HYDROGEOLOGIC INVESTIGATION
PHASE III

FRONTIER CHEMICAL WASTE PROCESS, INC.
NIAGARA FALLS, NEW YORK

APRIL 1990

ecco INC.
THE ENVIRONMENTAL CONSULTING COMPANY

VOLUME 2

APPENDIX C: GROUND WATER MONITORING, WELL DEVELOPMENT AND SAMPLING, FRONTIER CHEMICAL WASTE PROCESS, INC. (EFS REPORT)

FIELD REPORT

GROUNDWATER MONITORING
Well Development and Sampling

FRONTIER CHEMICAL WASTE PROCESS INC.

NIAGARA FALLS, NEW YORK

Prepared For:

ECCO, INC.

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APRIL 1989

EFS ENVIRONMENTAL FIELD SERVICES
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

FIELD REPORT

GROUNDWATER MONITORING

WELL DEVELOPMENT AND SAMPLING

at

FRONTIER CHEMICAL WASTE PROCESS, INC.

Niagara Falls, New York

Prepared for

ECCO, INC.
BUFFALO, NEW YORK

Prepared by

ENVIRONMENTAL FIELD SERVICES
Division of Ken W. Kloeber Consulting Engineers
BOSTON, NEW YORK

APRIL 1989

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I. INTRODUCTION

1.1 Background

A groundwater monitoring program for the industrial site of Frontier Chemical Waste Process, Inc., Niagara Falls, New York, occurred during October and November 1988. A Location Map is provided as **Figure 1**. This monitoring program is part of an environmental study being conducted by ECCO, Inc., Buffalo, New York. Groundwater samples were collected from 66 monitoring wells and delivered to BLT Technical Services in Niagara Falls, New York, for analytical testing. This report addresses the field activities associated with development, evacuation, and sampling of groundwater monitoring wells.

Initially, the groundwater monitoring system at the Frontier industrial site consisted of 34 monitoring wells. This system included the installation of 8 wells in 1981, 9 wells in 1984, and 17 wells in 1987. Monitoring wells MW-1 (installed in 1981) and MW-4 (installed in 1984) were decommissioned following well installation in 1984. The system was expanded in 1988 as part of ECCO's study to include an additional 39 wells. For this project, two of the 1981 monitoring wells and all of the 1984, 1987, and 1988 wells were monitored. The approximate location of each monitoring well/cluster is shown on **Figures 2** and 3.

1.2 Scope of Project

The first task involved development of the 39 newly installed monitoring wells (1988). Development began immediately after installation was complete to remove the effects associated with drilling and construction. This allows a free flow of formation water to enter the well.

The second task involved evacuation and sampling of groundwater from 66 study wells. The 1988 wells were allowed to remain idle for a two week period, following development, before evacuation of water for sampling purposes. Sampling was performed immediately after evacuation, allowing time for the volume of water in a well to recover sufficiently. Samples were collected utilizing pre-cleaned stainless steel bailers and placed directly into bottles prepared by BLT Technical. All sample bottles were sealed, labeled, and placed into ice chests to insure sample integrity. pH, temperature, and conductivity measurements were taken in the field and recorded on the Monitoring Well Sampling Field Sheets provided as **Appendix B**. At the conclusion of daily sampling activities, all samples were delivered directly to the laboratories of BLT Technical Services.

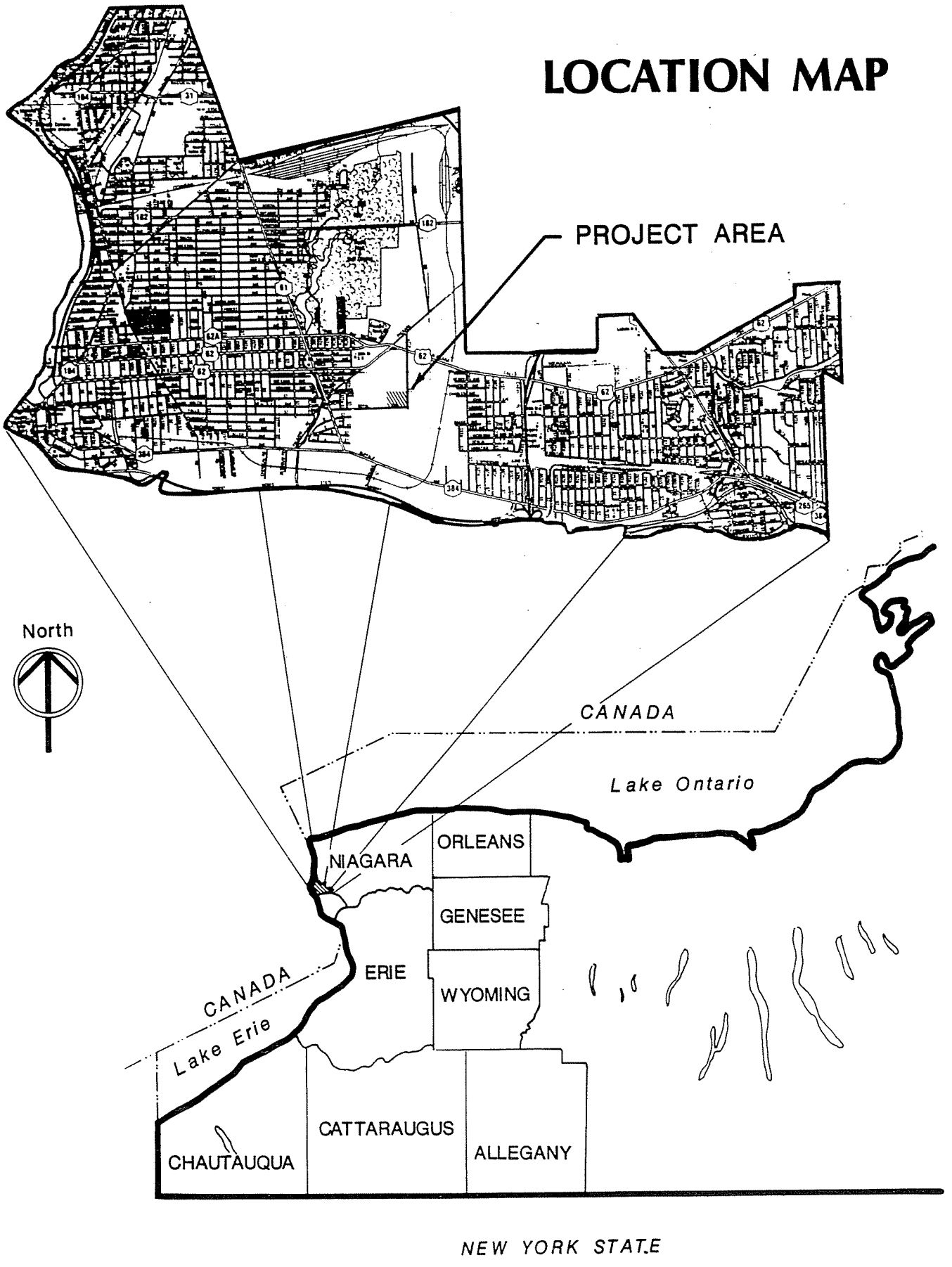
LOCATION MAP
PROJECT AREA
North
CANADA
Lake Ontario
NIAGARA
ORLEANS
GENESEE
ERIE
WYOMING
CANADA
Lake Erie
CHAUTAUQUA
CATTARAUGUS
ALLEGANY
NEW YORK STATE

FIGURE 1

EFS ENVIRONMENTAL FIELD SERVICES DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

FRONTIER CHEMICAL WASTE PROCESS INC.

NEW MONITORING WELLS INSTALLED 1988

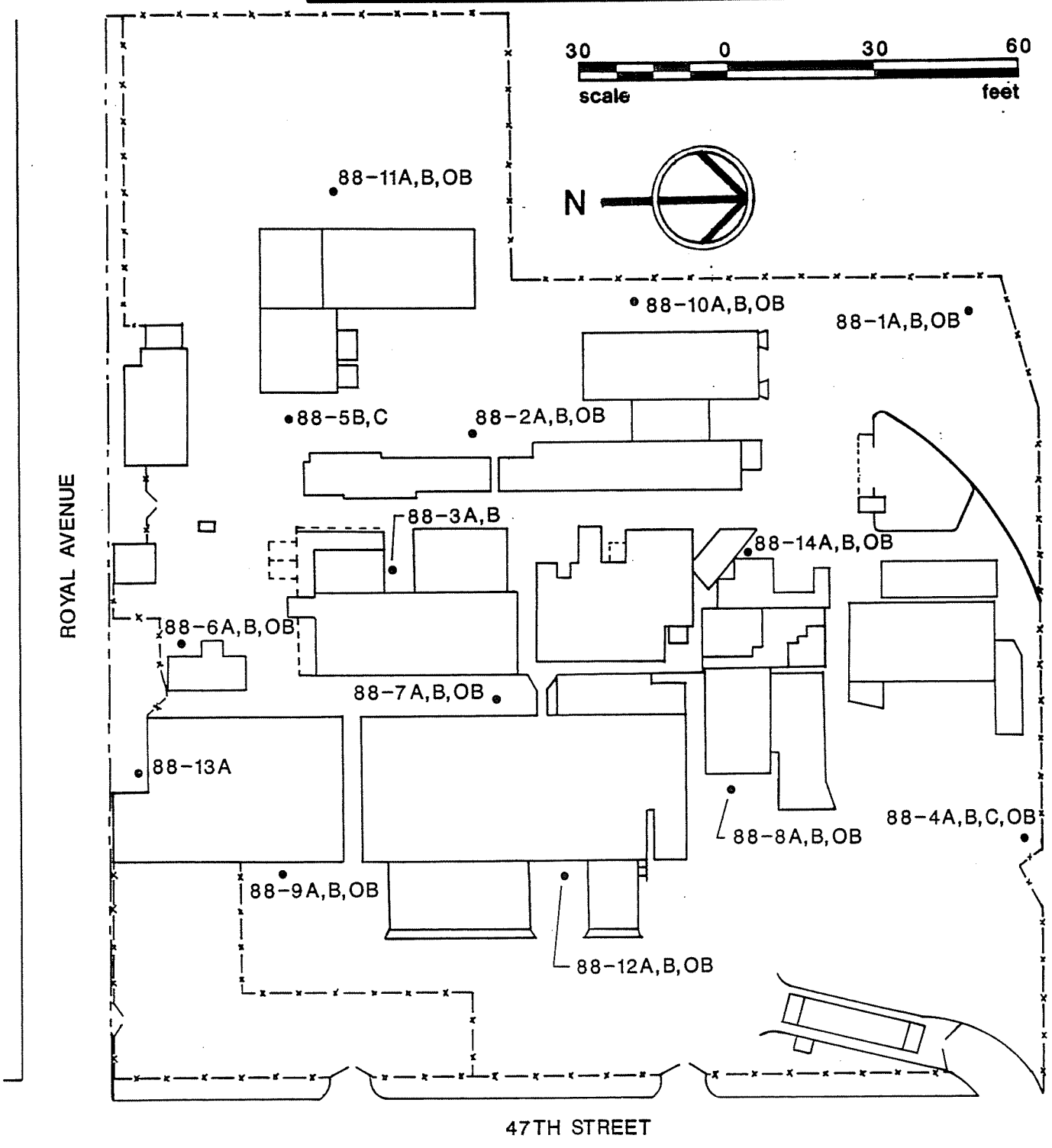

FIGURE 2

EFS ENVIRONMENTAL FIELD SERVICES DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

FRONTIER CHEMICAL WASTE PROCESS INC.

EXISTING MONITORING WELLS INSTALLED 1981, 1984, AND 1987

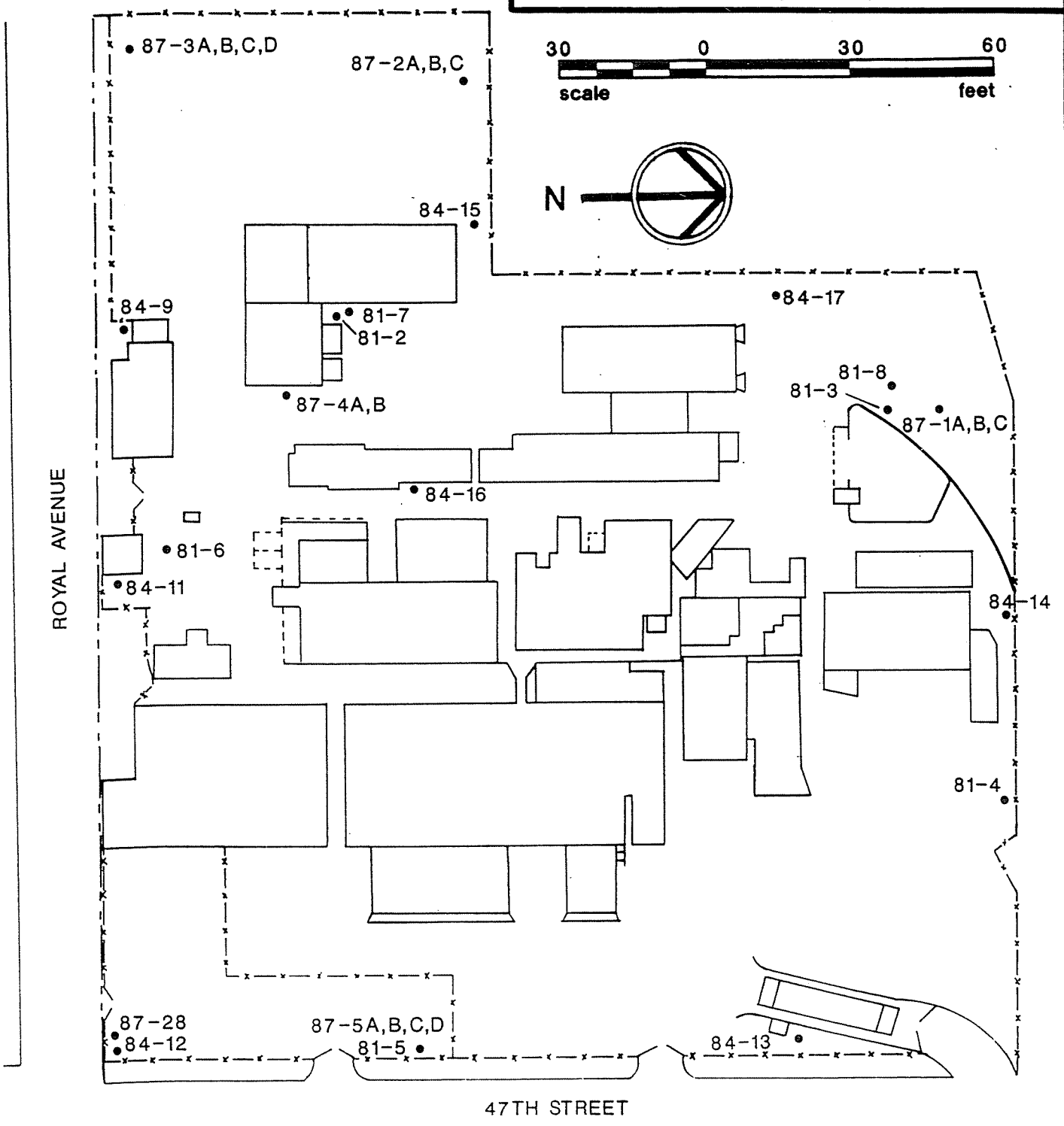

FIGURE 3

1.3 Observations

Observations made by our technical staff during field activities are recorded on data sheets found in Appendices A and B. A summary of these observations are presented here:

- Monitoring wells 87-1A, B, and C have 3/4 inch I.D. casing which require a custom fabricated stainless steel bailor to obtain samples. The small diameter of the bailor material restricts the installation of a reasonable check valve assembly resulting in the need for a top-fill bailor design.

- Monitoring wells installed prior to 1988 were equipped with dedicated 1/4 inch I.D. polyethylene tubing for evacuation purposes. In some cases, the tubing was not long enough to reach the full extent of the well, therefore, tubing was either replaced or spliced to complete evacuation.

- Proper development was difficult with monitoring wells that are less than 25 feet deep. These wells tend to have a very slow recovery rate and low water volume. Some wells only generate approximately one gallon of water and take a full 24-hour period, or greater, to recover that volume.

All field tasks (development, evacuation, and sampling) were performed in accordance with established methods and guidelines outlined by Environmental Protection Agency (EPA) documents; "RCRA Groundwater Monitoring Technical Enforcement Guidance Document" and "Characterization of Hazardous Waste Sites -A Methods Manual: Volume II Available Sampling Methods, Second Edition".

II WELL DEVELOPMENT

2.1 Description

Beginning in September 1988, 39 monitoring wells were installed at the Frontier industrial site by ECCO, Inc. Figure 2 shows the approximate location of these wells. Development procedures began immediately after drilling and construction was complete.

During well construction, the drilling process creates fines or cuttings that form a mud cake. This cake reduces the hydraulic conductivity of the surrounding strata and lessens the flow of formation water into the monitoring well. Development is geared to allow a free flow of representative formation water into the well by removing the mud cake and suspended solids introduced during drilling.

Suction pumps and surge block devices were used for development of the monitoring well. Development of a well was complete when the groundwater evacuated was observed to be visually clear and test samples demonstrated stable pH, temperature, and conductivity measurements.

2.2 Development Procedures

Prior to evacuating water, groundwater surface elevations were measured to the nearest hundredth of a foot using a Brainard-Kilman Water Rule (model 2260), electronic water level indicator. The volume of standing water was calculated and the process of evacuation began. The removal of groundwater was accomplished using suction pumps equipped with dedicated 1/2 inch I.D. polyethylene tubing and a dedicated polyethylene foot valve. A Teel Marine Pump (model 1P580D) and a McCulloch Aquamac pump were utilized.

The foot valve served a dual purpose. By moving the tubing in an up and down motion, the water level would rise in the tubing, thereby assisting in priming the pump. The motion of the foot valve acted as a plunger causing surges inside the well. This action is similar to a surge block device, that is used to force water in and out of the well screen. The fine particles flushed from the well screen were removed by the pump. This procedure was used for most wells except the deeper, higher volume "C" wells. A surge block was then incorporated with the standard pump set-up to achieve the necessary movement of water and fines.

Samples of groundwater were collected approximately every five minutes and field tested for pH, temperature, and conductivity. Visual observations for clarity were also recorded. In some instances the well volume was minimal resulting in only one test sample during a pumping event. The data obtained by these water tests are recorded on the Well Development Field Sheets provided in **Appendix A.**

High yield wells with a fast recharge rate were pumped continuously until the test parameters stabilized and the groundwater appeared clear of construction material (sand, grout, etc.). The low yielding wells with slow recharge rates were pumped dry. Daily pumping events, allowing a minimum of 24-hours to recover sufficient water volume, were required to achieve the development criteria of stabilization and clarity.

All groundwater evacuated from the wells was collected into drums for proper disposal by Frontier Chemical. Field measurements were performed with the following test equipment:

- pH and temperature measurements were taken with an Omega PHH-43, microprocessor pH meter, accurate to ± 0.01 pH units and ± 0.5°C.
- Conductivity measurements were taken with an Extech Compact Conductivity Meter, having a range of 0 - 20,000 µmhos/cm and better than 0.5% accuracy.

Calibration of test equipment (ie. pH, temperature, and conductivity meters) was performed at the beginning and end of each day using known buffers and standards. Periodic checks were performed throughout the day to keep the instrument calibrated properly.

2.3 Decontamination Procedures

Precautions were taken to insure against cross-contamination of wells during development. After a groundwater surface elevation was measured, the electronic water surface indicator probe was cleaned before reuse in the next well. Each well was assigned new dedicated polyethylene tubing equipped with a dedicated polyethylene foot valve. Upon completion of development, the foot valve was removed for cleaning and the polyethylene tubing was stored inside the individual well casing. The decontamination procedures for all equipment used for development was as follows:

- wash with Liquinox detergent
- rinse with tap water
- rinse with distilled water
- air dry before reuse

Decontamination of all equipment was performed at the decontamination pad area designated by Frontier Chemical. Rubber boots worn by field technicians were scrubbed down with Liquinox soap and rinsed with tap water. All disposable safety gear (ie. tyvek suits, latex gloves etc.) were disposed of into drums designated by Frontier Chemical.

2.4 Summary of Data

Tables 1A - 1L present the field measurements and observations of control samples taken during well development. This information is a summary of the Well Development Field Sheets in Appendix A.

TABLE 1 A

FRONTIER CHEMICAL

1988 Monitoring Well Development
Field Data

Monitoring Well	Date	Approx. Time of Pumping (min)	Groundwater Surface Elevation (top of riser) (ft)	Estimated Total Volume of Water Exacuted (gal)	pH Units	Temp. (°C)	Conductivity (µmhos/cm)	Observations
88-1 OB	10/17/88	3.0	7.70	2.2	--	--	--	Turbid brown with heavy solids; evacuated well to dryness
88-1 OB	10/17/88	3.0	--	2.2	--	--	--	Turbid tan-gray with solids; evacuated to dryness
88-1 OB	10/17/88	3.0	--	2.2	--	--	--	Turbid tan-gray and clearing; evacuated to dryness
88-1 OB	10/18/88	--	7.74	--	7.53	14.2	2,500	Tan color with surface sheen
88-1 OB	10/18/88	6.0	--	4.4	7.58	14.3	2,750	Tan color with surface sheen; evacuated to dryness
88-1 OB	10/19/88	--	7.51	--	7.67	13.7	2,460	Light tan tint with some very fine sands
88-1 OB	10/19/88	6.0	--	4.4	7.59	13.6	2,600	Light tan tint with very fine sands; evacuated to dryness
88-1 OB	10/20/88	3.0	7.39	2.2	7.44	11.7	2,510	Clear with light tan color and few solids; evacuated to dryness
88-1 OB	10/21/88	3.0	7.52	2.2	7.35	12.5	1,890	Clear and no solids, evacuated to dryness; development completed
88-1 A	10/17/88	--	15.56	--	6.36	13.6	1,980	Turbid light gray
88-1 A	10/17/88	30.0	15.60	25.0	6.33	14.0	1,780	Clear; evacuated to dryness; development completed
88-1 B	10/17/88	--	23.18	--	6.42	14.5	2,600	Turbid light gray
88-1 B	10/17/88	45.0	23.44	40.0	6.34	15.0	2,620	Clear; evacuated to dryness; development completed
88-2 OB	10/25/88	1.0	16.43	0.2	11.51	9.9	17,150	Layered sheen, NAPL, clear brown solvent on top and foaming; evacuated to dryness
88-2 OB	10/26/88	1.0	16.30	0.2	11.66	12.3	17,000	Opaque brown with foam, NAPL and strong solvent odor; evacuated to dryness
88-2 OB	10/27/88	1.0	16.34	0.2	11.69	11.7	>20,000	Opaque brown with heavy foam, NAPL, solvent odor and few fine solids; evacuated to dryness
88-2 OB	10/28/88	1.0	16.30	0.2	12.38	13.0	17,570	Same; evacuated to dryness
88-2 OB	10/31/88	1.0	16.32	0.2	11.39	12.9	14,290	Turbid brown, heavy foam, NAPL and solvent odor; evacuated to dryness
88-2 OB	11/01/88	1.0	16.30	0.2	11.46	13.0	18,340	Cloudy brown, foaming, silt and strong odor; evacuated to dryness; development completed
88-2 A	10/25/88	--	19.00	--	7.94	13.4	12,340	Opaque brown-white, oil sheen, foaming, and solvent smell
88-2 A	10/25/88	40.0	--	37.0	9.88	13.5	16,120	Opaque brown-white, NAPL, solvent smell and oil sheen; evacuated to dryness
88-2 A	10/26/88	3.0	19.00	3.0	9.12	12.8	11,540	Heavy foaming, NAPL, top layer opaque brown with solvent odor; development completed

Note: > = Greater than

TABLE 1 B

FRONTIER CHEMICAL

1988 Monitoring Well Development
Field Data

Monitoring Well	Date	Approx. Time of Pumping (min)	Groundwater Surface Elevation (top of riser) (ft)	Estimated Total Volume of Water Exacuted (gal)	pH Units	Temp. (°C)	Conductivity (µmhos/cm)	Observations
88-2 B	10/26/88	--	26.02	--	9.34	16.5	12,880	Cloudy brown-green with slight oil sheen and light sulfur odor
88-2 B	10/26/88	35.0	25.01	40.0	9.19	19.2	13,370	Clear with green tint and slight sulfur odor; development completed
88-3 A	10/31/88	3.0	18.77	1.3	12.41	11.8	>20,000	Opaque brown; evacuated to dryness
88-3 A	10/31/88	3.0	--	1.3	12.41	12.7	>20,000	Cloudy brown with solvent odor and slight oil sheen; evacuated to dryness
88-3 A	10/31/88	3.0	--	1.3	12.38	12.6	>20,000	Cloudy orange-brown with solvent odor; evacuated to dryness
88-3 A	10/31/88	3.0	--	1.3	12.38	12.2	>20,000	Cloudy rust color with chemical odor and oil sheen; evacuated to dryness
88-3 A	10/31/88	3.0	--	1.3	12.37	12.5	>20,000	Cloudy rust with chemical odor and surface sheen; evacuated to dryness
88-3 A	11/01/88	3.0	18.71	--	--	--	--	No water evacuated
88-3 A	11/02/88	--	18.70	--	12.45	12.5	>20,000	Turbid brown, surface sheen, chemical odor and fine sands
88-3 A	11/02/88	5.0	--	2.2	12.52	12.3	>20,000	Same; evacuated to dryness; development completed
88-3 B	10/31/88	--	27.80		10.35	11.7	>20,000	Cloudy brown-orange with chemical odor
88-3 B	10/31/88	45.0	--	48.0	10.27	12.8	>20,000	Clear with yellow tint; development completed
88-4 OB	10/18/88	3.0	6.64	2.4	--	--	--	Turbid gray with heavy solids; evacuated to dryness
88-4 OB	10/19/88	3.0	7.32	2.4	7.30	14.0	4,630	Opaque gray with some fine solids; evacuated to dryness
88-4 OB	10/19/88	3.0	--	2.4	7.07	13.1	3,280	Opaque light gray; evacuated to dryness
88-4 OB	10/20/88	3.0	7.87	2.4	6.84	13.8	3,000	Opaque light tan; evacuated to dryness
88-4 OB	10/21/88	3.0	8.11	2.4	6.81	14.2	2,630	Clear; evacuated to dryness; development completed
88-4 A	10/18/88	3.0	14.98	1.8	6.23	13.6	2,980	Turbid gray with surface sheen; evacuated to dryness
88-4 A	10/19/88	3.0	15.94	1.8	6.67	12.7	2,970	Turbid gray with heavy solids; evacuated to dryness
88-4 A	10/20/88	3.0	18.18	1.8	6.47	12.2	2,970	Turbid tan-gray; evacuated to dryness
88-4 A	10/21/88	3.0	17.96	1.8	6.39	13.1	2,930	Turbid tan-gray with some solids; evacuated to dryness
88-4 A	10/24/88	3.0	15.94	1.8	6.48	22.1	2,780	Turbid brown with fine solids; evacuated to dryness
88-4 A	10/25/88	3.0	17.18	1.8	6.65	11.7	3,000	Cloudy light brown with fine solids; evacuated to dryness
88-4 A	10/25/88	3.0	--	1.8	6.46	10.9	2,740	Cloudy brown-white with few fine solids; evacuated to dryness
88-4 A	10/26/88	3.0	15.68	1.8	6.62	13.8	3,600	Cloudy brown-white; evacuated to dryness

Note: > = Greater than

TABLE 1 C

FRONTIER CHEMICAL

1988 Monitoring Well Development
Field Data

Monitoring Well	Date	Approx. Time of Pumping (min)	Groundwater Surface Elevation (top of riser) (ft)	Estimated Total Volume of Water Exacuted (gal)	pH Units	Temp. (°C)	Conductivity (µmhos/cm)	Observations
88-4 A	10/27/88	3.0	17.16	1.8	6.25	11.5	2,900	Cloudy yellow-brown with few fine solids; evacuated to dryness
88-4 A	10/28/88	3.0	--	1.8	6.90	12.0	2,720	Cloudy with volatiles; evacuated to dryness
88-4 A	10/31/88	3.0	16.92	1.8	6.28	11.3	2,570	Cloudy rust colored with some fine solids; evacuated to dryness
88-4 A	11/01/88	3.0	16.97	1.8	6.42	12.5	2,660	Cloudy, light rust colored with fine sand; evacuated to dryness; development completed
88-4 B	10/21/88	3.0	27.69	2.5	8.58	14.4	2,410	Opaque brown with few fine solids and sulfur odor; evacuated to dryness
88-4 B	10/24/88	--	27.00	--	8.62	15.2	2,730	Light brown with sulfur odor
88-4 B	10/24/88	30.0	--	25.3	7.78	16.4	2,080	Nearly clear with brown-green tint and sulfur odor; evacuated to dryness
88-4 B	10/25/88	--	25.08	--	8.61	11.6	2,680	Clear brown with fine solids and sulfur odor
88-4 B	10/25/88	48.0	--	40.5	7.16	11.9	1,810	Opaque brown with few fine solids and sulfur odor; development completed
88-4 C	11/02/88	--	22.44	--	6.51	10.9	4,690	Clear, light foaming, and sulfur odor
88-4 C	11/02/88	115.0	22.62	60.0	6.51	10.7	5,410	Nearly clear with light gray tint and sulfur odor; development completed
88-5 B	10/31/88	--	26.34	--	10.69	12.9	>20,000	Cloudy rust-tan with light surface froth and chemical odor
88-5 B	10/31/88	50.0	--	45.0	10.04	12.7	>20,000	Clear amber with chemical odor; development completed
88-5 C	11/01/88	--	23.84	--	11.65	13.5	4,120	Clear with light tan color
88-5 C	11/01/88	60.0	--	25.0	8.71	12.8	5,360	Turbid gray with fine sediment and sulfur odor
88-5 C	11/02/88	--	24.00	--	8.97	12.9	5,470	Clear with light gray tint and sulfur odor
88-5 C	11/02/88	125.0	24.78	50.0	6.67	12.0	5,970	Cloudy, light gray with few very fine sands and sulfur odor; development completed

Note: > = Greater than

TABLE 1 D

FRONTIER CHEMICAL

1988 Monitoring Well Development
Field Data

Monitoring Well	Date	Approx. Time of Pumping (min)	Groundwater Surface Elevation (top of riser) (ft)	Estimated Total Volume of Water Exacuted (gal)	pH Units	Temp. (°C)	Conductivity (µmhos/cm)	Observations
88-6 OB	10/25/88	3.0	11.82	1.7	9.70	14.5	14,420	Opaque brown with solids and foam; evacuated to dryness
88-6 OB	10/26/88	3.0	13.60	1.7	9.64	13.5	17,160	Dark brown with fine solids and froth; evacuated to dryness
88-6 OB	10/27/88	3.0	14.52	1.7	9.58	12.4	15,500	Opaque brown and foaming; evacuated to dryness
88-6 OB	10/28/88	2.0	15.22	1.1	10.06	13.8	17,400	Very cloudy, muddy; evacuated to dryness
88-6 OB	10/31/88	3.0	14.38	1.7	9.57	13.3	18,600	Cloudy rust colored; evacuated to dryness
88-6 OB	11/01/88	2.0	15.36	1.1	9.35	14.5	17,350	Turbid brown with foaming, chemical odor and fine sediment; evacuated to dryness
88-6 OB	11/02/88	2.0	15.74	1.1	9.54	13.2	>20,000	Turbid rust-brown with fine sands, surface foam and surface sheen; evacuated to dryness; development completed
88-6 A	10/25/88	3.0	23.36	2.0	8.87	13.3	19,360	Light brown and cloudy with few solids; evacuated to dryness
88-6 A	10/26/88	3.0	23.46	2.0	10.47	12.3	>20,000	Opaque tan with few fine solids, froth, and weak chemical odor; evacuated to dryness
88-6 A	10/28/88	3.0	23.34	2.0	11.67	12.6	>20,000	Opaque, light red-brown, and very little sand; evacuated to dryness
88-6 A	10/31/88	3.0	23.40	2.0	10.84	13.1	>20,000	Nearly clear, orange-brown; evacuated to dryness
88-6 A	11/01/88	3.0	23.20	2.0	10.62	13.8	>20,000	Nearly clear amber with slight chemical odor; evacuated to dryness; development completed
88-6 B	10/26/88	--	28.53	--	10.41	17.3	>20,000	Turbid brown-gray with fine solids and some froth
88-6 B	10/26/88	45.0	29.23	35.0	10.39	18.9	>20,000	Clear amber, light froth and weak chemical odor; development completed
88-7 OB	10/21/88	3.0	5.95	1.9	11.18	12.7	11,620	Thick turbid brown with heavy solids; evacuated to dryness
88-7 OB	10/24/88	3.0	5.69	1.9	11.66	12.3	13,750	Turbid dark brown with heavy foam; evacuated to dryness
88-7 OB	10/25/88	3.0	5.82	1.9	11.45	13.0	13,430	Opaque red-brown with few solids and foam; evacuated to dryness
88-7 OB	10/26/88	3.0	5.90	1.9	11.49	12.0	13,150	Frothy, clear with dark brown tint; evacuated to dryness
88-7 OB	10/27/88	3.0	6.04	1.9	11.67	12.2	14,500	Opaque, red-brown with some volatiles; evacuated to dryness
88-7 OB	10/28/88	3.0	5.70	1.9	12.51	12.7	15,010	Rust colored, fairly clear, light foam, and some sand; evacuated to dryness

Note: > = Greater than

TABLE 1 E

FRONTIER CHEMICAL

1988 Monitoring Well Development
Field Data

Monitoring Well	Date	Approx. Time of Pumping (min)	Groundwater Surface Elevation (top of riser) (ft)	Estimated Total Volume of Water Exacuted (gal)	pH Units	Temp. (°C)	Conductivity (µmhos/cm)	Observations
88-7 OB	10/31/88	3.0	5.85	1.9	11.43	12.2	14,100	Cloudy brown-black; evacuated to dryness
88-7 OB	11/01/88	3.0	6.18	1.9	11.37	12.8	15,200	Cloudy brown with very fine sands; evacuated to dryness; development completed
88-7 A	10/21/88	4.0	18.63	2.9	10.29	12.6	>20,000	Turbid dark gray with heavy solids; evacuated to dryness
88-7 A	10/24/88	4.0	18.52	2.9	10.27	12.5	>20,000	Turbid dark brown-green with light foam; evacuated to dryness
88-7 A	10/25/88	4.0	18.60	2.9	10.04	12.3	>20,000	Opaque brown with fine solids and heavy foam; evacuated to dryness
88-7 A	10/26/88	--	18.58	--	9.96	11.8	14,960	Turbid brown with some fine solids, surface froth and chemical odor present
88-7 A	10/26/88	4.0	--	2.9	9.98	16.0	>20,000	Cloudy brown with few fine solids and heavy dissolved gases; evacuated to dryness
88-7 A	10/27/88	--	18.66	--	10.13	11.5	>20,000	Opaque light brown with heavy foam
88-7 A	10/27/88	4.0	--	2.9	10.10	12.0	>20,000	Same; evacuated to dryness
88-7 A	10/28/88	4.0	18.50	2.9	10.78	11.6	>20,000	Opaque light red-brown and very little fine sand; evacuated to dryness
88-7 A	10/31/88	4.0	18.34	2.9	9.92	12.0	>20,000	Cloudy rust colored; evacuated to dryness
88-7 A	11/01/88	4.0	18.26	2.9	9.83	12.4	>20,000	Translucent light brown with little fine sand; evacuated to dryness; development completed
88-7 B	10/21/88	--	27.46	--	9.87	19.6	>20,000	Turbid brown with solids and solvent odor
88-7 B	10/21/88	70.0	28.22	47.0	10.16	15.1	17,500	Clear amber with solvent odor; development completed
88-8 OB	10/18/88	4.0	7.68	3.0	6.90	15.5	>20,000	Opaque tan with solvent odor; evacuated to dryness
88-8 OB	10/19/88	--	8.02	--	7.63	16.2	>20,000	Turbid brown with solvent odor
88-8 OB	10/19/88	107.0	--	82.0	8.35	15.5	>20,000	Clear amber with frothy surface and solvent odor; development is completed
88-8 A	10/18/88	--	17.09	--	9.11	14.3	12,760	Turbid gray with solids and solvent odor
88-8 A	10/18/88	55.0	--	25.0	8.71	16.9	11,920	Opaque brown with heavy solvent odor
88-8 A	10/19/88	--	19.02	--	8.98	9.7	7,390	Opaque tan-brown with heavy solvent odor
88-8 A	10/19/88	60.0	19.96	25.0	8.93	15.3	12,260	Clear light brown with heavy solvent odor; development completed
88-8 B	10/18/88	--	28.47	--	7.34	16.2	3,540	Turbid brown
88-8 B	10/18/88	40.0	--	35.0	6.39	19.5	2,970	Clear with faint solvent odor; development completed

Note: > = greater than

TABLE 1 F

FRONTIER CHEMICAL

1988 Monitoring Well Development
Field Data

Monitoring Well	Date	Approx. Time of Pumping (min)	Groundwater Surface Elevation (top of riser) (ft)	Estimated Total Volume of Water Exacuted (gal)	pH Units	Temp. (°C)	Conductivity (µmhos/cm)	Observations
88-9 OB	10/20/88	2.0	13.52	0.7	10.48	16.9	>20,000	Turbid brown with heavy solids; evacuated to dryness
88-9 OB	10/21/88	2.0	12.66	0.7	10.23	15.5	>20,000	Same; evacuated to dryness
88-9 OB	10/24/88	2.0	13.52	0.7	9.43	15.0	19,000	Turbid brown with fine solids; evacuated to dryness
88-9 OB	10/25/88	2.0	14.08	0.7	9.29	15.0	>20,000	Opaque brown with chemical odor and fine solids; evacuated to dryness
88-9 OB	10/26/88	2.0	14.08	0.7	8.91	15.0	17,040	Cloudy white-brown; evacuated to dryness
88-9 OB	10/27/88	2.0	14.22	0.7	9.39	15.4	19,620	Opaque brown, foaming and chemical odor present; evacuated to dryness
88-9 OB	10/28/88	2.0	14.26	0.7	10.10	13.6	18,950	Cloudy brown, slightly volatile and fine solids; evacuated to dryness
88-9 OB	10/31/88	2.0	13.60	0.7	8.80	14.6	16,250	Cloudy brown-white; evacuated to dryness
88-9 OB	11/01/88	2.0	13.84	0.7	9.20	14.5	19,160	Cloudy brown with fine sand and foaming present; evacuated to dryness
88-9 OB	11/02/88	2.0	13.88	0.7	8.67	14.4	13,980	Cloudy tan with few fine sands; evacuated to dryness; development completed
88-9 A	10/20/88	4.0	20.96	2.2	--	--	--	Turbid gray with thick heavy solids; evacuated to dryness
88-9 A	10/21/88	4.0	20.20	2.2	12.28	14.8	16,200	Turbid gray with solids; evacuated to dryness
88-9 A	10/24/88	4.0	21.01	2.2	12.08	16.3	16,380	Cloudy brown with solids; evacuated to dryness
88-9 A	10/25/88	4.0	23.20	2.2	12.04	14.0	16,120	Cloudy brown-gray with fine solids; evacuated to dryness
88-9 A	10/26/88	4.0	23.41	2.2	12.15	15.9	>20,000	Turbid gray with heavy solids and frothy surface; evacuated to dryness
88-9 A	10/27/88	4.0	23.54	2.2	12.05	14.2	16,800	Opaque light brown with some foam; evacuated to dryness
88-9 A	10/28/88	4.0	19.68	2.2	12.98	11.7	15,560	Cloudy gray with volatiles and fine solids; evacuated to dryness
88-9 A	10/31/88	4.0	22.00	2.2	11.92	13.1	16,900	Cloudy orange-brown; evacuated to dryness
88-9 A	11/01/88	4.0	23.09	2.2	11.80	13.8	14,000	Cloudy brown with fine sands and foaming; evacuated to dryness; development completed
88-9 B	10/20/88	--	28.36	--	11.98	26.6	15,250	Turbid gray with chemcial odor
88-9 B	10/20/88	75.0	28.86	50.0	11.94	16.9	13,710	Clear with cloudiness caused by gas bubbles with a solvent odor; development completed

Note: > = Greater than

TABLE 1 G

FRONTIER CHEMICAL

1988 Monitoring Well Development
Field Data

Monitoring Well	Date	Approx. Time of Pumping (min)	Groundwater Surface Elevation (top of riser) (ft)	Estimated Total Volume of Water Exacuted (gal)	pH Units	Temp. (°C)	Conductivity (µmhos/cm)	Observations
88-10 OB	10/17/88	2.0	9.92	1.4	12.67	17.2	13,680	Layer of dark brown liquid becoming turbid chocolate brown; evacuated to dryness
88-10 OB	10/18/88	2.0	8.68	1.4	11.99	15.8	14,050	Turbid chocolate brown with heavy solids and dark brown, clear liquid layer; evacuated to dryness
88-10 OB	10/19/88	2.0	8.72	1.4	12.20	14.8	15,460	Same; evacuated to dryness
88-10 OB	10/20/88	2.0	8.70	1.4	12.33	12.1	14,980	Same; evacuated to dryness
88-10 OB	10/21/88	2.0	8.70	1.4	12.04	14.3	14,370	Dark brown, clear liquid with few fine solids; evacuated to dryness; development completed
88-10 A	10/17/88	--	18.04	--	12.75	15.4	10,670	Turbid gray with heavy solids
88-10 A	10/17/88	4.0	--	2.5	12.72	14.5	10,560	Same; evacuated to dryness
88-10 A	10/17/88	--	--	--	12.63	15.0	10,670	Turbid tan-gray
88-10 A	10/17/88	4.0	--	2.5	12.66	14.9	11,000	Same; evacuated to dryness
88-10 A	10/17/88	4.0	--	2.5	12.55	14.3	10,720	Turbid tan-gray; evacuated to dryness
88-10 A	10/18/88	--	18.00	--	11.71	14.2	10,680	Turbid tan-gray with heavy solids
88-10 A	10/18/88	4.0	--	2.5	11.73	14.4	10,630	Same; evacuated to dryness
88-10 A	10/18/88	4.0	--	2.5	11.83	14.7	10,760	Turbid tan-gray with heavy solids; evacuated to dryness
88-10 A	10/19/88	4.0	18.86	2.5	11.97	13.0	10,950	Turbid gray with some solids; evacuated to dryness
88-10 A	10/20/88	4.0	18.02	2.5	11.92	10.1	10,100	Opaque tan with some solids; evacuated to dryness
88-10 A	10/21/88	4.0	17.92	2.5	11.67	12.5	10,570	Turbid rust with thin layer of fine solids; evacuated to dryness
88-10 A	10/21/88	4.0	--	2.5	11.67	12.0	10,230	Opaque light rust with some fine solids; evacuated to dryness
88-10 A	10/25/88	--	17.62	--	11.59	12.0	11,050	Cloudy tan-brown with few fine solids
88-10 A	10/25/88	8.0	--	5.0	11.56	12.7	10,290	Cloudy white with light foaming; evacuated to dryness
88-10 A	10/26/88	--	17.14	--	11.65	18.0	10,990	Cloudy brown-white
88-10 A	10/26/88	4.0	--	2.5	11.38	14.0	8,750	Same; evacuated to dryness; development completed

Note: > = Greater than

TABLE 1 H

FRONTIER CHEMICAL

1988 Monitoring Well Development
Field Data

Monitoring Well	Date	Approx. Time of Pumping (min)	Groundwater Surface Elevation (top of riser) (ft)	Estimated Total Volume of Water Exacuted (gal)	pH Units	Temp. (°C)	Conductivity (µmhos/cm)	Observations
88-10 B	10/17/88	5.0	19.94	5.0	12.78	16.4	13,350	Turbid rust brown; evacuated to dryness
88-10 B	10/18/88	--	20.96	--	11.99	21.8	14,650	Turbid tan-gray with solids
88-10 B	10/18/88	5.0	--	5.0	12.00	22.7	15,250	Turbid rust-gray; evacuated to dryness
88-10 B	10/19/88	5.0	23.58	5.0	11.33	13.9	17,530	Turbid tan with some fine solids; evacuated to dryness
88-10 B	10/20/88	5.0	24.72	5.0	12.51	12.0	17,130	Turbid tan with some heavy solids; evacuated to dryness
88-10 B	10/21/88	5.0	23.05	5.0	12.14	16.0	17,050	Opaque rust-brown with few fine solids; evacuated to dryness
88-10 B	10/25/88	--	20.13	--	12.07	11.4	>20,000	Turbid brown with fine solids and heavy foam
88-10 B	10/25/88	15.0	--	15.0	12.18	11.6	19,350	Cloudy light brown with fine solids and heavy foam; evacuated to dryness
88-10 B	10/26/88	--	23.36	--	12.08	5.4	18,000	Nearly clear with orange-brown color
88-10 B	10/26/88	5.0	--	5.0	12.11	19.6	18,750	Same; evacuated to dryness; development completed
88-11 OB	10/17/88	3.0	7.62	1.2	--	--	--	Turbid gray-brown with heavy solids; evacuated to dryness
88-11 OB	10/18/88	3.0	7.92	1.2	7.71	15.6	>20,000	Turbid gray-brown; evacuated to dryness
88-11 OB	10/19/88	3.0	8.91	1.2	8.15	12.5	>20,000	Turbid tan with some solids; evacuated to dryness
88-11 OB	10/20/88	3.0	7.56	1.2	7.90	10.9	>20,000	Turbid rust with few heavy solids; evacuated to dryness
88-11 OB	10/21/88	3.0	7.42	1.2	7.57	13.9	>20,000	Turbid rust with few solids; evacuated to dryness
88-11 OB	10/24/88	--	7.06	--	7.88	15.2	>20,000	Cloudy light gray with few fine solids and light foaming
88-11 OB	10/24/88	10.0	--	4.1	7.79	15.2	>20,000	Turbid gray-brown with fine sands and light foam; evacuated to dryness
88-11 OB	10/25/88	3.0	6.95	1.2	7.44	13.4	>20,000	Cloudy light brown with few fine sands; evacuated to dryness
88-11 OB	10/26/88	3.0	6.88	1.2	7.81	13.6	>20,000	Cloudy white; evacuated to dryness
88-11 OB	10/27/88	3.0	7.25	1.2	7.88	13.2	>20,000	Nearly clear with yellow tint; evacuated to dryness
88-11 OB	10/28/88	3.0	--	1.2	8.44	13.4	>20,000	Cloudy white; evacuated to dryness
88-11 OB	10/31/88	3.0	7.08	1.2	7.69	12.3	>20,000	Cloudy white; evacuated to dryness
88-11 OB	11/01/88	3.0	6.92	1.2	7.75	13.6	>20,000	Cloudy with fine sand and foaming; evacuated to dryness; development completed

Note: > = Greater than

TABLE 1 1

FRONTIER CHEMICAL

1988 Monitoring Well Development
Field Data

Monitoring Well	Date	Approx. Time of Pumping (min)	Groundwater Surface Elevation (top of riser) (ft)	Estimated Total Volume of Water Exacuted (gal)	pH Units	Temp. (°C)	Conductivity (µmhos/cm)	Observations
88-11 A	10/17/88	2.0	20.68	1.2	12.98	15.4	>20,000	Thick clayey gray with heavy solids; evacuated to dryness
88-11 A	10/17/88	2.0	--	1.2	--	--	--	Turbid gray with heavy solids; evacuated to dryness
88-11 A	10/17/88	2.0	--	1.2	12.55	15.7	>20,000	Turbid gray with heavy solids; evacuated to dryness
88-11 A	10/18/88	2.0	20.98	1.2	11.81	14.3	>20,000	Turbid gray with very fine solids; evacuated to dryness
88-11 A	10/19/88	2.0	20.98	1.2	11.81	11.6	>20,000	Turbid light gray with some fine solids; evacuated to dryness
88-11 A	10/20/88	2.0	20.90	1.2	11.74	9.5	>20,000	Turbid light gray with some heavy solids; evacuated to dryness
88-11 A	10/21/88	2.0	20.88	1.2	11.39	11.4	>20,000	Turbid gray with few fine solids; evacuated to dryness
88-11 A	10/24/88	2.0	20.74	1.2	11.72	15.2	>20,000	Turbid light gray with few fine solids and light foam; evacuated to dryness
88-11 A	10/25/88	3.0	19.00	1.8	11.36	12.8	>20,000	Turbid light brown with few fine solids; evacuated to dryness
88-11 A	10/26/88	--	17.91	--	11.32	9.7	>20,000	Cloudy white
88-11 A	10/26/88	4.0	--	2.4	11.26	11.5	>20,000	Cloudy white and light foam; evacuated to dryness; development completed
88-11 B	10/17/88	--	24.64	--	7.35	18.6	8,340	Turbid gray with heavy solids
88-11 B	10/17/88	60.0	24.84	35.0	7.11	17.9	4,450	Clear; development completed
88-12 OB	10/20/88	3.0	7.95	1.6	8.27	15.2	1,250	Turbid brown with surface sheen; evacuated to dryness
88-12 OB	10/21/88	3.0	7.98	1.6	8.75	15.5	1,790	Turbid tan with some solids and surface sheen; evacuated to dryness
88-12 OB	10/24/88	3.0	7.74	1.6	7.47	14.6	1,770	Cloudy light gray; evacuated to dryness
88-12 OB	10/25/88	3.0	7.60	1.6	7.57	14.0	2,060	Cloudy brown with fine solids and foam; evacuated to dryness
88-12 OB	10/26/88	3.0	7.45	1.6	7.59	13.8	1,910	Cloudy white with light froth; evacuated to dryness
88-12 OB	10/27/88	3.0	7.35	1.6	8.18	13.9	1,990	Cloudy gray-green; evacuated to dryness
88-12 OB	10/28/88	3.0	7.53	1.6	7.84	13.3	1,980	Cloudy with volatiles and strong odor; evacuated to dryness
88-12 OB	10/31/88	3.0	7.61	1.6	7.66	13.1	2,060	Clear; evacuated to dryness
88-12 OB	11/01/88	3.0	7.64	1.6	7.22	14.0	2,080	Cloudy brown with fine sand; evacuated to dryness; development completed

Note: > = Greater than

TABLE 1 J

FRONTIER CHEMICAL

1988 Monitoring Well Development
Field Data

Monitoring Well	Date	Approx. Time of Pumping (min)	Groundwater Surface Elevation (top of riser) (ft)	Estimated Total Volume of Water Exacuted (gal)	pH Units	Temp. (°C)	Conductivity (µmhos/cm)	Observations
88-12 A	10/20/88		19.42		11.76	15.2	>20,000	Turbid gray with chemical odor
88-12 A	10/20/88	14.0	--	9.3	10.45	17.8	8,410	Turbid light gray with chemical odor; evacuated to dryness
88-12 A	10/21/88	4.0	19.23	2.7	7.87	14.5	11,360	Turbid blue-gray with some solids and chemical odor; evacuated to dryness
88-12 A	10/24/88		19.18		7.38	12.4	15,800	Turbid gray-black with some fine solids and chemical odor
88-12 A	10/24/88	8.0	--	5.4	7.60	14.8	10,660	Same; evacuated to dryness
88-12 A	10/25/88		19.28		7.20	12.3	16,180	Opaque black with fine solids, foaming and a chemical odor
88-12 A	10/25/88	4.0	--	2.7	7.20	12.9	13,820	Same; evacuated to dryness
88-12 A	10/26/88		19.13		7.42	13.0	11,620	Dark blue-black with chemical odor and light foaming
88-12 A	10/26/88	12.0	--	8.0	7.11	16.6	14,260	Same; evacuated to dryness
88-12 A	10/27/88		19.42		6.87	12.3	16,830	Opaque black with sulfur odor
88-12 A	10/27/88	4.0	--	2.7	7.10	12.5	15,000	Opaque gray-black with sulfur odor; evacuated to dryness
88-12 A	10/28/88	4.0	19.20	2.7	7.38	11.8	16,450	Cloudy black with strong chemical odor and volatiles; evacuated to dryness
88-12 A	10/31/88		19.22		6.79	11.8	18,750	Opaque black with chemical odor
88-12 A	10/31/88	5.0	--	3.3	7.01	12.4	14,360	Same; evacuated to dryness
88-12 A	11/01/88	4.0	19.01	2.7	6.77	12.6	16,820	Black with strong odor, no cloudiness; development completed
88-12 B	10/20/88		27.62		12.07	19.6	9,780	Turbid gray with heavy solids
88-12 B	10/20/88	120.0	27.90	48	7.02	21.1	3,460	Clear with faint chemical odor; development completed

Note: > = Greater than

TABLE 1 K

FRONTIER CHEMICAL

1988 Monitoring Well Development
Field Data

Monitoring Well	Date	Approx. Time of Pumping (min)	Groundwater Surface Elevation (top of riser) (ft)	Estimated Total Volume of Water Exacuted (gal)	pH Units	Temp. (°C)	Conductivity (µmhos/cm)	Observations
88-13 A	10/20/88	4.0	22.35	1.8	11.23	15.8	>20,000	Turbid gray with heavy solids; evacuated to dryness
88-13 A	10/21/88	4.0	20.86	1.8	10.08	21.3	>20,000	Turbid gray with heavy solids; evacuated to dryness
88-13 A	10/25/88		19.97		9.97	12.1	>20,000	Opaque yellow-brown with few solids and chemical odor
88-13 A	10/25/88	7.0	--	3.2	9.94	13.4	>20,000	Opaque brown-tan with few solids and foaming; evacuated to dryness
88-13 A	10/26/88		21.02		10.17	13.6	>20,000	Turbid gray-brown with some fine solids and chemical odor
88-13 A	10/26/88	17.0	--	7.9	9.87	14.1	>20,000	Cloudy rust with few fine solids and chemical odor; evacuated to dryness
88-13 A	10/27/88		22.22		9.99	15.9	>20,000	Cloudy brown-white with bubbles and chemical odor
88-13 A	10/27/88	10.0	--	4.6	9.91	15.0	>20,000	Same; evacuated to dryness
88-13 A	10/28/88	4.0	22.16	1.8	10.71	14.3	>20,000	Cloudy with little or no sediment; evacuated to dryness
88-13 A	10/31/88		22.16		10.15	13.1	>20,000	Cloudy gray-green
88-13 A	10/31/88	6.0	--	2.8	9.96	13.7	>20,000	Same; evacuated to dryness
88-13 A	11/01/88		22.00		10.16	14.6	>20,000	Cloudy gray with fine silt-sand
88-13 A	11/01/88	7.0	--	3.2	10.12	15.0	>20,000	Same; evacuated to dryness
88-13 A	11/02/88		22.80		10.21	12.6	>20,000	Cloudy rust with fine solids and chemical odor
88-13 A	11/02/88	6.0	--	2.8	10.10	14.3	>20,000	Cloudy rust with fine solids, chemical odor, and volatiles; evacuated to dryness; development completed
88-14 OB	10/27/88		8.54		8.47	15.0	4,660	Cloudy brown-tan with fine solids
88-14 OB	10/27/88	5.0	--	3.1	8.47	14.7	4,530	Cloudy tan-white with effervescence; evacuated to dryness
88-14 OB	10/27/88		--		8.40	14.4	4,380	Cloudy light brown with effervescence
88-14 OB	10/27/88	4.0	--	2.5	8.39	14.8	4,200	Cloudy light brown; evacuated to dryness
88-14 OB	10/27/88	3.0	9.42	1.9	8.35	15.3	4,180	Cloudy white; evacuated to dryness
88-14 OB	10/27/88	2.0	--	1.3	8.25	15.5	4,380	Cloudy yellow-white with few fine solids and chemical odor; evacuated to dryness
88-14 OB	10/27/88	2.0	--	1.3	8.34	15.5	4,180	Cloudy tan-white with few fine solids and chemical odor; evacuated to dryness
88-14 OB	10/27/88	2.0	--	1.3	8.38	14.7	4,180	Cloudy light tan with chemical odor and quick froth; evacuated to dryness
88-14 OB	10/27/88	2.0	--	1.3	8.33	15.5	4,410	Nearly clear with light yellow tint, light froth and chemical odor; evacuated to dryness
88-14 OB	10/27/88	2.0	--	1.3	8.36	15.2	4,210	Nearly clear with light yellow tint, light froth and chemical odor; evacuated to dryness

Note: > = Greater than

TABLE 1 L

FRONTIER CHEMICAL

1988 Monitoring Well Development
Field Data

Monitoring Well	Date	Approx. Time of Pumping (min)	Groundwater Surface Elevation (top of riser) (ft)	Estimated Total Volume of Water Exacuted (gal)	pH Units	Temp. (°C)	Conductivity (µmhos/cm)	Observations
88-14 OB	10/28/88	2.0	12.54	1.3	8.94	13.5	4,110	Cloudy with light tan color; evacuated to dryness
88-14 OB	10/31/88	2.0	13.25	1.3	8.40	13.3	4,500	Nearly clear, white with some effervescence; evacuated to dryness
88-14 OB	10/31/88	2.0	--	1.3	8.39	10.8	4,250	Nearly clear, white with some effervescence; evacuated to dryness
88-14 OB	10/31/88	2.0	13.30	1.3	8.38	14.3	4,260	Cloudy white; evacuated to dryness
88-14 OB	11/01/88	2.0	13.48	1.3	8.38	12.7	4,130	Cloudy with few fine solids; evacuated to dryness; development completed
88-14 A	10/27/88		17.06		7.59	13.1	9,650	Cloudy white with no solids
88-14 A	10/27/88	40.0	17.64	35.0	8.80	13.4	7,770	Clear with light effervescence; evacuated to dryness; development complete
88-14 B	10/27/88		26.30		7.39	19.6	6,190	Clear with white tint
88-14 B	10/27/88	65.0	--	50.0	6.84	13.9	4,370	Clear
88-14 B	10/31/88		26.62		6.84	12.2	8,150	Clear
88-14 B	10/31/88	8.0	--	5.0	6.82	12.0	7,550	Clear; development completed

Note:) = Greater than

III Evacuation Procedures

3.1 Description

The evacuation or purging of groundwater is performed prior to sample collection. This process removes stagnant water that is replaced by fresh formation water, insuring samples are representative of groundwater quality.

The evacuation of 66 monitoring wells was performed over a two week period from November 7 through 22, 1988. The 39 developed wells were allowed a two week idle period before evacuation was performed. Stagnant water pumped from each well was collected in drums for disposal by Frontier Chemical.

3.2 Evacuation Procedures

Groundwater within each well was continuously pumped until at least three well volumes were removed or the well was pumped dry. The water was evacuated from the top of the water column to insure proper flushing of the well. Well volumes were computed utilizing the inside diameter of the well casing and the height of the water column. The procedures used for evacuation are described as follows:

1. Groundwater surface elevations were taken to the top of each riser and measured to the nearest hundredth of a foot, utilizing the electronic water level indicator. The volume of water present was then computed.

2. Evacuation was accomplished utilizing a Teel Marine Utility Pump (model 1P580D) equipped with dedicated 3/8 inch I.D. polyethylene tubing or a Master Flex Pump (model 7015-52 provided by Frontier Chemical) equipped with dedicated 1/4 inch I.D. polyethylene tubing. Dedicated polyethylene foot valves were used in conjunction with the pumps and tubing.

3. Each well was continuously pumped from the top of the water column until at least 3 volumes were removed or the well went dry. All groundwater was collected into drums for disposal by Frontier Chemical.

3.3 Decontamination Procedures

Precautions were instituted during the evacuation of wells to insure against cross-contamination. Decontamination procedures for field equipment and personnel protection were similar to the methods described in Section 2.3. After pumping was complete, the dedicated tubing was removed and sealed in a clean plastic bag for storage during the sampling task. Technicians replaced gloves before beginning action on another well.

3.4 Summary of Data

Tables 2A - 2B present the field data obtained during the evacuation of monitoring wells. This information is a summary of the Evacuation and Sampling Field Sheets in Appendix B.

TABLE 2 A

FRONTIER CHEMICAL
GROUNDWATER MONITORING - EVACUATION DATA

Monitoring Well	Date	Groundwater Surface Elevation (top of riser)(ft)	Volume of Standing Water (gal.)	Volume Removed (gal.)	Observations
81-2	11/17/88	18.14	0.08	0.24	Orange-brown color with strong odor and light foaming
81-7	11/17/88	4.58	0.13	0.39	Clear
84-9	11/11/88	27.67	1.38	4.13	Orange-brown color with slight foaming and fine sediments
84-11	11/18/88	29.26	1.00	3.01	Clear, orange-brown tint, strong odor, sheen present on surface
84-12	11/11/88	29.32	0.91	2.73	Clear with yellowish tint
84-13	11/10/88	28.62	0.88	2.63	Clear with orange-brown tint and very fine sands
84-14	11/10/88	14.86	0.82	2.47	Clear with gray tint and fine sediments
84-15	11/10/88	16.26	0.59	1.78	Turbid brown with slight odor
84-16	11/11/88	18.09	0.39	1.18	Orange-brown color with light foaming
84-16	11/14/88	18.18	0.38	1.14	Orange-brown color with light foaming (purged for resampling)
84-17	11/10/88	15.51	0.50	1.51	Clear
87-1 A	11/18/88	27.00	0.16	0.49	Clear with slight sulfur odor
87-1 A	11/22/88	26.70	0.17	0.51	Clear with slight sulfur odor (purged for resampling)
87-1 B	11/09/88	17.00	0.09	0.28	Clear
87-1 C	11/09/88	6.84	0.10	0.29	Black color, no odor
87-2 A	11/07/88	25.61	0.68	2.04	Clear with gray tint
87-2 B	11/07/88	17.12	0.36	1.07	Turbid, tan color
87-2 C	11/07/88	6.86	0.56	1.69	Turbid yellow-tan
87-3 A	11/07/88	27.14	1.00	2.99	Clear with light tan color
87-3 B	11/08/88	18.94	0.10	0.29	Turbid, tan color
87-3 C	11/08/88	6.94	0.35	1.05	Opaque, orange-brown color
87-3 D	11/07/88	26.06	0.28	0.84	Clear
87-4 A	11/08/88	22.89	0.19	0.58	Yellowish tint with fine sediments
87-4 B	11/17/88	7.07	0.64	1.90	Clear, light yellow-brown tint, strong odor, NAPL
87-5 A	11/08/88	29.08	0.73	2.18	Clear with sulfur odor
87-5 B	11/10/88	28.52	2.71	8.12	Black color with sulfur odor
87-5 C	11/07/88	24.44	0.24	0.71	Orange-red color with fine solids
87-5 D	11/07/88	7.08	0.64	1.91	Turbid, orange color
87-28	11/07/88	23.60	0.44	1.32	Turbid, tan color with fine sands
88-1 OB	11/14/88	13.68	----	----	Well is dry
88-1 A	11/14/88	14.62	3.64	10.92	Clear with fine sediments
88-1 B	11/14/88	23.30	3.46	10.40	Initially cloudy, turned clear
88-2 OB	11/17/88	16.38	0.10	0.30	Turbid brown with organics, surface foam, and solvent odor
88-2 A	11/17/88	18.00	3.50	10.40	Turbid brown with organics, surface sheen, surface foam, and solvent odor
88-2 B	11/17/88	25.88	4.10	12.20	Green-black color with slight odor

TABLE 2 B

FRONTIER CHEMICAL
GROUNDWATER MONITORING - EVACUATION DATA

Monitoring Well	Date	Groundwater Surface Elevation (top of riser)(ft)	Volume of Standing Water (gal.)	Volume Removed (gal.)	Observations
88-3 A	11/16/88	18.18	3.30	10.00	Orange-brown color, light foaming, and surface sheen present
88-3 B	11/16/88	27.40	3.80	11.40	Medium orange-brown color with strong foaming
88-4 OB	11/14/88	4.94	1.33	4.00	Clear
88-4 A	11/14/88	15.53	2.72	8.17	Turbid, rust color
88-A B	11/14/88	26.48	1.25	3.76	Black color with strong sulfur odor
88-4 C	11/14/88	24.32	5.55	16.60	Initially turbid, turned clear
88-5 B	11/18/88	26.48	4.90	14.70	Turbid with medium brown color and foaming
88-5 C	11/14/88	25.54	12.90	38.60	Began turbid black with sulfur odor, then turned clear with sulfur odor
88-6 OB	11/16/88	12.28	0.90	2.80	Turbid brown with chemical odor, surface sheen, and some foaming
88-6 A	11/16/88	23.06	1.10	3.30	Cloudy brown with slight foam
88-6 B	11/16/88	28.64	3.80	11.50	Turbid brown with slight effervescence
88-7 OB	11/17/88	5.58	1.70	5.10	Dark red-brown with strong foaming
88-7 A	11/17/88	18.10	2.50	7.60	Turbid brown with strong foaming
88-7 B	11/17/88	26.89	3.10	9.40	Cloudy, turbid brown, fast dissipating foam, and a surface sheen present
88-8 OB	11/15/88	7.31	1.43	4.30	Light orange-brown with strong foaming
88-8 A	11/15/88	18.03	3.05	9.15	Medium orange-brown with strong effervescence
88-8 B	11/15/88	27.55	3.30	9.89	Cloudy tan becoming clear tan
88-9 OB	11/16/88	13.34	0.56	1.70	Turbid brown
88-9 A	11/16/88	20.50	3.10	9.20	Cloudy brown with heavy foaming and chemical odor
88-9 B	11/16/88	27.88	3.30	9.80	Green color with moderate effervescence
88-10 OB	11/14/88	7.18	1.16	3.49	Dark red-brown color, very strong foaming, and faint odor
88-10 A	11/14/88	16.30	4.18	12.50	Turbid with green brown color
88-10 B	11/14/88	17.18	9.87	29.60	Light red-brown color with very strong foaming
88-11 OB	11/15/88	6.69	1.57	4.71	Orange-brown color with light foaming
88-11 A	11/15/88	19.93	1.68	5.03	Clear, yellow-brown tint with light foaming
88-11 B	11/15/88	25.76	4.14	12.40	Turbid with tan-gray color
88-12 OB	11/15/88	7.18	1.57	4.70	Cloudy brown with light chemical odor
88-12 A	11/15/88	19.05	3.95	11.80	Dark blue-black color with heavy foaming and chemical odor
88-12 B	11/15/88	27.10	3.53	10.60	Light green-brown color (initially black) and odor
88-13 A	11/16/88	21.77	2.76	8.28	Turbid with brown color and strong foaming
88-14 OB	11/15/88	13.25	0.35	1.05	Light orange-brown color with little foaming
88-14 A	11/15/88	16.06	4.66	14.00	Nearly clear with fast dissipating foam
88-14 B	11/15/88	25.86	3.75	11.20	Began cloudy, orange-brown with chemical odor turning clear with tan color

IV SAMPLE COLLECTION

4.1 Description

Groundwater samples were obtained from 66 monitoring wells between November 9 through 22, 1988. All wells were sampled within 24 hours of being evacuated. Samples were obtained by using eight stainless steel bailors of various sizes. The nylon cord used to lower a bailor into a well was replaced after a well was sampled. Each bailor was pre-cleaned prior to use in the next monitoring well. Samples were delivered daily to the BLT Laboratory for analysis.

Sampling procedures and the transfer of samples were performed in accordance with established protocols outlined in "RCRA Ground Water Monitoring Technical Enforcement Guidance Document", US EPA, September 1986. Field measurements of pH, conductivity, and temperature were taken by Environmental Field Services Technicians at the sampling site.

4.2 Sampling Procedures

The procedures used to obtain samples from each monitoring well are described as follows:

1. Groundwater surface elevations were recorded before samples were extracted from a well. Measurements were taken as described in Section 3.2.

2. Samples were obtained using pre-cleaned stainless steel bailors and dedicated nylon cord.

3. The first and last samples drawn from the well were field tested for pH, temperature, and conductivity.

4. Additional samples were containerized in order of volatilization sensitivity of parameters as follows: volatile compounds, SOC, and phenol.

5. Samples were stored in an ice chest and delivered to the BLT Laboratory on a daily basis.

4.3 Quality Assurance and Control (QA/QC)

4.3.1 Equipment

All equipment was either dedicated or cleaned to eliminate cross-contamination between wells. The electronic surface indicator probe was cleaned as described in previous sections. The bailors were pre-cleaned before being used for sample collection as outlined below:

- rinse with water
- scrub with Liquinox detergent
- rinse with water
- rinse with distilled water
- rinse with methanol
- rinse with distilled water

The bailors were allowed to air dry and then sealed in a clean plastic bag. The sampling technicians wore a double layer of laytex gloves that were replaced before sampling another well.

4.3.2 Sample Integrity

The QA/QC plan used to check the reliability and validity of samples consisted of Trip and Field blanks, and duplicate samples. Daily Trip blanks were made by filling a VOA bottle with distilled water and placing the blank into the ice chest with groundwater samples. A Field blank was developed by pouring distilled water into a pre-cleaned bailor and transferring the water into a VOA bottle. One Field blank, was prepared for every 11 bailors cleaned, and a minimum of one for each day of sampling. Duplicate groundwater samples were obtained as instructed by ECCO personnel. All sample bottles were sealed with tape, labeled, and stored in an ice chest for delivery to BLT Technical Services. Copies of Chain of Custody Records are included in Appendix C.

4.4 Summary of Data

Tables 3A - 3E present the field data obtained during sample collection. This information is a summary of the Sampling Field Sheets included in Appendix B.

TABLE 3 A

FRONTIER CHEMICAL
GROUNDWATER MONITORING - SAMPLING DATA

Monitoring Well	Date	Groundwater Surface Elevation (top of riser)(ft)	pH (units)	Temp (°C)	Conductivity (µmhos/cm)	Observation
81-2	11/18/88	18.54	8.36	16.1	>20,000	Opaque, upper layer green-brown and lower layer red-brown with an odor present
			8.34	17.2	>20,000	Same
81-7	11/18/88	4.62	8.00	15.1	1,280	Clear with light yellow tint
			7.99	15.2	1,340	Translucent light yellow tint with precipitate
84-9	11/11/88	27.62	10.19	14.2	>20,000	Clear with yellow-brown tint with very fine sands and odor
			10.20	13.8	>20,000	Same
84-9	11/18/88	27.62	10.21	14.2	>20,000	Same (duplicate sample for QA/QC labeled well #84-9 OB)
			10.16	14.1	>20,000	Same
84-11	11/18/88	29.16	11.06	16.3	>20,000	Clear with orange-brown color, surface sheen and odor
			11.05	16.9	>20,000	Same
84-11	11/22/88	29.08	11.07	9.8	>20,000	Translucent yellow-brown tint, settled NAPL, strong odor, surface sheen (Bottom sample taken to supplement the previous sample)
84-12	11/11/88	29.20	9.98	13.7	>20,000	Clear with yellow-brown tint, very fine sands, and an odor
			9.81	15.4	>20,000	Same
84-13	11/11/88	28.82	7.06	10.8	1,840	Clear with light yellow tint and orange-brown sediments
			7.11	11.7	1,940	Same
84-14	11/11/88	15.12	7.30	10.6	1,330	Clear with very fine sands and sweet odor
			7.37	10.8	1,340	Opaque with black sediments and sweet odor
84-15	11/11/88	16.38	8.78	11.5	19,900	Turbid brown with brown solids
			8.83	13.6	>20,000	Same
84-16	11/15/88	19.70	10.68	12.9	9,210	Clear with orange-brown tint, very fine sands, and light odor
			10.67	12.7	9,400	Same
84-17	11/11/88	15.61	7.22	10.6	3,820	Translucent yellow with very fine sands and faint sweet odor
			7.24	10.9	3,800	Same
87-1 A	11/18/88	26.84	7.40	16.3	2,680	Clear with strong sulfur odor
			7.38	17.0	2,800	Same
87-1 A	11/22/88	26.66	7.14	9.8	2,620	Clear with sulfur odor and few sediments
			7.14	10.3	2,860	Same (well resampled)
87-1 A	11/22/88	26.66	7.15	10.9	2,770	Same (duplicate sample for QA/QC labeled well #87-1 OB)
			7.18	11.3	2,850	Same
87-1 B	11/10/88	16.90	7.26	10.7	4,000	Clear with very fine sands
			7.33	11.2	3,800	Same

Note: > = Greater than

TABLE 3 B

FRONTIER CHEMICAL
GROUNDWATER MONITORING - SAMPLING DATA

Monitoring Well	Date	Groundwater Surface Elevation (top of riser)(ft)	pH (units)	Temp (°C)	Conductivity (µmhos/cm)	Observation
87-1 C	11/10/88	6.47	7.78	10.8	4,420	Translucent yellow with very fine sands on top and black colored bottom layer
			7.84	12.2	4,270	Same
87-2 A	11/09/88	25.47	7.57	10.8	2,680	Nearly clear with very fine sands and floating particles
			7.47	11.8	2,930	Same
87-2 B	11/09/88	17.12	8.44	11.4	9,110	Turbid tan with very fine sands
			8.78	12.7	8,730	Clear with yellowish tint and very fine sands
87-2 C	11/09/88	8.64	7.85	12.1	1,670	Turbid yellow with very fine sands
			7.83	12.8	1,920	Same
87-3 A	11/09/88	26.95	7.43	13.5	6,470	Clear with very fine sands
			7.47	14.1	11,040	Same
87-3 A	11/10/88	26.88	7.36	11.8	8,000	Same (resampled to verify field measurements from 11/09/88)
			7.49	12.1	9,000	Same
87-3 B	11/09/88	19.26	8.47	15.6	120	Nearly clear yellow becoming turbid tan
			----	----	----	Well ran dry before recovery of 2nd sample
87-3 C	11/09/88	6.68	8.56	14.9	10,120	Clear with light yellow tint with very fine sands
			8.63	15.6	11,420	Translucent tan with very fine sands
87-3 C	11/09/88	6.68	8.61	15.3	10,640	Clear with light yellow tint and very fine sand (duplicate sample for QA/QC labeled well #87-3 OB)
			8.61	17.1	11,560	Translucent tan with very fine sands
87-3 D	11/09/88	26.26	7.69	17.3	19,550	Clear
			7.70	17.8	19,880	Clear with very fine sands
87-4 A	11/09/88	22.98	10.56	17.3	>20,000	Opaque orange-brown with strong odor
			10.34	17.6	>20,000	Same
87-4 B	11/18/88	6.84	7.68	17.0	7,690	Clear with yellow-brown color and medium odor
			7.65	16.9	7,800	Same
87-4 B	11/18/88	6.84	7.71	17.7	7,770	NAPL present with surface sheen, strong odor, and translucent light orange-brown color (duplicate bottom sample for QA/QC labeled well #87-4 OB)
			7.71	17.6	8,000	Same
87-5 A	11/09/88	29.10	7.26	17.4	3,120	Clear with very fine sands and sulfur odor present
			7.36	18.1	4,520	Clear with greenish tint, very fine sands, and sulfur odor present
87-5 B	11/11/88	27.65	7.27	10.6	3,450	Clear with light gray tint and strong sulfur odor
			7.29	11.1	3,750	Same

Note: > = Greater than

TABLE 3 C

FRONTIER CHEMICAL
GROUNDWATER MONITORING - SAMPLING DATA

Monitoring Well	Date	Groundwater Surface Elevation (top of riser)(ft)	pH (units)	Temp (°C)	Conductivity (µmhos/cm)	Observation
87-5 C	11/09/88	25.26	6.93	17.5	5,500	Clear with light yellow tint and orange-brown precipitate
			7.07	19.1	6,280	Same
87-5 C	11/09/88	25.26	6.94	18.1	5,480	Same (duplicate sample for QA/QC labeled well #87-5 OB)
			7.12	19.9	6,260	Same
87-5 D	11/09/88	6.98	7.55	18.6	1,100	Translucent yellow with very fine sands
			7.47	19.0	1,150	Same
87-28	11/09/88	26.70	7.62	20.4	>20,000	Clear with light yellow tint and very fine sands
			7.57	19.8	>20,000	Translucent yellow with very fine sands
88-1 OB	11/15/88	----	----	----	----	Well is dry
88-1 A	11/15/88	14.68	7.11	14.8	1,730	Clear
			7.15	14.9	1,730	Clear
88-1 B	11/15/88	23.34	6.96	14.4	1,980	Clear
			7.02	14.4	1,970	Clear with very fine sands
88-2 OB	11/18/88	16.38	11.65	18.7	15,200	Dark red-brown, NAPL, surface sheen present and strong chemical odor
			----	----	----	Well ran dry before recovery of 2nd sample
88-2 A	11/18/88	15.98	10.09	17.1	12,540	Clear with red-brown color and medium odor
			10.09	17.1	12,800	Same
88-2 A	11/18/88	15.98	10.13	17.1	12,920	Clear with red-brown color and medium odor, surface sheen present, and NAPL on bottom
			10.13	17.5	12,740	Same (duplicate sample for QA/QC labeled well #88-2 C)
88-2 B	11/18/88	25.98	8.36	16.3	7,600	Clear with light yellow tint
			8.40	16.9	7,950	Same
88-3 A	11/17/88	18.36	12.74	13.9	>20,000	Clear with medium, red-brown tint, and chemical odor
			12.73	14.3	>20,000	Clear with medium red-brown tint, very fine sands, and chemical odor
88-3 B	11/17/88	27.74	10.57	13.8	16,350	Clear with light yellow-brown color and odor
			10.56	14.2	16,600	Clear with light yellow-brown tint, very fine sands, and odor
88-4 OB	11/15/88	5.10	7.17	14.6	1,460	Clear
			7.21	14.4	1,480	Clear
88-4 A	11/15/88	16.44	6.96	14.9	1,840	Clear with light yellow tint, red-brown precipitate, and chemical odor
			7.09	15.9	1,680	Same
88-4 B	11/15/88	26.46	8.80	15.9	1,980	Translucent green-brown with fine sands and sulfur odor
			8.77	16.0	2,000	Same

Note: > = Greater than

TABLE 3 D

FRONTIER CHEMICAL
GROUNDWATER MONITORING - SAMPLING DATA

Monitoring Well	Date	Groundwater Surface Elevation (top of riser)(ft)	pH (units)	Temp (°C)	Conductivity (µmhos/cm)	Observation
88-4 C	11/15/88	23.13	7.01	15.9	4,250	Clear with strong sulfur odor and particulates
			7.00	16.2	4,370	Same
88-5 B	11/18/88	26.40	11.13	14.8	>20,000	Translucent light red-brown with mild odor
			11.22	15.4	>20,000	Same
88-5 B	11/18/88	26.40	11.31	14.6	>20,000	Same (duplicate sample for QA/QC labeled well #88-5 OB)
			11.30	15.1	>20,000	Same
88-5 C	11/15/88	24.68	7.18	12.4	4,570	Opaque black with sulfur odor and precipitate present
			7.17	12.3	4,570	Same
88-6 OB	11/17/88	14.42	9.70	14.1	15,400	Clear with medium red-brown color and chemical odor
			9.70	14.9	15,520	Clear with medium red-brown color, chemical odor, and very fine sands
88-6 A	11/17/88	23.32	11.01	14.6	>20,000	Clear with yellow tint and strong chemical odor
			10.96	16.0	>20,000	Clear with yellow tint, very fine sands, and strong chemical odor
88-6 B	11/17/88	29.00	10.84	15.0	18,800	Clear with medium yellow-brown tint and faint odor
			10.84	15.7	19,000	Same
88-7 OB	11/18/88	5.86	11.65	13.3	10,700	Opaque dark brown
			11.68	13.9	10,850	Same
88-7 A	11/18/88	18.42	10.19	12.9	15,600	Clear with medium red-brown tint and strong odor
			10.19	12.7	16,600	Same
88-7 A	11/18/88	18.42	10.18	12.6	16,500	Clear with medium red-brown tint, strong odor, and very fine sands (duplicate sample for QA/QC labeled well #88-7 C)
			10.18	13.6	16,870	Translucent red-brown, strong odor, and many fine sands
88-7 B	11/18/88	27.02	10.08	13.1	14,000	Clear, medium yellow tint with faint odor
			10.03	13.8	13,750	Clear with medium yellow tint, very fine sands, and faint odor
88-8 OB	11/16/88	7.26	7.65	17.2	13,950	Clear with yellow tint, very fine sands, and chemical odor
			7.67	17.2	13,960	Same
88-8 A	11/16/88	17.86	9.28	16.3	9,350	Clear with yellow tint, very fine sands, and chemical odor
			9.29	16.7	9,450	Same
88-8 B	11/16/88	27.52	7.01	16.9	2,320	Clear with few fine sands
			7.07	17.2	2,410	Same
88-9 OB	11/17/88	14.12	9.09	12.0	11,250	Clear with light yellow tint and fine sands
			9.11	12.8	11,700	Same
88-9 A	11/17/88	23.72	12.14	12.2	12,300	Translucent orange-brown with precipitate and faint odor
			12.16	12.9	12,550	Same

Note: > = Greater than

TABLE 3 E

FRONTIER CHEMICAL
GROUNDWATER MONITORING - SAMPLING DATA

Monitoring Well	Date	Groundwater Surface Elevation (top of riser)(ft)	pH (units)	Temp (°C)	Conductivity (µmhos/cm)	Observation
88-9 B	11/17/88	28.08	10.16	12.2	10,680	Clear with green-yellow tint and chemical odor
			10.11	12.4	10,900	Same
88-10 OB	11/15/88	7.20	12.04	12.6	9,260	Dark red-brown with weak odor
			12.25	12.5	10,270	Same
88-10 OB	11/15/88	7.20	12.08	12.3	9,870	Same (duplicate sample for QA/QC labeled well #88-10 C)
			12.15	12.7	10,650	Same
88-10 A	11/15/88	16.34	10.11	12.5	3,340	Clear with very fine sands and faint sweet odor
			10.26	12.8	3,400	Same
88-10 B	11/15/88	22.80	12.25	14.7	13,860	Clear with light orange-brown color and faint odor
			12.27	14.6	14,200	Same
88-11 OB	11/16/88	6.46	7.38	14.7	>20,000	Clear with light yellow tint
			7.45	15.0	>20,000	Same
88-11 A	11/16/88	19.80	11.61	14.8	>20,000	Clear with light yellow tint
			11.68	15.0	>20,000	Translucent with light yellow tint and precipitate
88-11 B	11/16/88	25.70	7.19	15.3	2,220	Clear with light brown tint and little precipitation
			7.18	15.5	2,410	Same
88-12 OB	11/16/88	7.12	7.68	17.4	1,530	Clear
			7.71	18.0	1,530	Clear
88-12 A	11/16/88	18.84	7.28	17.4	13,800	Opaque black with strong chemical odor
			7.28	17.8	13,830	Same
88-12 B	11/16/88	27.06	7.02	17.5	2,520	Clear with faint odor
			7.00	17.8	2,520	Same
88-13 A	11/17/88	22.02	10.36	12.9	>20,000	Clear with golden brown color and chemical odor
			10.35	13.4	>20,000	Clear with golden brown color, very fine sands, and chemical odor
88-14 OB	11/16/88	13.21	8.58	15.7	3,450	Clear with light yellow tint and chemical odor
			8.61	16.1	3,510	Clear with light and yellow tint, very fine sands, and chemical odor
88-14 A	11/16/88	15.89	9.12	15.7	2,310	Clear with light yellow tint and chemical odor
			9.14	16.0	2,300	Clear with light yellow tint, very fine sands, and chemical odor
88-14 B	11/16/88	25.88	7.10	16.2	3,730	Clear with precipitate
			7.13	16.3	3,780	Same

Note: > = Greater than

APPENDIX A

Well Development Field Sheets

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 1-OB DEPTH OF WELL FROM TOP OF RISER: 13.00 FT

TYPE/SIZE CASING: 2" Ø STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/17/88	3:10 PM	7.70	0.80	—	—	—	TURBID BROWN WITH HEAVY SOLIDS; EVAC TO DRYNESS
	3:17 PM			—	—	—	TURBID TAN/GRAY WITH SOLIDS; EVAC TO DRYNESS
	3:30 PM			—	—	—	TURBID TAN/GRAY AND CLEARING; EVAC. TO DRYNESS
10/18/88	12:00 PM	7.74	0.79	7.53	14.2	2,500	TAN COLOR WITH SURFACE SHEEN
	12:05 PM			7.58	14.3	2,750	SAME; EVAC. TO DRYNESS
10/19/88	11:05 PM	7.51	0.82	7.67	13.7	2,460	LT TAN TINT WITH SOME VERY FINE SOLIDS
	11:10 PM			7.59	13.6	2,600	SAME; EVAC TO DRYNESS
10/20/88	11:20 AM	7.39	0.84	7.44	11.7	2,510	CLEAR WITH LIGHT TAN COLOR AND FEW SOLIDS; EVAC TO DRYNESS
10/21/88	9:42 AM	7.52	0.82	7.35	12.5	1,890	CLEAR, NO SOLIDS; EVAC TO DRYNESS
							EVACUATED APPROXIMATELY 20GAL FROM 10/17 - 10/21

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 1-A DEPTH OF WELL FROM TOP OF RISER: 20.20 FT

TYPE/SIZE CASING: 4"Ø OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" I.D. POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/17/88	2:49 PM	15.56	2.78				
	3:09 PM			6.36	13.6	1,980	TURBID LIGHT GRAY
	3:12 PM			6.35	13.6	1,790	OPAQUE LIGHT GRAY
	3:16 PM			6.39	14.0	1,800	CLEAR
	3:21 PM			6.37	13.7	1,850	CLEAR
	3:28 PM			6.34	14.0	1,790	CLEAR
	3:33 PM			6.33	14.0	1,780	CLEAR ; EVACUATED APPROXIMATELY 25 GAL. OF WATER
	3:45 PM	15.60	2.76				

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
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MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 1-B DEPTH OF WELL FROM TOP OF RISER: 28.6 FT

TYPE/SIZE CASING: 4" ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" I.D. POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/17	2:51 PM	23.18	3.25				
	3:07 PM			6.42	14.5	2,1600	TURBID LIGHT GRAY
	3:14 PM			6.42	17.8	2,700	OPAQUE LIGHT GRAY
	3:19 PM			6.37	14.8	2,710	CLEAR
	3:25 PM			6.35	14.9	2,650	CLEAR
	3:31 PM			6.34	15.0	2,620	CLEAR ; EVACUATED APPROXIMATELY 40 GAL OF WATER
	3:43 PM	23.44	3.10				

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 2-OB DEPTH OF WELL FROM TOP OF RISER: 16.90

TYPE/SIZE CASING: 2"ϕ STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH 1/2" ID WITH POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/25/88	3:25 PM	16.43	.07	11.51	9.9	17,150	LAYERED SHEEN, HEAVY OIL TYPE ORGANIC LIQUID ON BOTTON & CLEAR BROWN SOLVENT ON TOP & FOAMING; EVAC TO DRYNESS
10/26/88	9:27 AM	16.30	.09	11.66	12.3	17,000	OPAQUE BROWN WITH FOAM AND OIL TYPE DROPLETS THAT SETTLE TO BOTTOM & STRONG SOLVENT ODOR; EVAC TO DRYNESS
10/27/88	8:34 AM	16.34	.08	11.69	11.7	720,000	OPAQUE BROWN WITH HEAVY FOAM & OIL TYPE DROPLETS, SOLVENT ODOR, VERY FEW FINE SOLIDS; EVAC TO DRYNESS
10/28/88	3:44 PM	16.30	.09	12.38	13.0	17,570	OPAQUE BROWN WITH ORGANICS AND FROTHY SURFACE AND VERY FEW FINE SOLIDS; EVAC. TO DRYNESS
10/31/88	3:09 PM	16.32	.09	11.39	12.9	14,290	TURBID BROWN, HEAVY FOAM WITH OIL DROPLETS AND SOLVENT ODOR; EVAC TO DRYNESS
11/1/88	9:55 AM	16.30	.09	11.46	13.0	18,340	CLOUDY BROWN, FOAMING, SILT, STRONG ODOR; EVAC TO DRYNESS
							EVACUATED APPROXIMATELY 1 GAL OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
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MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 2-A DEPTH OF WELL FROM TOP OF RISER: 23.3 FT

TYPE/SIZE CASING: 4"Φ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" I.D. POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC μmhos/cm	DESCRIPTION/COMMENTS
10/25/88	3:29	19.00	2.58	7.94	13.4	12340	Brown/white opaque oil sheen slight solvent smell, foam
	3:32			8.93	13.3	13380	Opaque Brown/white oil sheen, foam, solvent smell, Few solids
	3:37			9.78	13.2	15350	Opaque Brown/white oil droplets in Foam, solvent smell, oil sheen
	3:41			9.88	13.7	14220	SAME - NO solids
	3:46			9.87	13.9	15170	SAME - very volatile
	3:51			9.88	13.9	14700	SAME
	4:40			9.91	13.3	15820	SAME - Less Foaming
	4:09			9.88	13.5	16120	SAME - no Foam, Evac to dry
10/26/88	9:31	19.00	2.58	9.12	12.8	11540	Heavy oil droplets in foam drop to Bottom & Layer opaque brown solvent odor

(1) Water level measured from top of riser

(2) Volume of standing water

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MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 2-B DEPTH OF WELL FROM TOP OF RISER: 32.1 FT

TYPE/SIZE CASING: 4"Ø OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/26/88	9:36	26.02	3.65	9.34	16.5	12880	Cloudy Brown/green slight oil sheen slight sulfur odor
	9:40			9.02	18.7	13090	Cloudy light Brown/green slight oil sheen/drops, slight sulfur odor
	9:45			9.08	20.0	12950	CLEAR/GREEN TINT SLight ODOR No OIL
	9:50			9.12	20.0	12590	SAME
	9:55			9.16	18.8	13340	SAME
	10:00			9.09	20.2	13470	SAME
	10:04			9.16	20.3	13500	SAME
	10:08	25.01	4.25	9.19	19.2	13370	SAME

(1) Water level measured from top of riser

(2) Volume of standing water

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MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 3-A DEPTH OF WELL FROM TOP OF RISER: 23.3 ft

TYPE/SIZE CASING: 4" Ø OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/31/88	11:25	18.77	2.72	12.41	11.8	>20,000	OPAQUE BROWN (DRY)
	11:33			12.41	12.7	>20,000	CLOUDY BROWN Solvent ODOR, SLIGHT OIL SHEEN
	11:48			12.38	12.6	>20,000	CLOUDY Brown/ORANGE SOLVENT ODOR
	3:18			12.38	12.2	>20,000	CLOUDY RUST CHEM ODOR OIL SHEEN
	3:21			12.37	12.5	>20,000	SAME
11/1/88	9:45	18.71	2.75				NO WATER EVACUATED, WELL DRY, STRONG ODOR
11/2/88	3:04	18.70	2.76	12.45	12.5	>20,000	TURBID BROWN, SURFACE SHEEN, CHEM. ODOR, FINE SANDS
	3:08			12.52	12.3	720,000	SAME - EVAC. to DRYNESS

(1) Water level measured from top of riser

(2) Volume of standing water

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MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 3-B DEPTH OF WELL FROM TOP OF RISER: 33.2 Ft

TYPE/SIZE CASING: 4" ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/31/88	11:11	27.80	3.24	10.35	11.7	>20,000	CLOUDY BROWN/ORANGE CHEM. ODOR
	11:14			10.36	12.1	>20,000	CLOUDY YELLOW/ORANGE CHEM. ODOR
	11:19			10.36	11.6	>20,000	SEMI/CLEAR YELLOW
	11:23			10.33	12.3	>20,000	SAME
	11:27			10.33	12.5	>20,000	CLEAR/YELLOW
	11:31			10.32	12.1	>20,000	SAME
	11:35			10.30	12.4	>20,000	CLEAR/YELLOW
	11:39			10:29	12.6	>20,000	SAME
	11:43			10.27	11.9	>20,000	SAME
	11:50			10.27	12.8	>20,000	CLEAR/Yellow

(1) Water level measured from top of riser

(2) Volume of standing water

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MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 4-OB DEPTH OF WELL FROM TOP OF RISER: 12.90 BT

TYPE/SIZE CASING: 2"ϕ STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH 1/2" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/18/88	2:10PM	6.64	0.94	—	—	—	TURBIB GRAY WITH HEAVY SOLIDS; EVAC TO DRYNESS
10/19/88	11:53AM	7.32	0.84	7.30	14.0	4,630	OPAQUE GRAY WITH SOME FINE SOLIDS; EVAC TO DRYNESS
10/19/88	3:45PM			7.07	13.1	3,280	OPAQUE LT GRAY; EVAC TO DRYNESS
10/20/88	8:35AM	7.87	0.75	6.84	13.8	3,000	OPAQUE LT. TAN WITH NO SOLIDS; EVAC TO DRYNESS
10/21/88	10:49	8.11	0.72	6.81	14.2	2,630	CLEAR, NO SOLIDS; EVAC TO DRYNESS; TOTAL APPROXIMATE EVACUATION - 12 GAL

(1) Water level measured from top of riser

(2) Volume of standing water

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MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 4-A DEPTH OF WELL FROM TOP OF RISER: 19.70 FT

TYPE/SIZE CASING: 4" Ø OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/18/88	2:00PM	14.98	2.83	6.23	13.6	2,980	TURBID GRAY WITH SURFACE SHEEN; EVAC TO DRYNESS
10/19/88	12:11PM	15.94	2.26	6.67	12.7	2,970	TURBID GRAY WITH HEAVY SOLIDS; EVAC TO DRYNESS
10/20/88	8:42AM	18.18	0.91	6.47	12.2	2,970	TURBID TAN/GRAY; EVAC TO DRYNESS
10/21/88	10:58AM	17.96	1.04	6.39	13.1	2,930	TURBID TAN/GRAY WITH SOME SOLIDS; EVAC TO DRYNESS
10/24/88	9:40AM	15.94	2.26	6.48	22.1	2,780	TURBID BROWN WITH FINE SOLIDS; EVAC TO DRYNESS
10/25/88	9:53AM	17.18	1.51	6.65	11.7	3,000	CLOUDY LT. BROWN WITH FINE SOLIDS; EVAC TO DRYNESS
	9:56AM			6.46	10.9	2,740	CLOUDY BROWN/WHITE WITH FEW FINE SOLIDS; EVAC TO DRYNESS
10/26/88	11:08AM	15.68	2.41	6.62	13.8	3,600	CLOUDY BROWN/WHITE, NO ODOR; EVAC. TO DRYNESS
10/27/88	8:57AM	17.16	1.52	6.25	11.5	2,900	CLOUDY YELLOW/BROWN WITH FEW FINE SOLIDS; EVAC TO DRYNESS
10/28/88	11:00AM	—		6.90	12.0	2,720	CLOUDY, VOLATILE; EVAC. TO DRYNESS
10/31/88	8:34AM	16.92	1.67	6.28	11.3	2,570	CLOUDY RUST COLORED WITH SOME FINE SOLIDS; EVAC. TO DRYNESS
11/1/88	10:35AM	16.97	1.64	6.42	12.5	2,660	CLOUDY LT RUST COLORED WITH FINE SAND; EVAC TO DRYNESS
							EVACUATED APPROXIMATELY 20 GAL. OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 4-B DEPTH OF WELL FROM TOP OF RISER: 28.40 FT.

TYPE/SIZE CASING: 4"Φ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 1/2" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/18/88	1:50PM	25.94	1.48	8.87	14.5	2,680	TURBID BROWN WITH SULFUR ODOR ; EVAC. TO DRYNESS
10/19/88	11:40AM	22.50	3.54	8.71	13.6	2,710	TURBID DARK BROWN WITH SULFUR ODOR
	11:45AM			8.81	12.9	2,440	SAME ; EVAC TO DRYNESS
10/20/88	8:50AM	27.43	0.58	8.77	19.9	2,510	TURBID BROWN WITH SOME HEAVY SOLIDS & SULFUR ODOR ; EVAC TO DRYNESS
10/21/88	10:42AM	27.69	0.49	8.58	14.4	2,410	OPAQUE BROWN WITH FEW FINE SOLIDS & SULFUR ODOR ; EVAC. TO DRYNESS
10/24/88	9:27AM	27.00	0.84	8.62	15.2	2,730	LIGHT BROWN, NO SOLIDS & SULFUR ODOR
	9:31AM			8.55	15.2	2,700	NEARLY CLEAR WITH BROWN TINT AND SULFUR ODOR
	9:35AM			8.07	15.2	2,310	SAME
	9:38AM			7.75	15.2	2,170	SAME
	9:43AM			7.39	22.1	2,050	SAME
	9:48AM			7.75	16.9	2,050	NEARLY CLEAR WITH BROWN/GREEN TINT & SULFUR ODOR
	9:54AM			7.78	16.4	2,080	SAME ; EVAC TO DRYNESS
10/25/88	9:59AM	25.08	1.99	8.61	11.6	2,680	CLEAR BROWN WITH FEW FINE SOLIDS & SULFUR ODOR
	10:03AM			8.42	11.1	2,550	CLEAR BROWN, FINE SOLIDS, SULFUR ODOR AND BUBBLES PRESENT
	10:07AM			7.55	11.9	2,070	SAME

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 4-B DEPTH OF WELL FROM TOP OF RISER: 28.40 FT.

TYPE/SIZE CASING: 4"ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 1/2" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/25/88	10:11 AM	25.68	1.99	7.36	11.8	1,980	OPAQUE BROWN, FINE SOLIDS, SULFUR ODOR AND VOLATILE
	10:15 AM			7.14	11.7	1,950	OPAQUE BROWN, FINE SOLIDS & SULFUR ODOR
	10:20 AM			7.00	11.6	1,810	SAME
	10:25 AM			7.27	11.9	1,830	SAME
	10:29 AM			7.18	12.0	1,830	SAME
	10:33 AM			7.25	12.1	1,860	SAME
	10:37 AM			7.16	11.8	1,840	SAME
	10:41 AM			7.03	11.9	1,850	SAME
	10:45 AM			7.16	11.9	1,810	SAME ; EVACUATED APPROXIMATELY 8 GAL OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 4C DEPTH OF WELL FROM TOP OF RISER: 58.3 FT

TYPE/SIZE CASING: 2"ϕ STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING AND STAINLESS STEEL SURGE BLOCK

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
11/2/88	8:14	22.44	5.38	6.51	10.9	4690	CLEAR, LT. FOAMING, SULFUR ODOR
	8:19			6.41	10.6	5040	CLEAR WITH LIGHT BROWN/BLACK TINT, SULFUR ODOR
	8:24			6.43	10.8	5350	OPAQUE W/LT BROWN/BLACK TINT, SULFUR ODOR, NO SOLIDS
	8:29			6.46	10.3	5440	SAME
	8:34			6.50	10.4	5490	SAME
	8:40			6.50	10.6	5480	SAME
	8:45			6.50	10.6	5400	OPAQUE LT GRAY, SULFUR ODOR
	8:50			6.49	10.4	5470	SAME
	8:55			6.51	10.8	5480	SAME
	9:00			6.50	10.7	5410	SAME
	9:05			6.51	10.4	5360	SAME
	9:10			6.51	10.8	5360	SAME
	9:17			6.52	10.7	5510	SAME
	9:22			6.50	10.8	5430	CLOUDY LT GRAY, SULFUR ODOR, NO SOLIDS
	9:27			6.53	10.8	5450	SAME

(1) Water level measured from top of riser

(2) Volume of standing water

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MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 4C DEPTH OF WELL FROM TOP OF RISER: 58.3 Ft

TYPE/SIZE CASING: 2" ϕ STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP with 3/8" ID POLYETHYLENE TUBING AND STAINLESS STEEL SURGE Block

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
11/2/88	9:32	22.44	5.38	6.49	10.8	5470	SAME & CLEARING
	9:37			6.50	11.0	5480	SAME
	9:42			6.50	10.9	5460	NEARLY CLEAR, LT GRAY TINT, SULFUR ODOR
	9:47			6.52	10.8	5410	SAME
	9:52			6.51	10.8	5420	SAME
	9:57	22.62	5.35	6.51	10.7	5410	SAME

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
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MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 5-B DEPTH OF WELL FROM TOP OF RISER: 34.0 FT

TYPE/SIZE CASING: 4" Ø OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/31/88	2:11	26.34	4.60	10.69	12.9	>20,000	CLOUDY RUST-TAN W/LIGHT SURFACE FROTH & CHEM. ODOR
	2:15			10.44	12.6	>20,000	SAME
	2:20			10.30	12.9	>20,000	SAME
	2:24			10.18	12.8	>20,000	SAME
	2:30			10.12	12.9	>20,000	TAN W/LIGHT FROTH - CHEM. ODOR
	2:35			10.08	12.7	>20,000	AMBER W/LIGHT FROTH, CHEM. ODOR, NEARLY CLEAR
	2:40			10.05	12.8	>20,000	SAME
	2:45			10.02	12.7	>20,000	SAME
	2:50			10.02	13.0	>20,000	CLEAR AMBER, VERY LIGHT FROTH, CHEM. ODOR
	2:55			10.04	12.9	>20,000	CLEAR AMBER, LIGHT FOAM, CHEM. ODOR
	2:59			10.04	12.7	>20,000	SAME, NO FOAM

(1) Water level measured from top of riser

(2) Volume of standing water

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MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 5-C DEPTH OF WELL FROM TOP OF RISER: 60.60 ft.

TYPE/SIZE CASING: 4" ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" POLYETHYLENE TUBING AND STAINLESS STEEL SURGE BLOCK

DATE	TIME	WATER LEVEL (ft)[1]	VOLUME OF WATER (gal)[2]	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
11/1/88	2:53	23.84	22.06	11.65	13.5	4120	LIGHTLY TAN & CLEAR, NO ODOR
	2:58			11.74	13.1	4780	CLOUDY WHITE, NO ODOR, NO SOLIDS
	3:08			11.84	12.9	6320	OPAQUE GRAY, FINE SEDIMENT, NO ODOR
	3:13			11.59	13.3	6110	TURBID GRAY WITH FINE SEDIMENTS
	3:18			11.45	13.2	5610	SAME & LT. SULFUR SMELL
	3:23			11.14	12.7	5230	SAME
	3:28			10.67	12.9	5090	SAME
	3:41			9.06	12.5	5260	TURBID GRAY WITH FINE SEDIMENT & SULFUR ODOR
	3:46			8.71	12.8	5360	SAME
11/2/88	10:50	24.00	21.96	8.97	12.9	5470	CLEAR LT GRAY TINT, SULFUR ODOR
	10:55			8.97	12.4	5480	CLOUDY GRAY/BLACK, SULFUR ODOR, NO SOLIDS
	11:00			8.97	12.5	5520	SAME
	11:05			8.90	11.6	5540	TURBID GRAY, SULFUR ODOR, NO SOLIDS
	11:10			8.83	12.2	5590	TURBID GRAY WITH VERY FINE SOLIDS SETTLING
	11:15			8.67	12.1	5590	SAME

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 5C DEPTH OF WELL FROM TOP OF RISER: 60.60 FT

TYPE/SIZE CASING: 4" ∅ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" POLYETHYLENE TUBING AND STAINLESS STEEL SURGE BLOCK

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
11/2/88	11:25	24.00	21.96	7.75	12.1	5870	TURBID GRAY WITH VERY FINE SOLIDS SETTLING
	11:30			7.66	12.0	5810	SAME
	11:35			7.40	11.7	5870	SAME
	11:40			7.21	11.9	5850	SAME
	11:45			7.00	12.0	5930	SAME
	11:50			6.89	11.9	5980	SAME WITH ALESSENING of TURBIDITY
	11:55			6.77	12.2	5970	Continued TURBID GRAY, Little V.FINE SANDY, ODOR
	11:58	24.78	21.49				PUMP SHUT off @ 11:56 ≅ 30 gal. evacuated. Restart at 12:09 PM
	12:11			6.76	12.8	5980	TURBID GRAY, SULFUR ODOR, V.FINE SANDS
	12:16			6.79	12.0	5890	SAME
	12:21			6.85	11.9	5910	SAME
	12:26			6.85	11.8	5940	SAME
	12:31			6.77	12.2	6000	CLOUDY LT. GRAY w/Few VERY FINE SANDS, SULFUR ODOR
	12:36			6.72	12.2	5990	SAME
	12:41			6.69	12.1	5940	SAME

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 5C DEPTH OF WELL FROM TOP OF RISER: 60.60 Ft

TYPE/SIZE CASING: 4" ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" POLYETHYLENE TUBING AND STAINLESS STEEL SURGE BLOCK

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC μmhos/cm	DESCRIPTION/COMMENTS
11/2/88	12:46	24.78	21.49	6.71	12.1	5980	SAME
	12:51			6.69	12.0	6040	SAME
	12:54			6.67	12.0	5970	SAME IN 2 DAYS PUMPED ≈ 75 GAL. OF WATER 25 ON 11/1 & 50 ON 11/2 PH. IS STABLE AS IS

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: GOB DEPTH OF WELL FROM TOP OF RISER: 18.1'

TYPE/SIZE CASING: 2" ϕ STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/25/88	2:37 P	11.82	0.94	9.70	14.5	14420	OPAQUE BROWN WITH SOLIDS AND FOAM; EVACUATE TO DRYNESS
10/26/88	3:43 P	13.60	0.68	9.64	13.5	17160	DARK BROWN WITH FINE SOLIDS AND FROTH; EVAC TO DRYNESS
10/27/88	9:49 A	14.52	0.54	9.58	12.4	15,500	BROWN OPAQUE FOAMING; EVAC TO DRYNESS
10/28/88	3:15 P	15.22	0.43	10.06	13.8	17,400	VERY CLOUDY, MUDDY EVAC TO DRYNESS
10/31/88	9:17 A	14.38	0.56	9.57	13.3	18,600	CLOUDY, RUST COLORED; EVAC TO DRYNESS
11/1/88	2:09P	15.36	0.41	9.35	14.5	17,350	TURBID BROWN WITH FOAMING, CHEMICAL ODOR AND FINE SEDIMENT; EVAC TO DRYNESS
11/2/88	3:47P	15.74	0.35	9.54	13.2	>20,000	TURBID RUST/BROWN WITH FINE SANDS, SURFACE FOAM AND SURFACE SHEEN; EVAC TO DRYNESS

(1) Water level measured from top of riser

(2) Volume of standing water

ETS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 6A DEPTH OF WELL FROM TOP OF RISER: 24.70

TYPE/SIZE CASING: 4" ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" I.D. Polyethylene Tubing

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/25/88	2:40P	23.36	0.76	8.87	13.3	19,360	LIGHT BROWN AND CLOUDY WITH FEW SOLIDS; EVAC TO DRYNESS;
10/26/88	3:46P	23.46	0.71	10.47	12.3	>20,000	OPAQUE TAN WITH FEW FINE SOLIDS, FROTH WEAK CHEMICAL ODOR; EVAC TO DRYNESS
10/28/88	3:10P	23.34	0.78	11.67	12.6	>20,000	OPAQUE, LIGHT RED BROWN, VERY LITTLE SAND; EVAC TO DRYNESS
10/31/88	9:18A	23.40	0.74	10.84	13.1	>29,000	SEMICLEAR, ORANGE BROWN; EVAC TO DRYNESS
11/1/88	2:22P	23.20	0.86	10.62	13.8	>20,000	NEARLY CLEAR AMBER, NO SOLIDS, SLIGHT CHEMICAL ODOR; EVAC TO DRYNESS

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Engineering Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: GB . DEPTH OF WELL FROM TOP OF RISER: 34.5

TYPE/SIZE CASING: 4" ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" I.D. POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC μmhos/cm	DESCRIPTION/COMMENTS
10/26/88	3:42P	28.53		10.41	17.3	>20,000	TURBID BROWN-GRAY WITH FINE SOLIDS AND SOME FROTH
	3:48			10.36	18.9	>20,000	OPAQUE TAN, NO SOLIDS, WEAK CHEMICAL ODOR
	3:52			10.37	18.3	>20,000	OPAQUE RUST, NO SOLIDS, CLEARING, LIGHT FROTH WITH WEAK CHEMICAL ODOR
	3:57			10.37	18.1	>20,000	SAME
	4:02			10.38	18.2	>20,000	CLEAR-AMBER-RUST, WEAK CHEMICAL ODOR, LIGHT FROTH
	4:06			10.38	18.1	>20,000	SAME
	4:12			10.38	18.3	>20,000	SAME
	4:17			10.37	18.8	>20,000	SAME
	4:25	29.23		10.39	18.9	>20,000	CLEAR AMBER, NO SOLIDS, LIGHT FROTH, WEAK CHEMICAL ODOR; WELL IS DEVELOPED

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 7-OB DEPTH OF WELL FROM TOP OF RISER: 16.0

TYPE/SIZE CASING: 2"ϕ STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH ½ ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/21/88	3:35PM	5.95	1.51	11.18	12.7	11,620	THICK TURBID BROWN WITH HEAVY SOLIDS ; EVAC TO DRYNESS
10/24/88	12:43PM	5.69	1.55	11.66	12.3	13,750	TURBID DARK BROWN WITH HEAVY FOAM ; EVAC TO DRYNESS
10/25/88	2:08PM	5.82	1.53	11.45	13.0	13,430	OPAQUE RED/BROWN WITH FEW SOLIDS ; FOAM ; EVAC. TO DRYNESS
10/26/88	2:01PM	5.90	1.52	11.49	12.0	13,150	FROTHY CLEAR DARK BROWN, NO SOLIDS ; EVAC. TO DRYNESS
10/27/88	10:03AM	6.04	1.49	11.67	12.2	14,500	OPAQUE RED/BROWN, SOME VOLATILES ; EVAC. TO DRYNESS
10/28/88	2:40PM	5.70	1.54	12.51	12.7	15,010	RUST COLORED, FAIRLY CLEAR, LT FOAM, SOME SAND ; EVAC TO DRYNESS
10/31/88	1:31PM	5.85	1.52	11.43	12.2	14,100	CLOUDY BLACK/BROWN, NO SOLIDS ; EVAC. TO DRYNESS
11/1/88	1:47PM	6.18	1.47	11.37	12.8	15,200	CLOUDY BROWN, VERY FINE SANDS ; EVAC TO DRYNESS
							EVACUATED APPROXIMATELY 15GAL. OF WATER.

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 7-A DEPTH OF WELL FROM TOP OF RISER: 22.00 FT.

TYPE/SIZE CASING: 4"ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 1/2" I.D. POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/21/88	3:19 PM	18.63	1.92	10.29	12.6	>20,000	TURBID DARK GRAY WITH HEAVY SOLIDS; EVAC TO DRYNESS
10/24/88	12:49 PM	18.52	2.09	10.27	12.5	>20,000	TURBID DARK BROWN/GREEN WITH SLIGHT FOAM; EVAC TO DRYNESS
10/25/88	2:02 PM	18.60	2.04	10.04	12.3	>20,000	OPAQUE BROWN WITH FINE SOLIDS & HEAVY FOAM; EVAC TO DRYNESS
10/26/88	1:53 PM	18.58	2.05	9.96	11.8	14,960	TURBID BROWN WITH SOME FINE SOLIDS. SURFACE FROTH AND CHEMICAL ODOR PRESENT
	1:57 PM			9.98	16.0	>20,000	CLOUDY BROWN WITH FEW FINE SOLIDS AND HEAVY DISSOLVED GASES; EVAC TO DRYNESS
10/27/88	10:05 AM	18.66	2.00	10.13	11.5	>20,000	OPAQUE LT BROWN WITH HEAVY FOAM
	10:09 AM			10.10	12.0	>20,000	SAME; EVAC TO DRYNESS
10/28/88	2:50 PM	18.50	2.10	10.78	11.6	>20,000	OPAQUE LT RED/BROWN, VERY LITTLE SAND; EVAC TO DRYNESS
10/31/88	1:29 PM	18.34	2.20	9.92	12.0	>20,000	CLOUDY RUST COLORED, NO SOLIDS; EVAC TO DRYNESS
11/1/88	1:55PM	18.26	2.18	9.83	12.4	720,000	TRANSLUCENT LT BROWN WITH LITTLE FINE SAND; EVAC TO DRYNESS
							EVACUATED APPROXIMATELY 23 GAL. OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EES Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 7-B DEPTH OF WELL FROM TOP OF RISER: 31.7 Ft

TYPE/SIZE CASING: 4" ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH ½" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/21/88	3:15 PM	27.46	2.54	9.87	19.6	>20,000	TURBID BROWN WITH SOLIDS AND SOLVENT ODOR
	3:21 PM			10.06	25.4	>20,000	OPAQUE BROWN WITH FEW SOLIDS AND SOLVENT ODOR
	3:43 PM			10.22	17.9	17,050	SAME
	3:48 PM			10.21	15.9	17,690	CLEAR AMBER WITH SOLVENT ODOR
	3:52 PM			10.21	15.9	17,280	SAME
	3:57 PM			10.17	18.0	16,820	SAME
	4:02 PM			10.19	15.3	17,210	SAME
	4:07 PM			10.18	15.8	17,380	SAME
	4:12 PM			10.18	15.5	17,250	SAME
	4:17 PM			10.18	15.0	17,500	SAME
	4:22 PM	28.22	2.09	10.16	15.1	17,500	SAME; EVACUATED APPROXIMATELY 4 GAL OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 8-OB DEPTH OF WELL FROM TOP OF RISER: 15.4 FT

TYPE/SIZE CASING: 2" ϕ STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/18/88	3:33 PM	7.68	1.16	6.90	15.5	> 20,000	SOLVENT ODOR, OPAQUE TAN ; EVAC TO DRYNESS
10/19/88	2:42 PM	8.02	1.11	7.63	16.2	> 20,000	TURBID BROWN WITH SOLVENT ODOR
	2:55 PM			7.65	15.7	> 20,000	TURBID TAN WITH SOLVENT ODOR
	3:00 PM			8.31	15.2	> 20,000	SAME
	3:05 PM			8.29	15.6	> 20,000	OPAQUE TAN WITH FROTHY SURFACE AND FEW SOLIDS
	3:09 PM			8.38	15.1	> 20,000	SAME
	3:14 PM			8.56	15.5	> 20,000	SAME
	3:19 PM			8.33	15.1	> 20,000	SAME
	3:27 PM			8.00	14.8	> 20,000	CLEAR AMBER WITH FROTHY SURFACE, SOLVENT ODOR, NO SOLIDS
	3:33 PM			8.26	15.2	> 20,000	SAME
	3:38 PM			8.36	15.7	> 20,000	SAME
	3:44 PM			8.33	14.9	> 20000	SAME
	3:49 PM			8.30	15.4	> 20,000	SAME
	3:54 PM			8.35	14.8	> 20,000	OPAQUE AMBER WITH FROTHY SURFACE AND SOLVENT ODOR
10/19/88	4:07 PM			8.38	14.8	> 20,000	SAME - OPAQUENESS CAUSED BY GAS BUBBLES

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 8-OB DEPTH OF WELL FROM TOP OF RISER: 15.4 FT.

TYPE/SIZE CASING: 2"ϕ STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYPROPYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/19/88	4:12	8.02	1.11	8.32	15.8	>20,000	SAME
	4:17			8.33	15.1	720,000	CLEAR AMBER WITH FROTHY SURFACE AND SOLVENT ODOR
	4:22			8.34	15.4	720,000	SAME
	4:27			8.35	15.5	720,000	SAME; EVACUATED APPROXIMATELY 85GAL OF WATER FROM 10/18 - 10/19

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 8-A DEPTH OF WELL FROM TOP OF RISER: 22.7 FT

TYPE/SIZE CASING: 4" ϕ STEEL

EVACUATION METHOD: SUCTION PUMP WITH 3/8" I.D. POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC μmhos/cm	DESCRIPTION/COMMENTS
10/18/88	3:38 PM	17.09	3.37	9.11	14.3	12,760	TURBID GRAY WITH SOLIDS AND SOLVENT ODOR
	3:43 PM			8.84	14.0	12,150	TURBID GRAY BROWN WITH SOLVENT ODOR AND FROTHY SURFACE
	3:48 PM			8.84	14.0	12,010	OPAQUE BROWN WITH HEAVY SOLVENT ODOR AND FROTHY SURFACE
	3:53 PM			8.77	13.9	11,950	SAME
	4:00 PM			8.74	13.9	11,210	SAME
	4:06 PM			8.73	13.9	11,150	SAME
	4:12 PM			8.72	14.0	11,090	CLEAR BROWN WITH SOLVENT ODOR
	4:18 PM			8.73	14.1	11,790	SAME
	4:28 PM			8.70	17.6	11,990	SAME
	4:33 PM			8.71	16.9	11,920	OPAQUE BROWN WITH HEAVY SOLVENT ODOR; EVACUATED APPROXIMATELY 35 GAL OF WATER FOR 10/18
10/19/88	8:57 AM	19.02	2.21	8.98	9.7	7,390	OPAQUE TAN/BROWN WITH HEAVY SOLVENT ODOR
	9:02 AM			8.97	15.3	11,740	OPAQUE TAN AND CLEARING WITH HEAVY SOLVENT ODOR
	9:07 AM			8.97	15.3	11,330	SAME
	9:12 AM			8.98	15.5	11,530	CLEAR LIGHT BROWN WITH HEAVY SOLVENT ODOR, NO SOLIDS
	9:17 AM			8.99	15.4	11,960	SAME

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 8-A DEPTH OF WELL FROM TOP OF RISER: 22.7

TYPE/SIZE CASING: 4"Ø OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/19/88	9:24 AM	19.02	2.21	8.96	15.2	11,710	CLEAR LIGHT BROWN WITH HEAVY SOLVENT ODOR, NO SOLIDS
	9:31 AM			9.01	15.2	11,680	SAME
	9:36 AM			8.97	14.9	11,820	SAME
	9:42 AM			8.99	14.8	11,960	SAME
	9:47 AM			8.94	15.2	12,010	SAME
	9:52 AM			8.94	15.6	12,320	SAME
	9:57 AM	19.96	1.64	8.93	15.3	12,260	SAME ; EVACUATED APPROXIMATELY 30 GAL OF WATER ON 10/19
							TOTAL OF 85 GAL PUMPED ON 10/18-10/19

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 8-B DEPTH OF WELL FROM TOP OF RISER: 32.60 FT

TYPE/SIZE CASING: 4"ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8 I.D. POLYPROPYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/18/88	3:41 PM	28.47	2.48	7.34	16.2	3,540	TURBID BROWN
	3:45 PM			6.54	19.4	3,640	NEARLY CLEAR WITH BROWN TINT AND SOLVENT ODOR
	3:50 PM			6.42	18.0	3,090	CLEAR WITH FAINT SOLVENT ODOR
	3:56 PM			6.42	17.9	3,030	SAME
	4:02 PM			6.41	19.2	3,050	SAME
	4:08 PM			6.39	19.3	2,980	SAME
	4:14 PM			6.39	19.2	2,920	SAME
	4:20 PM			6.39	19.5	2,970	SAME; EVACUATED APPROXIMATELY 35 GAL OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 9-OB DEPTH OF WELL FROM TOP OF RISER: 16.50 FT.

TYPE/SIZE CASING: 2"ϕ STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH 1/2" I.D. POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/20/88	1:10PM	13.52	0.45	10.48	16.9	>20,000	TURBID BROWN W/HEAVY SOLIDS ; EVAC TO DRYNESS
10/21/88	2:30PM	12.66	0.58	10.23	15.5	>20,000	TURBID BROWN W/HEAVY SOLIDS ; EVAC. TO DRYNESS
10/24/88	10:52AM	13.52	0.45	9.43	15.0	19,000	TURBID BROWN W/FINE SOLIDS ; EVAC. TO DRYNESS
10/25/88	11:49AM	14.08	0.36	9.29	15.0	>20,000	OPAQUE BROWN W/CHEMICAL ODOR & FINE SOLIDS ; EVAC TO DRY
10/26/88	3:14PM	14.03	0.36	8.91	15.0	17,040	CLOUDY WHITE/BROWN, NO SOLIDS ; EVAC TO DRYNESS
10/27/88	2:30PM	14.22	0.34	9.39	15.4	19,620	OPAQUE BROWN, FOAMING & CHEMICAL ODOR ; EVAC TO DRYNESS
10/28/88	12:35PM	14.26	0.33	10.10	13.6	18,950	BROWN, CLOUDY, SLIGHTLY VOLATILE & FINE SOLIDS ; EVAC TO DRYNESS
10/31/88	9:45AM	13.60	0.44	8.80	14.6	16,250	CLOUDY BROWN/WHITE, NO SOLIDS ; EVAC. TO DRYNESS
11/1/88	11:20AM	13.84	0.40	9.20	14.5	19,160	CLOUDY BROWN WITH FINE SAND & FOAMING ; EVAC TO DRYNESS
11/2/88	2:50PM	13.88	0.39	8.67	14.4	13,980	CLOUDY TAN WITH FEW FINE SAND ; EVAC TO DRYNESS
							EVACUATED APPROXIMATELY 7 GAL OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 9-A DEPTH OF WELL FROM TOP OF RISER: 25.20 FT

TYPE/SIZE CASING: 4"Ø OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH ½" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/20/88	1:18 PM	20.96	2.54	—	—	—	TURBID GRAY WITH THICK HEAVY SOLIDS; EVAC. TO DRYNESS
10/21/88	2:36 PM	20.20	3.00	12.23	14.8	16,200	TURBID GRAY WITH SOLIDS; EVAC TO. DRYNESS
10/24/88	10:55 AM	21.01	2.51	12.08	16.3	16,380	CLOUDY BROWN WITH SOLIDS; EVAC TO DRYNESS
10/25/88	11:43 AM	23.20	1.20	12.04	14.0	16,120	CLOUDY GRAY/BROWN WITH FINE SOLIDS; EVAC. TO DRYNESS
10/26/88	3:17 PM	23.41	1.07	12.15	15.9	720,000	TURBID GRAY, FROTHY, HEAVY SOLIDS; EVAC TO DRYNESS
10/27/88	2:33 PM	23.54	1.00	12.05	14.2	16,800	OPAQUE LT. BROWN, SOME FOAM; EVAC TO DRYNESS
10/28/88	12:45 PM	19.68	3.31	12.98	11.7	15,560	CLOUDY GRAY WITH VOLATILES & FINE SOLIDS; EVAC TO DRYNESS
10/31/88	9:44 AM	22.00	1.92	11.92	13.1	16,900	CLOUDY ORANGE/BROWN, NO SOLIDS; EVAC TO DRYNESS
11/1/88	11:30AM	23.09	1.27	11.80	13.8	14,000	CLOUDY BROWN, FINE SAND AND FOAMING; EVAC TO DRYNESS
							EVACUATED APPROXIMATELY 20 GAL OF WATER.

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 9-B DEPTH OF WELL FROM TOP OF RISER: 32.90 ET

TYPE/SIZE CASING: 4"Ø OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH ½" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/20/88	1:29 PM	28.36	2.78	11.98	26.6	15,250	TURBID GRAY WITH CHEMICAL (SOLVENT) ODOR
	1:37 PM			11.92	27.7	720,000	TURBID GRAY WITH SOLVENT ODOR
	1:42 PM			12.14	19.1	15,040	SAME
	1:50 PM			12.13	17.1	14,380	OPAQUE GRAY WITH SOME SOLIDS AND SOLVENT ODOR
	2:00 PM			12.12	16.6	14,260	OPAQUE GRAY WITH FEW SOLIDS, AND SOLVENT ODOR WITH A DISSIPATING FOAM
	2:07 PM			12.06	17.9	13,730	SAME
	2:13 PM			12.03	16.9	13,290	SAME
	2:18 PM			11.94	17.6	13,170	OPAQUE GRAY-YELLOW WITH FEW SOLIDS AND SOLVENT ODOR WITH SLIGHT FROTH
	2:25 PM			11.90	16.2	14,020	SAME - OPAQUENESS CAUSED BY GAS BUBBLES
	2:30 PM			11.95	17.1	13,730	CLEAR WITH CLOUDINESS CAUSED BY GAS BUBBLES AND A SOLVENT ODOR
	2:35 PM			11.91	16.8	14,020	SAME
	2:40 PM			11.92	16.2	13,340	SAME
	2:45 PM	28.86	2.42	11.94	16.9	13,710	SAME, EVACUATED APPROXIMATELY 5D GAL OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EES Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 10-0B DEPTH OF WELL FROM TOP OF RISER: 13.8 FT

TYPE/SIZE CASING: 2" Ø STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/17/88	1:58 PM	9.92	0.58	12.67	17.2	13,680	LAYER OF DARK BROWN LIQUID BECOMING TURBID CHOCOLATE BROWN WITH EVACUATION - EVAC. TO DRYNESS.
10/18/88	11:00AM	8.68	0.77	11.99	15.8	14,050	TURBID CHOCOLATE BROWN WITH HEAVY SOLIDS AND DARK BROWN CLEAR LIQUID LAYER; EVAC. TO DRYNESS
10/19/88	10:30AM	8.72	0.76	12.20	14.8	15,460	TURBID CHOCOLATE BROWN WITH HEAVY SOLIDS AND DARK BROWN CLEAR LIQUID LAYER - EVAC. TO DRYNESS
10/20/88	11:05AM	8.70	0.77	12.33	12.1	14,980	SAME
10/21/88	9:12AM	8.70	0.77	12.04	14.3	14,370	DARK BROWN CLEAR LIQUID WITH FEW FINE SOLIDS EVAC TO DRYNESS; TOTAL EVAC. APPROXIMATELY 7GAL.

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 10-A DEPTH OF WELL FROM TOP OF RISER: 22.70 Ft

TYPE/SIZE CASING: 4" ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC μmhos/cm	DESCRIPTION/COMMENTS
10/17/88	11:05 AM	18.04	2.80	12.75	15.4	10,670	TURBID GRAY WITH HEAVY SOLIDS
	11:08 AM			12.72	14.5	10,560	SAME ; EVAC. TO DRYNESS
	12:48 PM			12.63	15.0	10,670	TURBID TAN/GRAY
	12:51 PM			12.66	14.9	11,000	SAME ; EVAC TO DRYNESS
	1:10 PM			12.55	14.3	10,720	SAME ; EVAC TO DRYNESS
10/18/88	11:03 AM	18.00	2.82	11.71	14.2	10,680	TURBID TAN/GRAY WITH HEAVY SOLIDS
	11:08 AM			11.73	14.4	10,630	SAME ; EVAC. TO DRYNESS
	11:18 AM			11.83	14.7	10,760	SAME ; EVAC TO DRYNESS
10/19/88	10:20 AM	18.86	2.30	11.97	13.0	10,950	TURBID GRAY WITH SOME SOLIDS ; EVAC. TO DRYNESS
10/20/88	10:45 AM	18.02	2.82	11.92	10.1	10,100	OPAQUE TAN WITH SOME SOLIDS ; EVAC TO DRYNESS
10/21/88	9:17 AM	17.92	2.87	11.67	12.5	10,570	TURBID RUST WITH THIN LAYER OF FINE SOLIDS ; EVAC TO DRYNESS
	9:23 AM			11.67	12.0	10,230	OPAQUE LT RUST WITH SOME FINE SOLIDS ; EVAC. TO DRYNESS
10/25/88	9:06 AM	17.62	3.05	11.59	12.0	11,050	CLOUDY TAN/BROWN, FEW FINE SOLIDS
	9:10 AM			11.39	12.4	10,400	CLOUDY LT TAN, NO SOLIDS
	9:13 AM			11.56	12.7	10,290	CLOUDY WHITE, NO SOLIDS, SLIGHT FOAM ; EVAC TO DRYNESS

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 10-A DEPTH OF WELL FROM TOP OF RISER: 22.70 FT.

TYPE/SIZE CASING: 4" Φ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/26/88	10:37 AM	17.14	3.34	11.65	18.0	10,990	CLOUDY BROWN/WHITE, NO SOLIDS
	10:41 AM			11.38	14.0	8,750	SAME; EVAC. TO DRYNESS
							EVACUATED APPROXIMATELY 28 GAL OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 10-B DEPTH OF WELL FROM TOP OF RISER: 32.30 FT.

TYPE/SIZE CASING: 4"ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/17/88	1:53PM	19.94	7.42	12.78	16.4	13,350	TURBID RUST BROWN ; EVAC TO DRYNESS
10/18/88	11:09 AM	20.96	6.80	11.99	21.8	14,650	TURBID TAN/GRAY WITH SOLIDS
	11:13AM			12.00	22.7	15,250	TURBID RUST/GRAY ; EVAC TO DRYNESS
10/19/88	10:40AM	23.58	5.23	11.33	13.9	17,530	TURBID TAN W/SOME FINE SOLIDS ; EVAC TO DRYNESS
10/20/88	10:55AM	24.72	4.55	12.51	12.0	17,130	TURBID TAN W/SOME HEAVY SOLIDS; EVAC TO DRYNESS
10/21/88	11:50 AM	23.05	5.55	12.14	16.0	17,050	OPAQUE RUST/BROWN W/FEW FINE SOLIDS ; EVAC TO DRYNESS
10/25/88	9:17 AM	20.13	7.30	12.07	11.4	>20,000	TURBID BROWN WITH FINE SOLIDS & HEAVY FOAM
	9:21 AM			12.17	12.2	17,780	CLOUDY LIGHT BROWN, FINE SOLIDS & HEAVY FOAM
	9:25 AM			12.13	12.5	19,250	SAME
	9:30 AM			12.18	11.6	19,350	SAME ; EVAC. TO DRYNESS
10/26/88	10:29 AM	23.36	5.36	12.08	15.4	18,000	ORANGE/BROWN, SEMI-CLEAR NO SOLIDS
	10:34AM			12.11	19.6	18,750	SAME ; EVAC. TO DRYNESS
							EVACUATED APPROXIMATELY 45 GAL. OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 11-OB DEPTH OF WELL FROM TOP OF RISER: 16.0

TYPE/SIZE CASING: 2" ϕ STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/17/88	9:20 AM	7.62	1.25				TURBID BROWN/GRAY WITH HEAVY SOLIDS; EVAC TO DRYNESS
10/18/88	10:15 AM	7.92	1.21	7.71	15.6	>20,000	TURBID BROWN/GRAY; EVAC TO DRYNESS
10/19/88	9:25 AM	8.91	1.06	8.15	12.5	>20,000	TURBID TAN WITH SOME SOLIDS; EVAC TO DRYNESS
10/20/88	10:30 AM	7.56	1.27	7.90	10.9	>20,000	TURBID RUST W/FEW HEAVY SOLIDS; EVAC TO DRYNESS
10/21/88	8:42 AM	7.42	1.29	7.57	13.9	>20,000	TURBID RUST W/FEW SOLIDS; EVAC TO DRYNESS
10/24/88	8:40 AM	7.06	1.34	7.88	15.2	>20,000	CLOUDY LT GRAY, FEW FINE SOLIDS, SLIGHT FOAMING
	8:43 AM			7.53	15.2	>20,000	NEARLY CLEAR, LT YELLOW TINT, NO SOLIDS
	8:48 AM			7.79	15.2	>20,000	TURBID BROWN/GRAY, FINE SOLIDS, SOME FOAM; EVAC TO DRYNESS
10/25/88	8:30 AM	6.95	1.36	7.44	13.4	>20,000	CLOUDY LT. BROWN, FEW FINE SOLIDS; EVAC TO DRYNESS
10/26/88	8:44 AM	6.88	1.37	7.81	13.6	>20,000	CLOUDY WHITE, NO SOLIDS, NO ODOR; EVAC TO DRYNESS
10/27/88	8:19 AM	7.25	1.31	7.88	13.2	>20,000	SEMI-CLEAR WITH YELLOW TINT, NO SOLIDS; EVAC. TO DRYNESS
10/28/88	10:50 AM	—		8.44	13.4	>20,000	CLOUDY WHITE, NO SOLIDS; EVAC TO DRYNESS
10/31/88	8:24 AM	7.08	1.34	7.69	12.3	>20,000	CLOUDY WHITE, NO SOLIDS; EVAC TO DRYNESS
11/1/88	10:10 AM	6.92	1.36	7.75	13.6	>20,000	CLOUDY, FOAMING, FINE SAND; EVAC TO DRYNESS
							EVACUATED APPROXIMATELY 19 GAL OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 11-OB DEPTH OF WELL FROM TOP OF RISER: 16.0

TYPE/SIZE CASING: 2" ϕ STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/17/88	9:20 AM	7.62	1.25				TURBID BROWN/GRAY WITH HEAVY SOLIDS ; EVAC TO DRYNESS
10/18/88	10:15 AM	7.92	1.21	7.71	15.6	>20,000	TURBID BROWN/GRAY ; EVAC TO DRYNESS
10/19/88	9:25 AM	8.91	1.06	8.15	12.5	>20,000	TURBID TAN WITH SOME SOLIDS ; EVAC TO DRYNESS
10/20/88	10:30 AM	7.56	1.27	7.90	10.7	>20,000	TURBID RUST W/FEW HEAVY SOLIDS ; EVAC TO DRYNESS
10/21/88	8:42 AM	7.42	1.29	7.57	13.9	>20,000	TURBID RUST W/FEW SOLIDS ; EVAC TO DRYNESS
10/24/88	8:40 AM	7.06	1.34	7.88	15.2	>20,000	CLOUDY LT GRAY, FEW FINE SOLIDS, SLIGHT FOAMING
	8:43 AM			7.53	15.2	>20,000	NEARLY CLEAR, LT YELLOW TINT, NO SOLIDS
	8:48 AM			7.79	15.2	>20,000	TURBID BROWN/GRAY, FINE SOLIDS, SOME FOAM ; EVAC TO DRYNESS
10/25/88	8:30 AM	6.95	1.36	7.44	13.4	>20,000	CLOUDY LT. BROWN, FEW FINE SOLIDS ; EVAC TO DRYNESS
10/26/88	8:44 AM	6.88	1.37	7.81	13.6	>20,000	CLOUDY WHITE, NO SOLIDS, NO ODOR ; EVAC TO DRYNESS
10/27/88	8:19 AM	7.25	1.31	7.88	13.2	>20,000	SEMI-CLEAR WITH YELLOW TINT, NO SOLIDS ; EVAC. TO DRYNESS
10/28/88	10:50 AM	-		8.44	13.4	>20,000	CLOUDY WHITE, NO SOLIDS ; EVAC TO DRYNESS
10/31/88	8:24 AM	7.08	1.34	7.69	12.3	>20,000	CLOUDY WHITE, NO SOLIDS ; EVAC TO DRYNESS
11/1/88	10:10 AM	6.92	1.36	7.75	13.6	>20,000	CLOUDY, FOAMING, FINE SAND ; EVAC TO DRYNESS
							EVACUATED APPROXIMATELY 19 GAL OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 11-A DEPTH OF WELL FROM TOP OF RISER: 22.50 FT

TYPE/SIZE CASING: 4" ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/17/88	9:33 AM	20.68	1.09	12.98	15.4	>20,000	THICK CLAYEY GRAY W/HEAVY SOLIDS; EVAC TO DRYNESS
	10:20 AM			—	—	—	TURBID GRAY W/HEAVY SOLIDS; EVAC TO DRYNESS
	1:15 PM			12.55	15.7	>20,000	TURBID GRAY W/HEAVY SOLIDS; EVAC TO DRYNESS
10/18/88	10:19 AM	20.98	0.91	11.81	14.3	>20,000	TURBID GRAY W/VERY FINE SOLIDS; EVAC. TO DRYNESS
10/19/88	9:15 AM	20.98	0.91	11.81	11.6	>20,000	TURBID LT. GRAY WITH SOME FINE SOLIDS; EVAC TO DRYNESS
10/20/88	10:20 AM	20.90	0.96	11.74	9.5	>20,000	TURBID LT GRAY W/SOME HEAVY SOLIDS; EVAC. TO DRYNESS
10/21/88	8:49 AM	20.88	0.97	11.39	11.4	>20,000	TURBID GRAY W/FEW FINE SOLIDS; EVAC TO DRYNESS
10/24/88	8:35 AM	20.74	1.06	11.72	15.2	>20,000	TURBID LT GRAY W/FINE SOLIDS & SOME FOAM; EVAC TO DRYNESS
10/25/88	8:32 AM	19.00	2.10	11.36	12.8	>20,000	TURBID LT BROWN W/FEW FINE SOLIDS; EVAC TO DRYNESS
10/26/88	8:51 AM	17.91	2.75	11.32	9.7	>20,000	CLOUDY WHITE, NO SOLIDS
	8:53 AM			11.26	11.5	>20,000	SAME & SLIGHT FOAMING; EVAC TO DRYNESS
							EVACUATED APPROXIMATELY 14 GAL OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 11-B DEPTH OF WELL FROM TOP OF RISER: 32.1 FT

TYPE/SIZE CASING: 4" ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC μmhos/cm	DESCRIPTION/COMMENTS
10/17/88	8:20 AM	24.64	4.48				
	9:01 AM			7.35	18.6	8,340	TURBID GRAY WITH HEAVY SOLIDS
	9:08 AM			7.15	18.1	4,340	VERY LIGHT BROWN WITH FEW SOLIDS
	9:13 AM			7.17	18.6	4,420	VERY LIGHT BROWN
	9:20 AM			7.16	18.5	4,480	NEARLY CLEAR, LIGHT BROWN TINT
	9:28 AM			7.10	18.5	4,430	CLEAR
	9:35 AM			7.09	18.8	4,480	CLEAR
	9:40 AM			7.21	18.7	4,470	CLEAR
	9:45 AM			7.20	18.8	4,470	CLEAR
	9:48 AM			7.18	18.7	4,490	CLEAR
	9:52 AM			7.13	18.3	4,480	CLEAR
	9:57 AM			7.11	17.9	4450	CLEAR ; EVACUATED APPROXIMATELY 35 GAL OF WATER
	10:00 AM	24.84	4.36				

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 12-0B DEPTH OF WELL FROM TOP OF RISER: 16.6 FT

TYPE/SIZE CASING: 2" ϕ STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH ½" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/20/88	11:31 AM	7.95	1.30	8.27	15.2	1,250	TURBID BROWN W/SURFACE SHEEN ; EVAC TO DRYNESS
10/21/88	11:30 AM	7.98	1.29	8.75	15.5	1,790	TURBID TAN W/SOME SOLIDS & SURFACE SHEEN ; EVAC TO DRYNESS
10/24/88	10:13 AM	7.74	1.33	7.41	14.6	1,770	CLOUDY LT GRAY, NO SOLIDS ; EVAC TO DRYNESS
10/25/88	11:10 AM	7.60	1.35	7.57	14.0	2,060	CLOUDY BROWN W/FINE SOLIDS & FOAM ; EVAC TO DRYNESS
10/26/88	2:28 PM	7.45	1.37	7.59	13.8	1,910	CLOUDY WHITE W/LT FROTH, NO SOLIDS ; EVAC TO DRYNESS
10/27/88	9:26 AM	7.35	1.39	8.18	13.9	1,990	CLOUDY GRAY-GREEN, NO SOLIDS ; EVAC TO DRYNESS
10/28/88	11:50 AM	7.53	1.36	7.84	13.3	1,980	CLOUDY, STRONG ODOR, VOLATILES ; EVAC TO DRYNESS
10/31/88	3:45 AM	7.61	1.35	7.66	13.1	2,060	CLEAR ; EVAC TO DRYNESS
11/1/88	10:50 AM	7.64	1.34	7.22	14.0	2,080	CLOUDY BROWN, FINE SAND ; EVAC TO DRYNESS
							EVACUATED APPROXIMATELY 14 GAL OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 12-A DEPTH OF WELL FROM TOP OF RISER: 25.10

TYPE/SIZE CASING: 4"ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 1/2" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/20/88	9:58 AM	19.42	3.41	11.76	15.2	>20,000	TURBID GRAY WITH CHEMICAL ODOR
	10:05 AM			11.28	16.2	9,220	TURBID MEDIUM GRAY WITH CHEMICAL ODOR
	10:10 AM			10.45	17.8	8,410	TURBID LT. GRAY WITH CHEMICAL ODOR ; EVAC TO DRYNESS
10/21/88	11:23AM	19.23	3.52	7.87	14.5	11,360	TURBID BLUE/GRAY WITH SOME SOLIDS & CHEMICAL ODOR ; EVAC. TO DRY
10/24/88	10:16 AM	19.18	3.55	7.38	12.4	15,800	TURBID BLACK/GRAY W/ SOME FINE SOLIDS & CHEMICAL ODOR
	10:23AM			7.60	14.8	10,660	SAME ; EVAC TO DRYNESS
10/25/88	11:22AM	19.28	3.49	7.20	12.3	16,180	OPAQUE BLACK, FINE SOLIDS, FOAMING, CHEMICAL ODOR
	11:25AM			7.20	12.9	13,820	SAME ; EVAC TO DRYNESS
10/26/88	2:26PM	19.13	3.58	7.42	13.0	11,620	DARK BLUE/BLACK, NO SOLIDS, CHEMICAL ODOR, LIGHT FOAMING
	2:31 PM			6.97	23.8	15,070	SAME
	2:36 PM			7.11	16.6	14,260	SAME ; EVAC TO DRYNESS
10/27/88	9:28AM	19.42	3.41	6.87	12.3	16,830	OPAQUE BLACK, SULFUR ODOR, NO SOLIDS
	9:31AM			7.10	12.5	15,000	OPAQUE GRAY/BLACK, NO SOLIDS, SULFUR ODOR ; EVAC TO DRYNESS
10/28/88	12:10 PM	19.20	3.54	7.38	11.8	16,450	CLOUDY BLACK, STRONG CHEMICAL ODOR, VOLATILES ; EVAC TO DRY

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 12-A DEPTH OF WELL FROM TOP OF RISER: 25.10

TYPE/SIZE CASING: 4" ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH ½" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC μmhos/cm	DESCRIPTION/COMMENTS
10/31/88	8:47 AM	19.22	3.53	6.79	11.8	18,750	OPAQUE BLACK, CHEMICAL ODOR, NO SOLIDS
	8:50 AM			7.01	12.4	14,360	SAME; EVAC. TO DRYNESS
11/1/88	11:00 AM	19.01	3.165	6.77	12.6	16,820	BLACK, STRONG ODOR, NO CLOUDINESS
							EVACUATED APPROXIMATELY 40 GAL OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 12-B DEPTH OF WELL FROM TOP OF RISER: 32.5 FT

TYPE/SIZE CASING: 4" Ø STEEL

EVACUATION METHOD: SUCTION PUMP AND 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/20/88	9:35 AM	27.62	2.93	12.07	19.6	9,780	TURBID GRAY WITH HEAVY SOLIDS
	9:40 AM			10.78	17.9	3,660	TURBID LT GRAY WITH HEAVY SOLIDS AND CHEMICAL ODOR
	9:45 AM			7.79	24.1	3,600	TURBID LT. GRAY WITH SOLIDS AND WEAK CHEMICAL ODOR
	9:50 AM			7.10	17.2	3,640	NEARLY CLEAR WITH GRAY TINT AND WEAK CHEMICAL ODOR
	9:55 AM			7.07	15.9	3,470	SAME
	10:00 AM			7.03	14.6	3,360	CLEAR WITH WEAK CHEMICAL ODOR
	10:15 AM			7.33	14.5	3,550	OPAQUE GRAY AND WEAK CHEMICAL ODOR
	10:22 AM			7.06	16.7	3,570	NEARLY CLEAR WITH GRAY TINT AND WEAK CHEMICAL ODOR
	10:29 AM			7.04	16.2	3,620	NEARLY CLEAR WITH FAINT GRAY TINT AND WEAK CHEMICAL ODOR
	10:48 AM			7.13	23.5	3,590	SAME
	10:54 AM			7.04	18.3	3,500	SAME
	10:57 AM			7.03	20.8	3,620	CLEAR WITH NO CHEMICAL ODOR
	11:04 AM			7.07	24.6	3,600	CLEAR WITH FAINT CHEMICAL ODOR
	11:09 AM			7.04	21.8	3,560	SAME
	11:20 AM	27.90	2.76	7.02	21.1	3,460	SAME ; EVACUATED APPROXIMATELY 48 GAL OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 13-A DEPTH OF WELL FROM TOP OF RISER: 26.0

TYPE/SIZE CASING: 4" ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/20/88	4:10 PM	22.35	2.19	11.23	15.8	>20,000	TURBID GRAY WITH HEAVY SOLIDS; EVAC. TO DRYNESS
10/21/88	1:10 PM	20.86	3.08	10.08	21.3	>20,000	SAME
10/25/88	1:30 PM	19.97	3.62	9.97	12.1	>20,000	OPAQUE YELLOW/BROWN W/FEW SOLIDS & CHEMICAL ODOR
	1:35 PM			9.94	13.4	>20,000	OPAQUE BROWN/TAN W/FEW SOLIDS & FOAMING; EVAC. TO DRYNESS
10/26/88	1:08 PM	21.02	2.99	10.17	13.6	>20,000	TURBID GRAY/BROWN W/SOME FINE SOLIDS & CHEMICAL ODOR
	1:13 PM			10.09	13.8	>20,000	OPAQUE RUST/BROWN, NO SOLIDS & CHEMICAL ODOR
	1:18 PM			10.01	14.1	>20,000	TURBID TAN W/FINE SOLIDS AND CHEMICAL ODOR
	1:23 PM			9.87	14.1	>20,000	CLOUDY RUST W/FEW FINE SOLIDS & CHEMICAL ODOR; EVAC TO DRYNESS
10/27/88	2:07 PM	22.22	2.27	9.99	15.9	>20,000	CLOUDY BROWN/WHITE WITH BUBBLES & CHEMICAL ODOR
	2:11 PM			9.99	15.2	>20,000	SAME
	2:15 PM			9.91	15.0	>20,000	SAME; EVAC TO DRYNESS
10/28/88	2:16 PM	22.16	2.30	10.71	14.3	>20,000	CLOUDY, LITTLE OR NO SEDIMENT; EVAC TO DRYNESS
10/31/88	9:59 AM	22.16	2.30	10.15	13.1	>20,000	CLOUDY GRAY/GREEN, NO SOLIDS
	10:03 AM			9.96	13.7	>20,000	SAME; EVAC. TO DRYNESS

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 13-A DEPTH OF WELL FROM TOP OF RISER: 26.0

TYPE/SIZE CASING: 4"Φ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
11/1/88	1:25 PM	22.00	2.40	10.16	14.6	720,000	CLOUDY GRAY, FINE SILT-SAND
	1:30 PM			10.12	15.0	720,1000	SAME ; EVAC TO DRYNESS
11/2/88	2:33 PM	22.80	1.92	10.21	12.6	720,000	CLOUDY RUST W/FINE SOLIDS & CHEMICAL ODOR
	2:38 PM			10.10	14.3	720,000	CLOUDY RUST W/FINE SOLIDS, CHEMICAL ODOR & GAS BUBBLES; EVAC TO DRY
							EVACUATED APPROXIMATELY 30 GAL. OF WATER

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL#: 14-05 DEPTH OF WELL FROM TOP OF RISER: 15.4

TYPE/SIZE CASING: 2"ϕ STAINLESS STEEL

EVACUATION METHOD: SUCTION PUMP WITH ½" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/27/88	11:03	8.54	1.03	8.47	15.0	4660	CLOUDY BROWN/TAN FINE SOLIDS (EVAC. TO DRYNESS)
	11:07			8.47	14.7	4530	CLOUDY TAN/WHITE NO SOLIDS, BUBBLES
	11:57			8.40	14.4	4380	CLOUDY LT BROWN, SOME BUBBLES
	12:00			8.39	14.8	4200	SAME - NO BUBBLES (EVAC. TO DRY)
	2:48	9.42	.90	8.35	15.3	4180	CLOUDY WHITE - EVAC. TO DRY
	3:13			8.25	15.5	4380	CLOUDY WHITE - YELLOW, FEW FINE SOLIDS, CHEM. ODOR - EVAC. TO DRYNESS
	3:28			8.34	15.5	4180	CLOUDY TAN - WHITE, FEW FINE SOLIDS, CHEM. ODOR - EVAC. TO DRYNESS
	3:56			8.38	14.7	4180	CLOUDY LT. TAN, CHEM. ODOR, QUICK FROTH, NO SOLIDS - EVAC. TO DRYNESS
	4:09			8.33	15.5	4410	EVAC. TO DRYNESS NEARLY CLEAR, LT. YELLOW TINT, LT. FROTH, CHEM. ODOR
	4:38			8.36	15.2	4210	SAME - NO SOLIDS, EVAC. TO DRYNESS
10/28/88	10:30	12.54	.43	8.94	13.5	4110	CLOUDY, LIGHT TAN - DRY
10/31/88	10:22	13.25	.32	8.40	13.3	4500	SEMI CLEAR/WHITE SOME BUBBLES (DRY)
	10:35			8.39	10.8	4250	SAME
	3:33	13.30	.32	8.38	14.3	4260	CLOUDY WHITE; EVAC TO DRYNESS
11/1/88	9:25	13.48	.29	8.38	12.7	4130	CLOUDY, SOME SOLIDS - DRY

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 14-A DEPTH OF WELL FROM TOP OF RISER: 23.2 FT

TYPE/SIZE CASING: 4" ϕ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/24/88	11:12	17.06	3.68	7.59	13.1	9650	CLOUDY WHITE NO SOLIDS
	11:16			8.49	13.4	8660	SEMI - CLEAR/WHITE
	11:21			8.70	13.5	8000	SAME
	11:26			8.80	13.1	8000	CLEAR
	11:31			8.80	13.5	8000	CLEAR - SOME BUBBLING
	11:36			8.84	13.8	8000	SAME
	11:41			8.80	13.6	7970	SAME
	11:46			8.81	13.1	7830	SAME
	11:51	17.64	3.34	8.80	13.4	7770	SAME - Pumped 35 gal

(1) Water level measured from top of riser

(2) Volume of standing water

EFS Environmental Field Services
DIVISION OF KEN W. KLOEBER CONSULTING ENGINEERS

MONITORING WELL DEVELOPMENT DATA

PROJECT NAME/NUMBER: ECCO/Frontier Chemical 50-50

MONITORING WELL #: 14-B DEPTH OF WELL FROM TOP OF RISER: 32.2 FT

TYPE/SIZE CASING: 4"Φ OPEN HOLE

EVACUATION METHOD: SUCTION PUMP WITH 3/8" ID POLYETHYLENE TUBING

DATE	TIME	WATER LEVEL (ft)(1)	VOLUME OF WATER (gal) (2)	pH UNITS	TEMP °C	SC µmhos/cm	DESCRIPTION/COMMENTS
10/27/88	3:07	26.30	3.54	7.39	19.6	6190	CLEAR - WHITE TINT
	3:36			6.78	13.7	5130	CLEAR - LT YELLOW TINT, CHEM. ODOR, NO SOLIDS
	3:42			6.80	13.7	4810	CLEAR - Lt YELLOW TINT, WEAKER CHEM. ODOR, NO SOLIDS
	3:47			6.82	13.4	4570	CLEAR, NO SOLIDS, Lt. CHEMICAL ODOR
	4:02			6.81	13.4	4370	CLEAR, NO SOLIDS
	4:06			6.84	13.9	4370	SAME
10/31/88	10:29	26.62	3.35	6.84	12.2	8150	CLEAR
	10:33			6.82	12.0	7550	CLEAR

(1) Water level measured from top of riser

(2) Volume of standing water

APPENDIX B

Evacuation and Sampling Field Sheets

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 81-2

Type/Size Casing: 1½" PVC

Depth of Well from Top of Casing: 19.0 FT

EVACUATION

Date: 11/17/88 Crew: DR/PS

Weather: OVERCAST, MILD, 40°F

Purge Method: PERISTALTIC PUMP

Time: 4:12 PM Water level from top of Riser (ft.): 18.14 ft.

Volume of Standing Water (gal.): 0.079 Volume of Purged Water (gal.): 0.24

Description/Comments: (Mult. factor = 0.0918 gal/ft.) 0.86 ft. Standing H_2O

ORANGE-BROWN COLOR, STRONG ODOR, LITE FOAMING / Evacuation complete (± 0.24 gals)

SAMPLING

Date: 18 NOV 1988 Crew: DE/PS

Weather: SUNNY 45°F

Sampling Method: 1.0 in S.S. BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
1:22P	18.54				
1:35P		8.36	16.1	720,000	ORANGE; UPPER LAYER GREEN-BROWN, LOWER LAYER RED-BROWN
1:37P		8.34	17.2	720,000	" ODOR

COMMENTS: (ECCO conductivity meter not available)

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 81-7

Type/Size Casing: 1½" PVC

Depth of Well from Top of Casing: 6.0 FT

EVACUATION

Date: 11/17/88 Crew: DR/PS

Weather: OVERCAST, WINDY, 40°F

Purge Method: PERISTALTIC PUMP

Time: 4:00 PM Water level from top of Riser (ft.): 4.58ft

Volume of Standing Water (gal.): 0.13 Volume of Purged Water (gal.): 0.39

Description/Comments: (M.H. factor = 0.0918 GAL/FT.) 1.42ft. Standing H2O
Evacuation complete (±0.5 gal's) / Clear

SAMPLING

Date: 18 NOV. 1988 Crew: DR / PS

Weather: SUNNY 45°F

Sampling Method: 1.0 in 5.5 bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
1:19P	4.62				
1:27P		8.00	15.1	1,280	clear, lt. Yellow tint
1:28P		7.99	15.2	1,340	Translucent, lt. Yellow tint ppt.

COMMENTS:

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 84-9

Type/Size Casing: 2" WHITE PVC

Depth of Well from Top of Casing: 36.1 ft,

EVACUATION

Date: 11/11/88 Crew: DR/PS

Weather: PARTLY SUNNY, 40°F

Purge Method: SUCTION PUMP WITH 1/4" POLYETHYLENE TUBING

Time: 10:20 AM Water level from top of Riser (ft.): 27.67 ft

Volume of Standing Water (gal.): 1.38 Volume of Purged Water (gal.): 4.13

Description/Comments: (mult. factor = 0.1632 gal/ft) 8.43 ft Standing H_2O
water color orangish brown, little foaming, few sediments Evacuation completed (± 4.13 g

SAMPLING

Date: 11/11/88 Crew: DR/PS/BO

Weather: OVERCAST 42°F

Sampling Method: 2" STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
2:35	27.62	10.19	14.2	>20,000	clear, yellow-brown tint, V. fine Sands, odor
2:42		10.21	14.2	>20,000	84-905 Clear, Yellowish-Brown tint, V. fine Sands, odor
2:45		10.20	13.8	>20,000	Clear, Yellowish-Brown tint, V. fine Sands, odor
		10.16	14.1	>20,000	84-908 "

COMMENTS:

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 84-11

Type/Size Casing: 2"ϕ PVC

Depth of Well from Top of Casing: 35.4 FT

EVACUATION

Date: 11/18/88 Crew: DR/PS

Weather: SUNNY, 40°F

Purge Method: PERISTALTIC PUMP & DEDICATED TUBING

Time: 9:43 AM Water level from top of Riser (ft.): 29.26 ft

Volume of Standing Water (gal.): 1.00 Volume of Purged Water (gal.): 3.01

Description/Comments: (Mult factor = 0.1632 gal/ft) 6.14 ft. Standing H_2O

Clear, Med. Orange-Brown tint, strong odor, sheen present on surface / Evacuation complete (@ 3.01 g

SAMPLING

Date: 18 NOV. 1988 Crew: DR/PS

Weather: SUNNY 45°F

Sampling Method: 1.0 in. S.S. Bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
2:35 PM	29.16				
2:41		11.06	16.3	>20,000	Clear, orange-brown, odor, surface sheen
2:42		11.05	16.9	>20,000	

COMMENTS: (ECCO conductivity meter not available)

EFS **Environmental Field Services** (Supplemental Sheet)

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 84-11

Type/Size Casing: PVC 2.0 in.

Depth of Well from Top of Casing: 35.4 ft.

EVACUATION

Date: _____ Crew: _____

Weather: _____

Purge Method: _____

Time: _____ Water level from top of Riser (ft.): _____

Volume of Standing Water (gal.): _____ Volume of Purged Water (gal.): _____

Description/Comments: _____

SAMPLING

Date: 22 NOV. 1988 Crew: PS/JB

Weather: OVERCAST, slight breeze 38°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
1:15P	29.08 ft.		~~9.8~~		
1:30		11.07	9.8	>20,000	translucent Yellowish-brown tint, settled NAPL ±strong odor/oily sheen on surf

COMMENTS: bottom sample taken, supplement to previous samples
2-VOA's taken + pH/SC sample (as per Rudy)

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 84-12

Type/Size Casing: PVC 2.0 in.

Depth of Well from Top of Casing: 34.9 ft.

EVACUATION

Date: 11 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, slight breeze 38°F

Purge Method: SUCTION PUMP

Time: 8:11 AM Water level from top of Riser (ft.): 29.32 ft

Volume of Standing Water (gal.): 0.911 Volume of Purged Water (gal.): 2.73

Description/Comments: (Multiplying factor = 0.1632 gal/ft) 5.58 ft. Standing H2O

Tubing (1/4 in. ded. coated tubing) is ± 4.0' short. Evacuation completed (± 2.73 gals)

SAMPLING

Date: 11/11/88 Crew: DR/PS/BO

Weather: OVERCAST 42°F

Sampling Method: 2" STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
2:17 PM	29.20				
2:21		9.98	13.7	>20,000	Clear, v. fine Sands, Yellowish-Brown tint, odor
2:27		9.81	15.4	>20,000	"

COMMENTS:

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 84-13

Type/Size Casing: 2" PVC (PVC casing = to STEEL OUTER)

Depth of Well from Top of Casing: 34.0 FT

EVACUATION

Date: 11/10/88 Crew: DR/PS

Weather: OVERCAST 55°F, WINDY 25-45 MPH

Purge Method: PERISTALTIC PUMP WITH 1/4" ID POLYETHYLENE TUBING (TUBING DOES NOT EXTEND to + depth)

Time: 11:10 AM Water level from top of Riser (ft.): 28.62

Volume of Standing Water (gal.): 0.878 Volume of Purged Water (gal.): 2.63

Description/Comments: 5.38 ft standing water (Multiplying factor = 0.1632 taken from Maeschalk Corp. Volume/Unit Length Table), water is an orangish-BROWN color (RUSTY) w/ v. fine sands on bottom of bucket, clear. EVACUATION complete (± 2.63 L)

SAMPLING

Date: 11 NOV. 1988 Crew: DR/PS

Weather: Overcast, breezy 42°F

Sampling Method: 2" Stainless steel

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
12:55	28.82				
1:02		7.06	10.8	1,840	Clear, lt. yellow tint, ORANGISH-BROWN Sediment
1:04		7.11	11.7	1,940	"

COMMENTS: SAMPLE IS MOSTLY CLEAR WITH RUST COLORED FLOATING PARTICLES AND SOME FINE MATERIALS

EFS Environmental Field Services

8397 BOSTON STATE ROAD · BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 84-14

Type/Size Casing: PVC 2.0 in.

Depth of Well from Top of Casing: 19.9 ft.

EVACUATION

Date: 10 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, HIGH WINDS, Periodic Rain (Heavy @ times) 55°F

Purge Method: Peristaltic Pump Provided by Frontier Chem. 1/4in. dedicated tubing

Time: 11:58 AM Water level from top of Riser (ft.): 14.86 ft

Volume of Standing Water (gal.): 0.823 Volume of Purged Water (gal.): 2.47

Description/Comments: (multiplying factor = 0.1632 GAL/FT) 5.04 ft. Standing H_2O

Evacuation complete (± 2.47 gals) water clear, greyish tint, few sediments

SAMPLING

Date: 11/11/88 Crew: DR/PS/BO

Weather: OVERCAST, 42°F

Sampling Method: 1" STAINLESS STEEL BAILER (RISER BENT)

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
1:13 PM	15.12				
1:17 PM		7.30	10.6	1,330	clear, v. fine Sands, Sweet odor
1:19 PM		7.37	10.8	1,340	OPAQUE, Blk sediments, Sweet odor

COMMENTS: BEGINNING SAMPLE CLEAR BECOMING TURBID GRAY/BLACK WITH FINE SOLIDS AND SWEET ODOR

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 84-15

Type/Size Casing: PVC 2in.

Depth of Well from Top of Casing: 19.9 ft.

EVACUATION

Date: 10 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, HIGH WINDS, 50°F

Purge Method: Peristaltic Pump Provided by Frontier Chem. 1/4in. dedicated tubing

Time: 1:05 pm Water level from top of Riser (ft.): 16.26ft.

Volume of Standing Water (gal.): 0.594 Volume of Purged Water (gal.): 1.78

Description/Comments: (Mult. factor = 0.1632) 3.64 ft Standing water

water brown in color, turbid, Evacuation completed (≈1.78 gals)

SAMPLING Slight odor

Date: 11/11/88 Crew: DR/PS/BO

Weather: OVERCAST 42°F

Sampling Method: 1" STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
1:52pm	16.38				
2:03		8.78	11.5	19,900	TURBID BROWN, BROWN ppt.
2:04		8.83	13.6	>20,000	"

COMMENTS:

EFS Environmental Field Services sheet 1 of 2

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 84-16

Type/Size Casing: PVC 2.0 in.

Depth of Well from Top of Casing: 20.5 ft.

EVACUATION

Date: 11 NOV. 1988 Crew: DZ/PS

Weather: PTLY sunny to overcast, breezy 37°F

Purge Method: Suction Pump

Time: 11:00AM Water level from top of Riser (ft.): 18.09 ft

Volume of Standing Water (gal.): 0.393 Volume of Purged Water (gal.): 1.18

Description/Comments: (Mult. factor = 0.1632 gal/ft) 2.41 ft. standing H_2O
orangish-brown color, foaming evident Evacuation complete to dryness (± 0.5 gals)

SAMPLING

Date: 11/11/88 Crew:

Weather:

Sampling Method:

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (μmhos/cm)	Observations
2:59 p	19.92				

COMMENTS: ± 0.5 ft. of water at time of attempted sampling. Inadequate volume to sample. Not attempted this date.

EFS **Environmental Field Services** Sheet 2 of 2

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 84-16

Type/Size Casing: PVC 2.0 in.

Depth of Well from Top of Casing: 20.5 ft

EVACUATION

Date: 14 NOV. 1988 Crew: DR / PS

Weather: OVERCAST, breezy 48°F

Purge Method: Suction Pump

Time: 9:30 AM Water level from top of Riser (ft.): 18.18 ft.

Volume of Standing Water (gal.): 0.379 Volume of Purged Water (gal.): 1.14

Description/Comments: (Mult. factor = 1.1632 $\frac{gal}{ft}$) 2.32 ft. Standing H_2O

Water color orangish-Brown, foaming / Evacuation complete to dryness (± 0.5 gals)

SAMPLING

Date: 15 NOV. 1988 Crew: DR / PS

Weather: SUNNY 32°F

Sampling Method: 1.0 in. Stainless Steel bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
8:35	19.70				(orangish-Brown tint)
8:47		10.68	12.9	9,210	clear, v. fine Sands, Gravels
8:49		10.67	12.7	9,400	"

COMMENTS:

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 84-17

Type/Size Casing: 2in.

Depth of Well from Top of Casing: 18.6 ft.

EVACUATION

Date: 10 Nov. 1988 Crew: DR / PS

Weather: OVERCAST, Heavy winds, 52°F

Purge Method: Peristaltic Pump Provided by Frontier Chemical Corp. ¼in. ded.cated tub

Time: 12:45p Water level from top of Riser (ft.): 15.51 ft.

Volume of Standing Water (gal.): 0.504 Volume of Purged Water (gal.): 1.51

Description/Comments: (x factor: 0.1632) 3.09 ft. Standing H_2O

Evacuation complete (± 1.5 l gals), (water clear)

SAMPLING

Date: 11 NOV. 1988 Crew: DR/PS

Weather: Overcast, breezy 42°F

Sampling Method: 1" Stainless steel (obstruction ± 3' below Riser)

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
1:28	15.61				
1:45		7.22	10.6	3,820	Translucent Yellow, v. fine Sands
1:46		7.24	10.9	3,800	" faint Sewer Odo

COMMENTS: LIGHT SWEET ODOR

Obstruction in casing PVC ± 3.0' below Surface, 2" S.S. could not be used.

EFS **Environmental Field Services** 1 of 2

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 · 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-1A

Type/Size Casing: 1" O.D. PVC (3/4 in. I.D.)

Depth of Well from Top of Casing: 34.2 FT

EVACUATION

Date: 11/18/88 Crew: DR/RS

Weather: SUNNY, 40°F

Purge Method: PERISTALTIC PUMP & DEDICATED TUBING

Time: 10:43 AM Water level from top of Riser (ft.): 27.00 ft.

Volume of Standing Water (gal.): 0.16 Volume of Purged Water (gal.): 0.48

Description/Comments: 0.0625 ft. = [(0.0039 ft²)(1 ft)/4](7.481 gal/ft³) = (0.0229 gal/ft. MwH fac

7.2 ft. Standing H_2O / Clear, slight odor (sulfer) / Evacuation complete (± 0.5 gals)

SAMPLING

Date: 18 NOV. 1988 Crew: DR/PS

Weather: SUNNY 45°F

Sampling Method: (3/4 in. S.S. bailer)

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
1:56 PM	26.84				
2:20 P		7.40	16.3	2680	clear, strong odor (Sulfer)
2:25 P		7.38	17.0	2800	"

COMMENTS:

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87 - 1A

Type/Size Casing: PVC 3/4in. I.D.

Depth of Well from Top of Casing: 34.2 ft.

EVACUATION

Date: 22 NOV. 1988 Crew: PS/JB

Weather: OVERCAST, Slight breeze 38°F

Purge Method: Peristaltic Pump Provided by Frontier Chemical

Time: 12:50 PM Water level from top of Riser (ft.): 26.70

Volume of Standing Water (gal.): .17 Volume of Purged Water (gal.): .51

Description/Comments: (Mult. factor = 0.0229 gal/ft); clear [illegible]

Evacuation complete (± 0.5 gals)

SAMPLING

Date: 22 NOV. 1988 Crew: PS/JB

Weather: OVERCAST, slight breeze 38°F

Sampling Method: 3/4in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
2:10p	26.66 / 2:30p	7.14	9.8	2,620	clear, sulfur odor, few sediments
2:45		7.14	10.3	2,860	" " " "
2:30p		7.15	10.9	2,770	(1 OB) " " " "
2:45		7.18	11.3	2,850	(1 OB) " " " "

COMMENTS: All Samples taken from bottom of Well 1A (WELL REGAMPLED)

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-1B

Type/Size Casing: PVC ~~1.0 in.~~ 3/4 in. I.D.

Depth of Well from Top of Casing: 21.1 Ft

EVACUATION

Date: 11/9/88 Crew: DR/PS

Weather: Pt Cly Sunny, Slight breeze, 45°F

Purge Method: Peristaltic Pump provided by Frontier Chem.

Time: 3:50 p Water level from top of Riser (ft.): 17.0'

Volume of Standing Water (gal.): 0.0939 Volume of Purged Water (gal.): 0.28

Description/Comments: $\frac{\pi D^2 H}{4}$ $(0.0039\ ft^2)(1\ ft)/4) \times 7.481 = 0.0229\ \frac{gal}{ft}$

4.1 ft standing H_2O (water clear) / Evacuation complete ± 0.28 gals

CASING 3/4 in. I.D.

SAMPLING

Date: 11/10/88 Crew: DR/PS/RO

Weather: cloudy, windy 45°

Sampling Method: 1/2" stainless steel bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
2:39	16.90				
2:50		7.26	10.7	4,100	clear, v.fine Sands
2:59		7.33	11.2	4,800	clear, v.fine Sands

COMMENTS: Water was clear

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-1C

Type/Size Casing: PVC 1.0 in O.D. (3/4 in. I.D.)

Depth of Well from Top of Casing: 11.1 Ft

EVACUATION

Date: 11/9/88 Crew: DR/PS

Weather: Ptly sunny, slight breeze 45°F

Purge Method: Peristaltic Pump provided by Frontier Chem.

Time: 3:55 p. Water level from top of Riser (ft.): 6.84A

Volume of Standing Water (gal.): 0.096 Volume of Purged Water (gal.): 0.29

Description/Comments: 0.0229 GAL/FT used (calc on 87-1B sheet)
4.26 ft. Standing H_2O / WATER COLOR Black, NO apparent odor
EVACUATION complete to dryness (± 0.25 gals)

SAMPLING

Date: 11/10/88 Crew: DR/PS/RO

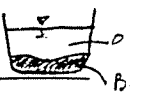
Weather: Cloudy, very windy ~ 45°

Sampling Method: ½" stainless steel Grab

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
2:25	6.47				(Yellowish tint)
229		7.70	10.8	4,420	TRANSLUCENT, v. fine Sands
236		7.84	12.2	4,270	OPAQUE, definite separation of Liquids (BLK color on bottom)

COMMENTS: Last pH Sample had oily sheen on surface.



EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87 - 2A

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 33.0 ft.

EVACUATION

Date: 07 NOV. 1988 Crew: DR / PS

Weather: OVERCAST 38°F, slight breeze

Purge Method: SUCTION PUMP

Time: 1:20 P Water level from top of Riser (ft.): 25.61

Volume of Standing Water (gal.): 0.678 Volume of Purged Water (gal.): 2.04

Description/Comments: 7.39 ft. Standing H_2O

Evacuation completed

SAMPLING

Date: 11/9/88 Crew: DR/PS/BO

Weather: OVERCAST 45°F

Sampling Method: STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:30AM	25.47	7.57	10.8	2,680	Nearly clear, f. fine Sands, part
9:32AM		7.47	11.0	2,930	nearly clear, v. fine sands floating particl

COMMENTS: NEARLY CLEAR WITH GRAY TINT

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87 - 2B

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 21.0 ft.

EVACUATION

Date: 07 NOV. 1988 Crew: DR / PS

Weather: OVERCAST 38°F, slight breeze

Purge Method: SUCTION PUMP

Time: 1:45 p Water level from top of Riser (ft.): 17.12 ft

Volume of Standing Water (gal.): 0.35L Volume of Purged Water (gal.): 1.07

Description/Comments: 3.88 ft. Standing H_2O

Evacuation Completed

SAMPLING

Date: 11/9/88 Crew: DR/PS/BO

Weather: OVERCAST 45°F

Sampling Method: STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:41AM	17.12	8.44	11.4	9,110	TURBID TAN, v. Fine Sands
9:43AM		8.78	12.7	8,730	clear, yellowish tint, v. fine Sands

COMMENTS: TURBID TAN COLOR WITH VERY FINE SANDS

Samples obtained, placed in cooler, tested after sampling Complete

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-2C

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 13.0 ft.

EVACUATION

Date: 07 NOV. 1988 Crew: DR / PS

Weather: OVERCAST 38°F, Slight breeze

Purge Method: SUCTION PUMP

Time: 2:00 P Water level from top of Riser (ft.): 6.86 ft

Volume of Standing Water (gal.): 0.564 Volume of Purged Water (gal.): 1.69

Description/Comments: 6.14 ft. Standing H_2O

Evacuation completed (pumped dry ± 0.5 gal)

SAMPLING

Date: 11/9/88 Crew: DR/PS/BO

Weather: OVERCAST 45°F

Sampling Method: STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:45	8.64				
9:49		7.85	12.1	1,670	TURBID yellowish, v. fine Sands
9:51		7.83	12.8	1,920	"

COMMENTS: well sample clear initially turning TURBID BROWN @ last sample, SOME V. fine Sands ppt.

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-3A

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 38.0 ft.

EVACUATION

Date: 07 NOVEMBER 1988 Crew: DR / PS

Weather: OVERCAST 38°F slight wind on/off RAIN

Purge Method: SUCTION PUMP

Time: 11:11 AM Water level from top of Riser (ft.): 27.14'

Volume of Standing Water (gal.): 0.997 Volume of Purged Water (gal.): 2.99

Description/Comments: 10.86ft. Standing H_2O
(Purging completed)

SAMPLING

Date: 11/9/88 Crew: DR/PS/BO

Weather: OVERCAST 45°F

Sampling Method: STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
~~10:27~~ 10:30AM	26.95	7.43	13.5	6,470	clear, v. fine Sands
10:32AM		7.47	14.1	11,040	clear, ppt. on bottom

COMMENTS: SAMPLE IS CLEAR LT TAN WITH FEW HEAVY SOLIDS

2 of 2

Supplemental Sheet

EFS Environmental Field Services

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-3A

Type/Size Casing: 1½" ID PVC

Depth of Well from Top of Casing: _____

EVACUATION

Date: _____ Crew: _____

Weather: _____

Purge Method: _____

Time: _____ Water level from top of Riser (ft.): _____

Volume of Standing Water (gal.): _____ Volume of Purged Water (gal.): _____

Description/Comments: _____

SAMPLING

Date: 11/10/88 Crew: DR/PS/RO

Weather: cloudy, windy, 45°

Sampling Method: 1" STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
3:19P	26.88				
3:34		7.36	11.8	8,000	Clear, v.fine sand
3:36		7.49	12.1	9,000	Clear, Rust colored sediments

COMMENTS: 87-3A SAMPLED 09 NOV. Had fluctuating SC
1ST SC taken that day was ± 6,000
2ND SC taken @ or near bottom of well was ± 11,000
1 pH/SC SAMPLE taken this date to verify Results 09 NOV.

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 ~~716-941-5644~~

MONITORING WELL SAMPLING FIELD SHEETS

SHEET 1 of 3

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-3B

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 20.0 ft.

EVACUATION

Date: 07 NOV. 1988 Crew: DR/PS

Weather: OVERCAST 38°F slight wind drizzle

Purge Method: SUCTION PUMP

Time: 11:23 AM Water level from top of Riser (ft.): 18.52 ft

Volume of Standing Water (gal.): 0.136 Volume of Purged Water (gal.): 0.41

Description/Comments: 1.48 ft. standing H2O

ISSCO pump

11:31 AM Ledy excavated trench to place foot valve into well, May have to use ISSCO pump for this well. foot valve will not fit

SAMPLING

Date: Crew:

Weather:

Sampling Method:

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations

COMMENTS:

Sheet 2 of 3

EFS Environmental Field Services

8397 BOSTON STATE ROAD · BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-3B

Type/Size Casing: PVC 1.5in.

Depth of Well from Top of Casing: 20.0ft.

EVACUATION

Date: 08 NOV, 1988 Crew: DZ / PS

Weather: OVERCAST, RAIN (Heavy @ Times) 42°F

Purge Method: Peristaltic Pump (?) Provided by Frontier Chemical Corp

Time: 1:18 P Water level from top of Riser (ft.): 18.94 ft

Volume of Standing Water (gal.): 0.097 Volume of Purged Water (gal.): 0.29

Description/Comments: ~~Casing 1.0 = 1 3/16 in.~~ PS ~~(0.00979 ft²(π)/4)(7.481 gal/ft) = 0.057~~ gal/ft

1.06 ft. Standing H_2O / Evacuation complete to dryness / water was turbid.

SAMPLING

Date: 11/9/88 Crew: DR/PS/BD

Weather: OVERCAST 45°F

Sampling Method: STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
~~10:??~~ 10:41AM	19.26	8.47	15.6	120.00	NEARLY CLEAR YELLOW
					BECOMING TURBID TAN
					THRU COLLECTION/
					ppt on Bottom after sample sat

COMMENTS: ONLY ABLE TO COLLECT 2VOA, 1 pH & SC, & ≅ 50ml FOR SOC & PHENOLS BEFORE WELL RAN DRY

Note: SC for sample time 10:41 lo possibly due to inadequate amt. of sample

NO Second sample for pH/SC available, well went dry

EFS **Environmental Field Services** (Supplemental Sheet)

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-3B

Type/Size Casing: 1½" ID PVC

Depth of Well from Top of Casing: _____

EVACUATION

Date: _____ Crew: _____

Weather: _____

Purge Method: _____

Time: _____ Water level from top of Riser (ft.): _____

Volume of Standing Water (gal.): _____ Volume of Purged Water (gal.): _____

Description/Comments: _____

SAMPLING

Date: 11/10/88 Crew: DR/PS/RO

Weather: cloudy, windy 45°

Sampling Method: 1" STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
3:22	16.74				

COMMENTS: NO pH/SC Sample obtainable due to low volume of H2O in well. ± 50 ml of H2O was obtained

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-3C

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 13.0 ft.

EVACUATION

Date: 07 NOV. 1988 Crew: DR/PS

Weather: OVERCAST 38°F, slight breeze, drizzle

Purge Method: SUCTION PUMP

Time: 11:59 a Water level from top of Riser (ft.): 6.70 ft

Volume of Standing Water (gal.): Volume of Purged Water (gal.):

Description/Comments: I.D. of BLK PVC NOT = 1.5 in (foot valve ~~[illegible]~~ FB could not enter.) / 4.3 ft. standing H_2O (PVC I.D = 1 5/16 in.)

ISCO pump

SAMPLING

Date: Crew:

Weather:

Sampling Method:

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations

COMMENTS:

SHEET 2 of 2

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-3C

Type/Size Casing: BLK PVC 1.5 in.

Depth of Well from Top of Casing: 13.0 ft.

EVACUATION

Date: 08 NOV. 1988 Crew: DR / PS

Weather: OVERCAST, RAIN (HEAVY @ TIMES) 41°F

Purge Method: Peristaltic Pump (?) Provided by Frontier Chem.

Time: 1:30 pm Water level from top of Riser (ft.): 6.94 ft

Volume of Standing Water (gal.): 0.348 Volume of Purged Water (gal.): 1.05

Description/Comments: CASING I.D. = 1 3/16 in. ≡ ((0.00979 ft² (π))/4)(7.481 gal/ft) = 0.0575
6.06' Standing H_2O / Evacuation complete (±1.05 gals)

SAMPLING

Date: 11/9/88 Crew: DR/PS/BO

Weather: OVERCAST 45°F

Sampling Method: STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
10:52 AM	6.68	8.56	14.9	10,120	Clear, Lt. Yellowish tint, v. fine Sand
10:52 AM		8.61	15.3	10,640	(3-OB) Clear, Lt. Yellow, v. fine Sand
10:55 AM		8.63	15.6	11,420	Translucent, tan, v. fine Sands
10:55 AM		8.61	17.1	11,560	(3-OB) Translucent, tan v. fine Sand

COMMENTS: CLEAR YELLOW TURNING TO OPAQUE RUST

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-3D

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 29.1 ft.

EVACUATION

Date: 07 NOV. 1988 Crew: DR / PS

Weather: OVERCAST 38°F, slight windy, drizzle

Purge Method: SUCTION Pump

Time: 12:25 p Water level from top of Riser (ft.): 26.06 ft

Volume of Standing Water (gal.): 0.279 Volume of Purged Water (gal.): 0.84 PS

Description/Comments: 3.04 ft. Standing H2O

(Evacuation completed)

SAMPLING

Date: 11/9/88 Crew: DR/PS/BO

Weather: OVERCAST 45°F

Sampling Method: STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
11:07	26.26	7.69	17.3	19,550	Clear
11:09		7.70	17.8	19,880	clear, v. fine Sands

COMMENTS: BEGINNING CLEAR BECOMING CLEAR WITH SOME FLOATING SOLIDS

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87 - 4A

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 25.0 ft.

EVACUATION

Date: 08 Nov. 1988 Crew: DR / PS

Weather: OVERCAST, RAIN (Heavy @ Times) 48°F

Purge Method: SUCTION PUMP

Time: 1:51 p Water level from top of Riser (ft.): 22.89 ft.

Volume of Standing Water (gal.): 0.194 Volume of Purged Water (gal.): 0.58

Description/Comments: 2.11 ft. Standing H_2O

Evacuation completed (± 0.58 gals.)

SAMPLING

Date: 11/9/88 Crew: DR/PS/BO

Weather: OVERCAST 45°F

Sampling Method: STAINLESS STEEL BAILER

Field Measurements:

Time 2.0	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
11:43 AM	22.98	10.96	17.3	>20,000	opaque, orange-brown, odor appa
11:48 AM		10.34	17.6	>20,000	

COMMENTS: BEGINNING CLEAR AMBER BECOMING TURBID BROWN/TAN

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-4B

Type/Size Casing: PVC 1.5in.

Depth of Well from Top of Casing: 14.0 ft.

EVACUATION

Date: 17 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, WINDY 45°F

Purge Method: Peristaltic Pump Provided by Frontier Chem.

Time: 4:28 PM Water level from top of Riser (ft.): 7.07ft

Volume of Standing Water (gal.): 0.164 Volume of Purged Water (gal.): 1.9

Description/Comments: (Mult. factor = 0.0918 gal/ft.) 6.93ft. Standing H2O

Clear, lt. Yellow-Brown tint, NAPL odor / evacuation complete (±2 gals)

SAMPLING

Date: 18 NOV. 1988 Crew: DR/PS

Weather: SUNNY 42°F

Sampling Method: 1.0in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
3:53p	6.84				
4:00p		7.68	17.0	7,690	Clear, med. odor, med. Yellow-Brown tint
4:02		7.65	16.9	7,800	"
4:09		7.71	17.7	7,770	(40B) NAPL Present, Surface sheen, Strong odor
4:11		7.71	17.6	8,000	(40B) translucent, lt. orange BTL

COMMENTS: NAPL stuck to tether and side of bailer

EFS Environmental Field Services
8397 BOSTON STATE ROAD, BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87 - 5A

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 37.0 ft.

EVACUATION

Date: 07 NOV. 1988 Crew: DR/PS

Weather: PTLY Sunny, breezy, 40°F

Purge Method: Suction pump

Time: 3:50 p Water level from top of Riser (ft.): 29.12 f

Volume of Standing Water (gal.): 0.723 Volume of Purged Water (gal.): 2.17

Description/Comments: 7.38 ft. standing wate / Blockage encountered when placing foot valve into well (NOT evacuated this date)

ISSCO pump

SAMPLING

Date: Crew:

Weather:

Sampling Method:

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations

COMMENTS:

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-5A

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 37.0 ft.

EVACUATION

Date: 08 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, RAIN (HEAVY @ TIMES) 41°F

Purge Method: Peristaltic Pump Provided by Frontier Chemical

Time: 2:30 P Water level from top of Riser (ft.): 29.08 ft

Volume of Standing Water (gal.): 0.727 Volume of Purged Water (gal.): 2.18

Description/Comments: 7.92 ft. Standing H2O

Evacuation complete (± 2.18 gals), Sulphur odor apparent, water clear, cool

SAMPLING

Date: 11/9/88 Crew: DR/PS/BO

Weather: PARTLY CLOUDY 48°F

Sampling Method: STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
12:36 PM	29.10	7.26	17.4	3,120	Clear, v. fine sands, odor pres. (Sulp
12:38 PM		7.36	18.1	4,520	clear, greenish tint, v. fine Sand odor pres (Sulphur

COMMENTS: STARTING OFF WITH CLEAR SAMPLES AND SULFUR ODOR BECOMING TURBID BLUE/BLACK WITH FINE SOLIDS AND HEAVY SULFUR ODOR

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-5B

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 58.0 ft.

EVACUATION

Date: 07 NOV. 1988 Crew: DR / PS

Weather: PTLY SUNNY, BREEZY 40°F

Purge Method: SUCTION PUMP

Time: 3:53p Water level from top of Riser (ft.): 29.10 ft

Volume of Standing Water (gal.): 2.65 Volume of Purged Water (gal.): 7.96

Description/Comments: 28.9 ft. Standing H_2O / due to excessive depth and limited daylight evacuation of well will be attempted 08 NOV. 1988.

SAMPLING

Date: Crew:

Weather:

Sampling Method:

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations

COMMENTS:

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-5B

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 58.0 ft.

EVACUATION

Date: 08 Nov. 1998 Crew: DE/PS

Weather: OVERCAST, RAIN (Heavy @ times) 41°F

Purge Method: Peristaltic Pump Provided By Frontier Chemical

Time: 2:55 p Water level from top of Riser (ft.): 28.84f

Volume of Standing Water (gal.): 2.68 Volume of Purged Water (gal.): 8.03

Description/Comments: 29.16 ft. standing Wate / Pump seemed to have broken, Rudy will have fixed 09 NOV. am. ± 0.375 gals removed today

SAMPLING

Date: Crew:

Weather:

Sampling Method:

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations

COMMENTS:

Sheet 3 of 4

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-5B

Type/Size Casing: 1½" PVC PIPE

Depth of Well from Top of Casing: 58.0 ft

EVACUATION

Date: 11/9/88 Crew: DR/PS

Weather: PARTLY SUNNY 48°F

Purge Method: PERISTALTIC PUMP WITH ¼" I.D. POLYETHYLENE TUBING Provided by Frontier Chemical

Time: 3:15p Water level from top of Riser (ft.): 28.92A.

Volume of Standing Water (gal.): 2.67 Volume of Purged Water (gal.): 0.01

Description/Comments: 29.08 ft. ∫ Standing H₂O

Once ABAM pump did not do adequate job once depth Reached +30.0'
±0.375 gals Removed

SAMPLING

Date: Crew:

Weather:

Sampling Method:

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations

COMMENTS:

SHEET 4 of 4

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-5B

Type/Size Casing: PVC 1.5in.

Depth of Well from Top of Casing: 58.0ft.

EVACUATION

Date: 10 NOV. 1988 Crew: DR/PS

Weather: OVERCAST RAIN, Heavy @ times 50°F

Purge Method: SUCTION Pump / (TEFL)

Time: 9:50 AM. Water level from top of Riser (ft.): 28.52ft

Volume of Standing Water (gal.): 2.71 Volume of Purged Water (gal.): 8.12

Description/Comments: 29.48ft. Standing water

water initially clear / ODOR (Sulfur), During Evacuation water turned to a black color

Evacuation complete to dryness (±2.0 gals)

SAMPLING

Date: 11/11/88 Crew: DR/PS/BO

Weather: OVERCAST 45°F

Sampling Method: 1" STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
12:38	27.65				
12:44		7.27	10.6	3,450	clear, lt. grey tint, Strong Sulfer odor
12:45		7.29	11.1	3,750	" "

COMMENTS: Distinct sulphur odor

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-5C

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 27.0 ft.

EVACUATION

Date: 07 NOV. 1988 Crew: DR/PS

Weather: PTLY SUNNY, breezy 40°F

Purge Method: SUCTION PUMP

Time: 3:35 p Water level from top of Riser (ft.): 24.44ft

Volume of Standing Water (gal.): 0.255 Volume of Purged Water (gal.): 0.71

Description/Comments: 2.56 ft. standing water

Evacuation complete to dryness, ± 0.375 gals. Removed
clear grit Red color associated w/ water.

SAMPLING

Date: 11/9/88 Crew: DR/PS/BO

Weather: PARTLY CLOUDY 47°F

Sampling Method: STAINLESS STEEL BAILER

Field Measurements:

Time ~~12:45~~	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
12:49 PM	25.26	6.93	17.5	5,500	clear, lt. yellowish tint, ppt. (5-08)
12:50 PM		6.94	18.1	5,480	(5-08) "
12:55 PM		7.07	19.1	6,280	clear, lt. yellowish tint, ppt (5-08)
12:56 PM		7.12	19.9	6,260	(5-08) "

COMMENTS: SAMPLE STARTING OFF CLEAR BECOMING CLEAR WITH FLOATING RUST COLORED SOLIDS TURNING TO OPAQUE WITH LIGHT RUST COLOR AND FEW FINE SOLIDS

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-5D

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 14.0 ft.

EVACUATION

Date: 07 NOV. 1988 Crew: DR/PS

Weather: Fly sunny, breezy, 40°F

Purge Method: Suction Pump

Time: 3:30 p Water level from top of Riser (ft.): 7.08ft.

Volume of Standing Water (gal.): 0.635 Volume of Purged Water (gal.): 1.5l

Description/Comments: 6.92 ft. Standing water.

Evacuation complete, pumped dry ± 1.75 gal. water was TURBID

SAMPLING

Date: 11/9/88 Crew: DR/PS/BO

Weather: Partly Cloudy, 47°F

Sampling Method: STAINLESS STEEL BAILER

Field Measurements:

Time 00	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
1:02PM	6.98	7.55	18.6	1,100	Translucent, lt. yellow, v fine Sand
1:04PM		7.47	19.0	1,150	"

COMMENTS: STARTING OFF WITH CLEAR SAMPLE GRADING THROUGH TO A TURBID LIGHT ROST SAMPLE WITH VERY FINE SANDS

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 87-28

Type/Size Casing: PVC 1.5 in.

Depth of Well from Top of Casing: 28.4 ft.

EVACUATION

Date: 07 NOV. 1988 Crew: DR/PS

Weather: PTLY SUNNY, breezy 40°F

Purge Method: SUCTION PUMP

Time: 2:33 P Water level from top of Riser (ft.): 23.60ft

Volume of Standing Water (gal.): 0.44 Volume of Purged Water (gal.): 1.32

Description/Comments: 4.0ft. Standing water

Evacuated to dryness

SAMPLING

Date: 11/9/88 Crew: DR/PS/BO

Weather: PARTLY SUNNY 45°F

Sampling Method: STAINLESS STEEL BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
~~12:00~~					
12:14PM	26.70	7.62	20.4	>20,000	clear, lt. yellowish tint, v. fine sand
12:16PM		7.57	19.8	>20,000	Turbid (yellowish), v. fine sand

COMMENTS: BEGINNING AS CLEAR LIGHT YELLOW SAMPLE BECOMING TURBID TAN WITH FEW FINE SANDS

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-10B

Type/Size Casing: Stainless Steel 2.0 in.

Depth of Well from Top of Casing: 13.6 ft.

EVACUATION

Date: 14 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, breezy 48°F

Purge Method: Suction Pump

Time: 9:55 AM Water level from top of Riser (ft.): 13.68 ft.

Volume of Standing Water (gal.): _____ Volume of Purged Water (gal.): _____

Description/Comments: (Mult. factor = 0.1632 $\frac{gal}{ft}$) / (WELL IS dry)

SAMPLING

Date: 15 NOV. 1988 Crew: DR/PS

Weather: SUNNY 40°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations

COMMENTS: dry well 14 NOV.

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-1A

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 20.2 ft.

EVACUATION

Date: 14 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, breezy 48°F

Purge Method: Suction Pump

Time: 10:03 AM Water level from top of Riser (ft.): 14.62 ft.

Volume of Standing Water (gal.): 3.64 Volume of Purged Water (gal.): 10.92

Description/Comments: (Mult. factor = 0.6528 gal/ft) 5.58 ft. Standing H_2O

Evacuation complete (± 10.92 gals) (clear, few sediment flakes)

SAMPLING

Date: 11-88 Crew: DR / PS

Weather: sunny, 40°F

Sampling Method: 1" stainless steel bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
10:17AM	14.68				
10:25AM		7.11	14.8	1,730	clear,
10:27AM		7.15	14.9	1,730	clear,

COMMENTS: CLEAR

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-1B

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 28.6 ft.

EVACUATION

Date: 14 NOV. 1988 Crew: DE / PS

Weather: OVERCAST, breezy, 48°F

Purge Method: SUCTION Pump

Time: 9:56 AM Water level from top of Riser (ft.): 23.30ft.

Volume of Standing Water (gal.): 3.46 Volume of Purged Water (gal.): 10.4

Description/Comments: (Mult. factor: 0.1628 $\frac{\text{Gal}}{\text{Ft.}}$) 5.3ft. standing H_2O
Evacuation complete (± 10.4 gals), initially cloudy, turning clear

SAMPLING

Date: 15 NOV 1988 Crew: DE / PS

Weather: SUNNY 40°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
10:31AM	23.34				
10:35AM		6.96	14.4	1,980	clear
10:37AM		7.02	14.4	1,970	clear, v. fine sands

COMMENTS: CLEAR WITH FEW FINE SANDS

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-20B

Type/Size Casing: 2.0in S.S.

Depth of Well from Top of Casing: 16.9 ft.

EVACUATION

Date: 17 NOV. 1988 Crew: DR / PS

Weather: OVERCAST, WINDY 40°F

Purge Method: Suction Pump

Time: 1:52PM Water level from top of Riser (ft.): 16.38

Volume of Standing Water (gal.): 0.1 Volume of Purged Water (gal.): 0.3

Description/Comments: (Mult. factor = 0.1632 (gal/ft.)) PURGED DRY (@ 0.3GAL)

TURBID BROWN WITH ORGANICS, SURFACE FOAM & SOLVENT ODOR

SAMPLING

Date: 18 NOV. 1988 Crew: DR / PS

Weather: SUNNY 42°F

Sampling Method: 1.0in. S.S. ~~BAILER~~

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
2:57p	16.38				DARK RED-BROWN
3:12p		11.65	18.7	15,200	NAPL, SURFACE SHEEN, STRONG ODOR
3:14p					NO SAMPLE RECOVERED

COMMENTS: WELL WENT dry @ last sample.

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: BB-2A

Type/Size Casing: OPEN 4" dia.

Depth of Well from Top of Casing: 23.3 ft.

EVACUATION

Date: 17 Nov. 1995 Crew: JZ / TS

Weather: [illegible], WIND 40°F

Purge Method: SUCTION PUMP

Time: 2:51 PM Water level from top of Riser (ft.): 13.1

Volume of Standing Water (gal.): 5.5 Volume of Purged Water (gal.): 10.4

Description/Comments: (Mult. factor = 0.6528 gal/ft) [illegible], SOLVENT-LIKE ODORS

SAMPLING

Date: [illegible] Crew: JZ / TS

Weather: SUNNY 42°F

Sampling Method: T.D.M. S.S. BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
2:54	15.78				
3:38		10.09	17.1	12,540	clear, med Fed-Brwn ODOR
3:40		10.09	17.1	12,300	"
[illegible]		10.13	17.1	12,920	" , surface sheen
3:42		10.13	17.5	12,740	NAPL present on Both

COMMENTS:

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-2B

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 32.1 ft.

EVACUATION

Date: 17 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, WINDY 40°F

Purge Method: SUCTION PUMP

Time: 2:50PM Water level from top of Riser (ft.): 25.88

Volume of Standing Water (gal.): 4.1 Volume of Purged Water (gal.): 12.2

Description/Comments: (Mult. factor = 0.6528 GAL/FT.)
EVACUATION (complete (12.2 gals) / brownish-BLK color slight odor

SAMPLING

Date: 18 NOV. 1988 Crew: DR/PS

Weather: SUNNY 45°F

Sampling Method: 1.0 in S.S. BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
2:58	25.98				
3:04 P		8.36	16.3	7,600	clear, v. [illegible]
3:07P		8.40	16.9	7,950	"

COMMENTS:

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-3A

Type/Size Casing: 4"ϕ OPEN HOLE

Depth of Well from Top of Casing: 23.3 FT

EVACUATION

Date: 11/16/88 Crew: DR/PS

Weather: OVERCAST 66°F

Purge Method: SUCTION PUMP WITH 3/8" TUBING

Time: 4:03PM Water level from top of Riser (ft.): 18.18

Volume of Standing Water (gal.): 3.3 Volume of Purged Water (gal.): 10.0 GAL

Description/Comments: (MULT. FACTOR .6528 GAL/FT)
Evacuation complete (± 8.3 gals) / dry) ORANGEish-Brown color, lt. foamy, oily sheen on surface.

SAMPLING

Date: 17 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, WINDY RAIN, SLEET 40°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
10:13AM	18.36				
10:18AM		12.74	13.9	>20,000	ODOR, clear, Med. Reddish-Brown
10:20AM		12.73	14.3	>20,000	" , v. fine sand

COMMENTS: (ECCO conductivity meter not available)

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-3B

Type/Size Casing: 4" ϕ OPEN HOLE

Depth of Well from Top of Casing: 33.2 FT

EVACUATION

Date: 11/16/88 Crew: DR/PS

Weather: OVERCAST 66°F

Purge Method: SUCTION PUMP WITH 3/8" ID TUBING

Time: 4:02 PM Water level from top of Riser (ft.): 27.40

Volume of Standing Water (gal.): 3.8 Volume of Purged Water (gal.): 11.4

Description/Comments: MULT FACTOR (.6525 GAL/FT)

EVACUATION Complete (± 11.5 gals) / MED. ORANGISH-BROWN color, STRONG FOAMING

SAMPLING

Date: 17 NOV. 1988 Crew: DR / PS

Weather: OVERCAST, WINDY, RAIN, SLEET 40°F

Sampling Method: 1.D.n. S.S. Bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
10:14AM	27.74				
10:25 AM		10.57	13.8	16,350	clear, lt. golden-brown, odor
10:26AM		10.56	14.2	16,600	" , v. fine sands

COMMENTS:

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88 - 4DB

Type/Size Casing: S.S. 2.0 in.

Depth of Well from Top of Casing: 13.1 ft.

EVACUATION

Date: 14 Nov. 1988 Crew: DR / PS

Weather: OVERCAST, breezy 50°F

Purge Method: Suction Pump

Time: 11:10 AM Water level from top of Riser (ft.): 4.94ft.

Volume of Standing Water (gal.): 1.33 Volume of Purged Water (gal.): 3.995

Description/Comments: (Mult. factor = 0.1632 $\frac{gal}{ft}$) 8.16 ft. Standing H_2O

Evacuation complete to dryness (± 1.80 gals)

SAMPLING

Date: 15 NOV. 1988 Crew: DR / PS

Weather: SUNNY 42°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
10:50A	5.10				
10:54		7.17	14.6	1,460	clear
10:55		7.21	14.4	1,480	clear,

COMMENTS:

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-4B

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 28.4 ft.

EVACUATION

Date: 14 NOV. 1988. Crew: DR / PS

Weather: OVERCAST, BREEZY 50°F

Purge Method: Suction Pump

Time: 11:12 AM Water level from top of Riser (ft.): 26.48ft

Volume of Standing Water (gal.): 1.25 Volume of Purged Water (gal.): 3.76

Description/Comments: (Mult. factor = 0.6528 gal/ft.) 1.92 ft. Standing H_2O

EVACUATION Complete (± 3.76 gals), BLK color, Strong Sulfe odor

SAMPLING

Date: 15 NOV. 1988 Crew: DR / PS

Weather: SUNNY 42°F

Sampling Method: 1.0 in. S.S. Bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations (Field)	(LAB)
11:14A	26.46					
11:19A		8.80	15.9	1,980	clear amber, sulfur odor	TRANSLUCENT, V. fine Sands, Sulfur odor
11:21A		8.77	16.0	2,000	w/fine & coarse sands	Greenish-Blue tint

COMMENTS:

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 90-4C

Type/Size Casing: S.S. 2.0 in.

Depth of Well from Top of Casing: 58.3 ft.

EVACUATION

Date: 14 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, breezy, 50°F

Purge Method: SUCTION Pump

Time: 11:15 AM Water level from top of Riser (ft.): 24.32 FT

Volume of Standing Water (gal.): 5.55 Volume of Purged Water (gal.): 16.6

Description/Comments: (Mult. factor = 0.1632 $\frac{GAL}{FT}$) 33.98 ft. Standing H_2O
Evacuation complete (± 16.6 gals) initially turbid, clear @ end

SAMPLING

Date: 15 NOV. 1988 Crew: DR/PS

Weather: SUNNY 42°F

Sampling Method: 1.0 in. S.S. Bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
11:25AM	23.13				(FIELD/LAB)
11:29A		7.01	15.9	4,250	clear, sulfur odor (from
11:30A		7.00	16.2	4,370	particulates

COMMENTS:

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-5B

Type/Size Casing: 4" ϕ OPEN

Depth of Well from Top of Casing: 34.0FT

EVACUATION

Date: 11/18/88 Crew: DR/PS

Weather: SUNNY, 40°F

Purge Method: SUCTION PUMP AND DEDICATED TUBING

Time: 9:03AM Water level from top of Riser (ft.): 26.48

Volume of Standing Water (gal.): 2.9 Volume of Purged Water (gal.): 14.7

Description/Comments: (WELL FACTOR .6528 GAL/FT) 7.52 ft. STANDING H2O

Well was found with frozen water initially / EVACUATION COMPLETE (≈14.7 gals)

SAMPLING

Date: 18 NOV. 1988 Crew: DR/PS

Weather: SUNNY, 45°F

Sampling Method: 1.0in S.S. BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
12:54	26.40				
12:58P		11.13	14.8	>20,000	ODOR, TRANSLUCENT, LT. RED-BROWN TINT
1:00P		11.22	15.4	>20,000	"
1:02P		11.31	14.6	>20,000	(SOB) "
1:03P		11.30	15.1	>20,000	(SOB) "

COMMENTS: (ECCO conductivity meter not available)

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-5C

Type/Size Casing: Steel 3.0 in.

Depth of Well from Top of Casing: 60.6 ft.

EVACUATION

Date: 14 NOV. 1988 Crew: DE / PS

Weather: Sunny, windy 56°F

Purge Method: Suction Pump

Time: 1:40 pm Water level from top of Riser (ft.): 25.54 ft.

Volume of Standing Water (gal.): 12.9 Volume of Purged Water (gal.): 38.6

Description/Comments: (Mult. factor = 0.3672 gal/ft.) 35.06 ft. standing H_2O

PURGED 39 GAL. SAMPLE STARTED OFF TURBID BLACK WITH SULFUR ODOR. BECAME NEARLY CLEAR WITH GRAY TINT & SULFUR ODOR. WELL BECAME TURBID BLACK AFTER 4 MIN. STOPPAGE TO EMPTY 5 GAL BUCKET

SAMPLING

Date: 15 NOV. 1988 Crew: DE / PS

Weather: SUNNY 33°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
900 A	24.68				ODOR PRESENT (Sulfer)
906 A		7.18	12.4	4,570	OPAQUE BLK color, ppt.
907 A		7.17	12.3	4,570	"

COMMENTS: BLK color initially, odor present (Sulfer)

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-6 OB

Type/Size Casing: 2.0in S.S.

Depth of Well from Top of Casing: 18.1 ft.

EVACUATION

Date: 16 NOV. 1988 Crew: PS/DR

Weather: OVERCAST, RAIN 55°F

Purge Method: SUCTION PUMP

Time: 3:14 PM Water level from top of Riser (ft.): 12.28

Volume of Standing Water (gal.): 0.9 Volume of Purged Water (gal.): 2.8

Description/Comments: (Mult factor = 0.1632 $\frac{Gal}{Ft.}$) EVACUATED TO DRYNESS (± 1 GAL)

TURBID BROWN, CHEM ODOR, SURFACE SHEEN, SOME FOAM

SAMPLING

Date: 11/17/88 Crew: DR/PS

Weather: OVERCAST, WINDY, 40°F

Sampling Method: 1.0" S.S. BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
10:44AM	14.42				
10:51A		9.70	14.1	15,400	Clear, odor, MED. DK Reddish-BRN.
10:52A		9.70	14.9	15,520	" V. fine sands

COMMENTS:

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88 - 6A

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 24.7 ft.

EVACUATION

Date: 16 NOV. 1988 Crew: PS / DR

Weather: OVERCAST, RAIN 55°F

Purge Method: SUCTION PUMP

Time: 3:15 PM Water level from top of Riser (ft.): 23.06

Volume of Standing Water (gal.): 1.1 Volume of Purged Water (gal.): ~~3.9~~ 3.3

Description/Comments: (Mult. Factor = 0.6528 GAL/FT.). EVACUATED TO DRYNESS (± 1.0 GAL)
CLOUDY BROWN WITH SLIGHT FOAM

SAMPLING

Date: 11/17/88 Crew: DR/PS

Weather: OVERCAST, WINDY, 40°F

Sampling Method: 1.1" S.S. BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
10:45A	23.32				
10:58A		11.01	14.6	> 20,000	Clear, Yellow color, Strong odor
10:59A		10.96	16.0	> 20,000	" v. fine Sands

COMMENTS: (ECCO conductivity meter not available)

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-6B

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 34.5 ft.

EVACUATION

Date: 16 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, RAIN 55°F

Purge Method: SUCTION PUMP

Time: 3:16 PM Water level from top of Riser (ft.): 28.64

Volume of Standing Water (gal.): 3.8 Volume of Purged Water (gal.): 11.5

Description/Comments: (Mult. factor = 0.6528 $\frac{\text{Gal}}{\text{Ft.}}$) EVACUATED APPROX 11.5 GAL.
TURBID BROWN, SLIGHT EFFERVESENCE

SAMPLING

Date: 11/17/88 Crew: DR/PS

Weather: OVERCAST, WINDY, 40°F

Sampling Method: 1.0" S.S. BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
10:46AM	29.00				
11:05A		10,84	15,0	18,800	Clear, faint odor, Med. Yellow-Brown
11:06A		10,84	15.7	19,000	"

COMMENTS:

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-70B

Type/Size Casing: S.S. 2.0in.

Depth of Well from Top of Casing: 15.90 FT

EVACUATION

Date: 17 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, RAIN/SLET, WINDY 40°F

Purge Method: SUCTION PUMP

Time: 2:04 PM Water level from top of Riser (ft.): 5.58

Volume of Standing Water (gal.): 1.7 Volume of Purged Water (gal.): 5.1

Description/Comments: (Mult. factor = 0.1632 $\frac{Gal}{Ft}$) PUMPED DRY (±2.0GAL)
DARK RED/BROWN STRONG FOAMING

SAMPLING

Date: 18 NOV. 1988 Crew: DR/PS

Weather: SUNNY 44°F

Sampling Method: 1.0in S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
12:03p	5.86	(11.65)		(10,700)	
12:28		~~11.77~~	13.3	~~7,700~~	OPAQUE, DK BROWN,
12:29		11.68	13.9	10,850	"

COMMENTS: 12:28 sample was re-checked after significant increase in SC on 12:29 sample. Corrected values are circled.

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-7A

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 22.0 ft.

EVACUATION

Date: 17 NOV. 1988 Crew: DE/PS

Weather: OVERCAST, RAIN/SLEET, WINDY 40°F

Purge Method: Suction Pump

Time: 2:02 PM Water level from top of Riser (ft.): 18.10

Volume of Standing Water (gal.): 2.5 Volume of Purged Water (gal.): 7.6

Description/Comments: (Mult. factor = 0.6523 gal/ft.)

Evacuation complete to dryness (±3.1 gals) / TURBID BROWN, STRONG FUEL ODOR

SAMPLING

Date: 18 NOV. 1988 Crew: DE/PS

Weather: SUNNY 44°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
12:11 12:00 P	18.42	10.19	12.9	15,600	Clear, ODOR, med. Red-Brown fine
12:12		10.19	12.7	16,600	"
12:13		10.18	12.6	16,500	(DUPLICATE #88-7C) ", v. fine Sand
12:15		10.18	13.6	16,870	TRANSLUCENT, many v. fine Sand Red-Brown, ODOR

COMMENTS: Duplicate sampled from bottom of well

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 80 - 7B

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 31.7 ft.

EVACUATION

Date: 17 NOV. 1988 Crew: DR / PS

Weather: OVERCAST, RAIN/SLEET, WINDY 40°F

Purge Method: Suction Pump

Time: 2:03PM Water level from top of Riser (ft.): 26.89

Volume of Standing Water (gal.): 3.1 Volume of Purged Water (gal.): 9.4

Description/Comments: (Mult. factor = 0.6528 gal/ft.) PURGED (± 9.5 GAL) CLOUDY TO TURBID BROWN/AMBER, FAST DISSIPATING IRON SURFACE SHEEN

SAMPLING

Date: 18 NOV. 1988 Crew: DR / PS

Weather: SUNNY 44°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
12:02p	27.02				
12:22		10.08	13.1	14,000	clear, med. yellow, fine sand
12:23		10.03	13.8	13,750	" , v. fine sand

COMMENTS:

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88 - 8 OB

Type/Size Casing: 2.0 in. S.S.

Depth of Well from Top of Casing: 16.1 ft.

EVACUATION

Date: 15 NOV. 1988 Crew: DR / PS

Weather: SUNNY ~~48~~ 53 °F

Purge Method: Suction Pump

Time: 3:52 pm Water level from top of Riser (ft.): 7.31 ft.

Volume of Standing Water (gal.): 1.43 Volume of Purged Water (gal.): 4.3

Description/Comments: (Mult. factor: 0.1632 gal/ft.) 8.79 ft. Standing H2O

Evacuation complete to dryness (± 3.1 gals) / lt. brownish Brwn, strong foaming Action

SAMPLING

Date: 16 NOV. 1988 Crew: DR / PS

Weather: OVERCAST 58°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:39 AM	7.26	7.65	17.2	13,950	
~~9:47 A~~		~~7.88 PS~~	~~16.5 PS~~	~~13,750 PS~~	Clear, Yellowish tint, v. fine sand, odor
~~9:48 A~~		~~7.22 PS~~	~~16.7 PS~~	~~13,450 PS~~	"
		7.67	17.2	13,960	

COMMENTS: CLEAR MEDIUM YELLOW WITH CHEMICAL ODOR AND FEW PARTICULATES

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-8A

Type/Size Casing: OPEN 4.0in.

Depth of Well from Top of Casing: 22.7 ft.

EVACUATION

Date: 15 NOV. 1988 Crew: DR / PS

Weather: SUNNY 53°F

Purge Method: SUCTION PUMP

Time: 3:51 PM Water level from top of Riser (ft.): 18.03ft.

Volume of Standing Water (gal.): 3.05 Volume of Purged Water (gal.): 9.15

Description/Comments: (Mult. factor = 0.6528 gal/ft.) 4.67 ft. standing WATER EVACUATION complete (± 9.2 gals) / med ORANGISH-BROWN, strong effervescence

SAMPLING

Date: 16 NOV. 1988 Crew: DR / PS

Weather: OVERCAST 58°F

Sampling Method: 1.0in. S.S. Bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:40AM	17.86				
9:52A		9.28	16.3	9,350	clear, yellowish tint, v. fine sands, odor
9:53A		9.29	16.7	9,450	"

COMMENTS: CLEAR MEDIUM YELLOW WITH CHEMICAL ODOR AND FEW PARTICULATES

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88 - 8 B

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 32.6 ft.

EVACUATION

Date: 15 NOV. 1988 Crew: PS / DR

Weather: SUNNY 53°F

Purge Method: SUCTION PUMP

Time: 3:50 PM Water level from top of Riser (ft.): 27.55 ft.

Volume of Standing Water (gal.): 3.30 Volume of Purged Water (gal.): 9.89

Description/Comments (Mult. factor = 0.6528 gal/ft.) 5.05 ft. Standing H_2O

PURGED (± 10 GAL) CLOUDY TAN TO CLEAR TAN

SAMPLING

Date: 16 NOV. 1988 Crew: DR / PS

Weather: OVERCAST 58°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:41 AM	27.52				
9:58 A		7.01	16.9	2320	Clear, few v. fine sand
9:59 A		7.07	17.2	2,410	"

COMMENTS: CLEAR WITH FEW PARTICULATES

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-9 OB

Type/Size Casing: S.S. 2.0in.

Depth of Well from Top of Casing: 16.8ft.

EVACUATION

Date: 16 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, RAIN 56°F

Purge Method: SUCTION PUMP

Time: 1:38PM Water level from top of Riser (ft.): 13.34

Volume of Standing Water (gal.): 0.56 Volume of Purged Water (gal.): 1.7

Description/Comments: (Mult. factor: 0.1632 $\frac{GAL}{ft}$)

EVACUATION complete to dryness (±1.0 gals) / TURBID BROWN

SAMPLING

Date: 17 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, RAIN 41°F (MUDDY)

Sampling Method: 1.0in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:12 A	14.12				
9:25A		9.09	12.0	11,250	CLEAR, LT YELLOW, FINE SANDS
9:26A		9.11	12.8	11,700	"

COMMENTS:

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-9A

Type/Size Casing: OPEN 4.0in.

Depth of Well from Top of Casing: 25.2 ft.

EVACUATION

Date: 16 NOV. 1988 Crew: PS/DR

Weather: OVERCAST, RAIN 56°F

Purge Method: SUCTION PUMP

Time: 1:39 PM Water level from top of Riser (ft.): 20.50

Volume of Standing Water (gal.): 3.1 Volume of Purged Water (gal.): 9.2

Description/Comments: (Mult. factor = 0.6528 $\frac{GAL}{FT}$) EVACUATED TO DRYNESS (±2.9 GAL)
CLOUDY BROWN WITH HEAVY FOAM & CHEMICAL ODOR

SAMPLING

Date: 17 NOV. 1988 Crew: DR/PS

Weather: OVERCAST, WINDY, RAIN 41°F

Sampling Method: 1.0in. S.S. Bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:13A	23.72				
9:31A		12.14	12.2	12,300	Translucent orange-brown, ppt.
9:32A		12.16	12.9	12,550	faint odor

COMMENTS:

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88 - 9B

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 32.9 ft.

EVACUATION

Date: 16 NOV. 1988 Crew: DR / PS

Weather: OVERCAST, RAIN 56°F

Purge Method: SUCTION PUMP

Time: 1:40 PM Water level from top of Riser (ft.): 27.88

Volume of Standing Water (gal.): 3.3 Volume of Purged Water (gal.): 9.8

Description/Comments: (Mult. factor : 0.6528 gal/ft.)

EVAUATION complete (± 9.8 gals) / green in color, mod. effervecence.

SAMPLING

Date: 17 NOV. 1988 Crew: DR / PS

Weather: OVERCAST, WINDY, RAIN 41°F

Sampling Method: 1.0 in. SS. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:14 AM	28.08				
9:37 AM		10.16	12.2	10,680	clear, greenish-yellow tint, sl
9:39 AM		10.11	12.4	10,900	"

COMMENTS:

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-10 OB

Type/Size Casing: S.S. 2.0 in.

Depth of Well from Top of Casing: 14.3 ft.

EVACUATION

Date: 14 NOV. 1988 Crew: DR/PS

Weather: SUNNY, WINDY 58°F

Purge Method: Suction pump

Time: 1:51 PM Water level from top of Riser (ft.): 7.18 ft.

Volume of Standing Water (gal.): 1.16 Volume of Purged Water (gal.): 3.49

Description/Comments: (Mult. factor = 0.1632 gal/ft.) 7.12 ft. Standing H_2O

EVACUATION complete to dryness / DARK REDDISH-BROWN COLOR, VERY strong FOAMING Action. faint ODOR (±2.0 gals)

SAMPLING

Date: 11/15/88 Crew: DR / PS

Weather: clear, 40°F sunny

Sampling Method: 1" S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:18 A	7.20				
9:27 A		12.04	12.6	9,260	DK Reddish-Brwn, ODOR
9:27 A		12.08	12.3	9,870	10C "
9:28 A		12.25	12.5	10,270	DK Reddish-Brwn ODOR
9:29 A		12.15	12.7	10,650	10C "

COMMENTS: DK Reddish-Brwn, foaming

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-10A

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 22.7 ft.

EVACUATION

Date: 14 Nov. 1988 Crew: DR/PS

Weather: Sunny, windy 58°F

Purge Method: Suction Pump

Time: 2:15 pm Water level from top of Riser (ft.): 16.30 ft.

Volume of Standing Water (gal.): 4.18 Volume of Purged Water (gal.): 12.5

Description/Comments: (Mult. factor = 0.6528 gal/ft.) 6.4 ft. Standing H_2O

Evacuation complete to dryness / Treated Greenish-Brown color (± 5.5 gals.)

SAMPLING

Date: 11/15/88 Crew: DR / PS

Weather: Sunny 40°F

Sampling Method: Stainless Bailer 1"

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:38 A	16.34				
9:42 A		10.11	12.5	3,340	Clear, v.fine sands, faint sweet odor
9:43 A		10.26	12.8	3,400	"

COMMENTS: Clear

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-10 B

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 32.3 ft.

EVACUATION

Date: 14 Nov. 1988 Crew: DR/PS

Weather: Sunny, windy 58°F

Purge Method: Suction Pump

Time: 8:16 pm Water level from top of Riser (ft.): 17.18 ft.

Volume of Standing Water (gal.): 9.87 Volume of Purged Water (gal.): 29.6

Description/Comments: (Mult. factor: 0.6528 gal/ft) 15.12 ft. Standing H_2O

EVACUATION complete to dryness /(± 12 gals) Lt. Reddish-Brown color, V. Strong foaming

SAMPLING

Date: 11/15/88 Crew: DR / PS

Weather: Sunny, 40°F

Sampling Method: 1" S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
945A	22.80				
950A		12.25	14.7	13,860	Light Clear Brownish-Brown, odor
952A		12.27	14.6	14,200	"

COMMENTS: Lt. Reddish-Brown,

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-11 0B

Type/Size Casing: 2.0 in. S.S.

Depth of Well from Top of Casing: 16.3 ft.

EVACUATION

Date: 15 NOV. 1988 Crew: DR/PS

Weather: SUNNY 46°F

Purge Method: Suction Pump

Time: 2:16 pm Water level from top of Riser (ft.): 6.69 ft.

Volume of Standing Water (gal.): 1.57 Volume of Purged Water (gal.): 4.71

Description/Comments: (Mult. factor = 0.1632 gal/ft.) 9.61 ft. Standing H_2O
EVACUATION complete to dryness (± 2.25 gals) / Orangish-Brown color ~~Grayish-Brown color~~ Lite Brown Rs

SAMPLING

Date: 16 NOV. 1988 Crew: DR/PS

Weather: OVERCAST 48°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (μmhos/cm)	Observations
8:09 A	6.46				
8:24		7.38	14.7	>20,000	Clear, Lt. Yellowish tint
8:25		7.45	15.0	>20,000	"

COMMENTS: CLEAR WITH LIGHT YELLOW TINT APPEARING
(ECCO conductivity meter not available)

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-11A

Type/Size Casing: OPEN 4.0in

Depth of Well from Top of Casing: 22.5ft.

EVACUATION

Date: 15 NOV. 1988 Crew: DR / PS

Weather: SUNNY 46°F

Purge Method: Suction Pump

Time: 2:15 pm Water level from top of Riser (ft.): 19.93ft.

Volume of Standing Water (gal.): 1.68 Volume of Purged Water (gal.): 5.03

Description/Comments: (Mult. factor = 0.6528 gal/ft.) 2.57 ft. Standing H2O

Evacuation complete to dryness (± 1.375 gals) / clear, slight foaming tan-brown tint.

SAMPLING

Date: 16 NOV. 1988 Crew: DR / PS

Weather: OVERCAST 48°F

Sampling Method: 1.0in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
8:16A	19.80				
8:30		11.61	14.8	> 20,000	clear, lt. yellowish tint
8:31		11.68	15.0	> 20,000	translucent, lt. yellowish tint, ppt.

COMMENTS: CLEAR BECOMING TRANSLUCENT GRAY / YELLOW

(ECCO conductivity meter not available)

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-11B

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 32.1 ft.

EVACUATION

Date: 15 NOV. 1988 Crew: DR / PS

Weather: SUNNY 46°F

Purge Method: Suction Pump

Time: 2:13 pm Water level from top of Riser (ft.): 25.76 ft.

Volume of Standing Water (gal.): 4.14 Volume of Purged Water (gal.): 12.4

Description/Comments: (Multi. factor: 0.6528 $\frac{\text{GAL}}{\text{FT.}}$) 6.34 ft. Standing H2O
EVACUATION complete (± 12.4 gals) / TURBID, TAN-GREY color

SAMPLING

Date: 16 NOV. 1988 Crew: DR / PS

Weather: OVERCAST 48°F

Sampling Method: 1.0 in. SS. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
8:10A	25.70				
8:36A		7.19	15.3	2,220	Clear, Lt. brownish tint, little ppt
8:37A		7.18	15.5	2,410	"

COMMENTS: CLEAR WITH LIGHT YELLOW TINT

EFS Environmental Field Services
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-12 OB

Type/Size Casing: S.S. 2.0 in.

Depth of Well from Top of Casing: 16.8 ft.

EVACUATION

Date: 15 NOV. 1988 Crew: PS / DR

Weather: SUNNY 56°F

Purge Method: SUCTION PUMP

Time: 4:34 pm Water level from top of Riser (ft.): 7.18 ft.

Volume of Standing Water (gal.): 1.57 Volume of Purged Water (gal.): 4.7

Description/Comments: (Mult. Factor = 0.1632 $\frac{GAL}{Ft}$) 9.62 ft. Standing H2O

BAIL TO DRYNESS (± 2.1 GAL) CLOUDY BROWN W/ LIGHT CHEMICAL ODOR

SAMPLING

Date: 16 NOVEMBER 88 Crew: DR / PS

Weather: OVERCAST 58°F

Sampling Method: 1.0" S.S. BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
10:12AM	7.12				
10:19A		7.68	17.4	1530	Clear
10:20A		7.71	18.0	1530	Clear

COMMENTS: CLEAR

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-12A

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 25.1 ft.

EVACUATION

Date: 15 NOV. 1988 Crew: PS/DR

Weather: SUNNY 55°F

Purge Method: SUCTION PUMP

Time: 4:35 pm Water level from top of Riser (ft.): 19.05 ft.

Volume of Standing Water (gal.): 3.95 Volume of Purged Water (gal.): 11.8

Description/Comments: (Mult. factor = 0.6528 $\frac{\text{GAL}}{\text{FT.}}$) 6.05 ft. Standing H2O EVAC TO DRYNESS (± 4.8 GAL) DARK BLUE/BLACK, HEAVY FOAM AND CHEMICAL ODOR

SAMPLING

Date: 16 NOVEMBER 88 Crew: DR/PS

Weather: OVERCAST 58°F

Sampling Method: 1.0" S.S. BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
10:13 AM	18.84				
10:24A		7.28	17.4	13,800	OPAQUE, BLK, STRONG ODOR
10:25A		7.28	17.8	13,830	"

COMMENTS: CLEAR DARK BLUE/BLACK WITH HEAVY CHEMICAL ODOR

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-12B

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 32.5 ft.

EVACUATION

Date: 15 NOV. 1988 Crew: DR/PS

Weather: SUNNY 54°F

Purge Method: SUCTION PUMP

Time: 4:36 pm Water level from top of Riser (ft.): 27.10 ft.

Volume of Standing Water (gal.): 3.53 Volume of Purged Water (gal.): 10.6

Description/Comments: (Mult. factor = 0.6528 gal/ft) 5.4 ft Standing H2O evacuation complete (± 10.6 gals) / H. Brown-Brown (initially Black) odor

SAMPLING

Date: 16 NOVEMBER 88 Crew: DR/PS

Weather: OVERCAST 58°F

Sampling Method: 1.0" S.S. BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
10:14AM	27.06				
10:29A		7.02	17.5	2520	Clear, faint odor
10:31A		7.00	17.8	2520	"

COMMENTS: CLEAR, LIGHT CHEM ODOR, SOME FLOATING PARTICULATES

EFS **Environmental Field Services**

8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88 - 134

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 26.0 ft.

EVACUATION

Date: 16 NOV. 1988 Crew: DR / PS

Weather: OVERCAST, RAIN 55°F

Purge Method: Suction Pump

Time: 2:34 PM Water level from top of Riser (ft.): 21.77 ft

Volume of Standing Water (gal.): 2.76 Volume of Purged Water (gal.): 8.28

Description/Comments: (Mult. factor: 0.6528 gal/ft) 4.23 ft. Standing H2O

Hybrid Brown, strong foaming action / Evacuation complete to dryness (±4.5 gals)

SAMPLING

Date: 11/17/88 Crew: DR/PS

Weather: OVERCAST WINDY 40°F

Sampling Method: 10" S.S. BAILER

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:53 AM	22.02				
9:56 AM		10.36	12.9	> 20,000	clear, odor, Golden Brown color, fine Sand
9:58 AM		10.35	13.4	> 20,000	" "

COMMENTS: (ECCO conductivity meter not available)

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88 - 14 oB

Type/Size Casing: S.S. 2.0 in

Depth of Well from Top of Casing: 15.4 ft.

EVACUATION

Date: 15 NOV. 1988 Crew: DR/PS

Weather: SUNNY 48°F

Purge Method: Suction Pump

Time: 2:55 pm Water level from top of Riser (ft.): 13.25 ft.

Volume of Standing Water (gal.): 0.35 Volume of Purged Water (gal.): 1.05

Description/Comments: (Mult. factor = 0.1632 Gal/Ft) 2.15 ft. Standing H_2O

Evacuation Complete to Dryness (± 0.5 gals) / lt. orangish-Brown color, little foam

SAMPLING

Date: 16 NOV. 1988 Crew: DR/PS

Weather: OVERCAST 53°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:00AM	13.21				
9:06A		8.58	15.7	3,450	clear, lt. yellowish tint, odor
9:07A		8.61	16.1	3,510	" , v. fine sands

COMMENTS: CLEAR FAINT YELLOW TINT

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88-14A

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 23.2 ft.

EVACUATION

Date: 15 NOV. 1988 Crew: DR/PS

Weather: SUNNY 48°F

Purge Method: SUCTION PUMP

Time: 2:53 pm Water level from top of Riser (ft.): 16.06ft.

Volume of Standing Water (gal.): 4.66 Volume of Purged Water (gal.): 14.0

Description/Comments: (Mult. factr = 0.6528 Gal/Ft.) 7.14 ft. Standing H_2O

GROUNDWATER IS NEARLY CLEAR TO CLEAR TAN WITH FAST DISSIPATING FOAM. EVACUATED (14.0 GAL.)
SURFACE SHEEN ALSO OBSERVED

SAMPLING

Date: 16 NOV. 1988 Crew: DR/PS

Weather: OVERCAST 53°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:01AM	15.89				
9:11A		9.12	15.7	2,310	clear, lt. yellowish tint, odor
9:12A		9.14	16.0	2,300	" , v.fine sand

COMMENTS: CLEAR WITH FAINT YELLOW TINT

EFS **Environmental Field Services**
8397 BOSTON STATE ROAD BOSTON, NEW YORK 14025 716 941-5544

MONITORING WELL SAMPLING FIELD SHEETS

Project Name/Number: ECCO/Frontier Chemical 50-50

Monitoring Well Number: 88 - 14 B

Type/Size Casing: OPEN 4.0 in.

Depth of Well from Top of Casing: 31.6 ft

EVACUATION

Date: 15 NOV. 1988 Crew: DR / PS

Weather: SUNNY 48°F

Purge Method: SUCTION PUMP

Time: 2:54 PM Water level from top of Riser (ft.): 25.86 ft

Volume of Standing Water (gal.): 3.75 Volume of Purged Water (gal.): 11.2

Description/Comments: (Mult. factor = 0.6528 gal/ft) 5.74 ft. Standing H_2O

BEGAN CLOUDY OR/BEN W/ CHEMICAL ODOR TURNIN CLEAR WITH TAN COLOR. EVACUATED (11.5 gal.)

SAMPLING

Date: 16 NOV. 1988 Crew: DR / PS

Weather: OVERCAST 53°F

Sampling Method: 1.0 in. S.S. bailer

Field Measurements:

Time	Water Level (ft)	pH (Units)	Temp (°c)	SC (µmhos/cm)	Observations
9:02AM	25.88				
9:16A		7.10	16.2	3,730	Clear, ppt.
9:17A		7.13	16.3	3,780	Clear, ppt.

COMMENTS: CLEAR

APPENDIX C

Chain of Custody Records

CHAIN OF CUSTODY RECORD

SAMPLE I.D.	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	CONTAINERS	STORAGE AND TRANSPORTATION
87-2A	2-40ML VOA'S 1-250ML PHENOL/SOC (ground water samples)	11/9/88	9:27 AM	2-40ML [redacted] glass VOA 1-250ML glass	ICE CHEST
87-2B	2-40ML VOA'S 1-250ML PHENOL/SOC	11/9/88	9:40 AM	2-40ML glass 1-250ML glass	" "
87-2C	2-40ML VOA'S 1-250ML PHENOL/SOC	11/9/88	9:50 AM	2-40ML glass 1-250ML glass	" "
87-3OB	2-40ML VOA'S 1-250ML PHENOL/SOC	11/9/88	10:54 AM	2-40ML glass 1-250ML glass	" "
87-ØØ	FIELD BLANK	11/9/88	10:58 AM	1-40ML glass	" "
87-3A	2-40ML VOA'S 1-250ML PHENOL/SOC	11/9/88	10:31 AM	2-40ML glass 1-250ML glass	" "
87-3B	2-40ML VOA'S 1-250ML PHENOL/SOC	11/9/88	10:41 AM	2-40ML glass 1-250ML glass	" "
87-3C	2-40ML VOA'S 1-250ML PHENOL/SOC	11/9/88	10:51 AM	2-40ML glass 1-250ML glass	" "
87-3D	2-40ML VOA'S 1-250ML PHENOL/SOC	11/9/88	11:10 AM	2-40ML glass 1-250ML glass	" "
87-EC	FIELD BLANK	11/9/88	12:48 PM	1-40ML glass	" "

****

SAMPLER Paul E. Smith AFFILIATION EFS WITNESS Douglas M. Ruszczyk

****

CUSTODY RELINQUISHED BY Douglas M. Ruszczyk (signature) DATE/TIME 11/9/88 1:30PM

RECEIVED BY Robert Williams (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

****

CUSTODY RELINQUISHED BY _____ (signature) DATE/TIME _____

RECEIVED BY _____ (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CHAIN OF CUSTODY RECORD

SAMPLE I.D.	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	CONTAINERS	STORAGE AND TRANSPORTATION
87-4A	2-40ML VOA's 1-250ML PHENOL/SOC (Ground water Sample)	11/9/88	11:17AM	2-40ML glass 1-250ML glass	ICE CHEST
87-5OB	2-40ML VOA's 1-250 ML PHENOL/SOC	11/9/88	12:53PM	2-40ML glass 1-250ML glass	" "
87-5A	2-40 ML VOA's 1-250 ML PHENOL/SOC	11/9/88	12:37PM	2-40 ML glass 1-250 ML glass	" "
87-5C	2-40ML VOA's 1-250ML PHENOL/SOC	11/9/88	12:55PM	2-40 ML glass 1-250 ML glass	" "
87-5D	2-40ML VOA's 1-250ML PHENOL/SOC	11/9/88	1:01PM	2-40ML glass 1-250ML glass	" "
87-2B	2-40ML VOA's 1-250 ML PHENOL/SOC	11/9/88	12:16PM	2-40ML glass 1-250 ML glass	" "
87-CO	Trip Blank	11/9/88	9:06AM	1-40ML glass	" "

****

SAMPLER Paul E. Smith AFFILIATION EFS WITNESS Douglas M. Ruzzyak

****

CUSTODY RELINQUISHED BY Douglas M. Ruzzyak (signature) DATE/TIME 11/9/88 1:30 PM

RECEIVED BY Robert L. Williams (Signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

****

CUSTODY RELINQUISHED BY _____ (signature) DATE/TIME _____

RECEIVED BY _____ (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CHAIN OF CUSTODY RECORD

SAMPLE I.D.	SAMPLE DESCRIPTION		COLLECTION DATE	COLLECTION TIME	CONTAINERS	STORAGE AND TRANSPORTATION
87-1B	2-40mL VIALS 1-250mL GLASS	GROUNDWATER	11/10/88	2:18PM	2-40mL VOA's 1-250mL AMBER GLASS	ICE CHEST
87-1C	2-40mL VIALS 1-250mL GLASS	GROUNDWATER	11/10/88	2:33PM	2-40mL VOA'S 1-250mL AMBER GLASS	ICE CHEST
87-3B	1-250mL GLASS	GROUNDWATER	11/10/88	3:22PM	1-250mL AMBER GLASS	ICE CHEST; WELL RAN DRY
87-FB	1-40mL VIAL	DISTILLED WATER	11/10/88	2:10PM	1-40mL VOA	ICE CHEST
TB	1-40mL VIAL	DISTILLED WATER	11/10/88	2:05PM	1-40mL VOA	ICE CHEST

SAMPLER Paul E Smith AFFILIATION EFS WITNESS Douglas M. Ruszczyk

CUSTODY RELINQUISHED BY Douglas M. Ruszczyk (signature) DATE/TIME 11/10/88 4:00 PM

RECEIVED BY Ralph J Williams (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CUSTODY RELINQUISHED BY _____ (signature) DATE/TIME _____

RECEIVED BY _____ (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CHAIN OF CUSTODY RECORD

SAMPLE I.D.	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	CONTAINERS	STORAGE AND TRANSPORTATION
87-5B	2-40mL GLASS 1-250mL GLASS GROUNDWATER	11/11/88	12:44 PM	2-40mL VOA GLASS 1-250mL AMBER GLASS	ICE CHEST
84-9	2-40mL GLASS 1-250mL GLASS		2:41 PM	2-40mL GLASS 1-250mL AMBER GLASS	
84-90B	2-40mL GLASS 1-250mL GLASS		2:44 PM	2-40 mL GLASS 1-250 mL AMBER GLASS	
84-12	2-40mL GLASS 1-250mL GLASS		2:25 PM	2-40 mL GLASS 1-250 mL AMBER GLASS	
84-13	2-40mL GLASS 1-250mL GLASS		1:03 PM	2-40 mL GLASS 1-250 mL AMBER GLASS	
84-14	2-40mL GLASS 1-250mL GLASS		1:18 PM	2-40 mL GLASS 1-250 mL AMBER GLASS	
84-15	2-40mL GLASS 1-250mL GLASS		2:03 PM	2-40 mL GLASS 1-250 mL AMBER GLASS	
84-17	2-40mL GLASS 1-250mL GLASS		1:45 PM	2-40 mL GLASS 1-250 mL AMBER GLASS	
84-TB	1-40mL GLASS DISTILLED WATER		12:30 PM	1-40 mL GLASS	
84-FB	1-40mL GLASS DISTILLED WATER		12:32 PM	1-40 mL GLASS	

SAMPLER Paul G. Smith AFFILIATION EPS WITNESS Douglas M. Ruegsegger

CUSTODY RELINQUISHED BY Douglas M. Ruegsegger (signature) DATE/TIME 11/11/88 3:23 PM

RECEIVED BY Ralph J. Wilbourn (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CUSTODY RELINQUISHED BY _____ (signature) DATE/TIME _____

RECEIVED BY _____ (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS

CHAIN OF CUSTODY RECORD

SAMPLE I.D.	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	CONTAINERS	STORAGE AND TRANSPORTATION
84-16	2 - 40ml VIAL 1 - 250ml GLASS, GROUNDWATER	11/15/88	8:48AM	2 - 40 VOA 1 - 250 AMBER GLASS	ICE CHEST
88-5C	2 - 40ml VIAL 1 - 250ml GLASS,	11/15/88	9:06AM	2 - 40 VOA 1 - 250 AMBER GLASS	
88-1ΦA	2 - 40ml VIAL 1 - 250ml GLASS,	11/15/88	9:42AM	2 - 40 VOA 1 - 250 AMBER GLASS	
88-1ΦB	2 - 40ml VIAL 1 - 250ml GLASS,	11/15/88	9:51AM	2 - 40 VOA 1 - 250 AMBER GLASS	
88-1ΦOB	2 - 40ml VIAL 1 - 250ml GLASS,	11/15/88	9:27AM	2 - 40 VOA 1 - 250 AMBER GLASS	
88-1ΦC	2 - 40ml VIAL 1 - 250ml GLASS,	11/15/88	9:28AM	2 - 40 VOA 1 - 250 AMBER GLASS	
88-1A	2 - 40ml VIAL 1 - 250ml GLASS,	11/15/88	10:36AM	2 - 40 VOA 1 - 250 AMBER GLASS	
88-1B	2 - 40ml VIAL 1 - 250ml GLASS,	11/15/88	10:26AM	2 - 40 VOA 1 - 250 AMBER GLASS	
88-4A	2 - 40ml VIAL 1 - 250ml GLASS,	11/15/88	11:09AM	2 - 40 VOA 1 - 250 AMBER GLASS	
88-4B	2 - 40ml VIAL 1 - 250ml GLASS,	11/15/88	11:20AM	2 - 40 VOA 1 - 250 AMBER GLASS	
88-40B	2 - 40ml VIAL 1 - 250ml GLASS,	11/15/88	10:54AM	2 - 40 VOA 1 - 250 AMBER GLASS	

SAMPLER Paul E. Smith AFFILIATION EFS WITNESS Douglas M. Ruzycki

CUSTODY RELINQUISHED BY Douglas M. Ruzycki (signature) DATE/TIME 11/15/88 12:13PM

RECEIVED BY Ralph Wilburn (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CUSTODY RELINQUISHED BY _____ (signature) DATE/TIME _____

RECEIVED BY _____ (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS

CHAIN OF CUSTODY RECORD

SAMPLE I.D.	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	CONTAINERS	STORAGE AND TRANSPORTATION
88-4C	2-40ml VIAL 1-250ml GLASS GROUNDWATER	11/15/88	11:29AM	2-40ml VOA GLASS 1-250ml AMBER GLASS	ICE CHEST
88-FB	40ml VIAL DISTILLED WATER	11/15/88	8:30AM	1-40ml VOA GLASS	ICE CHEST
88-TB	40ml VIAL DISTILLED WATER	11/15/88	8:25AM	1-40ml VOA GLASS	ICE CHEST

SAMPLER Paul E. Smith AFFILIATION EFS WITNESS Douglas M. Ruzycki

CUSTODY RELINQUISHED BY Douglas M. Ruzycki (signature) DATE/TIME 11/15/88 12:13 PM

RECEIVED BY Ralph Fullbrun (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CUSTODY RELINQUISHED BY _____ (signature) DATE/TIME _____

RECEIVED BY _____ (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS

CHAIN OF CUSTODY RECORD

SAMPLE I.D.	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	CONTAINERS	STORAGE AND TRANSPORTATION
88-2FB	1-40mL VIAL DISTILLED WATER	11/16/88	9:25AM	1-40mL VOA	ICE CHEST
88-2TB	1-40mL VIAL DISTILLED WATER		8:00 AM	1-40mL VOA	
88-110B	2-40 mL VIALS 1-250 mL GLASS GROUNDWATER		8:24AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-11A	2-40 mL VIALS 1-250 mL GLASS		8:30AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-11B	2-40 mL VIALS 1-250 mL GLASS		8:36AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-140B	2-40 mL VIALS 1-250 mL GLASS		9:06AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-14A	2-40 mL VIALS 1-250 mL GLASS		9:11AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-140B	2-40 mL VIALS 1-250 mL GLASS		9:16AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-80B	2-40 mL VIALS 1-250 mL GLASS		9:47AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-8A	2-40 mL VIALS 1-250 mL GLASS		9:52AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-8B	2-40 mL VIALS 1-250 mL GLASS		9:58AM	2-40mL VOA'S 1-250mL AMBER GLASS	

SAMPLER Paul S. Smith AFFILIATION EFS WITNESS Douglas M. Ruegsegger

CUSTODY RELINQUISHED BY Douglas M. Ruegsegger (signature) DATE/TIME 11/16/88 11:42AM

RECEIVED BY (signature) TITLE AFFILIATION

SAMPLE STATUS

CUSTODY RELINQUISHED BY (signature) DATE/TIME

RECEIVED BY (signature) TITLE AFFILIATION

SAMPLE STATUS

CHAIN OF CUSTODY RECORD

SAMPLE I.D.	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	CONTAINERS	STORAGE AND TRANSPORTATION
88-12CB	2-40 ml VIALS 1-250 ml GLASS GROUNDWATER	11/16/88	10:19 AM	2-40ml VOAS 1-250ml AMBER GLASS	ICE CHEST
88-12A	2-40 ml VIALS 1-250 ml GLASS		10:24 AM	2-40ml VOAS 1-250ml AMBER GLASS	
88-12B	2-40 ml VIALS 1-250ml GLASS		10:29 AM	2-40ml VOAS 1-250ml AMBER GLASS	

SAMPLER Paul E. Smith AFFILIATION EFS WITNESS Michael M. Ruggeri

CUSTODY RELINQUISHED BY Michael M. Ruggeri (signature) DATE/TIME 11/16/88 11:42 AM

RECEIVED BY Joseph Wallace (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CUSTODY RELINQUISHED BY _____ (signature) DATE/TIME _____

RECEIVED BY _____ (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CHAIN OF CUSTODY RECORD

SAMPLE I.D.	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	CONTAINERS	STORAGE AND TRANSPORTATION
88-3TB	1-40mL GLASS VIAL; DISTILLED WATER	11/17/88	9:15AM	1-40mL VOA	ICE CHEST
88-3FB	1-40mL GLASS VIAL; DISTILLED WATER		10:16AM	1-40mL VOA	
88-9DB	2-40mL VIALS 1-250mL GLASS; GROUNDWATER		9:25AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-9A	2-40mL VIALS 1-250mL GLASS;		9:31AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-9B	2-40mL VIALS 1-250mL GLASS;		9:37AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-13A	2-40mL VIALS 1-250mL GLASS;		9:56AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-6DB	2-40mL VIALS 1-250mL GLASS;		10:5AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-6A	2-40mL VIALS 1-250mL GLASS;		10:58AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-6B	2-40mL VIALS 1-250mL GLASS;		11:05AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-3A	2-40mL VIALS 1-250mL GLASS;		10:18AM	2-40mL VOA'S 1-250mL AMBER GLASS	
88-3B	2-40mL VIALS 1-250mL GLASS;		10:25AM	2-40mL VOA'S 1-250mL AMBER GLASS	

SAMPLER Paul G. Fitch AFFILIATION EFS WITNESS Douglas M. Ruggeri

CUSTODY RELINQUISHED BY Douglas M. Ruggeri (signature) DATE/TIME 11/17/88 11:41AM

RECEIVED BY Reply Fullbarn (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CUSTODY RELINQUISHED BY _____ (signature) DATE/TIME _____

RECEIVED BY _____ (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CHAIN OF CUSTODY RECORD

SAMPLE I.D.	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	CONTAINERS	STORAGE AND TRANSPORTATION
88-7B	1-40mL VIAL DISTILLED WATER	11/19/88	11:55AM	1-40mL VOA	ICE CHEST
89-FB	1-40mL VIAL DISTILLED WATER		12:46PM	1-40mL VOA	
90-FB	1-40mL VIAL DISTILLED WATER		2:52PM	1-40mL VOA	
88-7A	2-40mL VIAL 1-250mL GLASS GROUNDWATER		12:11PM	2-40mL VOA 1-250mL AMBER GLASS	
88-7B	2-40mL VIAL 1-250mL GLASS		12:22PM	2-40mL VOA 1-250mL AMBER GLASS	
88-7DB	2-40mL VIAL 1-250mL GLASS		12:28PM	2-40mL VOA 1-250mL AMBER GLASS	
88-7C	2-40mL VIAL 1-250mL GLASS		12:15PM	2-40mL VOA 1-250mL AMBER GLASS	
88-2A	2-40mL VIAL 1-250mL GLASS		3:37PM	2-40mL VOA 1-250mL AMBER GLASS	
88-2B	2-40mL VIAL 1-250mL GLASS		3:05PM	2-40mL VOA 1-250mL AMBER GLASS	
88-2DB	2-40mL VIAL 1-250mL GLASS		3:13PM	2-40mL VOA 1-250mL AMBER GLASS	
88-2C	2-40mL VIAL 1-250mL GLASS		3:42PM	2-40mL VOA 1-250mL AMBER GLASS	

SAMPLER Paul E Smith AFFILIATION EES WITNESS Marlon M. Ruszczyk

CUSTODY RELINQUISHED BY Marlon M. Ruszczyk (signature) DATE/TIME 11/18/88 4:45PM

RECEIVED BY Ralph Williams (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CUSTODY RELINQUISHED BY _____ (signature) DATE/TIME _____

RECEIVED BY _____ (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CHAIN OF CUSTODY RECORD

SAMPLE I.D.	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	CONTAINERS	STORAGE AND TRANSPORTATION
88-5B	2-40ml VIAL 1-250ml GLASS GROUNDWATER	11/18/88	12:57 PM	2-40ml VOA'S 1-250ml AMBER GLASS	ICE CHEST
88-5aB	2-40ml VIAL 1-250ml GLASS		1:02 PM	2-40ml VOAS 1-250ml AMBER GLASS	
87-1A	2-40ml VIAL 1-250ml GLASS		2:22 PM	2-40ml VOAS 1-250ml AMBER GLASS	
87-4B	2-40ml VIAL 1-250ml GLASS		4:01 PM	2-40ml VOA'S 1-250ml AMBER GLASS	
87-40B	2-40ml VIAL 1-250ml GLASS		4:10 PM	2-40ml VOA'S 1-250ml AMBER GLASS	
84-11	2-40ml VIAL 1-250ml GLASS		2:41 PM	2-40ml VOA'S 1-250ml AMBER GLASS	
81-2	2-40ml VIAL 1-250ml GLASS		1:36 PM	2-40ml VOAS 1-250ml AMBER GLASS	
81-7	2-40ml VIAL 1-250ml GLASS		1:27 PM	2-40ml VOAS 1-250ml AMBER GLASS	

SAMPLER Paul E. Smith AFFILIATION EES WITNESS Douglas M. Ruegsegger

CUSTODY RELINQUISHED BY Douglas M. Ruegsegger (signature) DATE/TIME 11/18/88 4:45PM

RECEIVED BY Joseph J. Gilmann (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CUSTODY RELINQUISHED BY _____ (signature) DATE/TIME _____

RECEIVED BY _____ (signature) TITLE _____ AFFILIATION _____

SAMPLE STATUS _____

CHAIN OF CUSTODY RECORD

SAMPLE I.D.	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	CONTAINERS	STORAGE AND TRANSPORTATION
87-1A	Ground water samples	11/22/88	2:30p	2 40ml VOA's 1-250ml AMBER Phenol/SOC	Cooler
87-10B	↓	11/22/88	2:40p	2-40ml VOA's 1-250ml AMBER Phenol/SOC	↓
84-11	↓	11/22/88	1:25p	3-40ml VOA's ~~1-250ml AMBER Phenol/SOC~~	↓

SAMPLER Paul E. Smith AFFILIATION E.F.S. WITNESS [signature]

CUSTODY RELINQUISHED BY Paul E. Smith (signature) DATE/TIME 11/22/88 3:08pm

RECEIVED BY Sid Engell (signature) TITLE _____ AFFILIATION BLT

SAMPLE STATUS _____

CUSTODY RELINQUISHED BY _____ (signature) DATE/TIME _____

RECEIVED BY _____ (signature) TITLE _____ AFFILIATION _____