB, ug/L As PCB-1254	MDL ug/L
921343-1	OV-88MW-1	ND	0.1
921343-2	OV-88MW-2	ND	0.1
921343-3	OV-88MW-2A	ND	0.1
921343-4	OV-88MW-3	ND	0.1
921343-5	OV-88MW-3A	ND	0.1
921343-6	OV-88MW-4	ND	0.1
921343-7	OV-88MW-4A	ND	0.1
921343-8	Field Blank	ND	0.1

MDL = Method Detection Limit, ug/L (parts-per-billion)
ND = Parameter NOt Detected At MDL

K00000740

TABLE 2. STATIC WATER ELEVATION

Overisel Compressor Station
Sampling Date: August 05, 1992

Monitoring Well ID	Elevation Top-Of-Casing (ft)	Depth-To Water (ft)	Static Water Elevation (ft)
88MW-1	116.80	14.35	102.45
88MW-2	105.02	3.57	101.45
88MW-2A	105.33	3.61	101.72
88MW-3	104.43	3.70	100.73
88MW-3A	104.08	2.52	101.56
88MW-4	104.11	2.56	101.55
88MW-4A	104.30	2.71	101.59

K00000741

TABLE 3. MONITORING WELL SAMPLING FIELD PARAMETERS

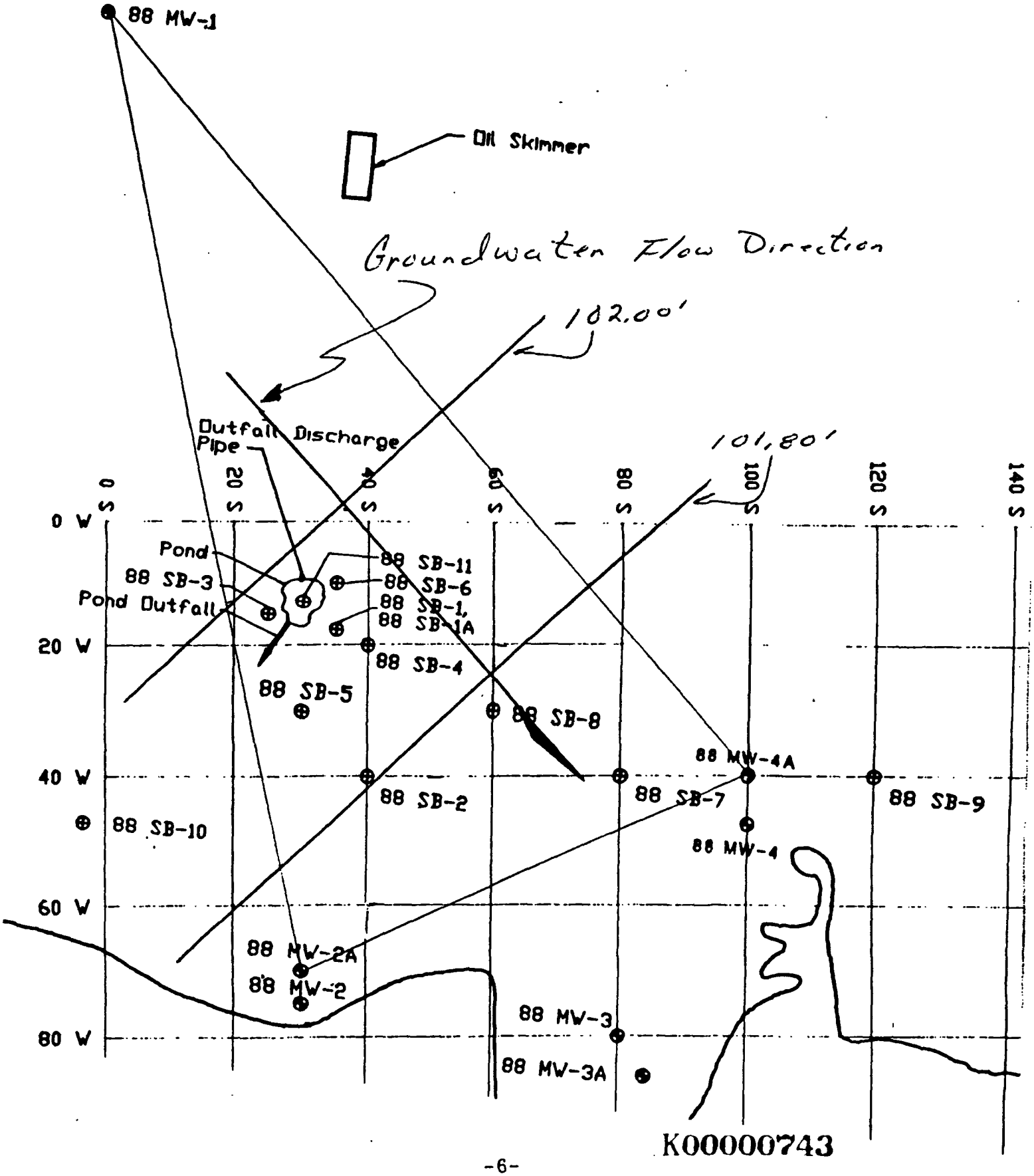
Overisel Compressor Station
Sampling Date: August 05, 1992

MW ID	SCRN Depth (ft)	DWL (ft)	Well Volume (gal)	Pump Volume (gal)	Final pH (SU)	Final Specific Conductance (umho/cm)
88MW-1	22.02	14.35	1.23	6.0	6.75	410
88MW-2	12.11	3.57	1.37	7.0	7.05	405
88MW-2A	23.09	3.61	3.12	16.0	7.30	425
88MW-3	11.79	3.70	1.30	7.0	7.45	470
88MW-3A	21.02	2.52	3.00	15.0	7.60	500
88MW-4	11.93	2.56	1.50	8.0	7.45	450
88MW-4A	21.84	2.71	3.10	16.0	7.90	445

K00000742

FIGURE 1. GROUNDWATER CONTOUR MAP

Overisel Compressor Station
Sampling Date: August 05, 1992



K00000743

APPENDIX A-1 FIELD NOTES

CHAIN OF CUSTODY

CONSUMERS POWER COMPANY
ENVIRONMENTAL & TECHNICAL SERVICES
135 W. TRAIL ST.
JACKSON, MICHIGAN 49201
(517) 788-1251
FAX (517) 788-1104

PAGE 1 OF 1

SEND REPORT TO :

PHONE :

SAMPLING SITE : Overisel Gas Comp. Station

PROJECT NUMBER : 529217-XXX-343

SAMPLING TEAM : R B Lauer & G.L. Cattell

DATE SHIPPED : Hand carried 8/05/92

SITE SKETCH ATTACHED ? CIRCLE ONE : YES NO

ANALYSIS REQUESTED: PC, B

CPCO CONTROL NO.	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE	SAMPLE DESCRIPTION / LOCATION	SAMPLE DEPTH	# OF CONTAINERS	PC	B	REMARKS
92-1343 -1	8-05-92	0954	water	88MW-1		2ea. 8L.	✓		
-2		1055		88MW-2			✓		
-3		1115		88MW-2A			✓		
-4		1135		88MW-3			✓		
-5		1200		88MW-3A			✓		
-6		1225		88MW-4			✓		
-7		1300		88MW-4A			✓		
-8		—		Field blank			✓		

RELINQUISHED BY : (SIGNATURE)	DATE / TIME	RECEIVED BY : (SIGNATURE)
	080592	[illegible]
RELINQUISHED BY : (SIGNATURE)	DATE / TIME	RECEIVED BY : (SIGNATURE)
RELINQUISHED BY : (SIGNATURE)	DATE / TIME	RECEIVED BY : (SIGNATURE)

K00000745

COMMENTS :

MOMITORING WELL DEPTH-TO-WATER MEASUREMENTS

LOCATION Overisel Gas Comp. Station — Monitoring wells

DATE 8-05-92 PROJECT NUMBER 528217-XXX-343

WELL ID Number	Time	Trial-1 Top-Of Casing (ft)	Trial-1 Wetted Tape (ft)	Trial-1 DWL (ft)	Trial-2 Top-Of Casing (ft)	Trial-2 Wetted Tape (ft)	Trial-2 DWL (ft)
MW-1	0933	15.00	0.65	14.35	16.00	1.65	14.35
MW-2	0957	4.00	0.43	3.57	5.00	1.43	3.57
MW-2A	1000	4.00	0.39	3.61	5.00	1.39	3.61
MW-3	1010	5.00	1.30	3.70	6.00	2.30	3.70
MW-3A	1020	3.00	0.48	2.52	4.00	1.48	2.52
MW-4	1025	3.00	0.44	2.56	4.00	1.44	2.56
MW-4A	1033	4.00	1.29	2.71	5.00	2.29	2.71

Notes : DWL measurements are read to the nearest 0.01 ft.

Remarks:

K00000746

Measurements Taken By RBL, verified & calculated by PBL

Reviewed By PBW Date 08/14/92

****

MONITORING WELL SAMPLING LOG - pg. 1 of 3.

Site Location: Overisel Gas Comp. Station

Date: 8/05/92 Project Number: 529217-xxx-343

Leader: GLCattell GLC Helper: RBLauer RBL

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88MW-1	22.02	14.35	7.67	1.23	6.1	6.0
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	0942	1	1	7.00	400	
	0945	2	1	6.70	415	
	0948	3	1	6.70	410	
	0949	4	1	6.70	410	
	0951	5	2	6.75	410	
			6			

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88MW-2	12.11	3.57	8.54	1.37	6.8	7.0
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1040	1	1	6.90	410	
	1041	2	1	6.75	405	
	1042	3	1	6.90	415	
	1044	4	2	7.05	405	
	1046	5	2	7.05	405	
			7			

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88MW-2A	23.09	3.61	19.48	3.12	15.6	16.0
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1057	1	3	7.35	400	
	1100	2	3	7.30	420	
	1102	3	3	7.25	425	
	1105	4	3	7.30	425	
	1110	5	4	7.30	425	
			16			

K00000747

MONITORING WELL SAMPLING LOG -pg. 2 of 3

Site Location: Overisel Gas Comp. Station

Date: 8/05/92 Project Number: 529217-XXX-343

Leader: GLCattell GRL Helper: RBLauer RBL

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88mw-3	11.79	3.69	8.10	1.30	6.5	7.0
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1125	1	1	7.30	460	
	1126	2	1	7.45	465	
	1127	3	1	7.45	465	
	1129	4	2	7.45	470	
	1131	5	2	7.45	470	
			7			

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88mw-3A	21.02	2.52	18.50	3.0	15.0	15.0
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1145	1	3	7.75	550	
	1148	2	3	7.60	500	
	1151	3	3	7.55	500	
	1154	4	3	7.60	500	
	1157	5	3	7.60	500	
			15			

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88mw-4	11.96	2.56	9.40	1.5	7.5	8.0
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
	1215	1	1	7.40	465	
	1216	2	1	7.35	460	
	1218	3	2	7.45	460	
	1220	4	2	7.45	450	
	1222	5	2	7.45	450	
			8			

K00000748

MONITORING WELL SAMPLING LOG — pg. 3 of 3

Site Location: Overisel Gas Comp. Station

Date: 8/05/92 Project Number: 528217-XXX-343

Leader: GLCattell GLC Helper: RBlauer RBL

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
88MW-4A	21.84	2.71	19.13	3.1	15.5	16.0

Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	
1240	1	3	8.00	400	
1243	2	3	7.80	440	
1246	3	3	7.85	440	
1249	4	3	7.80	445	
1253	5	4	7.80	445	
		16			

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)

Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)

Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	

K00000749

MW ID	Screen Depth (ft)	DTW (ft)	Casing Volume (gal)	5 X Volume (gal)	
88mw-1	22.02	14.35 1	1.23	6.1	
88mw-2	12.11	3.57	1.37	6.8	
88mw-2A	23.09	3.61	3.12	15.6	
88mw-3	11.79	3.69	1.3	6.5	
88mw-3A	21.02	2.52	3.0	15.0	
88mw-4	11.96	2.56	1.5	7.5	
88mw-4A	21.84	2.71	3.1	15.5	

$$\text{Casing Volume (gal)} = \begin{pmatrix}\text{Screen}\\ \text{Depth}\\ \text{(ft)}\end{pmatrix} - \begin{pmatrix}\text{Depth}\\ \text{To}\\ \text{Water}\\ \text{(ft)}\end{pmatrix} \times 0.16$$

Pump Volume (gal) = 5 x Casing Volume(gal)

K00000750

MONITORING WELL SAMPLING EQUIPMENT LOG

Site Location: Overisel Gas Comp. station — Monitoring wells

Date: 8-05-92 Project Number: 529217-xxx-343

Leader: GLCattell [signature] Helper: RB Lauer RBL

++

CALIBRATION SOLUTIONS - pH BUFFER SOLUTIONS

pH Buffer	Source	Lot Number
4.00	Fisher Scientific, cat.# SB101-500	910363-24, exp. May '93
7.00	↓ ↓ , ↓ SB107-500	913235-24, exp. June '93
10.00	↓ ↓ , ↓ SB115-500	910862-24, exp. June '93

CALIBRATION SOLUTIONS - SPECIFIC CONDUCTANCE SOLUTIONS

umho/cm	Source	Lot Number
46.5	Myron L Co.	Not given on bth.
447.1	↓	↓ ↓ ↓
732.9	↓	↓ ↓ ↓
1414	↓	

++

FIELD EQUIPMENT CALIBRATION

pH Meter

Meter ID (CPCO #) 3744-00065 S/N 31/4598

pH Buffer	Start Of Day Check pH	Start Of Day Check Time	End Of Day Check pH	End Of Day Check Time
4.00	4.00	0935	3.95	1300
7.00	6.90	↓	6.90	↓
10.00	10.00	↓	10.05	↓

Specific Conductance Meter

Meter ID NONE S/N 1060347

umho/cm	Start Of Day Check umho/cm	Start Of Day Check Time	End Of Day Check umho/cm	End Of Day Check Time
46.5	47.0	0936	47.0	1302
447.1	450	0939	450	1303
732.9	~700	0939	~700	1305
1414	~1400	0942	~1400	1305

++

K00000751

APPENDIX A-2 ANALYTICAL WORKSHEETS

SITE INVESTIGATION ANALYTICAL PARAMETERS

PROJECT #	92-1343		ORGANIC ANALYSIS									METAL ANALYSIS							
SITE	Overisel Gas Comp. Station		Sample Prep Dates									Split Date							
Date Rec'd	8/5				8/6							cc:DJS	WAY						
Report Due												DUE DATE							
Control Number	Sample ID	Type s/w	Organic									Inorganic							
			BTEX	PAH	PCB	TPH	MTBE	601				Pb	Pb Cd Cr	Cr +6					
92-1343-1	88MW1	W			✓														
-2	88MW2	W			✓														
-3	88MW2A	W			✓														
-4	88MW3	W			✓														
-5	88MW3A	W			✓														
-6	88MW4	W			✓														
-7	88MW4A	W			✓														
-8	Field blank	W			✓														

Notes/Remarks All were taken in duplicate

K00000753

PCB - WATER SAMPLE

EXTRACTION WORKSHEET

Project Number 92-1343

Date 08-06-92

Analyst ASC (HCOU)

Extraction Solvent $MeCl_2$

Exchange Solvent nC_6

Extraction Method: Separatory Funnel ✓

Continous Liquid - Liquid Extractor ___

Extraction Number	Control Number 92-1343	Sample Volume (mL)	Final Volume (mL)	Remarks
1	-1	960	10	88MW1
2	-2	960		2
3	-3	960		2A
4	-4	960		3
5	-5	960		3A
6	-6	960		4
7	-7	960		4A
8	-8	960		Field Blank
9	-9	960		QC
10	-10	1000		Method Blank

K00000754

PCB - WATER SAMPLE

INITIAL CALIBRATION RUN
CALIBRATION CHECK RUN

Project Number 92-1343

Date 08/08/92

Analyst HWJ

INITIAL CALIBRATION

Standard ID	Standard Conc ug/ml	Found	Acceptance Criterion
S1	0.010	0.011	0.010 +/- 0.001
S2	0.050	0.052	0.050 +/- 0.005
S3	0.100	0.098	0.100 +/- 0.010
S4	0.200	0.195	0.200 +/- 0.020
			+/-
			+/-

MIDDLE - OF - RUN CALIBRATION CHECK

Standard ID	Standard Conc	Found	Acceptance Criterion
na			+/-
			+/-
			+/-
			+/-
			+/-
			+/-

END - OF - RUN CALIBRATION CHECK

Standard ID	Standard Conc ug/ml	Found ug/ml	Acceptance Criterion
S1	0.010	0.009	0.010 +/- 0.002
S3	0.100	0.097	0.100 +/- 0.020
			+/-
			K00000755 +/-
			+/-
			+/-

PCB - WATER SAMPLE

CALIBRATION STANDARDS PREPARATION

Project Number ~~75-8775~~

Date 05-14-92

Analyst HWJ

Material Name Aroclor 1254

Material Source Supelco

Material Lot Number LA29840 Material Stock Number 4-4808

Purity or Concentration 1000 Units ug/ml

Stock Preparation By Weight ____ Stock Preparation As Received ✓

Balance ID ____

Final Wt ____
Tare Wt ____
Sample Wt ____

Dilution Solvent ____

Dilution Volume ____

Initial Stock Concentration ____

Working Dilutions Of Stock Concentration

Dilution Solvent n C6

A = Initial Stock Concentration Of 1000 ug/ml

B = Dilute A By 1 To 100 = 1000 x 1/100 = 10

C = Dilute B By 10 To 100 = 10 x 10/100 = 1.00

D = Dilute C By 10 To 50 = 1.00 x 10/50 = 0.20

E = Dilute C By 5 To 100 = 1.00 x 5/100 = 0.05

F = Dilute C By 1 To 100 = 1.00 x 1/100 = 0.01

G = Dilute C By 10 To 100 = 1.00 x 10/100 = 0.10

Standard ID	Final Concentration		
S1	0.010	=	F
S2	0.050	=	E
S3	0.100	=	G
S4	0.200	=	~~G~~ D

K00000756

PCB - WATER SAMPLE

QC

Project Number 92-1343

Date 080692

Analyst ASC (HOU)

QC SPIKE PREPARATION

Spike Material A1254 - Acetone

Control Number 92-1343	Sample Matrix	Initial Sample Volume, L	Spike Conc In Sample ug/L	QC Concentrate Added QC ID	mL Added
-9	MW 4A	0.960	4.90	200mg/ml	0.0235

QC PERCENT RECOVERY

Spike Material A1254

Control Number 92134)	Conc Added ug/L	Conc Found ug/L	Actual Percent Recovery %	Acceptance Criteria Range For Percent Recovery %
-9	4.90	3.99	81	D- 540

METHOD BLANKS

Control Number	Sample Name	Final Concentration Found As 1254 ug/L
-8	Field Blank	< 0.1
-10	Method Blank	< 0.1

K00000757

PCB - WATER SAMPLE

SAMPLE LIST

Project Number 92-1343

Date 08-10-92

Analyst HWJ

Btl #	Control Number 921343	Conentration Calculated As PCB-~~1242~~/1254 Units ~~ug/mL~~	Sample Dilution Fractor	Final Conc Calculated As PCB-~~1242~~/1254 Units ~~ug/L~~
12	S1	0.011	1X	na
13	S1	0.011		na
14	S2	0.052		na
15	S3	0.098		na
16	S4	0.195		na
17	-01	<0.009		<0.1
18	02	<0.009		<0.1
19	03	<0.009		<0.1
20	04	<0.009		<0.1
21	05	<0.009		<0.1
22	06	<0.009		<0.1
23	07	<0.009		<0.1
24	08	<0.009		<0.1
25	09	0.0766	x5	3.99
26	10	<0.009	1X	<0.1
27	S1	0.009		na
28	S3	0.097		na
			K00000758	

PCB - WATER SAMPLE

INSTRUMENT CONDITIONS

Project Number 92-1343

Date 08-10-92

Analyst HWJ

Gas Chromatograph Model HP 5890

Number 3244-00058

Detector Ni 63 S/N L 6450

Column: Phase 3% SP2100

Support Supelcoport

Column Material glass

Length 6' od 1/4" id 4mm

Oven Temperature Profile:

Initial Temp 200 Initial Time 0

Program Rate 0 C/mim

Final Temp 200 Final Time 00

Carrier Gas P5 Flow Rate 53

Detector Temp 300 Injector Temp 250

Auto - Sampler Model HP 7673A

Injection Volume 2ml

Calibration Date 08-10-92

K00000759

File Overisel Compressor Station PCB

Consumers Power
POWERING MICHIGAN'S PROGRESS

General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

Writer's Direct Dial (517) 788-0331

August 24, 1993

Ms Wanda Neal
Waste Management Division
Department of Natural Resources
Secondary Complex
PO Box 30028
Lansing, MI 48909

OVERISEL COMPRESSOR STATION -
1993 GROUNDWATER MONITORING REPORT

Dear Ms Neal

In the PCB Action Plan for Consumers Power Company's Overisel Compressor Station filed with the Michigan Department of Natural Resources (MDNR) on August 8, 1988, Consumers Power stated its plans to undertake a long-term, annual groundwater monitoring program at the site. The program commenced in March of 1988 utilizing the existing six monitoring wells and is intended to assure detection of any changes in conditions at the site. The duration will be at least 10 years, but will be evaluated on an annual basis using the data obtained from the monitoring.

This is to report the results of the monitoring for 1993 conducted on August 4, 1993. As shown in the attached report, PCB was not detected in any of the wells at 0.1 μg/L, with the exception that PCB-1254 was detected at 0.32 μg/L in one well (Monitoring Well 88 MW-4). The direction of groundwater flow was to the southwest.

Please contact me if you have any questions regarding this matter.

Sincerely

Bruce Rasher
Environmental and Technical Services

K00000760

BCC: JPDickey, M-1046
JANiemi, P-11-110
Overisel Compressor Station Superintendent

File Overisel Compressor Station PCB

To	BWRasher, P-24-300	CONSUMERS POWER COMPANY
From	HWVoigt, T-260	
Date	August 18, 1993	Internal Correspondence
Subject	OVERISEL COMPRESSOR STATION - Monitoring Well Samples PCB Results - Sampling Date - August 04, 1993	
CC		File Index # 529317-552-671

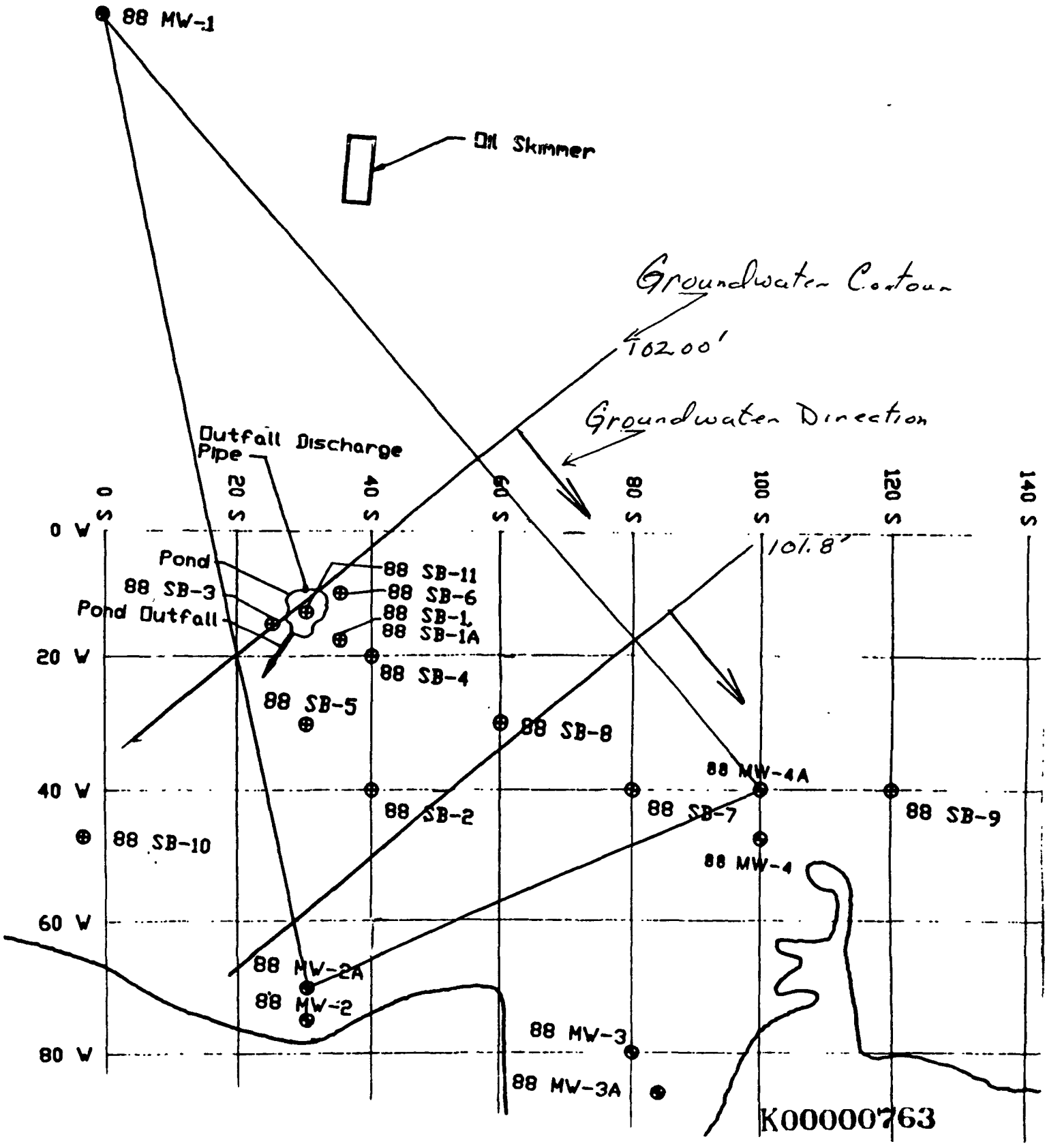
On August 04, 1993 personnel from the Chemistry and Materials Services Department (C&MS) of Environmental and Technical Services completed Depth-To-Water (DWL) measurements and groundwater sample collection from seven (7) monitoring well installations at the Overisel Compressor Station. Samples were returned to C&MS for the determination of PCB.

Analytical results are attached for your review.

K00000762

GROUNDWATER CONTOUR MAP

Overisel Compressor Station
Sampling Date: August 04, 1993



K00000763

ANALYTICAL RESULTS

ANALYTICAL METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water_Sample_Collection - The monitoring wells were pumped at a rate of 0.5 gallon per minute to a constant pH and specific conductance readings with a suction pump fitted with a rubber hose and a screened foot valve. During pumping the screened foot valve was positioned 1 foot below the DWL so that the completed well volume was evacuated. Measurements of pH and specific conductance were taken at intervals corresponding to approximately one pumped casing volume for a minimum of five casing volumes. After the required pump volume was removed, a 1-quart water sample was collected at screen depth with a clean bailer. Samples were iced and returned to C&MS for analysis.

Sample Handling - Sample handling was in accordance with the SW-846 recommendations for organic analytes. All samples were iced (stored a 4'C) immediately after sampling and labeling.

pH and Specific Conductance - E&TS Procedure - CHEM-74

PCB Analysis - Method 8080, Organochlorine Pesticides and PCB, (PCB only). SW-846, Test Methods For Evaluating Solid Waste - Physical / Chemical Methods, USEPA.

K00000765

STATIC WATER ELEVATIONS

Overisel Compressor Station
Sampling Date: August 04, 1993

Monitoring Well ID	Elevation Top-Of-Casing (ft)	Depth-To Water (ft)	Static Water Elevation (ft)
88MW-1	116.80	14.31	102.49
88MW-2	105.02	3.62	101.40
88MW-2A	105.33	3.58	101.75
88MW-3	104.43	3.60	100.83
88MW-3A	104.08	2.46	101.62
88MW-4	104.11	2.52	101.59
88MW-4A	104.30	2.66	101.64

K00000766

MONITORING WELL SAMPLING FIELD PARAMETERS

Overisel Compressor Station
Sampling Date: August 04, 1993

MW ID	SCRN Depth (ft)	DWL (ft)	Well Volume (gal)	Pump Volume (gal)	Final pH (SU)	Final Specific Conductance (umho/cm)
88MW-1	21.74	14.31	1.19	6.0	7.50	325
88MW-2	12.09	3.60	1.36	7.0	7.70	455
88MW-2A	23.10	3.58	3.12	16.0	8.00	440
88MW-3	11.85	3.60	1.32	7.0	7.75	500
88MW-3A	21.09	2.46	2.98	15.0	7.75	750
88MW-4	11.91	2.52	1.50	8.0	7.75	470
88MW-4A	21.86	2.66	3.07	16.0	7.90	450

K00000767

ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Sampling Of August 04, 1993				Project Number CHEM-93-1671	
Sample Identification	88MW-1	88MW-2	88MW-2A	88MW-3	88MW-3A	
Static Water Level (ft)	102.49	101.40	101.75	100.83	101.62	
Sample Type	water	water	water	water	water	
Sample Date	08-04-93	08-04-93	08-04-93	08-04-93	08-04-93	
Received Date	08-04-93	08-04-93	08-04-93	08-04-93	08-04-93	
Analysis Date	08-09-93	08-09-93	08-09-93	08-09-93	08-09-93	
Report Date	08-17-93	08-17-93	08-17-93	08-17-93	08-17-93	
Control Number	931671-01	931671-02	931671-03	931671-04	931671-05	
PCB, ug/L - Method 8080						***TMDL***
PCB-1016	nd	nd	nd	nd	nd	0.1
PCB-1221	nd	nd	nd	nd	nd	0.1
PCB-1232	nd	nd	nd	nd	nd	0.1
PCB-1242	nd	nd	nd	nd	nd	0.1
PCB-1248	nd	nd	nd	nd	nd	0.1
PCB-1254	nd	nd	nd	nd	nd	0.1
PCB-1260	nd	nd	nd	nd	nd	0.1
Surrogate Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	
Decachlorobiphenyl	108	105	115	120	103	

Notes: TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

Reviewed By [illegible] Date 08-17-93 Data File 931671

K00000768

ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Sampling Of August 04, 1993				Project Number CHEM-93-1671	
Sample Identification	88MW-4	88MW-4A	Field Blank			
Static Water Level (ft)	101.59	101.64	-			
Sample Type	water	water	water			
Sample Date	08-04-93	08-04-93	08-04-93			
Received Date	08-04-93	08-04-93	08-04-93			
Analysis Date	08-09-93	08-09-93	08-09-93			
Report Date	08-17-93	08-17-93	08-17-93			
Control Number	931671-06	931671-07	931671-08			
PCB, ug/L - Method 8080						TMDL
PCB-1016	nd	nd	nd			0.1
PCB-1221	nd	nd	nd			0.1
PCB-1232	nd	nd	nd			0.1
PCB-1242	nd	nd	nd			0.1
PCB-1248	nd	nd	nd			0.1
PCB-1254	0.32	nd	nd			0.1
PCB-1260	nd	nd	nd			0.1
Surrogate Recovery	% Recovery	% Recovery	% Recovery			
Decachlorobiphenyl	107	111	102			

Notes TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

Reviewed By [illegible] Date 08-13-93 Data File 931671

K00000769

ANALYTICAL QC

Overisel Compressor Station
Sampling Date: August 04, 1993

QC RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - QC SPIKE					Project Number CHEM-93-1671
Sample Identification	88MW-3A					
Static Water Level (ft)	101.62					
Sample Type	water					
Sample Date	08-04-93					
Received Date	08-04-93					
Analysis Date	08-09-93					
Report Date	08-17-93					
Control Number	931671-qc1					
PCB, ug/L - Method 8080						
Spike Analyte	PCB-1254					
Conc. Added, ug/L	5.0					TMDL
Conc. Found, ug/L	4.9					0.1
Percent Recovery	98.4					
Surrogate Recovery	% Recovery					
Decachlorobiphenyl	105					

Notes TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

Reviewed By [signature] Date 08-17-93 Data File 931671

K00000771

QC RESULTS

CONSUMERS POWER COMPANY
Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - METHOD BLANK	Project Number CHEM-93-1671

Sample Identification	Method Blank					
Static Water Level (ft)	-					
Sample Type	reagent					
Sample Date	08-04-93					
Received Date	08-04-93					
Analysis Date	08-09-93					
Report Date	08-17-93					
Control Number	931671-qc2					
PCB, ug/L - Method 8080						**TMDL**
PCB-1016	nd					0.1
PCB-1221	nd					0.1
PCB-1232	nd					0.1
PCB-1242	nd					0.1
PCB-1248	nd					0.1
PCB-1254	nd					0.1
PCB-1260	nd					0.1
Surrogate Recovery	% Recovery					
Decachlorobiphenyl	104					

Notes
TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

Reviewed By [signature] Date 08-17-93 Data File 931671

K00000772

QC RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - ONGOING CALIBRATION CHECK					Project Number CHEM-93-1671
Sample Identification	Ongoing Calibration Check					
Analysis Date	08-09-93					
ONGOING CALIBRATION PCB, ug/ml - Method 8080	Known Conc. ug/mL	Conc. Found ug/mL	Percent Difference %			
PCB-1016	0.50	0.52	0.04			
PCB-1221	0.50	0.51	0.02			
PCB-1232	0.50	0.51	0.02			
PCB-1242	0.50	0.50	0.00			
PCB-1248	0.50	0.49	0.02			
PCB-1254	0.50	0.49	0.02			
PCB-1260	0.50	0.47	0.06			

Reviewed By HWDaft Date 08-12-93 Data File 931671

K00000773

CHAIN-OF-CUSTODY RECORD

CHAIN OF CUSTODY

CONSUMERS POWER COMPANY
ENVIRONMENTAL & TECHNICAL SERVICES
135 W. TRAIL ST.
JACKSON, MICHIGAN 49201
(517) 788-1251
FAX (517) 788-1104

ANALYSIS REQUESTED

PAGE 1 OF 1

SEND REPORT TO :

PHONE :

SAMPLING SITE : Ovensel Compressor Station

PROJECT NUMBER : 529317-JT-671

SAMPLING TEAM : JC Heap / RB Lauer

DATE SHIPPED : 08-04-93

SITE SKETCH ATTACHED ? CIRCLE ONE : YES (NO)

CPCO CONTROL NO.	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE	SAMPLE DESCRIPTION / LOCATION	SAMPLE DEPTH	# OF CONTAINERS	PCBs							REMARKS
93-1671 -1	080493		WATER	88MW-1	SCREEN	2 QUART	✓							
-2				88MW-2			✓							
-3				88MW-2A			✓							
-4				88MW-3			✓							
-5				88MW-3A			✓							
-6				88MW-4			✓							
-7				88MW-4A			✓							
-8				FIELD BLANK	NA		✓							

RELINQUISHED BY : (SIGNATURE)	DATE / TIME	RECEIVED BY : (SIGNATURE)
James K. Heap	080493/1600	[illegible]
RELINQUISHED BY : (SIGNATURE)	DATE / TIME	RECEIVED BY : (SIGNATURE)
RELINQUISHED BY : (SIGNATURE)	DATE / TIME	RECEIVED BY : (SIGNATURE)

COMMENTS :

K00000275

FIELD NOTES

Overisel Compressor Station
Sampling Date: August 04, 1993

MONITORING WELL DEPTH-TO-WATER MEASUREMENTS

LOCATION Overisel Comp Sta

DATE 08-04-93 PROJECT NUMBER 528317-552-671

WELL ID Number	Time	Trial-1 Top-Of Casing (ft)	Trial-1 Wetted Tape (ft)	Trial-1 DWL (ft)	Trial-2 Top-Of Casing (ft)	Trial-2 Wetted Tape (ft)	Trial-2 DWL (ft)
88MW-1	1240	15.00	0.69	14.31	16.00	1.69	14.31
88MW-2	1200	5.00	1.38	3.62	6.00	2.38	3.62
88MW-2A	1203	5.00	1.42	3.58	6.00	2.42	3.58
88MW-3	1030	4.00	0.40	3.60	5.00	1.40	3.60
88MW-3A	1033	4.00	1.54	2.46	5.00	2.54	2.46
88MW-4	1117	4.00	1.48	2.52	5.00	2.48	2.52
88MW-4A	1120	4.00	1.34	2.66	5.00	2.34	2.66

Notes : DWL measurements are read to the nearest 0.01 ft.

Remarks:

Measurements Taken By JKHEAP/RBLAUER

Reviewed By [signature] Date 08-06-93

****

K00000777

MONITORING WELL SAMPLING LOG

Site Location: Ovensel Comp Sta

Date: 08-04-93 Project Number: 528317-552671

Leader: JCH Helper: RBL

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	21.74	14.31	7.43	1.19	5.9	
88MW-1	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	6.0
	1245	1	1.0	7.25	320	1.0
	1246	2	1.0	7.55	320	2.0
	1248	3	2.0	7.50	325	4.0
	1249	4	1.0	7.50	325	5.0
	1250	5	1.0	7.50	325	6.0

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	12.09	3.62	8.47	1.36	6.8	
88MW-2	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	7.0
	1208	1	1.0	7.00	455	1.0
	1210	2	2.0	7.70	455	3.0
	1212	3	1.0	7.70	455	4.0
	1214	4	2.0	7.70	455	6.0
	1216	5	1.0	7.70	455	7.0

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	23.10	3.58	19.52	3.12	15.6	
88MW-2A	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	16.0
	1220	1	3.0	8.10	415	3.0
	1222	2	3.0	8.00	440	6.0
	1225	3	4.0	8.00	440	10.0
	1227	4	3.0	8.00	440	13.0
	1230	5	3.0	8.00	440	16.0

MONITORING WELL SAMPLING LOG

Site Location: Oversel Comp. Sta.

Date: 08-04-93 Project Number: 529317-582-671

Leader: JKH Helper: RBL

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	11.85	3.60	8.25	1.32	6.6	
88MW-3	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	7.0
	1041	1	1.0	7.40	550	1.0
	1044	2	2.0	7.75	500	3.0
	1046	3	1.0	7.80	500	4.0
	1048	4	2.0	7.75	500	6.0
	1050	5	1.0	7.75	500	7.0

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	21.09	2.46	18.63	2.98	15.0	
88MW-3A	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	15.0
	1055	1	3.0	7.85	750	3.0
	1058	2	3.0	7.75	750	6.0
	1101	3	3.0	7.75	750	9.0
	1104	4	3.0	7.75	750	12.0
	1107	5	3.0	7.75	750	15.0

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	11.91	2.52	9.39	1.5	7.5	
88MW-4	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	8.0
	1125	1	2.0	7.40	475	2.0
	1127	2	1.0	7.70	475	3.0
	1129	3	2.0	7.75	470	5.0
	1131	4	1.0	7.75	470	6.0
	1133	5	2.0	7.75	470	8.0

MONITORING WELL SAMPLING LOG

Site Location: Ovensel Comp. Sta.

Date: 08-04-93 Project Number: 5293175,2-671

Leader: JCH Helper: RBL

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	21.86	2.66	19.2	3.07	15.4	
88MW-4A	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	16.0
	1137	1	3.0	8.1	430	3.0
		2	3.0	8.0	450	6.0
	1145	3	4.0	7.90	450	10.0
		4	3.0	7.90	450	13.0
	1153	5	3.0	7.90	450	16.0

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	

Monitoring Well ID	Screen Bottom Depth (ft)	Depth-To-Water (ft)	Water Column (ft)	Volume Per Casing (gal)	Five Casing Volume (gal)	Actual Volume Pumped (gal)
	Time	Pump Number	Pump Volume	pH SU	SpCond umho/cm	

K00000780

MONITORING WELL SAMPLING EQUIPMENT LOG

Site Location: Overisel Comp Sta

Date: 08-04-93 Project Number: 529317- -671

Leader: JCHEAP Helper: RBLAUER

++

CALIBRATION SOLUTIONS - pH BUFFER SOLUTIONS

pH Buffer	Source	Lot Number
4.0	FISHER	925918-24
7.0	↓	914078-24
10.0	↓	923246-24

CALIBRATION SOLUTIONS - SPECIFIC CONDUCTANCE SOLUTIONS

umho/cm	Source	Lot Number
46.5	MYRON L	KLM 30
447.1	↓	CHR 300
1414	↓	CHR 1000

++

FIELD EQUIPMENT CALIBRATION

pH Meter

Meter ID METROHM E-488 S/N 3744-00065

pH Buffer	Start Of Day Check ~~pH~~ TIME	~~Time~~ pH	End Of Day Check pH	Time
4.0	1025	4.0	4.0	1300
7.0	↓	7.0	7.0	↓
10.0	↓	10.0	10.0	↓

Specific Conductance Meter

Meter ID MYRON L EP METER S/N 0500610

umho/cm	Start Of Day Check ~~umho/cm~~ time	~~Time~~ pH umho/cm	End Of Day Check umho/cm	Time
46.5	1030	46.5	46.5	1305
447.1	↓	447	450	↓
1414	↓	1400	1400	↓

++

K00000781

File

Consumers Power

POWERING MICHIGAN'S PROGRESS

General Offices: 212 West Michigan Avenue, Jackson, MI 49201 • (517) 788-0550

Writer's Direct Dial (517) 788-0331

August 25, 199~~5~~4

Ms Wanda Neal
Waste Management Division
Department of Natural Resources
Secondary Complex
PO Box 30028
Lansing, MI 48909

M90518.3

OVERISEL COMPRESSOR STATION -
1994 GROUNDWATER MONITORING REPORT

Dear Ms Neal

In the PCB Action Plan for Consumers Power Company's Overisel Compressor Station filed with the DNR on August 8, 1988, Consumers Power stated its plans to undertake a long-term, annual groundwater monitoring program at the site. The program commenced in March of 1988 utilizing the existing six monitoring wells and is intended to assure detection of any changes in conditions at the site. The duration will be at least 10 years, but will be evaluated on an annual basis using the data obtained from the monitoring.

Attached are the results of the monitoring for 1994 conducted on August 4, 1994. The direction of groundwater flow was to the southwest.

Please contact me if you have any questions regarding this matter.

Sincerely

Bruce Rasher
Environmental and Technical Services Department

CC: JPDickey, M-1046
DTKetcham, P-11-210
Overisel Compressor Station

K00000782

RECEIVED AUG 1 6 1994

To	BWRasher, P-24-501A	CONSUMERS POWER COMPANY
From	HWVoigt, T-260	
Date	August 16. 1994	
Subject	OVERISEL COMPRESSOR STATION - Monitor Well Groundwater Samples - PCB Results - Sampling Date - August 04, 1994	Internal Correspondence
CC	O Essink, Overisel Compressor	File Index # 529417-551-864

On August 04, 1994 personnel from the Chemistry and Materials Services Department (C&MS) of Environmental and Technical Services completed Depth-To-Water (DWL) measurements and groundwater sample collection from seven (7) monitoring well installations at the Overisel Compressor Station. Samples were returned to C&MS for the determination of Polychlorinated Biphenyls (PCBs).

SUMMARY OF RESULTS

Groundwater direction remains to the general southwest. PCB as PCB-1254 is detected in the groundwater sample collected from OV-88-MW-4A at 0.2 ug/L, with a Target Method Detection Limit of 0.2 ug/L.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - The monitoring wells were initially evacuated of 5-times the casing volume by pumping at a rate of 1 gallon per minute with a suction pump fitted with a rubber hose and a screened foot valve. During pumping the screened foot valve was positioned 1 foot below the DWL so that the completed well volume was evacuated. Measurements of pH and specific conductance were taken at intervals corresponding to approximately one pumped casing volume for a minimum of five casing volumes. After the required pump volume was removed, a 1-quart water sample was collected at screen depth with a clean bailer. Samples were iced and returned to C&MS for analysis.

Sample Handling - Sample handling was in accordance with the SW-846 recommendations for organic analytes.

pH and Specific Conductance - ESTS Procedure - CHEM-74

Polychlorinated Biphenyls (PCBs) - Method 8080, Organochlorine Pesticides and PCB (PCB only). SW-846, Test Methods For Evaluating Solid Waste - Physical / Chemical Methods, USEPA. (NOTE: PCB is reported as PCB-1254 only, since this was the PCB type of the original release. All other PCB formulations are not detected at the TMDL of 0.2 ug/L.)

K00000783

RESULTS

Table 1 - PCB Analysis Results

Table 2 - Depth-To-Water Measurements

Table 3 - Field Parameter: Constant pH and Specific Conductance Readings and Casing Pump Volumes

Figure 1 - Groundwater Contour Map

K00000784

TABLE 1. PCB ANALYSIS RESULTS

Overisel Compressor Station
Sampling Date: August 04, 1994

Control Number	Monitoring Well ID	PCB, ug/L As PCB-1254	TMDL ug/L
941864-1	OV-88-MW-1	ND	0.20
941864-2	OV-88-MW-2	ND	0.20
941864-3	OV-88-MW-2A	ND	0.20
941864-4	OV-88-MW-3	ND	0.20
941864-5	OV-88-MW-3A	ND	0.20
941864-6	OV-88-MW-4	ND	0.20
941864-7	OV-88-MW-4A	0.2	0.20
941864-8	OV-Field Blank	ND	0.20

TMDL = Target Method Detection Limit, Parts-Per-Billion (ug/L)
ND = Parameter Not Detected At TMDL

NOTE: PCB is reported as PCB-1254 only, since this was the PCB type of the original release. All other PCB formulations are not detected at the TMDL of 0.2 ug/L.

K00000785

TABLE 2. STATIC WATER ELEVATIONS

Overisel Compressor Station
Sampling Date: August 04, 1994

Monitoring Well ID	Elevation Top-Of-Casing (ft)	Depth-To Water (ft)	Static Water Elevation (ft)
OV-88-MW-1	116.80	13.85	102.95
OV-88-MW-2	105.02	3.14	101.88
OV-88-MW-2A	105.33	3.03	102.30
OV-88-MW-3	104.43	2.36	102.07
OV-88-MW-3A	104.08	1.99	102.09
OV-88-MW-4	104.11	2.09	102.02
OV-88-MW-4A	104.30	1.94	102.36

K00000786

TABLE 3. MONITORING WELL SAMPLING FIELD PARAMETERS

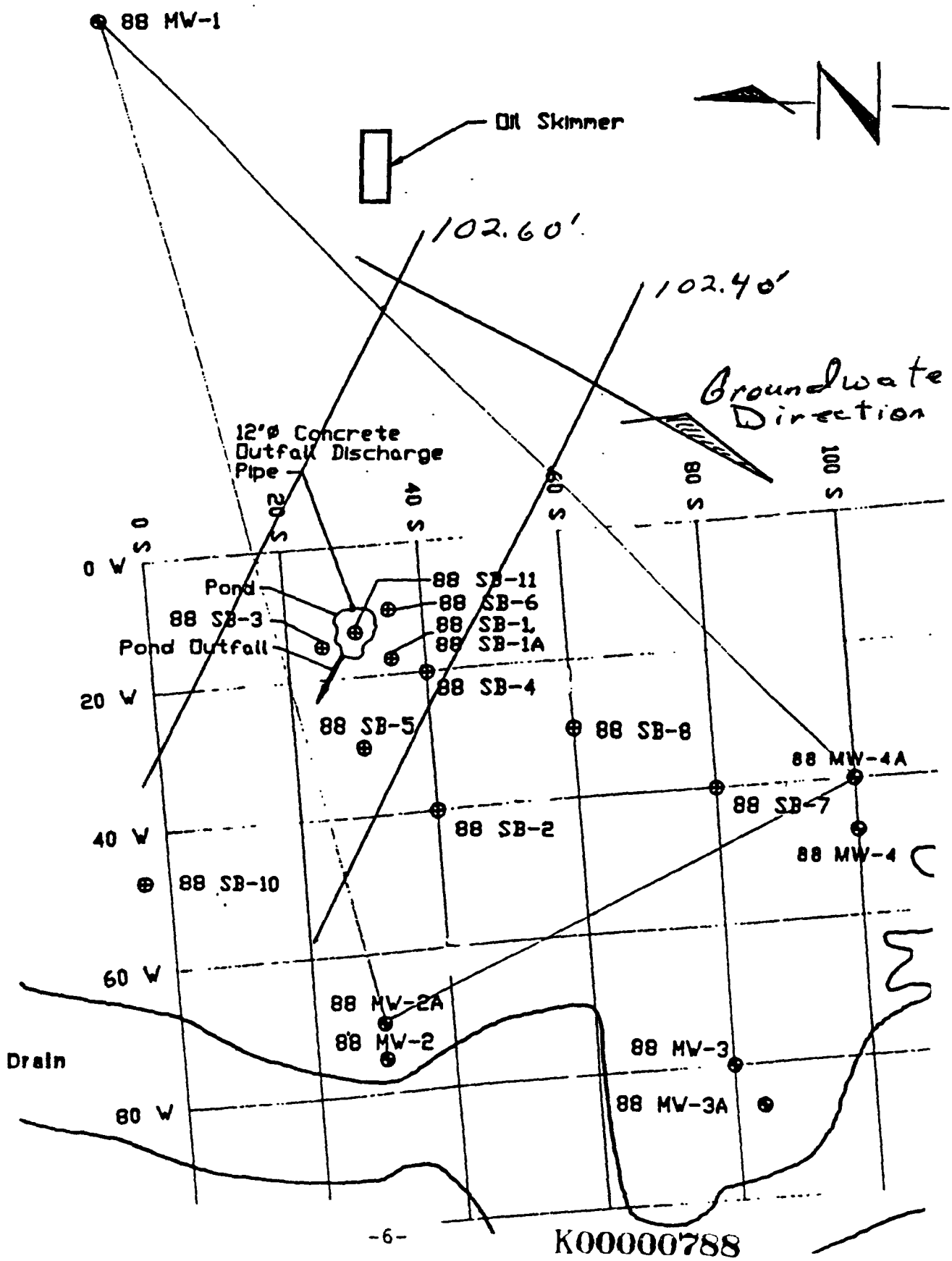
Overisel Compressor Station
Sampling Date: August 04, 1994

MW ID	SCRN Depth (ft)	DWL (ft)	Well Volume (gal)	Pump Volume (gal)	Final pH (SU)	Final Specific Cond. (umho/cm)
OV-88-MW-1	21.5	13.85	1.2	6.0	7.30	285.
OV-88-MW-2	11.7	3.14	1.4	7.0	7.45	435.
OV-88-MW-2A	23.0	3.03	3.2	16.0	7.65	435.
OV-88-MW-3	11.9	2.36	1.5	7.5	7.60	480.
OV-88-MW-3A	20.9	1.99	3.0	15.0	7.55	485.
OV-88-MW-4	21.9	2.09	3.2	16.0	7.45	430.
OV-88-MW-4A	11.3	1.94	1.5	7.5	7.55	440.

K00000787

FIGURE 1. GROUNDWATER CONTOUR MAP

Overisel Compressor Station
Sampling Date: August 04, 1994



K00000788

TABLE A1. ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Sampling Of August 04, 1994				Project Number CHEM-94-1864	
Sample Identification	OV88MW-1	OV88MW-2	OV88MW-2A	OV88MW-3	OV88MW-3A	
Sample Depth (ft)	screen	screen	screen	screen	screen	
Sample Type	water	water	water	water	water	
Sample Date	08-04-94	08-04-94	08-04-94	08-04-94	08-04-94	
Received Date	08-04-94	08-04-94	08-04-94	08-04-94	08-04-94	
Report Date	08-16-94	08-16-94	08-16-94	08-16-94	08-16-94	
Control Number	941864-01	941864-02	941864-03	941864-04	941864-05	
Percent Solids, wt/wt	-	-	-	-	-	
Extraction Date	08-10-94	08-10-94	08-10-94	08-10-94	08-10-94	
Analysis Date	08-11-94	08-11-94	08-11-94	08-11-94	08-11-94	
PCBs, ug/L - Method 8080						**TMDL**
PCB-1016	nd	nd	nd	nd	nd	0.2
PCB-1221	nd	nd	nd	nd	nd	0.2
PCB-1232	nd	nd	nd	nd	nd	0.2
PCB-1242	nd	nd	nd	nd	nd	0.2
PCB-1248	nd	nd	nd	nd	nd	0.2
PCB-1254	nd	nd	nd	nd	nd	0.2
PCB-1260	nd	nd	nd	nd	nd	0.2
Surrogate Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	
Dechlorobiphenyl	101	103	102	102	101	

NOTES: TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

Reviewed By [signature] Date 08/16/94 Data File 941864

K00000789

TABLE A2. ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Sampling Of August 04, 1994				Project Number CHEM-94-1864	
Sample Identification	OV88MW-4	OV88MW-4A	OVFieldBlank			
Sample Depth (ft)	screen	screen	-			
Sample Type	water	water	water			
Sample Date	08-04-94	08-04-94	08-04-94			
Received Date	08-04-94	08-04-94	08-04-94			
Report Date	08-16-94	08-16-94	08-16-94			
Control Number	941864-06	941864-07	941864-08			
Percent Solids, wt/wt	-	-	-			
Extraction Date	08-10-94	08-10-94	08-10-94			
Analysis Date	08-11-94	08-11-94	08-11-94			
PCBs, ug/L - Method 8080						**TMDL**
PCB-1016	nd	nd	nd			0.2
PCB-1221	nd	nd	nd			0.2
PCB-1232	nd	nd	nd			0.2
PCB-1242	nd	nd	nd			0.2
PCB-1248	nd	nd	nd			0.2
PCB-1254	nd	0.2	nd			0.2
PCB-1260	nd	nd	nd			0.2
Surrogate Recovery	% Recovery	% Recovery	% Recovery			
Dechlorobiphenyl	103	103	102			

NOTES: TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

Reviewed By MWU Date 081694 Data File 941864

K00000790

TABLE PCB-QC1. ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Sampling Date Of August 04, 1994	Project Number CHEM-94-1864

WATER MATRIX SPIKES	
Sample Matrix Spike	OV-88-MW-3A
Sample Control Number	941864-05
Sample Depth	screen
Sample Type	water
Sample Date	08-04-94
Received Date	08-04-94
Report Date	08-16-94
Percent Solids, w/w	-
Extraction Date	08-10-94
Analysis Date	08-11-94
Control Number	941864-qc1

MS, ug/L - 8080	AsAnalyzed	Spike Conc	AsFound	% Recovery	Acceptance	LMDL
PCB-1016	<0.2					0.1
PCB-1221	<0.2					0.1
PCB-1232	<0.2					0.1
PCB-1242	<0.2					0.1
PCB-1248	<0.2					0.1
PCB-1254	<0.2	5.0	4.8	93	80-120	0.1
PCB-1260	<0.2					0.1
Surrogate Recovery, %				% Recovery	Criteria	
Dechlorobiphenyl				103	80-120	

NOTES: LMDL = Laboratory Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At LMDL

Reviewed By HW Doyt Date 08/16/94 Data File 941864

K00000791

TABLE PCB-QC2. ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Sampling Date Of August 04, 1994					Project Number CHEM-94-1864
WATER SYSTEM BLANK						
Sample Identification	Method Blank					
Sample Depth	-					
Sample Type	water					
Sample Date	-					
Received Date	-					
Report Date	08-16-94					
Percent Moisture, w/w	-					
Extraction Date	08-10-94					
Analysis Date	08-11-94					
Control Number	941864-mb					
PCB, ug/L - Method 8080						LMDL
PCB-1016	nd					0.1
PCB-1221	nd					0.1
PCB-1232	nd					0.1
PCB-1242	nd					0.1
PCB-1248	nd					0.1
PCB-1254	nd					0.1
PCB-1260	nd					0.1
Surrogate Recovery, %	% Recovery					Criteria
Dechlorobiphenyl	102					80-120

NOTES: LMDL = Laboratory Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At LMDL

Reviewed By [signature] Date 08/16/94 Data File 941864

K00000792

CHAIN OF CUSTODY

CONSUMERS POWER COMPANY
ENVIRONMENTAL & TECHNICAL SERVICES
135 W. TRAIL ST.
JACKSON, MICHIGAN 49201
(517) 788-1251
FAX (517) 788-1104

PAGE 1 OF 1

SEND REPORT TO :

PHONE :

SAMPLING SITE : Oversel Compressor Station

PROJECT NUMBER : 529417 — —864

SAMPLING TEAM : JKH/DT

DATE SHIPPED : 08-04-94

SITE SKETCH ATTACHED ? CIRCLE ONE : YES NO

ANALYSIS REQUESTED

CPCO CONTROL NO.	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE	SAMPLE DESCRIPTION / LOCATION	SAMPLE DEPTH	# OF CONTAINERS	REMARKS
1	08.04.94	1305	WATER	88MW-1	SCREEN	2 QUART	
2	↓	1050	↓	88MW-2	↓	↓	
3	↓	1110	↓	88MW-2A	↓	↓	
4	↓	1125	↓	88MW-3	↓	↓	
5	↓	1140	↓	88MW-3A	↓	↓	
6	↓	1210	↓	88MW-4	↓	↓	
7	↓	1230	↓	88MW-4A	↓	↓	
8	↓	NA	↓	FIELD BLANK	NA	↓	

RELINQUISHED BY : (SIGNATURE)	DATE / TIME	RECEIVED BY : (SIGNATURE)
James K. Hess	08.04.94 1600	[signature]
RELINQUISHED BY : (SIGNATURE)	DATE / TIME	RECEIVED BY : (SIGNATURE)
RELINQUISHED BY : (SIGNATURE)	DATE / TIME	RECEIVED BY : (SIGNATURE)

COMMENTS :

K00000793

Consumers Power
POWERING MICHIGAN'S PROGRESS
Environmental & Technical Services Department: 1945 West Parnall Rd, Jackson, MI 49201 • FAX (517) 788-2329

Writer's Direct Dial (517) 788-2980

September 8, 1995

Ms Wanda Neal
Waste Management Division
Department of Natural Resources
Secondary Complex
PO Box 30028
Lansing, MI 48909

M90518.3
DAO 95-048

OVERISEL COMPRESSOR STATION -
1995 GROUNDWATER MONITORING REPORT

Dear Ms Neal

In the PCB Action Plan for Consumers Power Company's Overisel Compressor Station filed with the Michigan Department of Natural Resources (MDNR) on August 8, 1988, Consumers Power stated its plans to undertake a long-term, annual groundwater monitoring program at the site. The program commenced in March of 1988 utilizing the existing monitoring wells and is intended to assure detection of any changes in conditions at the site. The duration will be at least 10 years, but will be evaluated on an annual basis using the data obtained from the monitoring.

This letter is intended to report the results of the monitoring for 1995 conducted on August 7, 1995. As shown in the attached report, PCB was not detected on any of the wells at the Method Detection Limit of 0.2 μg/L. The direction of groundwater flow was to the southwest.

Please contact me if you have any questions regarding this matter.

Sincerely

David A Olsen, PE
Environmental & Technical Services

K00000794

A CMS ENERGY COMPANY

BCC JPDickey, M-1046
DTKetcham, P-11-210
BWRasher, P-24-501A
Overisel Compressor Station

K00000795

O0995-03.DAO

To	DAOlsen, P-24-505	CONSUMERS POWER COMPANY
From	HWVoigt, T-260	
Date	August 18, 1995	
Subject	OVERISEL COMPRESSOR STATION - Monitor Well Groundwater Samples - PCB Results - Sampling Date - August 07, 1995	Internal Correspondence
CC	O Essink, Overisel Compressor	File Index # 539417-551-001

On August 07, 1995 personnel from the Chemistry and Materials Services Department (C&MS) of Technical Services completed Depth-To-Water (DWL) measurements and groundwater sample collection from seven (7) monitoring well installations at the Overisel Compressor Station. Samples were returned to C&MS for the determination of Polychlorinated Biphenyls (PCBs).

SUMMARY OF RESULTS

Groundwater direction remains to the general southwest. PCBs are not detected in any of the groundwater samples collected, at a Target Method Detection Limit (TMDL) is less than 0.2 ug/L.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - The monitoring wells were initially evacuated of 5-times the casing volume by pumping at a rate of 1 gallon per minute with a suction pump fitted with a rubber hose and a screened foot valve. During pumping the screened foot valve was positioned 1 foot below the DWL so that the completed well volume was evacuated. Measurements of pH and specific conductance were taken at intervals corresponding to approximately one pumped casing volume for a minimum of five casing volumes. After the required pump volume was removed, a 1-quart water sample was collected at screen depth with a clean bailer. Samples were iced and returned to C&MS for analysis.

Sample Handling - Sample handling was in accordance with the SW-846 recommendations for organic analytes.

pH and Specific Conductance - ESTS Procedure - CHEM-74

Polychlorinated Biphenyls (PCBs) - Method 8080, Organochlorine Pesticides and PCB (PCB only). SW-846, Test Methods For Evaluating Solid Waste - Physical / Chemical Methods, USEPA.

K00000796

TABLE 1a. ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Sampling Of August 07, 1995				Project Number CHEM-95-2001	
Sample Identification	88MW-1	88MW-2	88MW-2A	88MW-3	88MW-3A	
Sample Depth (ft)	screen	screen	screen	screen	screen	
Sample Type	water	water	water	water	water	
Sample Date	08-07-95	08-07-95	08-07-95	08-07-95	08-07-95	
Received Date	08-07-95	08-07-95	08-07-95	08-07-95	08-07-95	
Report Date	08-18-95	08-18-95	08-18-95	08-18-95	08-18-95	
Percent Solids, wt/wt	-	-	-	-	-	
Extraction Date	08-08-95	08-08-95	08-08-95	08-08-95	08-08-95	
Analysis Date	08-10-95	08-10-95	08-10-95	08-10-95	08-10-95	
Control Number	952001-01	952001-02	952001-03	952001-04	952001-05	
PCBs, ug/L - Method 8080						TMDL
PCB-1016	nd	nd	nd	nd	nd	0.2
PCB-1221	nd	nd	nd	nd	nd	0.2
PCB-1232	nd	nd	nd	nd	nd	0.2
PCB-1242	nd	nd	nd	nd	nd	0.2
PCB-1248	nd	nd	nd	nd	nd	0.2
PCB-1254	nd	nd	nd	nd	nd	0.2
PCB-1260	nd	nd	nd	nd	nd	0.2
Surrogate Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	Criteria
Decachlorobiphenyl	97	101	104	102	103	60-110

NOTES: TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

Reviewed By H.W.J. Date 081895 Data File 952001

K00000797

TABLE 1b. ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Sampling Of August 07, 1995				Project Number CHEM-95-2001	
Sample Identification	88MW-4	88MW-4A	FieldBlank	MethodBlank		
Sample Depth (ft)	screen	screen	-	-		
Sample Type	water	water	water	water		
Sample Date	08-07-95	08-07-95	-	-		
Received Date	08-07-95	08-07-95	-	-		
Report Date	08-18-95	08-18-95	08-18-95	08-18-95		
Percent Solids, wt/wt	-	-	-	-		
Extraction Date	08-08-95	08-08-95	08-08-95	08-08-95		
Analysis Date	08-10-95	08-10-95	08-10-95	08-10-95		
Control Number	952001-06	952001-07	952001-FB	952001-MB		
PCBs, ug/L - Method 8080						TMDL
PCB-1016	nd	nd	nd	nd		0.2
PCB-1221	nd	nd	nd	nd		0.2
PCB-1232	nd	nd	nd	nd		0.2
PCB-1242	nd	nd	nd	nd		0.2
PCB-1248	nd	nd	nd	nd		0.2
PCB-1254	nd	nd	nd	nd		0.2
PCB-1260	nd	nd	nd	nd		0.2
Surrogate Recovery	% Recovery	% Recovery	% Recovery	% Recovery		Criteria
Decachlorobiphenyl	98	102	103	102		60-110

NOTES: TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

Reviewed By HWJ Date 08/8/95 Data File 952001

K00000798

TABLE 2. STATIC WATER ELEVATIONS

Overisel Compressor Station
Sampling Date: August 07, 1995

Monitoring Well ID	Elevation Top-Of-Casing (ft)	Depth-To Water (ft)	Static Water Elevation (ft)
OV-88-MW-1	116.80	14.26	102.59
OV-88-MW-2	105.02	3.60	101.42
OV-88-MW-2A	105.33	3.50	101.83
OV-88-MW-3	104.43	2.73	101.70
OV-88-MW-3A	104.08	2.43	101.65
OV-88-MW-4	104.11	2.47	101.64
OV-88-MW-4A	104.30	2.62	101.68

K00000799

TABLE 3. MONITORING WELL SAMPLING FIELD PARAMETERS

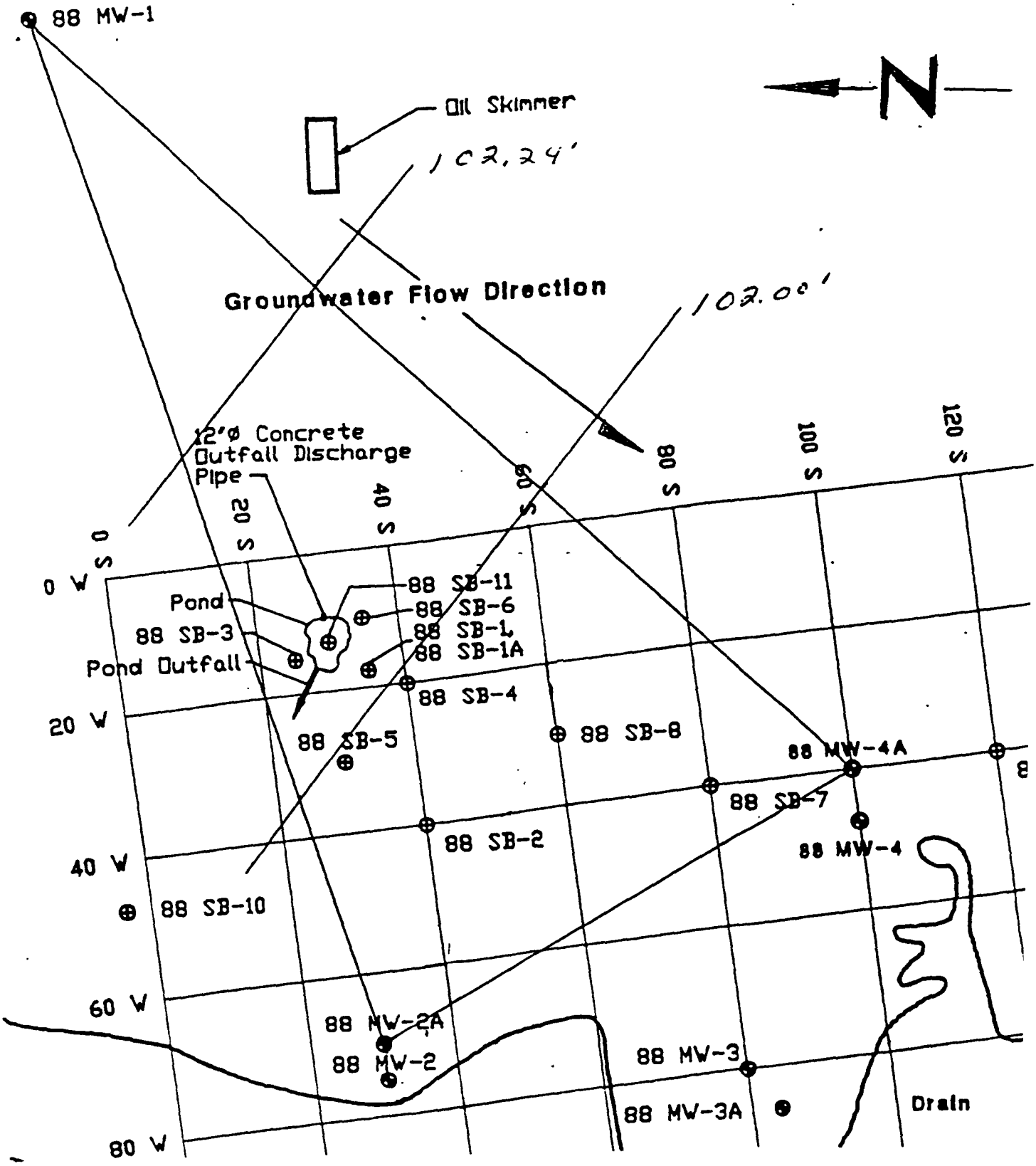
Overisel Compressor Station
Sampling Date: August 07, 1995

MW ID	SCRN Depth (ft)	DWL (ft)	Well Volume (gal)	Pump Volume (gal)	Final pH (SU)	Final Specific Cond. (umho/cm)
OV-88-MW-1	21.5	14.26	1.2	6.0	6.90	280.
OV-88-MW-2	12.0	3.60	1.4	7.0	7.20	420.
OV-88-MW-2A	23.1	3.50	3.1	16.0	7.40	430.
OV-88-MW-3	12.0	2.73	1.3	7.0	7.65	425.
OV-88-MW-3A	21.0	2.43	3.0	15.0	7.75	540.
OV-88-MW-4	11.9	2.47	1.5	7.5	7.45	400.
OV-88-MW-4A	21.9	2.62	3.1	15.4	7.40	410.

K00000800

FIGURE 1. GROUNDWATER CONTOUR MAP

Overisel Compressor Station
Sampling Date: August 07, 1995



K00000801

TABLE PCB-QC1. ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Sampling Date Of August 07, 1995	Project Number CHEM-95-2001

WATER MATRIX SPIKE	
Sample Matrix Spike	88MW-1
Sample Control Number	952001-01
Sample Depth	screen
Sample Type	water
Sample Date	08-07-95
Received Date	08-07-95
Report Date	08-18-95
Percent Solids, w/w	-
Extraction Date	08-08-95
Analysis Date	08-10-95
Control Number	952001-qc1

MS, ug/L - 8080	AsAnalyzed	Spike Conc	AsFound	% Recovery	Acceptance	TMDL
PCB-1254	<0.20	5.3	4.9	93.2	60-110	0.2

Surrogate Recovery, %				% Recovery	Criteria	
Decachlorobiphenyl				104	60-110	

NOTES: TMDL = Target Method Detection Limit, ug/L (parts-per-billion)

Reviewed By HLW Date 08/18/95 Data File 952001

K00000802

CHAIN OF CUSTODY

CONSUMERS POWER COMPANY
ENVIRONMENTAL & TECHNICAL SERVICES
135 W. TRAIL ST.
JACKSON, MICHIGAN 49201
(517) 788-1251
FAX (517) 788-1104

PAGE 1 OF 1

SEND REPORT TO :

PHONE :

SAMPLING SITE : Overisel Gas Compr. Station

PROJECT NUMBER : 534517-XXX-001

SAMPLING TEAM : G.L. Cattell & M.D. Morrissey

DATE SHIPPED : Hand Carried 8/07/95

SITE SKETCH ATTACHED ? CIRCLE ONE : YES NO

ANALYSIS REQUESTED: PCBs

CPCO CONTROL NO.	DATE SAMPLED	TIME SAMPLED	SAMPLE TYPE	SAMPLE DESCRIPTION / LOCATION	SAMPLE DEPTH	# OF CONTAINERS	PCBs							REMARKS
95-2001-1	8/07/95	1225	Water	MW-1	Screen	2ea. 1qt	✓							
-2		1242		MW-2			✓							
-3		1235		MW-2A			✓							
-4		1246		MW-3			✓							
-5		1250		MW-3A			✓							
-6		1259		MW-4			✓							
-7		1254		MW-4A			✓							
-8		0700		Field Blank	—	1ea. 1qt.	✓							

RELINQUISHED BY : (SIGNATURE)	DATE / TIME	RECEIVED BY : (SIGNATURE)
[signature]	8/10/95 1530	PCB Receiving
RELINQUISHED BY : (SIGNATURE)	DATE / TIME	RECEIVED BY : (SIGNATURE)
RELINQUISHED BY : (SIGNATURE)	DATE / TIME	RECEIVED BY : (SIGNATURE)

COMMENTS :

K00000803

Consumers Power
POWERING MICHIGAN'S PROGRESS
Environmental & Technical Services Department: 1945 West Parnall Rd, Jackson, MI 49201 • FAX (517) 788-2329

Writer's Direct Dial (517) 788-2980

August 26, 1996

M90518.3
DAO 96-045

Mr Tom Leep
Waste Management Division
Michigan Department of Environmental Quality
621 North 10th Street
PO Box 355
Plainwell, MI 49080

OVERISEL COMPRESSOR STATION -
1996 GROUNDWATER MONITORING REPORT

Dear Mr Leep

In the PCB Action Plan for Consumers Power Company's Overisel Compressor Station filed with the Michigan Department of Natural Resources (MDNR) on August 8, 1988, Consumers Power stated its plans to undertake a long-term, annual groundwater monitoring program at the site. The program commenced in March of 1988 utilizing the existing monitoring wells and is intended to assure detection of any changes in conditions at the site. The duration will be at least 10 years, but will be evaluated on an annual basis using the data obtained from the monitoring.

This letter is intended to report the results of the monitoring for 1996 conducted on August 7, 1996. As shown in the attached report, PCB was not detected on any of the wells at the Method Detection Limit of 0.2 μg/L. The direction of groundwater flow was to the southwest.

Please contact me if you have any questions regarding this matter.

Sincerely

David A. Olsen

David A Olsen, PE
Environmental & Technical Services

K00000804

BCC JPDickey, M-1046
RWHaifley, Overisel
BWRasher, P-24-501A
GWallace, Overisel

To	DAOlsen, P24-505	CONSUMERS POWER COMPANY
From	HWVoigt, T-260	
Date	August 23, 1996	
Subject	OVERISEL COMPRESSOR STATION - Annually Groundwater Sampling - Monitor Well Groundwater Samples - PCB Results - Sampling Date - August 07, 1996	Internal Corrsespondence
CC	O Essink, Overisel Compressor	File Index # 529617-330-774

On August 07, 1996 personnel from the Chemistry and Materials Services Department (C&MS) of Technical Services completed Depth-To-Water (DWL) measurements and groundwater sample collection from seven (7) monitoring well installations at the Overisel Compressor Station. Samples were returned to C&MS for the determination of Polychlorinated Biphenyls (PCBs).

SUMMARY OF RESULTS

Groundwater direction remains to the general southwest. PCBs are not detected in any of the groundwater samples collected at a Target Method Detection Limit of 0.2 ug/L.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - The monitoring wells were initially evacuated of 5-times the casing volume by pumping at a rate of 1 gallon per minute with a suction pump fitted with a rubber hose and a screened foot valve. During pumping the screened foot valve was positioned 1 foot below the DWL so that the completed well volume was evacuated. Measurements of pH and specific conductance were taken at intervals corresponding to approximately one pumped casing volume for a minimum of five casing volumes. After the required pump volume was removed, a 1-quart water sample was collected at screen depth with a clean bailer. Samples were iced and returned to C&MS for analysis.

Sample Handling - Sample handling was in accordance with the SW-846 recommendations for organic analytes.

pH and Specific Conductance - ESTS Procedure - CHEM-74

Polychlorinated Biphenyls (PCBs) - Method 8080A, Organochlorine Pesticides and PCB (PCB only). SW-846, Test Methods For Evaluating Solid Waste - Physical / Chemical Methods, USEPA.

K00000806

FIGURE 1. GROUNDWATER CONTOUR MAP

Overisel Compressor Station
Sampling Date: August 07, 1996

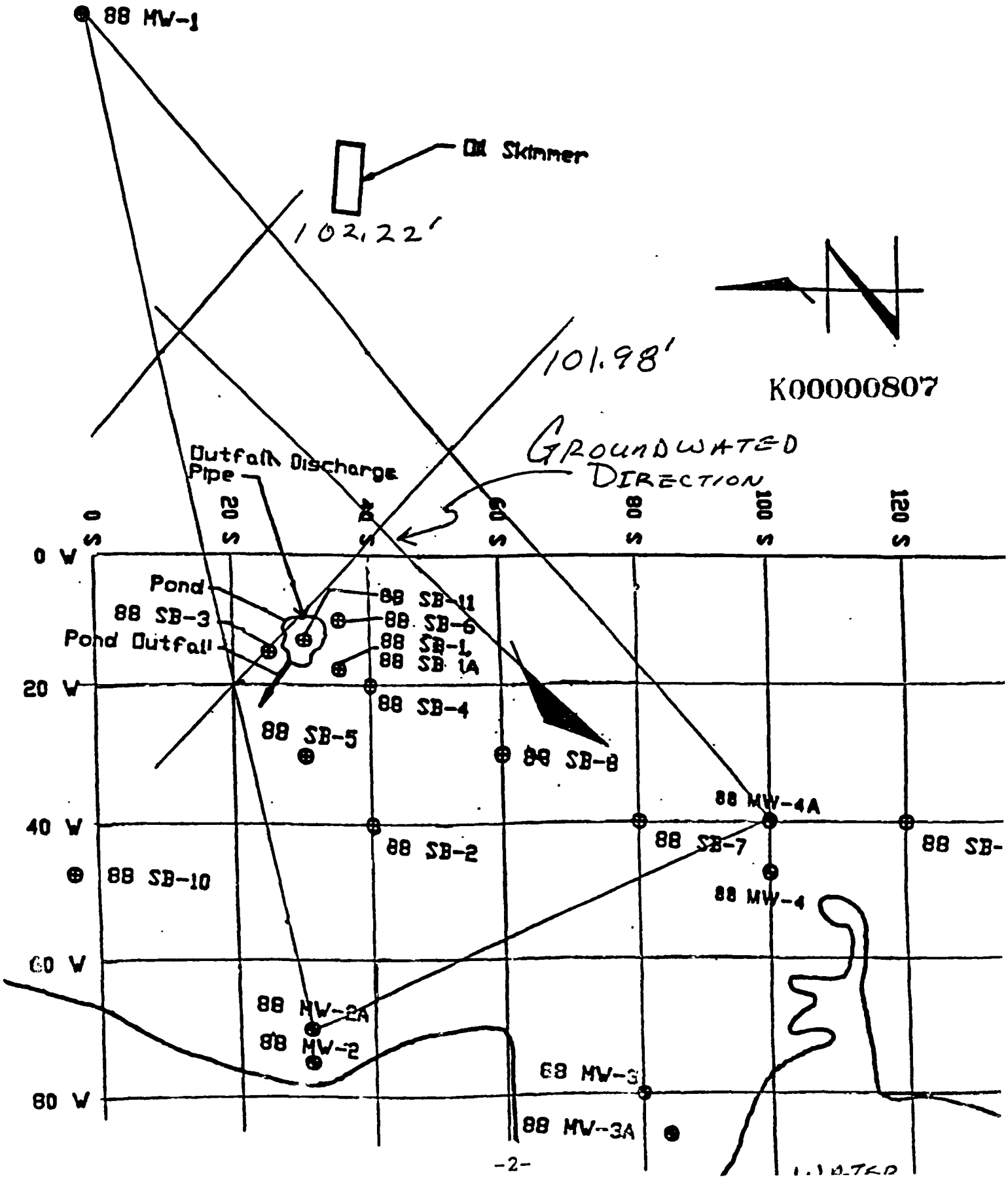


TABLE 1. STATIC WATER ELEVATIONS

Overisel Compressor Station
Sampling Date: August 07, 1996

Monitoring Well ID	Elevation Top-Of-Casing (ft)	Depth-To Water (ft)	Static Water Elevation (ft)
OV-88-MW-1	116.80	14.39	102.45
OV-88-MW-2	105.02	3.74	101.28
OV-88-MW-2A	105.33	3.60	102.73
OV-88-MW-3	104.43	3.87	100.56
OV-88-MW-3A	104.08	2.53	101.55
OV-88-MW-4	104.11	2.59	101.52
OV-88-MW-4A	104.30	2.72	101.58

K00000808

TABLE 2A. ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Sampling Date Of August 07, 1996 - PCB RESULTS				Project Number CHEM-96-1774	
Sample Identification	OV-88-MW-1	OV-88-MW-2	OV-88-MW-2A	OV-88-MW-3	OV-88-MW-3A	
Sample Depth (ft)	screen	screen	screen	screen	screen	
Sample Type	water	water	water	water	water	
Sample Date	08-07-96	08-07-96	08-07-96	08-07-96	08-07-96	
Received Date	08-07-96	08-07-96	08-07-96	08-07-96	08-07-96	
Report Date	08-23-96	08-23-96	08-23-96	08-23-96	08-23-96	
Percent Solids, %w/w	-	-	-	-	-	
Extraction Date	08-09-96	08-09-96	08-09-96	08-09-96	08-09-96	
Analysis Date	08-19-96	08-19-96	08-19-96	08-19-96	08-19-96	
Control Number	961774-01	961774-02	961774-03	961774-04	961774-05	
PCBs, ug/L - 8080A						TMDL
PCB-1016	nd	nd	nd	nd	nd	0.2
PCB-1221	nd	nd	nd	nd	nd	0.2
PCB-1232	nd	nd	nd	nd	nd	0.2
PCB-1242	nd	nd	nd	nd	nd	0.2
PCB-1248	nd	nd	nd	nd	nd	0.2
PCB-1254	nd	nd	nd	nd	nd	0.2
PCB-1260	nd	nd	nd	nd	nd	0.2
Surrogate Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	Criteria
Decachlorobiphenyl	81	80	92	85	99	60-120

NOTES: TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

Reviewed By JCW Date 08 23 96 Data File 961774

K00000809

TABLE 2B. ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Sampling Date Of August 07, 1996 - PCB RESULTS				Project Number CHEM-96-1774	
Sample Identification	OV-88-MW-4	OV-88-MW-4A		Field Blank	Method Blank	
Sample Depth (ft)	screen	screen		-	-	
Sample Type	water	water		water	water	
Sample Date	08-07-96	08-07-96		08-07-96	-	
Received Date	08-07-96	08-07-96		08-07-96	-	
Report Date	08-23-96	08-23-96		08-23-96	08-23-96	
Percent Solids, %w/w	-	-		-	-	
Extraction Date	08-09-96	08-09-96		08-09-96	08-09-96	
Analysis Date	08-19-96	08-19-96		08-19-96	08-19-96	
Control Number	961774-06	961774-07		961774-FB	961774-MB	
PCBs, ug/L - 8080A						TMDL
PCB-1016	nd	nd		nd	nd	0.2
PCB-1221	nd	nd		nd	nd	0.2
PCB-1232	nd	nd		nd	nd	0.2
PCB-1242	nd	nd		nd	nd	0.2
PCB-1248	nd	nd		nd	nd	0.2
PCB-1254	nd	nd		nd	nd	0.2
PCB-1260	nd	nd		nd	nd	0.2
Surrogate Recovery	% Recovery	% Recovery		% Recovery	% Recovery	Criteria
Decachlorobiphenyl	90	99		84	88	60-120

NOTES: TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

Reviewed By HEW Date 082396 Data File 961774

K00000810

TABLE PCB-QC1. ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Sampling Date Of August 07, 1996	Project Number CHEM-96-1774

WATER MATRIX SPIKES	
Sample Matrix Spike	OV-88-MW-3A
Sample Control Number	961774-05
Sample Depth	screen
Sample Type	water
Sample Date	08-07-96
Received Date	08-07-96
Report Date	08-23-96
Percent Solids, w/w	-
Extraction Date	08-09-96
Analysis Date	08-19-96
Control Number	961774-qc

MS, ug/L - 8080A	AsAnalyzed	Spike Conc	AsFound	% Recovery	Acceptance	LMDL
PCB-1016	<0.2					0.1
PCB-1221	<0.2					0.1
PCB-1232	<0.2					0.1
PCB-1242	<0.2					0.1
PCB-1248	<0.2					0.1
PCB-1254	<0.2	5.00	4.71	94	60-120	0.1
PCB-1260	<0.2					0.1
Surrogate Recovery, %				% Recovery	Criteria	
Decachlorobiphenyl				90	60-120	

NOTES: LMDL = Laboratory Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At LMDL

Reviewed By [illegible] Date 082396 Data File 961774

K00000811

TABLE 3. MONITORING WELL SAMPLING FIELD PARAMETERS

Overisel Compressor Station
Sampling Date: August 07, 1996

MW ID	SCRN Depth (ft)	DWL (ft)	Well Volume (gal)	Pump Volume (gal)	Final pH (SU)	Final Specific Cond. (umho/cm)
OV-88-MW-1	21.4	14.39	1.1	6.0	7.30	292.
OV-88-MW-2	11.8	3.74	1.3	7.0	7.20	495.
OV-88-MW-2A	23.1	3.74	3.1	16.0	7.15	490.
OV-88-MW-3	12.0	3.87	1.3	7.0	7.20	495.
OV-88-MW-3A	21.0	2.53	3.0	15.0	7.30	710.
OV-88-MW-4	11.2	2.59	1.5	8.0	6.95	480.
OV-88-MW-4A	21.9	2.72	3.1	16.0	7.30	488.

K00000812

CHAIN OF CUSTODY

CONSUMERS POWER COMPANY – ENVIRONMENTAL AND TECHNICAL SERVICES
LABORATORY COMMERCIAL SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251 • FAX (517) 788-1104

SAMPLING SITE: Overisel Gas Compr. Station

PROJECT NUMBER: 528617- -774

SAMPLING TEAM: GLCattell

DATE SHIPPED: Hand delivered 8-07-96

SITE SKETCH ATTACHED? CIRCLE ONE: YES NO

PAGE 1 OF 1

SEND REPORT TO:

PHONE:

ANALYSIS REQUESTED: PCBs

CPCO CONTROL #	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	SAMPLE DESCRIPTION / LOCATION	DEPTH	# OF CONTAINERS	PCBs							REMARKS
96-1774-1	8/07/96	1045	Water	MW1		2ea. 1gt. glass	✓							
-2		1122		MW2			✓							
-3		1120		MW2A			✓							
-4		1147		MW3			✓							
-5		1150		MW3A			✓							
-6		1221		MW4			✓							
-7		1224		MW4A			✓							
-8		0850		Field ~~Trip~~ Blank		1ea. 1gt glass	✓							

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
[signature]	8/07/96, 1500	Sample Storage
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
K00000813		

COMMENTS

ORIGINAL TO LAB COPY TO CUSTOMER

Consumers Energy

A CMS Energy Company

Writer's Direct Dial (517) 788-2980

Environmental & Technical
Services Department
1945 West Parnall Road
Jackson, MI 49201-8643

Fax: 517 788 1064

September 4, 1997

M90518.3
DAO-97.044

Mr Tom Leep
Michigan Department of Environmental Quality
Waste Management Division
621 North 10th Street
PO Box 355
Plainwell, MI 49080

OVERISEL COMPRESSOR STATION -
1996 GROUNDWATER MONITORING REPORT

Dear Mr Leep

In the PCB Action Plan for Consumers Energy Company's Overisel Compressor Station filed with the Michigan Department of Natural Resources (MDNR) on August 8, 1988, Consumers Energy stated its plans to undertake a long-term, annual groundwater monitoring program at the site. The program commenced in March of 1988 utilizing the existing monitoring wells and is intended to assure detection of any changes in conditions at the site. The duration will be at least 10 years, but will be evaluated on an annual basis using the data obtained from the monitoring.

This letter is intended to report the results of the monitoring for 1997 conducted on August 7, 1997. As shown in the attached report, PCB was not detected on any of the wells at the Method Detection Limit of 0.2 μg/L. The direction of groundwater flow was to the southwest.

Please contact me if you have any questions regarding this matter.

Sincerely

David A. Olsen

David A Olsen, PE
Environmental & Technical Services

K00000814

BCC JPDickey, M-1046
RWHaifley, Overisel Compressor Station
GLKelterborn, P-24-605A
GWallace, Overisel Compressor Station

K00000815

CONSUMERS ENERGY Memorandum

To: DAOlsen, T-24-505

From: HWVoigt, T-260

Date: August 26, 1997

Subject: OVERISEL COMPRESSOR STATION
- Annually Groundwater Sampling
- Monitor Well Groundwater Samples
- PCB Results
- Sampling Date - August 07, 1997

CC: Roger Haifley, Overisel Compressor

File Index No.
529717-330-688

On August 07, 1997 personnel from the Chemistry and Materials Services Section (C&MS) of Technical Services completed Depth-To-Water (DWL) measurements and groundwater sample collection from seven (7) monitoring well installations at the Overisel Compressor Station. Samples were returned to C&MS for the determination of Polychlorinated Biphenyls (PCBs).

SUMMARY OF RESULTS

Groundwater direction remains to the general southwest. PCBs are not detected in any of the groundwater samples collected at a Target Method Detection Limit of 0.1 ug/L.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - The monitoring wells were initially evacuated of 5-times the casing volume by pumping at a rate of 1 gallon per minute with a suction pump fitted with a rubber hose and a screened foot valve. During pumping the screened foot valve was positioned 1 foot below the DWL so that the completed well volume was evacuated. Measurements of pH and specific conductance were taken at intervals corresponding to approximately one pumped casing volume for a minimum of five casing volumes. After the required pump volume was removed, a 1-quart water sample was collected at screen depth with a clean bailer. Samples were iced and returned to C&MS for analysis.

Sample Handling - Sample handling was in accordance with the SW-846 recommendations for organic analytes.

K00000816

pH and Specific Conductance - ESTS Procedure - CHEM-74

Polychlorinated Biphenyls (PCBs) - Method 8080A, Organochlorine Pesticides and PCB (PCB only). SW-846, Test Methods For Evaluating Solid Waste - Physical / Chemical Methods, USEPA.

TABLE 1. STATIC WATER ELEVATIONS

Overisel Compressor Station
Sampling Date: August 07, 1997

Monitoring Well ID	Elevation Top-Of-Casing (ft)	Depth-To Water (ft)	Static Water Elevation (ft)
OV-88-MW-1	116.80	14.29	102.51
OV-88-MW-2	105.02	3.91	101.11
OV-88-MW-2A	105.33	3.61	101.72
OV-88-MW-3	104.43	4.00	100.43
OV-88-MW-3A	104.08	2.52	101.56
OV-88-MW-4	104.11	2.57	101.54
OV-88-MW-4A	104.30	2.71	101.59

TABLE 2A. ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION – Sampling Date Of August 07, 1997 – PCB RESULTS					Project Number CHEM-97-1688
Sample Identification	OV-88-MW-1	OV-88-MW-2	OV-88-MW-2A	OV-88-MW-3	OV-88-MW-3A	
Sample Depth (ft)	screen	screen	screen	screen	screen	
Sample Type	water	water	water	water	water	
Sample Date	08-07-97	08-07-97	08-07-97	08-07-97	08-07-97	
Received Date	08-07-97	08-07-97	08-07-97	08-07-97	08-07-97	
Report Date	08-25-97	08-25-97	08-25-97	08-25-97	08-25-97	
Percent Solids, %w/w	–	–	–	–	–	
Extraction Date	08-11-97	08-11-97	08-11-97	08-11-97	08-11-97	
Analysis Date	08-12-97	08-12-97	08-12-97	08-12-97	08-12-97	
Control Number	971688-01	971688-02	971688-03	971688-04	971688-05	
PCBs, ug/L – 8080A						**TMDL**
PCB-1016	nd	nd	nd	nd	nd	0.1
PCB-1221	nd	nd	nd	nd	nd	0.1
PCB-1232	nd	nd	nd	nd	nd	0.1
PCB-1242	nd	nd	nd	nd	nd	0.1
PCB-1248	nd	nd	nd	nd	nd	0.1
PCB-1254	nd	nd	nd	nd	nd	0.1
PCB-1260	nd	nd	nd	nd	nd	0.1
Surrogate Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	Criteria
Decachlorobiphenyl	96	106	105	99	99	60-120

NOTES: TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

K00000818

Reviewed By [signature] Date 082597 Data File 971688

TABLE 2B. ANALYTICAL RESULTS

CONSUMERS POWER COMPANY

Environmental & Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Sampling Date Of August 07, 1997 - PCB RESULTS				Project Number CHEM-97-1688	
Sample Identification	OV-88-MW-4	OV-88-MW-4A		Field Blank	Method Blank	
Sample Depth (ft)	screen	screen		-	-	
Sample Type	water	water		water	water	
Sample Date	08-07-97	08-07-97		08-07-97	-	
Received Date	08-07-97	08-07-97		08-07-97	-	
Report Date	08-25-97	08-25-97		08-25-97	08-25-97	
Percent Solids, %w/w	-	-		-	-	
Extraction Date	08-11-97	08-11-97		08-11-97	08-11-97	
Analysis Date	08-12-97	08-12-97		08-12-97	08-12-97	
Control Number	971688-06	971688-07		971688-FB	971688-MB	
PCBs, ug/L - 8080A						TMDL
PCB-1016	nd	nd		nd	nd	0.1
PCB-1221	nd	nd		nd	nd	0.1
PCB-1232	nd	nd		nd	nd	0.1
PCB-1242	nd	nd		nd	nd	0.1
PCB-1248	nd	nd		nd	nd	0.1
PCB-1254	nd	nd		nd	nd	0.1
PCB-1260	nd	nd		nd	nd	0.1
Surrogate Recovery	% Recovery	% Recovery		% Recovery	% Recovery	Criteria
Decachlorobiphenyl	104	93		104	99	60-120

NOTES: TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

K00000819

Reviewed By HWJ Date 08 25 97 Data File 971688

TABLE 3. MONITORING WELL SAMPLING FIELD PARAMETERS

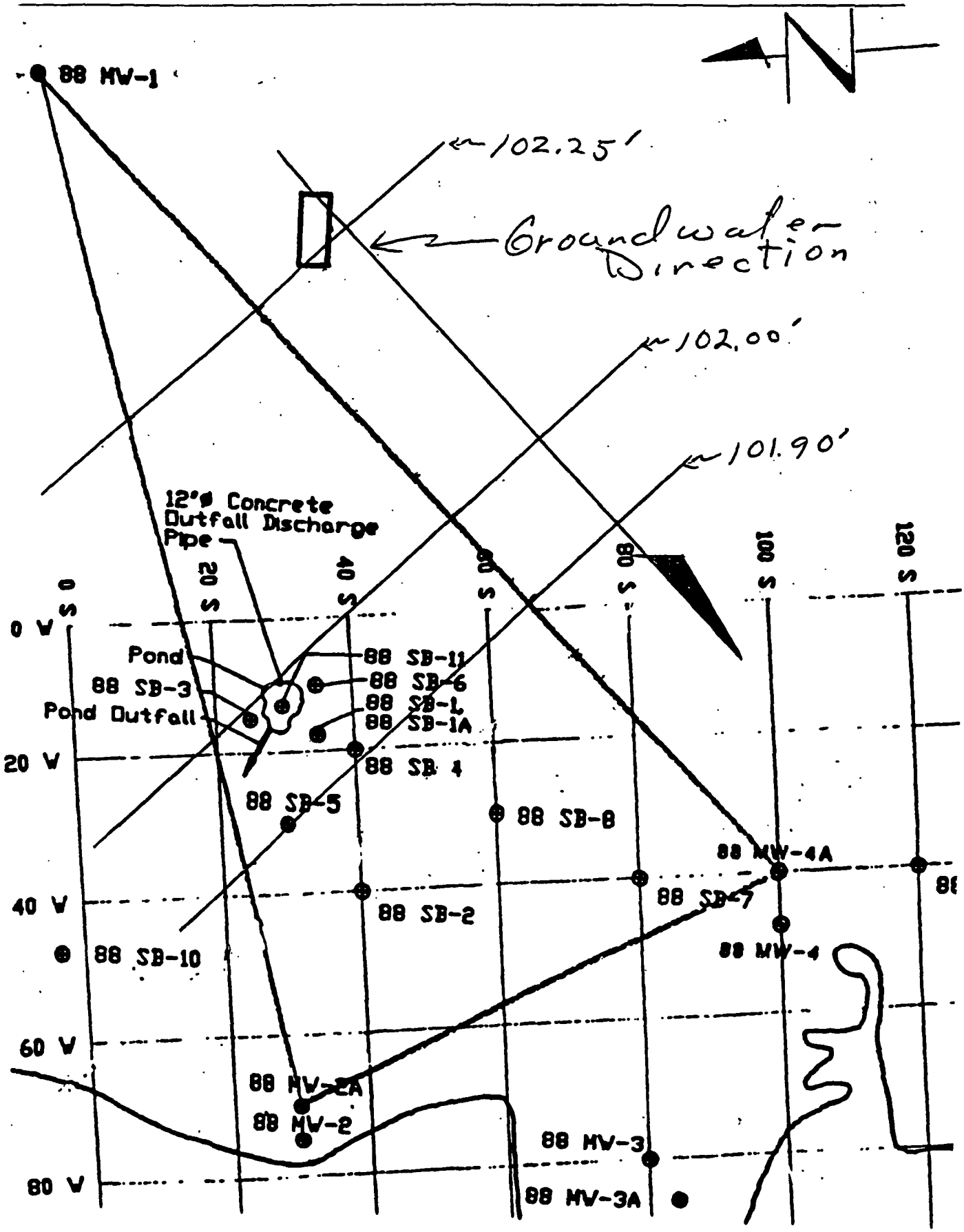
Overisel Compressor Station
Sampling Date: August 07, 1997

MW ID	SCRN Depth (ft)	DWL (ft)	Well Volume (gal)	Pump Volume (gal)	Final pH (SU)	Final Specific Cond. (umho/cm)
OV-88-MW-1	21.4	14.29	1.1	6.0	6.60	340.
OV-88-MW-2	12.4	3.91	1.3	7.0	6.90	510.
OV-88-MW-2A	23.1	3.61	3.1	16.0	7.30	500.
OV-88-MW-3	12.1	4.00	1.3	7.0	7.10	530.
OV-88-MW-3A	21.0	2.52	3.0	15.0	7.00	650.
OV-88-MW-4	11.9	2.57	1.5	8.0	7.00	460.
OV-88-MW-4A	22.0	2.71	3.1	16.0	6.90	488.

K00000820

FIGURE 1. GROUNDWATER CONTOUR MAP

Overisel Compressor Station
Sampling Date: August 07, 1997



K00000821

CHAIN OF CUSTODY

CONSUMERS POWER COMPANY – ENVIRONMENTAL AND TECHNICAL SERVICES
LABORATORY COMMERCIAL SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251 • FAX (517) 788-1104

SAMPLING SITE: Overisel Compr. Station

PROJECT NUMBER: 529177- -688

SAMPLING TEAM: G Cattell & F Rand

DATE SHIPPED: Hand delivered 8-07-97

SITE SKETCH ATTACHED? CIRCLE ONE: YES (NO)

PAGE 1 OF 1

SEND REPORT TO:

PHONE:

CPCO CONTROL #	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	SAMPLE DESCRIPTION / LOCATION	DEPTH	# OF CONTAINERS	ANALYSIS REQUESTED: PCBs	REMARKS
97-1688-1	8/07/97	1045	H_2O	MW-1	Screen	2ea. amber qt.	✓	
-2		1125		MW-2			✓	
-3		1130		MW-2A			✓	
-4		1155		MW-3			✓	
-5		1158		MW-3A			✓	
-6		1222		MW-4			✓	
-7		1225		MW-4A			✓	
-8		0630		Field blank	NA	1ea. amber qt.	✓	

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
[signature]	8/07/97, 1530	Sample Refrig.
RELINQUISHED BY: (SIGNATURE) K00000822	DATE / TIME	RECEIVED BY: (SIGNATURE)
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)

COMMENTS

Consumers Energy

A CMS Energy Company

Writer's Direct Dial (517) 788-2980

Environmental & Technical Services Department
1945 West Parnall Road
Jackson, MI 49201-8643

Fax: 517 788 1064

September 3, 1998

M90518.3
DAO-98.040

Mr Tom Leep
Michigan Department of Environmental Quality
Waste Management Division
621 North 10th Street
PO Box 355
Plainwell, MI 49080

OVERISEL COMPRESSOR STATION -
1998 GROUNDWATER MONITORING REPORT

Dear Mr Leep

In the PCB Action Plan for Consumers Energy Company's Overisel Compressor Station filed with the Michigan Department of Natural Resources (MDNR) on August 8, 1988, Consumers Energy stated its plans to undertake a ten year, annual groundwater monitoring program at the site. The program commenced in March of 1988 utilizing the existing monitoring wells and was intended to assure detection of any changes in conditions at the site. The analytical report for monitoring conducted on August 6, 1998 is attached to this letter. These results indicate that PCBs are not present in any of the wells at the Method Detection Limit of 0.1 ug/L. In addition, the groundwater flow direction continues to be toward the southwest.

With the submittal of this final monitoring report, all of the PCB Action Plan activities have been completed for this site. Since the monitoring program has successfully verified that the groundwater is not impacted by PCBs, no further activity is planned other than to remove or plug the existing monitoring wells.

Please contact me if you have any questions regarding this matter.

Sincerely

David A. Olsen

David A. Olsen, PE
Environmental & Technical Services

K00000823

BCC JPDickey, M-1042
RWHaifley, Overisel Compressor Station
GLKelterborn, P-24-605A
HWVoigt, T-260
GWallace, Overisel Compressor Station

K00000824

CONSUMERS ENERGY Memorandum

To: DAOlsen, P-24-505

From: HWVoigt, T-260

Date: August 28, 1998

Subject: OVERISEL COMPRESSOR STATION
- Annually Groundwater Sampling
- Monitor Well Groundwater Samples
- PCB Results
- Sampling Date - August 06, 1998

CC: Roger Haifley, Overisel Compressor

File Index No.
529817-330-429

On August 06, 1998 personnel from the Chemistry Section (CHEM) of Technical Services completed Depth-To-Water (DWL) measurements and groundwater sample collection from seven (7) monitoring well installations at the Overisel Compressor Station. Samples were returned to CHEM for the determination of Polychlorinated Biphenyls (PCBs).

SUMMARY OF RESULTS

Groundwater direction remains to the general southwest. PCBs are not detected in any of the groundwater samples collected at a Target Method Detection Limit of 0.1 ug/L.

METHODS

Depth-To-Water Measurements - Wetted Taped Method.

Water Sample Collection - The monitoring wells were initially evacuated of 5-times the casing volume by pumping at a rate of 0.1 gallons per minute with a suction pump fitted with a polyethylene tube and a screened foot valve. During pumping the screened foot valve was positioned 1 foot below the DWL so that the completed well volume was evacuated. Measurements of pH and specific conductance were taken at intervals corresponding to approximately one pumped casing volume for a minimum of five casing volumes. After the required pump volume was removed, a 1-quart water sample was collected at screen depth with a clean bailer. Samples were iced and returned to CHEM for analysis.

Sample Handling - Sample handling was in accordance with the SW-846 recommendations for organic analytes.

pH and Specific Conductance - ESTS Procedure - CHEM-74

Polychlorinated Biphenyls (PCBs) - Method 8080A, Organochlorine Pesticides and PCB (PCB only). SW-846, Test Methods For Evaluating Solid Waste - Physical / Chemical Methods, USEPA.

K00000825

TABLE 1. STATIC WATER ELEVATIONS

Overisel Compressor Station
Sampling Date: August 06, 1998

Monitoring Well ID	Elevation Top-Of-Casing (ft)	Depth-To Water (ft)	Static Water Elevation (ft)
OV-88-MW-1	116.80	14.83	101.97
OV-88-MW-2	105.02	3.96	101.06
OV-88-MW-2A	105.33	3.92	101.41
OV-88-MW-3	104.43	3.92	100.51
OV-88-MW-3A	104.08	2.84	101.24
OV-88-MW-4	104.11	2.89	101.22
OV-88-MW-4A	104.30	3.05	101.25

K00000826

TABLE 2. ANALYTICAL RESULTS

CONSUMERS ENERGY COMPANY

Chemistry Section - Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Annuall Groundwater Sampling - Sampling Date Of August 06, 1998				Project Number CHEM-98-1429	
Sample Identification	OV-88-MW-1	OV-88-MW-2	OV-88-MW-2A	OV-88-MW-3	OV-88-MW-3A	
Sample Depth (ft), DTW	14.83	3.96	3.92	3.92	2.84	
Sample Type	water	water	water	water	water	
Sample Date	08-06-98	08-06-98	08-06-98	08-06-98	08-06-98	
Received Date	08-06-98	08-06-98	08-06-98	08-06-98	08-06-98	
Report Date	08-28-98	08-28-98	08-28-98	08-28-98	08-28-98	
PCB Extraction Date	08-11-98	08-11-98	08-11-98	08-11-98	08-11-98	
PCB Analysis Date	08-20-98	08-20-98	08-20-98	08-20-98	08-20-98	
Control Number	981429-01	981429-02	981429-03	981429-04	981429-05	
PCBs, ug/L - Method 8080						**TMDL**
PCB-1016	nd	nd	nd	nd	nd	0.1
PCB-1221	nd	nd	nd	nd	nd	0.1
PCB-1232	nd	nd	nd	nd	nd	0.1
PCB-1242	nd	nd	nd	nd	nd	0.1
PCB-1248	nd	nd	nd	nd	nd	0.1
PCB-1254	nd	nd	nd	nd	nd	0.1
PCB-1260	nd	nd	nd	nd	nd	0.1
Surrogate Recovery - 8080	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	Criteria
Decachlorobiphenyl	99	115	111	110	99	80-120

NOTES: TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

Reviewed By HWJ Date 082898 Data File 981429

K00000827

TABLE 2. ANALYTICAL RESULTS

CONSUMERS ENERGY COMPANY

Chemistry Section - Technical Services Department

LOCATION	OVERISEL COMPRESSOR STATION - Annuall Groundwater Sampling - Sampling Date Of August 06, 1998				Project Number CHEM-98-1429	
Sample Identification	OV-88-MW-4	OV-88-MW-4A	Field Blank	Method Blank		
Sample Depth (ft), DTW	2.89	3.05	-	-		
Sample Type	water	water	water	water		
Sample Date	08-06-98	08-06-98	08-06-98	-		
Received Date	08-06-98	08-06-98	08-06-98	-		
Report Date	08-28-98	08-28-98	08-28-98	08-28-98		
PCB Extraction Date	08-11-98	08-11-98	08-11-98	08-11-98		
PCB Analysis Date	08-20-98	08-20-98	08-20-98	08-20-98		
Control Number	981429-06	981429-07	981429-08	981429-mb		
PCBs, ug/L - Method 8080						TMDL
PCB-1016	nd	nd	nd	nd		0.1
PCB-1221	nd	nd	nd	nd		0.1
PCB-1232	nd	nd	nd	nd		0.1
PCB-1242	nd	nd	nd	nd		0.1
PCB-1248	nd	nd	nd	nd		0.1
PCB-1254	nd	nd	nd	nd		0.1
PCB-1260	nd	nd	nd	nd		0.1
Surrogate Recovery - 8080	% Recovery	% Recovery	% Recovery	% Recovery		Criteria
Decachlorobiphenyl	107	113	110	99		80-120

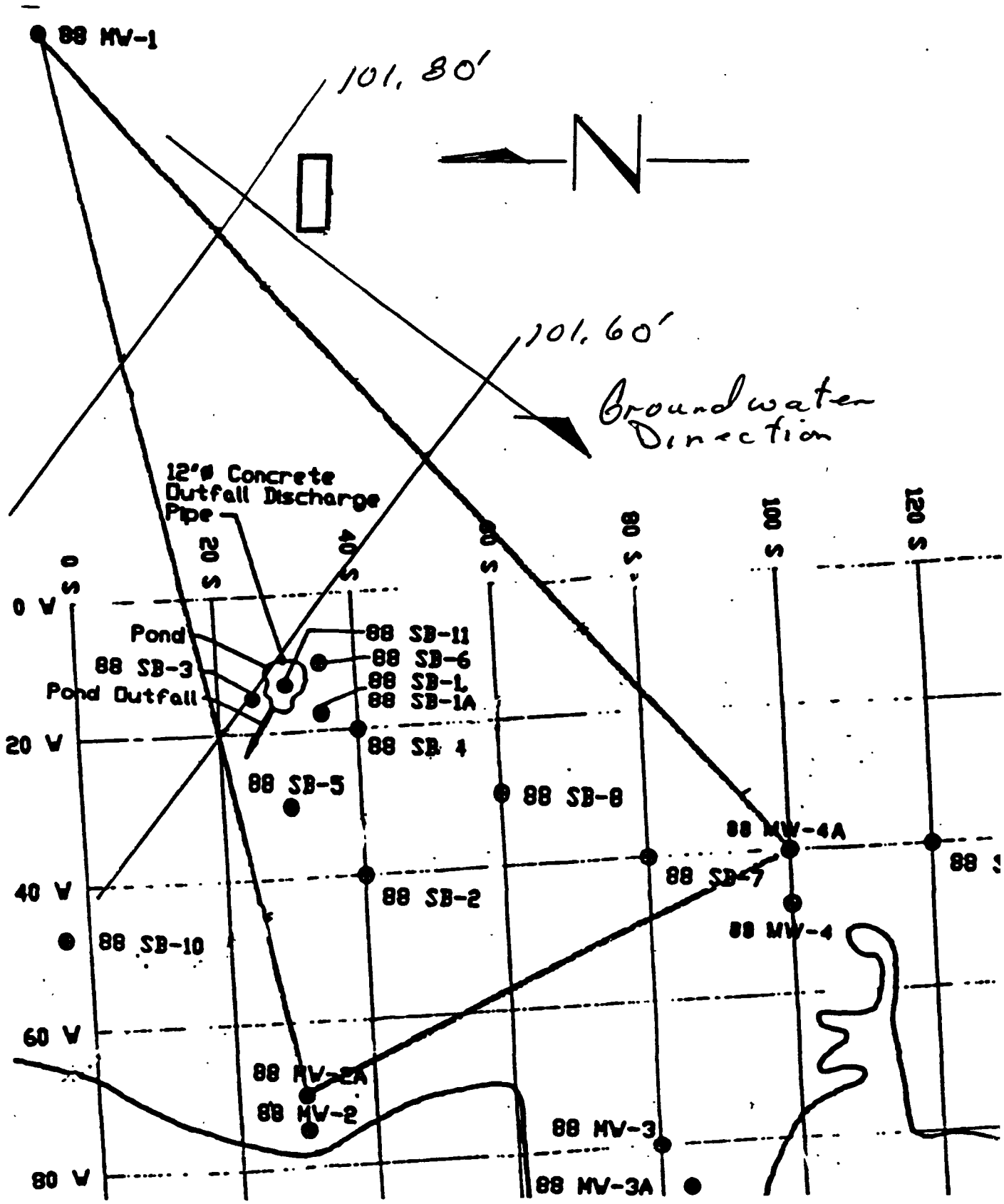
NOTES: TMDL = Target Method Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected At TMDL

Reviewed By MWJ Date 082898 Data File 981429

K00000828

FIGURE 1. GROUNDWATER CONTOUR MAP

Overisel Compressor Station
Sampling Date: August 06, 1998



K00000829

TABLE 3. MONITORING WELL SAMPLING FIELD PARAMETERS

Overisel Compressor Station
Sampling Date: August 06, 1998

MW ID	SCRN Depth (ft)	DWL (ft)	Well Volume (gal)	Pump Volume (gal)	Final pH (SU)	Final Specific Cond. (umho/cm)
OV-88-MW-1	21.3	14.83	1.1	5.0	8.30	290.
OV-88-MW-2	12.1	3.96	1.3	6.5	7.25	430.
OV-88-MW-2A	23.1	3.92	3.1	15.5	7.30	465.
OV-88-MW-3	12.1	3.92	1.3	6.5	7.15	480.
OV-88-MW-3A	21.0	2.84	2.9	14.5	7.25	780.
OV-88-MW-4	11.8	2.89	1.4	7.0	7.15	520.
OV-88-MW-4A	22.0	3.05	3.0	15.0	7.35	465.

K00000830

CHAIN OF CUSTODY

CONSUMERS POWER COMPANY – ENVIRONMENTAL AND TECHNICAL SERVICES
LABORATORY COMMERCIAL SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251 • FAX (517) 788-1104

SAMPLING SITE: Overisel Gas Compr. Station

PROJECT NUMBER: 528817- -428

SAMPLING TEAM: GLC, MB

DATE SHIPPED: Hand carried 80681

SITE SKETCH ATTACHED? CIRCLE ONE: YES NO

PAGE 1 OF 1

SEND REPORT TO:

PHONE:

CPCO CONTROL #	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	SAMPLE DESCRIPTION / LOCATION	DEPTH	# OF CONTAINERS	PCBs							REMARKS
98-1429-1	8/06/88	1035	H_2O	MW-1	Screen	2ea. Amber Qt.	✓							
-2		~~1016~~ 1116		MW-2			✓							
-3		~~1018~~ 1118		MW-2A			✓							
-4		1151		MW-3			✓							
-5		1155		MW-3A			✓							
-6		1228		MW-4			✓							
-7		1232		MW-4A			✓							
-8		0530		Field Blank		1ea. Amber Qt	✓							

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
[signature]	8/06/88 1600	Sample Refrig.
K00000831		

COMMENTS

ORIGINAL TO LAB COPY TO CUSTOMER

CONSUMERS ENERGY Memorandum

To: DAOlsen, P-24-505

From: GLCattell, T-251 pll

Date: September 14, 1999

Subject: OVERISEL COMPRESSOR STATION
- Monitor Well Groundwater Samples
- PCB Results
- Sampling Date of August 12, 1999

CC: GWallace, Overisel Compressor Station File Index: 529917-330-276

On August 12, 1999 personnel from the Chemistry Department (CHEM) of Environmental and Laboratory Services performed depth-to-water (DWL) measurements and groundwater sample collection from seven monitoring wells at Overisel Compressor Station. Samples were returned to CHEM for determination of polychlorinated biphenyls (PCBs).

SUMMARY OF RESULTS

Groundwater direction remains to the general southwest. PCBs were not detected in any of the samples collected, at the Target Detection Limit of less than 0.1ug/L.

METHODS

Depth-to-Water Measurements – Electronic tape method.

Water Sample Collection – The monitoring wells were initially evacuated of 5 times the casing volume by pumping at a rate of 1 gallon per minute with a suction pump fitted with an inert tubing and a screened foot valve. During pumping the screened foot valve was positioned 1 foot below the DWL so that the complete well volume was evacuated. Measurements of pH and specific conductance were taken at intervals corresponding to approximately one pumped casing volume for a minimum of five casing volumes. After the required pump volume was removed, a 1 liter water sample was collected at screen depth with a clean bailer. Samples were iced and returned to CHEM for analysis.

Sample Handling – Sample handling was in accordance with the SW-846 recommendations for organic analytes.

pH and Specific Conductance – E&LS procedure CHEM-74.

Polychlorinated Biphenyls (PCBs) – Method 8082, "Polychlorinated Biphenyls By Gas Chromatography"/Method 8080, "Organochlorine Pesticides and PCBs" (PCBs only). SW-846, Test Methods For Evaluating Solid Waste – Physical/Chemical Methods, USEPA.

TABLE 1a. ANALYTICAL RESULTS

CONSUMERS ENERGY COMPANY
Environmental and Laboratory Services

LOCATION	OVERSIEL COMPRESSOR STATION - Sampling of August 12, 1999				Project Number CHEM-99-1276	
Sample Identification	88MW-1	88MW-2	88MW-2A	88MW-3	88MW-3A	
Sample Depth (ft)	screen	screen	screen	screen	screen	
Sample Type	water	water	water	water	water	
Sample Date	08-12-99	08-12-99	08-12-99	08-12-99	08-12-99	
Received Date	08-12-99	08-12-99	08-12-99	08-12-99	08-12-99	
Report Date	09-14-99	09-14-99	09-14-99	09-14-99	09-14-99	
Percent Solids, w/w	-	-	-	-	-	
Extraction Date	08-16-99	08-16-99	08-16-99	08-16-99	08-16-99	
Analysis Date	08-27-99	08-27-99	08-30-99	08-27-99	08-27-99	
Control Number	99-1276-01	99-1276-02	99-1276-03	99-1276-04	99-1276-05	
PCBs,ug/L,Method 8082/8080						TDL
PCB-1016	nd	nd	nd	nd	nd	0.1
PCB-1221	nd	nd	nd	nd	nd	0.1
PCB-1232	nd	nd	nd	nd	nd	0.1
PCB-1242	nd	nd	nd	nd	nd	0.1
PCB-1248	nd	nd	nd	nd	nd	0.1
PCB-1254	nd	nd	nd	nd	nd	0.1
PCB-1260	nd	nd	nd	nd	nd	0.1
PCB Sum, ug/L	nd	nd	nd	nd	nd	
Surrogate Recovery, %						Criteria
Decachlorobiphenyl	86	95	99	97	91	50-120

Notes:
TDL = Target Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected at TDL
PCB Sum is the summation of all PCB types detected

Reviewed By [illegible] Date 9-14-99 Data File 991276

K00000833

TABLE 1b. ANALYTICAL RESULTS

CONSUMERS ENERGY COMPANY
Environmental and Laboratory Services

LOCATION	OVERSIEL COMPRESSOR STATION - Sampling of August 12, 1999					Project Number CHEM-99-1276
Sample Identification	88MW-4	88MW-4A	Field Blank	MethodBlank		
Sample Depth (ft)	screen	screen	-	-		
Sample Type	water	water	water	water		
Sample Date	08-12-99	08-12-99	08-12-99	-		
Received Date	08-12-99	08-12-99	08-12-99	-		
Report Date	09-14-99	09-14-99	09-14-99	09-14-99		
Percent Solids, w/w	-	-	-	-		
Extraction Date	08-16-99	08-16-99	08-16-99	08-16-99		
Analysis Date	08-27-99	08-30-99	08-27-99	08-30-99		
Control Number	99-1276-06	99-1276-07	99-1276-08	99-1276-mb		
PCBs,ug/L,Method 8082/8080						TDL
PCB-1016	nd	nd	nd	nd		0.1
PCB-1221	nd	nd	nd	nd		0.1
PCB-1232	nd	nd	nd	nd		0.1
PCB-1242	nd	nd	nd	nd		0.1
PCB-1248	nd	nd	nd	nd		0.1
PCB-1254	nd	nd	nd	nd		0.1
PCB-1260	nd	nd	nd	nd		0.1
PCB Sum, ug/L	nd	nd	nd	nd		
Surrogate Recovery, %						Criteria
Decachlorobiphenyl	90	93	95	92		50-120

Notes:
TDL = Target Detection Limit, ug/L (parts-per-billion)
nd = Parameter Not Detected at TDL
PCB Sum is the summation of all PCB types detected

Reviewed By _____ Date 9/14/99 Data File 991276

K00000834

TABLE 2. STATIC WATER ELEVATIONS

Overisel Compressor Station
Sampling Date: August 12, 1999

Monitoring Well ID	Elevation Top-of-Casing (ft)	Depth-to-Water (ft)	Static Water Elevation (ft)
OV-88-MW-1	116.80	14.86	101.94
OV-88-MW-2	105.02	3.90	101.12
OV-88-MW-2A	105.33	3.87	101.46
OV-88-MW-3	104.43	3.83	100.60
OV-88-MW-3A	104.08	2.83	101.25
OV-88-MW-4	104.11	2.89	101.22
OV-88-MW-4A	104.30	3.06	101.24

K00000835

TABLE 3. MONITORING WELL SAMPLING FIELD PARAMETERS

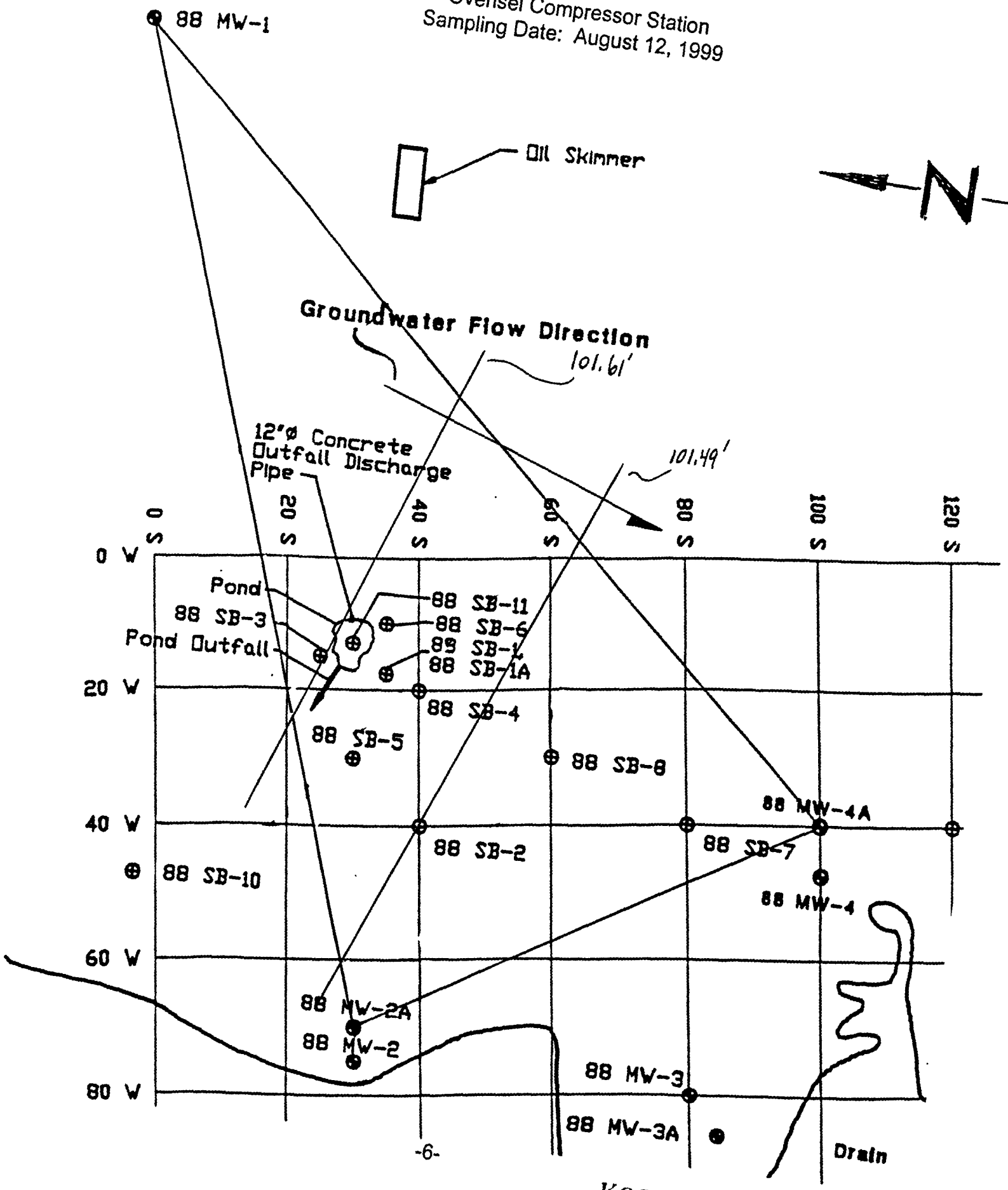
Overisel Compressor Station
Sampling Date: August 12, 1999

Monitoring Well ID	Screen Depth (ft)	DWL (ft)	Well Volume (ft)	Pump Volume (ft)	Final pH (SU)	Final Specific Conductance (umho/cm)
OV-88-MW-1	21.30	14.86	1.0	5.0	7.60	275.
OV-88-MW-2	12.12	3.90	1.3	7.0	7.65	460.
OV-88-MW-2A	23.15	3.87	3.0	15.0	7.60	468.
OV-88-MW-3	12.10	3.83	1.3	7.0	7.60	660.
OV-88-MW-3A	21.05	2.83	3.0	15.0	7.55	1010.
OV-88-MW-4	12.02	2.89	1.5	8.0	7.50	600.
OV-88-MW-4A	22.03	3.06	3.0	15.0	7.70	590.

K00000836

FIGURE 1. GROUNDWATER CONTOUR MAP

Overisel Compressor Station
Sampling Date: August 12, 1999



K00000837

CHAIN OF CUSTODY

CONSUMERS ENERGY COMPANY – ENVIRONMENTAL AND TECHNICAL SERVICES
LABORATORY COMMERCIAL SERVICES

Consumers Energy

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251 • FAX (517) 788-1104

SAMPLING SITE: Overisel gas Compr. Station

PROJECT NUMBER: 529917- -276

SAMPLING TEAM: GLC, CHS

DATE SHIPPED: 081299

SITE SKETCH ATTACHED? CIRCLE ONE: YES NO

PAGE 1 OF 1

SEND REPORT TO: DA Olsen

PHONE:

CPCO CONTROL #	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	SAMPLE DESCRIPTION / LOCATION	DEPTH	# OF CONTAINERS	PCBs							REMARKS
99-1276-1	8/12/99	1120	H_2O	MW-1	Screen	2ea. Amber gl.	✓							
-2		1257		MW-2			✓							
-3		1300		MW-2A			✓							
-4		1306		MW-3			✓							
-5		1309		MW-3A			✓							
-6		1313		MW-4			✓							
-7		1315		MW-4A			✓							
-8		0700		Field Blank	NA	1 ea. amber gl.	✓							

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
[signature]	8/12/99 1545	H_2O sample storage
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
RELINQUISHED BY: (SIGNATURE) K00000838	DATE / TIME	RECEIVED BY: (SIGNATURE)

COMMENTS

ORIGINAL TO LAB COPY TO CUSTOMER