GLENN SPRINGS HOLDINGS, INC.

MILLER SPRINGS REMEDIATION MANAGEMENT INC.

1998 OPERATION AND MONITORING REPORT FOURTH YEAR

Love Canal
Occidental Chemical Corporation
Niagara Falls, New York

LOVE CANAL
1998 ANNUAL OPERATION AND MAINTENANCE REPORT

Miller Springs Remediation Management, Inc.
Niagara Falls, New York

FOREWORD

The 1998 Love Canal Annual Operation and Maintenance Report is submitted pursuant to Section 2.C. of Appendix B of the Consent Judgment between Occidental Chemical Corporation (OCC) and the State of New York, effective October 7,1994. It covers those developments and activities which occurred in the 1998 calendar year. This is the fourth Annual Report issued by OCC. Annual Reports prior to the 1995 calendar year were issued by the New York State Department of Environmental Conservation (NYSDEC).

Effective July 1, 1998 site operational responsibility for the Love Canal site was assigned by Occidental Chemical Company to Miller Springs Remediation Management Inc. (MSRM), a Glenn Springs Holdings, Inc. (GSHI) affiliate. GSHI, is a subsidiary of Occidental Petroleum Company.

For further information regarding the developments and activities at Love Canal, please contact:

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SUMMARY

Responsibility for site operations and control passed from NYSDEC to OCC on January 5, 1995. Shortly thereafter, on January 12, 1995, the NYSDEC reclassified the site to Class 4. This is a site, which has been properly closed and requires continued management. Operations in 1998 were routine in nature.

LOVE CANAL LEACHATE COLLECTION AND TREATMENT

The City of Niagara Falls issued a wastewater discharge permit to Occidental Chemical Corp on January 5, 1995. In 1998 the permit was modified to include the treatment of leachate water from the 102nd Street Landfill. It is anticipated that leachate from 102nd Street will be pumped to Love Canal starting in the first quarter, 1999.

The Love Canal Leachate Treatment Facility's discharges met all discharge requirements of the City permit during the year. The leachate collection system continued to function as designed drawing groundwater toward the underground drain system from both the landfill and the surrounding area beyond the cap.

On July 23, 1997, New York State Department of Environmental Conservation (NYSDEC) Region 9 Office conducted a multimedia inspection of the Love Canal Site. This inspection was a component of a multimedia Pollution Prevention initiative which is designed to coordinate pollution control, remediation and regulatory activities at selected facilities across the State, and to promote the reduction of toxic releases from theses facilities. On May 01, 1998 the NYSDEC issued a report of the inspection. The report indicates that the Love Canal facility was operating in substantial compliance with Department regulations at the time of the inspection.

1998 LOVE CANAL TREATMENT FACILITY

- Treated 3,087,500 gallons of groundwater.
- No NAPL shipped out in 1998.

OPERATION AND MAINTENANCE ACTIVITIES

During 1998, the following operation and maintenance activities were performed.

- Began construction on a forcemain to deliver leachate water from the 102nd Street landfill to the Love Canal treatment system.
- Upgraded the process system software. The new software (Fix-32 by Intellution) provides improved, monitoring and logging control of the process parameters.
- Replaced the raw tank and filter feed air diaphragm pumps with variable speed centrifugal pumps. This upgrade significantly improved the reliability of the treatment system.

THE LONG-TERM MONITORING PROGRAM

The Long-Term Monitoring Program examines hydrogeologic and chemical data from the Love Canal area in order to evaluate the overall effectiveness of the containment system. In 1998 one round of samples was collected from 34 long-term monitoring wells that surround the site. Quarterly groundwater elevations were taken in six groups of piezometers located around the site.

The basic conclusion from the 1998 data is that it is similar to previous data gathered from 1989 to 1997, and that the barrier drain is functioning as designed. Both the hydrological and chemical evidence supports this conclusion.

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1.0 INTRODUCTION

Operation of the Love Canal Site (Site) was transferred from the New York State Department of Environmental Conservation (NYSDEC) to Occidental Chemical Corporation (OxyChem) in April 1995.

Effective July 1, 1998 site responsibility for the Love Canal Site was assigned by Occidental Chemical to Miller Springs Remediation Management Inc. (MSRM), a Glenn Springs Holdings, Inc. (GSHI) affiliate. GSHI, is a subsidiary of Occidental Petroleum Company, the parent of Oxy-Chem. This report is the fourth annual report prepared for OxyChem and covers operating and monitoring activities for 1998.

2.0 ACTIVITIES AT THE SITE

2.1 OPERATION OF THE BARRIER DRAIN AND TREATMENT SYSTEM

i) Operation and Maintenance of the Barrier Drain

ii) Treatment System

i) During 1998 there was no maintenance performed on the Barrier Drain system. The system functioned without any problems or irregularities during 1998.

ii) The treatment system during 1998 did not require any Carbon-bed change due to low loading in the influent groundwater and reduced flows due to abnormally low rainfall. There were no major problems or repairs, other than normal maintenance, in the operation of the system. Several upgrades in the treatment process were implemented for 1998 (see List below).

- New centrifugal pumps with variable speed drive replaced the air diaphragm pumps for the raw and filter feed tanks.
- New effluent flow meter that interfaces with the computer control system.
- New process control software program (Fix-32 from Intellution).
- New parameters were added for the upcoming tie-in of 102nd Street.
- Initial work began linking the 102nd Street landfill leachate line into the Love Canal treatment system.

2.2 NON-PROCESS ACTIVITIES

Non-process related activity included landscaping of the Love Canal office area, including addition of new flowerbeds, removal of overgrown bushes/shrubs and general lawn care.

3.0 GROUND-WATER TREATMENT AND MONITORING

3.1 GROUND-WATER TREATMENT

During 1998 the total volume of groundwater from the Site treated at the Love Canal Leachate Treatment Facility was 3,087,458 gallons for an average monthly volume of 257,288 gallons (Table 3.1). The 1998 total and average monthly treated volumes were less than the 1997 volumes (3,471,400 and 289,280 gallons respectively). In 1998 precipitation for year there was a totaled 27.97 inches compared to the average of 41.17 inches, which decreased infiltration into the shallow overburden groundwater system.

3.2 GROUND-WATER MONITORING

i) **Chemical Monitoring**
ii) **Hydraulic**

i) The 1998 chemical sampling event was performed over a 5-week period from May 28 to June 29, 1998 in which 34 wells were sampled. Figure 3.1 shows the wells sampled and their locations on the site. Presented in Table 3.2 is a summary of the 34 wells (17 Overburden & 17 Bedrock) sampled and the number of compounds found at or above detection limits.

Table 3.3 shows the 34 wells sampled in 1998 and the detection level of each compound in the individual wells. The total number of different compounds detected in 1998 sampling was fourteen VOCs, twenty SVOCs & four Pesticides. The majority of these compounds (thirteen VOCs, nine semi-VOC and four pesticides) were detected in well 10135, which historically has the highest number and concentration of compounds (see Table 3.4). Table 3.4 presents a summary of detected compounds of the four long-term monitoring wells (10210A, 10210B, 10210C & 10135) from 1990 to 1998. Table 3.4 shows that the compounds that were detected in 1998 were at similar concentrations to those compounds detected in previous years.

Recra Environmental, Inc. (Recra) of Amherst, New York conducted the sample analyses. Conestoga-Rovers & Associates (CRA) from Niagara Falls, New York performed the analytical Quality Assurance/Quality Control (QA/QC). The report is filed in the MSRM Western New York Office at Love Canal and is available for review upon request.

The Quality Assurance/Quality Controls (QA/QC) criteria by which these data have been assessed are outlined in Methods 95-1, 95-2 and 95-3 reference from the New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP) (10/95 Rev) and the "USEAP Contract Laboratory Program National Functional Guidelines for Organic Data Review" EPA 540/R-94/012, February 1994. The QA/QC evaluation concluded all sample results were acceptable with the exception of six 2-chloroethylvinylether results which were rejected due to poor instrument sensitivity and three results of Pentachlorophenol were rejected based on poor analyte efficiency.

The 1998 chemical analytical results are consistent with previous Long-Term Monitoring analytical results. Similar to previous Long-Term Monitoring events, which were performed by the NYSDEC, there was minimal detection of chemicals in the wells sampled in 1998. Detected chemicals were at low levels and do not indicate a failure in the barrier drain or pose an immediate threat to groundwater quality.

ii) Water levels were measured at six nested piezometer strings in January, April, July and November 1998. Figures 3.2 to 3.7 show the overburden groundwater flow conditions for July 1998 along the six piezometer strings. The water level data are on file in the MSRM Western New York Office and are available for review upon request.

The 1998 groundwater levels and flow nets show that groundwater flow was toward the barrier drain. The barrier drain is drawing in groundwater from outside the drain and successfully capturing horizontal groundwater flow from the Site.

4.0 OTHER MAJOR ACTIVITIES

Summaries of normal activities and repairs performed in 1998 are listed in Table 4.1. A brief description of major activities is presented below.

On July 23, 1997, New York State Department of Environmental Conservation (NYSDEC) Region 9 Office conducted a multimedia inspection of the Love Canal Site. This inspection was a component of a Multimedia Pollution Prevention Initiative, which is designed to coordinate pollution control, remediation and regulatory activities at selected facilities across the State, and to promote the reduction of toxic releases from theses facilities. On May 01, 1998 the NYSDEC issued a report of the inspection. The report indicates that the Love Canal facility was operating in substantial compliance with Department regulations at the time of the inspection.

A modification to the Love Canal Discharge Permit from the city of Niagara Falls was approved and incorporated into the permit during 1998. The permit now includes the ability to receive leachate water from the 102nd Street Landfill and process the water on site.

In 1998 work began on a self-contained pipeline (forcemain) system to deliver the 102nd Street landfill leachate to the Love Canal treatment system. Completion of the tie-in will be performed in 1999, the leachate from the 102nd Street Landfill will be treated along with the Love Canal leachate.

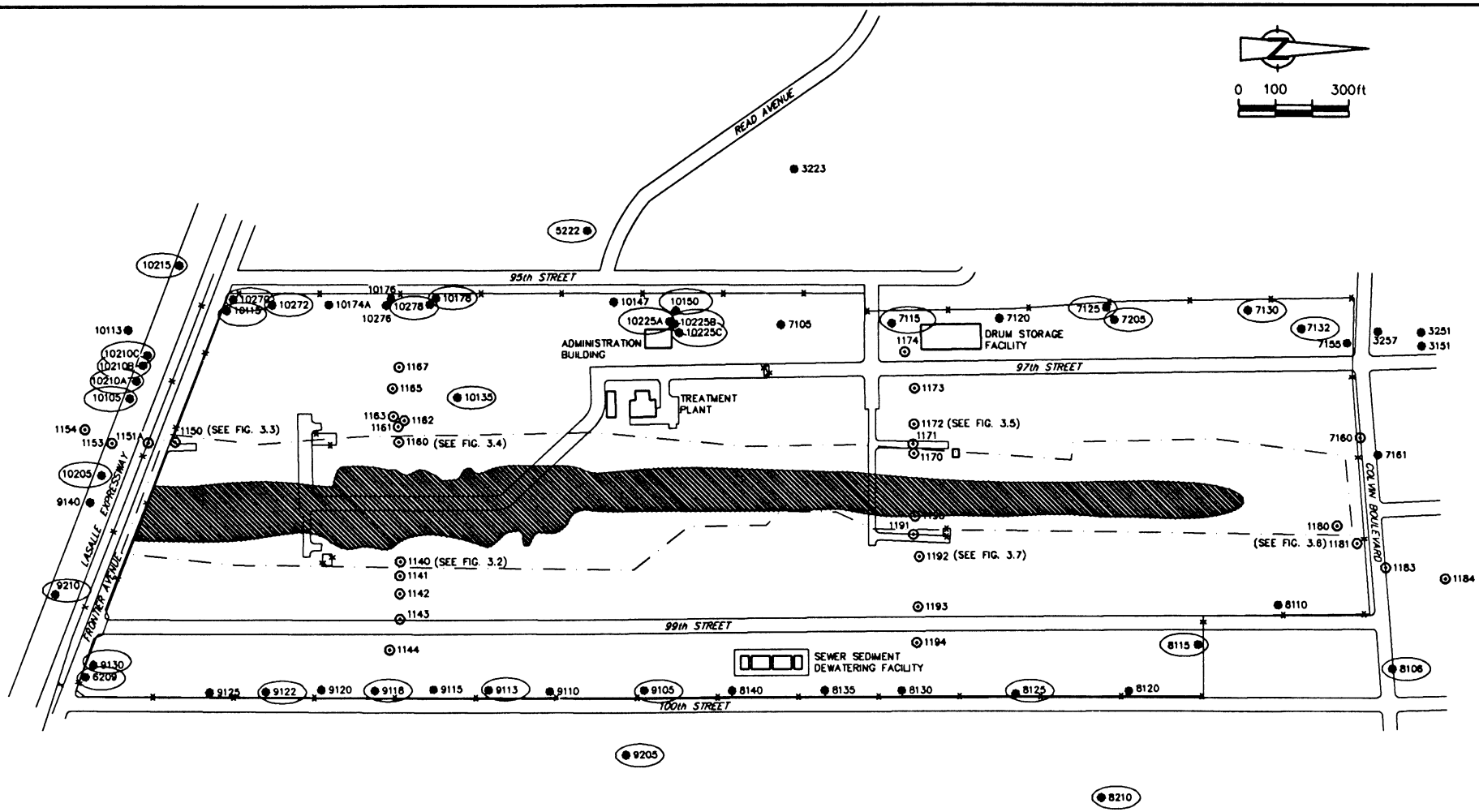
Tours of the facility were given through out the year to college and high schools students from the surrounding area. A tour was also given to the attendees of the State of the Lakes Conference, which is sponsored by The Great Lake's Commission (GLC). The GLC is made up of state officials, legislators and governs' appointees. Representatives from a variety of observer agencies and organizations, including Canadian interests. In addition to the other group tours a tour was given to representatives from the Japan Environment Agency.

Upgrade of the process system software was implemented in 1998. The new software (Fix-32 by Intellution) provides improved, monitoring and logging control of the site conditions and treatment plant process parameters.

5.0 CONCLUSION

The 1998 results show that there was no significant change in chemical and hydrological conditions at the Site. The barrier drain is successfully capturing leachate from the Site, and preventing off-Site migration of chemicals. The remediation system is functioning as designed.

FIGURES



LEGEND

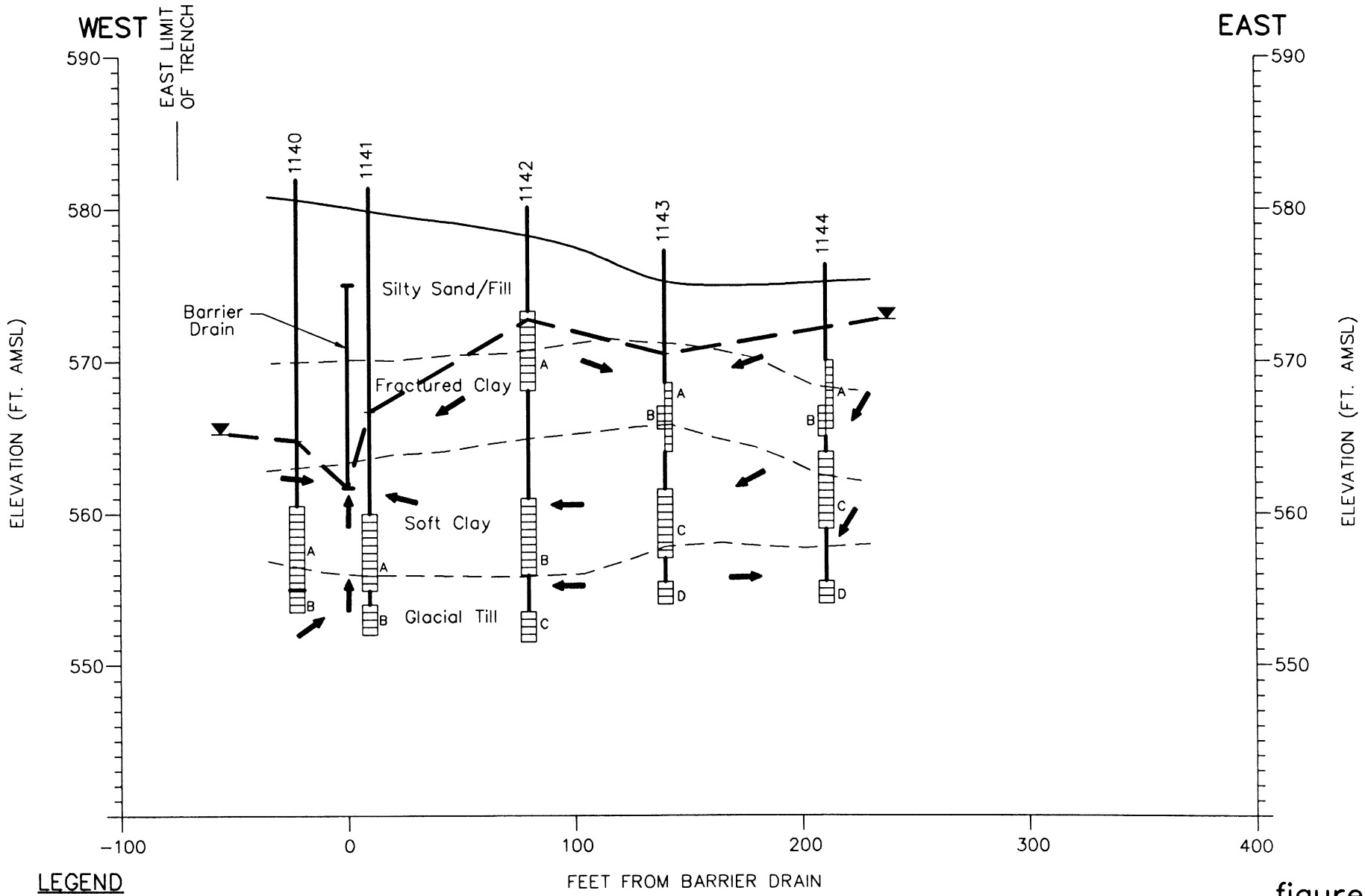
- FENCE LINE
- BARRIER DRAIN
- 7105 PIEZOMETER WELL
- 1167 OBSERVATION WELL
- WELLS SAMPLED IN 1997
- APPROXIMATE LIMITS OF DISPOSED WASTE

figure 3.1

1999 GROUNDWATER SAMPLE COLLECTION PROGRAM
LOVE CANAL
Miller Springs Remediation Management

CRA SERVICES

9554 (1) FEB 22/99(W) REV.0 (P-07)



LEGEND

A PIEZOMETER DESIGNATION

GROUNDWATER LEVEL

FLOW DIRECTION

SCREENED INTERVAL

NOTE: (1) GROUNDWATER LEVEL SHOWN IS FOR UPPERMOST MONITORED INTERVAL

(2) PIEZOMETERS WERE INSTALLED IN SEPARATE BOREHOLES.

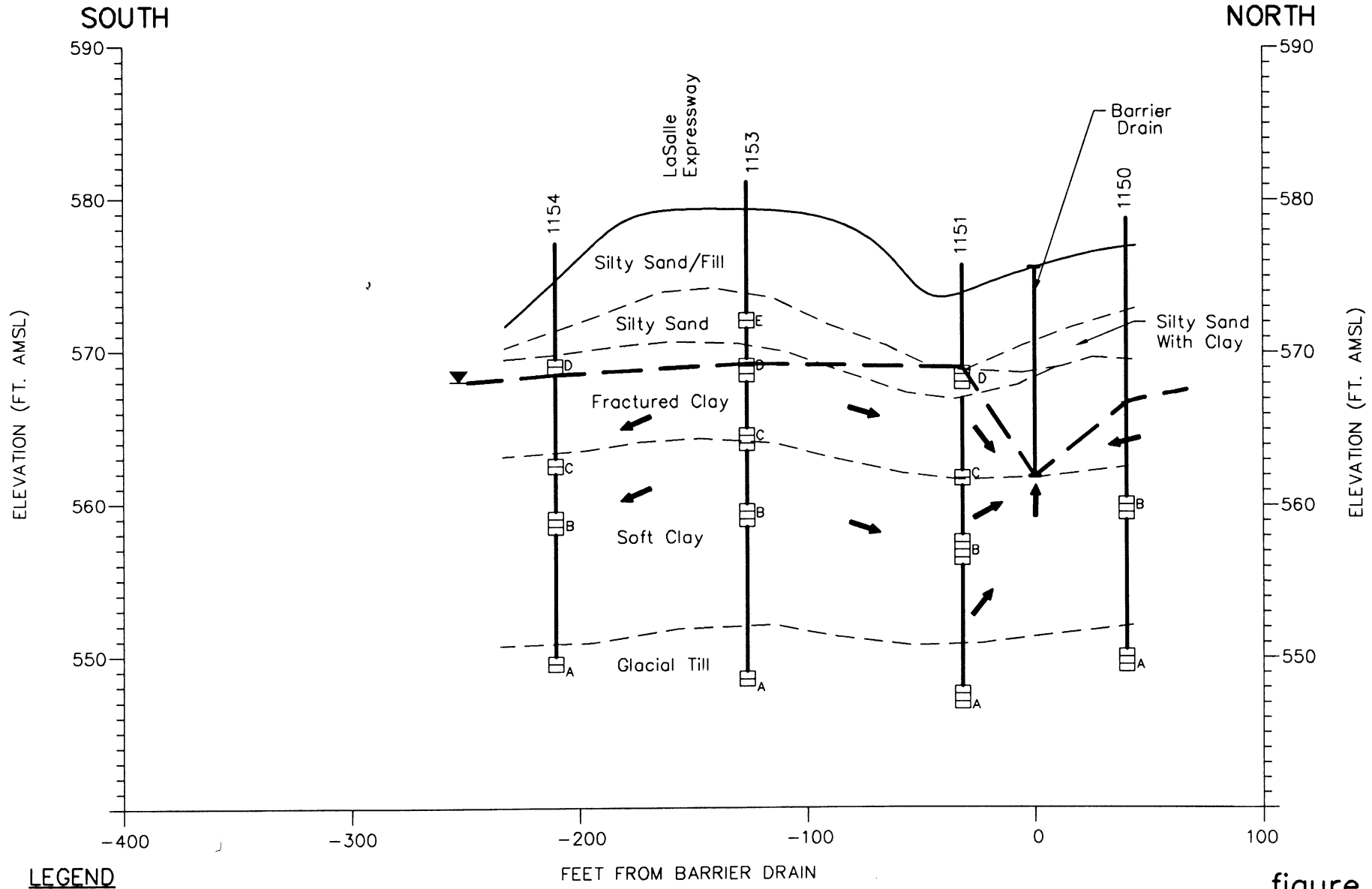
figure 3.2

JULY 1998 FLOW DIAGRAM
1140 SERIES PIEZOMETERS
LOVE CANAL

Miller Springs Remediation Management

CRA SERVICES

09954-00(001)GN-WA001 FEB 02/99



LEGEND

A PIEZOMETER DESIGNATION

GROUNDWATER LEVEL

FLOW DIRECTION

SCREENED INTERVAL

NOTE: (1) GROUNDWATER LEVEL SHOWN IS FOR UPPERMOST MONITORED INTERVAL

(2) PIEZOMETERS WERE INSTALLED IN SEPARATE BOREHOLES.

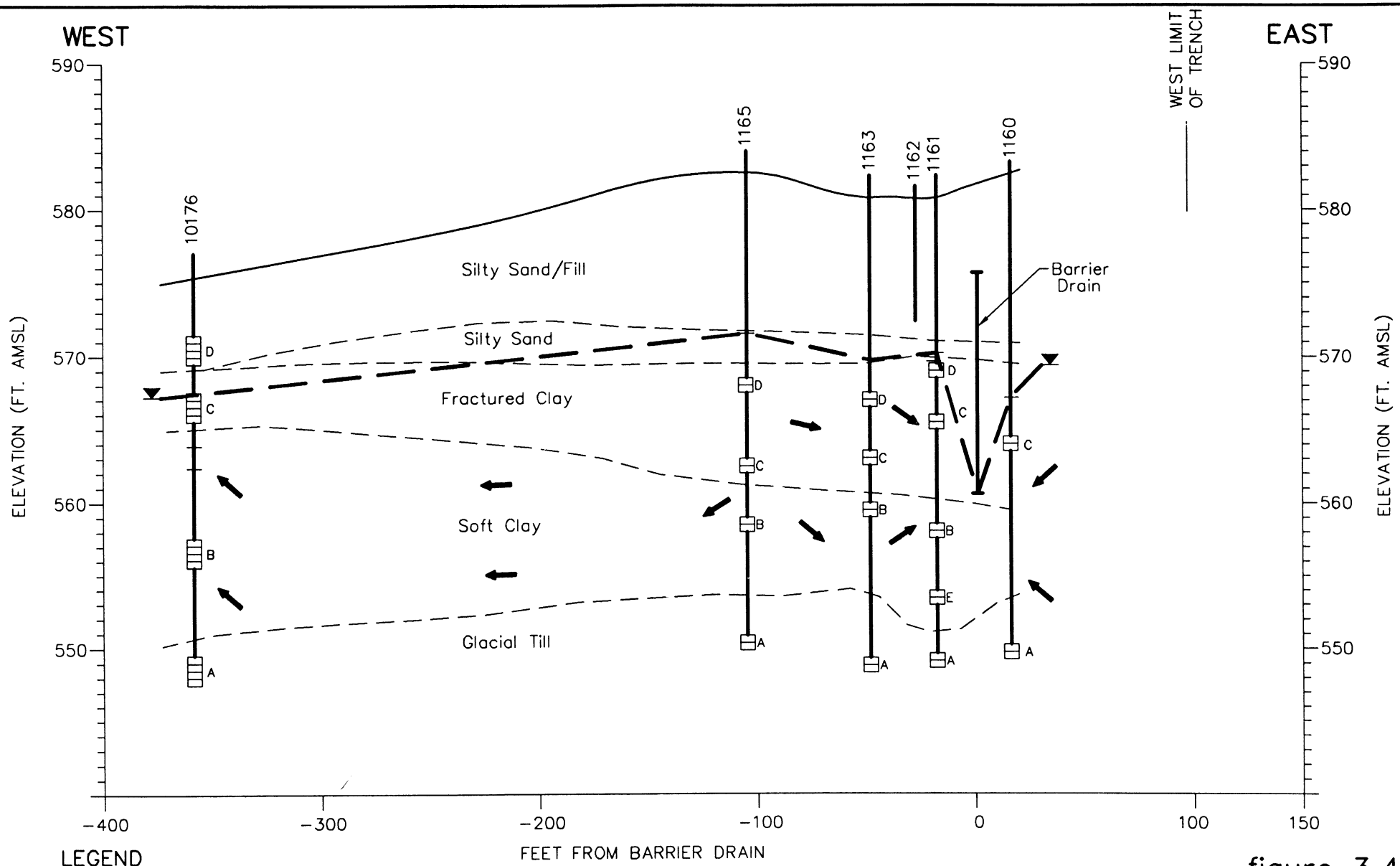
figure 3.3

JULY 1998 FLOW DIAGRAM 1150 SERIES PIEZOMETERS LOVE CANAL

Miller Springs Remediation Management

CRA SERVICES

09954-00(001)GN-WA002 FEB 02/99



LEGEND

A PIEZOMETER DESIGNATION

GROUNDWATER LEVEL

FLOW DIRECTION

SCREENED INTERVAL

NOTE: (1) GROUNDWATER LEVEL SHOWN IS FOR UPPERMOST MONITORED INTERVAL

(2) PIEZOMETERS WERE INSTALLED IN SEPARATE BOREHOLES.

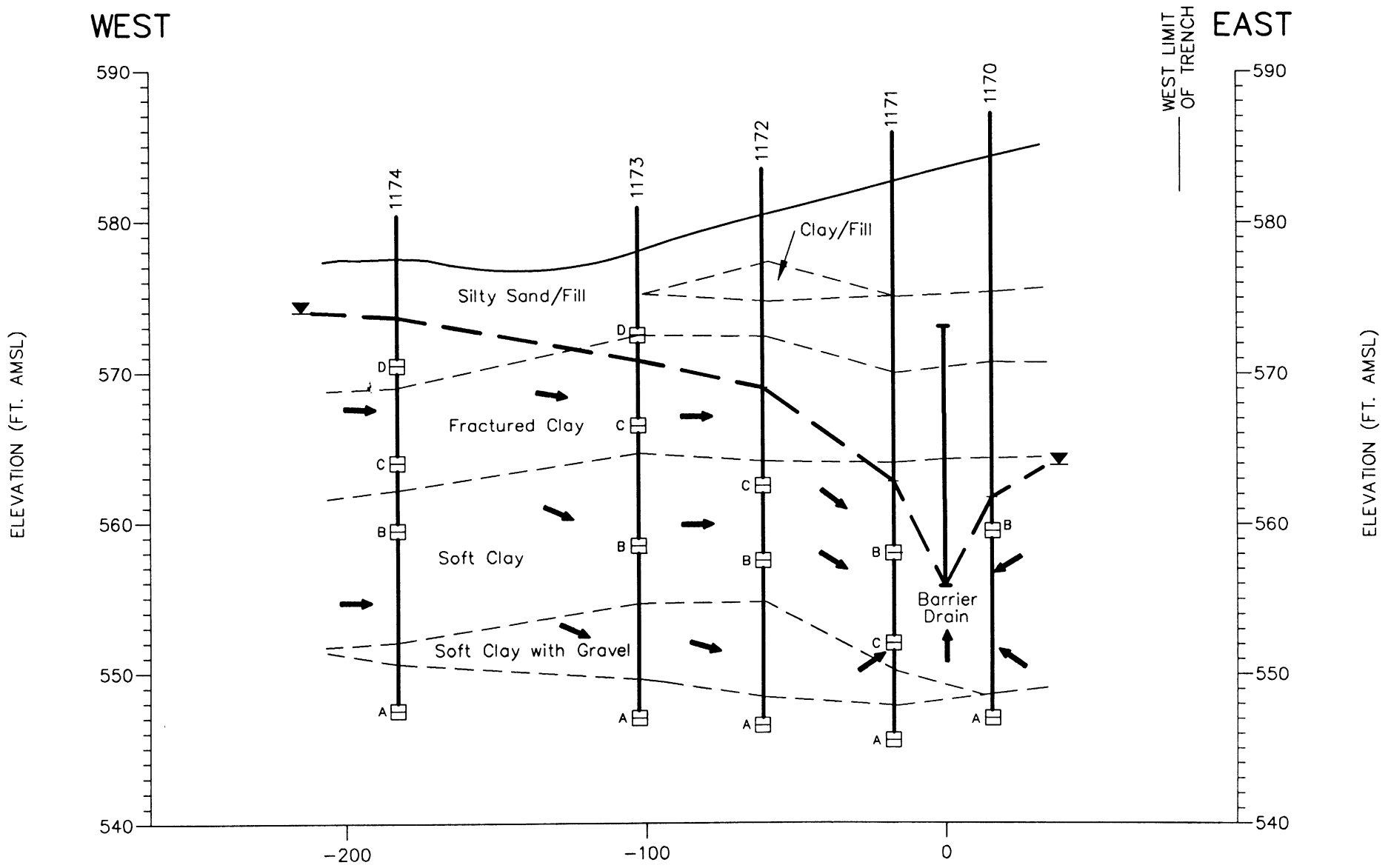
figure 3.4

JULY 1998 FLOW DIAGRAM
1160 SERIES PIEZOMETERS
LOVE CANAL

Miller Springs Remediation Management

CRA SERVICES

09954-00(001)GN-WA003 FEB 02/99



LEGEND

A PIEZOMETER DESIGNATION

GROUNDWATER LEVEL

FLOW DIRECTION

SCREENED INTERVAL

NOTE: (1) GROUNDWATER LEVEL SHOWN IS FOR UPPERMOST MONITORED INTERVAL

(2) PIEZOMETERS WERE INSTALLED IN SEPARATE BOREHOLES.

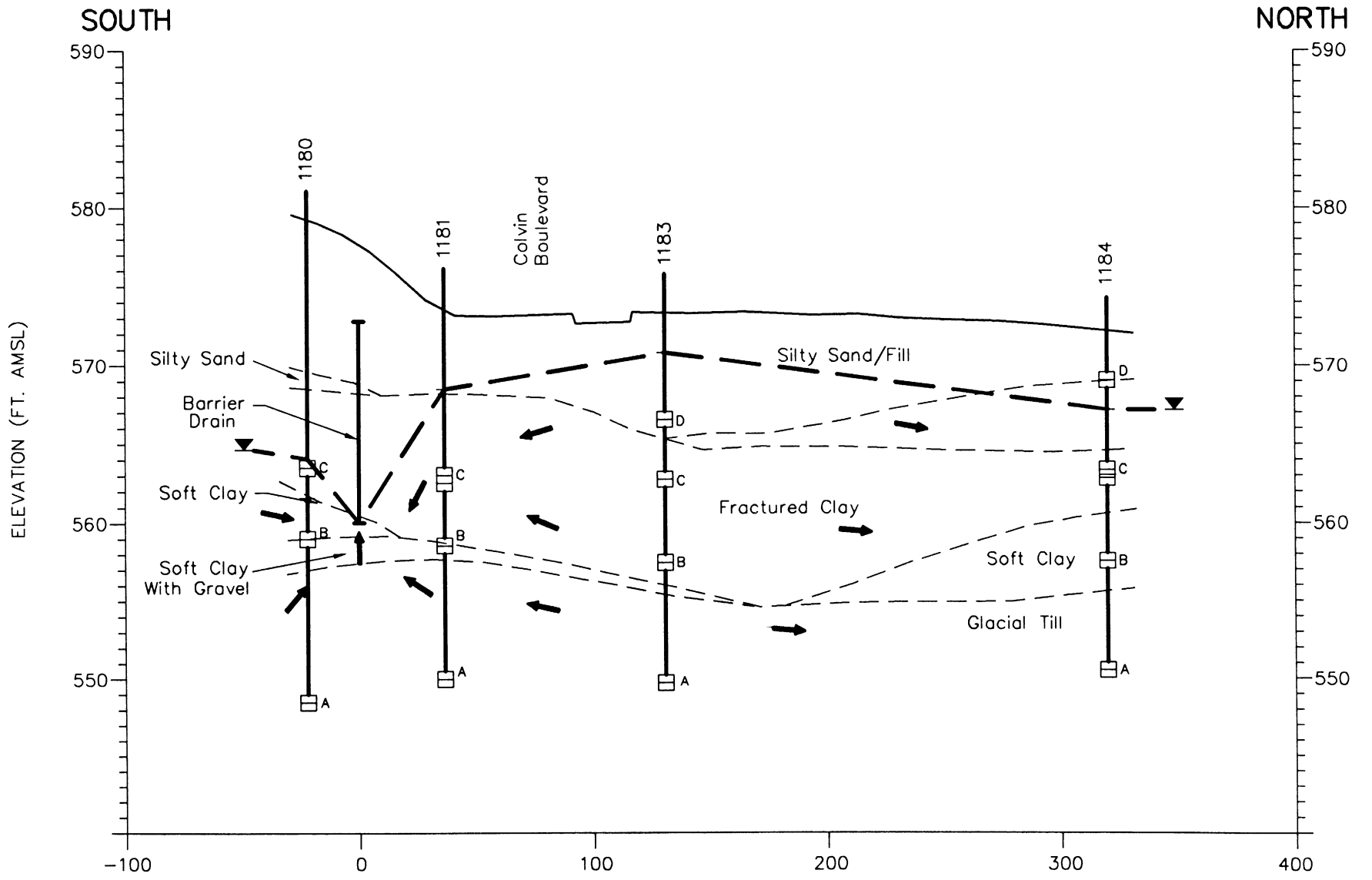
figure 3.5

JULY 1998 FLOW DIAGRAM 1170 SERIES PIEZOMETERS LOVE CANAL

Miller Springs Remediation Management

CRA SERVICES

09954-00(001)GN-WA004 FEB 02/99



LEGEND

A PIEZOMETER DESIGNATION

GROUNDWATER LEVEL

FLOW DIRECTION

SCREENED INTERVAL

NOTE: (1) GROUNDWATER LEVEL SHOWN IS FOR UPPERMOST MONITORED INTERVAL

(2) PIEZOMETERS WERE INSTALLED IN SEPARATE BOREHOLES.

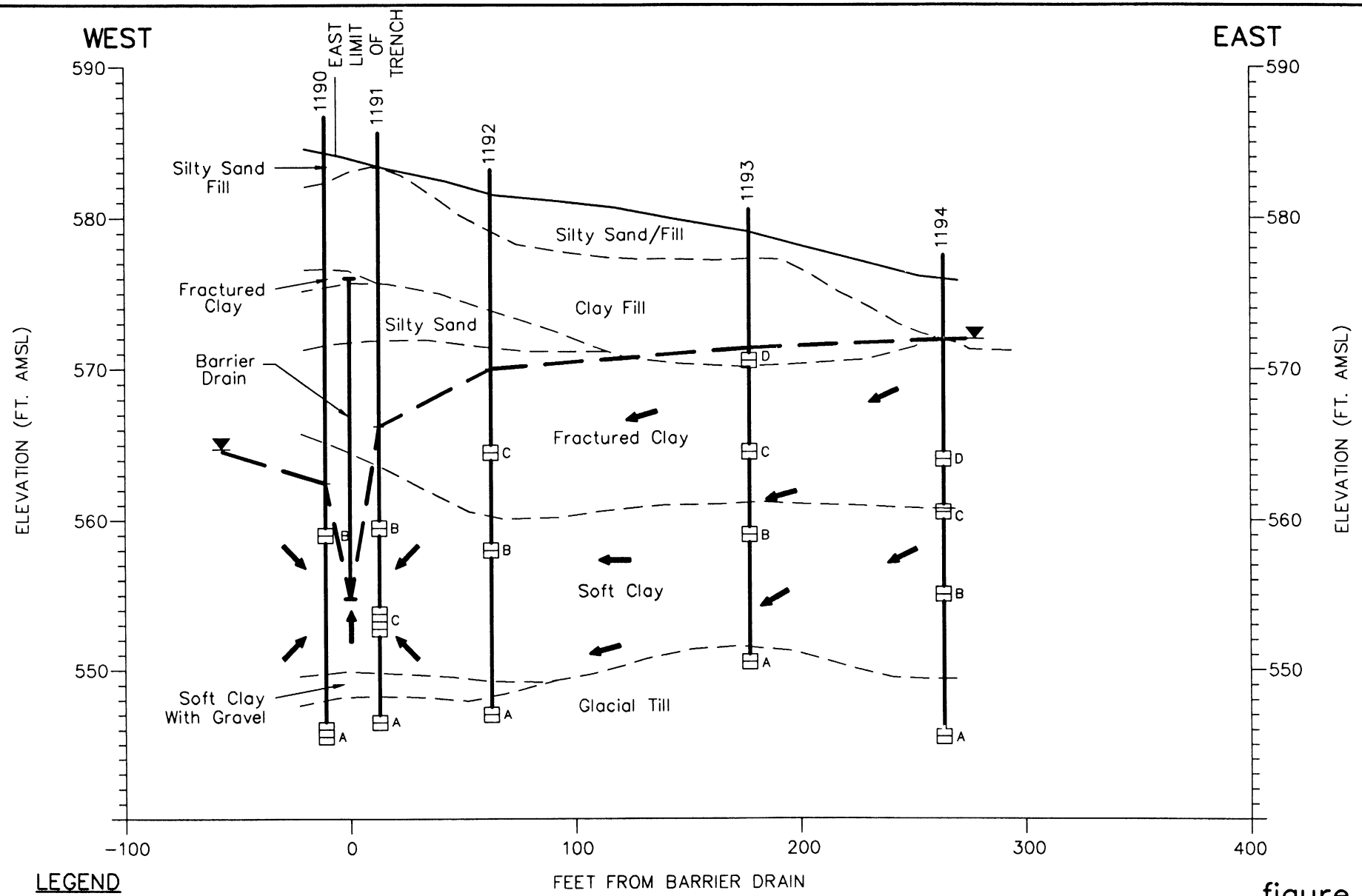
figure 3.6

JULY 1998 FLOW DIAGRAM
1180 SERIES PIEZOMETERS
LOVE CANAL

Miller Springs Remediation Management

CRA SERVICES

09954-00(001)GN-WA005 FEB 02/99



LEGEND

A PIEZOMETER DESIGNATION

GROUNDWATER LEVEL

FLOW DIRECTION

SCREENED INTERVAL

NOTE: (1) GROUNDWATER LEVEL SHOWN IS FOR UPPERMOST MONITORED INTERVAL

(2) PIEZOMETERS WERE INSTALLED IN SEPARATE BOREHOLES.

figure 3.7

JULY 1998 FLOW DIAGRAM
1190 SERIES PIEZOMETERS
LOVE CANAL

Miller Springs Remediation Management

CRA SERVICES

09954-00(001)GN-WA006 FEB 02/99

TABLES

TABLE 3.1

MONTHLY VOLUMES OF GROUNDWATER TREATED
LOVE CANAL LEACHATE TREATMENT FACILITY
OCCIDENTAL CHEMICAL CORPORATION

Month	*Volume (gal)*			
	1995	*1996*	*1997*	*1998*
January	597,650	474,330	337,720	700,070
February	202,235	252,450	456,800	539,838
March	385,910	331,690	520,600	615,133
April	132,790	615,350	184,400	437,817
May	123,140	513,310	126,850	139,600
June	125,300	251,400	210,630	99,800
July	132,400	113,300	96,810	130,200
August	112,910	146,700	223,390	138,300
September	111,200	310,550	116,790	95,200
October	491,440	532,360	326,100	71,500
November	641,210	393,730	346,550	46,200
December	235,900	499,540	524,760	73,800
Total	3,292,085	4,434,710	3,471,400	3,087,458
Monthly Average	274,340	369,560	289,280	257,288
Rainfall Inches	33.99	48.22	41.17	27.97

TABLE 3.2

SUMMARY OF DETECTED COMPOUNDS
1998 LONG-TERM MONITORING PROGRAM
LOVE CANAL
OCCIDENTAL CHEMICAL CORPORATION

Overburden Wells	*VOCs*	*SVOCs*	*Pesticides/PCBs*
7115	ND	ND	ND
7125	ND/ND	ND/ND	ND/ND
7130	ND	ND	ND
7132	ND	ND	ND
8106	ND	ND	ND
8115	ND	ND	ND
8125	ND	ND	ND
9105	ND	ND	ND
9113	ND	ND	ND
9118	ND/ND	ND/ND	ND/ND
9122	ND	ND	ND
9130	ND	2	ND
10105	ND	ND	ND
10115	ND	1	ND
10135	13	9	4
10150	ND	ND	ND
10178	ND	ND	ND
Bedrock Wells			
5222	1	8	ND
6209	ND	ND	ND
7205	ND	ND	ND
8210	ND	1	ND
9205	ND	ND	ND
9210	ND	ND	ND
10205	ND	ND	ND
10210A	1	ND	ND
10210B	1	1	ND
10210C	ND	1	ND
10215	1	ND	ND
10225A	1	ND	ND
10225B	1	1	ND
10225C	ND	1	ND
10270	ND	ND	ND
10272	ND	ND	ND
10278	ND	ND	ND
Total # of Detections	**19**	**25**	**4**

Notes:
33 - Number of parameters detected.
ND/ND - Duplicate analyses.
ND - No parameters detected at or above detection limits.

TABLE 3.3

SUMMARY OF DETECTED COMPOUNDS
ALL WELLS SAMPLED IN 1998
LOVE CANAL
MAY - JUNE 1998

Location ID:		10225A	10225C	8210	5222	9130	10115	10210A	10225B	10135	10210B	10215	10210C
Collection Date:		06/09/98	06/11/98	05/29/98	06/04/98	06/01/98	06/01/98	06/26/98	06/29/98	06/17/98	06/18/98	06/11/98	06/22/98
Parameters	**Units**												
Volatiles													
Vinyl chloride	mg/L	ND 20	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**48J**	ND 10	ND 10	ND 10
Acetone	mg/L	**96J**	ND 10	ND 10	ND 10	ND 10	ND 10	**120J**	**42J**	**110J**	ND 14	ND 10	ND 25J
Carbon disulfide	mg/L	ND 20	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10J	**8J**	**2J**	ND 10
trans-1,2-Dichloroethene	mg/L	ND 20	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**58J**	ND 10	ND 10	ND 10
Chloroform	mg/L	ND 20	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**150J**	ND 10	ND 10	ND 10
Trichloroethene	mg/L	ND 20	ND 10	ND 10	**10J**	ND 10	ND 10	ND 10	ND 10	**170J**	ND 10	ND 10	ND 10
1,1,2-Trichloroethane	mg/L	ND 20	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**29J**	ND 10	ND 10	ND 10
Benzene	mg/L	ND 20	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**5300J**	ND 10	ND 10	ND 10
Tetrachloroethene	mg/L	ND 20	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**40J**	ND 10	ND 10	ND 10
1,1,2,2-Tetrachloroethane	mg/L	ND 20	ND 10	ND 10	ND 10J	ND 10J	ND 10J	ND 10	ND 10	**94J**	ND 10	ND 10	ND 10
Toluene	mg/L	ND 20	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**16000**	ND 10	ND 10	ND 10
Chlorobenzene	mg/L	ND 20	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**1900J**	ND 10	ND 10	ND 10
Ethylbenzene	mg/L	ND 20	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**12**	ND 10	ND 10	ND 10
Xylene (total)	mg/L	ND 20	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**55J**	ND 10	ND 10	ND 10
Semi-Volatiles													
bis(2-Chloroethyl)ether	mg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**24J**	ND 10J	ND 10	ND 10
2-Chlorophenol	mg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**28J**	ND 10	ND 10	ND 10
1,4-Dichlorobenzene	mg/L	ND 10	ND 10	ND 10	**0.6J**	ND 10	ND 10	ND 10	ND 10	ND 500	ND 10J	ND 10	ND 10
2-Methylphenol	mg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**55J**	ND 10	ND 10	ND 10
4-Methylphenol	mg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**130J**	ND 10	ND 10	**0.6J**
2,4-Dichlorophenol	mg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**2000**	ND 10	ND 10	ND 10
1,2,4-Trichlorobenzene	mg/L	ND 10	**3J**	ND 10	**4J**	ND 10	ND 10	ND 10	ND 10	**78J**	ND 10J	ND 10	ND 10
2,4,5-Trichlorophenol	mg/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 26	ND 25	**38J**	ND 25	ND 25	ND 25
Diethylphthalate	mg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**0.5J**	ND 500	ND 10J	ND 10	ND 10
Fluoranthene	mg/L	ND 10	ND 10	ND 10	**0.5J**	ND 10	ND 10	ND 10	ND 10	ND 500	ND 10J	ND 10	ND 10
Butylbenzylphthalate	mg/L	ND 10	ND 10	ND 10	ND 10	**2J**	ND 10	ND 10	ND 10	ND 500	ND 10J	ND 10	ND 10
Benzo(a)anthracene	mg/L	ND 10	ND 10	ND 10	**0.6J**	ND 10	ND 10	ND 10	ND 10	ND 500	ND 10J	ND 10	ND 10
Chrysene	mg/L	ND 10	ND 10	ND 10	**1J**	ND 10	ND 10	ND 10	ND 10	ND 500	ND 10J	ND 10	ND 10
bis(2-Ethylhexyl)phthalate	mg/L	ND 10	ND 80	**1800**	ND 10	ND 350	ND 130	ND 10	ND 21	ND 500	**6J**	ND 100	ND 10
Di-n-octylphthalate	mg/L	ND 10	ND 10	ND 10	ND 10	**2J**	**0.9J**	ND 10	ND 10	ND 500	ND 10J	ND 10	ND 10
Benzo(b)fluoranthene	mg/L	ND 10	ND 10	ND 10	**1J**	ND 10	ND 10	ND 10	ND 10	ND 500	ND 10J	ND 10	ND 10
Benzo(k)fluoranthene	mg/L	ND 10	ND 10	ND 10	**0.9J**	ND 10	ND 10	ND 10	ND 10	ND 500	ND 10J	ND 10	ND 10
Benzo(a)pyrene	mg/L	ND 10	ND 10	ND 10	**0.7J**	ND 10	ND 10	ND 10	ND 10	ND 500	ND 10J	ND 10	ND 10
Benzyl alcohol	mg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**2700**	ND 10	ND 10	ND 10J
Benzoic acid	mg/L	ND 50J	ND 50	ND 50	ND 50	ND 50	ND 50	ND 51	ND 50	**23000**	ND 50	ND 50	ND 50J
Pesticides/PCBs													
alpha-BHC	mg/L	ND 0.050	ND 0.050	ND 0.50	ND 2.5	ND 0.050	ND 0.050	ND 0.050	ND 0.050	**59**	ND 0.050	ND 0.050	ND 0.050
beta-BHC	mg/L	ND 0.050	ND 0.050	ND 0.50	ND 2.5	ND 0.050	ND 0.050	ND 0.050	ND 0.050	**12**	ND 0.050	ND 0.050	ND 0.050
delta-BHC	mg/L	ND 0.050	ND 0.050	ND 0.50	ND 2.5	ND 0.050	ND 0.050	ND 0.050	ND 0.050	**8.9**	ND 0.050	ND 0.050	ND 0.050
gamma-BHC (Lindane)	mg/L	ND 0.050	ND 0.050	ND 0.50	ND 2.5	ND 0.050	ND 0.050	ND 0.050	ND 0.050	**6.5J**	ND 0.050	ND 0.050	ND 0.050

Notes:
J Estimated.
NDx Not detected at or above x.
PCBs Polychlorinated Biphenyls.

TABLE 3.3

SUMMARY OF DETECTED COMPOUNDS
ALL WELLS SAMPLED IN 1998
LOVE CANAL
MAY - JUNE 1998

Parameters	Units	Location ID: / Collection Date:											
		10225A 06/09/98	10225C 06/11/98	8210 05/29/98	5222 06/04/98	9130 06/01/98	10115 06/01/98	10210A 06/26/98	10225B 06/29/98	10135 06/17/98	10210B 06/18/98	10215 06/11/98	10210C 06/22/98

R Data Rejected.

TABLE 3.4

SUMMARY OF DETECTED COMPOUNDS FOR SELECTED WELLS, 1990 TO 1998
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Well Number:	*10210A*								*10210B*							
Sample Date:	*7/24/90*	*8/22/91*	*8/26/92*	*8/11/93*	*5/25/95*	*7/1/96*	*7/10/97*	*6/26/98*	*7/24/90*	*8/22/91*	*8/26/92*	*8/11/93*	*6/15/94*	*6/1/95*	*7/5/96*	*7/1/97*	*6/18/98*
Volatiles (ug/L)																	
Vinyl Chloride																	
Methylene Chloride																	
Acetone	14C			13B				120J			31		12B	23			
Toluene																	
1,1-Dichloroethane																	
1,2-Dichloroethene (total)																	
Carbon Disulfide					20	310											8J
2-Butanone																	
Chloroform																	
Trichloroethene																	
1,1,2-Trichloroethane																	
Benzene																	
Chlorobenzene																	
Xylene (total)																	
1,1,2,2-Tetrachloroethane																	
Vinyl Acetate																	
Ethylbenzene																	
Tetrachloroethene																	
Semi-volatiles (ug/L)																	
Pentachlorophenol																	
Phenol										3							
bis(2-Ethylhexyl)Phthalate		12	21	31	51				7B	13		11				55	6J
2,4-Dichlorophenol																	
2,4,5-Trichlorophenol																	
2-Methylphenol																	
4-Methylphenol																	
2-Chloronaphthalene																	
Benzyl Alcohol																	
Benzoic Acid							12J										
Di-n-Octyl Phthalate	3B																
Dimethyl Phthalate	16																
1,2-Dichlorobenzene																	
1,4-Dichlorobenzene																	
1,2,4-Trichlorobenzene																	
Aldrin																	

SUMMARY OF DETECTED COMPOUNDS FOR SELECTED WELLS, 1990 TO 1998
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Well Number:	*10210A*								*10210B*							
Sample Date:	*7/24/90*	*8/22/91*	*8/26/92*	*8/11/93*	*5/25/95*	*7/1/96*	*7/10/97*	*6/26/98*	*7/24/90*	*8/22/91*	*8/26/92*	*8/11/93*	*6/15/94*	*6/1/95*	*7/5/96*	*7/10/97*	6/18/98
Semi-volatiles (cont'd) (ug/L)																	
Bis(2-Chloroethyl)Ether																	
Endrin																	
Endosulfan Sulfate																	
2-Chlorophenol																	
Pesticides/PCBs (ug/L)																	
Alpha-BHC																	
Beta-BHC																	
Delta-BHC																	
Beta & Gamma-BHC (sum of isomers)																	

Notes:

B - Found in blank.
C - Confirmed data.
J - Estimated Concentration.
D - Diluted Sampled.
E - Exceeded calibration range of the instrument
P - Greater than 25% difference for detected concentrations between the two GC columns in the pesticide target analyte. Lower of two values is reported.

TABLE 3.4

SUMMARY OF DETECTED COMPOUNDS FOR SELECTED WELLS, 1990 TO 1998
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Well Number:	*10210C*									*10135*						
Sample Date:	*7/25/90*	*8/22/91*	*8/26/92*	*8/11/93*	*6/8/94*	*6/1/95*	*7/1/96*	*7/1/97*	*6/22/98*	*8/26/92*	*8/19/93*	*6/22/94*	*6/1/95*	*6/27/96*	*7/7/97*	6/17/98
Volatiles (ug/L)																
Vinyl Chloride														50		48J
Methylene Chloride											41			11		
Acetone			10B	23B	19B						270	100B		60		110J
Toluene										2700	1700E	21500BE	18000D	14000	19000/17000	16000J
1,1-Dichloroethane											15					
1,2-Dichloroethene (total)										700	840			560		58J
Carbon Disulfide																
2-Butanone											5200					
Chloroform											100			110		150J
Trichloroethene											24			36		170J
1,1,2-Trichloroethane														14		29J
Benzene												6000E	4900D	4800	5600/5000	5300J
Chlorobenzene										2600	1700		2000D	1500	2300/ND	1900J
Xylene (total)											47	10B		28		55J
1,1,2,2-Tetrachloroethane											12			26		94J
Vinyl Acetate										6800		12B				
Ethylbenzene											13					12
Tetrachloroethene																40J
Semi-volatiles (ug/L)																
Pentachlorophenol											52					
Phenol			6			22		22			96	91	140			
bis(2-Ethylhexyl)Phthalate	7B	13		38							50					
2,4-Dichlorophenol										1200B	420	610	150		2100/2100	2000
2,4,5-Trichlorophenol											70					38J
2-Methylphenol											51					55J
4-Methylphenol						29	110	62	0.6J		80					130J
2-Chloronaphthalene													150			
Benzyl Alcohol													380		1900/1600	2700
Benzoic Acid													6400D	4000	30000J/27000J	23000J
Di-n-Octyl Phthalate																
Dimethyl Phthalate																
1,2-Dichlorobenzene											35					
1,4-Dichlorobenzene										110	94	91				
1,2,4-Trichlorobenzene											74	87B				78J
Aldrin										0.53	0.24P					

TABLE 3.4

SUMMARY OF DETECTED COMPOUNDS FOR SELECTED WELLS, 1990 TO 1998
LOVE CANAL LONG-TERM MONITORING PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Well Number:	*10210C*									*10135*						
Sample Date:	*7/25/90*	*8/22/91*	*8/26/92*	*8/11/93*	*6/8/94*	*6/1/95*	*7/1/96*	*7/1/97*	6/22/98	*8/26/92*	*8/19/93*	*6/22/94*	*6/1/95*	*6/27/96*	*7/7/97*	6/17/98
Semi-volatiles (cont'd) (ug/L)																
Bis(2-Chloroethyl)Ether											23					24J
Endrin												0.15P				
Endosulfan Sulfate											0.43P					
2-Chlorophenol																28J
Pesticides/PCBs (ug/L)																
Alpha-BHC										84	42C	24CEP	28D	29	39/39	59
Beta-BHC													10D	11	8.1/8.6	12
Delta-BHC										15	9.8P	7.5CE	4.7	5.2	ND/5.1	8.9
Beta & Gamma-BHC (sum of isomers)										33	19.5	20.4CE			13.2/14.8	6.5J

Notes:

B - Found in blank.
C - Confirmed data.
J - Estimated Concentration.
D - Diluted Sampled.
E - Exceeded calibration range of the instrument
P - Greater than 25% difference for detected concentrations between the two GC columns in the pesticide target analyte. Lower of two values is reported.

TABLE 4.1

1998 LOVE CANAL SYSTEM REPAIRS
MILLER SPRINGS REMEDIATION MANAGEMENT

Repaired entrance lighting located at the Main Gate and Administration Bldg.

Repaired Treatment Bldg. Dravo heating unit motor.

Replaced Treatment Bldg. Hot Water Heater.

Repaired Treatment Bldg. air compressor, changed oil and filter.

Installed additional 120 volt electrical plugs in Administration Bldg.

Aligned air compressor in Treatment Bldg.

Added wall between the lunchroom and the front office in the Administration Bldg.

Replaced effluent flow meter.

Replaced impeller filter feed pump.

Repaired valve on #4 sludge tank.

Removed ice machine from lab and placed in garage.

Installed confined space signs where needed.

Preventative maintenance on various equipment at the Love Canal site.

Repaired the PC2 Well Pump.

Replaced the Bristol Computer Communications Card / Failed due to lighting.