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2000 ANNUAL REMEDIAL ACTION GROUND-WATER MONITORING REPORT ORMET CORPORATION SUPERFUND SITE HANNIBAL, OHIO

MARCH 30, 2001

Prepared for:

The Ormet Corporation
Hannibal, Ohio

Prepared by:

HMI
Environmental Consulting Services

HYDROSYSTEMS MANAGEMENT, INC.
Glass Works Center - Suite 109
331 S. Main Street
Washington, PA 15301
Phone: (724) 228-4310 Fax: (724) 228-4343

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BACKGROUND/INTRODUCTION

Under the terms of a Consent Decree entered on December 18, 1995 between the United States Environmental Protection Agency (USEPA) and the Ormet Primary Aluminum Corporation for the Ormet Corporation Superfund Site, Ormet has undertaken Remedial Action (RA) at the site consisting of the following:

- Containment of the plume in the alluvial aquifer through continued pumping of the interceptor wells and Ormet Ranney well and treatment of ground water pumped by the interceptor wells using ferrous salt precipitation;

- Installation and operation of a soil flushing system in the Former Spent Potliner Storage Area (FSPSA);

- Capping of the former construction material scrap dump (CMSD) with a multi-layer cap, including construction of a TSCA-compliant cell within the CMSD for disposal of backwater area sediment containing PCBs;

- Installation of a drain system around the toe of the former CMSD to collect seeps, with treatment of the collected seep water using activated carbon followed by treatment at the ground-water treatment plant;

- Excavation of carbon material from the former carbon runoff and deposition area and disposal of the material in the former CMSD;

- Excavation of sediment from the former Outfall 004 backwater area and disposal of the sediment in the CMSD; and

- Relocation of the Outfall 004 channel.

Areas of the site that were subject to remedial action are shown in Figure 1.

Remedial construction was initiated in April 1997 and was certified as being complete in August 1998. During the period from August1998 through October 1998, the FSPSA soil flushing system was operated on a trial basis, with flushing occurring for a period of approximately three hours per day. Beginning in April 1999, the soil flushing system began full operation (i.e., flushing for eight hours per day).

As specified in the Statement of Work (SOW) attached to the Consent Decree, Ormet began a program of routine ground-water monitoring in conjunction with the completion of remedial construction. The purpose of ground-water monitoring is to document/evaluate changes in ground-water conditions beneath the site associated with the remedial actions. To provide a baseline characterization of ground-water conditions immediately prior to remedial activities, a sitewide ground-water monitoring event was conducted during May 5 to 9, 1997. Routine ground-water monitoring was initiated in May 1998. Ground- water monitoring activities have been conducted in accordance with the Remedial Action Ground-Water Monitoring Plan (Revision 1 - April 28, 1997), which was submitted to the USEPA during Remedial Design.

SUMMARY OF GROUND-WATER MONITORING PROGRAM

The current system of ground-water monitoring wells and piezometers at the Ormet site is shown in Figure 1. Under the RA Ground-Water Monitoring Plan, monitoring is to be conducted three times per year (approximately once every four months). During 2000, ground-water monitoring events were conducted during January 10 and 11, May 15 to 18, and October 9 and 10.

Each monitoring event included measurement of water-level elevations at all MW- and TH-series monitoring wells, PPB-series piezometers monitoring the alluvial aquifer, and at the Ohio River pool measuring points RP-1 and RP-2. Water-level elevation data collected in conjunction with the 2000 monitoring events are provided in Tables 1, 2, and 3, respectively.

During each monitoring event, ground-water samples were collected from the following wells located within and downgradient of the FSPSA:

MW - 2	MW - 31
MW - 5	MW - 32
MW - 16	MW - 35
MW - 18	MW - 36
MW - 28	MW - 37

Each monitoring event also included sampling of monitoring well MW-12, located immediately downgradient of the CMSD. These wells were identified in the RA Ground-Water Monitoring Plan as Points of Compliance, as required under Section II.6. of the Consent Decree SOW.

The RA Ground-Water Monitoring Plan specifies that one monitoring event each year is to be an expanded monitoring event which includes sampling of selected wells not hydraulically downgradient from any of the potential source areas at the site (i.e., background wells) and additional wells located within the plume outside of the FSPSA. These wells include the following:

MW-1	MW-29S & D
MW-7 (background)	MW-30
MW-8	MW-34S & D
MW-10	MW-39S & D
MW-11	MW-40S & D
MW-15	MW-41 (background)
MW-17	MW-42S & D
MW-19 (background)	

Water Sampling Log forms for each of the monitoring events conducted during 2000 are provided in Appendix A.

The primary purpose of the annual expanded monitoring event is to collect data to facilitate preparation of plume isopleth maps. Based on the isopleth maps, estimates of contaminant mass-in-place and the total area of the aquifer exceeding cleanup goals for selected indicator parameters were made and compared with estimates based on historical monitoring results as a means of assessing the progress of the remediation program. The expanded monitoring event to characterize baseline conditions at the start of remedial construction in 1997 was conducted in May. To enable more direct comparison of the associated estimates of contaminant mass-in-place and aquifer area exceeding cleanup goals, subsequent expanded monitoring events have also been conducted during May.

Ground-water samples from all monitoring wells were analyzed for constituents for which cleanup goals were specified in the Record of Decision (ROD) for the site; i.e., arsenic, beryllium, cyanide, manganese, vanadium, and fluoride. Samples were also analyzed for pH, specific conductance, and sodium, which are additional indicators of the plume in the alluvial aquifer. Tetrachloroethene (PCE) was analyzed in samples from the MW-2, MW-5, MW-18, MW-30, and MW-31 monitoring wells, in which PCE was detected during the Remedial Investigation (RI). Ground-water analyses were performed by Kemron Environmental Services, Inc. (Kemron) of

Marietta, OH. Kemron also provided analytical services during the RI, for treatability testing performed during Remedial Design, and during remedial construction. Methods used by Kemron to analyze ground-water samples from the RA monitoring events were as shown below.

Analytical Parameter	Analytical Method	Ground-Water Clean-Up Goal (ug/L)	Reporting Limit (ug/L)
Arsenic	SW846/6010A-trace ICP	10*	4
Beryllium	SW846/6010A-trace ICP	4	0.5
Manganese	SW846/6010A	230*	10
Vanadium	SW846/6010A	260	10
Cyanide (total)	SW846/9010A	N/A	10
Cyanide (amenable)	SW846/9010A	200	10
Fluoride	EPA 340.2	4000	100
Tetrachloroethene	SW846/8260A	5	5
pH	EPA 150.1	N/A	N/A
Specific Conductance	EPA 120.1	N/A	N/A
Sodium	SW846/6010A	N/A	500

N/A - Not Applicable

* - Final determination of cleanup goals for arsenic and manganese are pending. The USEPA and Ormet negotiated a Consent Decree and associated Statement of Work for implementation of the ROD. Because arsenic and manganese are common ground-water constituents in the Ohio River Valley and can occur naturally at concentrations above the cleanup goals presented in the ROD, the SOW specified that as part of the Remedial Design process, Ormet would conduct a statistical evaluation to determine background levels of arsenic and manganese in the alluvial aquifer. The resulting background levels would then be considered for use as cleanup goals in place of the levels presented in the ROD. The results of the statistical analyses, which were presented to USEPA in the August 28, 1996 HydroSystems Management, Inc. report titled, "Statistical Analyses of Background Levels of Manganese and Arsenic in Ground Water", indicated background levels of 40 ug/L for arsenic and 9,780 ug/L for manganese.

Laboratory analytical reports for the 2000 monitoring events are provided in Appendix B. The analytical results are summarized in Table 4. For purposes of comparison, Table 4 also includes historical results for the parameters and wells being monitored. Analytical results for the 2000

monitoring events were validated by applying principles and concepts of the USEPA National Functional Guidelines. A data validation summary report is provided in Appendix C.

RESULTS OF 2000 REMEDIAL ACTION GROUND-WATER MONITORING

GROUND-WATER FLOW

Water-level elevation data collected during the 2000 monitoring events (Tables 1 through 3) were used to construct the water table contour maps shown in Figures 2, 3, and 4. The ground-water elevation contours and associated ground-water flow patterns shown in Figures 2 through 4 are consistent with those previously mapped, indicating that the ground-water pumping component of the site remedy is effective in containing the plume in the alluvial aquifer beneath the Ormet Reduction Mill property and extracting contaminated ground water for treatment at Ormet's ground-water treatment plant. Ground-water flow in the alluvial aquifer is generally from northeast to southwest, toward the Ormet Reduction Mill Ranney well and interceptor wells. Current pumping maintains the water table at an elevation that is below the pool elevation of the Ohio River, and a hydraulic potential does not exist for the natural discharge of ground water from the alluvial aquifer to the Ohio River along the river/plant boundary. The ground-water elevation contour maps for the 2000 monitoring events indicate that the operation of the FSPSA soil flushing system has had no discernable effect on ground-water flow patterns beneath that area of the site.

Pumping by the Ormet Reduction Mill Ranney well and the Ormet Rolling Mill Ranney well (located approximately 2000 feet west of the Reduction Mill Ranney well) have created large cones of influence around each pumping center, which converge to form a gently rounded ground-water divide, situated roughly parallel to and west of the fenceline separating the two plants. A ground-water divide is a high point, or ridge, in the surface of the water table. The ground-water divide creates a hydraulic barrier, such that ground water on the west side of the divide flows toward the Rolling Mill Ranney well, and ground water on the east side flows toward the Reduction Mill Ranney well and interceptor well. By this condition, a hydraulic potential does not exist for ground water beneath the Reduction Mill to flow toward the Rolling Mill Ranney well.

HydroSystems Management, Inc.

SUMMARY OF TIME VS. CONCENTRATION TRENDS

	TOTAL CN	AMEN. CN	As	Be	Mn	V	F	Na
Wells within FSPSA								
MW - 32	⇓⇑	–	⇓⇑	–	⇑	–	⇓⇑	--
MW - 35	–	⇑	⇓	--	⇑⇓	⇓⇑	⇓	⇓
MW - 36	⇓	--	⇑⇓	⇓	--	⇓	⇓	⇓
MW - 37	⇓	--	⇓	--	--	⇓	⇓	⇓
Downgradient Edge of FSPSA								
MW - 16	⇑	⇑	–	–	⇑	–	–	⇓⇑
MW - 18	--	⇑	⇑⇓	--	⇑	--	⇓	⇓
MW - 28	⇓⇑	⇓⇑	--	--	--	--	--	--
MW - 31	⇑⇓	--	⇑	⇑⇓	⇑	⇑	⇑	⇑
Mid - Plant Area								
MW - 2	⇑⇓	–	–	⇓	–	⇓	⇓	⇓
MW - 5	⇓⇑	⇑	--	--	⇓⇑	--	⇓	⇓
Downgradient of CMSD								
MW - 12	–	–	–	–	–	–	⇓	–

Total CN - Total Cyanide; Amen. CN - Amenable Cyanide; As - Arsenic; Be - Beryllium; Mn - Manganese; V - Vanadium; F - Fluoride; Na - Sodium

⇑ - Trend of increasing concentration. ⇓ - Trend of decreasing concentration. -- No apparent trend.

Combinations of symbols indicate changes in trends.

COMPARISON OF LATEST REPORTED CONCENTRATION VERSUS CLEANUP GOALS/BACKGROUND

	AMEN. CN	As	Be	Mn	V	F
Wells within FSPSA						
MW - 32			*	+	*	
MW - 35		*	*	+	*	
MW - 36	*	+	*	+	*	
MW - 37	*	*	*	+	*	
Downgradient Edge of FSPSA						
MW - 16	*	*	*	+	*	
MW - 18	*		*	+	*	
MW - 28		*	*	*	*	*
MW - 31			*	+	*	
Mid-Plant Area						
MW - 2			*	+	*	
MW - 5		*	*	+	*	
Downgradient of CMSD						
MW - 12	*	*	*	+	*	*

Amen. CN - Amenable Cyanide; As - Arsenic; Be - Beryllium; Mn - Manganese; V - Vanadium; F - Fluoride
* - Latest result at or below ROD Cleanup Goal.
+ - Latest result above Cleanup Goal, but below background.
Blanks indicate latest result is above cleanup goal. For arsenic, a blank indicates latest result is above background.

Discussions of the time versus concentrations trends for each parameter for which a cleanup goal has been established are provided in the following sections.

Cyanide (Amenable to Chlorination)

The cleanup goal for cyanide established in the ROD (0.2 mg/L) is the Safe Drinking Water Act Maximum Contaminant Level (MCL) for cyanide amenable to chlorination. Cyanide amenable to chlorination is that portion of total cyanide which is weakly bound in cyanide complexes or is in the form of free (non-complexed) cyanide. Cyanide amenable to chlorination is a more reactive form of cyanide than the more strongly bound metal-cyanide complexes (e.g., iron cyanide). The form of cyanide occurring in the ground water beneath the Ormet site appears to be predominantly the stable cyanide complexes, which exhibit relatively low toxicity. This interpretation is supported by the relative concentrations of total versus amenable or free cyanide reported in ground-water samples from the site; i.e., the concentration of amenable or free cyanide is typically much lower than the total cyanide concentration in a sample. Also, the area of the alluvial aquifer containing concentrations of amenable cyanide above the cleanup goal is smaller than the area of aquifer containing total cyanide at levels above 0.2 mg/L. This comparison is further discussed later in this report.

Analyses for amenable cyanide tend to be subject to a higher degree of variability than other plume indicators, such as total cyanide and fluoride. Consequently, concentration versus time graphs for amenable cyanide are somewhat erratic and exhibit less consistent trends. For this reason, the long-term concentration trends for amenable cyanide at a given monitoring well are more significant than fluctuations observed from one monitoring event to the next.

Concentration versus time graphs for total cyanide and amenable cyanide are presented in Appendix D-1 and D-2, respectively. At five of the eleven compliance point wells, the most recently reported amenable cyanide concentration was below the clean-up goal of 0.2 mg/L. At five of the

wells (MW-5, MW-16, MW-18, MW-28, and MW-35), amenable cyanide concentrations exhibit an upward trend. The 11 remaining compliance wells exhibit no consistent trend.

Fluoride

Of the main plume indicators, fluoride is less prone to analytical variability than cyanide, and is potentially a more reliable indicator of changes in overall plume quality. Concentration versus time graphs for fluoride for each of the compliance wells are provided in Appendix D-3.

The most recent result for fluoride was below the cleanup goal of 4 mg/L at two of the eleven compliance point wells, MW-12 and MW-28, and a downward concentration trend was observed at seven of the compliance wells (MW-2, MW-5, MW-12, MW-18, MW-35, MW-36, and MW-37). The only compliance wells in which the concentration of fluoride exhibits an increasing trend are MW-31 and MW-32. MW-31 is about 100 feet downgradient of the soil flushing area. At MW-32, the concentration of fluoride, during the 2000 monitoring events was 27 mg/L, 19 mg/L and 70 mg/L. Although these results are lower than the 120 mg/L reported during the September 1999 monitoring event, they are higher than all values reported since May 1997. As shown on the ground-water contour maps for the 2000 monitoring events, (Figures 2, 3, and 4), the MW-32 monitoring well is located near the downgradient edge of the FSPSA soil flushing area. Increases in concentrations of fluoride at MW-31 and MW-32 are believed to reflect increased leaching of residual spent potliner materials in the soil of the FSPSA as a result of soil flushing.

Arsenic

Concentration versus time graphs for arsenic for each of the compliance point wells are provided in Appendix D-4. At five of the eleven compliance point wells, MW-2, MW-5, MW-16, MW-35, and MW-37, the concentrations of arsenic reported during recent sampling events are substantially lower than levels reported during the Phase I RI. Data for the MW-31 and MW-32 wells show an increasing trend. At MW-32, arsenic values reported during the 2000 sampling events

were higher than any value reported since June 1996, with the exception of 0.057 mg/L reported during the September 1999 monitoring event. As discussed above for fluoride, the MW-31 and MW-32 wells are near the downgradient edge of the FSPSA soil flushing area. Increases in concentrations of arsenic at these wells are believed to reflect increased leaching of residual spent potliner materials in the soil of the FSPSA as a result of soil flushing.

As discussed earlier in this report, the final cleanup goal for arsenic is pending. In the ROD, the cleanup goal for arsenic was set at 0.010 mg/L. The MCL for arsenic is 0.050 mg/L. Because arsenic is a common constituent of ground water in the Ohio River Valley for which naturally-occurring concentrations can exceed the cleanup goal presented in the ROD, the SOW specified that as part of the Remedial Design process, Ormet would conduct a statistical evaluation to determine the background level of arsenic in the alluvial aquifer. The resulting background level would then be considered for use as the cleanup goal in place of the level presented in the ROD. The results of the statistical analyses, which were presented to USEPA in the August 28, 1996 HydroSystems Management, Inc. report titled, "Statistical Analyses of Background Levels of Manganese and Arsenic in Ground Water", indicated a background level of 0.040 mg/L for arsenic. At six of the compliance wells (MW-5, MW-12, MW-16, MW-28, MW-35, and MW-37), the most recent results are below the 0.010 mg/L cleanup goal presented in the ROD. At a seventh well, MW-36, the most recent result is below the background level for arsenic.

Beryllium

Concentration versus time graphs for beryllium are provided in Appendix D-5. The cleanup goal for beryllium established in the ROD was the MCL, 0.004 mg/L. Beryllium was reported above the MCL only in samples collected during the Phase I RI (June/July 1988) and only at two wells: MW-18 and MW-37. Since the Phase I RI, beryllium has been consistently below the MCL in all samples analyzed, including samples from all of the compliance point monitoring wells during each of the 2000 monitoring events.

Manganese

Concentration versus time graphs for manganese are provided in Appendix D-6. Manganese results for MW-5, MW-16, MW-18, MW-31, and MW-32 show slight increasing trends during more recent monitoring events. Recent results for MW-35 show a decreasing trend. The data for the remaining five compliance wells exhibit no consistent trend with regard to manganese. As discussed above for other monitoring parameters, the MW-16, MW-18, MW-31, and MW-32 wells are located near the downgradient edge or just downgradient from the FSPSA soil flushing area. Increases in manganese concentrations at these wells are believed to reflect increased leaching of residual spent potliner materials in the soil of the FSPSA as a result of soil flushing.

As discussed for arsenic, the final cleanup goal for manganese is pending. In the ROD, the cleanup goal for manganese was set at 0.230 mg/L. Because manganese is a common constituent of ground-water in the Ohio River Valley for which naturally-occurring concentrations can be well above the cleanup goal presented in the ROD, the SOW specified that as part of the remedial Design process, Ormet would conduct a statistical evaluation to determine the background level of manganese in the alluvial aquifer. The resulting background level would then be considered for use as the cleanup goal in place of the level presented in the ROD. The results of the statistical analyses, which were presented to USEPA in the August 28, 1996 HydroSystems Management, Inc. report titled, "Statistical Analyses of Background Levels of Manganese and Arsenic in Ground Water", indicated a background level of 9,780 ug/L for manganese.

At MW-28, the most recent results for manganese are below the 0.230 mg/L cleanup goal presented in the ROD. Manganese concentrations were below the background level in all of the compliance wells during each of the 2000 monitoring events.

Vanadium

Concentration versus time graphs for vanadium are provided in Appendix D-7. The cleanup goal for vanadium established in the ROD was 0.260 mg/L. As with beryllium, vanadium was reported at or above the cleanup goal only in samples collected during the Phase I RI (June/July 1988) and only at two wells: MW-2 and MW-37. Since the Phase I RI, vanadium has been consistently below the cleanup goal in all samples analyzed, including samples from all of the compliance point monitoring wells during all of the 2000 monitoring events.

Tetrachloroethene (PCE)

Under the RA Ground-Water Monitoring Plan, analyses for tetrachloroethene (PCE) were performed on samples from five of the compliance wells where PCE was detected during the RI, MW-2, MW-5, MW-18, MW-30, and MW-31. Concentration versus time graphs for PCE for these five wells are provided in Appendix D-8. Since the Phase I RI, PCE concentrations have shown a decline at MW-2 and MW-5; PCE levels have increased at MW-30. The cleanup goal for PCE is the MCL of 0.005 mg/L. The most recent results for PCE were at or below the MCL (also the detection limit) at MW-2 and MW-5, indicating that, since the RI, the area of the aquifer affected by PCE has decreased.

Contaminant Mass-in-Place

In accordance with Section II.3.C. of the Consent Decree SOW, data from the May 2000 expanded routine monitoring event were used to estimate the masses of fluoride and cyanide (the primary plume indicators) in the alluvial aquifer as a means of evaluating the progress of the remediation. The procedure used for estimating the mass-in-place was as described in the RD Work Plan and the HydroSystems Management, Inc. (HMI) report titled, "Estimation of Dissolved Contaminant Mass in the Alluvial Aquifer, Ormet Primary Aluminum Corporation Superfund Site,

Hannibal, Ohio" (August 28, 1996) that was submitted to the USEPA in conjunction with the 30% RD submittal. The approach used for estimation of contaminant mass-in-place is based on methods described in "Methods for Monitoring Pump-and-Treat Performance" (USEPA, July 1994). Results of the mass-in-place estimates for fluoride and cyanide are summarized in Table 5. For comparison, Table 5 also includes fluoride and cyanide mass-in-place estimates based on previous monitoring events. The mass-in-place estimates are based on the fluoride and total cyanide isopleth maps shown in Figures 5 and 6. Data and supporting calculations for the May 2000 mass-in-place estimates are provided in Appendix E. Data and supporting calculations for the previous mass-in-place estimates have been submitted to the USEPA in prior reports.

Based on the estimates presented in Table 5, the mass of fluoride in the alluvial aquifer declined substantially during the period from June 1988 through January 1995, from approximately 85,700 pounds to a little more than 28,000 pounds (approximately 67%). The fluoride mass-in-place calculated in 1997 (slightly more than 29,000 pounds) showed little change over 1995. The value calculated in 1998 indicated a further reduction in the fluoride mass to under 24,000 pounds (a decrease of nearly 18% from 1997). However, the fluoride mass-in-place calculated in 1999, some 30,400 pounds, represented an increase of more than 27% over the 1998 value. Using the May 2000 monitoring data, the fluoride mass-in-place was estimated to be just over 27,000 pounds, a decrease of about 11% from 1999.

The mass-in-place estimates for cyanide exhibit a similar pattern, with substantial decreases during the period from 1988 to 1998 (from over 6,800 pounds to about 2,600 pounds, a reduction of nearly 62%), an increase of over 100% in 1999 to nearly 5,600 pounds, followed by a decrease of about 16% in 2000 to under 4,700 pounds.

To assess the extent to which cyanide and fluoride continue to leach from soil in the FSPSA, the masses of fluoride and cyanide removed from the aquifer through pumping of the interceptor wells and Ranney well for the period between the two most recent expanded monitoring events (i.e., May 1999 through May 2000) were calculated and compared to the estimated masses in the aquifer.

The masses of cyanide and fluoride removed through pumping of the interceptor wells were calculated using daily analytical and flow data for the influent to Ormet's ground-water treatment plant, which receives the water pumped by the interceptor wells. The masses of cyanide and fluoride removed through pumping of the Reduction Mill Ranney well were calculated using quarterly analytical data and daily flow data collected by Ormet for NPDES reporting purposes.

During the period from May 1999 to May 2000, approximately 18,900 pounds of fluoride and approximately 2,900 pounds of cyanide (total) were removed from the alluvial aquifer by the interceptor wells and Ranney well. During the same period, the estimated mass of fluoride in the aquifer decreased by approximately 1,900 pounds and the estimated mass of cyanide decreased by approximately 900 lbs.

As discussed in the ROD and the remedial design documents for the Ormet site, the purpose of soil flushing in the FSPSA is to accelerate the rate at which contaminants are leached from the source area soils and subsequently removed from the aquifer and treated. As discussed in the 1999 RA Ground-Water Monitoring Report, the increases in the mass of fluoride and cyanide in the aquifer that occurred between 1998 and 1999, despite the substantial masses of fluoride and cyanide removed from the aquifer during the same period through the pumping of the interceptor and Ranney wells, are attributed to an increase in the rate of leaching of residual spent potliner material in the FSPSA as a result of the start of soil flushing in that area. Over time, as the leachable material in the soils in the FSPSA is depleted, the removal of fluoride and cyanide mass from the aquifer through pumping of the interceptor and Ranney wells is expected to again result in decreases in the contaminant mass-in-place. The reductions in the estimated fluoride and cyanide masses from 1999 to 2000 suggest such a trend. Results of future RA ground-water monitoring events will be used to further assess the effectiveness of soil flushing in the FSPSA.

Aquifer Area Above Cleanup Goals

As a further check of the progress of the remediation, the approximate areas of the aquifer containing fluoride and cyanide at concentrations above their respective cleanup goals were estimated using analytical results from the May 2000 sampling event. The results are summarized in Table 5. The estimates of aquifer areas above the cleanup goal are based on the fluoride and amenable cyanide isopleth maps shown in Figures 5 and 7, respectively. For comparison, Table 5 also includes estimates of the aquifer areas above the fluoride and cyanide cleanup goals prepared for previous monitoring events. These estimates are based on plume isopleth maps submitted to the USEPA in previous reports.

The area of the alluvial aquifer containing fluoride above the cleanup goal increased slightly between 1988 (approximately 43 acres) and 1995 (approximately 48 acres). Between 1995 and 1998, the area above the cleanup goal for fluoride decreased nearly 24%, from over 48 acres to approximately 37 acres. Following the start of soil flushing in the FSPSA in 1998, the area of aquifer above the fluoride cleanup goal increased approximately 18% to nearly 44 acres. Similar to the trend for fluoride mass-in-place, the increase in aquifer area above the cleanup goal between 1998 and 1999 was followed by a decrease of about 5% from 1999 to 2000.

The area of the aquifer with concentrations of amenable cyanide above the cleanup goal of 0.2 mg/L shows a substantially greater degree of variability than for fluoride. As discussed previously, analyses for amenable cyanide tend to be subject to a higher degree of variability than other plume indicators, such as total cyanide and fluoride. For these reasons, trends in the area of the aquifer with amenable cyanide above its cleanup goal tend to be less consistent and should be regarded in a long-term context. The area of the aquifer exceeding the cleanup goal for amenable cyanide that was calculated using data from the 2000 expanded monitoring event was 36.5 acres, compared to 27.5 acres in 1999, an increase of 32.7%.

As discussed previously in this report, analytical results for total cyanide and cyanide amenable to chlorination indicate that the form of cyanide occurring in the ground water beneath the Ormet site is predominantly the stable, cyanide complexes. This interpretation is supported by a comparison of the area of the alluvial aquifer with total cyanide concentrations above 0.2 mg/L to the area of the aquifer with amenable cyanide concentrations above 0.2 mg/L. As shown in Figure 8, the area of the aquifer with amenable cyanide above 0.2 mg/L is less than the area with total cyanide above 0.2 mg/L.

SUMMARY/CONCLUSIONS

- Pumping of Ranney well and interceptor wells continues to provide containment of the plume beneath the Ormet property and removes contaminant mass from the alluvial aquifer.

- Operation of the soil flushing system had no discernable effect on ground-water flow patterns beneath the FSPSA, and the flow of ground water continues to be from the river to the aquifer.

- Analytical results for the 2000 monitoring events indicate increases in concentrations of several parameters (e.g., cyanide, fluoride, arsenic) at wells near the downgradient edge of the FSPSA soil flushing area (including MW-31, MW-32, and, to some degree, MW-16), suggesting increased leaching of residual spent potliner materials in the soil of the FSPSA as a result of soil flushing.

- Pumping of the interceptor wells and Ranney well removed approximately 18,900 pounds of fluoride and approximately 2,900 pounds of cyanide from the alluvial aquifer during the period May 1999 to May 2000.

- During the same period, the estimated mass of fluoride in the aquifer decreased by about 3,345 pounds (11%) and the mass of cyanide in the aquifer decreased by nearly 900 pounds (nearly 16%).

- The decreases in the mass-in-place estimates are substantially less than the masses of fluoride and cyanide removed through pumping of the interceptor and Ranney wells, despite the masses of fluoride and cyanide removed from the aquifer by pumping. The data suggest that soil flushing in the FSPSA is effective in accelerating the rate at which leaching of residual spent potliner material occurs in the FSPSA.

- Over time, as the leachable material in the soils in the FSPSA is depleted, the removal of fluoride and cyanide mass from the aquifer through pumping of the interceptor and Ranney wells is expected to result in decreases in the contaminant mass-in-place. Decreases in the masses of fluoride and cyanide in the aquifer between 1999 and 2000 suggest such a trend.

- The estimated area of the alluvial aquifer with fluoride concentrations above the cleanup goal set forth in the ROD decreased by approximately 5% between 1999 and 2000.

- The estimated area of the aquifer with amenable cyanide concentrations above the cleanup goal set forth in the ROD increased by about 33% between 1999 and 2000.

- Reductions in the area of the plume in the alluvial aquifer and the contaminant mass-in-place were occurring prior to the completion of Remedial Construction and full-time operation of the FSPSA soil flushing system. These improvements in site conditions are attributable to operational changes and remedial activities undertaken by Ormet prior to the Superfund project, including pumping of wells that intercept the plume, which has been ongoing since 1972, and discontinued use of the disposal ponds and the potliner storage area.

TABLES

TABLE 1
WATER-LEVEL ELEVATION DATA
ORMET CORPORATION
HANNIBAL, OHIO
DATE: JANUARY 10, 2000

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
MW-1	668.07	(Damaged)55.43	612.64
MW-2	668.12	58.45	609.67
MW-3	645.17	30.49	614.68
MW-4	661.07	60.06	601.01
MW-5	668.16	65.77	602.39
MW-7	667.94	59.83	608.11
MW-8	667.71	71.99	595.72
MW-9	666.59	70.53	596.06
MW-10	667.16	71.98	595.18
MW-11	667.31	65.65	601.66
MW-12	636.73	23.79	612.94
MW-13	661.44	42.30	619.14
MW-14	653.59	38.44	615.15
MW-15	657.31	37.86	619.45
MW-16	662.72	49.44	613.28
MW-17	655.03	37.82	617.21
MW-18	660.91	40.14	620.77
MW-19	662.03	41.72	620.31
MW-20	632.33	12.35	619.98
MW-21s	664.02	67.58	596.44
MW-21d	663.60	67.18	596.42
MW-22s	667.47	71.26	596.21
MW-22d	667.21	71.02	596.19
MW-23s	663.18	66.42	596.76
MW-23d	663.41	66.80	596.61
MW-24s	667.88	72.24	595.64
MW-24d	667.75	72.14	595.61
MW-25	667.73	(Damaged) 66.18	601.55
MW-26s	665.54	69.61	595.93
MW-26d	665.59	69.73	595.86
MW-27	667.86	67.50	600.36
MW-28	663.27	22.03	641.24
MW-29s	653.40	40.56	612.84
MW-29d	653.07	40.17	612.90
MW-30	667.58	49.49	618.09
MW-31	661.59	47.36	614.23
MW-32	656.66	40.24	616.42
MW-34s	655.67	37.80	617.87
MW-34d	654.67	35.86	618.81
MW-35	661.90	36.05	625.85
MW-36	655.14	38.29	616.85
MW-37	661.14	21.42	639.72
MW-38	666.64	20.52	646.12
MW-39s	657.30	41.42	615.88
MW-39d	657.18	41.12	616.06
MW-40s	662.22	52.44	609.78
MW-40d	661.95	52.26	609.69
MW-41	637.67	13.48	624.19
MW-42s	654.37	40.49	613.88
MW-42d	654.34	40.36	613.98
MW-44s	662.01	52.62	609.39
MW-44d	661.76	53.18	608.58

TABLE 1 (CONT.)
WATER-LEVEL ELEVATION DATA
ORMET CORPORATION
HANNIBAL, OHIO
DATE: JANUARY 10, 2000

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
PPB-01*	663.24	20.88	642.36
PPB-02s*	663.14	17.60	645.54
PPB-02d+	662.78	43.46	619.32
PPB-04+	661.57	45.89	615.68
PPB-05*	661.62	20.43	641.19
PPB-06+	663.04	47.90	615.14
PPB-07*	661.71	Not Found	--
PPB-09+	664.30	43.70	620.60
PPB-10*	663.45	15.02	648.43
PPB-14*	660.64	Dry	--
TH-3	667.81	59.59	608.22
TH-10	658.17	38.18	619.99
TH-11	659.08	37.09	621.99
TH-15	663.62	67.91	595.71
TH-16	664.62	68.29	596.33
TH-17	663.93	67.38	596.55
RP-1	643.17	19.29	623.88
RP-2	643.05	19.03	624.02

NOTE:

All MW-series wells are measured from the top of the PVC casing.

All TH-series wells are measured from the top of steel casing

River pool (RP) measuring points are located on the walkway below the dry scrubbers.

* - Designates a perched zone piezometer

+ - Designates an alluvial aquifer piezometer.

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TABLE 2
WATER-LEVEL ELEVATION DATA
ORMET CORPORATION
HANNIBAL, OHIO
DATE: MAY 15, 2000

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
MW-1	668.07	(Damaged) 55.56	612.51
MW-2	668.12	59.87	608.25
MW-3	645.17	31.43	613.74
MW-4	661.07	63.28	597.79
MW-5	668.16	68.75	599.41
MW-7	667.94	61.38	606.56
MW-8	667.71	76.43	591.28
MW-9	666.59	74.73	591.86
MW-10	667.16	76.47	590.69
MW-11	667.31	68.75	598.56
MW-12	636.73	24.91	611.82
MW-13	661.44	42.72	618.72
MW-14	653.59	39.28	614.31
MW-15	657.31	38.27	619.04
MW-16	662.72	50.49	612.23
MW-17	655.03	38.41	616.62
MW-18	660.91	39.93	620.98
MW-19	662.03	42.11	619.92
MW-20	632.33	12.58	619.75
MW-21s	664.02	71.69	592.33
MW-21d	663.60	71.27	592.33
MW-22s	667.47	75.46	592.01
MW-22d	667.21	75.24	591.97
MW-23s	663.18	70.10 (Dry)	<593.08
MW-23d	663.41	70.94	592.47
MW-24s	667.88	76.60	591.28
MW-24d	667.75	76.49	591.26
MW-25	667.73	(Damaged) 66.52	601.21
MW-26s	665.54	73.87	591.67
MW-26d	665.59	74.04	591.55
MW-27	667.86	69.35	598.51
MW-28	663.27	20.86	642.41
MW-29s	653.40	41.68	611.72
MW-29d	653.07	41.28	611.79
MW-30	667.58	49.35	618.23
MW-31	661.59	48.32	613.27
MW-32	656.66	40.83	615.83
MW-34s	655.67	38.23	617.44
MW-34d	654.67	36.32	618.35
MW-35	661.90	36.50	625.40
MW-36	655.14	38.72	616.42
MW-37	661.14	20.20	640.94
MW-38	666.64	20.27	646.37
MW-39s	657.30	42.23	615.07
MW-39d	657.18	41.88	615.30
MW-40s	662.22	53.88	608.34
MW-40d	661.95	53.73	608.22
MW-41	637.67	13.36	624.31
MW-42s	654.37	41.43	612.94
MW-42d	654.34	41.30	613.04
MW-44s	662.01	54.22	607.79
MW-44d	661.76	54.81	606.95

TABLE 2 (CONT.)
WATER-LEVEL ELEVATION DATA
ORMET CORPORATION
HANNIBAL, OHIO
DATE: MAY 15, 2000

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
PPB-01*	663.24	18.89	644.35
PPB-02s*	663.14	17.56	645.58
PPB-02d+	662.78	43.86	618.92
PPB-04+	661.57	46.63	614.94
PPB-05*	661.62	18.56	643.06
PPB-06+	663.04	48.52	614.52
PPB-07*	661.71	Not Found	--
PPB-09+	664.30	44.04	620.26
PPB-10*	663.45	13.96	649.49
PPB-14*	660.64	Not Found	--
TH-3	667.81	61.33	606.48
TH-10	658.17	38.41	619.76
TH-11	659.08	36.95	622.13
TH-15	663.62	72.18	591.44
TH-16	664.62	72.37	592.25
TH-17	663.93	71.49	592.44
RP-1	643.17	18.95	624.22
RP-2	643.05	19.20	623.85

NOTE:

All MW-series wells are measured from the top of the PVC casing.

All TH-series wells are measured from the top of steel casing.

River pool (RP) measuring points are located on the walkway below the dry scrubbers.

* - Designates a perched zone piezometer

+ - Designates an alluvial aquifer piezometer.

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TABLE 3
WATER-LEVEL ELEVATION DATA
ORMET CORPORATION
HANNIBAL, OHIO
DATE: OCTOBER 9, 2000

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
MW-1	668.07	54.70	613.37
MW-2	668.12	57.49	610.63
MW-3	645.17	29.93	615.24
MW-4	661.07	59.02	602.05
MW-5	668.16	64.73	603.43
MW-7	667.94	60.17	607.77
MW-8	667.71	71.17	596.54
MW-9	666.59	69.49	597.10
MW-10	667.16	71.10	596.06
MW-11	667.31	64.59	602.72
MW-12	636.73	22.78	613.95
MW-13	661.44	41.53	619.91
MW-14	653.59	37.49	616.10
MW-15	657.31	37.18	620.13
MW-16	662.72	48.45	614.27
MW-17	655.03	36.80	618.23
MW-18	660.91	39.61	621.30
MW-19	662.03	41.19	620.84
MW-20	632.33	11.80	620.53
MW-21s	664.02	66.48	597.54
MW-21d	663.60	66.08	597.52
MW-22s	667.47	70.21	597.26
MW-22d	667.21	69.98	597.23
MW-23s	663.18	65.28	597.90
MW-23d	663.41	65.69	597.72
MW-24s	667.88	71.29	596.59
MW-24d	667.75	71.19	596.56
MW-25	667.73	65.14	602.59
MW-26s	665.54	68.61	596.93
MW-26d	665.59	68.72	596.87
MW-27	667.86	66.84	601.02
MW-28	663.27	20.67	642.60
MW-29s	653.40	39.54	613.86
MW-29d	653.07	39.17	613.90
MW-30	667.58	48.84	618.74
MW-31	661.59	46.36	615.23
MW-32	656.66	38.95	617.71
MW-34s	655.67	36.95	618.72
MW-34d	654.67	35.09	619.58
MW-35	661.90	35.98	625.92
MW-36	655.14	37.38	617.76
MW-37	661.14	20.02	641.12
MW-38	666.64	20.35	646.29
MW-39s	657.30	40.47	616.83
MW-39d	657.18	40.19	616.99
MW-40s	662.22	51.43	610.79
MW-40d	661.95	51.26	610.69
MW-41	637.67	13.42	624.25
MW-42s	654.37	39.50	614.87
MW-42d	654.34	39.39	614.95
MW-44s	662.01	51.59	610.42
MW-44d	661.76	52.11	609.65

TABLE 3 (CONT.)
WATER-LEVEL ELEVATION DATA
ORMET CORPORATION
HANNIBAL, OHIO
DATE: OCTOBER 9, 2000

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
PPB-01*	663.24	20.96	642.28
PPB-02s*	663.14	18.15	644.99
PPB-02d+	662.78	42.81	619.97
PPB-04+	661.57	44.90	616.67
PPB-05*	661.62	20.66	640.96
PPB-06+	663.04	47.04	616.00
PPB-07*	661.71	Not Found	--
PPB-09+	664.30	43.16	621.14
PPB-10*	663.45	15.56	647.89
PPB-14*	660.64	Not Found	--
TH-3	667.81	58.54	609.27
TH-10	658.17	37.38	620.79
TH-11	659.08	36.54	622.54
TH-15	663.62	66.91	596.71
TH-16	664.62	67.20	597.42
TH-17	663.93	66.28	597.65
RP-1	643.17	19.10	624.07
RP-2	643.05	18.83	624.22

NOTE:

All MW-series wells are measured from the top of the PVC casing.

All TH-series wells are measured from the top of steel casing.

River pool (RP) measuring points are located on the walkway below the dry scrubbers.

* - Designates a perched zone piezometer

+ - Designates an alluvial aquifer piezometer.

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
MW-1															
12/83	6.4	6.0	270	210	0.018	0.014		0.1			0.04	0.65	14.2		
2/84	6.1	6.1	270	215	0.04			0.1			0.01	0.54	14.9		
9/84	6.1	5.7	195	210	<0.01	<0.01		<0.2			0.02	0.33	13.8		
5/85	6.4	6.0	200	210	0.13	0.13		<0.2			0.04	0.15	16.2		
6/88	6.2	6.4	670	540	<0.01		<0.01	0.2	0.0024	<0.0015	6.21	0.379	20.3	0.006	
1/95	6.2	4.7	370	550	0.02		<0.01	0.1	<0.004	<0.01	<0.04	0.39	21	<0.01	
5/97	5.9	6.32	470	365	<0.01			0.1	<0.004	<0.0005		0.13	19	<0.01	
5/98	6.01	5.65	480	505	<0.01			0.20	<0.004	<0.0005		0.10	20	<0.01	
MW-2															
12/83	10.3	10.3	6,000	6,000	56.0	0.27		400			55.2	1.98	1,950		
2/84	10.3	10.3	7,752	2,750	48.0			420			58	2.46	2,290		
9/84	10.5	9.9	6,308	6,900	40.8	0.095		480			59.3	2.1	2,460		
5/85	10.4	10.4	13,200	5,800	95	0.10		400			54.0	1.74	2150		
10/85	10.5		7,100		140	12		390		<0.01	54.0	1.82	2,060		
7/88	10.4	10.4	6,200	6,000	22		12	330	0.394	<0.0015	34.2	1.00	1,450	0.251	0.011
2/90	10.34	10.2	4,800	3,900	36.2		29.6	200			31.0		1,200		
1/95	10.0	9.6	2,400	>2,000	7.1		<0.01	93	0.085	<0.01	8.6	0.82	520	0.09	
5/97	10.1	10.07	2,100	1,865	17		<1.0	63	0.092	0.001		1	470	0.06	0.008
5/98	9.98	10.24	1,900	1,880	13		<0.01	68	0.082	0.001		0.93	450	0.06	0.0053
9/98	9.96	9.96	1,900	1,991	21		0.30	69	0.086	0.00089		0.90	440	0.051	<0.005
1/99	9.98	10.27	2,000	2,000	21		5.3	65	0.085	0.00064		1.1	440	0.054	<0.005
1/99 (DUP)	9.98	10.27	1,900	2,000	22		<0.1	66	0.087	0.00064		1.0	440	0.053	<0.005
5/99	10.1	9.94	1,900	1,940	25		3.5	67	0.095	0.00088		0.96	400	0.046	<0.005
9/99	9.88	10.60	1,600	1,830	22		2.6	59	0.077	<0.0005		0.85	430	0.032	<0.005
9/99 (DUP)	9.88	10.60	1,900	1,830	22		2.5	60	0.079	<0.0005		0.95	460	0.039	<0.005
1/00	9.88	9.65	2,000	1,825	23		2.4	66	0.086	0.0006		0.99	360	0.041	<0.005
5/00	9.92	9.84	2,000	1,863	18		<0.5	66	0.0809	0.00075	13	1.0	430	0.045	<0.005
5/00 (DUP)	9.97	9.84	1,900	1,863	18		11	67	0.081	0.00076	13	1.1	410	0.045	<0.005
10/00	9.92	9.95	1,800	1,518	17		0.73	61	0.077	0.00051		1.0	270	0.039	<0.005
MW-5															
12/83	9.7	9.5	3,058	2,825	18.8	0.064		130			17.5	1.61	880		
2/84	9.6	9.6	3,636	2,700	14.5			120			18.0	1.39	1,030		
9/84	9.8	9.3	2,278	3,100	4.94	0.032		140			19.4	1.7	850		
5/85	9.8	9.9	4,800	2,400	25.0	0.037		91			15.8	1.01	710		
10/85	9.8		2,550		22.0	2.0		70		<0.01	13.0	0.93	650		
7/88	9.5	9.6	2,000	2,050	5.5		0.10	90	0.076	<0.0015	7.05	0.514	449	0.025	0.012
1/95	8.6	8.5	1,500	1,250	3.1		<0.01	32	0.008	<0.01	1.3	0.27	270	<0.01	
5/97	9.0	9.2	1,500	1,318	3.5		<0.25	16	0.015	<0.0005		0.4	310	<0.01	<0.005
5/98	8.83	8.84	1,400	1,340	2.1		<0.01	18	0.007	<0.0005		0.17	300	<0.01	<0.005
5/98 (DUP)	8.83	8.84	1,400	1,340	1.3		<0.01	18	0.007	<0.0005		0.18	300	<0.01	<0.005
9/98	8.92	8.66	1,200	1,219	2.0		0.02	18	0.0089	<0.0005		0.16	240	<0.01	<0.005
1/99	8.95	8.93	1,100	1,175	1.8		0.14	17	0.0086	<0.0005		0.16	240	<0.01	<0.005
5/99	8.97	8.60	1,200	1,260	1.9		<0.01	16	0.0094	<0.0005		0.27	250	<0.01	<0.005
5/99 (DUP)	8.97	8.60	1,200	1,260	2.2		2.2	16	0.0097	<0.0005		0.25	240	<0.01	<0.005
9/99	8.78	9.10	1,100	1,030	2.4		0.10	17	0.0074	<0.0005		0.23	230	<0.01	<0.005
1/00	8.76	8.30	1,200	1,040	2.0		2.0	15	0.0063	<0.0005		0.24	180	<0.01	<0.005
1/00 (DUP)	8.77	8.30	1,100	1,040	1.9		1.9	16	0.006	<0.005		0.23	180	<0.01	<0.005
5/00	8.81	8.59	1,100	1,020	2.3		2.3	16	0.0082	<0.0005	1.8	0.37	110	<0.01	<0.005
10/00	8.71	8.59	1,000	817	2.6		2.6	11	<0.0085	<0.0005		0.35	120	<0.01	<0.005
10/00 (DUP)	8.71	9	1,000	817	2.5		2.5	11	<0.0085	<0.0005		0.35	110	<0.01	<0.005

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.)
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
MW-7															
12/83	6.8	6.2	613	700	0.019	0.020		0.1			1.01	7.88	49.0		
2/84	5.9	5.9	581	750	<0.01			0.1			9.0	4.72	49.2		
9/84	5.8	5.7	410	680	<0.01	<0.01		<0.2			11.6	4.65	58.0		
5/85	6.1	5.6	720	890	0.023	0.021		<0.2			24.7	3.70	61.0		
6/88	5.7	5.8	740	760	0.02		0.01	0.2	0.012	<0.0015	17.6	3.05	64.2	0.0032	
1/95	5.5	5.3	850	1,500	<0.01		<0.01	0.2	0.040	<0.01	22	2.3	72	<0.01	
5/97	5.6	6.04	790	670	<0.01			0.10	0.038	<0.0005		2.2	89	<0.01	
5/97 (DUP)	5.7		800	670	<0.01			0.20	0.038	<0.0005		2.2	84	<0.01	
5/98	5.71	5.69	770	900	<0.01			0.20	0.051	<0.0005		2.2	78	<0.01	
5/99	5.81	6.00	780	700	<0.01			0.16	0.042	<0.0005		2.0	78	<0.01	
5/00	5.74	5.96	810	777	<0.01			0.14	0.041	<0.0005	18	2.0	93	<0.01	
MW-8															
12/83	9.5	9.2	820	700	0.32	0.017		18			0.20	0.01	202		
2/84	9.5	9.5	820	700	0.14			18			0.23	0.04	199		
9/84	9.5	9.0	661	800	0.35	0.013		22			1.00	0.04	216		
5/85	9.2	9.2	830	550	0.11	0.024		7.9			0.21	0.01	151		
5/86	8.8		550		0.04						<0.01	<0.01	111		
6/88	8.4	8.3	560	550	0.06		<0.01	2.8	0.0018	<0.0015	0.044	0.023	67.8	<0.0026	<0.005
1/95	7.8	7.8	610	930	0.09		<0.01	3.1	<0.004	<0.01	<0.04	0.08	50	<0.01	
5/97	7.8	8.02	560	442	0.040		<0.01	2.2	<0.004	<0.0005		0.12	44	<0.01	
5/98	7.81	7.60	490	514	0.02		<0.01	2.3	<0.004	<0.0005		0.14	30	<0.01	
5/99	8.00	8.10	530	455	0.028		0.028	2.4	<0.004	<0.0005		0.15	34	<0.01	
5/00	7.91	8.01	600	533	0.026		0.026	2.2	<0.004	<0.0005	0.054	0.24	36	<0.01	
MW-10															
12/83	7.7	7.6	1,205	1,280	1.36	0.083		6.9			0.60	0.26	195		
2/84	7.6	7.5	820	800	0.79			5.5			0.30	0.26	106		
9/84	7.6	6.5	547	675	0.22	0.14		4.3			0.13	0.34	88		
5/85	7.7	7.0	800	710	0.33	0.060		2.9			0.07	0.05	53		
6/88	7.3	7.2	770	750	<0.01		<0.01	2.1	0.0038	<0.0015	0.081	<0.001	28.7	<0.0026	
1/95	7.0	6.8	800	560	0.02		0.02	0.5	<0.004	<0.01	<0.04	<0.01	26	<0.01	
5/97	7.2	7.4	670	510	<0.01			0.70	<0.004	<0.0005		<0.01	25	<0.01	
5/98	7.22	7.23	970	1,110	0.15		0.01	0.60	<0.008	<0.0005		<0.01	120	<0.01	
5/99	7.40	7.32	750	545	<0.01			0.41	<0.004	<0.0005		0.012	30	<0.01	
5/00	7.45	7.51	650	549	<0.01			0.48	<0.004	<0.0005	0.079	<0.01	21	<0.01	
MW-11															
12/83	9.6	9.4	980	825	0.52	0.021		33			0.48	0.06	238		
2/84	9.6	9.5	962	775	0.25			27			7.9	0.37	232		
9/84	9.7	9.1	656	800	0.20	0.015		22			4.90	0.21	213		
5/85	9.4	9.5	750	650	0.30	0.026		13			2.68	0.13	181		
6/88	8.5	8.4	570	565	0.12		<0.01	4.9	0.0043	<0.0015	0.071	0.227	78.5	<0.0026	<0.005
1/95	7.6	7.9	540	680	0.02		<0.01	2.3	<0.004	<0.01	<0.04	0.40	30	<0.01	
5/97	7.8	7.64	530	404	0.09		<0.01	1.8	<0.004	<0.0005		0.42	33	<0.01	
5/98	7.84	7.57	490	507	0.02		<0.01	1.7	<0.004	<0.0005		0.45	31	<0.01	
5/98 (DUP)	7.85	7.57	500	507	0.02		<0.01	1.7	<0.004	<0.0005		0.43	29	<0.01	
5/99	8.07	8.39	490	425	0.024		0.011	1.7	<0.004	<0.0005		0.45	28	<0.01	
5/00	7.96	7.58	580	500	0.013		0.013	1.4	<0.004	<0.0005	0.046	0.54	32	<0.01	

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.)
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
MW-12															
12/83	7.5	7.3	476	400	0.074	0.021		2.1			<0.01	0.94	24.3		
2/84	7.5	7.2	476	385	0.02			2.0			0.02	0.71	23.8		
9/84	7.7	6.3	366	375	<0.01	<0.01		2.2			<0.01	0.61	29.0		
5/85	7.7	7.4	540	390	0.024	0.022		1.6			<0.01	1.00	27.7		
5/86	7.5		494		<0.01						<0.01	1.23	27		
6/88	7.2	7.5	510	515	<0.01		<0.01	1.3	<0.0015	<0.0015	0.066	1.09	24.4	<0.0026	<0.005
1/95	7.4	7.6	530	350	<0.01		<0.01	1.1	<0.004	<0.01	<0.04	1.5	23	<0.01	
5/97	7.5	7.7	540	422	<0.01			0.90	<0.004	<0.0005		1.7	19	<0.01	
5/98	7.43	7.43	470	550	<0.01			0.80	<0.008	<0.0005		1.9	23	<0.01	
9/98	7.57	7.38	470	481	<0.01			0.92	<0.004	<0.0005		1.6	20	<0.01	
1/99	7.53	7.04	470	440	<0.01			0.89	<0.004	<0.0005		1.8	22	<0.01	
5/99	7.42	7.39	630	515	0.026		0.026	0.73	<0.004	<0.0005		2.5	29	<0.01	
9/99	7.54	7.25	530	565	0.017		0.012	0.68	<0.004	<0.0005		1.9	27	<0.01	
1/00	7.44	6.65	570	495	<0.01			0.74	<0.004	<0.0005		1.8	22	<0.01	
5/00	7.53	7.57	600	558	<0.01			0.73	<0.004	<0.0005	0.043	2.0	29	<0.01	
10/00	7.64	7.33	530	429	<0.01			0.83	<0.004	<0.0005		1.6	22	<0.01	
MW-15															
12/83	6.9	6.7	568	435	0.44	0.018		0.1			0.14	0.03	28.8		
2/84	6.9	6.7	550	435	0.51			0.1			0.13	<0.01	29.4		
5/85	7.4	6.8	590	445	0.44	0.034		0.3			0.18	<0.01	32.5		
5/86	7.1		550		0.39						0.15	<0.01	34		
7/88	7.0/7.1	7.1/7.1	610/630	600/600	0.43/0.32		0.10/<0.01	0.2/0.2	0.0045	0.0025	10.8	0.117	34.4	0.0059	<0.005
1/95	7.0	7.1	720	420	0.49		0.12	1.4	<0.004	<0.01	0.26	<0.01	45	<0.01	
7/96	6.8	7.07	570	613	1.0	<0.020		2.1	<0.004	<0.0005		<0.01		<0.01	
5/97	7.4	7.44	800	731	2.8		0.20	11	<0.004	<0.0005		0.02	140	<0.01	
5/97 (DUP)	7.4	7.44	800	731	3.3		0.40	8.9	<0.004	<0.0005		0.05	140	<0.01	
5/98	6.99	6.78	610	625	0.49		0.02	0.40	<0.004	<0.0005		<0.01	40	<0.01	
5/99	7.49	7.70	980	785	8.5		<0.01	15	<0.004	<0.0005		0.017	150	<0.01	
5/00	7.53	7.56	1,200	1,169	12		<0.01	25	<0.004	<0.0005	10	0.17	120	<0.01	
MW-16															
12/83	9.8	9.9	2,092	1,800	7.35	0.034		110			12.4	0.91	530		
2/84	9.7	9.7	2,049	1,550	5.5			98			13.9	1.41	570		
9/84	9.8	9.2	1,390	10,500	2.11	<0.01		80			9.5	0.5	475		
5/85	9.4	9.0	2,300	1,400	10.0	0.11		72			10.3	1.09	443		
10/85	8.4		1,540		3.9	0.0		30		<0.01	2.10	0.41	186		
7/88	9.4	9.7	1,400	1,410	4.6		<0.01	61	0.063	<0.0015	6.57	0.22	300	0.018	0.006
1/95	7.7	9.0	850	930	1.4		0.13	7.9	<0.004	<0.01	0.52	1.1	81	<0.01	
7/96	7.3	7.75	990	941	1.6	<0.020		7.9	<0.004	<0.0005		1		<0.01	
5/97	7.6	7.6	980	801	1.3		0.3	11	<0.004	<0.0005		0.43	130	<0.01	
5/98	7.72	7.70	750	760	2.0		0.40	11	<0.004	<0.0005		1.2	80	<0.01	
9/98	7.70	7.50	860	790	1.4		1.4	9.5	<0.004	<0.0005		1.3	75	<0.01	
1/99	7.70	7.12	740	665	1.4		<0.04	9.8	<0.004	<0.0005		1.5	85	<0.01	
5/99	7.88	7.90	750	600	2.8		0.16	9.0	<0.004	<0.0005		1.5	82	<0.01	
9/99	7.62	8.15	730	745	2.9		0.88	8.2	<0.004	<0.0005		1.7	78	<0.01	
1/00	7.76	6.95	950	810	5.5		5.5	7.6	<0.004	<0.0005		2.2	68	<0.01	
1/00 (DUP)	7.77	6.95	940	810	5.8		5.8	7.8	<0.004	<0.005		2.2	70	<0.01	
5/00	7.69	7.53	1,100	945	12		12	7.9	<0.004	<0.0005	4.3	2.3	91	<0.01	
5/00 (DUP)	7.72	7.53	1,000	945	12		12	8.1	<0.004	<0.0005	4.4	2.4	91	<0.01	
10/00	7.74	7.67	1,000	774	16		<0.01	13	<0.004	<0.0005		1.6	130	<0.01	
10/00 (DUP)	7.77	7.67	1,000	774	15		<0.01	13	<0.004	<0.0005		1.7	130	<0.01	

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.)
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
MW-17															
12/83	7.9	7.6	613	475	0.99	0.021		5.6			0.44	1.38	78		
2/84	7.6	7.4	581	470	1.03			4.4			0.39	1.77	52		
9/84	8.0	6.7	485	550	0.17	<0.01		9.1			0.28	1.27	99		
5/85	7.9	7.9	610	470	0.76	0.045		4.1			0.28	1.80	45.3		
10/85	7.9		564		0.56	0.43		4.2		<0.01	6.80	1.93	43.4		
6/88	7.7	7.5	590	475	1.3		0.46	5.2	0.0054	<0.0015	0.973	1.72	39.7	<0.0026	<0.005
2/90	7.7	7.55	680	640	0.582		<0.005	4.1			18		40		
1/95	7.5	7.7	710	420	0.64		<0.01	3.9	<0.004	<0.01	0.26	1.9	36	<0.01	
5/97	7.5	7.67	870	488	0.54		<0.01	3.1	<0.004	<0.0005		1.9	30	<0.01	
5/98	7.6	7.40	570	580	0.72		0.09	3.4	<0.004	<0.0005		1.8	34	<0.01	
5/99	7.50	7.40	550	470	0.46		0.46	3.2	<0.004	<0.0005		1.8	31	<0.01	
5/99 (DUP)	7.37	7.40	550	470	0.49		0.49	3.2	<0.004	<0.0005		1.8	30	<0.01	
5/00	7.57	7.61	610	523	0.53		0.31	2.9	<0.004	<0.0005	0.34	1.8	24	<0.01	
MW-18															
12/83	9.9	10.0	10,526	8,750	110.0	0.45		460			58.7	0.26	3,150		
2/84	9.8	9.8	9,615	7,500	52.0			350			61	0.50	2,750		
9/84	10.1	9.5	9,111	10,000	194	0.19		690			103	0.3	4,130		
5/85	9.8	9.9		7,000	35.2	0.091		410			64.2	0.35	2,540		
10/85	9.9		6,300		120	12		350		<0.01	71.4	1.06	1,940		
7/88	10.0	10.1	9,700	10,000	29		25	820	0.159	0.0071	144	1.75	2,640	0.191	0.022
2/90	10.0	10.1	8,000	11,400	67.0		10.5	710			110		3,500		
1/95	9.6	11.1	5,900	>2,000	15		6.6	290	0.062	<0.01	56	0.22	1,500	0.02	
7/96	9.1	8.67	4,300	4,200	7.2	<0.020		180	0.065	0.0006	56	0.19	1,500	0.01	0.006
5/97	9.7	9.58	4,000	4,110	8.7		<0.50	200	0.078	0.0009		0.29	1,100	0.02	
5/98	9.76	10.06	4200	4,300	9.8		0.40	260	0.094	0.0014		0.49	1100	0.05	0.024
9/98	9.70	9.88	3,600	3,590	5.9		<0.01	210	0.085	0.00084		0.29	800	0.022	0.014
1/99	9.67	10.04	3,600	3,450	79		3.0	210	0.088	0.00063		0.29	830	0.028	0.0219
5/99	9.72	9.80	3,000	3,000	95		81	370	0.088	0.0014		0.92	650	0.045	0.017
9/99	9.62	10.26	3,000	2,870	90		14	170	0.074	<0.0005		0.24	700	0.011	0.016
1/2000	9.56	9.15	3,000	2,700	27		19	180	0.078	0.00059		0.26	680	0.017	0.020
5/00	9.59	9.73	2,800	2,270	84		75	160	0.075	0.00089	25	0.56	620	0.035	0.019
5/00 (DUP)	9.60	9.73	2,800	2,270	64		50	160	0.073	0.00062	20	0.33	620	0.023	0.016
10/00	9.54	9.67	2,400	1,948	29		<0.01	130	0.074	0.0024		2.1	400	0.08	0.012
MW-19															
12/83	7.2	7.1	581	435	0.068	0.013		0.3			<0.01	0.54	22.9		
2/84	7.1	6.8	575	405	0.04			0.5			0.05	0.26	20.2		
9/84	7.2	6.3	451	460	0.01	<0.01		0.4			0.02	0.04	23.5		
5/85	7.6	7.0	640	460	0.019	0.014		0.5			0.12	0.02	23.6		
7/88	7.3	7.3	630	600	<0.01		<0.01	0.5	0.0067	<0.0015	17.6	0.23	32.2	0.015	<0.005
2/90	7.3	7.27	520	560	0.2		<0.005	0.7					21.0		
1/95	7.3	7.2	630	410	<0.01		<0.01	1.0	<0.004	<0.01	0.09	<0.01	24	<0.01	
5/97	7.4	7.5	520	431	<0.01		<0.01	2.0	<0.004	<0.0005		<0.01	18	<0.01	
5/98	7.23	6.95	560	575	<0.01			1.4	<0.008	<0.0005		<0.01	23	<0.01	
5/99	7.47	7.40	570	460	<0.01			1.3	<0.004	<0.0005		<0.01	22	<0.01	
5/00	7.33	7.20	580	538	<0.01			1.2	<0.004	<0.0005	0.13	<0.01	16	<0.01	

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.)
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
MW-28															
5/86	5.5		382		0.89	0.08		<0.1			0.36	0.02	41		
6/88	5.7	5.8	640	665	7.4		0.6	<0.1	<0.0015	<0.0015	2.41	0.035	83.3	<0.0026	<0.005
1/95	6.2	7.4	500	700	0.74		0.26	2.7	<0.004	<0.01	0.38	0.02	79	<0.01	
7/96	5.7	5.92	440	429	0.26	<0.020		0.50	<0.004	<0.0005		0.01		<0.01	
5/97	5.6	6.4	590	453	0.11		<0.02	0.2	<0.004	<0.0005		0.01	62	<0.01	
5/98	5.74	5.32	500	550	0.12		<0.01	0.20	<0.004	<0.0005		0.01	65	<0.01	
9/98	5.81	5.28	540	527	0.11		0.11	0.27	<0.004	<0.0005		0.011	64	<0.01	
9/98 (DUP)	5.83	5.28	540	527	0.11		0.11	0.24	<0.004	<0.0005		0.01	65	<0.01	
1/99	5.72	5.17	470	450	0.087		0.027	0.38	<0.004	<0.0005		0.013	67	<0.01	
5/99	5.72	5.43	460	405	0.13		0.13	0.35	<0.004	<0.0005		0.011	70	<0.01	
9/99	5.95	6.15	480	480	0.12		0.016	0.26	<0.004	<0.0005		<0.01	57	<0.01	
1/00	6.04	5.25	460	410	0.23		0.22	0.35	<0.004	<0.0005		<0.01	58	<0.01	
5/00	5.89	5.90	470	464	1.0		1.0	0.30	<0.004	<0.0005	0.69	0.014	77	<0.01	
10/00	5.85	5.47	460	384	0.96		0.28	0.27	<0.004	<0.0005		0.014	52	<0.01	
MW-29S															
5/86	8.4		2,350		1.5	0.02		28			0.64	0.08	590		
6/88	9.0	9.0	1,100	1,090	0.99		0.37	44	0.0052	<0.0015	1.52	0.094	224	0.0044	<0.005
1/95	8.3	10.0	2,900	1,750	0.79		0.07	56	<0.004	<0.01	0.37	0.12	590	<0.01	
5/97	8.3	8.43	2,200	1,735	0.6		<0.1	44	<0.004	<0.0005		0.14	410	<0.01	
5/98	8.64	8.70	1,700	1,665	0.18		<0.01	26	<0.004	<0.0005		0.09	370	<0.01	
5/99	8.35	8.37	1,300	1,090	0.22		0.021	16	<0.004	<0.0005		0.30	230	<0.01	
5/00	8.11	8.11	1,200	1,023	0.17		0.17	16	0.0057	<0.0005	0.14	0.41	130	<0.01	
MW-29D															
5/86	8.6		648		0.31	0.01		9.7			0.18	0.26	139		
6/88	8.1	8.0	590	570	0.25		<0.01	4.2	0.002	<0.0015	0.082	1.16	60.4	<0.0026	<0.005
1/95	7.5	8.9	650	770	0.22		0.03	3.7	<0.004	<0.01	0.09	2.0	33	<0.01	
5/97	7.7	7.9	600	479	0.18		<0.02	3.3	<0.004	<0.0005		2	31	<0.01	
5/98	7.65	7.53	550	560	0.17		<0.01	3.5	<0.004	<0.0005		1.8	28	<0.01	
5/99	7.82	7.60	550	465	0.19		0.19	3.4	<0.004	<0.0005		1.8	28	<0.01	
5/00	7.75	7.66	590	503	0.15		0.15	3.1	<0.004	<0.0005	0.12	1.9	24	<0.01	
MW-30															
5/86	6.6		342		0.01	<0.01		0.5			<0.01	2.10	20		
6/88	6.3	6.3	340	400	0.01		<0.01	<0.1	0.0018	<0.0015	4.42	0.753	18.7	0.0044	0.005
1/95	6.2	6.0	430	570	0.01		<0.01	<0.1	<0.004	<0.01	0.78	0.60	19	<0.01	
5/97	6.2	6.47	420	334	<0.01			<0.1	<0.004	<0.005		0.6	18	<0.01	0.012
5/98	6.19	5.70	390	418	<0.01			0.10	<0.004	<0.0005		0.68	21	<0.01	0.013
5/99	6.43	6.10	400	390	0.016		0.013	<0.19	<0.004	<0.0005		0.71	21	<0.01	0.02
5/00	6.34	5.91	430	380	0.026		0.026	0.12	<0.004	<0.0005	1.5	0.70	21	<0.01	0.017
MW-31															
5/86	9.1		1,250		12	1.5		46			84.5	3.67	380		
6/88	10.2	10.5	3,400	3,500	39		<0.01	140	0.046	<0.0015	20.3	1.93	703	0.184	0.040
2/90	10.0	9.95	2,300	2,700	4.80		3.94	110			49		660		
1/95	9.6	10.4	1,900	1,600	7.1		<0.01	89	0.027	<0.01	4.6	0.66	420	<0.02	
7/96	9.5	9.52	2,300	2,100	12	<0.020		91	0.042	0.0007		0.62		0.04	0.041
5/97	9.9	9.69	2,500	2,100	12		<0.50	110	0.04	0.0007		0.68	480	0.05	0.028
5/97 (DUP)	9.9	9.69	2,500	2,100	6.2			93	0.038	0.0008		0.74	480	0.05	0.029
5/98	9.63	9.80	2,400	2,350	9.3		<0.01	100	0.036	0.0013		1.1	490	0.04	0.022
9/98	9.67	9.86	2,600	2,520	9.8		<0.01	120	0.044	0.0014		1.1	620	0.045	0.017
9/98 (DUP)	9.67	9.86	2,700	2,520	9.5		<0.01	130	0.045	0.0013		1.1	600	0.043	0.020
1/99	9.72	9.97	2,500	2,240	22		0.63	120	0.047	0.0012		1.3	620	0.065	0.019
5/99	9.91	10.02	2,600	2,510	29		6.5	130	0.06	0.0014		1.2	600	0.07	0.034
9/99	9.83	10.03	2,600	2,810	30		4.3	150	0.063	0.0011		1.6	750	0.088	<0.005
1/00	9.98	9.80	2,900	2,600	24		6.3	150	0.072	0.001		1.4	650	0.120	0.028
5/00	10.1	10.10	2,900	2,400	21		1.7	140	0.096	0.0011	13	1.6	820	0.12	0.020
10/00	9.99	10.18	2,800	2,550	20		0.54	140	0.056	0.00076		1.1	480	0.079	0.043

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.)
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
MW-32															
5/86	10.5		6430		97	18		369			27.4	0.69	2120		
7/88	9.2	9.3	890	1,040	7.2		0.30	39	0.014	<0.0015	4.05	0.513	234	0.024	<0.005
1/95	9.4	9.4	1,300	630	12		3.6	47	0.014	<0.01	2.7	0.37	230	0.03	
7/96	8.6	8.89	1,000	1,038	6.9	<0.020		29	0.011	<0.0005		0.84		0.01	
5/97	8.7	8.71	930	697	4.4		1.3	19	0.008	<0.0005		1.1	110	<0.01	
5/98	8.03	8.10	630	697	2.5		0.34	7.7	<0.004	<0.0005		1.9	61	<0.01	
5/98 (DUP)	8.05	8.10	690	697	2.5		0.09	8.0	<0.004	<0.0005		2.0	68	<0.01	
9/98	8.30	8.26	760	760	4.5		1.0	13	<0.004	<0.0005		1.8	78	<0.01	
1/99	8.39	8.00	710	650	3.1		<0.02	13	<0.004	<0.0005		1.7	77	<0.01	
1/99 (DUP)	8.39	8.00	720	650	3.7		<0.02	13	<0.004	<0.0005		1.7	76	<0.01	
5/99	8.38	8.50	690	555	4.4		0.59	12	<0.004	<0.0005		2.0	78	<0.01	
9/99	9.84	10.01	2,200	2,300	18		1.8	120	0.057	0.0014		2.2	520	0.093	
1/00	8.93	8.28	950	770	4.8		0.57	27	0.017	<0.0005		1.9	97	0.024	
5/00	8.80	8.95	830	858	3.9		<0.01	19	0.013	<0.0005	3.1	1.6	70	<0.01	
10/00	9.75	9.98	1,500	1,227	8.3		0.76	70	0.051	0.00099		1.6	290	0.058	
MW-34S															
5/86	7.4		668		0.13	<0.01		9.4			0.07	0.42	64		
7/88	7.2	7.2	690	670	40		38	7.3	0.0087	<0.0015	14.6	0.416	33.1	0.018	<0.005
2/90	7.4	6.93	690	740	0.113		0.26	6.5			21		49		
1/95	7.2	7.1	700	430	0.03		<0.01	7.3	<0.004	<0.01	0.18	0.01	35	<0.01	
5/97	7.4	7.43	710	579	0.18		0.04	8.1	<0.004	<0.0005		0.04	69	<0.01	
5/98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
5/99	7.34	7.55	650	505	0.19		<0.01	6.8	<0.004	<0.0005		0.014	46	<0.01	
5/00	7.60	7.46	740	607	1.1		1.1	11	<0.004	<0.0005	1.2	0.044	83	<0.01	
MW-34D															
5/86	7.3		602		0.05	<0.01		10.2			0.02	0.55	42		
7/88	7.4	7.4	560	580	0.07		<0.01	4.4	0.0031	<0.0015	0.538	0.762	32.4	<0.0026	<0.005
1/95	7.3	7.4	640	400	0.07		0.07	4.2	<0.004	<0.01	<0.04	0.82	34	<0.01	
5/97	7.4	7.43	630	492	0.05		<0.01	3.6	<0.004	<0.0005		0.79	31	<0.01	
5/98	7.37	7.23	590	595	0.09		0.01	3.9	<0.004	<0.0005		0.68	35	<0.01	
5/99	7.40	7.52	470	475	0.062		<0.01	3.6	<0.004	<0.0005		0.72	29	<0.01	
5/00	7.55	7.37	620	519	0.063		0.063	4.2	<0.004	<0.0005	0.14	0.76	28	<0.01	
MW-35															
5/86	10.2		6,430		240	38		358			125	1.76	2,070		
7/88	10.2	10.4	6,100	6,150	43		41	400	0.147	0.002	56.5	0.337	1,630	0.053	<0.005
2/90	9.6	9.7	1,500	1,540	8.0		<0.005	71			20		350		
1/95	9.5	9.7	1,200	562	16		<0.01	35	0.018	<0.01	11	0.43	220	<0.01	
7/96	9.5	9.5	1,700	1,851	6.0	0.040		71	0.028	0.0006		0.5		0.03	
5/97	9.4	9.47	1,000	900	16		<1.0	40	0.02	0.0006		0.68	220	0.02	
5/98	8.93	9.10	710	766	15		2.9	27	0.012	<0.0005		0.92	140	0.01	
9/98	8.97	8.90	550	778	16		0.99	26	0.01	<0.0005		0.88	130	<0.01	
1/99	9.28	9.15	820	925	23		2.9	40	0.019	<0.0005		0.81	190	0.016	
5/99	9.35	9.70	830	870	28		10	38	0.013	<0.0005		0.86	160	0.015	
9/99	9.18	9.60	790	930	18		2.0	34	0.012	<0.0005		0.53	170	0.05	
1/00	8.91	8.15	610	500	13		3.3	21	0.0077	<0.0005		0.47	94	0.068	
5/00	9.07	9.24	690	693	27		20	28	0.081	<0.0005	5.2	0.48	69	0.077	
10/00	8.76	8.84	520	470	7.3		0.59	17	<0.0085	<0.0005		0.57	81	0.11	

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.)
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
MW-36															
5/86	9.7		2,700		25	1.4		97			39.5	1.13	760		
7/88	8.9	9.6	940	1,255	8.6		1.3	18	0.0078	<0.0015	3.52	0.332	161	0.0063	<0.005
1/95	9.8	9.7	3,500	1,350	18		<0.01	160	0.034	<0.01	8.7	0.83	770	0.07	
7/96	9.6	9.55	3,300	3,280	8.1	<0.020		160	0.058	0.0021		0.67		0.07	
5/97	9.8	9.64	3,600	3,290	9.2		3.5	180	0.084	0.0035		1.7	850	0.1	
5/98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
9/98	9.90	10.10	4,500	4,380	6.5		0.03	230	0.11	0.0036		1.4	990	0.074	
1/99	9.76	10.20	3,500	3,300	41		1.2	190	0.076	0.0036		1.5	820	0.072	
5/99	10.10	10.40	2,500	2,260	19		4.4	150	0.12	0.0019		1.3	600	0.12	
9/99	10.10	10.10	1,800	1,790	6.2		0.69	93	0.059	0.00055		1.2	420	0.067	
9/99 (DUP)	10.10	10.10	1,800	1,790	6.3		<0.5	96	0.061	0.00062		1.2	450	0.07	
1/00	10.2	9.80	1,600	1,450	3.9		0.51	80	0.072	<0.0005		0.70	290	0.082	
5/00	10.2	10.42	1,200	1,272	1.6		<0.01	50	0.03	<0.0005	4.0	0.54	150	0.03	
10/00	9.84	10.05	1,200	1,043	4.9		<0.01	41	0.024	0.00061		1.6	210	0.033	
MW-37															
5/86	10.1		7,340		97	8.2		890			498	46.3	1,800		
7/88	9.9	9.8	5,600	5,500	0.30		<0.01	1000	0.169	0.035	115	15.4	1,470	0.369	<0.005
2/90	9.6	9.65	2,700	3,100	4.6		22.7	360			1000		970		
1/95	9.1	9.2	1,200	970	18		<0.01	87	0.033	<0.01	8.5	0.58	280	0.01	
7/96	9.1	8.89	570	832	14	<0.020		45	0.042	0.0005		0.51		0.03	
5/97	9.2	9.07	1,100	846	13		1.7	53	0.027	<0.0005		0.56	210	0.02	
5/98	8.57	8.30	530	505	6.4		<0.01	6.8	0.018	<0.0005		0.28	120	0.02	
9/98	8.90	8.26	670	682	15		5.5	52	0.020	<0.0005		0.53	140	0.017	
1/99	9.02	9.25	660	750	19		<0.10	25	0.02	<0.0005		0.68	140	0.029	
5/99	9.39	9.45	610	540	11		3.6	22	0.023	<0.0005		0.23	130	0.016	
9/99	8.78	8.91	760	753	7.9		0.91	31	0.01	<0.0005		0.33	170	<0.01	
1/00	8.83	8.40	880	822	10		2.2	32	0.011	<0.0005		0.49	110	<0.01	
5/00	8.51	8.89	770	765	5.2		0.93	32	0.015	<0.0005	9.0	0.72	92	<0.01	
10/00	8.39	8.46	750	630	6.6		<0.01	17	0.0089	<0.0005		0.61	79	<0.01	
MW-39S															
5/86	9.5		8,360		11	2.9		244			25.0	1.35	2780		
6/88	9.3	9.1	3,500	2,550	3.8		0.10	110	0.016	<0.0015	36.6	1.63	826	0.053	<0.005
1/95	8.9	8.7	2,700	900	0.64		<0.01	59	<0.004	<0.01	0.36	0.22	520	<0.01	
5/97	8.9	9.2	5,500	5,500	3.6		<0.2	150	0.009	<0.0005		0.15	1300	<0.01	
5/98	9.04	9.09	4,000	4,000	2.3		<0.01	98	0.009	<0.0005		0.11	700	<0.01	
5/99	9.05	9.30	4,300	3,620	3.4		0.24	120	0.0096	<0.0005		0.12	950	<0.01	
5/99 (DUP)	9.05	9.30	4,200	3,620	3.6		0.89	120	0.009	<0.0005		0.11	1,100	<0.01	
5/00	9.18	9.19	4,500	3,870	3.5		3.5	110	0.013	<0.0005	2.3	0.097	1,100	<0.01	
MW-39D															
5/86	8.1		627		0.21	0.02		7.4			0.14	0.54	103		
6/88	7.9	7.8	590	595	0.17		0.03	6.1	0.0021	<0.0015	0.36	0.681	53.9	<0.0026	<0.005
1/95	7.5	7.6	630	410	0.07		<0.01	3.9	<0.004	<0.01	0.06	0.87	36	<0.01	
5/97	7.5	7.66	630	457	0.06		0.06	3.8	<0.004	<0.0005		0.87	32	<0.01	
5/98	7.52	7.35	590	560	0.04		<0.01	3.6	<0.004	<0.0005		0.77	34	<0.01	
5/99	7.59	7.64	540	447	0.037		<0.01	3.4	<0.004	<0.0005		0.87	33	<0.01	
5/00	7.68	7.60	580	503	0.027		0.027	3.2	<0.004	<0.0005	0.13	0.90	29	<0.01	
MW-40S															
5/86	8.9		2,550		1.7	0.03		28			12.8	0.49	650		
6/88	9.2	9.2	2,100	2,200	1.5		<0.01	5.9	0.018	<0.0015	1.89	0.139	445	0.0056	<0.005
1/95	7.9	7.9	2,500	1,600	0.87		<0.01	40	<0.004	<0.01	0.36	0.33	470	<0.01	
5/97	7.9	8.07	1,900	1,417	0.72		0.40	21	<0.004	<0.0005		0.66	380	<0.01	
5/98	8.2	8.18	1,400	1,335	0.36		<0.01	39	<0.004	<0.0005		0.13	270	<0.01	
5/99	8.50	8.83	1,300	1,100	0.32		<0.01	30	<0.004	<0.0005		0.11	250	<0.01	
5/00	8.08	8.04	1,100	900	0.25		0.25	14	<0.004	<0.0005	0.19	0.42	110	<0.01	

Note: All results in mg/L unless otherwise noted. NS = Not sampled. Well damaged during remedial construction.

TABLE 4 (CONT.)
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Conductance (lab)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
MW-40D															
5/86	9.4		1,120		7.4	0.06		20			11.7	0.62	280		
6/88	9.4	9.4	1,200	1,290	7.0		<0.01	36	0.018	<0.0015	7.81	0.454	258	0.012	<0.005
1/95	7.6	7.7	2,000	1,375	0.70		<0.01	16	<0.004	<0.01	0.29	0.74	340	<0.01	
5/97	7.6	7.9	1,800	1,350	0.59		<0.1	7.6	<0.004	<0.0005		1.3	340	<0.01	
5/98	7.85	7.73	1,300	1,250	0.49		0.47	19	<0.004	<0.0005		0.36	250	<0.01	
5/99	7.99	8.25	920	745	0.16		0.16	12	<0.004	<0.0005		0.42	150	<0.01	
5/00	7.88	7.84	960	810	0.25		0.25	11	<0.004	<0.0005	0.16	0.69	97	<0.01	
MW-41															
1/95	6.6	8.2	490	600	0.04		0.02	0.2	0.017	<0.01	8.9	1.3	22	<0.01	
5/97	6.8	6.98	490	357	<0.01			0.20	0.022	<0.0005		1.6	21	<0.01	
5/98	6.67	6.74	420	449	<0.01			0.30	0.016	<0.0005		1.3	21	<0.01	
5/99	6.79	6.80	420	370	<0.01			0.33	0.014	<0.0005		1.1	20	<0.01	
5/00	6.79	6.96	430	424	<0.01			0.25	0.016	<0.0005	9.2	1.1	17	<0.01	
MW-42S															
6/88	8.0	8.4	930	870	0.70		0.25	14.0	0.002	<0.0015	0.232	0.237	143	0.0027	<0.005
2/90	8.4	8.25	2,100	2,400	0.266		0.079	35.0			0.88		520		
1/95	8.2	8.4	1,600	765	0.45		<0.01	22	<0.004	<0.01	0.2	0.35	280	<0.01	
5/97	8.2	8.57	1,700	1,350	0.56		<0.02	29	<0.004	<0.0005		0.33	300	<0.01	
5/98	8.26	8.46	1,400	1,460	0.52		<0.01	27	<0.004	<0.0005		0.37	270	<0.01	
5/99	8.19	8.54	1,500	1,100	0.54		0.033	26	<0.004	<0.0005		0.49	260	<0.01	
5/00	8.19	8.18	1,900	1,530	0.66		0.66	28	<0.004	<0.0005	0.39	0.65	280	<0.01	
MW-42D															
6/88	7.9	8.1	550	600	0.16		<0.01	6.0	0.0028	<0.0015	1.11	0.636	68.6	0.0028	<0.005
1/95	7.5	7.7	640	410	0.04		<0.01	3.6	<0.004	<0.01	0.08	1.5	31	<0.01	
5/97	7.6	7.99	580	468	0.04		<0.01	3.2	<0.004	<0.0005		1.3	27	<0.01	
5/98	7.54	7.64	550	535	0.07		0.01	3.3	<0.008	<0.0005		1.2	26	<0.01	
5/99	7.56	7.83	530	435	0.03		<0.01	3.4	<0.004	<0.0005		1.3	26	<0.01	
5/00	7.73	7.74	580	490	0.027		0.027	3.0	<0.004	<0.0005	0.053	1.3	24	<0.01	

Note: All results in mg/L unless otherwise noted.

0311ANN-4 123

TABLE 5
SUMMARY OF ESTIMATED AQUIFER AREAS ABOVE CLEANUP GOALS
AND CONTAMINANT MASS-IN-PLACE
ORMET CORPORATION
HANNIBAL REDUCTION DIVISION
HANNIBAL, OHIO

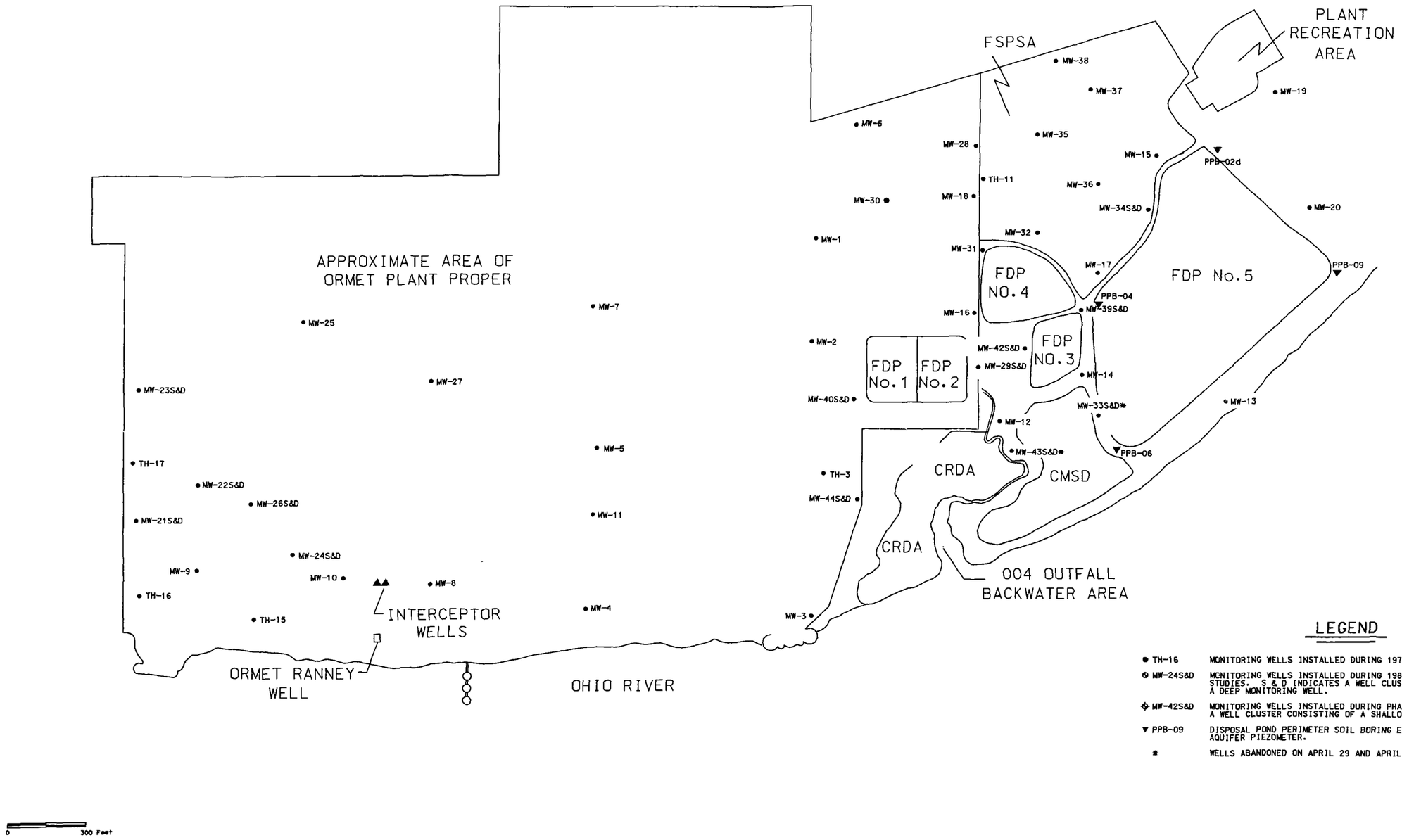
Sampling Date	Estimated Area of Aquifer Above 4 mg/L Fluoride	% Change	Estimated Area of Aquifer Above 0.2 mg/L Amenable CN	% Change
6/88	43.3 a.		24.5 a.	
1/95	48.4 a.	+11.6	5.9 a.	-75.8
5/97	43.7 a.	-9.7	21.3 a.	+259
5/98	36.9 a.	-15.6	10.5 a.	-50.6
5/99	43.7*a.	+18.4	27.5 a.	+161
5/00	41.6 a.	-4.8	36.5 a.	+32.7

Sampling Date	Estimated Fluoride Mass-in-Place	% Change	Estimated Total CN Mass-in-Place	% Change
6/88	85,702 lbs.		6,821 lbs.	
1/95	28,168 lbs.	-67.1	4,271 lbs.	-37.4
5/97	29,033 lbs.	+3.1	2,943 lbs.	-31.1
5/98	23,888 lbs.	-17.7	2,597 lbs.	-11.8
5/99	30,416* lbs.	+27.3	5,566 lbs.	+114
5/00	27,071 lbs.	-11.0	4,679 lbs.	-15.9

* - Value corrected due to omission during 1999 calculation.

0311ANN-5.123

FIGURES



LEGEND

● TH-16	MONITORING WELLS INSTALLED DURING 1972 FRED KLAIR & ASSOC. STUDY.
⊗ MW-24S&D	MONITORING WELLS INSTALLED DURING 1983 & 1986 GERAGHTY & MILLER, INC. STUDIES. S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.
⊕ MW-42S&D	MONITORING WELLS INSTALLED DURING PHASE I RI (TASK 3-E). S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.
▼ PPB-09	DISPOSAL POND PERIMETER SOIL BORING EQUIPPED WITH ALLUVIAL AQUIFER PIEZOMETER.
*	WELLS ABANDONED ON APRIL 29 AND APRIL 30, 1997.

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Environmental Consulting Services

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Glass Works Center ~ Suite 109
331 S. Main Street
Washington, Pennsylvania 15301

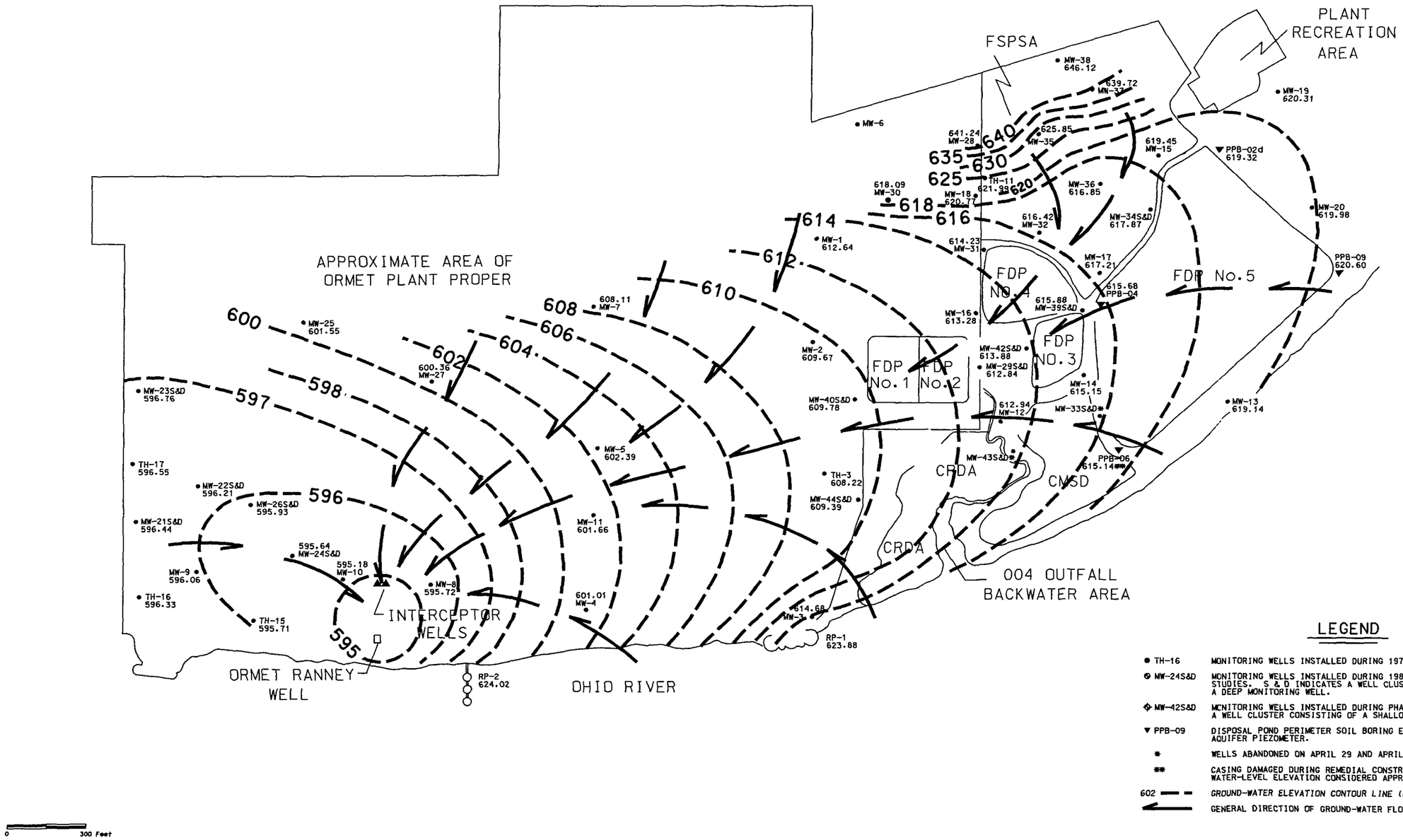
PROJECT NO.: HM00301	FILE NO:
DRAWING: BASEMAP	PLOT SIZE: 1"=300'
DRAFTED BY: SJP\EDA	DATE: 7/10/97
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

BASE MAP

ORMET CORPORATION

HANNIBAL OHIO

FIGURE 1



LEGEND

● TH-16	MONITORING WELLS INSTALLED DURING 1972 FRED KLAIR & ASSOC. STUDY.
⊗ MW-24S&D	MONITORING WELLS INSTALLED DURING 1983 & 1986 GERAGHTY & MILLER, INC. STUDIES. S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.
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▼ PPB-09	DISPOSAL POND PERIMETER SOIL BORING EQUIPPED WITH ALLUVIAL AQUIFER PIEZOMETER.
*	WELLS ABANDONED ON APRIL 29 AND APRIL 30, 1997.
**	CASING DAMAGED DURING REMEDIAL CONSTRUCTION WATER-LEVEL ELEVATION CONSIDERED APPROXIMATE
602 — —	GROUND-WATER ELEVATION CONTOUR LINE (FEET MSL)
⟵	GENERAL DIRECTION OF GROUND-WATER FLOW

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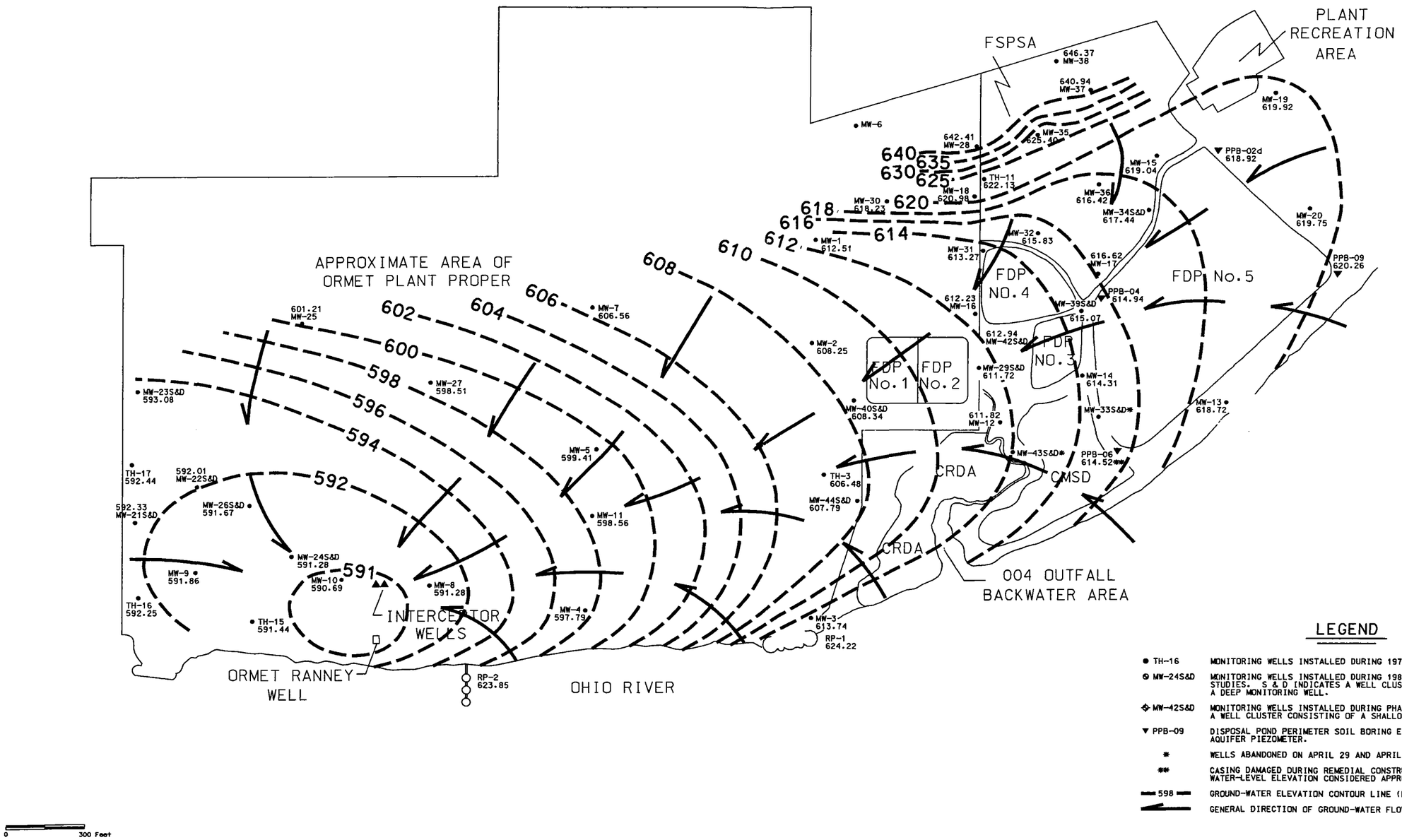
PROJECT NO.: HM00301	FILE NO:
DRAWING: C071097A	PLOT SIZE: 1"=300'
DRAFTED BY: SJP\EDA	DATE: 7/10/97
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

GROUND-WATER ELEVATION CONTOUR MAP (BASED ON DATA COLLECTED JANUARY 10, 2000)

ORMET CORPORATION

HANNIBAL OHIO

FIGURE 2



LEGEND

● TH-16	MONITORING WELLS INSTALLED DURING 1972 FRED KLAIR & ASSOC. STUDY.
⊗ MW-24S&D	MONITORING WELLS INSTALLED DURING 1983 & 1986 GERAGHTY & MILLER, INC. STUDIES. S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.
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▼ PPB-09	DISPOSAL POND PERIMETER SOIL BORING EQUIPPED WITH ALLUVIAL AQUIFER PIEZOMETER.
*	WELLS ABANDONED ON APRIL 29 AND APRIL 30, 1997.
**	CASING DAMAGED DURING REMEDIAL CONSTRUCTION WATER-LEVEL ELEVATION CONSIDERED APPROXIMATE
598	GROUND-WATER ELEVATION CONTOUR LINE (FEET MSL)
	GENERAL DIRECTION OF GROUND-WATER FLOW

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331 S. Main Street
Washington, Pennsylvania 15301

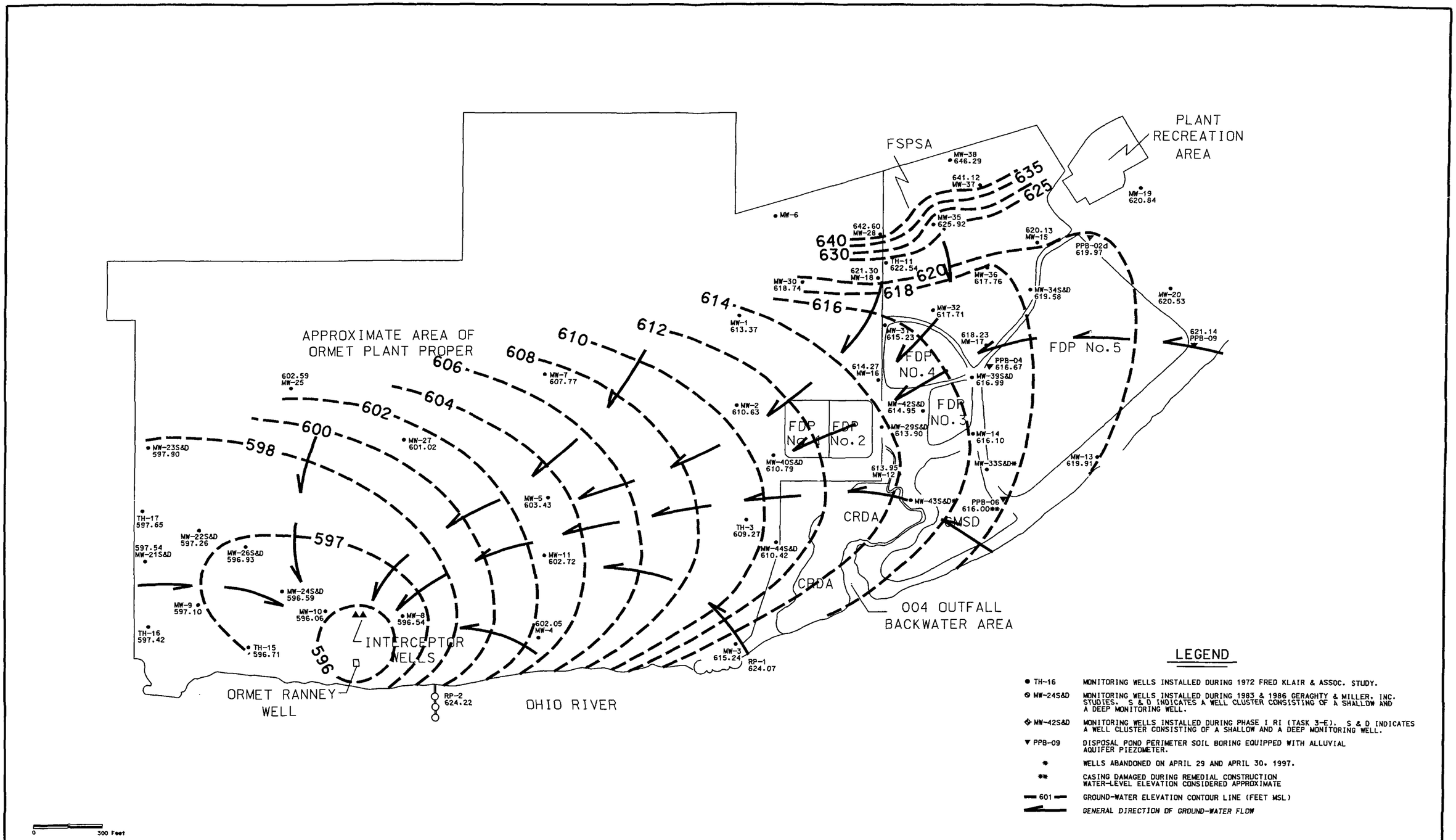
PROJECT NO.: HM00311	FILE NO:
DRAWING: C021401B	PLOT SIZE: 1"=300'
DRAFTED BY: JLM\EDA	DATE: 2/14/01
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

GROUND-WATER ELEVATION CONTOUR MAP (BASED ON DATA COLLECTED MAY 15, 2000)

ORMET CORPORATION

HANNIBAL OHIO

FIGURE 3



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331 S. Main Street
Washington, Pennsylvania 15301

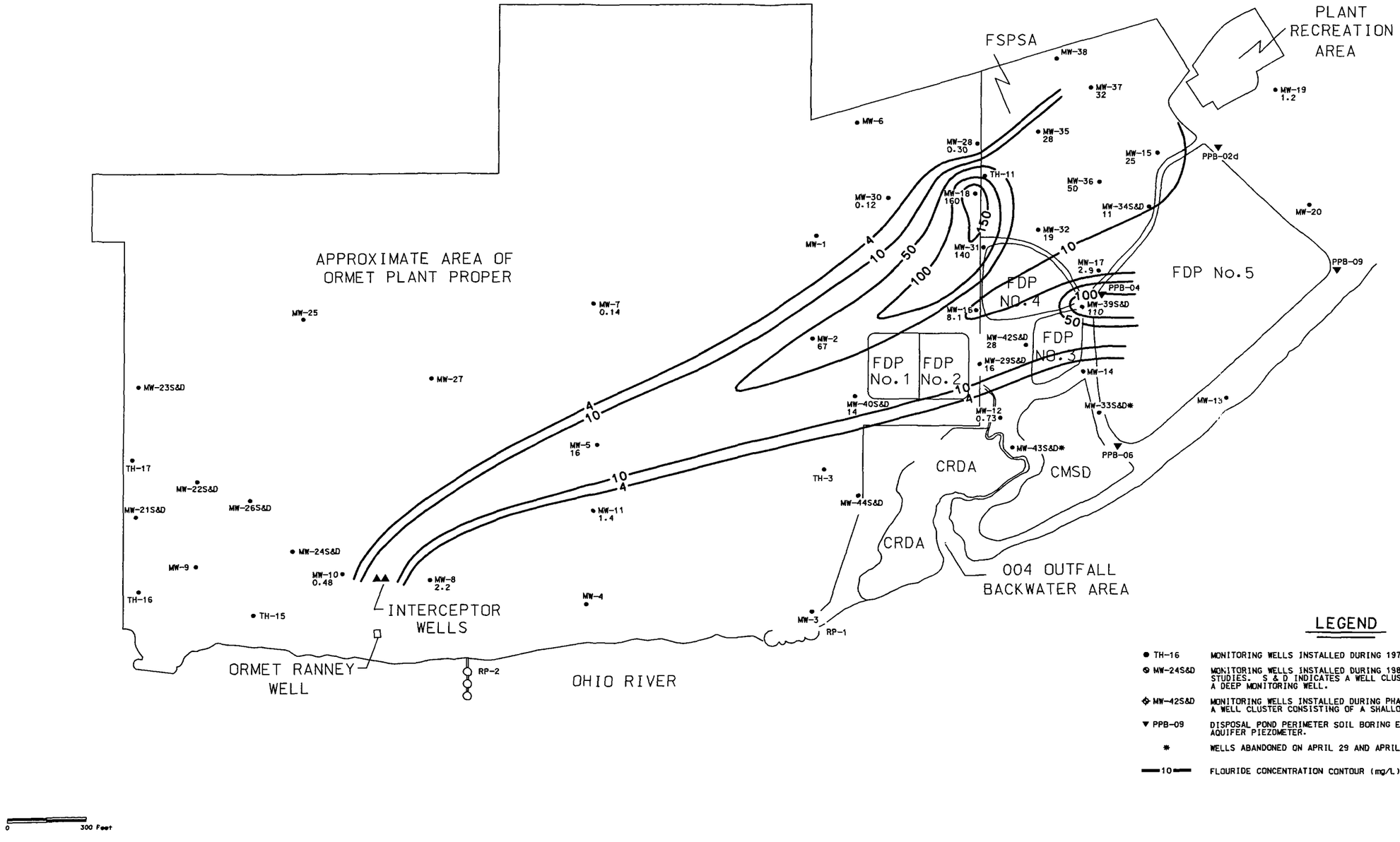
PROJECT NO.: HM00311	FILE NO:
DRAWING: C021401C	PLOT SIZE: 1"=300'
DRAFTED BY: JLM\EDA	DATE: 2/14/01
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

GROUND-WATER ELEVATION CONTOUR MAP (BASED ON DATA COLLECTED OCTOBER 9, 2000)

ORMET CORPORATION

HANNIBAL OHIO

FIGURE 4



LEGEND

● TH-16	MONITORING WELLS INSTALLED DURING 1972 FRED KLAIR & ASSOC. STUDY.
⊗ MW-24S&D	MONITORING WELLS INSTALLED DURING 1983 & 1986 GERAGHTY & MILLER, INC. STUDIES. S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.
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▼ PPB-09	DISPOSAL POND PERIMETER SOIL BORING EQUIPPED WITH ALLUVIAL AQUIFER PIEZOMETER.
*	WELLS ABANDONED ON APRIL 29 AND APRIL 30, 1997.
—10—	FLOURIDE CONCENTRATION CONTOUR (mg/L)

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Washington, Pennsylvania 15301

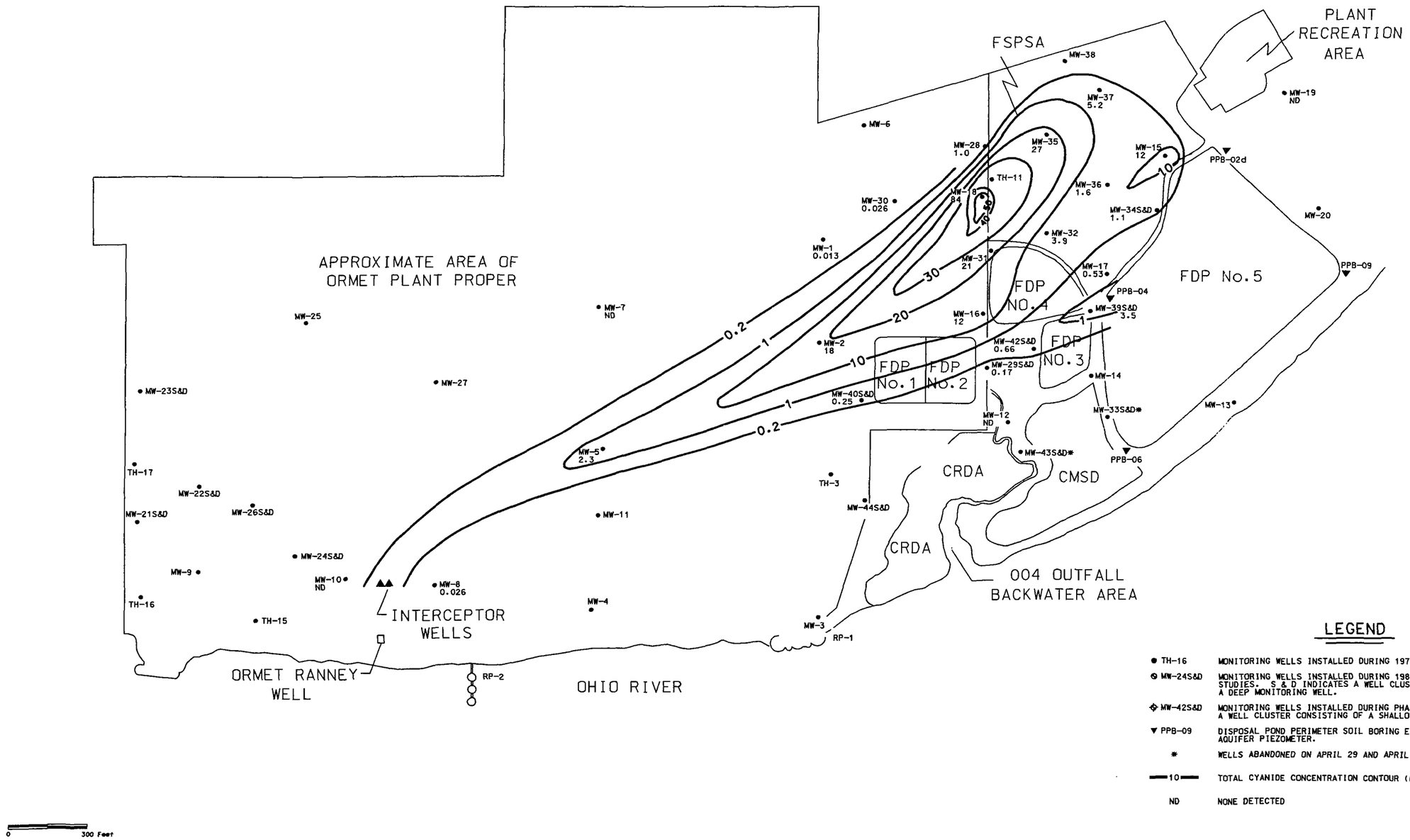
PROJECT NO.: HM00311	FILE NO:
DRAWING: C021401D	PLOT SIZE: 1"=300'
DRAFTED BY: JLM\EDA	DATE: 2/14/01
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

FLOURIDE ISOPLETH MAP FOR THE ALLUVIAL AQUIFIER (BASED ON SAMPLES COLLECTED MAY 16-18, 2000)

ORMET CORPORATION

HANNIBAL OHIO

FIGURE 5



LEGEND

● TH-16	MONITORING WELLS INSTALLED DURING 1972 FRED KLAIR & ASSOC. STUDY.
⊗ MW-24S&D	MONITORING WELLS INSTALLED DURING 1983 & 1986 GERAGHTY & MILLER, INC. STUDIES. S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.
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▼ PPB-09	DISPOSAL POND PERIMETER SOIL BORING EQUIPPED WITH ALLUVIAL AQUIFER PIEZOMETER.
*	WELLS ABANDONED ON APRIL 29 AND APRIL 30, 1997.
—10—	TOTAL CYANIDE CONCENTRATION CONTOUR (mg/L)
ND	NONE DETECTED

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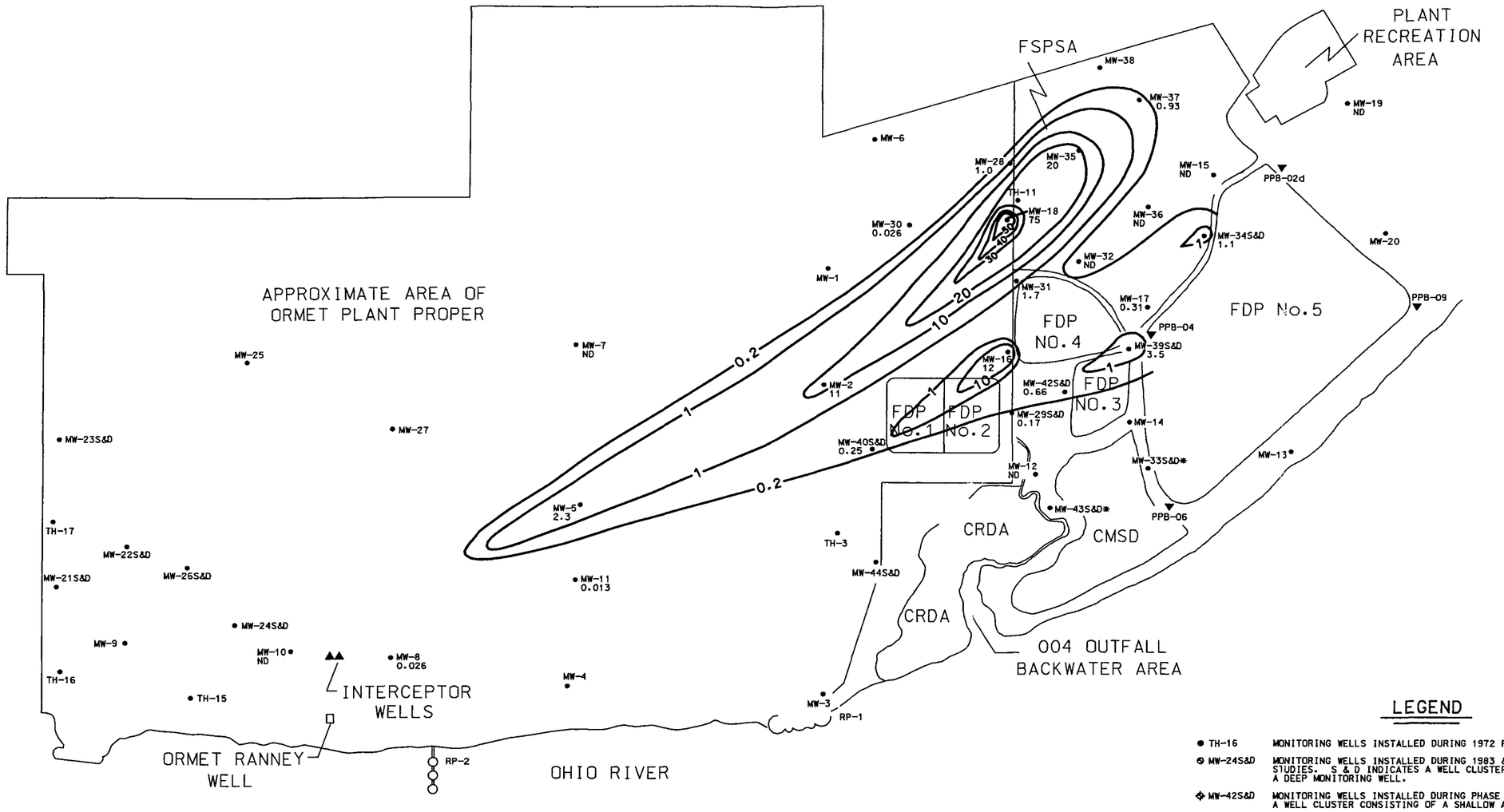
PROJECT NO.: HM00311	FILE NO:
DRAWING: C021401E	PLOT SIZE: 1"=300'
DRAFTED BY: JLM\EDA	DATE: 2/14/01
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

TOTAL CYANIDE ISOPLETH MAP FOR THE ALLUVIAL AQUIFER (BASED ON SAMPLES COLLECTED MAY 16-18, 2000)

ORMET CORPORATION

HANNIBAL OHIO

FIGURE 6



LEGEND

● TH-16	MONITORING WELLS INSTALLED DURING 1972 FRED KLAIR & ASSOC. STUDY.
⊗ MW-24S&D	MONITORING WELLS INSTALLED DURING 1983 & 1986 GERAGHTY & MILLER, INC. STUDIES. S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.
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▼ PPB-09	DISPOSAL POND PERIMETER SOIL BORING EQUIPPED WITH ALLUVIAL AQUIFER PIEZOMETER.
*	WELLS ABANDONED ON APRIL 29 AND APRIL 30, 1997.
—10—	AMENABLE CYANIDE CONCENTRATION CONTOUR (mg/L)
ND	NONE DETECTED

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331 S. Main Street
Washington, Pennsylvania 15301

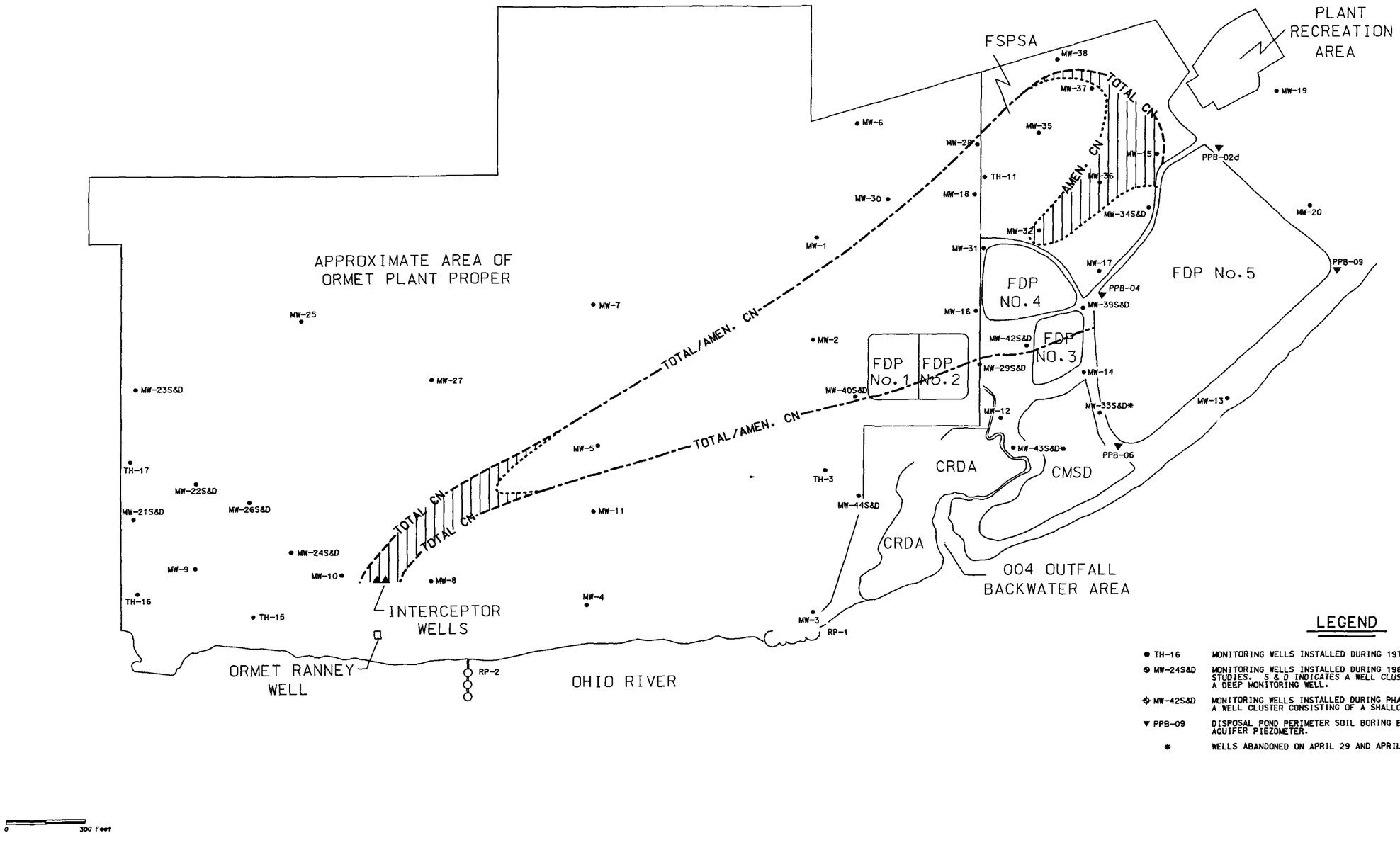
PROJECT NO.: HM00311	FILE NO:
DRAWING: C021401F	PLOT SIZE: 1"=300'
DRAFTED BY: JLM\EDA	DATE: 2/14/01
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

AMENABLE CYANIDE ISOPLETH MAP FOR THE ALLUVIAL AQUIFER (BASED ON SAMPLES COLLECTED MAY 16-18, 2000)

ORMET CORPORATION

HANNIBAL OHIO

FIGURE 7



LEGEND

● TH-16	MONITORING WELLS INSTALLED DURING 1972 FRED KLAIR & ASSOC. STUDY.
⊙ MW-24S&D	MONITORING WELLS INSTALLED DURING 1983 & 1986 GERAGHTY & MILLER, INC. STUDIES. S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.
⊕ MW-42S&D	MONITORING WELLS INSTALLED DURING PHASE I RI (TASK 3-E). S & D INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL.
▼ PPB-09	DISPOSAL POND PERIMETER SOIL BORING EQUIPPED WITH ALLUVIAL AQUIFER PIEZOMETER.
*	WELLS ABANDONED ON APRIL 29 AND APRIL 30, 1997.

HMI Environmental Consulting Services

HydroSystems Management, Inc.
Glass Works Center - Suite 109
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Washington, Pennsylvania 15301

PROJECT NO.: HM00311	FILE NO:
DRAWING: C021401G	PLOT SIZE: 1"=300'
DRAFTED BY: JLM\EDA	DATE: 2/14/01
CHECKED BY:	DATE:
APPROVED BY:	DATE:
REVISION NO.:	DATE:

2000 COMPARISON OF TOTAL vs. AMENABLE CYANIDE DISTRIBUTION IN GROUND-WATER (BASED ON 0.2mg/L CONCENTRATION CONTOURS)

ORMET CORPORATION

HANNIBAL OHIO

FIGURE 8

Appendix A

APPENDIX A

WATER SAMPLING LOG FORMS

Appendix A-1	Water Sampling Log Forms for January 2000 Monitoring Event
Appendix A-2	Water Sampling Log Forms for May 2000 Monitoring Event
Appendix A-3	Water Sampling Log Forms for October 2000 Monitoring Event

APPENDIX A-1

WATER SAMPLING LOG FORMS FOR JANUARY 2000 MONITORING EVENT

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM003.11
Site Location: Hannibal Ohio
Sampling Date: 1-11-00 Weather: Clearing 30's

Sample ID: MW-2
Replicate ID: ~
Time Sampling Began: 0840
Time Sampling Completed: 0910

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 82.25
Depth to Water Below MP (DTW): 58.45
Water Column (WC) in Well [TD-DTW]: 23.80
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.8 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): (11.5)

GALLONS PER FOOT (gpf)			
1½" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.28	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Black Odor: — Turbidity: Stained

Well Volumes (gal.):	4	8	11.5	final				
pH (s.u.):	9.52	9.62	9.65	9.65				
Sp. Cond. (µmhos/cm):	1,900	1,825	1,850	1,825				
Temperature (°C):	13.5	13.5	13.5	13.5				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 mL Glass	NAOH
pH, Sp Cond, F	250 mL Plastic	4°C
PCE	2x40 mL Glass	HCL

Sampling Personnel: J Campbell, S Menosky
Comments: Color does not filter out

HM07-07WS-LOG.WK3

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM003.11
Site Location: Hannibal Ohio
Sampling Date: 1-11-00 Weather: Cloudy 30's

Sample ID: MW-5
Replicate ID: MW-5d
Time Sampling Began: 0755
Time Sampling Completed: 0830

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 92.00
Depth to Water Below MP (DTW): 65.77
Water Column (WC) in Well [TD-DTW]: 26.23
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 4.2 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): (13)

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Lt Brown Odor: — Turbidity: 51 Stained

Well Volumes (gal.):	4.5	9	13	final				
pH (s.u.):	8.05	8.26	8.29	8.30				
Sp. Cond. (µmhos/cm):	1050	1060	1065	1040				
Temperature (°C):	13	13	13	13				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 mL Glass	NAOH
pH, Sp Cond, F	250 mL Plastic	4°C
PCE	2x40 mL Glass	HCL

Sampling Personnel: J Campbell, S Menosky
Comments: Color does not filter out

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM003.11
Site Location: Hannibal Ohio
Sampling Date: 1-11-00 Weather: v windy 30's

Sample ID: MW-12
Replicate ID: ~
Time Sampling Began: 1450
Time Sampling Completed: 1530

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 68.42
Depth to Water Below MP (DTW): 23.79
Water Column (WC) in Well [TD-DTW]: 44.63
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 7.15 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 21.5

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: None Odor: Turbidity: Clear

Well Volumes (gal.):	7.5	14.5	21.5	final				
pH (s.u.):	6.25	6.60	6.60	6.65				
Sp. Cond. (µmhos/cm):	500	490	490	495				
Temperature (°C):	14	14	14	14				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 mL Glass	NAOH
pH, Sp Cond, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky
Comments:

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM003.11
Site Location: Hannibal Ohio
Sampling Date: 1-11-00 Weather: Sunny windy 30's

Sample ID: MW-16
Replicate ID: MW-16d
Time Sampling Began: 0920
Time Sampling Completed: 0950

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 83.12
Depth to Water Below MP (DTW): 49.44
Water Column (WC) in Well [TD-DTW]: 33.68
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 5.4 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 16.5

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.28	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: Turbidity: Sl Cloudy + Stained

Well Volumes (gal.):	5.5	11	16.5	final				
pH (s.u.):	6.90	6.90	6.90	6.95				
Sp. Cond. (µmhos/cm):	805	815	810	810				
Temperature (°C):	12.5	13	13	13				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 mL Glass	NAOH
pH, Sp Cond, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky
Comments: 0930 Collect FB
Color does not filter out completely

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM003.11
Site Location: Hannibal Ohio
Sampling Date:
Weather: V windy 30's

Sample ID: MW-18
Replicate ID: ~
Time Sampling Began: 0955
Time Sampling Completed: 1025

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 61.16
Depth to Water Below MP (DTW): 40.14
Water Column (WC) in Well [TD-DTW]: 21.02
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.4

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 10.5
= Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.28	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color:			Odor:			Turbidity:		
Well Volumes (gal.):	3.5	7	10.5	final				
pH (s.u.):	9.05	9.30	NA	9.15				
Sp. Cond. (µmhos/cm):	2,700	2,600	NA	2700				
Temperature (°C):	13.5	13.5	NA	13.5				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 mL Glass	NAOH
pH, Sp Cond, F	250 mL Plastic	4°C
PCE	2x40 mL Glass	HCL

Sampling Personnel: J Campbell, S Menosky
Comments: Color does not filter out, used 2 filters, very hard to filter sampled after well dried

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM003.11
Site Location: Hannibal Ohio
Sampling Date: 1-11-00 Weather: V windy 30's

Sample ID: MW-28
Replicate ID: ~
Time Sampling Began: 1045
Time Sampling Completed: 1105

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 46.20
Depth to Water Below MP (DTW): 22.03
Water Column (WC) in Well [TD-DTW]: 24.17
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.86 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 12

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.28	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Tan/orange Odor: Turbidity: Cloudy

Well Volumes (gal.):	4	8	12	final				
pH (s.u.):	5.15	5.21	5.23	5.25				
Sp. Cond. (µmhos/cm):	411	400	400	410				
Temperature (°C):	15	15	15	15				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 mL Glass	NAOH
pH, Sp Cond, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky
Comments:

HM07-07WS-LOG.WK3

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM003.11
Site Location: Hannibal Ohio
Sampling Date: 1/11/00 Weather: V windy 30's

Sample ID: MW-31
Replicate ID: ~
Time Sampling Began: 1115
Time Sampling Completed: 1145

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 67.58
Depth to Water Below MP (DTW): 47.36
Water Column (WC) in Well [TD-DTW]: 20.22
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.23 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): (10)

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Black Odor: Turbidity: V Stained

Well Volumes (gal.):	3.5	7	10	final				
pH (s.u.):	9.70	9.75	9.75	9.80				
Sp. Cond. (µmhos/cm):	2,500	2,600	2,550	2,600				
Temperature (°C):	14	14	14	14				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 mL Glass	NAOH
pH, Sp Cond, F	250 mL Plastic	4°C
PCE	2x40 mL Glass	HCL

Sampling Personnel: J Campbell, S Menosky
Comments: Color does not filter out

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM003.11
Site Location: Hannibal Ohio
Sampling Date: 1-11-00 Weather: V windy, 30's

Sample ID: MW-32
Replicate ID: ~
Time Sampling Began: 1425
Time Sampling Completed: 1445

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 57.36
Depth to Water Below MP (DTW): 40.24
Water Column (WC) in Well [TD-DTW]: 17.12
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 2.73 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 8.5

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.28	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown-black Odor: Turbidity: Stained

Well Volumes (gal.):	3	6	8.5	final				
pH (s.u.):	7.80	8.20	8.25	8.28				
Sp. Cond. (µmhos/cm):	770	765	770	770				
Temperature (°C):	14	14	14	14				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 mL Glass	NAOH
pH, Sp Cond, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky
Comments:

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM003.11
Site Location: Hannibal Ohio
Sampling Date: 1-11-00 Weather: v windy 30's

Sample ID: MW-35
Replicate ID: ~
Time Sampling Began: 1315
Time Sampling Completed: 1335

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 46.94
Depth to Water Below MP (DTW): 36.05
Water Column (WC) in Well [TD-DTW]: 10.89
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 1.74 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 5.5

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.28	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Dk brown - black Odor: — Turbidity: Stained + cloudy

Well Volumes (gal.):	2	~~4~~ 3+	5.5	final				
pH (s.u.):	8.11	8.05	NA	8.15				
Sp. Cond. (µmhos/cm):	442	445	NA	500				
Temperature (°C):	14	14	NA	14				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 mL Glass	NAOH
pH, Sp Cond, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments: well dried at 3+ gallons removed, sampled upon recovery
Color does not filter out

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM003.11
Site Location: Hannibal Ohio
Sampling Date: 1-11-00 Weather: V. Windy 30's

Sample ID: MW-36
Replicate ID: ~
Time Sampling Began: 1405
Time Sampling Completed: 1420

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 52.08
Depth to Water Below MP (DTW): 38.29
Water Column (WC) in Well [TD-DTW]: 13.79
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 2.2 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged: 7
(3 WCVs, 5 WCVs, etc.)

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown-black Odor: Turbidity: V Cloudy + Stained

Well Volumes (gal.):	2.5	5	7	final				
pH (s.u.):	9.80	9.70	9.75	9.80				
Sp. Cond. (µmhos/cm):	1,425	1,410	1,420	1,450				
Temperature (°C):	14.5	14.5	14.5	14.5				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 mL Glass	NAOH
pH, Sp Cond, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky

Comments:

HM07-07WS-LOG.WK3

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM003.11
Site Location: Hannibal Ohio
Sampling Date: 1-11-00 Weather: V windy 30's

Sample ID: MW-37
Replicate ID: ~
Time Sampling Began: 1340
Time Sampling Completed: 1400

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 36.90
Depth to Water Below MP (DTW): 21.42
Water Column (WC) in Well [TD-DTW]: 15.48
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 2.5 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 7.5

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.28	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Odor: Turbidity: Turbid + Stained

Well Volumes (gal.):	2.5	5	7.5	final				
pH (s.u.):	7.95	8.25	8.25	8.40				
Sp. Cond. (µmhos/cm):	850	855	840	822				
Temperature (°C):	14.5	14.5	14.5	14.5				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 mL Glass	NAOH
pH, Sp Cond, F	250 mL Plastic	4°C

Sampling Personnel: J Campbell, S Menosky
Comments: Color does not filter out

APPENDIX A-2

WATER SAMPLING LOG FORMS FOR MAY 2000 MONITORING EVENT

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/ /00 Weather:

Sample ID: MW-1
Replicate ID: DAMAGED
Time Sampling Began: NOT SAMPLED
Time Sampling Completed:

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 71.11
Depth to Water Below MP (DTW):
Water Column (WC) in Well [TD-DTW]:
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]:

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.):
= Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color:				Odor:				
Well Volumes (gal.):								
pH (s.u.):								
Sp. Cond. (µmhos/cm):								
Temperature (°C):								
Turbidity (N.T.U):								

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments: WELL NOT SAMPLED

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/16/00 Weather: Sunny 50

Sample ID: MW-2
* Replicate ID: MW-2d
Time Sampling Began: 9:30
Time Sampling Completed: 9:35

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 85.23
Depth to Water Below MP (DTW): 59.87
Water Column (WC) in Well [TD-DTW]: 25.36
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 4.06 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged: 12.2
(3 WCVs, 5 WCVs, etc.)

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown - Black Stained				Odor: None				
Well Volumes (gal.):	5	10	12.5	Final				
pH (s.u.):	9.82	9.82	9.84	9.84				
Sp. Cond. (µmhos/cm):	1880	1878	1853	1863				
Temperature (°C):	13°(c)	13°(c)	13°(c)	13°(c)				
Turbidity (N.T.U):	High	High	High	High				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C
Tetrachloroethene (PCE)	2 x 40 mL Glass	HCL

Sampling Personnel: S. Menosky, J. Keller
Comments: Color does not filter out, Spotty sheen

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/16/00 Weather: Sunny 40's

Sample ID: MW-5
Replicate ID: ~
Time Sampling Began: 8:00
Time Sampling Completed: 8:20

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 91.88
Depth to Water Below MP (DTW): 68.75
Water Column (WC) in Well [TD-DTW]: 23.13
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.7 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 11.1

GALLONS PER FOOT (gpf)			
1½" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Stained Odor: None

Well Volumes (gal.):	4	8	12	Final				
pH (s.u.):	8.70	8.70	8.65	8.59				
Sp. Cond. (µmhos/cm):	1022	1043	1052	1020				
Temperature (°C):	13°(c)	13°(c)	13°(c)	13				
Turbidity (N.T.U):								

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C
Tetrachloroethene (PCE)	2 x 40 mL Glass	HCL

Sampling Personnel: S. Menosky, J. Keller
Comments: Color does not filter out

HM07-GTWS-LOG.XLS

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/16/00 Weather: Sunny 70

Sample ID: MW-7
Replicate ID: ~
Time Sampling Began: 2:25
Time Sampling Completed: 2:35

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 79.70
Depth to Water Below MP (DTW): 61.38
Water Column (WC) in Well [TD-DTW]: 18.32
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 2.93 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged: 8.79
(3 WCVs, 5 WCVs, etc.)

GALLONS PER FOOT (gpf)			
1½" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: ~~Sm~~ light brown
Odor: None

Well Volumes (gal.):	3	6	9	Final			
pH (s.u.):	5.78	5.76	5.79	5.81	5.96		
Sp. Cond. (µmhos/cm):	869	837	796	806	777		
Temperature (°C):	40°(c)	40.0°(c)	41°(c)	41	40		
Turbidity (N.T.U):	Slightly Hazy	Very Cloudy	Very Cloudy	Very Cloudy	Very Cloudy		

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments: Color filters out

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/16/00 Weather: Partly Cloudy 70's

Sample ID: MW-8
Replicate ID: ~
Time Sampling Began: 3:30
Time Sampling Completed: 3:40

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 99.78
Depth to Water Below MP (DTW): 76.43
Water Column (WC) in Well [TD-DTW]: 23.35
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.74 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 11.21

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Clear				Odor: None				
Well Volumes (gal.):	4	8	12	Final				
pH (s.u.):	7.93	7.93	7.95	8.01				
Sp. Cond. (µmhos/cm):	505	521	524	533				
Temperature (°C):	16	16	16	17				
Turbidity (N.T.U):	Clear	Clear	Clear	Clear				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller

Comments:

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/16/00 Weather: Cloudy 70

Sample ID: MW-10
Replicate ID: ~
Time Sampling Began: 3:05
Time Sampling Completed: 3:10

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 100.72
Depth to Water Below MP (DTW): 76.47
Water Column (WC) in Well [TD-DTW]: 24.25
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.88 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 11.64

GALLONS PER FOOT (gpf)			
1½" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: light brown
Odor: None

Well Volumes (gal.):	4	8	12	Final				
pH (s.u.):	7.42	7.45	7.45	7.51				
Sp. Cond. (µmhos/cm):	548	567	561	549				
Temperature (°C):	17	17	17	17				
Turbidity (N.T.U):	Slightly Cloudy	Slightly Cloudy	Slightly Cloudy	Slightly Cloudy				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments: Color filters out

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/16/00 Weather: Sunny 40's

Sample ID: MW-11
Replicate ID: ~
Time Sampling Began: 8:40
Time Sampling Completed: 8:49

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 97.35
Depth to Water Below MP (DTW): 68.75
Water Column (WC) in Well [TD-DTW]: 28.60
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 4.58

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 13.73
= Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Clear				Odor: None				
Well Volumes (gal.):	5	10	14	Final				
pH (s.u.):	7.54	7.56	7.56	7.58				
Sp. Cond. (µmhos/cm):	523	5.07	516	500				
Temperature (°C):	14° (c)	14° (c)	14	15				
Turbidity (N.T.U):								

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky; J. Keller
Comments:

HM07-07WS-LCQ.WK3

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/18/00 Weather: Partly Cloudy 60's

Sample ID: MW-12
Replicate ID: ~
Time Sampling Began: 9:15
Time Sampling Completed: 9:25

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 68.24
Depth to Water Below MP (DTW): 24.91
Water Column (WC) in Well [TD-DTW]: 43.33
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 6.93 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 20.8

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Clear				Odor: None				
Well Volumes (gal.):	7	14	21	Final				
pH (s.u.):	7.47	7.50	7.52	7.57				
Sp. Cond. (µmhos/cm):	528	561	552	558				
Temperature (°C):	16	16	16	16				
Turbidity (N.T.U):	Clear	Clear	Clear	Clear				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky; J. Keller
Comments:

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/18/00 Weather: Cloudy 70

Sample ID: MW-15
Replicate ID: ~
Time Sampling Began: 10:55
Time Sampling Completed: 11:03

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 57.86
Depth to Water Below MP (DTW): 38.27
Water Column (WC) in Well [TD-DTW]: 19.59
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.13 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 9.40

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Stained				Odor: None				
Well Volumes (gal.):	3	6	10	Final				
pH (s.u.):	7.59	7.55	7.55	7.56				
Sp. Cond. (µmhos/cm):	1566	1308	1178	1169				
Temperature (°C):	17	17	17	17				
Turbidity (N.T.U):	Silty	Silty	Silty	Silty				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments: Color does not filter out

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/17/00 Weather: 65° CLEAR

Sample ID: MW-16
Replicate ID: MW-16D
Time Sampling Began: 7:30
Time Sampling Completed:

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 83.11
Depth to Water Below MP (DTW): 50.49
Water Column (WC) in Well [TD-DTW]: 32.62
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 5.22 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 15.66

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: TAN/CLEAR				Odor: NONE				
Well Volumes (gal.):	5.5	11	16	FINAL				
pH (s.u.):	7.47	7.41	7.42	7.53				
Sp. Cond. (µmhos/cm):	888	975	962	945				
Temperature (°C):	13	13	13	13				
Turbidity (N.T.U):	TINTED	TINTED	TINTED	TINTED				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky; J. Keller

Comments:

HM07-0FWB-LOG.WK3

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/ /00 Weather:

Sample ID: MW-17
Replicate ID: ~
Time Sampling Began: 10:25
Time Sampling Completed: 10:30

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 77.91
Depth to Water Below MP (DTW): 38.41
Water Column (WC) in Well [TD-DTW]: 39.50
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 6.32 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 18.96

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: light brown				Odor: None				
Well Volumes (gal.):	6	7	7	Final				
pH (s.u.):	7.59	7.59	7.58	7.61				
Sp. Cond. (µmhos/cm):	520	524	515	523				
Temperature (°C):	15	15	15	15				
Turbidity (N.T.U):	Silty	Silty	Silty	Silty				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments: Color filters out

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/ /00 Weather:

Sample ID: MW-18
Replicate ID: 18d (MW)
Time Sampling Began: 10:45
Time Sampling Completed: 11:06

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 57.00
Depth to Water Below MP (DTW): 39.93
Water Column (WC) in Well [TD-DTW]: 17.07
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 2.73

Diameter of Well Casing: 2"
Gallons to be Purged: 8.19
(3 WCVs, 5 WCVs, etc.)
= Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)			
1½" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown
Odor: None

Well Volumes (gal.):	3	6	8.5	Final				
pH (s.u.):	9.65	9.69	9.70	9.73				
Sp. Cond. (µmhos/cm):	2160	2300	2300	2270				
Temperature (°C):	15	15	15	16				
Turbidity (N.T.U):	Very Cloudy	Very Cloudy	Very Cloudy	Very Cloudy				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C
Tetrachloroethene (PCE)	2 x 40 mL Glass	HCL

Sampling Personnel: S. Menosky, J. Keller
Comments: Color does not filter out

HM07-07WS-LOG.XLS

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/18/00 Weather: P-cloudy 60's

Sample ID: MW-19
Replicate ID: ~
Time Sampling Began: 7:45
Time Sampling Completed: 7:53

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 65.20
Depth to Water Below MP (DTW): 42.11
Water Column (WC) in Well [TD-DTW]: 23.09
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.70 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 11.08

GALLONS PER FOOT (gpf)			
1½" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Tan				Odor: None				
Well Volumes (gal.):	4	8	11.5	Final				
pH (s.u.):	7.02	7.08	7.11	7.20				
Sp. Cond. (µmhos/cm):	561	543	540	538				
Temperature (°C):	13	13	13	13				
Turbidity (N.T.U):	Cloudy	Cloudy	Cloudy	Cloudy				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments: Color filters out

HM07-07WS-LOG.WK3

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/16/00 Weather: Sunny 70's

Sample ID: MW-28
Replicate ID: ~
Time Sampling Began: 1:55
Time Sampling Completed: 2:00

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 46.06
Depth to Water Below MP (DTW): 20.86
Water Column (WC) in Well [TD-DTW]: 25.20
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 4.03 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 12.1

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: light brown				Odor: None				
Well Volumes (gal.):	4	8	12.5	Final				
pH (s.u.):	5.91	5.86	5.80	5.90				
Sp. Cond. (µmhos/cm):	472	427	396	464				
Temperature (°C):	14	14	14	15				
Turbidity (N.T.U):	Cloudy	Cloudy	Cloudy	Cloudy				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments: Color filters out

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/17/00 Weather: Sunny 65°

Sample ID: MW-29s
Replicate ID: ~
Time Sampling Began: 9:30
Time Sampling Completed: 9:45

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 61.35
Depth to Water Below MP (DTW): 41.68
Water Column (WC) in Well [TD-DTW]: 19.67
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.15 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 9.44

GALLONS PER FOOT (gpf)			
1½" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: CLEAR / TINT				Odor: NONE				
Well Volumes (gal.):	3	6	9.5	FINAL				
pH (s.u.):	8.12	8.11	8.10	8.11				
Sp. Cond. (µmhos/cm):	1005	1009	1020	1023				
Temperature (°C):	15	14	14	14				
Turbidity (N.T.U):	CLEAR	CLEAR	CLEAR	CLEAR				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller

Comments:

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/17/00 Weather: Sunny 65°

Sample ID: MW-29D
Replicate ID: ~
Time Sampling Began: 8:40
Time Sampling Completed: 9:30

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 81.98
Depth to Water Below MP (DTW): 41.28
Water Column (WC) in Well [TD-DTW]: 40.70
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 6.5

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 19.5
= Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)			
1½" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: CLEAR				Odor: NONE				
Well Volumes (gal.):	6.5	13	19.5	FINAL				
pH (s.u.):	7.67	7.67	7.67	7.66				
Sp. Cond. (µmhos/cm):	515	512	516	503				
Temperature (°C):	14	14	14	14				
Turbidity (N.T.U):	CLEAR	CLEAR	CLEAR	CLEAR				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky; J. Keller
Comments:

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/16/00 Weather: Sunny 50's

Sample ID: MW-30
Replicate ID: ~
Time Sampling Began: 10:00
Time Sampling Completed: 10:12

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 60.41
Depth to Water Below MP (DTW): 49.35
Water Column (WC) in Well [TD-DTW]: 11.06
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 1.77 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 5.31

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Muddy brown Odor: None

Well Volumes (gal.):	2	4	6	Final				
pH (s.u.):	5.91	5.99	5.95	5.91				
Sp. Cond. (µmhos/cm):	391	382	380	380				
Temperature (°C):	14	14	14	14				
Turbidity (N.T.U):	cloudy	cloudy	cloudy	cloudy				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C
Tetrachloroethene (PCE)	2 x 40 mL Glass	HCL

Sampling Personnel: S. Menosky, J. Keller
Comments: Color filters out.

HM07-SWB-LOG.WK3

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/16/00 Weather: Sunny 70

Sample ID: MW-31
Replicate ID: ~
Time Sampling Began: 1:25
Time Sampling Completed: 1:35

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 67.51
Depth to Water Below MP (DTW): 48.32
Water Column (WC) in Well [TD-DTW]: 19.19
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.07

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 9.2
= Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown-Black
Odor: None

Well Volumes (gal.):	3	6	9.5	Final				
pH (s.u.):	10.08	10.14	10.14	10.10				
Sp. Cond. (µmhos/cm):	2380	2500	2510	2460				
Temperature (°C):	16	15	15	16				
Turbidity (N.T.U):	High	High	High	High				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C
Tetrachloroethene (PCE)	2x40 mL Glass	HCL

Sampling Personnel: S. Menosky, J. Keller
Comments: Color does not filter out

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/18/00 Weather: P-cloudy 70's

Sample ID: MW-32
Replicate ID: ~
Time Sampling Began: 1:10
Time Sampling Completed: 1:16

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 57.18
Depth to Water Below MP (DTW): 40.83
Water Column (WC) in Well [TD-DTW]: 16.35
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 2.62 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 7.85

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown-black stained
Odor: None

Well Volumes (gal.):	3	6	8	Final				
pH (s.u.):	8.22	8.29	8.30	8.95				
Sp. Cond. (µmhos/cm):	~~[illegible]~~ 709	771	817	858				
Temperature (°C):	~~[illegible]~~ 17	17	17	17				
Turbidity (N.T.U):	stained	stained	stained	stained				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments: Color almost filters out

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/17/00 Weather: Sunny 75°

Sample ID: MW-34S
Replicate ID: ~
Time Sampling Began: 3:30
Time Sampling Completed: 3:50

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 49.35
Depth to Water Below MP (DTW): 38.23
Water Column (WC) in Well [TD-DTW]: 11.12
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 1.78 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 5.34

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown				Odor: None				
Well Volumes (gal.):	2.5	4	5.5	FINAL				
pH (s.u.):	7.42	7.40	7.43	7.46				
Sp. Cond. (µmhos/cm):	603	603	605	607				
Temperature (°C):	15	15	15	15				
Turbidity (N.T.U):				SILTY				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky; J. Keller

Comments:

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/17/00 Weather: Sunny 75°

Sample ID: MW-34D
Replicate ID: ~
Time Sampling Began: 2:50
Time Sampling Completed: 3:25

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 68.24
Depth to Water Below MP (DTW): 36.32
Water Column (WC) in Well [TD-DTW]: 31.92
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 5.10 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 15.32

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: TAN				Odor: NONE				
Well Volumes (gal.):	5	10	15.5	FINAL				
pH (s.u.):	7.41	7.40	7.40	7.37				
Sp. Cond. (µmhos/cm):	540	515	520	519				
Temperature (°C):	14	14	14	14				
Turbidity (N.T.U):				CLOUDY				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky; J. Keller
Comments:

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/18/00 Weather: P Cloudy 70's

Sample ID: MW-35
Replicate ID: ~
Time Sampling Began: 2:35
Time Sampling Completed: 2:55

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 46.70
Depth to Water Below MP (DTW): 36.50
Water Column (WC) in Well [TD-DTW]: 10.20
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 1.63 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged: 4.9
(3 WCVs, 5 WCVs, etc.)

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Black-Stained				Odor: None				
Well Volumes (gal.):	2	4	5.5	Final				
pH (s.u.):	9.42	9.39	9.37	9.24				
Sp. Cond. (µmhos/cm):	621	735	682	693				
Temperature (°C):	17	17	17	17				
Turbidity (N.T.U):	Silty	Silty	Silty	Silty				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments: Color does not filter out

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/18/00 Weather: P-Cloudy

Sample ID: MW-36
Replicate ID: ~
Time Sampling Began: 1:35
Time Sampling Completed: 1:41

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 52.08
Depth to Water Below MP (DTW): 38.72
Water Column (WC) in Well [TD-DTW]: 13.36
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 2.14 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged: 6.41
(3 WCVs, 5 WCVs, etc.)

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown - Stained Odor: None

Well Volumes (gal.):	2	4	7	Final				
pH (s.u.):	10.40	10.42	10.44	10.42				
Sp. Cond. (µmhos/cm):	1202	1221	1227	1272				
Temperature (°C):	16	16	16	16				
Turbidity (N.T.U):	Stained	Stained	Stained	Stained				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments: Color does not filter out

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/18/00 Weather: P-Cloudy 70's

Sample ID: MW-37
Replicate ID: ~
Time Sampling Began: 2:10
Time Sampling Completed: 2:15

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 36.98
Depth to Water Below MP (DTW): 20.20
Water Column (WC) in Well [TD-DTW]: 16.78
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 2.68 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged: 8.05
(3 WCVs, 5 WCVs, etc.)

GALLONS PER FOOT (gpf)			
1½" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown				Odor: None				
Well Volumes (gal.):	3	6	8.5	Final				
pH (s.u.):	9.03	8.71	8.64	8.89				
Sp. Cond. (µmhos/cm):	838	740	723	765				
Temperature (°C):	15	15	15	15				
Turbidity (N.T.U):	Silty	Silty	Silty	Silty				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments: Color does not filter out

HM07-07WS-LOG.WK3

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/17/00 Weather: Sunny 75°

Sample ID: MW-39s
Replicate ID: ~
Time Sampling Began: 1:30
Time Sampling Completed: 1:50

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 60.23
Depth to Water Below MP (DTW): 42.23
Water Column (WC) in Well [TD-DTW]: 18.00
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 2.88

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 8.64
= Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)			
1½" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: TAN				Odor: None				
Well Volumes (gal.):	3	6	9	FINAL				
pH (s.u.):	9.22	9.22	9.21	9.19				
Sp. Cond. (µmhos/cm):	4180	4,050	3,920	3,870				
Temperature (°C):	15	15	15	15				
Turbidity (N.T.U):				CLOUDY				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments:

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/17/00 Weather: Sunny 70

Sample ID: MW-39D
Replicate ID: ~
Time Sampling Began: 1:00
Time Sampling Completed: 1:30

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 80.21
Depth to Water Below MP (DTW): 41.88
Water Column (WC) in Well [TD-DTW]: 38.33
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 6.13 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged: 18.4
(3 WCVs, 5 WCVs, etc.)

GALLONS PER FOOT (gpf)			
1½" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1¼" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: LT. TAN				Odor: NONE				
Well Volumes (gal.):	6	12	18.5	FINAL				
pH (s.u.):	7.57	7.59	7.56	7.60				
Sp. Cond. (µmhos/cm):	503	496	493	503				
Temperature (°C):	15	15	15	15				
Turbidity (N.T.U):				SL. CLOUDY				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments:

HM07-07WB-LOG.WK3

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/17/00 Weather: Sunny 65°

Sample ID: MW-40s
Replicate ID: ~
Time Sampling Began: 10:45
Time Sampling Completed: 11:15

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 70.40
Depth to Water Below MP (DTW): 53.88
Water Column (WC) in Well [TD-DTW]: 16.52
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 2.64

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 7.93
= Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: SL. TAN				Odor: NONE				
Well Volumes (gal.):	2.5	5.0	8.0	FINAL				
pH (s.u.):	8.03	8.03	803	8.04				
Sp. Cond. (µmhos/cm):	860	850	890	900				
Temperature (°C):	14.5	14.5	14.5	14.5				
Turbidity (N.T.U):	TAN TINT	TAN TINT	CLOUDY	CLOUDY				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments:

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/17/00 Weather: Sunny 65°

Sample ID: MW-40D
Replicate ID: ~
Time Sampling Began: 10:00
Time Sampling Completed: 10:40

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 90.40
Depth to Water Below MP (DTW): 53.73
Water Column (WC) in Well [TD-DTW]: 36.67
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 5.87 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged: 17.6
(3 WCVs, 5 WCVs, etc.)

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: CLEAR				Odor: NONE				
Well Volumes (gal.):	6	12	18	FINAL				
pH (s.u.):	7.80	7.81	7.85	7.84				
Sp. Cond. (µmhos/cm):	830	809	807	810				
Temperature (°C):	14	14	14	14				
Turbidity (N.T.U):	CLEAR	CLEAR	CLEAR	CLEAR				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller

Comments:

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/18/00 Weather: Partly Cloudy 60's

Sample ID: MW-41
Replicate ID: ~
Time Sampling Began: 8:35
Time Sampling Completed: 8:41

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 62.26
Depth to Water Below MP (DTW): 13.36
Water Column (WC) in Well [TD-DTW]: 48.90
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 7.82 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 23.47

GALLONS PER FOOT (gpf)			
1½" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: light tan - clear
Odor: None

Well Volumes (gal.):	8	16	24	Final				
pH (s.u.):	6.85	6.87	6.90	6.96				
Sp. Cond. (µmhos/cm):	404	414	423	424				
Temperature (°C):	14	14	14	14				
Turbidity (N.T.U):	slight cloudiness	slight cloudiness	slight cloudiness	slight cloudiness				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments: Color filters out

HMI-GWS-LOG.WK3

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/17/00 Weather: Sunny 75°

Sample ID: MW-42S
Replicate ID: ~
Time Sampling Began: 2:30
Time Sampling Completed: 2:45

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 52.30
Depth to Water Below MP (DTW): 41.43
Water Column (WC) in Well [TD-DTW]: 10.87
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 1.74 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 5.22

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: TAN / TINT				Odor: None				
Well Volumes (gal.):	2	4	6	FINAL				
pH (s.u.):	8.16	8.17	8.17	8.18				
Sp. Cond. (µmhos/cm):	1364	1475	1493	1530				
Temperature (°C):	15	15	15	15				
Turbidity (N.T.U):				CLOUDY				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description From Lab X or HMI ___	Preservative preserved by: Lab X or HMI ___
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller

Comments:

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet
Project Number: HM00311
Site Location: Hannibal, Ohio
Sampling Date: 5/17/00 Weather: Sunny 75°

Sample ID: MW-42D
Replicate ID: ~
Time Sampling Began: 2:00
Time Sampling Completed: 2:35

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 85.10
Depth to Water Below MP (DTW): 41.30
Water Column (WC) in Well [TD-DTW]: 43.80
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 7.1

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 21.02
= Well Casing Volume (WCV)

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with polypropylene rope

SAMPLING DATA AND FIELD PARAMETERS

Color: CLEAR				Odor: None				
Well Volumes (gal.):	7	14	21	FINAL				
pH (s.u.):	7.60	7.58	758	7.74				
Sp. Cond. (µmhos/cm):	515	498	494	490				
Temperature (°C):	15	15	15	15				
Turbidity (N.T.U):				Clear				

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 mL plastic	HNO_3 - field filtered (1 micron)
Cn total + Cn amenable	250 mL plastic	NAOH
pH, sp. Cond, F	250 mL plastic	4° C

Sampling Personnel: S. Menosky, J. Keller
Comments:

HM87-GWS-LOG.XLS

APPENDIX A-3

WATER SAMPLING LOG FORMS FOR OCTOBER 2000
MONITORING EVENT

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM00311
Site Location: Hannibal Ohio
Sampling Date: 10-10-00 Weather: Sunny 50's

Sample ID: MW-2
Replicate ID: ~
Time Sampling Began: 1250
Time Sampling Completed: 1255

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 82.25
Depth to Water Below MP (DTW): 57.49
Water Column (WC) in Well [TD-DTW]: 24.76
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.9616 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 11.88

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Dark brown Odor: None Turbidity: Turbid, silty

Well Volumes (gal.):	4	8	12	Final				
pH (s.u.):	9.92	9.95	9.95	9.95				
Sp. Cond. (µmhos/cm):	1493	1502	1510	1518				
Temperature (°C):	14°c	14°c	14°c	14°				
Turbidity (N.T.U):	Turbid	Turbid	Turbid	Turbid				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss. As, Be, Mn, Na, V	500 ml Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 ml Glass	NAOH
pH, Sp Cond, F	250 ml Plastic	4°c
PCE	2 x 40 ml glass	HCL

Sampling Personnel: S. Menosky / J. Keller
Comments: Color does not filter out

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM00311
Site Location: Hannibal Ohio
Sampling Date: 10-10-00 Weather: Sunny 50's

Sample ID: MW-5
Replicate ID: MW-5d
Time Sampling Began: 1210
Time Sampling Completed: 1215

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 92.00
Depth to Water Below MP (DTW): 64.73
Water Column (WC) in Well [TD-DTW]: 27.27
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 4.3632 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 13.09

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Gold tint, stained Odor: None Turbidity:

Well Volumes (gal.):	4	8	13	Final				
pH (s.u.):	8.55	8.55	8.56	8.59				
Sp. Cond. (µmhos/cm):	861	848	840	817				
Temperature (°C):	15°c	14°c	14°c	14°c				
Turbidity (N.T.U):	clear	clear	clear	clear				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, Y	500 ml Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 ml Glass	NAOH
pH, Sp Cond, F	250 ml Plastic	4°c
PCE	2 x 40 ml glass	HCL

Sampling Personnel: S. Merosky / J. Keller

Comments:

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM00311
Site Location: Hannibal Ohio
Sampling Date: 10-10-00 Weather: Sunny 50's

Sample ID: MW-12
Replicate ID: ~
Time Sampling Began: 1445
Time Sampling Completed: 1450

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 68.42
Depth to Water Below MP (DTW): 22.78
Water Column (WC) in Well [TD-DTW]: 45.64
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 7.3024 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 21.91

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: clear Odor: None Turbidity: clear

Well Volumes (gal.):	7	14	22	Final				
pH (s.u.):	7.37	7.31	7.33	7.33				
Sp. Cond. (µmhos/cm):	428	427	4.28	429				
Temperature (°C):	16°	16°	16°	16°C				
Turbidity (N.T.U):	clear	clear	clear	clear				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 ml Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 ml Glass	NAOH
pH, Sp Cond, F	250 ml Plastic	4° C

Sampling Personnel: S. Menosky / J. Keller
Comments:

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM00311
Site Location: Hannibal Ohio
Sampling Date: 10-10-00 Weather: Sunny 50's

Sample ID: MW-16
Replicate ID: MW-16d
Time Sampling Began: 1755
Time Sampling Completed: 1800

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 83.12
Depth to Water Below MP (DTW): 48.45
Water Column (WC) in Well [TD-DTW]: 34.67
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 5.5472 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 16.64

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.28	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: clear, brown tint Odor: None Turbidity:

Well Volumes (gal.):	6	12	17	Final				
pH (s.u.):	7.84	7.66	7.63	7.67				
Sp. Cond. (µmhos/cm):	788	782	774	774				
Temperature (°C):	14°c	14°c	14°c	14°c				
Turbidity (N.T.U):	clear	clear	clear	clear				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 ml Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 ml Glass	NAOH
pH, Sp Cond, F	250 ml Plastic	4° C

Sampling Personnel: S. Menosky / J. Keller
Comments: Color does not filter out

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM00311
Site Location: Hannibal Ohio
Sampling Date: 10-10-00 Weather: Sunny 50's

Sample ID: MW-18
Replicate ID: ~
Time Sampling Began: 1315
Time Sampling Completed: 1325

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 61.16
Depth to Water Below MP (DTW): 39.61
Water Column (WC) in Well [TD-DTW]: 21.55
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.448 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 10.34

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown, Silty Odor: No odor Turbidity:

Well Volumes (gal.):	3.5	7.0	10.5	Final				
pH (s.u.):	9.66	9.58	9.62	9.67				
Sp. Cond. (µmhos/cm):	1988	2,25n	1931	1948				
Temperature (°C):	14°C	14°c	14°	14°c				
Turbidity (N.T.U):	Silty	Silty	Silty	Silty				

8.0 gal bailed dry

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss. As, Be, Mo, Na, V	500 ml Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 ml Glass	NAOH
pH, Sp Cond, F	250 ml Plastic	4°c
PCE	2 x 40 ml glass	HCL

Sampling Personnel: S. Menosky / J. Keller

Comments: Bailed dry at 8.0 gallons. Let well recover for 5 min took sample

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM00311
Site Location: Hannibal Ohio
Sampling Date: 10-10-00 Weather: Sunny 50's

Sample ID: MW-28
Replicate ID: ~
Time Sampling Began: 1525
Time Sampling Completed: 1529

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 46.20
Depth to Water Below MP (DTW): 20.67
Water Column (WC) in Well [TD-DTW]: 25.53
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 4.0848 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 12.25

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.28	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Yellow-brown Odor: None Turbidity:

Well Volumes (gal.):	4	8	12.5	Final				
pH (s.u.):	5.62	5.44	5.52	5.47				
Sp. Cond. (µmhos/cm):	380	349	401	384				
Temperature (°C):	15°c	15°	15°	15°				
Turbidity (N.T.U):	Trans	Trans	Trans	Trans				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 ml Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 ml Glass	NAOH
pH, Sp Cond, F	250 ml Plastic	4° C

Sampling Personnel: S. Menosky / J. Keller
Comments:

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM00311
Site Location: Hannibal Ohio
Sampling Date: 10-10-00 Weather: Sunny 50's

Sample ID: MW-31
Replicate ID: ~
Time Sampling Began: 1350
Time Sampling Completed: 1357

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 67.58
Depth to Water Below MP (DTW): 46.36
Water Column (WC) in Well [TD-DTW]: 21.22
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 3.3952 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged: 10.19
(3 WCVs, 5 WCVs, etc.)

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Dark brown/black Odor: None Turbidity:

Well Volumes (gal.):	3.5	7.0	10.0	Final				
pH (s.u.):	10.04	10.14	10.12	10.18				
Sp. Cond. (µmhos/cm):	2,370	2,550	2,460	2,550				
Temperature (°C):	14°c	14°	14°c	14°c				
Turbidity (N.T.U):	Turbid	Turbid	Turbid	Turbid				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss. As, Be, Mn, Na, V	500 ml Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 ml Glass	NAOH
pH, Sp Cond, F	250 ml Plastic	4°c
PCE	2 x 40 ml glass	HCL

Sampling Personnel: S. Menosky / J. Keller

Comments:

HM07-07\WS-LOG.WK3

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM00311
Site Location: Hannibal Ohio
Sampling Date: 10-10-00 Weather: Sunny 50's

Sample ID: MW-32
Replicate ID: ~
Time Sampling Began: 1715
Time Sampling Completed: 1720

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 57.36
Depth to Water Below MP (DTW): 38.95
Water Column (WC) in Well [TD-DTW]: 18.41
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 2.9456 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged: 8.84
(3 WCVs, 5 WCVs, etc.)

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown/Black Stained Odor: None Turbidity:

Well Volumes (gal.):	3	6	9	Final				
pH (s.u.):	9.91	9.96	9.95	9.98				
Sp. Cond. (µmhos/cm):	1245	1271	1224	1227				
Temperature (°C):	15°c	14°c	15°c	15°				
Turbidity (N.T.U):	Stained	Stained	Stained	Stained				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 ml Plastic	HNO_3- field filtered (1 micron)
Total + Amenable Cn	250 ml Glass	NAOH
pH, Sp Cond, F	250 ml Plastic	4° C

Sampling Personnel: S. Menosky / J. Keller
Comments: Color does not filter out

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM00311
Site Location: Hannibal Ohio
Sampling Date: 10-10-00 Weather: Sunny 50's

Sample ID: MW-35
Replicate ID: ~
Time Sampling Began: 1545
Time Sampling Completed: 1550

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 46.94
Depth to Water Below MP (DTW): 35.98
Water Column (WC) in Well [TD-DTW]: 10.96
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 1.7536 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged: 5.26
(3 WCVs, 5 WCVs, etc.)

GALLONS PER FOOT (gpf)			
1¼" = 0.08	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown, Black Stained Odor: Earthy Turbidity:

Well Volumes (gal.):	2	3.0	5.5	Final				
pH (s.u.):	9.50	8.79		8.84				
Sp. Cond. (µmhos/cm):	551	379		470				
Temperature (°C):	15°C	15°		15°C				
Turbidity (N.T.U):	Turbid	Turbid		Turbid				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 ml Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 ml Glass	NAOH
pH, Sp Cond, F	250 ml Plastic	4° C

Sampling Personnel: S. Menosky / J. Keller

Comments: Bailed dry at 3.0 gallons, let recover for 5 min then sampled
Color does not filter out

HMI Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM00311
Site Location: Hannibal Ohio
Sampling Date: 10-10-00 Weather: Sunny 50's

Sample ID: MW-36
Replicate ID: ~
Time Sampling Began: 1645
Time Sampling Completed: 1647

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 52.08
Depth to Water Below MP (DTW): 37.38
Water Column (WC) in Well [TD-DTW]: 14.70
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 2.352 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 7.06

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.26	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown silty stained Odor: None Turbidity: —

Well Volumes (gal.):	2	4	7	Final				
pH (s.u.):	10.05	10.05	10.05					
Sp. Cond. (µmhos/cm):	1021	1034	1043					
Temperature (°C):	16°c	16°c	16°c					
Turbidity (N.T.U):	Silty	Silty	Silty					

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 ml Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 ml Glass	NAOH
pH, Sp Cond, F	250 ml Plastic	4° c

Sampling Personnel: S. Menosky / J. Keller
Comments: Color does not filter out

HMI
Environmental Consulting Services

WATER SAMPLING LOG

Project Name: Ormet - Reduction Mill
Project Number: HM00311
Site Location: Hannibal Ohio
Sampling Date: 10-10-00 Weather: Sunny 50's

Sample ID: MW-37
Replicate ID: ~
Time Sampling Began: 1608
Time Sampling Completed: 1611

EVACUATION DATA

Description of Measuring Point (MP): Top of PVC
MP Elevation:
Total Sounded Depth of Well Below MP (TD): 36.90
Depth to Water Below MP (DTW): 20.02
Water Column (WC) in Well [TD-DTW]: 16.88
Gallons per foot (GPF); from chart: 0.16
Gallons in Well [WC x GPF]: 2.7008 = Well Casing Volume (WCV)

Diameter of Well Casing: 2"
Gallons to be Purged (3 WCVs, 5 WCVs, etc.): 8.10

GALLONS PER FOOT (gpf)			
1¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1½" = 0.09	2½" = 0.28	3½" = 0.50	6" = 1.47

Evacuation Method and Material: Disposable bailer with poly rope

SAMPLING DATA AND FIELD PARAMETERS

Color: Brown Silty, turbid Odor: None Turbidity:

Well Volumes (gal.):	3	6	8.5	Final				
pH (s.u.):	8.56	8.48	8.46	8.46				
Sp. Cond. (µmhos/cm):	635	632	630	630				
Temperature (°C):	16°	16°	16°	16°				
Turbidity (N.T.U):	Silty	Silty	Silty	Silty				

Sampling Method and Material(s): Disposable bailer with poly rope

Parameters to be Analyzed	Container Description (From Lab X or HMI ___)	Preservative (preserved by: Lab X or HMI ___)
Diss As, Be, Mn, Na, V	500 ml Plastic	HNO_3 - field filtered (1 micron)
Total + Amenable Cn	250 ml Glass	NAOH
pH, Sp Cond, F	250 ml Plastic	4° C

Sampling Personnel: S Menosky / J. Keller
Comments:

HM07-07WS-LOG.WK3

APPENDIX B

LABORATORY ANALYTICAL REPORTS

Appendix B-1 Laboratory Analytical Report for January 2000 Monitoring Event

Appendix B-2 Laboratory Analytical Report for May 2000 Monitoring Event

Appendix B-3 Laboratory Analytical Report for October 2000 Monitoring Event

APPENDIX B-1

LABORATORY ANALYTICAL REPORT FOR JANUARY 2000 MONITORING EVENT

KEMRON Environmental Services
109 Starlite Park
Marietta, Ohio 45750
Phone: (740) 373-4071

Ormet Corporation
Hydrosystems Management Inc.
331 S. Main Street, Suite 109
Washington, PA 15301
Attention: Bob Fargo

PO Number:
Account Number: ORMET-086

Login #: L0001149
Report Date: 01/19/00
Work ID: HM003.11/REDUCTION MILL
Date Received: 01/11/00

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
L0001149-01	MW-2	L0001149-02	MW-5
L0001149-03	MW-5D	L0001149-04	MW-18
L0001149-05	MW-31	L0001149-06	FIELD BLANK
L0001149-07	MW-12	L0001149-08	MW-16
L0001149-09	MW-16D	L0001149-10	MW-28
L0001149-11	MW-32	L0001149-12	MW-35
L0001149-13	MW-36	L0001149-14	MW-37
L0001149-15	TRIP BLANK		

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

Dennis S. Tepe

Certified By
Dennis S. Tepe

KEMRON ENVIRONMENTAL SERVICES

Login #L0001149
January 19, 2000 04:49 pm

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0001149-01
Client Sample ID: MW-2
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	23		1.0	100	N/A	JWR	01/13/00	09:20	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	2.4		1.0	100	N/A	DLN	01/18/00	08:00	335.1
Specific Conductance.....	umhos/cm	2000		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L	66		1.0	10	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	9.88			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L	0.086		0.004	1	N/A	SLP	01/13/00	18:30	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	18:30	6010B
Manganese, Dissolved.....	mg/L	0.99		0.01	1	N/A	SLP	01/13/00	18:30	6010B/3005A
Sodium, Dissolved.....	mg/L	360		5.0	10	N/A	SLP	01/13/00	18:30	6010B/3005A
Vanadium, Dissolved.....	mg/L	0.041		0.01	1	N/A	SLP	01/13/00	18:30	6010B\3005

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0001149-01
Client Sample ID: MW-2
Site/Work ID: HM003.11/REDUCTION MILL
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 01/11/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 01/13/00 Time: 17:17

Instrument: HPMS9
Analyst: JLH
Lab File ID: 9M6731

Method: 8260B
Run ID: R81181
Batch : WG70800

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	95.7	(86 - 118%)
1,2-Dichloroethane-d4.....	88.6	(80 - 120%)
Toluene-d8.....	94.9	(88 - 110%)
4-Bromofluorobenzene.....	98.8	(86 - 115%)

RL = Reporting Limit

Login #L0001149
January 19, 2000 04:49 pm

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0001149-02
Client Sample ID: MW-5
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	2.0		0.10	10	N/A	JWR	01/13/00	09:20	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	2.0		0.01	1	N/A	DLN	01/18/00	08:00	335.1
Specific Conductance.....	umhos/cm	1200		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L	15		0.20	2	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	8.76			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L	0.0063		0.004	1	N/A	SLP	01/13/00	18:34	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	18:34	6010B
Manganese, Dissolved.....	mg/L	0.24		0.01	1	N/A	SLP	01/13/00	18:34	6010B/3005A
Sodium, Dissolved.....	mg/L	180		5.0	10	N/A	SLP	01/13/00	18:34	6010B/3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	01/13/00	18:34	6010B\3005

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0001149-02
Client Sample ID: MW-5
Site/Work ID: HM003.11/REDUCTION MILL
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 01/11/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 01/13/00 Time: 17:47

Instrument: HPMS9
Analyst: JLH
Lab File ID: 9M6732

Method: 8260B
Run ID: R81181
Batch : WG70800

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	96.8	(86 - 118%)
1,2-Dichloroethane-d4.....	90.8	(80 - 120%)
Toluene-d8.....	95.3	(88 - 110%)
4-Bromofluorobenzene.....	98.3	(86 - 115%)

RL = Reporting Limit

Login #L0001149
January 19, 2000 04:49 pm

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0001149-03
Client Sample ID: MW-5D
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	1.9		0.10	10	N/A	JWR	01/13/00	09:20	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	1.9		0.01	1	N/A	DLN	01/18/00	08:00	335.1
Specific Conductance.....	umhos/cm	1100		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L	16		0.20	2	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	8.77			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L	0.006		0.004	1	N/A	SLP	01/13/00	18:56	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	18:56	6010B
Manganese, Dissolved.....	mg/L	0.23		0.01	1	N/A	SLP	01/13/00	18:56	6010B/3005A
Sodium, Dissolved.....	mg/L	180		5.0	10	N/A	SLP	01/13/00	18:56	6010B/3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	01/13/00	18:56	6010B\3005

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0001149-03
Client Sample ID: MW-5D
Site/Work ID: HM003.11/REDUCTION MILL
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 01/11/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 01/13/00 Time: 18:17

Instrument: HPMS9
Analyst: JLH
Lab File ID: 9M6733

Method: 8260B
Run ID: R81181
Batch : WG70800

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	97.1	(86 - 118%)
1,2-Dichloroethane-d4.....	92.3	(80 - 120%)
Toluene-d8.....	95.3	(88 - 110%)
4-Bromofluorobenzene.....	99.1	(86 - 115%)

RL = Reporting Limit

Login #L0001149
January 19, 2000 04:49 pm

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0001149-04
Client Sample ID: MW-18
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	27		1.0	100	N/A	JWR	01/13/00	09:20	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	19		1.0	100	N/A	DLN	01/18/00	08:00	335.1
Specific Conductance.....	umhos/cm	3000		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L	180		2.5	25	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	9.56			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L	0.078		0.004	1	N/A	SLP	01/13/00	19:00	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	19:00	6010B
Manganese, Dissolved.....	mg/L	0.26		0.01	1	N/A	SLP	01/13/00	19:00	6010B/3005A
Sodium, Dissolved.....	mg/L	680		5.0	10	N/A	SLP	01/13/00	19:00	6010B/3005A
Vanadium, Dissolved.....	mg/L	0.017		0.01	1	N/A	SLP	01/13/00	19:00	6010B\3005

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0001149-04
Client Sample ID: MW-18
Site/Work ID: HM003.11/REDUCTION MILL
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 01/11/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 01/13/00 Time: 18:48

Instrument: HPMS9
Analyst: JLH
Lab File ID: 9M6734

Method: 8260B
Run ID: R81181
Batch : WG70800

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	20		5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	97.7	(86 - 118%)
1,2-Dichloroethane-d4.....	93.8	(80 - 120%)
Toluene-d8.....	95.1	(88 - 110%)
4-Bromofluorobenzene.....	100	(86 - 115%)

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0001149-05
Client Sample ID: MW-31
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	24		1.0	100	N/A	JWR	01/13/00	09:20	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	6.3		1.0	100	N/A	DLN	01/18/00	08:00	335.1
Specific Conductance.....	umhos/cm	2900		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L	150		2.5	25	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	9.98			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L	0.072		0.004	1	N/A	SLP	01/13/00	19:04	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	19:04	6010B
Manganese, Dissolved.....	mg/L	1.4		0.01	1	N/A	SLP	01/13/00	19:04	6010B/3005A
Sodium, Dissolved.....	mg/L	650		5.0	10	N/A	SLP	01/13/00	19:04	6010B/3005A
Vanadium, Dissolved.....	mg/L	0.12		0.01	1	N/A	SLP	01/13/00	19:04	6010B\3005

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0001149-05
Client Sample ID: MW-31
Site/Work ID: HM003.11/REDUCTION MILL
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 01/11/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 01/13/00 Time: 19:17

Instrument: HPMS9
Analyst: JLH
Lab File ID: 9M6735

Method: 8260B
Run ID: R81181
Batch : WG70800

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	28		5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	97.3	(86 - 118%)
1,2-Dichloroethane-d4.....	92.7	(80 - 120%)
Toluene-d8.....	95.0	(88 - 110%)
4-Bromofluorobenzene.....	103	(86 - 115%)

RL = Reporting Limit

Login #L0001149
January 19, 2000 04:49 pm

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0001149-06
Client Sample ID: FIELD BLANK
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L		ND	0.01	1	N/A	JWR	01/13/00	09:20	9010B\9014
Specific Conductance.....	umhos/cm	1.0		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L		ND	0.10	1	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	5.34			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	SLP	01/13/00	19:09	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	19:09	6010B
Manganese, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	01/13/00	19:09	6010B/3005A
Sodium, Dissolved.....	mg/L		ND	0.50	1	N/A	SLP	01/13/00	19:09	6010B/3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	01/13/00	19:09	6010B\3005

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0001149-06
Client Sample ID: FIELD BLANK
Site/Work ID: HM003.11/REDUCTION MILL
Matrix: Water

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 01/13/00 Time: 16:47

Dil. Type: N/A
COC Info: N/A
Date Collected: 01/11/00

Instrument: HPMS9
Analyst: JLH
Lab File ID: 9M6730

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

Method: 8260B
Run ID: R81181
Batch : WG70800

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	94.2	(86 - 118%)
1,2-Dichloroethane-d4.....	89.0	(80 - 120%)
Toluene-d8.....	93.8	(88 - 110%)
4-Bromofluorobenzene.....	97.6	(86 - 115%)

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0001149-07
Client Sample ID: MW-12
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L		ND	0.01	1	N/A	JWR	01/13/00	09:20	9010B\9014
Specific Conductance.....	umhos/cm	570		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L	0.74		0.10	1	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	7.44			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	SLP	01/13/00	19:13	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	19:13	6010B
Manganese, Dissolved.....	mg/L	1.8		0.01	1	N/A	SLP	01/13/00	19:13	6010B/3005A
Sodium, Dissolved.....	mg/L	22		0.50	1	N/A	SLP	01/13/00	19:13	6010B/3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	01/13/00	19:13	6010B\3005

Lab Sample ID: L0001149-08
Client Sample ID: MW-16
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	5.5		0.25	25	N/A	JWR	01/13/00	09:20	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	5.5		0.01	1	N/A	DLN	01/18/00	08:00	335.1
Specific Conductance.....	umhos/cm	950		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L	7.6		0.20	2	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	7.76			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	SLP	01/13/00	18:09	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	18:09	6010B
Manganese, Dissolved.....	mg/L	2.2		0.01	1	N/A	SLP	01/13/00	18:09	6010B/3005A
Sodium, Dissolved.....	mg/L	68		5.0	10	N/A	SLP	01/13/00	18:09	6010B/3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	01/13/00	18:09	6010B\3005

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0001149-09
Client Sample ID: MW-16D
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	5.8		0.25	25	N/A	JWR	01/13/00	09:20	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	5.8		0.01	1	N/A	DLN	01/18/00	08:00	335.1
Specific Conductance.....	umhos/cm	940		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L	7.8		0.20	2	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	7.77			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	SLP	01/13/00	19:17	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	19:17	6010B
Manganese, Dissolved.....	mg/L	2.2		0.01	1	N/A	SLP	01/13/00	19:17	6010B/3005A
Sodium, Dissolved.....	mg/L	70		5.0	10	N/A	SLP	01/13/00	19:17	6010B/3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	01/13/00	19:17	6010B\3005

Lab Sample ID: L0001149-10
Client Sample ID: MW-28
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.23		0.01	1	N/A	JWR	01/13/00	09:20	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.22		0.01	1	N/A	DLN	01/18/00	08:00	335.1
Specific Conductance.....	umhos/cm	460		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L	0.35		0.10	1	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	6.04			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	SLP	01/13/00	18:18	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	18:18	6010B
Manganese, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	01/13/00	18:18	6010B/3005A
Sodium, Dissolved.....	mg/L	58		0.50	1	N/A	SLP	01/13/00	18:18	6010B/3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	01/13/00	18:18	6010B\3005

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0001149-11
Client Sample ID: MW-32
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	4.8		0.25	25	N/A	JWR	01/13/00	09:20	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.57		0.25	25	N/A	DLN	01/18/00	08:00	335.1
Specific Conductance.....	umhos/cm	950		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L	27		0.50	5	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	8.93			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L	0.017		0.004	1	N/A	SLP	01/13/00	19:22	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	19:22	6010B
Manganese, Dissolved.....	mg/L	1.9		0.01	1	N/A	SLP	01/13/00	19:22	6010B/3005A
Sodium, Dissolved.....	mg/L	97		5.0	10	N/A	SLP	01/13/00	19:22	6010B/3005A
Vanadium, Dissolved.....	mg/L	0.024		0.01	1	N/A	SLP	01/13/00	19:22	6010B\3005

Lab Sample ID: L0001149-12
Client Sample ID: MW-35
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	13		0.50	50	N/A	JWR	01/13/00	09:20	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	3.3		0.50	50	N/A	DLN	01/18/00	08:00	335.1
Specific Conductance.....	umhos/cm	610		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L	21		1.0	10	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	8.91			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L	0.0077		0.004	1	N/A	SLP	01/13/00	19:26	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	19:26	6010B
Manganese, Dissolved.....	mg/L	0.47		0.01	1	N/A	SLP	01/13/00	19:26	6010B/3005A
Sodium, Dissolved.....	mg/L	94		0.50	1	N/A	SLP	01/13/00	19:26	6010B/3005A
Vanadium, Dissolved.....	mg/L	0.068		0.01	1	N/A	SLP	01/13/00	19:26	6010B\3005

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0001149-13
Client Sample ID: MW-36
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	3.9		0.20	20	N/A	JWR	01/13/00	09:20	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.51		0.10	10	N/A	DLN	01/18/00	08:00	335.1
Specific Conductance.....	umhos/cm	1600		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L	80		2.5	25	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	10.2			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L	0.072		0.004	1	N/A	SLP	01/13/00	19:31	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	19:31	6010B
Manganese, Dissolved.....	mg/L	0.70		0.01	1	N/A	SLP	01/13/00	19:31	6010B/3005A
Sodium, Dissolved.....	mg/L	290		5.0	10	N/A	SLP	01/13/00	19:31	6010B/3005A
Vanadium, Dissolved.....	mg/L	0.082		0.01	1	N/A	SLP	01/13/00	19:31	6010B\3005

Lab Sample ID: L0001149-14
Client Sample ID: MW-37
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	10		0.40	40	N/A	JWR	01/13/00	09:20	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	2.2		0.25	25	N/A	DLN	01/18/00	08:00	335.1
Specific Conductance.....	umhos/cm	880		1.0	1	N/A	DLN	01/12/00	15:30	120.1
Fluoride.....	mg/L	32		1.0	10	N/A	DLN	01/13/00	16:15	SM4500-F-C
pH	UNITS	8.83			1	N/A	DLP	01/12/00	16:45	150.1
Arsenic, Dissolved.....	mg/L	0.011		0.004	1	N/A	SLP	01/13/00	19:44	6010B\3005
Beryllium, Dissolved.....	mg/L		ND	0.005	1	N/A	SLP	01/13/00	19:44	6010B
Manganese, Dissolved.....	mg/L	0.49		0.01	1	N/A	SLP	01/13/00	19:44	6010B/3005A
Sodium, Dissolved.....	mg/L	110		5.0	10	N/A	SLP	01/13/00	19:44	6010B/3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	01/13/00	19:44	6010B\3005

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0001149-15
Client Sample ID: TRIP BLANK
Site/Work ID: HM003.11/REDUCTION MILL
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 01/11/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 01/13/00 Time: 16:17

Instrument: HPMS9
Analyst: JLH
Lab File ID: 9M6729

Method: 8260B
Run ID: R81181
Batch : WG70800

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	95.0	(86 - 118%)
1,2-Dichloroethane-d4.....	86.9	(80 - 120%)
Toluene-d8.....	92.7	(88 - 110%)
4-Bromofluorobenzene.....	97.7	(86 - 115%)

RL = Reporting Limit

Reduction Mill

HMI Environmental Consulting Services

CHAIN-OF-CUSTODY RECORD

Project Number: HM003.11

Project Name/Location: Ormet - Reduction Mill

Laboratory: Kemron

Sampling Personnel: J Campbell, S Menosky

Sample ID	Date/Time	Sample Code	40 mL Glass Tetrachloroethene (HCL)	500 mL Plastic Diss As, Br, Mn, Mo, V HNO3 - field filtered	250 mL Glass Total + Amenable Cyanide (NaOH)	250 mL Plastic pH, Sp Cond, F						TOTAL
MW-2	1/11/00 0900	L	2	1	1	1						5
MW-5	0815		2	1	1	1						5
MW-5d	0755		2	1	1	1						5
MW-18	1020		2	1	1	1						5
MW-31	1140		2	1	1	1						5
Field Blank	0930		2	1	1	1						5
MW-12	1530			1	1	1						3
MW-16	1000			1	1	1						3
MW-16d	0940			1	1	1						3
MW-28	1100			1	1	1						3
MW-32	1440			1	1	1						3
MW-35	1325			1	1	1						3
MW-36	1415			1	1	1						3
MW-37	1350			1	1	1						3
Trip Blank			2									2

on bottle

Sample Code: L = Liquid; S = Solid; A = Air

Total Number of Containers: 56

Relinquished by: [signature]	Organization: HMI	Date: 1-11-00	Time: 1615	Seal Intact?			
Received by: Jack [signature]	Organization: KEMRON	Date: 1-11-00	Time: 1615	Yes	No	NA
Relinquished by: Jack [signature]	Organization: KEMRON	Date: 1-11-00	Time: 1745	Seal Intact?			
Received by: Stacy Baldwin	Organization: Kemron	Date: 1/12/00	Time: 0800	Yes	No	NA

REMARKS: Only analyze for Amenable Cyanide if Total Cyanide detected
C/C sealed Cooler-temps 5, 4
SXS intact SXS stored in locked walkin over ~~weekend~~ night 1/11/00 TLB

DELIVERY METHOD: In Person [ ] Common Carrier [ ] Lab Courier [Kemron] Other [ ]

KEMRON Environmental Services
109 Starlite Park
Marietta, Ohio 45750
Phone: (740) 373-4071

Ormet Corporation
Hydrosystems Management Inc.
331 S. Main Street, Suite 109
Washington, PA 15301
Attention: Bob Fargo

PO Number:
Account Number: ORMET-086

Login #: L0001398
Report Date: 01/28/00
Work ID: HM003.11/REDUCTION MILL
Date Received: 01/11/00

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
L0001398-01	MW-2	L0001398-02	MW-5
L0001398-03	MW-18	L0001398-04	MW-31
L0001398-05	MW-12	L0001398-06	MW-16
L0001398-07	MW-28	L0001398-08	MW-32
L0001398-09	MW-35	L0001398-10	MW-36
L0001398-11	MW-37		

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

Certified By
Dennis S. Tepe

KEMRON
ENVIRONMENTAL SERVICES

Login #L0001398
January 28, 2000 12:40 pm

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0001398-01
Client Sample ID: MW-2
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Beryllium, Total.....	mg/L	0.0006		0.0005	1	N/A	KHR	01/26/00	14:16	6010B\3005A

Lab Sample ID: L0001398-02
Client Sample ID: MW-5
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Beryllium, Total.....	mg/L		ND	0.0005	1	N/A	KHR	01/26/00	14:29	6010B\3005A

Lab Sample ID: L0001398-03
Client Sample ID: MW-18
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Beryllium, Total.....	mg/L	0.00059		0.0005	1	N/A	KHR	01/26/00	14:33	6010B\3005A

Lab Sample ID: L0001398-04
Client Sample ID: MW-31
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Beryllium, Total.....	mg/L	0.001		0.0005	1	N/A	KHR	01/26/00	14:37	6010B\3005A

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0001398-05
Client Sample ID: MW-12
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Beryllium, Total.....	mg/L		ND	0.0005	1	N/A	KHR	01/26/00	13:46	6010B\3005A

Lab Sample ID: L0001398-06
Client Sample ID: MW-16
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Beryllium, Total.....	mg/L		ND	0.0005	1	N/A	KHR	01/26/00	13:55	6010B\3005A

Lab Sample ID: L0001398-07
Client Sample ID: MW-28
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Beryllium, Total.....	mg/L		ND	0.0005	1	N/A	KHR	01/26/00	14:03	6010B\3005A

Lab Sample ID: L0001398-08
Client Sample ID: MW-32
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Beryllium, Total.....	mg/L		ND	0.0005	1	N/A	KHR	01/26/00	14:42	6010B\3005A

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0001398-09
Client Sample ID: MW-35
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Beryllium, Total.....	mg/L		ND	0.0005	1	N/A	KHR	01/26/00	14:46	6010B\3005A

Lab Sample ID: L0001398-10
Client Sample ID: MW-36
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Beryllium, Total.....	mg/L		ND	0.0005	1	N/A	KHR	01/26/00	14:51	6010B\3005A

Lab Sample ID: L0001398-11
Client Sample ID: MW-37
Site/Work ID: HM003.11/REDUCTION MILL

Matrix: Water
Collected: 01/11/00 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Beryllium, Total.....	mg/L		ND	0.0005	1	N/A	KHR	01/26/00	14:55	6010B\3005A

RL = Reporting Limit

APPENDIX B-2

LABORATORY ANALYTICAL REPORT FOR MAY 2000 MONITORING EVENT

KEMRON Environmental Services
109 Starlite Park
Marietta, Ohio 45750
Phone: (740) 373-4071

Ormet Corporation
Hydrosystems Management Inc.
331 S. Main Street, Suite 109
Washington, PA 15301
Attention: Bob Fargo

PO Number:
Account Number: ORMET-086

Login #: L0005445
Report Date: 05/30/00
Work ID: HM00311/ORMET/HANNIBAL, OH
Date Received: 05/18/00

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
L0005445-01	MW-19	L0005445-02	MW-41
L0005445-03	MW-12	L0005445-04	MW-17
L0005445-05	MW-15	L0005445-06	MW-32
L0005445-07	MW-36	L0005445-08	MW-37
L0005445-09	MW-35		

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

Dennis S. Tepe

Certified By
Dennis S. Tepe

KEMRON
ENVIRONMENTAL SERVICES

KEMRON ENVIRONMENTAL SERVICES
REPORT NARRATIVE

CONVENTIONALS:

Cyanide

Cyanide, amenable to chlorination is analyzed by running two separate portions of the sample. One portion is run for total cyanide, the other is treated to release cyanide. The treated portion is then analyzed for total cyanide. Cyanide, amenable to chlorination is the difference between the two portions. The treated and untreated portions on several samples needed large dilutions. Statistically the high results are similar which indicate that very little of the sample is amenable to chlorination. Samples MW-15, MW-32, MW-36 had treated results slightly higher than the total results. These samples were diluted fifty, twenty-five, and ten-fold respectively. At these high dilutions, it is possible for the treated result to be higher. The results have been reported as ND (non-detect),

Login #L0005445
May 30, 2000 03:30 pm

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005445-01
Client Sample ID: MW-19
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L		ND	0.01	1	N/A	JWR	05/22/00	09:30	9010B\9014
Specific Conductance.....	umhos/cm	580		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	1.2		0.10	1	N/A	JCR	05/24/00	09:25	SM4500-F-C
pH	UNITS	7.33			1	N/A	JCR	05/19/00	14:55	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	SLP	05/26/00	18:35	3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	SLP	05/26/00	18:35	6010B
Manganese, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	05/26/00	18:35	3005A
Sodium, Dissolved.....	mg/L	16		0.50	1	N/A	SLP	05/26/00	18:35	3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	05/26/00	18:35	3005A

Lab Sample ID: L0005445-02
Client Sample ID: MW-41
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L		ND	0.01	1	N/A	JWR	05/22/00	09:30	9010B\9014
Specific Conductance.....	umhos/cm	430		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	0.25		0.10	1	N/A	JCR	05/24/00	09:25	SM4500-F-C
pH	UNITS	6.79			1	N/A	JCR	05/19/00	14:55	150.1
Arsenic, Dissolved.....	mg/L	0.016		0.004	1	N/A	SLP	05/26/00	18:27	3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	SLP	05/26/00	18:27	6010B
Manganese, Dissolved.....	mg/L	1.1		0.01	1	N/A	SLP	05/26/00	18:27	3005A
Sodium, Dissolved.....	mg/L	17		0.50	1	N/A	SLP	05/26/00	18:27	3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	05/26/00	18:27	3005A

RL = Reporting Limit

Login #L0005445
May 30, 2000 03:30 pm

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005445-03
Client Sample ID: MW-12
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L		ND	0.01	1	N/A	JWR	05/22/00	09:30	9010B\9014
Specific Conductance.....	umhos/cm	600		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	0.73		0.10	1	N/A	JCR	05/24/00	09:25	SM4500-F-C
pH	UNITS	7.53			1	N/A	JCR	05/19/00	14:55	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	SLP	05/26/00	19:29	3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	SLP	05/26/00	19:29	6010B
Manganese, Dissolved.....	mg/L	2.0		0.01	1	N/A	SLP	05/26/00	19:29	3005A
Sodium, Dissolved.....	mg/L	29		0.50	1	N/A	SLP	05/26/00	19:29	3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	05/26/00	19:29	3005A

Lab Sample ID: L0005445-04
Client Sample ID: MW-17
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.53		0.02	2	N/A	JWR	05/22/00	09:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.31		0.01	1	N/A	DLN	05/25/00	08:30	335.1
Specific Conductance.....	umhos/cm	610		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	2.9		0.10	1	N/A	JCR	05/24/00	09:25	SM4500-F-C
pH	UNITS	7.57			1	N/A	JCR	05/19/00	14:55	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	SLP	05/26/00	19:34	3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	SLP	05/26/00	19:34	6010B
Manganese, Dissolved.....	mg/L	1.8		0.01	1	N/A	SLP	05/26/00	19:34	3005A
Sodium, Dissolved.....	mg/L	24		0.50	1	N/A	SLP	05/26/00	19:34	3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	05/26/00	19:34	3005A

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005445-05
Client Sample ID: MW-15
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	12		0.50	50	N/A	DLN	05/24/00	13:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L		ND	0.01	1	N/A	DLN	05/25/00	08:30	335.1
Specific Conductance.....	umhos/cm	1200		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	25		0.50	5	N/A	JCR	05/24/00	09:25	SM4500-F-C
pH	UNITS	7.53			1	N/A	JCR	05/19/00	14:55	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	SLP	05/26/00	19:38	3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	SLP	05/26/00	19:38	6010B
Manganese, Dissolved.....	mg/L	0.17		0.01	1	N/A	SLP	05/26/00	19:38	3005A
Sodium, Dissolved.....	mg/L	120		50	100	N/A	SLP	05/26/00	19:38	3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	05/26/00	19:38	3005A

Lab Sample ID: L0005445-06
Client Sample ID: MW-32
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	3.9		0.10	10	N/A	DLN	05/24/00	13:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L		ND	0.01	1	N/A	DLN	05/25/00	08:30	335.1
Specific Conductance.....	umhos/cm	830		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	19		0.20	2	N/A	JCR	05/24/00	09:25	SM4500-F-C
pH	UNITS	8.80			1	N/A	JCR	05/19/00	14:55	150.1
Arsenic, Dissolved.....	mg/L	0.013		0.004	1	N/A	SLP	05/26/00	19:42	3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	SLP	05/26/00	19:42	6010B
Manganese, Dissolved.....	mg/L	1.6		0.01	1	N/A	SLP	05/26/00	19:42	3005A
Sodium, Dissolved.....	mg/L	70		50	100	N/A	SLP	05/26/00	19:42	3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	05/26/00	19:42	3005A

RL = Reporting Limit

Login #L0005445
May 30, 2000 03:30 pm

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005445-07
Client Sample ID: MW-36
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	1.6		0.25	25	N/A	DLN	05/24/00	13:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L		ND	0.01	1	N/A	DLN	05/25/00	08:30	335.1
Specific Conductance.....	umhos/cm	1200		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	50		2.5	25	N/A	JCR	05/24/00	09:25	SM4500-F-C
pH	UNITS	10.2			1	N/A	JCR	05/19/00	14:55	150.1
Arsenic, Dissolved.....	mg/L	0.03		0.004	1	N/A	SLP	05/26/00	19:47	3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	SLP	05/26/00	19:47	6010B
Manganese, Dissolved.....	mg/L	0.54		0.01	1	N/A	SLP	05/26/00	19:47	3005A
Sodium, Dissolved.....	mg/L	150		50	100	N/A	SLP	05/26/00	19:47	3005A
Vanadium, Dissolved.....	mg/L	0.03		0.01	1	N/A	SLP	05/26/00	19:47	3005A

Lab Sample ID: L0005445-08
Client Sample ID: MW-37
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	5.2		0.20	20	N/A	DLN	05/24/00	13:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.93		0.01	1	N/A	DLN	05/25/00	08:30	335.1
Specific Conductance.....	umhos/cm	770		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	32		0.50	5	N/A	JCR	05/24/00	09:25	SM4500-F-C
pH	UNITS	8.51			1	N/A	JCR	05/19/00	14:55	150.1
Arsenic, Dissolved.....	mg/L	0.015		0.004	1	N/A	SLP	05/26/00	19:51	3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	SLP	05/26/00	19:51	6010B
Manganese, Dissolved.....	mg/L	0.72		0.01	1	N/A	SLP	05/26/00	19:51	3005A
Sodium, Dissolved.....	mg/L	92		50	100	N/A	SLP	05/26/00	19:51	3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	SLP	05/26/00	19:51	3005A

RL = Reporting Limit

Login #L0005445
May 30, 2000 03:30 pm

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005445-09
Client Sample ID: MW-35
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	27		1.0	100	N/A	DLN	05/24/00	13:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	20		0.01	1	N/A	DLN	05/25/00	08:30	335.1
Specific Conductance.....	umhos/cm	690		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	28		1.0	10	N/A	JCR	05/24/00	09:25	SM4500-F-C
pH	UNITS	9.07			1	N/A	JCR	05/19/00	15:15	150.1
Arsenic, Dissolved.....	mg/L	0.0081		0.004	1	N/A	SLP	05/26/00	19:56	3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	SLP	05/26/00	19:56	6010B
Manganese, Dissolved.....	mg/L	0.48		0.01	1	N/A	SLP	05/26/00	19:56	3005A
Sodium, Dissolved.....	mg/L	69		50	100	N/A	SLP	05/26/00	19:56	3005A
Vanadium, Dissolved.....	mg/L	0.077		0.01	1	N/A	SLP	05/26/00	19:56	3005A

RL = Reporting Limit

HMI
Environmental Consulting Services

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name/Location	Laboratory	Sampling Personnel
HM00311	ORMET / HANNIBAL OH	KEMRON	S. MENOSKY / J. Keller

Container Description/ Number of Containers

Sample ID	Date/Time	Sample Code	500ml PLASTIC DISSOLVED As, Be, Mn, Na, V HNO3-Field Filtered	250ml. Amber GLASS Cn (TOTAL + Amenable) NAOH	250ml PLASTIC pH, SP. COND., F 4°C							TOTAL
MW-19	5-18-2000	L	1	1	1							3
MW-41	↓	↓	1	1	1							3
MW-12	↓	↓	1	1	1							3
MW-17	↓	↓	1	1	1							3
MW-15	↓	↓	1	1	1							3
MW-32	↓	↓	1	1	1							3
MW-36	↓	↓	1	1	1							3
MW-37	↓	↓	1	1	1							3
MW-35	↓	↓	1	1	1							3

Sample Code: (L) = Liquid; S = Solid; A = Air

Total Number of Containers:

Relinquished by: Steve Menosky	Organization: HMI	Date: 5-18-2000	Time: 4:25	Seal Intact?	
Received by: [signature]	Organization: Kemron	Date: 5-18-2000	Time: 4:25	(Yes) No NA	
Relinquished by: [signature]	Organization: Kemron	Date: 5-18-2000	Time: 1725	Seal Intact?	
Received by: [signature]	Organization: Kemron	Date: 5-18-00	Time: 1725	(Yes) No NA	

REMARKS: Only Run Amenable Cn if TOTAL CN is Detected

SXS intact
Cooler Temps 6/6

DELIVERY METHOD: In Person ☐ Common Carrier ☐ Lab Courier Kemron Other ☐

TEST CERTIFICATE
KEMRON Environmental Services
109 Starlite Park
Marietta, Ohio 45750
Phone: (740) 373-4071

Ormet Corporation
Hydrosystems Management Inc.
331 S. Main Street, Suite 109
Washington, PA 15301
Attention: Steve Menoski

Login #: L0005408
Report Date: 02/21/01
Work ID: HM00311/ORMET/HANNIBAL, OH
Date Received: 05/17/00

PO Number: HRDS55078
Account Number: ORMET-086
Invoice Number: 547261

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
L0005408-01	MW-16	L0005408-02	MW-16D
L0005408-03	MW-29S	L0005408-04	MW-29D
L0005408-05	MW-40D	L0005408-06	MW-40S
L0005408-07	MW-39S	L0005408-08	MW-39D
L0005408-09	MW-42S	L0005408-10	MW-42D
L0005408-11	MW-34S	L0005408-12	MW-34D

CORRECTED REPORT

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

Certified By
David L. Bumgarner

KEMRON
ENVIRONMENTAL SERVICES

KEMRON ENVIRONMENTAL SERVICES
REPORT NARRATIVE

CONVENTIONALS:

Cyanide

Cyanide, amenable to chlorination is analyzed by running two separate portions of the sample. One portion is run for total cyanide, the other is treated to release cyanide. The treated portion is then analyzed for total cyanide. Cyanide, amenable to chlorination is the difference between the two portions. The treated and untreated portions on several samples needed large dilutions. Statistically the high results are similar which indicate that very little of the sample is amenable to chlorination.

Login #L0005408
February 21, 2001 09:34 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005408-01
Client Sample ID: MW-16
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	12		0.50	50	N/A	DLN	05/19/00	08:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	12		0.01	1	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	1100		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	7.9		0.10	1	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	7.69			1	N/A	DLN	05/18/00	15:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/26/00	12:15	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/26/00	12:15	6010B\3005A
Manganese, Dissolved.....	mg/L	2.3		0.01	1	N/A	KHR	05/26/00	12:15	6010B\3005A
Sodium, Dissolved.....	mg/L	91		10	20	N/A	KHR	05/26/00	12:15	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/26/00	12:15	6010B\3005A

Lab Sample ID: L0005408-02
Client Sample ID: MW-16D
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	12		0.50	50	N/A	DLN	05/19/00	08:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	12		0.01	1	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	1000		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	8.1		0.10	1	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	7.72			1	N/A	DLN	05/18/00	15:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/26/00	12:19	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/26/00	12:19	6010B\3005A
Manganese, Dissolved.....	mg/L	2.4		0.01	1	N/A	KHR	05/26/00	12:19	6010B\3005A
Sodium, Dissolved.....	mg/L	91		10	20	N/A	KHR	05/26/00	12:19	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/26/00	12:19	6010B\3005A

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005408-03
Client Sample ID: MW-29S
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.17		0.01	1	N/A	DLN	05/19/00	08:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.17		0.01	1	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	1200		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	16		0.20	2	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	8.11			1	N/A	DLN	05/18/00	15:00	150.1
Arsenic, Dissolved.....	mg/L	0.0057		0.004	1	N/A	KHR	05/26/00	11:48	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/26/00	11:48	6010B\3005A
Manganese, Dissolved.....	mg/L	0.41		0.01	1	N/A	KHR	05/26/00	11:48	6010B\3005A
Sodium, Dissolved.....	mg/L	130		10	20	N/A	KHR	05/26/00	11:48	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/26/00	11:48	6010B\3005A

Lab Sample ID: L0005408-04
Client Sample ID: MW-29D
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.15		0.01	1	N/A	JWR	05/22/00	09:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.15		0.01	1	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	590		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	3.1		0.10	1	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	7.75			1	N/A	DLN	05/18/00	15:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/26/00	12:06	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/26/00	12:06	6010B\3005A
Manganese, Dissolved.....	mg/L	1.9		0.01	1	N/A	KHR	05/26/00	12:06	6010B\3005A
Sodium, Dissolved.....	mg/L	24		0.50	1	N/A	KHR	05/26/00	12:06	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/26/00	12:06	6010B\3005A

RL = Reporting Limit

Login #L0005408
February 21, 2001 09:34 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005408-05
Client Sample ID: MW-40D
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.25		0.01	1	N/A	JWR	05/22/00	09:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.25		0.01	1	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	960		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	11		0.20	2	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	7.88			1	N/A	DLN	05/18/00	15:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/26/00	12:32	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/26/00	12:32	6010B\3005A
Manganese, Dissolved.....	mg/L	0.69		0.01	1	N/A	KHR	05/26/00	12:32	6010B\3005A
Sodium, Dissolved.....	mg/L	97		10	20	N/A	KHR	05/26/00	12:32	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/26/00	12:32	6010B\3005A

Lab Sample ID: L0005408-06
Client Sample ID: MW-40S
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.25		0.01	1	N/A	JWR	05/22/00	09:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.25		0.01	1	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	1100		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	14		0.50	5	N/A	JCR	05/18/00	13:10	SM4500-F-C
pH	UNITS	8.08			1	N/A	DLN	05/18/00	15:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/26/00	12:36	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/26/00	12:36	6010B\3005A
Manganese, Dissolved.....	mg/L	0.42		0.01	1	N/A	KHR	05/26/00	12:36	6010B\3005A
Sodium, Dissolved.....	mg/L	110		10	20	N/A	KHR	05/26/00	12:36	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/26/00	12:36	6010B\3005A

RL = Reporting Limit

Login #L0005408
February 21, 2001 09:34 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005408-07
Client Sample ID: MW-39S
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	3.5		0.10	10	N/A	JWR	05/22/00	09:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	3.5		0.01	1	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	4500		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	110		2.5	25	N/A	JCR	05/18/00	13:10	SM4500-F-C
pH	UNITS	9.18			1	N/A	DLN	05/18/00	15:00	150.1
Arsenic, Dissolved.....	mg/L	0.013		0.004	1	N/A	KHR	05/26/00	12:41	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/26/00	12:41	6010B\3005A
Manganese, Dissolved.....	mg/L	0.097		0.01	1	N/A	KHR	05/26/00	12:41	6010B\3005A
Sodium, Dissolved.....	mg/L	1100		10	20	N/A	KHR	05/26/00	12:41	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/26/00	12:41	6010B\3005A

Lab Sample ID: L0005408-08
Client Sample ID: MW-39D
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.027		0.01	1	N/A	JWR	05/22/00	09:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.027		0.01	1	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	580		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	3.2		0.10	1	N/A	JCR	05/18/00	13:10	SM4500-F-C
pH	UNITS	7.68			1	N/A	DLN	05/18/00	15:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/26/00	12:45	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/26/00	12:45	6010B\3005A
Manganese, Dissolved.....	mg/L	0.90		0.01	1	N/A	KHR	05/26/00	12:45	6010B\3005A
Sodium, Dissolved.....	mg/L	29		0.50	1	N/A	KHR	05/26/00	12:45	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/26/00	12:45	6010B\3005A

RL = Reporting Limit

Login #L0005408
February 21, 2001 09:34 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005408-09
Client Sample ID: MW-42S
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.66		0.02	2	N/A	JWR	05/22/00	09:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.66		0.01	1	N/A	DLN	05/24/00	13:00	335.1
Specific Conductance.....	umhos/cm	1900		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	28		0.50	5	N/A	JCR	05/18/00	13:10	SM4500-F-C
pH	UNITS	8.19			1	N/A	DLN	05/18/00	15:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/26/00	12:49	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/26/00	12:49	6010B\3005A
Manganese, Dissolved.....	mg/L	0.65		0.01	1	N/A	KHR	05/26/00	12:49	6010B\3005A
Sodium, Dissolved.....	mg/L	280		10	20	N/A	KHR	05/26/00	12:49	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/26/00	12:49	6010B\3005A

Lab Sample ID: L0005408-10
Client Sample ID: MW-42D
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.027		0.01	1	N/A	JWR	05/22/00	09:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.027		0.01	1	N/A	DLN	05/24/00	13:00	335.1
Specific Conductance.....	umhos/cm	580		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	3.0		0.10	1	N/A	JCR	05/18/00	13:10	SM4500-F-C
pH	UNITS	7.73			1	N/A	DLN	05/18/00	15:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/26/00	12:54	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/26/00	12:54	6010B\3005A
Manganese, Dissolved.....	mg/L	1.3		0.01	1	N/A	KHR	05/26/00	12:54	6010B\3005A
Sodium, Dissolved.....	mg/L	24		0.50	1	N/A	KHR	05/26/00	12:54	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/26/00	12:54	6010B\3005A

RL = Reporting Limit

Login #L0005408
February 21, 2001 09:34 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005408-11
Client Sample ID: MW-34S
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	1.1		0.04	4	N/A	JWR	05/22/00	09:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	1.1		0.01	1	N/A	DLN	05/24/00	13:00	335.1
Specific Conductance.....	umhos/cm	740		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	11		0.20	2	N/A	JCR	05/18/00	13:10	SM4500-F-C
pH	UNITS	7.60			1	N/A	DLN	05/18/00	15:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/26/00	12:58	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/26/00	12:58	6010B\3005A
Manganese, Dissolved.....	mg/L	0.044		0.01	1	N/A	KHR	05/26/00	12:58	6010B\3005A
Sodium, Dissolved.....	mg/L	83		0.50	1	N/A	KHR	05/26/00	12:58	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/26/00	12:58	6010B\3005A

Lab Sample ID: L0005408-12
Client Sample ID: MW-34D
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.063		0.01	1	N/A	JWR	05/22/00	09:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.063		0.01	1	N/A	DLN	05/24/00	13:00	335.1
Specific Conductance.....	umhos/cm	620		1.0	1	N/A	DLP	05/22/00	11:00	120.1
Fluoride.....	mg/L	4.2		0.10	1	N/A	JCR	05/18/00	13:10	SM4500-F-C
pH	UNITS	7.55			1	N/A	DLN	05/18/00	15:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/26/00	13:03	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/26/00	13:03	6010B\3005A
Manganese, Dissolved.....	mg/L	0.76		0.01	1	N/A	KHR	05/26/00	13:03	6010B\3005A
Sodium, Dissolved.....	mg/L	28		0.50	1	N/A	KHR	05/26/00	13:03	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/26/00	13:03	6010B\3005A

RL = Reporting Limit

HMI
Environmental Consulting Services

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name/Location	Laboratory	Sampling Personnel
HM00311	ORMET / HANNIBAL OH	KEMRON	S. MENOSKY / J. KELLER

Sample ID	Date/Time	Sample Code	500ml PLASTIC DISSOLVED As, Be, Mn, Na, V HNO3 - Field FILTERED	250ml. Amber GLASS CN (TOTAL + Amenable) NAOH	250ml. PLASTIC pH, Sp. Cond, F 4°C							TOTAL
MW-16	5-17-00	L	1	1	1							3
MW-16d			1	1	1							3
MW-29s			1	1	1							3
MW-29d			1	1	1							3
MW-40d			1	1	1							3
MW-40s			1	1	1							3
MW-39s			1	1	1							3
MW-39d			1	1	1							3
MW-42s			1	1	1							3
MW-42d			1	1	1							3
MW-34s			1	1	1							3
MW-34d			1	1	1							3

Sample Code: L = Liquid; S = Solid; A = Air

Total Number of Containers:

Relinquished by:	Steve Menosky	Organization:	HMI	Date:	5-17-00	Time:	1630
Received by:	Jack Shewman	Organization:	KEMRON	Date:	5-17-00	Time:	1630
Relinquished by:	Jack Shewman	Organization:	KEMRON	Date:	5-17-00	Time:	1745
Received by:	Sherri Gregory	Organization:	Kemron	Date:	5-17-00	Time:	1745

Seal Intact? Yes No NA

Seal Intact? Yes No NA

REMARKS: Only Run Amenable Cn if Total Cn is Detected / Bottles IN 2 coolers

DELIVERY METHOD: In Person [ ] Common Carrier [ ] Lab Courier [KEMRON] Other [ ]

TEST CERTIFICATE
KEMRON Environmental Services
109 Starlite Park
Marietta, Ohio 45750
Phone: (740) 373-4071

Ormet Corporation
Hydrosystems Management Inc.
331 S. Main Street, Suite 109
Washington, PA 15301
Attention: Steve Menoski

PO Number: HRDS55078
Account Number: ORMET-086
Invoice Number: 547260

Login #: L0005376
Report Date: 02/21/01
Work ID: HM00311/ORMET/HANNIBAL, OH
Date Received: 05/16/00

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
L0005376-01	MW-2	L0005376-02	MW-5
L0005376-03	MW-7	L0005376-04	MW-8
L0005376-05	MW-10	L0005376-06	MW-11
L0005376-07	MW-18	L0005376-08	MW-30
L0005376-09	MW-31	L0005376-10	MW-28
L0005376-11	MW-18D	L0005376-12	MW-2D
L0005376-13	FIELD BLANK	L0005376-14	TRIP BLANK

CORRECTED REPORT

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

Certified By
David L. Bumgarner

KEMRON ENVIRONMENTAL SERVICES

Login #L0005376
February 21, 2001 09:34 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005376-01
Client Sample ID: MW-2
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	18		1.0	100	N/A	DLN	05/17/00	09:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L		ND	0.50	50	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	2000		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	66		1.0	10	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	9.92			1	N/A	DLN	05/17/00	14:00	150.1
Arsenic, Dissolved.....	mg/L	0.0809		0.004	1	N/A	KHR	05/23/00	14:21	6010B\3015
Beryllium, Dissolved.....	mg/L	0.00075		0.0005	1	N/A	KHR	05/23/00	14:21	6010B\3015
Manganese, Dissolved.....	mg/L	1.0		0.01	1	N/A	KHR	05/23/00	14:21	6010B\3015
Sodium, Dissolved.....	mg/L	430		10	20	N/A	KHR	05/23/00	14:21	6010B\3015
Vanadium, Dissolved.....	mg/L	0.045		0.01	1	N/A	KHR	05/23/00	14:21	6010B\3015

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0005376-01
Client Sample ID: MW-2
Site/Work ID: HM00311/ORMET/HANNIBAL, OH
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 05/16/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 05/24/00 Time: 05:59

Instrument: HPMS2
Analyst: CMS
Lab File ID: 2M35887

Method: 8260B
Run ID: R90405
Batch : WG77497

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	94.3	(86 - 118%)
1,2-Dichloroethane-d4.....	98.7	(80 - 120%)
Toluene-d8.....	90.6	(88 - 110%)
4-Bromofluorobenzene.....	97.5	(86 - 115%)

RL = Reporting Limit

Login #L0005376
February 21, 2001 09:34 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005376-02
Client Sample ID: MW-5
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	2.3		0.10	10	N/A	DLN	05/17/00	09:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	2.3		0.01	1	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	1100		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	16		0.20	2	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	8.81			1	N/A	DLN	05/17/00	14:00	150.1
Arsenic, Dissolved.....	mg/L	0.0082		0.004	1	N/A	KHR	05/23/00	14:26	6010B\3015
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/23/00	14:26	6010B\3015
Manganese, Dissolved.....	mg/L	0.37		0.01	1	N/A	KHR	05/23/00	14:26	6010B\3015
Sodium, Dissolved.....	mg/L	110		10	20	N/A	KHR	05/23/00	14:26	6010B\3015
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/23/00	14:26	6010B\3015

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0005376-02
Client Sample ID: MW-5
Site/Work ID: HM00311/ORMET/HANNIBAL, OH
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 05/16/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 05/24/00 Time: 06:33

Instrument: HPMS2
Analyst: CMS
Lab File ID: 2M35888

Method: 8260B
Run ID: R90405
Batch : WG77497

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	94.2	(86 - 118%)
1,2-Dichloroethane-d4.....	97.9	(80 - 120%)
Toluene-d8.....	91.5	(88 - 110%)
4-Bromofluorobenzene.....	97.1	(86 - 115%)

RL = Reporting Limit

Login #L0005376
February 21, 2001 09:34 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005376-03
Client Sample ID: MW-7
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L		ND	0.01	1	N/A	DLN	05/17/00	09:00	9010B\9014
Specific Conductance.....	umhos/cm	810		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	0.14		0.10	1	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	5.74			1	N/A	DLN	05/17/00	14:00	150.1
Arsenic, Dissolved.....	mg/L	0.041		0.004	1	N/A	KHR	05/23/00	14:30	6010B\3015
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/23/00	14:30	6010B\3015
Manganese, Dissolved.....	mg/L	2.0		0.01	1	N/A	KHR	05/23/00	14:30	6010B\3015
Sodium, Dissolved.....	mg/L	93		0.50	1	N/A	KHR	05/23/00	14:30	6010B\3015
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/23/00	14:30	6010B\3015

Lab Sample ID: L0005376-04
Client Sample ID: MW-8
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.026		0.01	1	N/A	DLN	05/17/00	09:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.026		0.01	1	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	600		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	2.2		0.10	1	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	7.91			1	N/A	DLN	05/17/00	14:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/23/00	14:35	6010B\3015
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/23/00	14:35	6010B\3015
Manganese, Dissolved.....	mg/L	0.24		0.01	1	N/A	KHR	05/23/00	14:35	6010B\3015
Sodium, Dissolved.....	mg/L	36		0.50	1	N/A	KHR	05/23/00	14:35	6010B\3015
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/23/00	14:35	6010B\3015

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005376-05
Client Sample ID: MW-10
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L		ND	0.01	1	N/A	DLN	05/17/00	09:00	9010B\9014
Specific Conductance.....	umhos/cm	650		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	0.48		0.10	1	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	7.45			1	N/A	DLN	05/17/00	14:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/23/00	14:39	6010B\3015
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/23/00	14:39	6010B\3015
Manganese, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/23/00	14:39	6010B\3015
Sodium, Dissolved.....	mg/L	21		0.50	1	N/A	KHR	05/23/00	14:39	6010B\3015
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/23/00	14:39	6010B\3015

Lab Sample ID: L0005376-06
Client Sample ID: MW-11
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.013		0.01	1	N/A	DLN	05/19/00	08:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.013		0.01	1	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	580		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	1.4		0.10	1	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	7.96			1	N/A	DLN	05/17/00	14:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/23/00	14:43	6010B\3015
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/23/00	14:43	6010B\3015
Manganese, Dissolved.....	mg/L	0.54		0.01	1	N/A	KHR	05/23/00	14:43	6010B\3015
Sodium, Dissolved.....	mg/L	32		0.50	1	N/A	KHR	05/23/00	14:43	6010B\3015
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/23/00	14:43	6010B\3015

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005376-07
Client Sample ID: MW-18
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	84		5.0	500	N/A	DLN	05/19/00	08:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	75		0.50	50	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	2800		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	160		2.5	25	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	9.59			1	N/A	DLN	05/17/00	14:00	150.1
Arsenic, Dissolved.....	mg/L	0.075		0.004	1	N/A	KHR	05/23/00	14:48	6010B\3015
Beryllium, Dissolved.....	mg/L	0.00089		0.0005	1	N/A	KHR	05/23/00	14:48	6010B\3015
Manganese, Dissolved.....	mg/L	0.56		0.01	1	N/A	KHR	05/23/00	14:48	6010B\3015
Sodium, Dissolved.....	mg/L	620		10	20	N/A	KHR	05/23/00	14:48	6010B\3015
Vanadium, Dissolved.....	mg/L	0.035		0.01	1	N/A	KHR	05/23/00	14:48	6010B\3015

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0005376-07
Client Sample ID: MW-18
Site/Work ID: HM00311/ORMET/HANNIBAL, OH
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 05/16/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 05/24/00 Time: 07:08

Instrument: HPMS2
Analyst: CMS
Lab File ID: 2M35889

Method: 8260B
Run ID: R90405
Batch : WG77497

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	19		5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	92.0	(86 - 118%)
1,2-Dichloroethane-d4.....	103	(80 - 120%)
Toluene-d8.....	89.1	(88 - 110%)
4-Bromofluorobenzene.....	96.4	(86 - 115%)

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005376-08
Client Sample ID: MW-30
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.026		0.01	1	N/A	DLN	05/19/00	08:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.026		0.01	1	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	430		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	0.12		0.10	1	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	6.34			1	N/A	DLN	05/17/00	14:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/23/00	15:01	6010B\3015
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/23/00	15:01	6010B\3015
Manganese, Dissolved.....	mg/L	0.70		0.01	1	N/A	KHR	05/23/00	15:01	6010B\3015
Sodium, Dissolved.....	mg/L	21		0.50	1	N/A	KHR	05/23/00	15:01	6010B\3015
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/23/00	15:01	6010B\3015

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0005376-08
Client Sample ID: MW-30
Site/Work ID: HM00311/ORMET/HANNIBAL, OH
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 05/16/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 05/24/00 Time: 07:44

Instrument: HPMS2
Analyst: CMS
Lab File ID: 2M35890

Method: 8260B
Run ID: R90405
Batch : WG77497

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	17		5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	93.9	(86 - 118%)
1,2-Dichloroethane-d4.....	102	(80 - 120%)
Toluene-d8.....	88.5	(88 - 110%)
4-Bromofluorobenzene.....	97.0	(86 - 115%)

RL = Reporting Limit

Login #L0005376
February 21, 2001 09:34 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005376-09
Client Sample ID: MW-31
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	21		1.0	100	N/A	DLN	05/19/00	08:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	1.7		0.50	50	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	2900		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	140		2.5	25	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	10.1			1	N/A	DLN	05/17/00	14:00	150.1
Arsenic, Dissolved.....	mg/L	0.096		0.004	1	N/A	KHR	05/23/00	15:05	6010B\3015
Beryllium, Dissolved.....	mg/L	0.0011		0.0005	1	N/A	KHR	05/23/00	15:05	6010B\3015
Manganese, Dissolved.....	mg/L	1.6		0.01	1	N/A	KHR	05/23/00	15:05	6010B\3015
Sodium, Dissolved.....	mg/L	820		10	20	N/A	KHR	05/23/00	15:05	6010B\3015
Vanadium, Dissolved.....	mg/L	0.12		0.01	1	N/A	KHR	05/23/00	15:05	6010B\3015

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0005376-09
Client Sample ID: MW-31
Site/Work ID: HM00311/ORMET/HANNIBAL, OH
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 05/16/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 05/24/00 Time: 18:00

Instrument: HPMS2
Analyst: CMS
Lab File ID: 2M35907

Method: 8260B
Run ID: R90531
Batch : WG77505

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	20		5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	86.3	(86 - 118%)
1,2-Dichloroethane-d4.....	89.6	(80 - 120%)
Toluene-d8.....	90.5	(88 - 110%)
4-Bromofluorobenzene.....	95.8	(86 - 115%)

RL = Reporting Limit

Login #L0005376
February 21, 2001 09:34 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0005376-10
Client Sample ID: MW-28
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	1.0		0.04	4	N/A	JWR	05/22/00	09:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	1.0		0.01	1	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	470		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	0.30		0.10	1	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	5.89			1	N/A	DLN	05/17/00	14:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/23/00	15:09	6010B\3015
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/23/00	15:09	6010B\3015
Manganese, Dissolved.....	mg/L	0.014		0.01	1	N/A	KHR	05/23/00	15:09	6010B\3015
Sodium, Dissolved.....	mg/L	77		0.50	1	N/A	KHR	05/23/00	15:09	6010B\3015
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/23/00	15:09	6010B\3015

Lab Sample ID: L0005376-11
Client Sample ID: MW-18D
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	64		2.5	250	N/A	DLN	05/19/00	08:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	50		0.50	50	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	2800		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	160		2.5	25	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	9.60			1	N/A	DLN	05/17/00	14:00	150.1
Arsenic, Dissolved.....	mg/L	0.073		0.004	1	N/A	KHR	05/23/00	15:14	6010B\3015
Beryllium, Dissolved.....	mg/L	0.00062		0.0005	1	N/A	KHR	05/23/00	15:14	6010B\3015
Manganese, Dissolved.....	mg/L	0.33		0.01	1	N/A	KHR	05/23/00	15:14	6010B\3015
Sodium, Dissolved.....	mg/L	620		10	20	N/A	KHR	05/23/00	15:14	6010B\3015
Vanadium, Dissolved.....	mg/L	0.023		0.01	1	N/A	KHR	05/23/00	15:14	6010B\3015

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0005376-11
Client Sample ID: MW-18D
Site/Work ID: HM00311/ORMET/HANNIBAL, OH
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 05/16/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 05/24/00 Time: 18:35

Instrument: HPMS2
Analyst: CMS
Lab File ID: 2M35908

Method: 8260B
Run ID: R90531
Batch : WG77505

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	16		5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	82.0	*	(86 - 118%)
1,2-Dichloroethane-d4.....	84.0		(80 - 120%)
Toluene-d8.....	89.6		(88 - 110%)
4-Bromofluorobenzene.....	96.9		(86 - 115%)

Lab Sample ID: L0005376-12
Client Sample ID: MW-2D
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	18		1.0	100	N/A	JWR	05/22/00	09:30	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	11		0.50	50	N/A	DLN	05/24/00	09:00	335.1
Specific Conductance.....	umhos/cm	1900		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L	67		1.0	10	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	9.97			1	N/A	DLN	05/17/00	14:00	150.1
Arsenic, Dissolved.....	mg/L	0.081		0.004	1	N/A	KHR	05/23/00	15:18	6010B\3015
Beryllium, Dissolved.....	mg/L	0.00076		0.0005	1	N/A	KHR	05/23/00	15:18	6010B\3015
Manganese, Dissolved.....	mg/L	1.1		0.01	1	N/A	KHR	05/23/00	15:18	6010B\3015
Sodium, Dissolved.....	mg/L	410		10	20	N/A	KHR	05/23/00	15:18	6010B\3015
Vanadium, Dissolved.....	mg/L	0.045		0.01	1	N/A	KHR	05/23/00	15:18	6010B\3015

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0005376-12
Client Sample ID: MW-2D
Site/Work ID: HM00311/ORMET/HANNIBAL, OH
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 05/16/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 05/24/00 Time: 19:09

Instrument: HPMS2
Analyst: CMS
Lab File ID: 2M35909

Method: 8260B
Run ID: R90531
Batch : WG77505

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	83.4	*	(86 - 118%)
1,2-Dichloroethane-d4.....	85.8		(80 - 120%)
Toluene-d8.....	88.7		(88 - 110%)
4-Bromofluorobenzene.....	95.9		(86 - 115%)

Lab Sample ID: L0005376-13
Client Sample ID: FIELD BLANK
Site/Work ID: HM00311/ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L		ND	0.01	1	N/A	DLN	05/19/00	08:30	9010B\9014
Specific Conductance.....	umhos/cm	2.1		1.0	1	N/A	DLP	05/22/00	08:30	120.1
Fluoride.....	mg/L		ND	0.10	1	N/A	JCR	05/18/00	12:00	SM4500-F-C
pH	UNITS	5.29			1	N/A	DLN	05/17/00	14:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	05/23/00	15:23	6010B\3015
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	05/23/00	15:23	6010B\3015
Manganese, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/23/00	15:23	6010B\3015
Sodium, Dissolved.....	mg/L		ND	0.50	1	N/A	KHR	05/23/00	15:23	6010B\3015
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	05/23/00	15:23	6010B\3015

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0005376-13
Client Sample ID: FIELD BLANK
Site/Work ID: HM00311/ORMET/HANNIBAL, OH
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 05/16/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 05/25/00 Time: 00:04

Instrument: HPMS10
Analyst: MES
Lab File ID: 10M3468

Method: 8260B
Run ID: R90550
Batch : WG77520

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1
	SURROGATES- In Percent Recovery:					
	Dibromofluoromethane.....		96.8	(86 - 118%)		
	1,2-Dichloroethane-d4.....		104	(80 - 120%)		
	Toluene-d8.....		87.7 *	(88 - 110%)		
	4-Bromofluorobenzene.....		89.2	(86 - 115%)		

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0005376-14
Client Sample ID: TRIP BLANK
Site/Work ID: HM00311/ORMET/HANNIBAL, OH
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 05/16/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 05/25/00 Time: 00:34

Instrument: HPMS10
Analyst: MES
Lab File ID: 10M3469

Method: 8260B
Run ID: R90550
Batch : WG77520

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1
	SURROGATES- In Percent Recovery:					
	Dibromofluoromethane.....		101	(86 - 118%)		
	1,2-Dichloroethane-d4.....		106	(80 - 120%)		
	Toluene-d8.....		88.5	(88 - 110%)		
	4-Bromofluorobenzene.....		88.2	(86 - 115%)		

RL = Reporting Limit

HMI
Environmental Consulting Services

CHAIN – OF – CUSTODY RECORD

Project Number: HM00311
Project Name/Location: ORMET / HANNIBAL OH
Laboratory: KEMRON
Sampling Personnel: S. MENOSKY, J. KELLER

Sample ID	Date/Time	Sample Code	500ml. PLASTIC DISSOLVED As, Be, Mn, Na, V HNO_3- Field Filtered	250ml. Amber Glass Cn (total+Amenable) NAOH	250 ml. PLASTIC pH, Sp. Cond, F 4°C	40ml GLASS Tetrachloroethene (8260) HCL						TOTAL
MW-2	5-16-00	L	1	1	1	2						5
MW-5	5-16-00	↓	1	1	1	2						5
MW-7	5-16-00	↓	1	1	1							3
MW-8	5-16-00	↓	1	1	1							3
MW-10	5-16-00	↓	1	1	1							3
MW-11	5-16-00	↓	1	1	1							3
MW-18	5-16-00	↓	1	1	1	2						5
MW-30	5-16-00	↓	1	1	1	2						5
MW-31	5-16-00	↓	1	1	1	2						5
MW-28	5-16-00	↓	1	1	1							3
MW-18d	5-16-00	↓	1	1	1	2						5
MW-2d	5-16-00	↓	1	1	1	2						5
Trip blank	5-16-00										2	2
Field blank	5-16-00		1	1	1	2						5

Sample Code: L = Liquid; S = Solid; A = Air

Total Number of Containers: 57

Relinquished by: Steve Menosky	Organization: HMI	Date: 5-16-00	Time: 1630	Seal Intact?
Received by: Jack Keller	Organization: KEMRON	Date: 5-16-00	Time: 1630	(Yes) No NA
Relinquished by: Jack Keller	Organization: KEMRON	Date: 5-16-00	Time: 1950	Seal Intact?
Received by: Brenda Gregory	Organization: Kemron	Date: 5-17-00	Time: 0800	(Yes) No NA

REMARKS: Only Run Amenable Cn if total Cn is detected, 2 coolers
SXS intact
Cooler temps 4/4 (BG)
(2) SXS stored in locked Cooler overnight (BG)

DELIVERY METHOD: In Person [ ] Common Carrier [ ] Lab Courier [KEMRON] Other [ ]

KEMRON Environmental Services
109 Starlite Park
Marietta, Ohio 45750
Phone: (740) 373-4071

Ormet Corporation
Hydrosystems Management Inc.
331 S. Main Street, Suite 109
Washington, PA 15301
Attention: Steve Menoski

PO Number:
Account Number: ORMET-086

Login #: L0006450
Report Date: 07/05/00
Work ID: ORMET/HANNIBAL, OH
Date Received: 05/16/00

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
L0006450-01	MW-16	L0006450-02	MW-16D
L0006450-03	MW-29S	L0006450-04	MW-29D
L0006450-05	MW-40D	L0006450-06	MW-40S
L0006450-07	MW-39S	L0006450-08	MW-39D
L0006450-09	MW-42S	L0006450-10	MW-42D
L0006450-11	MW-34S	L0006450-12	MW-34D
L0006450-13	MW-19	L0006450-14	MW-41
L0006450-15	MW-12	L0006450-16	MW-17
L0006450-17	MW-15	L0006450-18	MW-32
L0006450-19	MW-36	L0006450-20	MW-37
L0006450-21	MW-35	L0006450-22	MW-2
L0006450-23	MW-5	L0006450-24	MW-7
L0006450-25	MW-8	L0006450-26	MW-10
L0006450-27	MW-11	L0006450-28	MW-18
L0006450-29	MW-30	L0006450-30	MW-31
L0006450-31	MW-28	L0006450-32	MW-18D
L0006450-33	MW-2D	L0006450-34	FIELD BLANK

KEMRON
ENVIRONMENTAL SERVICES

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

Certified By
Dennis S. Tepe

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0006450-01
Client Sample ID: MW-16
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	4.3		0.04	1	N/A	KHR	06/26/00	12:15	6010B\3015

Lab Sample ID: L0006450-02
Client Sample ID: MW-16D
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	4.4		0.04	1	N/A	KHR	06/26/00	12:19	6010B\3015

Lab Sample ID: L0006450-03
Client Sample ID: MW-29S
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.14		0.04	1	N/A	KHR	06/26/00	11:48	6010B\3015

Lab Sample ID: L0006450-04
Client Sample ID: MW-29D
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.12		0.04	1	N/A	KHR	06/26/00	12:06	6010B\3015

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0006450-05
Client Sample ID: MW-40D
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.16		0.04	1	N/A	KHR	06/26/00	12:32	6010B\3015

Lab Sample ID: L0006450-06
Client Sample ID: MW-40S
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.19		0.04	1	N/A	KHR	06/26/00	12:36	6010B\3015

Lab Sample ID: L0006450-07
Client Sample ID: MW-39S
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	2.3		0.04	1	N/A	KHR	06/26/00	12:41	6010B\3015

Lab Sample ID: L0006450-08
Client Sample ID: MW-39D
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.13		0.04	1	N/A	KHR	06/26/00	12:45	6010B\3015

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0006450-09
Client Sample ID: MW-42S
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.39		0.04	1	N/A	KHR	06/26/00	12:49	6010B\3015

Lab Sample ID: L0006450-10
Client Sample ID: MW-42D
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.053		0.04	1	N/A	KHR	06/26/00	12:54	6010B\3015

Lab Sample ID: L0006450-11
Client Sample ID: MW-34S
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	1.2		0.04	1	N/A	KHR	06/26/00	12:58	6010B\3015

Lab Sample ID: L0006450-12
Client Sample ID: MW-34D
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/17/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.14		0.04	1	N/A	KHR	06/26/00	13:03	6010B\3015

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0006450-13
Client Sample ID: MW-19
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.13		0.04	1	N/A	KHR	06/26/00	18:35	6010B\3015

Lab Sample ID: L0006450-14
Client Sample ID: MW-41
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	9.2		0.04	1	N/A	KHR	06/26/00	18:27	6010B\3015

Lab Sample ID: L0006450-15
Client Sample ID: MW-12
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.043		0.04	1	N/A	KHR	06/26/00	19:29	6010B\3015

Lab Sample ID: L0006450-16
Client Sample ID: MW-17
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.34		0.04	1	N/A	KHR	06/26/00	19:34	6010B\3015

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0006450-17
Client Sample ID: MW-15
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	10		0.04	1	N/A	KHR	06/26/00	19:38	6010B\3015

Lab Sample ID: L0006450-18
Client Sample ID: MW-32
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	3.1		0.04	1	N/A	KHR	06/26/00	19:42	6010B\3015

Lab Sample ID: L0006450-19
Client Sample ID: MW-36
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	4.0		0.04	1	N/A	KHR	06/26/00	19:47	6010B\3015

Lab Sample ID: L0006450-20
Client Sample ID: MW-37
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	9.0		0.04	1	N/A	KHR	06/26/00	19:51	6010B\3015

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0006450-21
Client Sample ID: MW-35
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/18/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	5.2		0.04	1	N/A	KHR	06/26/00	19:56	6010B\3015

Lab Sample ID: L0006450-22
Client Sample ID: MW-2
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	13		0.04	1	N/A	KHR	05/23/00	14:21	6010B\3015

Lab Sample ID: L0006450-23
Client Sample ID: MW-5
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	1.8		0.04	1	N/A	KHR	05/23/00	14:26	6010B\3015

Lab Sample ID: L0006450-24
Client Sample ID: MW-7
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	18		0.04	1	N/A	KHR	05/23/00	14:30	6010B\3015

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0006450-25
Client Sample ID: MW-8
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.054		0.04	1	N/A	KHR	05/23/00	14:35	6010B\3015

Lab Sample ID: L0006450-26
Client Sample ID: MW-10
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.079		0.04	1	N/A	KHR	05/23/00	14:39	6010B\3015

Lab Sample ID: L0006450-27
Client Sample ID: MW-11
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.046		0.04	1	N/A	KHR	05/23/00	14:43	6010B\3015

Lab Sample ID: L0006450-28
Client Sample ID: MW-18
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	25		0.04	1	N/A	KHR	05/23/00	14:48	6010B\3015

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0006450-29
Client Sample ID: MW-30
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	1.5		0.04	1	N/A	KHR	05/23/00	15:01	6010B\3015

Lab Sample ID: L0006450-30
Client Sample ID: MW-31
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	13		0.04	1	N/A	KHR	05/23/00	15:05	6010B\3015

Lab Sample ID: L0006450-31
Client Sample ID: MW-28
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	0.69		0.04	1	N/A	KHR	05/23/00	15:09	6010B\3015

Lab Sample ID: L0006450-32
Client Sample ID: MW-18D
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	20		0.04	1	N/A	KHR	05/23/00	15:14	6010B\3015

RL = Reporting Limit

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0006450-33
Client Sample ID: MW-2D
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L	13		0.04	1	N/A	KHR	05/23/00	15:18	6010B\3015

Lab Sample ID: L0006450-34
Client Sample ID: FIELD BLANK
Site/Work ID: ORMET/HANNIBAL, OH

Matrix: Water
Collected: 05/16/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Iron, Dissolved.....	mg/L		ND	0.04	1	N/A	KHR	05/23/00	15:23	6010B\3015

RL = Reporting Limit

APPENDIX B-3

LABORATORY ANALYTICAL REPORT FOR OCTOBER 2000 MONITORING EVENT

TEST CERTIFICATE
KEMRON Environmental Services
109 Starlite Park
Marietta, Ohio 45750
Phone: (740) 373-4071

Hydrosystems Management Inc.
Glassworks Center Suite 109
331 S. Main street
Washington, PA 15301
Attention: Steve Menosky

PO Number:
Account Number: HYDRO-360

Login #: L0010276
Report Date: 10/24/00
Work ID: HM00311/ORMET REDUCTION MILL
Date Received: 10/11/00

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
L0010276-01	MW-36	L0010276-02	MW-32
L0010276-03	MW-16D	L0010276-04	MW-16

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

David L. Bumgarner

Certified By
David L. Bumgarner

KEMRON
ENVIRONMENTAL SERVICES

REPORT NARRATIVE
GENERAL CHEMISTRY

KEMRON Login No: L0010276

Cyanide

The laboratory attempted to analyze all of the samples without an initial dilution, however, in several cases these data were considered suspect. Color interference and the high levels of total and complex cyanide resulted in inconsistent results. Results after chlorination were often higher than the untreated samples. This suggests a possible matrix affect.

Please find that due to the large dilutions necessary, some results are non-detect at a higher detection limit.

The original analysie for sample MW-32, MW-16D, and MW-16 yielded total cyanide results much higher than the treated sample for cyanide amenable to chlorination. The analyses were repeated with the samples being distilled at a dilution. The results from the reanalysis are being reported.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Analyst: dih REVIEWED: clch DATE: 10/24/00

Rev. 6/00

Login #L0010276
October 24, 2000 10:51 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0010276-01
Client Sample ID: MW-36
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	4.9		0.50	50	N/A	DLN	10/13/00	09:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L		ND	0.50	50	N/A	JWR	10/17/00	10:00	335.1
Specific Conductance.....	umhos/cm	1200		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L	41		0.50	5	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	9.84			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L	0.024		0.004	1	N/A	KHR	10/20/00	10:50	6010B\3005A
Beryllium, Dissolved.....	mg/L	0.00061		0.0005	1	N/A	KHR	10/20/00	10:50	6010B\3005A
Manganese, Dissolved.....	mg/L	1.6		0.005	1	N/A	KHR	10/20/00	10:50	6010B\3005A
Sodium, Dissolved.....	mg/L	210		5.0	10	RE	KHR	10/20/00	11:26	6010B\3005A
Vanadium, Dissolved.....	mg/L	0.033		0.01	1	N/A	KHR	10/20/00	10:50	6010B\3005A

Lab Sample ID: L0010276-02
Client Sample ID: MW-32
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	8.3		0.25	25	N/A	JWR	10/19/00	10:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.76		0.25	25	N/A	JWR	10/19/00	10:00	335.1
Specific Conductance.....	umhos/cm	1500		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L	70		1.0	10	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	9.75			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L	0.051		0.004	1	N/A	KHR	10/20/00	10:54	6010B\3005A
Beryllium, Dissolved.....	mg/L	0.00099		0.0005	1	N/A	KHR	10/20/00	10:54	6010B\3005A
Manganese, Dissolved.....	mg/L	1.6		0.005	1	N/A	KHR	10/20/00	10:54	6010B\3005A
Sodium, Dissolved.....	mg/L	290		5.0	10	RE	KHR	10/20/00	11:31	6010B\3005A
Vanadium, Dissolved.....	mg/L	0.058		0.01	1	N/A	KHR	10/20/00	10:54	6010B\3005A

RL = Reporting Limit

Login #L0010276
October 24, 2000 10:51 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0010276-03
Client Sample ID: MW-16D
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	15		0.50	50	N/A	JWR	10/19/00	10:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L		ND	0.50	50	N/A	JWR	10/19/00	10:00	335.1
Specific Conductance.....	umhos/cm	1000		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L	13		0.20	2	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	7.77			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	10/20/00	09:27	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	10/20/00	09:27	6010B\3005A
Manganese, Dissolved.....	mg/L	1.7		0.005	1	N/A	KHR	10/20/00	09:27	6010B\3005A
Sodium, Dissolved.....	mg/L	130		5.0	10	RE	KHR	10/20/00	11:35	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	10/20/00	09:27	6010B\3005A

Lab Sample ID: L0010276-04
Client Sample ID: MW-16
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	16		0.50	50	N/A	JWR	10/19/00	10:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L		ND	0.50	50	N/A	JWR	10/19/00	10:00	335.1
Specific Conductance.....	umhos/cm	1000		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L	13		0.20	2	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	7.74			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	10/20/00	09:40	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	10/20/00	09:40	6010B\3005A
Manganese, Dissolved.....	mg/L	1.6		0.005	1	N/A	KHR	10/20/00	09:40	6010B\3005A
Sodium, Dissolved.....	mg/L	130		5.0	10	RE	KHR	10/20/00	11:48	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	10/20/00	09:40	6010B\3005A

RL = Reporting Limit

HMI
Environmental Consulting Services

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name/Location	Laboratory
HM00311	Ormet Reduction Mill, OH	Kemron

Sampling Personnel: J. Keller / J. Menosky

Sample ID	Date/Time	Sample Code	Total + Amenable Cr 250 ml Amber glass NAOH	pH, Sp. Cond F 500 ml plastic 4°C	Dissolved Metals Field Filtered 500 ml plastic HNO3							TOTAL
MW-36	10-10-00	L	1	1	1							3
MW-32	↓	↓	1	1	1							3
MW-16D			1	1	1							3
MW-16			1	1	1							3

Sample Code: L = Liquid; S = Solid; A = Air

Total Number of Containers: 12

Relinquished by: Jed Keller	Organization: HMI	Date: 10-11-00	Time: 1508	Seal Intact? Yes No NA
Received by: Jeanette K. Warden	Organization: Kemron	Date: 10-11-00	Time: 1508	
Relinquished by: Jeanette K. Warden	Organization: Kemron	Date: 10-11-00	Time: 1620	Seal Intact? Yes No NA
Received by: Brenda Oregon	Organization: Kemron	Date: 10-11-00	Time: 1620	

REMARKS: SKS intact
Cooler temp 3
KLG

DELIVERY METHOD: In Person [ ] Common Carrier [ ] Lab Courier [KEMRON] Other [ ]

TEST CERTIFICATE
KEMRON Environmental Services
109 Starlite Park
Marietta, Ohio 45750
Phone: (740) 373-4071

Hydrosystems Management Inc.
Glassworks Center Suite 109
331 S. Main street
Washington, PA 15301
Attention: Steve Menosky

PO Number:
Account Number: HYDRO-360

Login #: L0010245
Report Date: 10/24/00
Work ID: HM00311/ORMET REDUCTION MILL
Date Received: 10/10/00

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
L0010245-01	MW-12	L0010245-02	MW-28
L0010245-03	MW-35	L0010245-04	MW-37

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

David L. Bumgarner

Certified By
David L. Bumgarner

KEMRON
ENVIRONMENTAL SERVICES

REPORT NARRATIVE
GENERAL CHEMISTRY

KEMRON Login No: L0010245

Cyanide

The laboratory attempted to analyze all of the samples without an initial dilution, however, in several cases these data were considered suspect. Color interference and the high levels of total and complex cyanide resulted in inconsistent results. Results after chlorination were often higher than the untreated samples. This suggests a possible matrix affect.

Please find that due to the large dilutions necessary, some results are non-detect at a higher detection limit.

The original analysis for sample MW-35 yielded a total cyanide result much higher than the treated sample for cyanide amenable to chlorination. The analysis was repeated with the sample being distilled at a dilution. The results from the reanalysis are being reported.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Analyst: dih

REVIEWED: dih DATE: 10/24/00

Login #L0010245
October 24, 2000 10:51 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0010245-01
Client Sample ID: MW-12
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L		ND	0.01	1	N/A	DLN	10/13/00	09:00	9010B\9014
Specific Conductance.....	umhos/cm	530		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L	0.83		0.10	1	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	7.64			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	10/17/00	15:12	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	10/17/00	15:12	6010B\3005A
Manganese, Dissolved.....	mg/L	1.6		0.005	1	N/A	KHR	10/17/00	15:12	6010B\3005A
Sodium, Dissolved.....	mg/L	22		0.50	1	N/A	KHR	10/17/00	15:12	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	10/17/00	15:12	6010B\3005A

Lab Sample ID: L0010245-02
Client Sample ID: MW-28
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	0.96		0.05	5	N/A	DLN	10/13/00	09:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.28		0.02	2	N/A	JWR	10/17/00	10:00	335.1
Specific Conductance.....	umhos/cm	460		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L	0.27		0.10	1	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	5.85			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	10/17/00	15:30	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	10/17/00	15:30	6010B\3005A
Manganese, Dissolved.....	mg/L	0.014		0.005	1	N/A	KHR	10/17/00	15:30	6010B\3005A
Sodium, Dissolved.....	mg/L	52		0.50	1	N/A	KHR	10/17/00	15:30	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	10/17/00	15:30	6010B\3005A

RL = Reporting Limit

Login #L0010245
October 24, 2000 10:51 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0010245-03
Client Sample ID: MW-35
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	7.3		0.25	25	N/A	JWR	10/19/00	10:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.59		0.25	25	N/A	JWR	10/19/00	10:00	335.1
Specific Conductance.....	umhos/cm	520		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L	17		0.50	5	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	8.76			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L	0.0076		0.004	1	N/A	KHR	10/17/00	15:56	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	10/17/00	15:56	6010B\3005A
Manganese, Dissolved.....	mg/L	0.57		0.005	1	N/A	KHR	10/17/00	15:56	6010B\3005A
Sodium, Dissolved.....	mg/L	81		0.50	1	N/A	KHR	10/17/00	15:56	6010B\3005A
Vanadium, Dissolved.....	mg/L	0.11		0.01	1	N/A	KHR	10/17/00	15:56	6010B\3005A

Lab Sample ID: L0010245-04
Client Sample ID: MW-37
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	6.6		0.50	50	N/A	DLN	10/13/00	09:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L		ND	0.50	50	N/A	JWR	10/17/00	10:00	335.1
Specific Conductance.....	umhos/cm	750		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L	17		0.50	5	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	8.39			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L	0.0089		0.004	1	N/A	KHR	10/17/00	16:01	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	10/17/00	16:01	6010B\3005A
Manganese, Dissolved.....	mg/L	0.61		0.005	1	N/A	KHR	10/17/00	16:01	6010B\3005A
Sodium, Dissolved.....	mg/L	79		10	20	RE	KHR	10/18/00	12:52	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	10/17/00	16:01	6010B\3005A

RL = Reporting Limit

HMI
Environmental Consulting Services

Page _____ of _____

CHAIN-OF-CUSTODY RECORD

Project Number	Project Name/Location	Container Description/ Number of Containers										
HM00311	Ormet Reduction Mill, OH Laboratory: Kemron											
Sampling Personnel: J. Keller, S. Menosky												
Sample ID	Date/Time	Sample Code	Dissolved Metals Field Filtered 500 ml plastic HNO3	pH, Sp. Cond, F 500 ml plastic 4°C	Total + Amenable CN 250 Amber glass NAOH							TOTAL
MW-12	10-10-00	L	1	1	1							3
MW-28	↓	↓	1	1	1							3
MW-35	↓	↓	1	1	1							3
MW-37	↓	↓	1	1	1							3

Sample Code: L = Liquid; S = Solid; A = Air

Total Number of Containers: 12

Relinquished by: [signature]	Organization: HMI	Date: 10-10-00	Time: 1620	Seal Intact?	
Received by: [signature]	Organization: KEMRON	Date: 10-10-00	Time: 1620	Yes No NA	
Relinquished by: [signature]	Organization: KEMRON	Date: 10-10-00	Time: 1735	Seal Intact?	
Received by: Brenda Gregory	Organization: Kemron	Date: 10-11-00	Time: 0830 (*)	Yes No NA	

REMARKS:

SXS intact
Cooler Temp 5 [initials]
(*) SXS stored in locked cooler overnight [initials]

DELIVERY METHOD: In Person ☐ Common Carrier ☐ Lab Courier KEMRON Other ☐

TEST CERTIFICATE
KEMRON Environmental Services
109 Starlite Park
Marietta, Ohio 45750
Phone: (740) 373-4071

Hydrosystems Management Inc.
Glassworks Center Suite 109
331 S. Main street
Washington, PA 15301
Attention: Steve Menosky

PO Number:
Account Number: HYDRO-360

Login #: L0010246
Report Date: 10/30/00
Work ID: HM00311/ORMET REDUCTION MILL
Date Received: 10/10/00

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
L0010246-01	MW-2	L0010246-02	MW-5
L0010246-03	MW-5D	L0010246-04	MW-18
L0010246-05	MW-31	L0010246-06	FIELD BLANK-1
L0010246-07	TRIP BLANK		

cc:Elizebeth Tandy

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

Certified By
David L. Bumgarner

KEMRON
ENVIRONMENTAL SERVICES

REPORT NARRATIVE
GENERAL CHEMISTRY

KEMRON Login No: L0010246

Cyanide

The laboratory attempted to analyze all of the samples without an initial dilution, however, in several cases these data were considered suspect. Color interference and the high levels of total and complex cyanide resulted in inconsistent results. Results after chlorination were often higher than the untreated samples. This suggests a possible matrix affect.

Please find that due to the large dilutions necessary, some results are non-detect at a higher detection limit.

The original analyses for sample MW-2 and MW-31 yielded total cyanide results much higher than the treated sample for cyanide amenable to chlorination. The analyses were repeated with the samples being distilled at a dilution. The results from the reanalysis are being reported.

Sample MW-18 was analyzed several times to try and yield consistent results. The sample was distilled straight and at a dilution. Similar results were achieved when the sample was distilled at a ten fold dilution. However, the results for the treated portion were consistently higher than the total cyanide results. The result being reported for the cyanide, amenable to chlorination is < 1 mg/L.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Analyst: dih

REVIEWED: _____ DATE: _____

Rev. 6/00

Login #L0010246
October 30, 2000 11:15 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0010246-01
Client Sample ID: MW-2
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	17		0.50	50	N/A	JWR	10/19/00	10:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.73		0.50	50	N/A	JWR	10/19/00	10:00	335.1
Specific Conductance.....	umhos/cm	1800		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L	61		1.0	10	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	9.92			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L	0.077		0.004	1	N/A	KHR	10/17/00	16:05	6010B\3005A
Beryllium, Dissolved.....	mg/L	0.00051		0.0005	1	N/A	KHR	10/17/00	16:05	6010B\3005A
Manganese, Dissolved.....	mg/L	1.0		0.005	1	N/A	KHR	10/17/00	16:05	6010B\3005A
Sodium, Dissolved.....	mg/L	270		10	20	RE	KHR	10/18/00	12:56	6010B\3005A
Vanadium, Dissolved.....	mg/L	0.039		0.01	1	N/A	KHR	10/17/00	16:05	6010B\3005A

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0010246-01
Client Sample ID: MW-2
Site/Work ID: HM00311/ORMET REDUCTION MILL
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 10/10/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 10/13/00 Time: 15:55

Instrument: HPMS9
Analyst: RSS
Lab File ID: 9M12849

Method: 8260B
Run ID: R104230
Batch : WG85743

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	88.1	(86 - 118%)
1,2-Dichloroethane-d4.....	97.0	(80 - 120%)
Toluene-d8.....	108	(88 - 110%)
4-Bromofluorobenzene.....	109	(86 - 115%)

RL = Reporting Limit

Login #L0010246
October 30, 2000 11:15 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0010246-02
Client Sample ID: MW-5
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	2.6		0.10	10	N/A	DLN	10/13/00	09:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	2.6		0.10	10	N/A	JWR	10/17/00	10:00	335.1
Specific Conductance.....	umhos/cm	1000		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L	11		0.20	2	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	8.71			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L	0.006		0.004	1	N/A	KHR	10/17/00	16:10	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	10/17/00	16:10	6010B\3005A
Manganese, Dissolved.....	mg/L	0.35		0.005	1	N/A	KHR	10/17/00	16:10	6010B\3005A
Sodium, Dissolved.....	mg/L	120		10	20	RE	KHR	10/18/00	13:00	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	10/17/00	16:10	6010B\3005A

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0010246-02
Client Sample ID: MW-5
Site/Work ID: HM00311/ORMET REDUCTION MILL
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 10/10/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 10/13/00 Time: 15:24

Instrument: HPMS9
Analyst: RSS
Lab File ID: 9M12848

Method: 8260B
Run ID: R104230
Batch : WG85743

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	87.2	(86 - 118%)
1,2-Dichloroethane-d4.....	93.5	(80 - 120%)
Toluene-d8.....	107	(88 - 110%)
4-Bromofluorobenzene.....	109	(86 - 115%)

RL = Reporting Limit

Login #L0010246
October 30, 2000 11:15 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0010246-03
Client Sample ID: MW-5D
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	2.5		0.10	10	N/A	DLN	10/13/00	09:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	2.5		0.10	10	N/A	JWR	10/17/00	10:00	335.1
Specific Conductance.....	umhos/cm	1000		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L	11		0.20	2	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	8.71			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L	0.0061		0.004	1	N/A	KHR	10/17/00	16:14	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	10/17/00	16:14	6010B\3005A
Manganese, Dissolved.....	mg/L	0.35		0.005	1	N/A	KHR	10/17/00	16:14	6010B\3005A
Sodium, Dissolved.....	mg/L	110		10	20	RE	KHR	10/18/00	13:04	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	10/17/00	16:14	6010B\3005A

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0010246-03
Client Sample ID: MW-5D
Site/Work ID: HM00311/ORMET REDUCTION MILL
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 10/10/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 10/13/00 Time: 14:52

Instrument: HPMS9
Analyst: RSS
Lab File ID: 9M12847

Method: 8260B
Run ID: R104230
Batch : WG85743

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	85.8	*	(86 - 118%)
1,2-Dichloroethane-d4.....	93.2		(80 - 120%)
Toluene-d8.....	107		(88 - 110%)
4-Bromofluorobenzene.....	109		(86 - 115%)

RL = Reporting Limit

Login #L0010246
October 30, 2000 11:15 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0010246-04
Client Sample ID: MW-18
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	29		1.0	100	N/A	JWR	10/19/00	10:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L		ND	1.0	100	N/A	JWR	10/19/00	10:00	335.1
Specific Conductance.....	umhos/cm	2400		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L	130		2.5	25	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	9.54			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L	0.074		0.004	1	N/A	KHR	10/17/00	16:19	6010B\3005A
Beryllium, Dissolved.....	mg/L	0.0024		0.0005	1	N/A	KHR	10/17/00	16:19	6010B\3005A
Manganese, Dissolved.....	mg/L	2.1		0.005	1	N/A	KHR	10/17/00	16:19	6010B\3005A
Sodium, Dissolved.....	mg/L	400		10	20	RE	KHR	10/18/00	13:09	6010B\3005A
Vanadium, Dissolved.....	mg/L	0.08		0.01	1	N/A	KHR	10/17/00	16:19	6010B\3005A

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0010246-04
Client Sample ID: MW-18
Site/Work ID: HM00311/ORMET REDUCTION MILL
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 10/10/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 10/13/00 Time: 14:21

Instrument: HPMS9
Analyst: RSS
Lab File ID: 9M12846

Method: 8260B
Run ID: R104230
Batch : WG85743

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	12		5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	97.2	(86 - 118%)
1,2-Dichloroethane-d4.....	110	(80 - 120%)
Toluene-d8.....	104	(88 - 110%)
4-Bromofluorobenzene.....	110	(86 - 115%)

RL = Reporting Limit

Login #L0010246
October 30, 2000 11:15 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0010246-05
Client Sample ID: MW-31
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L	20		0.50	50	N/A	JWR	10/19/00	10:00	9010B\9014
Cyanide, Amenable to Cl.....	mg/L	0.54		0.50	50	N/A	JWR	10/19/00	10:00	335.1
Specific Conductance.....	umhos/cm	2800		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L	140		2.5	25	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	9.99			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L	0.056		0.004	1	N/A	KHR	10/17/00	16:23	6010B\3005A
Beryllium, Dissolved.....	mg/L	0.00076		0.0005	1	N/A	KHR	10/17/00	16:23	6010B\3005A
Manganese, Dissolved.....	mg/L	1.1		0.005	1	N/A	KHR	10/17/00	16:23	6010B\3005A
Sodium, Dissolved.....	mg/L	480		10	20	RE	KHR	10/18/00	13:13	6010B\3005A
Vanadium, Dissolved.....	mg/L	0.079		0.01	1	N/A	KHR	10/17/00	16:23	6010B\3005A

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0010246-05
Client Sample ID: MW-31
Site/Work ID: HM00311/ORMET REDUCTION MILL
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 10/10/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 10/13/00 Time: 13:50

Instrument: HPMS9
Analyst: RSS
Lab File ID: 9M12845

Method: 8260B
Run ID: R104230
Batch : WG85743

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L	43		5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	86.0	(86 - 118%)
1,2-Dichloroethane-d4.....	96.1	(80 - 120%)
Toluene-d8.....	106	(88 - 110%)
4-Bromofluorobenzene.....	109	(86 - 115%)

RL = Reporting Limit

Login #L0010246
October 30, 2000 11:15 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L0010246-06
Client Sample ID: FIELD BLANK-1
Site/Work ID: HM00311/ORMET REDUCTION MILL

Matrix: Water
Collected: 10/10/00 00:00
COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total.....	mg/L		ND	0.01	1	N/A	JWR	10/17/00	10:00	9010B\9014
Specific Conductance.....	umhos/cm	1.4		1.0	1	N/A	DLP	10/16/00	15:50	120.1
Fluoride.....	mg/L		ND	0.10	1	N/A	DLP	10/12/00	09:30	SM4500-F-C
pH	UNITS	5.44			1	N/A	DLP	10/11/00	08:00	150.1
Arsenic, Dissolved.....	mg/L		ND	0.004	1	N/A	KHR	10/17/00	16:27	6010B\3005A
Beryllium, Dissolved.....	mg/L		ND	0.0005	1	N/A	KHR	10/17/00	16:27	6010B\3005A
Manganese, Dissolved.....	mg/L		ND	0.005	1	N/A	KHR	10/17/00	16:27	6010B\3005A
Sodium, Dissolved.....	mg/L		ND	0.50	1	N/A	KHR	10/17/00	16:27	6010B\3005A
Vanadium, Dissolved.....	mg/L		ND	0.01	1	N/A	KHR	10/17/00	16:27	6010B\3005A

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0010246-06
Client Sample ID: FIELD BLANK-1
Site/Work ID: HM00311/ORMET REDUCTION MILL
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 10/10/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 10/13/00 Time: 13:19

Instrument: HPMS9
Analyst: RSS
Lab File ID: 9M12844

Method: 8260B
Run ID: R104230
Batch : WG85743

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	87.4	(86 - 118%)
1,2-Dichloroethane-d4.....	96.8	(80 - 120%)
Toluene-d8.....	107	(88 - 110%)
4-Bromofluorobenzene.....	107	(86 - 115%)

RL = Reporting Limit

Login #L0010246
October 30, 2000 11:15 am

KEMRON ENVIRONMENTAL SERVICES

Product: 826-TETRACHLOROETHEN - Volatile Organics

Lab Sample ID: L0010246-07
Client Sample ID: TRIP BLANK
Site/Work ID: HM00311/ORMET REDUCTION MILL
Matrix: Water

Dil. Type: N/A
COC Info: N/A
Date Collected: 10/10/00

Sample Weight: N/A
Extract Volume: N/A
% Solid: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 10/13/00 Time: 16:26

Instrument: HPMS9
Analyst: RSS
Lab File ID: 9M12850

Method: 8260B
Run ID: R104230
Batch : WG85743

CAS #	Compound	Units	Result	Qualifiers	RL	Dilution
127-18-4	Tetrachloroethene.....	ug/L		ND	5.0	1

SURROGATES- In Percent Recovery:

Dibromofluoromethane.....	89.3	(86 - 118%)
1,2-Dichloroethane-d4.....	96.2	(80 - 120%)
Toluene-d8.....	109	(88 - 110%)
4-Bromofluorobenzene.....	108	(86 - 115%)

RL = Reporting Limit

HMI
Environmental Consulting Services

CHAIN – OF – CUSTODY RECORD

Project Number	Project Name/Location	Container Description/ Number of Containers
HM00311	Ormet Reduction Mill, OH	
	Laboratory: Kemron	
Sampling Personnel: J. Keller / S. Menosky		

Sample ID	Date/Time	Sample Code	Dissolved Metals Field Filtered 500 ml plastic HNO_3	Total + Amenable Cn 250 ml glass NAOH	pH, Sp Cond, F 500 ml plastic 4° C	PCE 40 ml glass HCL						TOTAL
MW-2	10-10-00	L	1	1	1	2						5
MW-5	↓	↓	1	1	1	2						5
MW-5d	↓	↓	1	1	1	2						5
MW-18	↓	↓	1	1	1	2						5
MW-31	↓	↓	1	1	1	2						5
Field Blank-1	↓	↓	1	1	1	2						5
Trip Blank	↓	↓				2						2

Sample Code: L = Liquid; S = Solid; A = Air

Total Number of Containers: 32

Relinquished by: [signature]	Organization: HMI	Date: 10-10-00	Time: 1621	Seal Intact?	
Received by: [signature]	Organization: KEMRON	Date: 10-10-00	Time: 1621	Yes No NA	
Relinquished by: [signature]	Organization: KEMRON	Date: 10-10-00	Time: 1735	Seal Intact?	
Received by: Brenda Gregory	Organization: Kemron	Date: 10-11-00	Time: 0830 (*)	Yes No NA	

REMARKS:

SYS intact
Cooler Temp 5 (69)
(*) sys stored in locked cooler overnight
(BG)

DELIVERY METHOD: In Person ☐ Common Carrier ☐ Lab Courier KEMRON Other ☐

APPENDIX C

DATA VALIDATION SUMMARY REPORT FOR 2000 MONITORING EVENTS

APPENDIX C
DATA VALIDATION SUMMARY REPORT
2000 REMEDIAL ACTION GROUND-WATER MONITORING

ORMET CORPORATION
HANNIBAL, OHIO

Under the Remedial Action Ground-Water Monitoring Plan for the Ormet Corporation site, ground-water samples were collected in January, May and September. The samples were analyzed by Kemron Environmental Services of Marietta, Ohio using SW-846 and EPA protocols. Validation of the analytical results was conducted by applying principals and concepts of the USEPA National Functional Guidelines. The validation process included review of holding times, blank results, surrogate and matrix spike recoveries, and laboratory control sample results. A summary of the validation results for each of the monitoring events conducted during 2000 is provided below.

January 2000 Monitoring Event

- Amenable cyanide reported in method blank at 0.002 mg/L. By application of 5X rule, results below 0.010 mg/L would be considered non-detect. No data affected by application of 5X rule.

May 2000 Monitoring Event

- Beryllium and sodium reported in method blank at 0.0001 mg/L and 0.1280 mg/L, respectively. By application of 5X rule, results below 0.0005 mg/L for beryllium and 0.640 mg/L for sodium would be considered non-detect. Standard reporting limits for beryllium and sodium are 0.0005 mg/L and 10 mg/L, respectively. Therefore, no data are affected by application of the 5X rule.

- Recoveries for the surrogate compound dibromofluoromethane for the MW-2D (83.4%) and MW-18D (82%) samples were slightly below the control range of 86% - 118%. This is not considered significant, and the results were not qualified.

- Matrix spike result for total cyanide (77.59%) and amenable cyanide (60.5%)were below the lower control limit of 81%. This is not considered significant, and the results were not qualified.

October 2000 Monitoring Event

- During the analysis of the MW-5D sample for tetrachloroethene, recovery for the surrogate compound dibromofluoromethane (85.8%) was slightly below the control range of 86% - 118%. This is not considered significant, and the results were not qualified.

- Arsenic, beryllium, and sodium reported in method blank at 0.0017 mg/L, 0.0001 mg/L, and 0.1640 mg/L, respectively. By application of the 5X rule, results below 0.0085 mg/L for arsenic, 0.0005 mg/L for beryllium, and 0.82 mg/L for sodium would be considered non-detect. Standard reporting limits for beryllium and sodium are 0.0005 mg/L and 10 mg/L, respectively. Therefore, no data are affected by application of the 5X rule for these parameters. With regard to arsenic, results for samples MW-5, MW-5D, and MW-35 were 0.006 mg/L, 0.0061 mg/L, and 0.0076 mg/L, respectively. By application of the 5X rule, the arsenic results for these three samples were reported in the database as <0.0085 mg/L.

- For samples MW-16, MW-16D, MW-32, and MW-36, the matrix spike result (74%) for manganese was slightly below the control range of 75% - 125%. This is not considered significant, and the results were not qualified.

ORMET-00.C

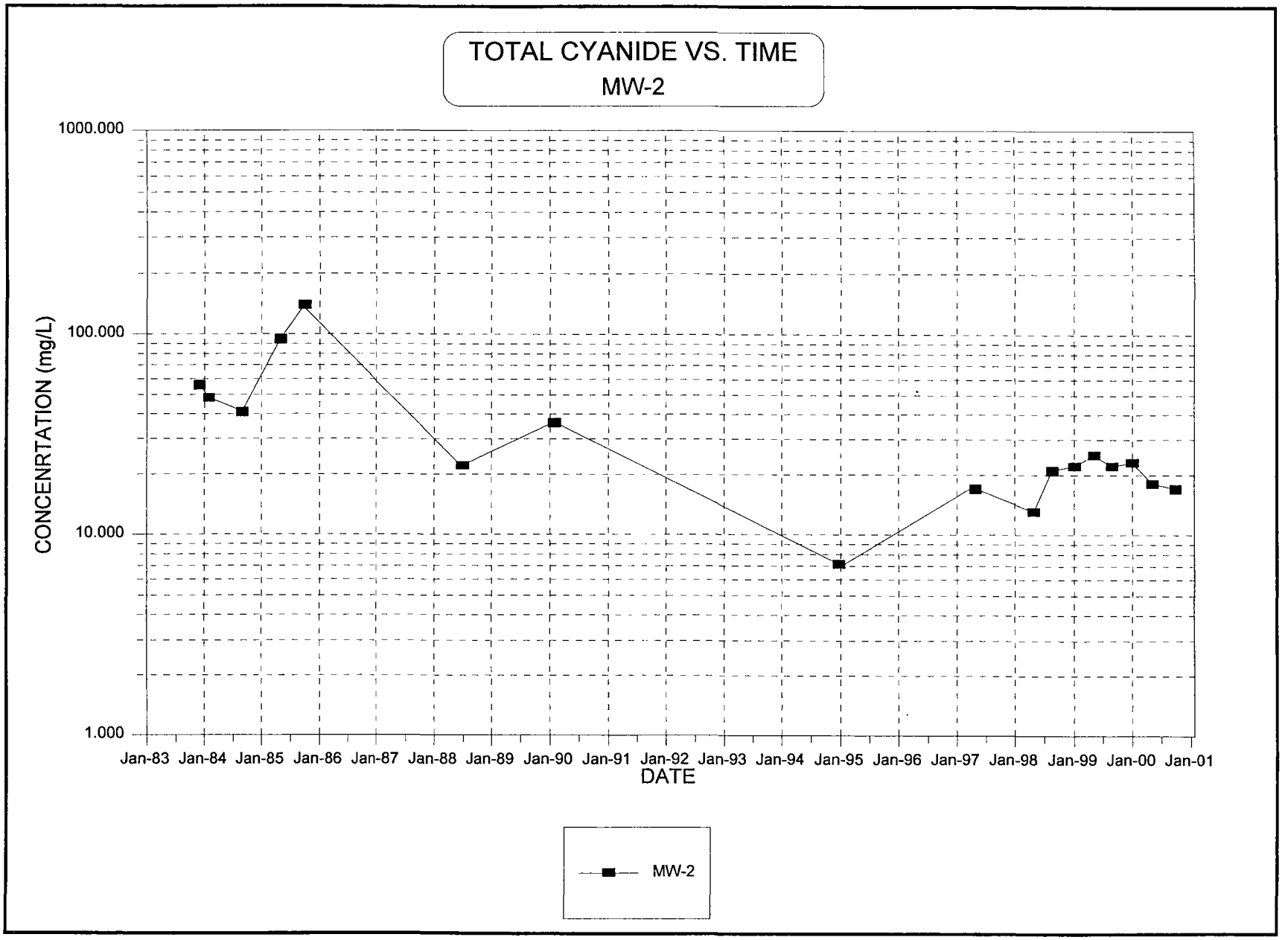
APPENDIX D

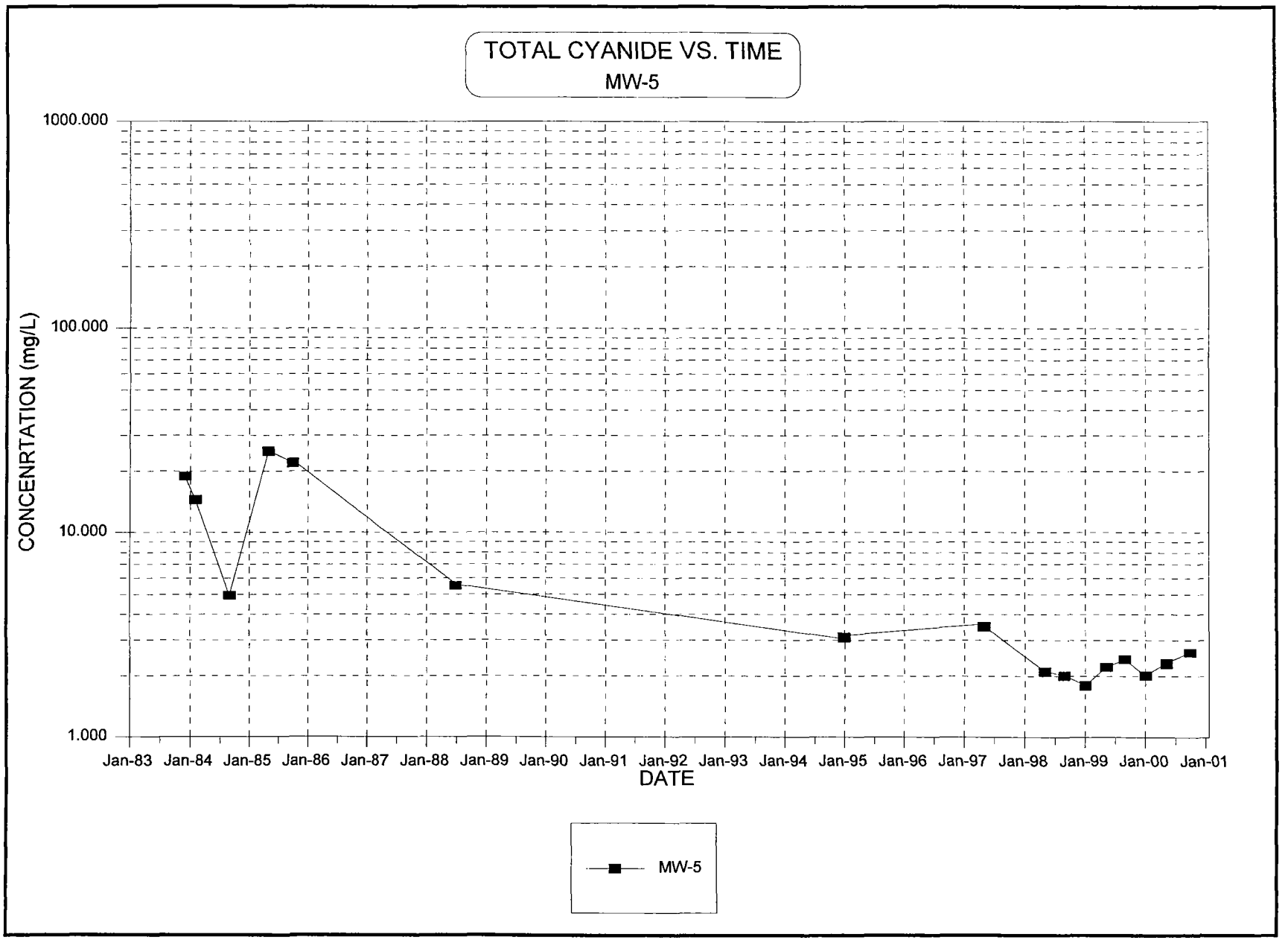
CONCENTRATION VS. TIME GRAPHS FOR REMEDIAL ACTION MONITORING PARAMETERS

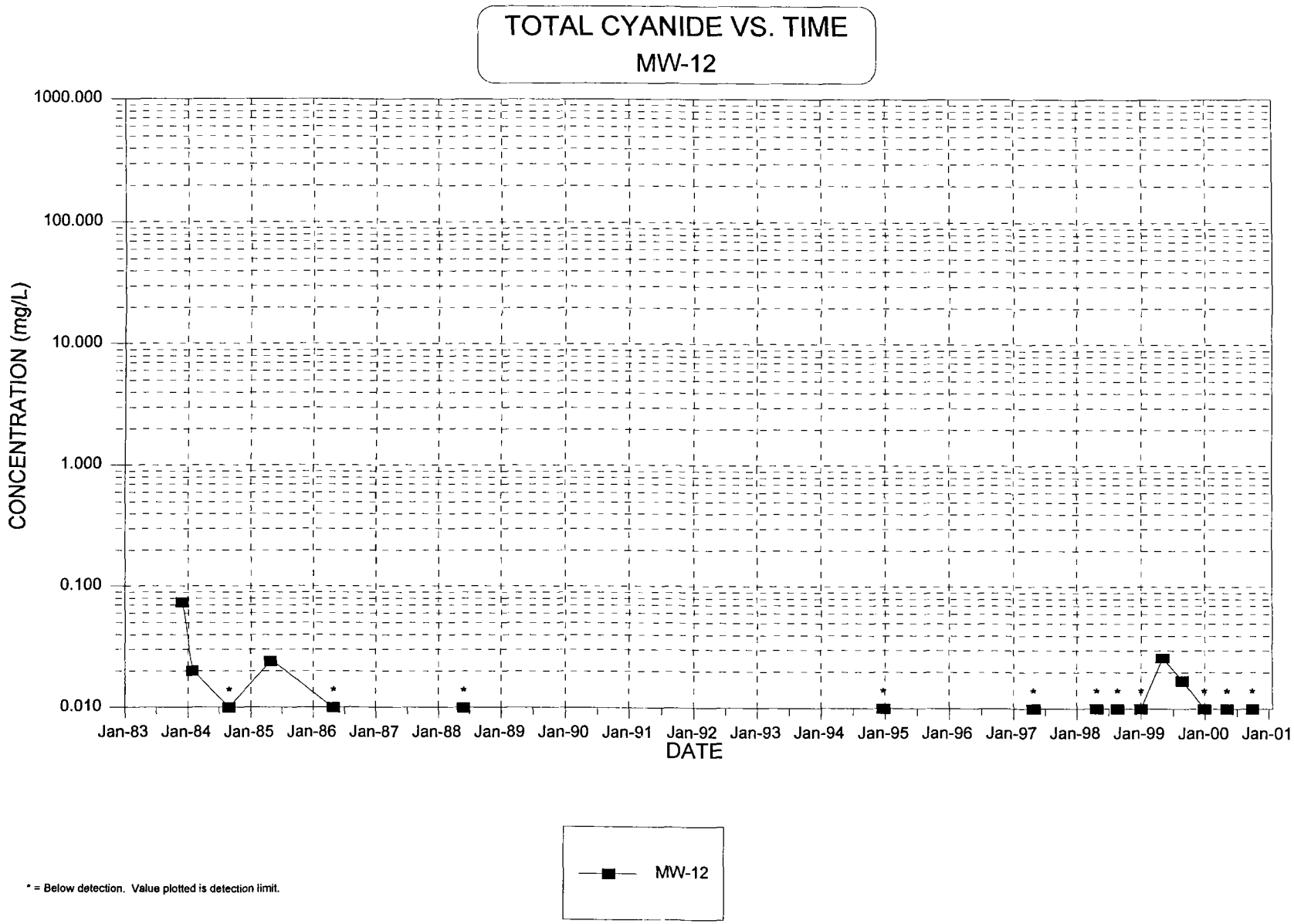
Appendix D-1	Total Cyanide
Appendix D-2	Cyanide Amenable to Chlorination
Appendix D-3	Fluoride
Appendix D-4	Arsenic
Appendix D-5	Beryllium
Appendix D-6	Manganese
Appendix D-7	Vanadium
Appendix D-8	Tetrachloroethene
Appendix D-9	Sodium

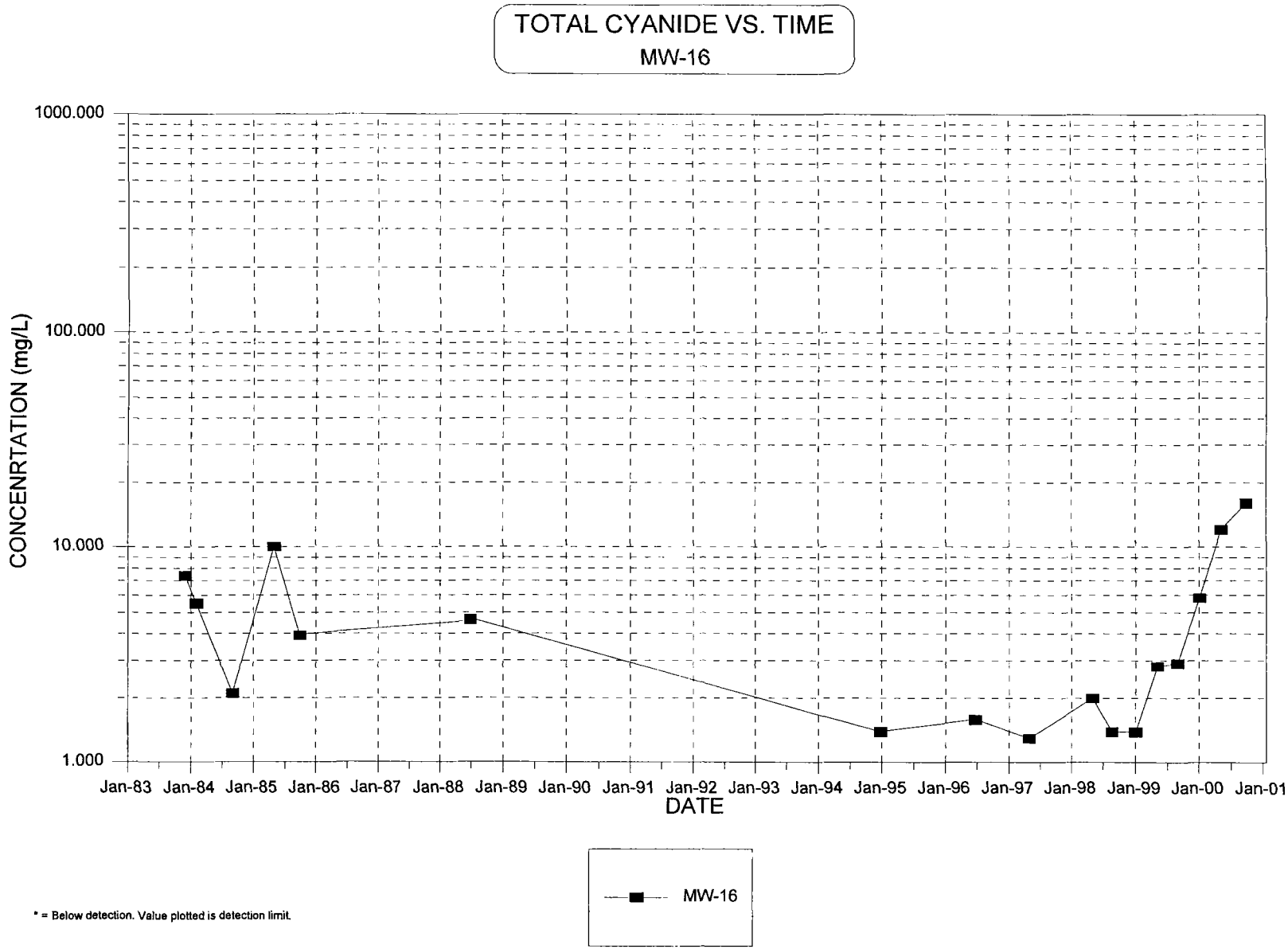
APPENDIX D-1

TOTAL CYANIDE


TOTAL CYANIDE VS. TIME
MW-2
1000.000
100.000
10.000
1.000
CONCENRTATION (mg/L)
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-2

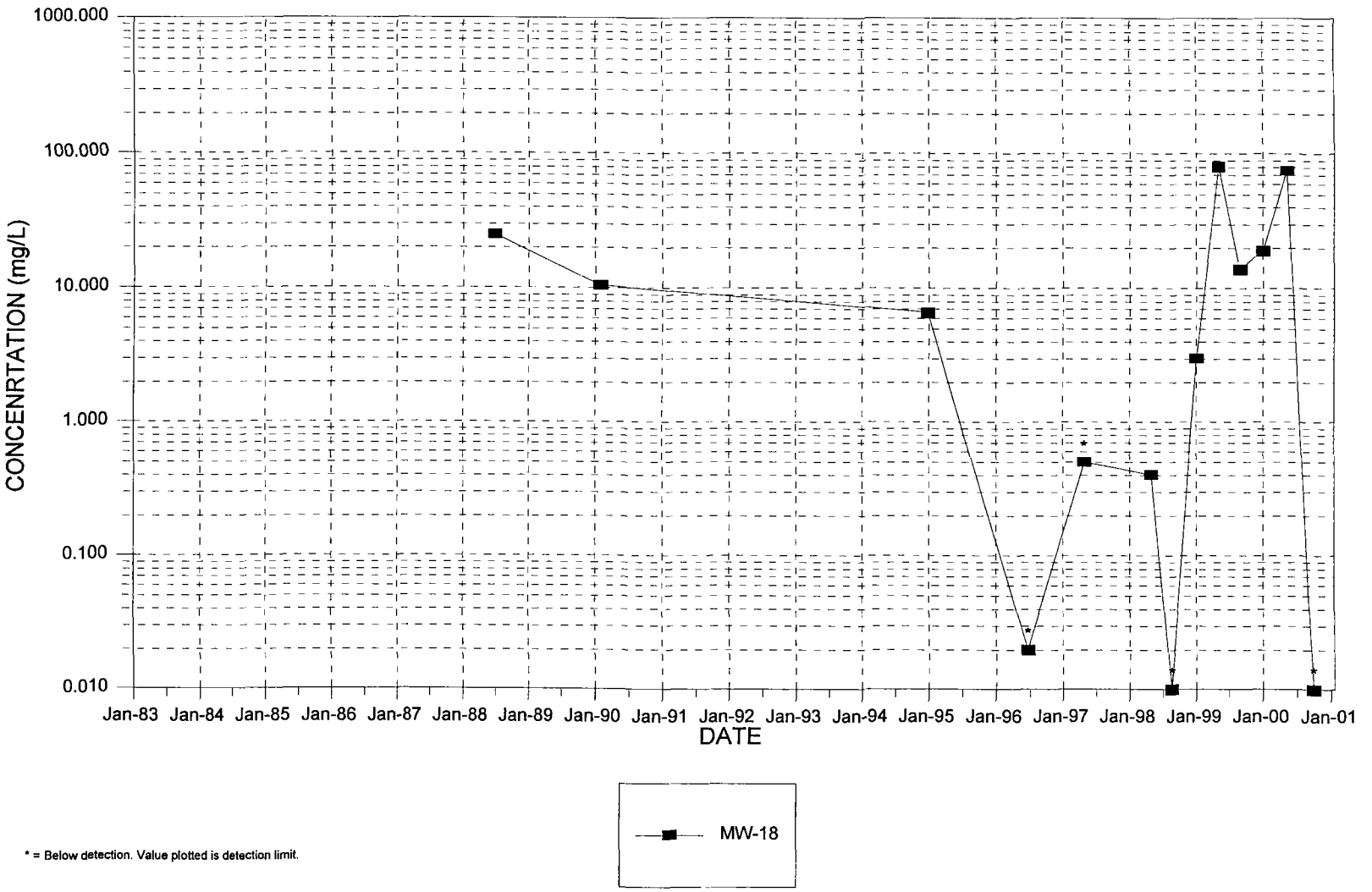

TOTAL CYANIDE VS. TIME
MW-5
1000.000
100.000
10.000
1.000
CONCENRTATION (mg/L)
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-5


TOTAL CYANIDE VS. TIME
MW-12
1000.000
100.000
10.000
1.000
0.100
0.010
CONCENTRATION (mg/L)
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-12
* = Below detection. Value plotted is detection limit.

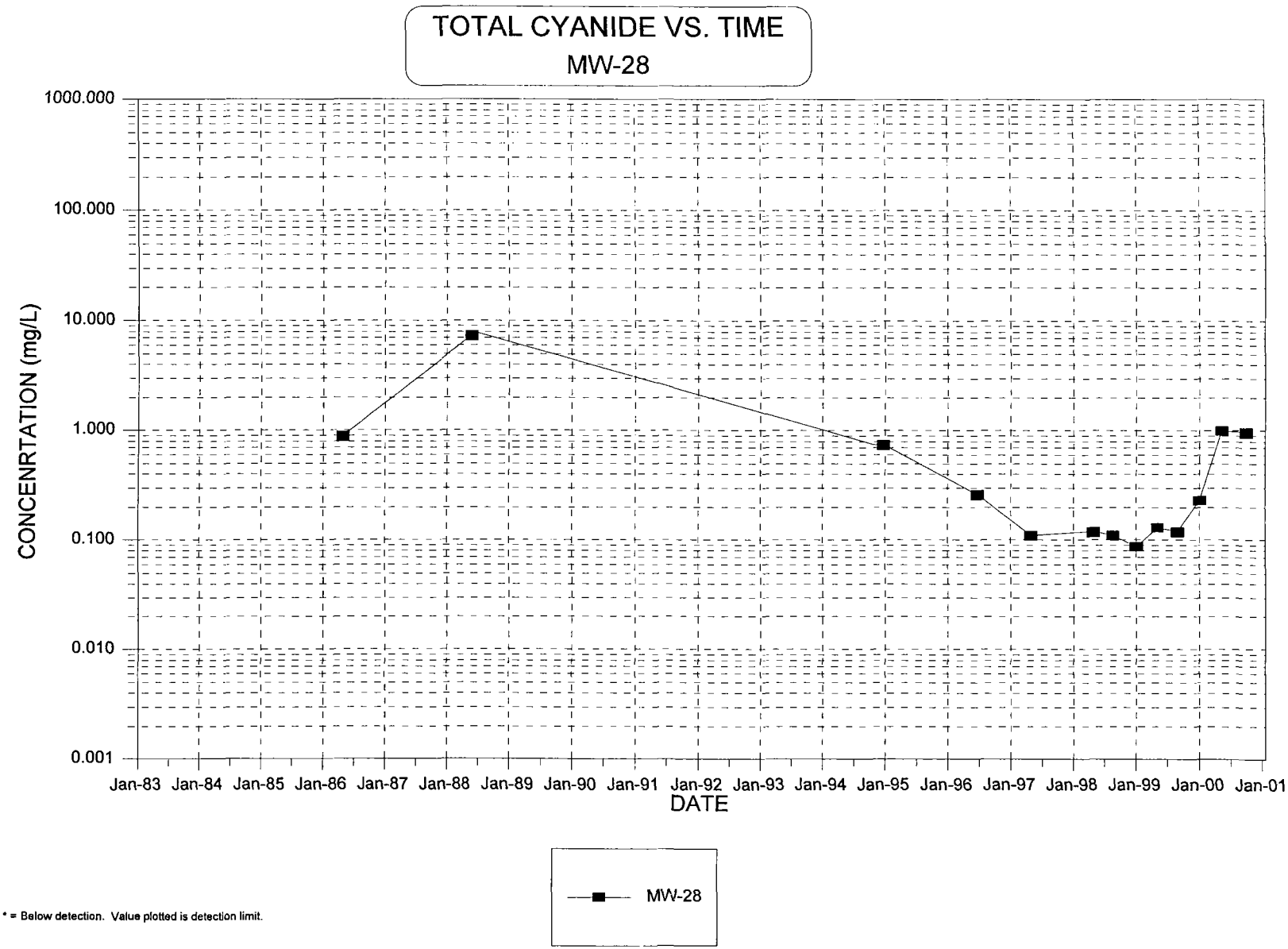


* = Below detection. Value plotted is detection limit.

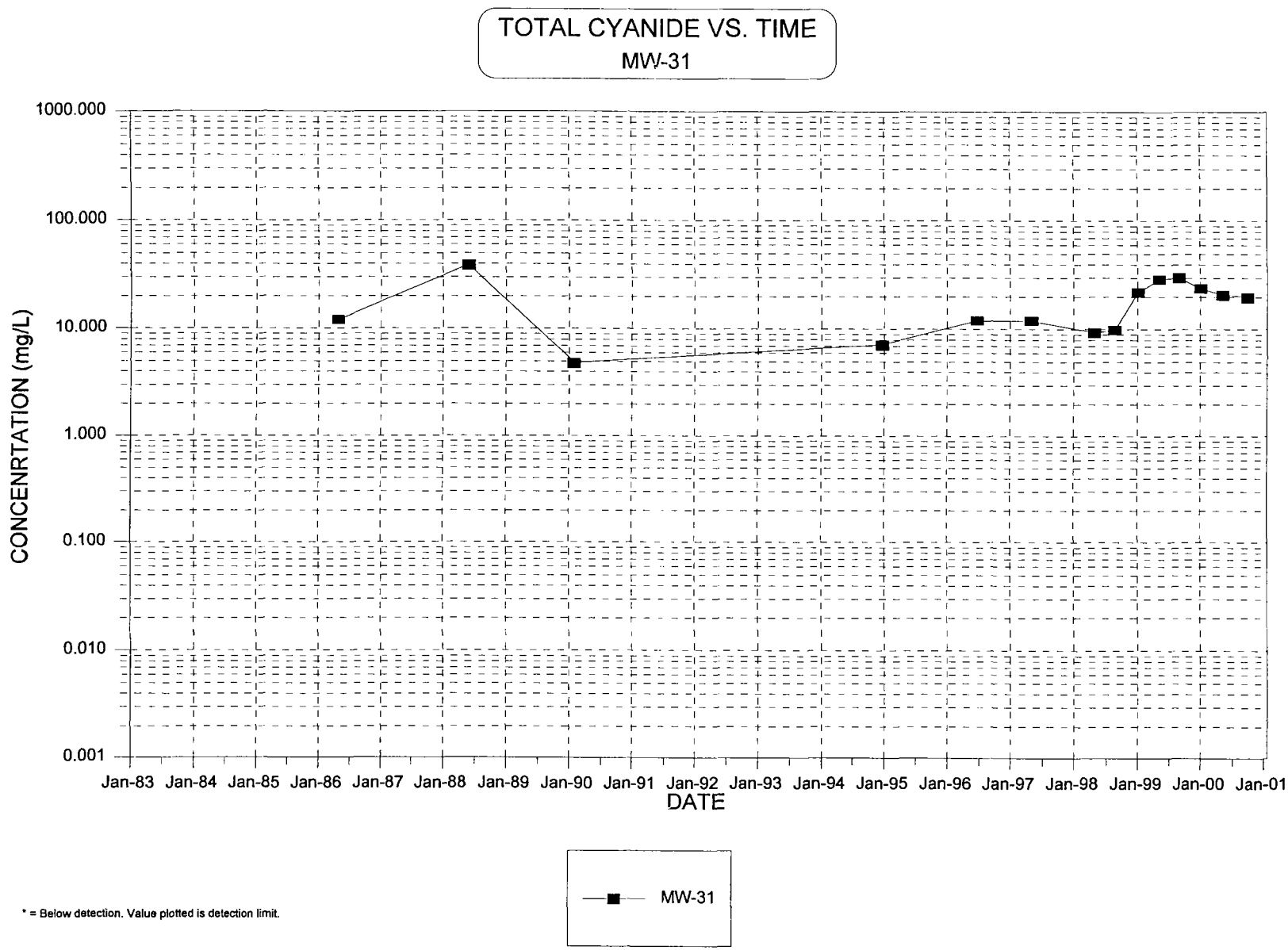
TOTAL CYANIDE VS. TIME
MW-18



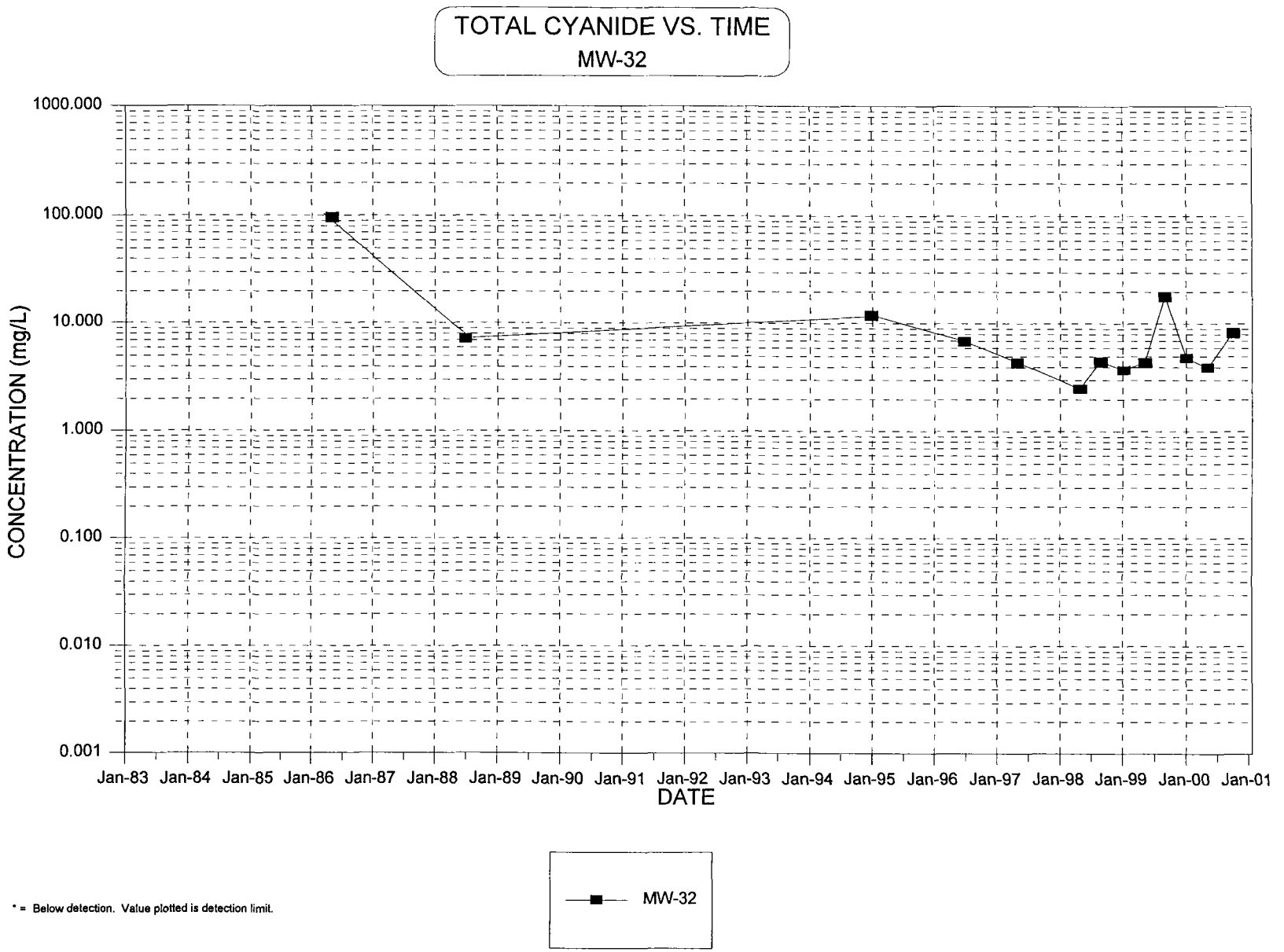
* = Below detection. Value plotted is detection limit.



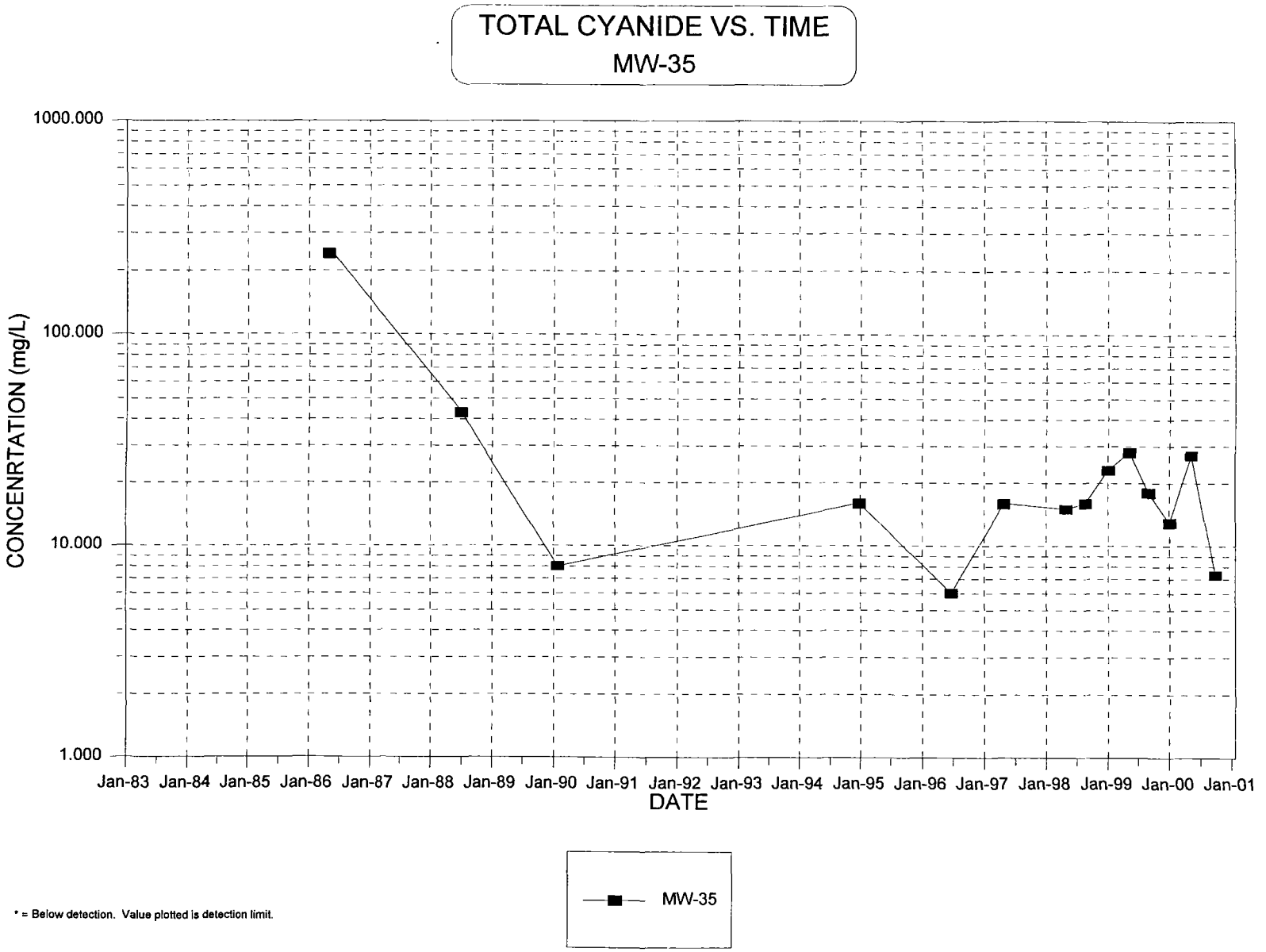
* = Below detection. Value plotted is detection limit.



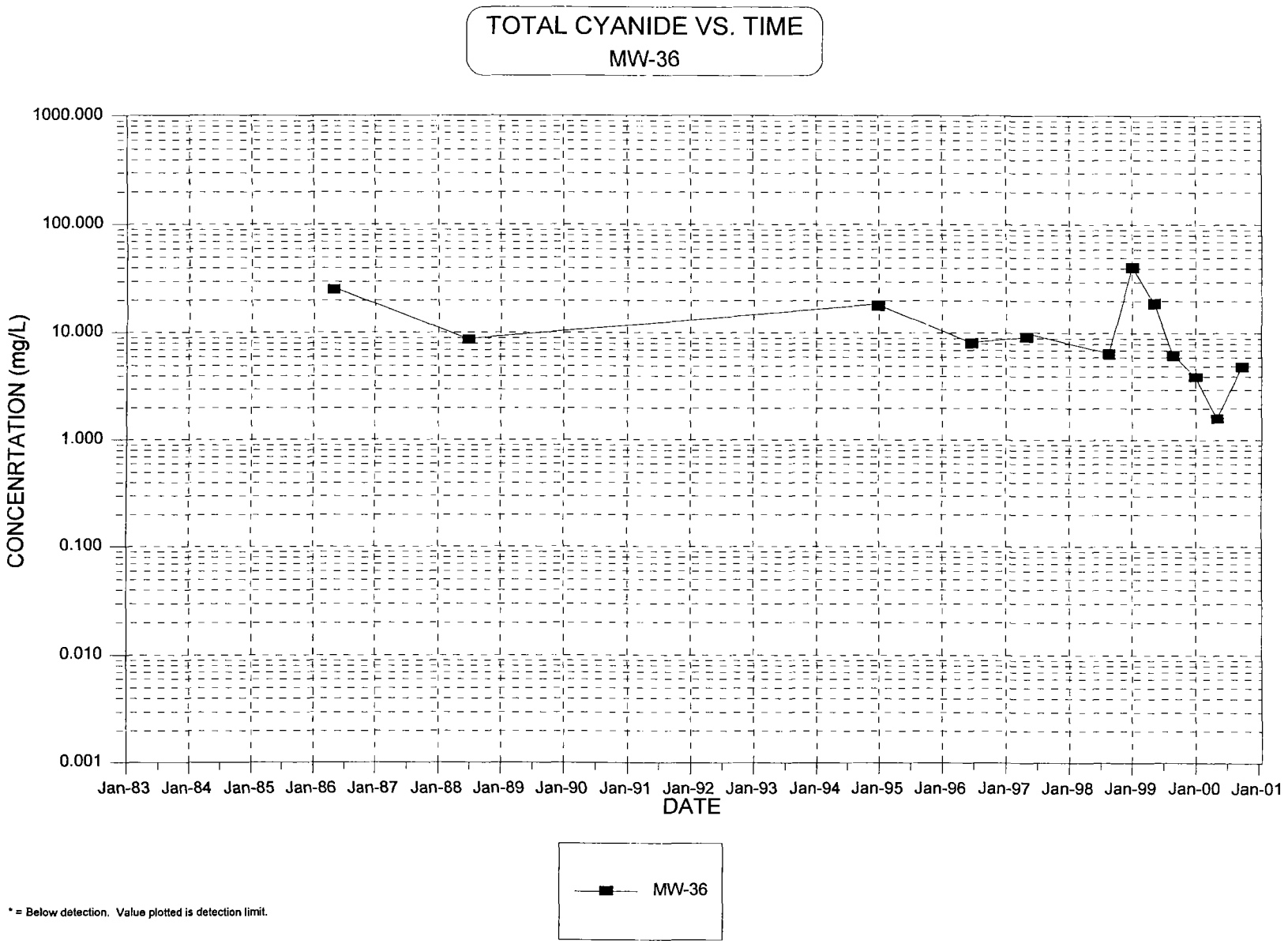
* = Below detection. Value plotted is detection limit.



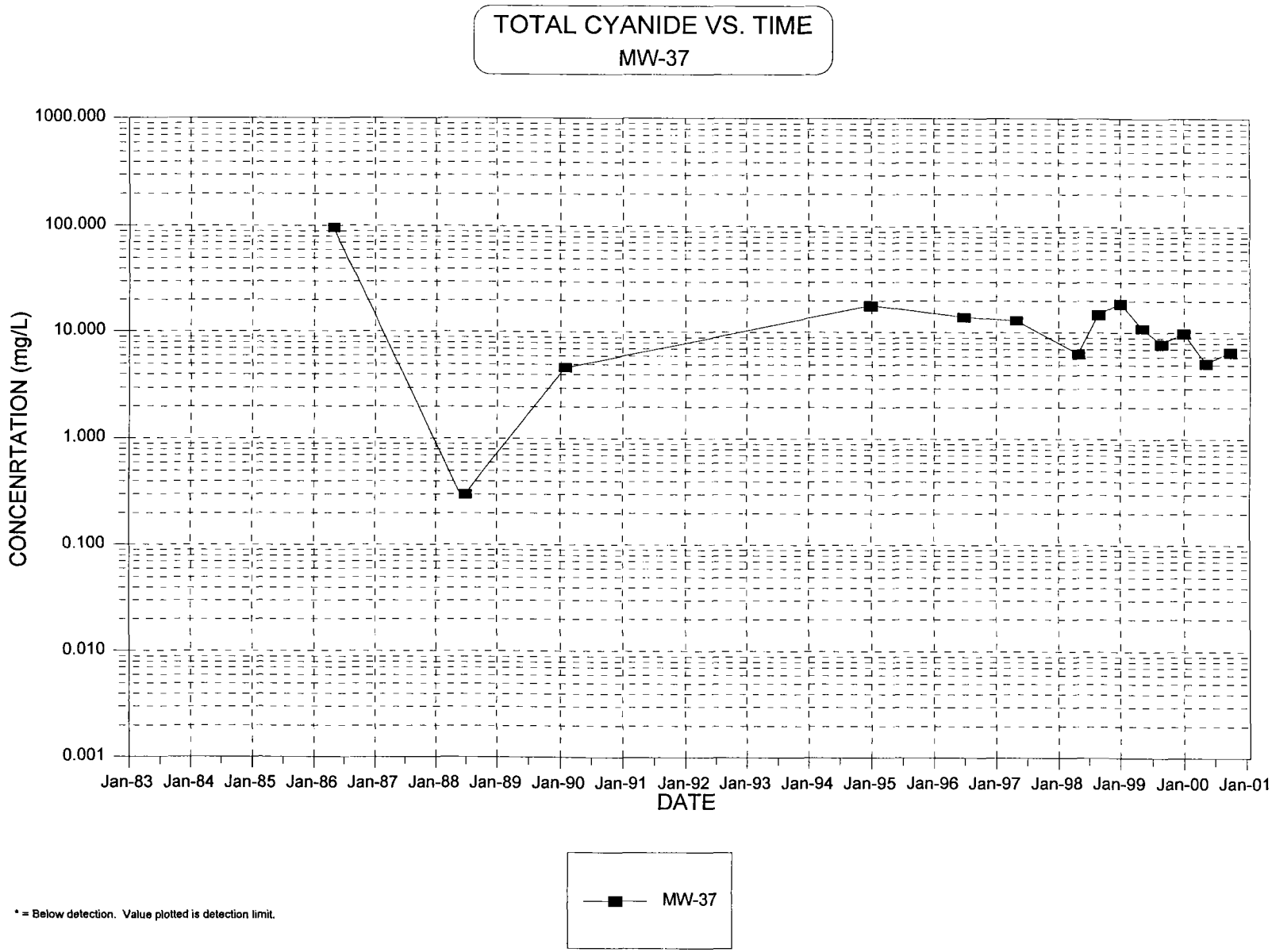
* = Below detection. Value plotted is detection limit.



* = Below detection. Value plotted is detection limit.



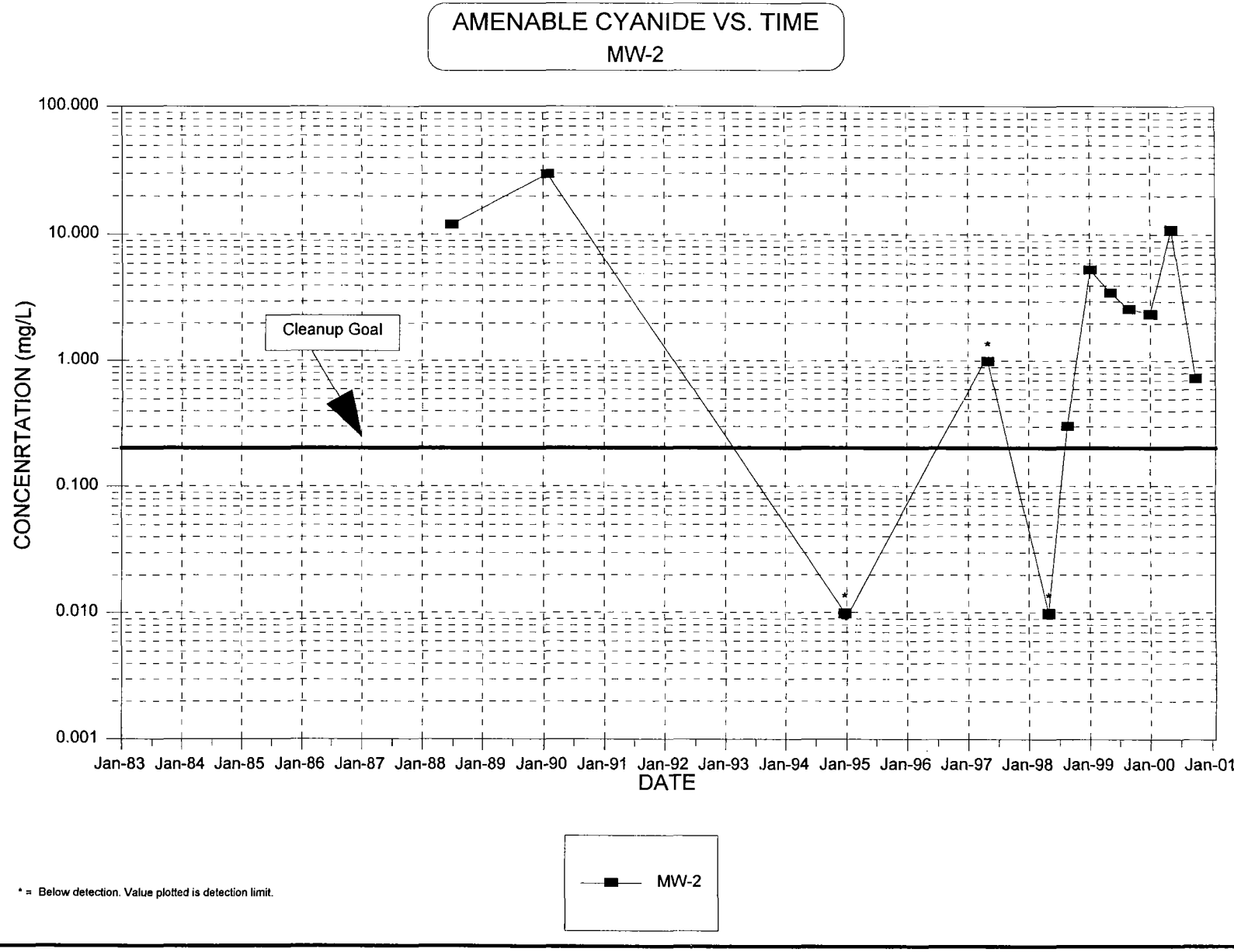
* = Below detection. Value plotted is detection limit.



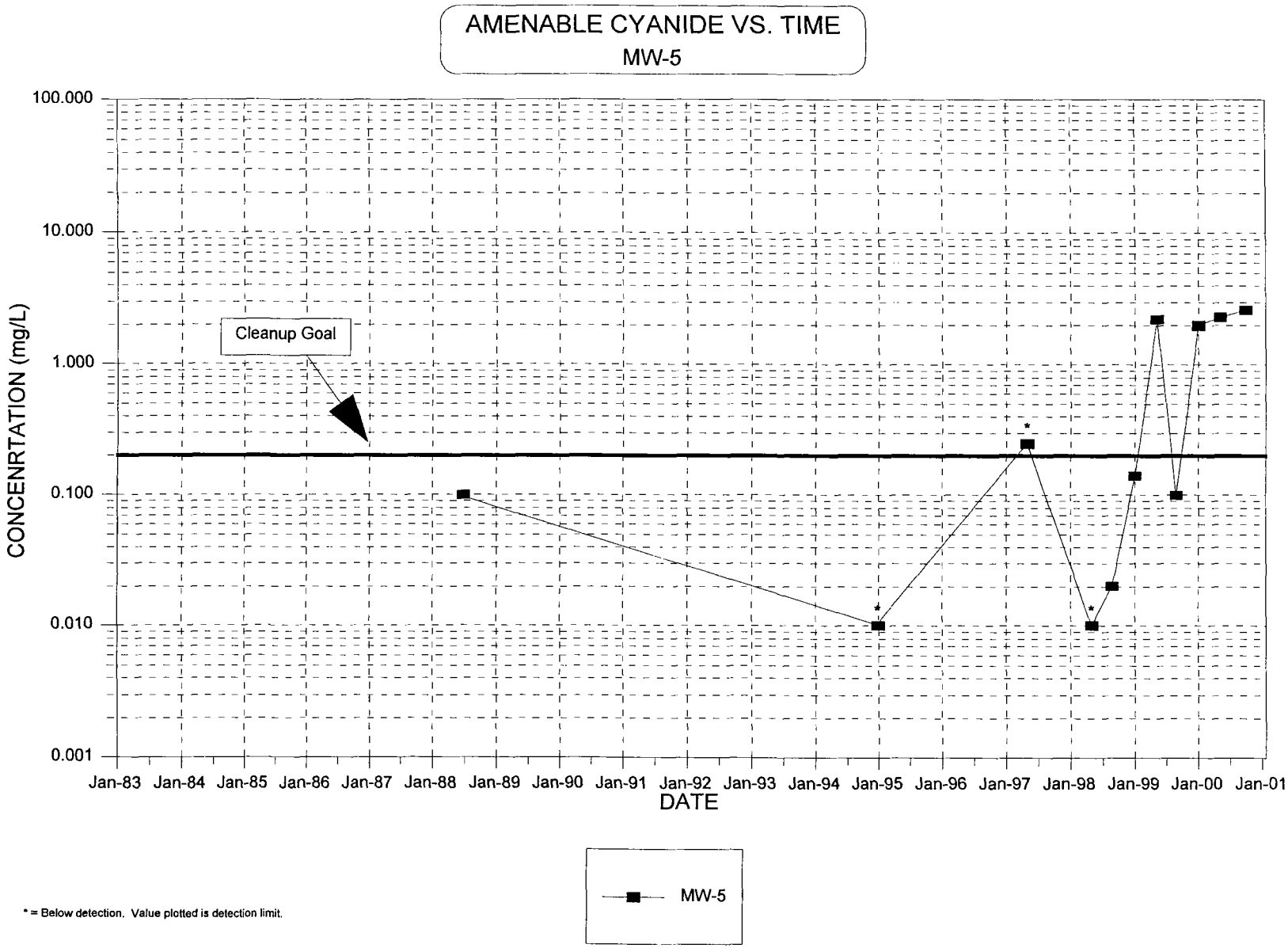
* = Below detection. Value plotted is detection limit.

APPENDIX D-2

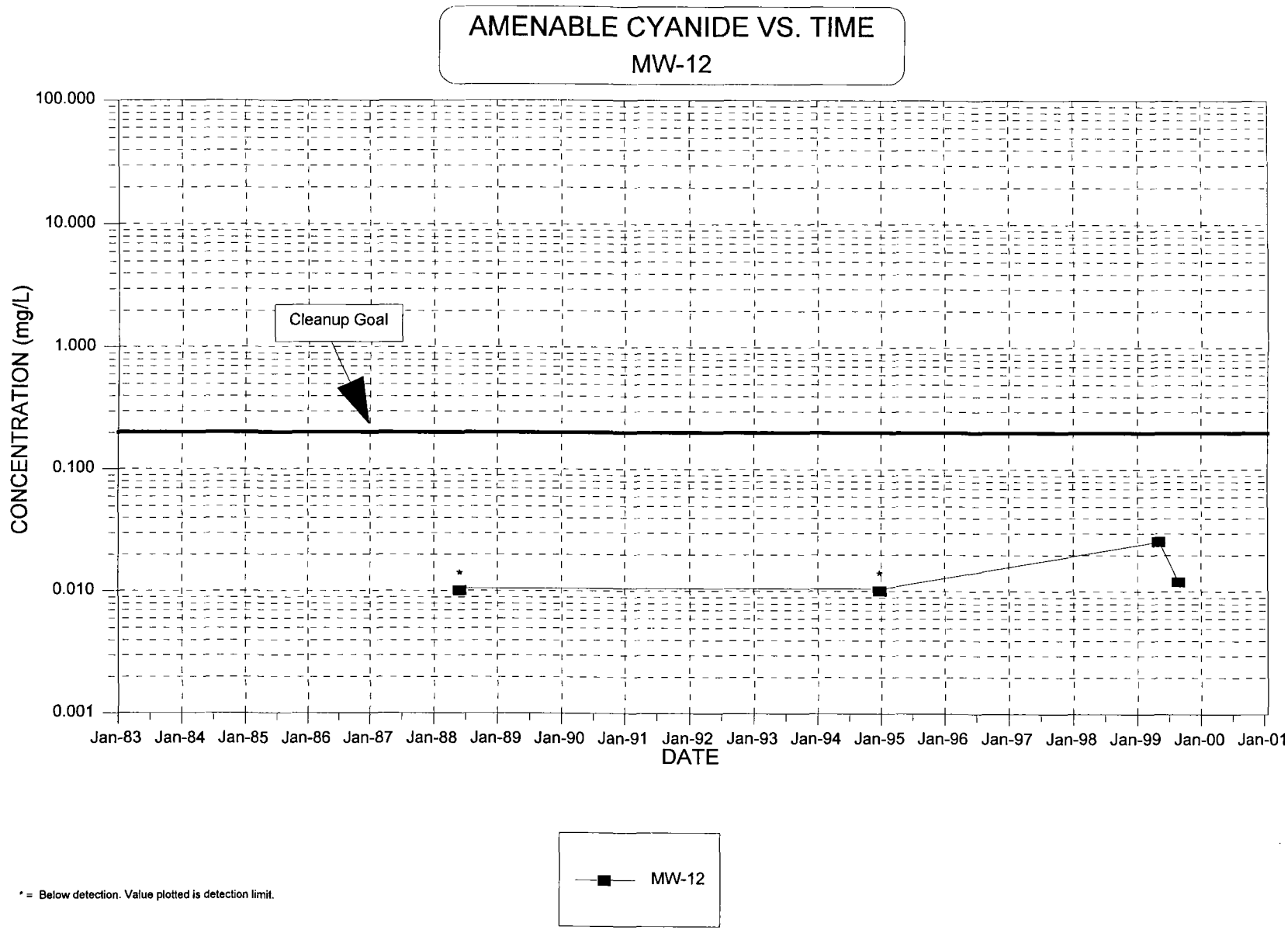
CYANIDE AMENABLE TO CHLORINATION



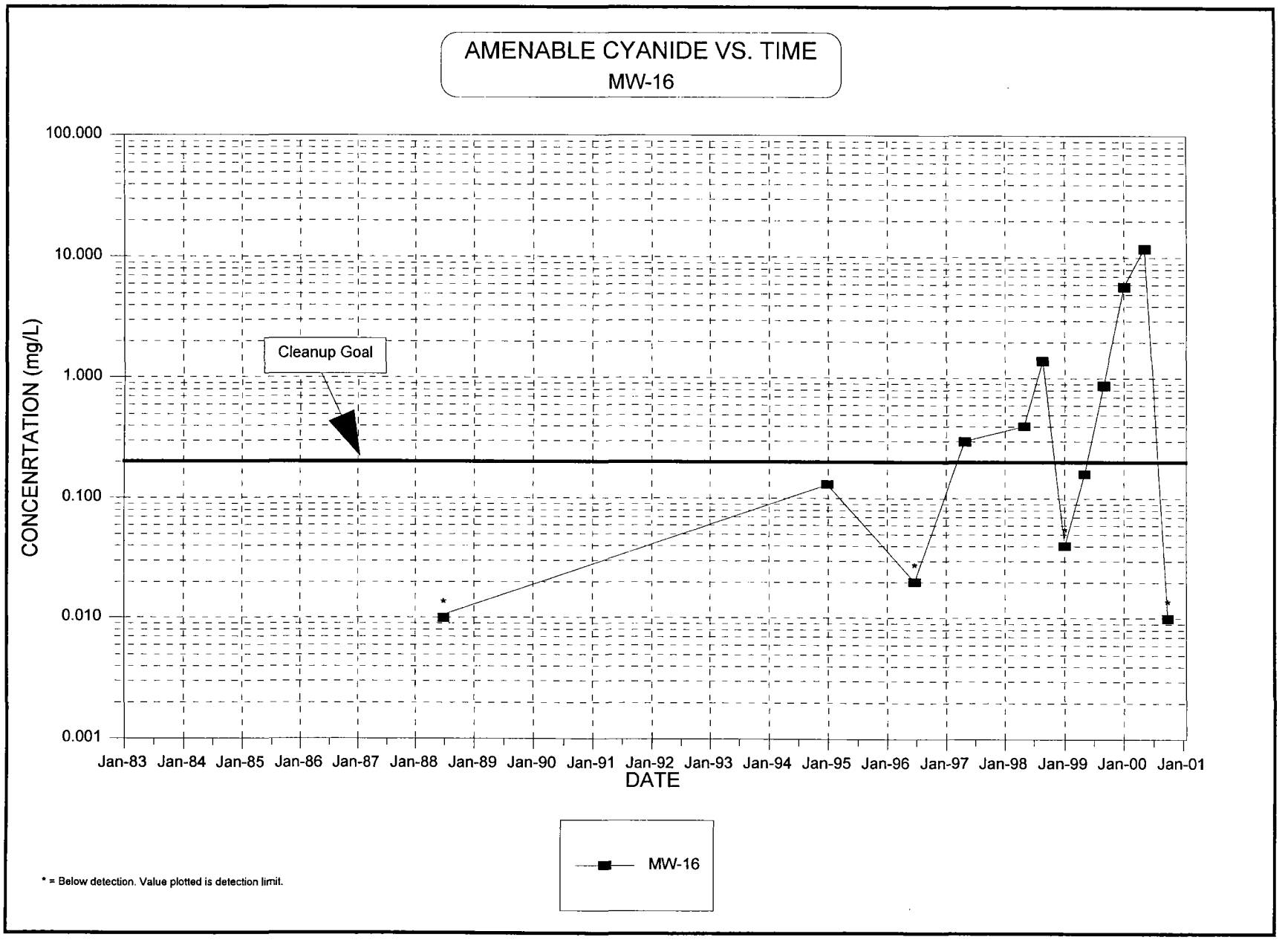
* = Below detection. Value plotted is detection limit.

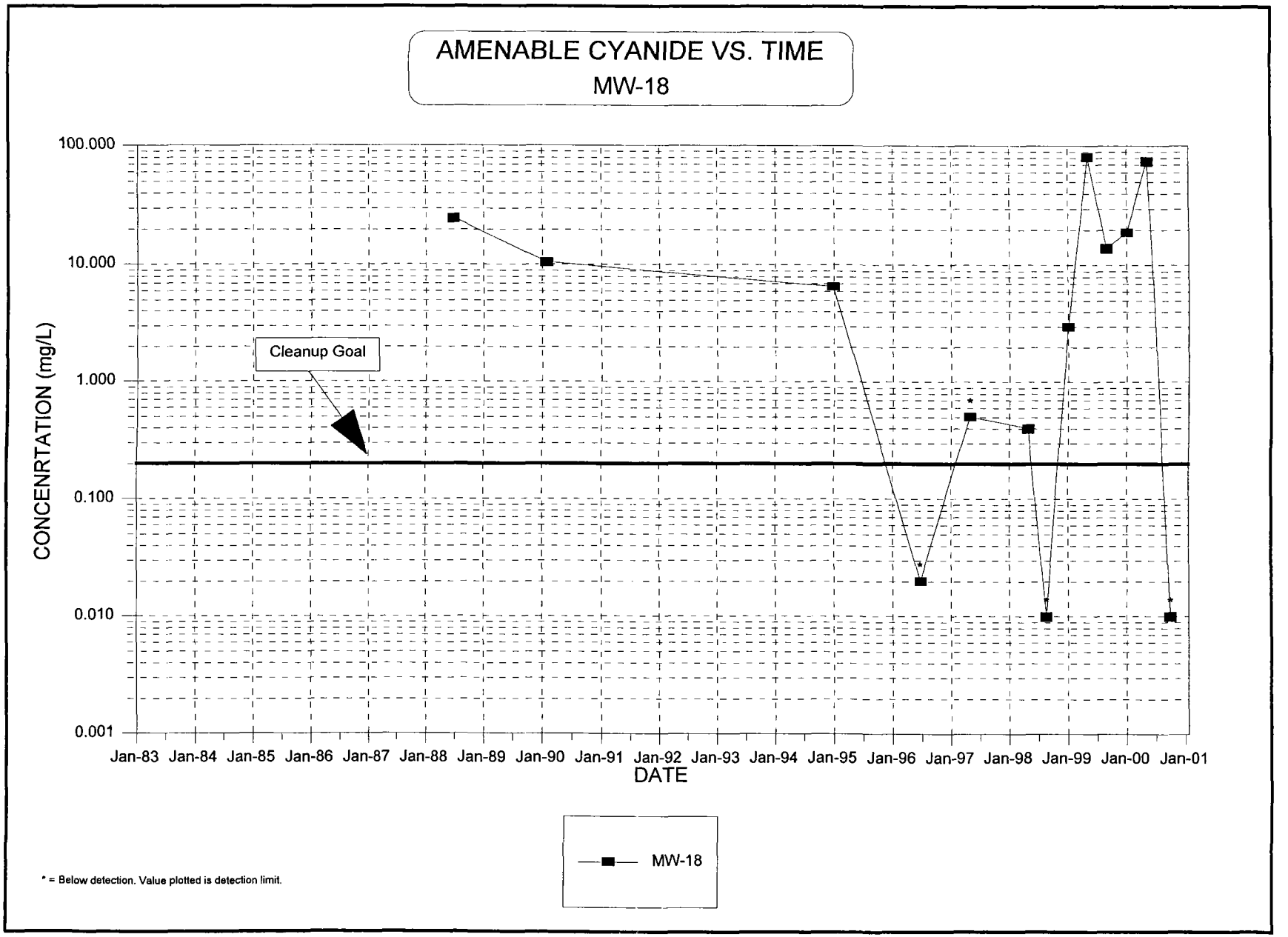


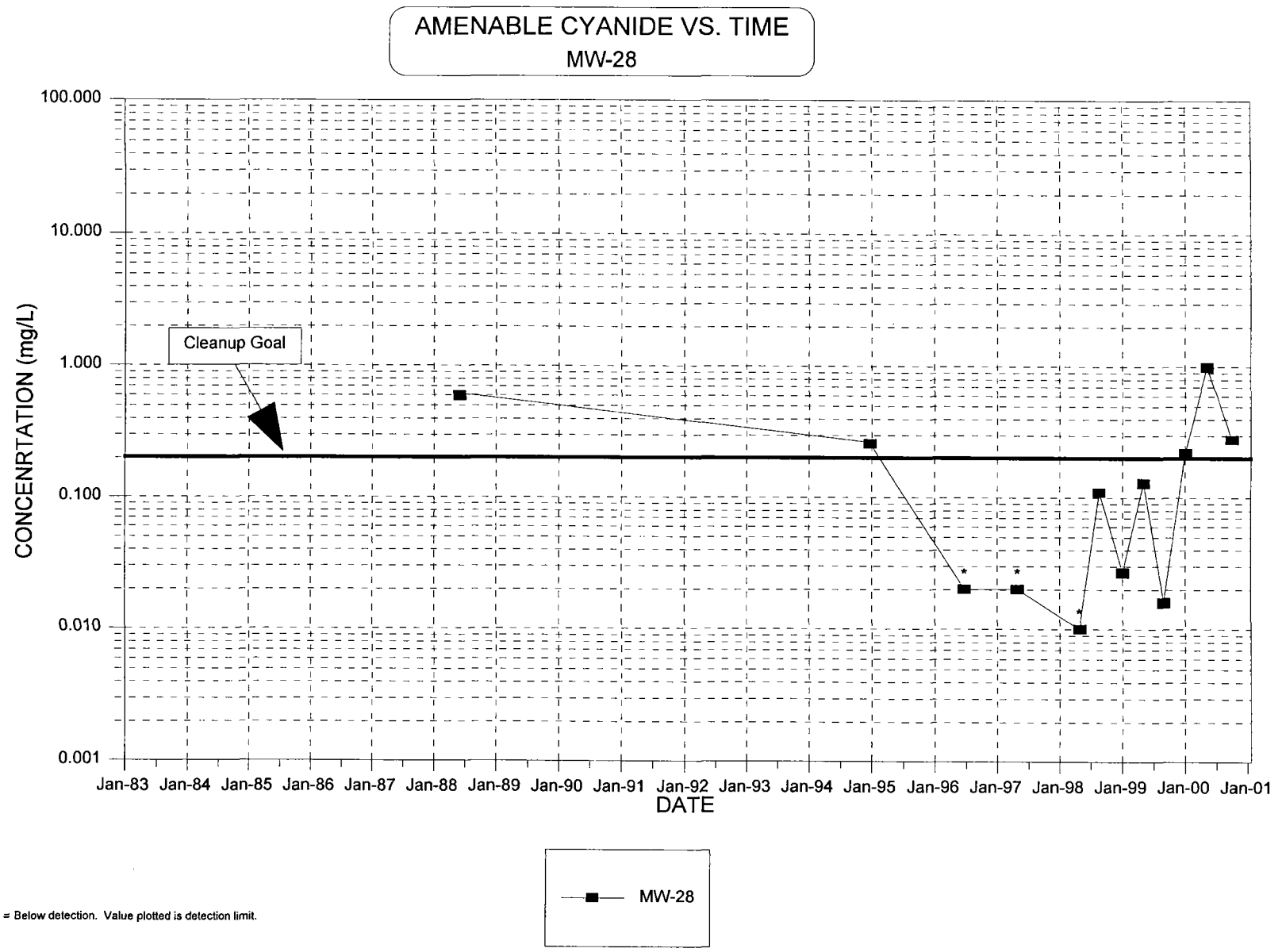
* = Below detection. Value plotted is detection limit.

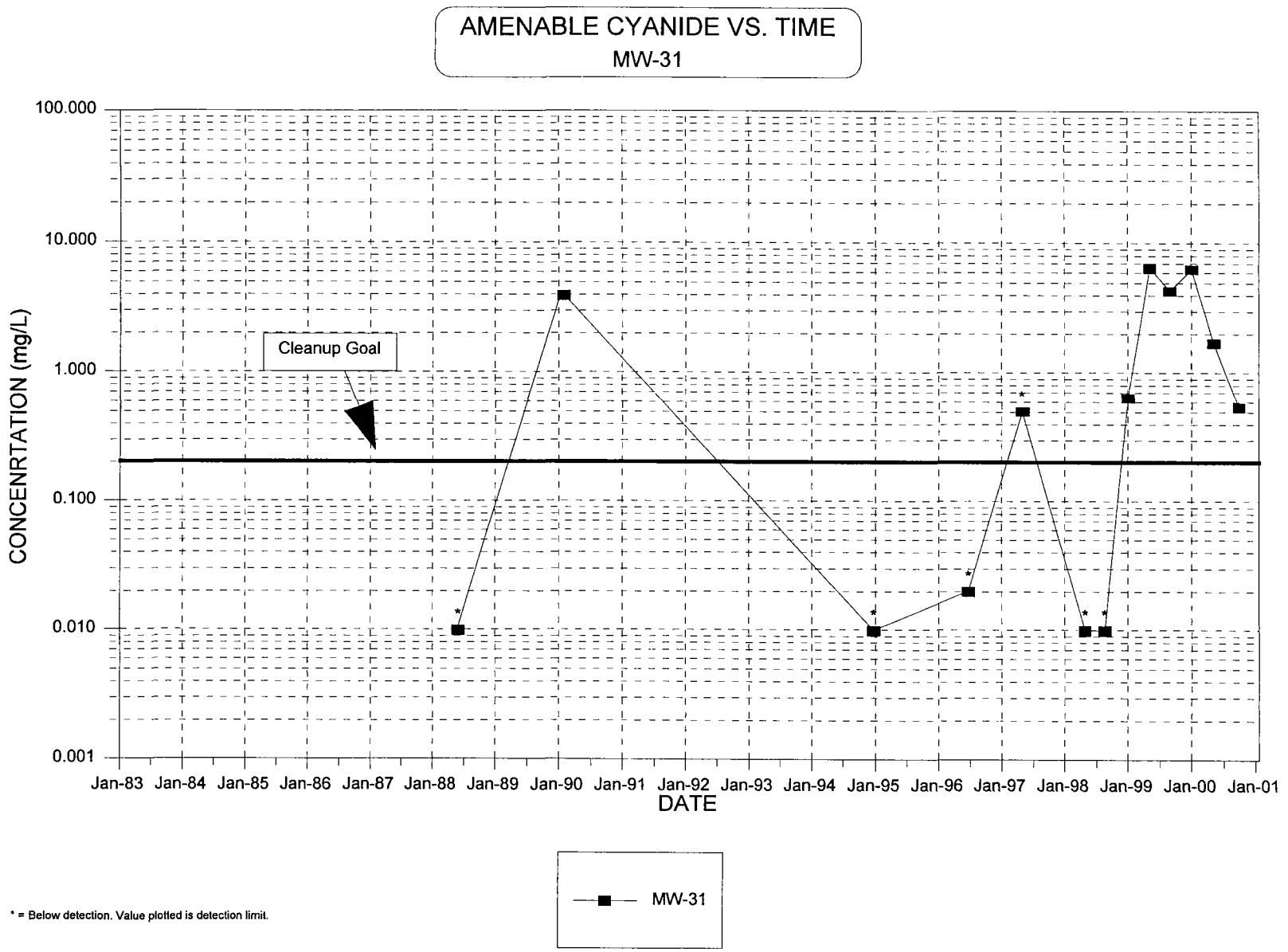


* = Below detection. Value plotted is detection limit.

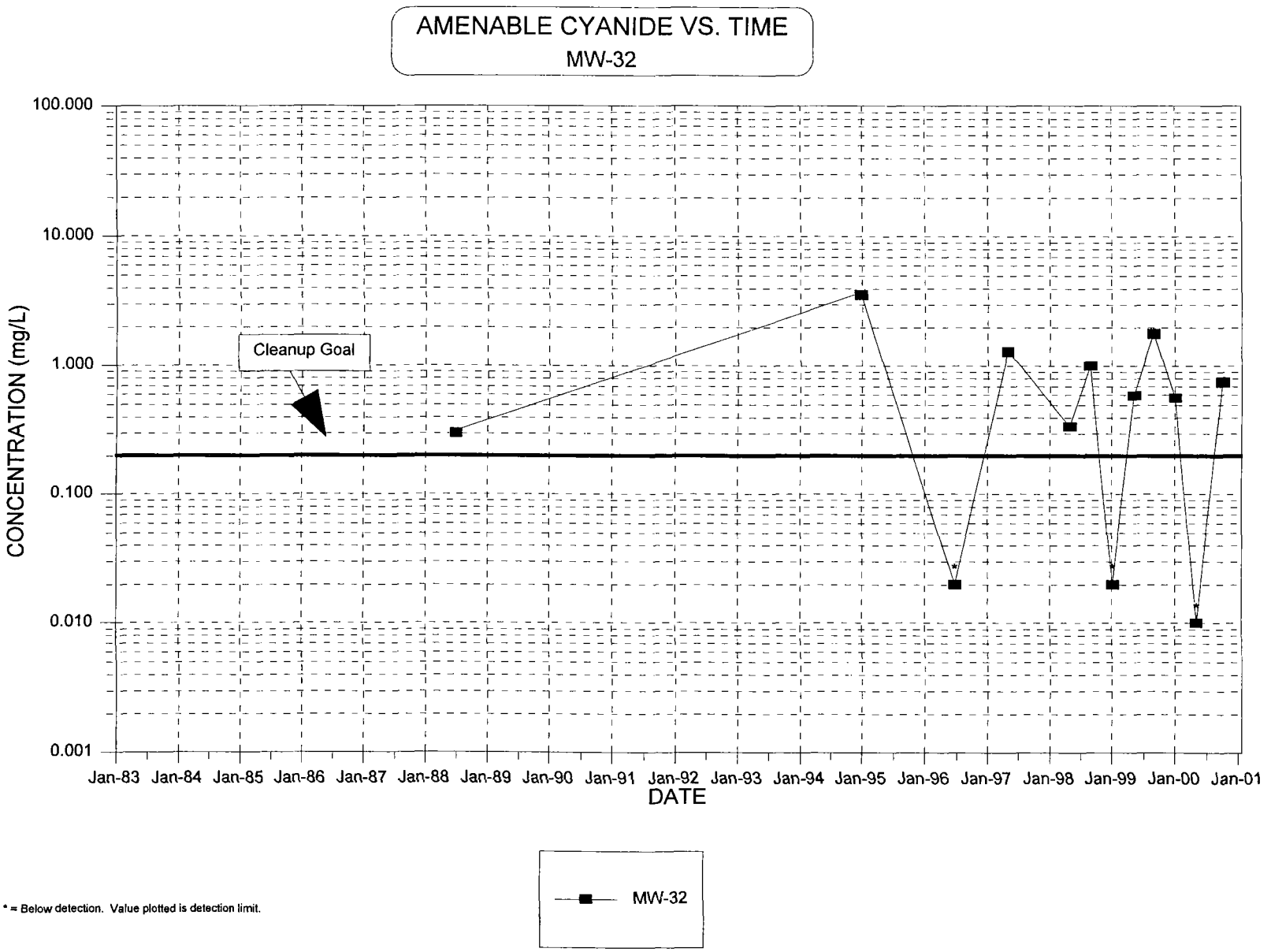

AMENABLE CYANIDE VS. TIME
MW-16
100.000
10.000
1.000
0.100
0.010
0.001
CONCENRTATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-16
* = Below detection. Value plotted is detection limit.


AMENABLE CYANIDE VS. TIME
MW-18
100.000
10.000
1.000
0.100
0.010
0.001
CONCENRTATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-18
* = Below detection. Value plotted is detection limit.


AMENABLE CYANIDE VS. TIME
MW-28
100.000
10.000
1.000
0.100
0.010
0.001
CONCENRTATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-28
* = Below detection. Value plotted is detection limit.

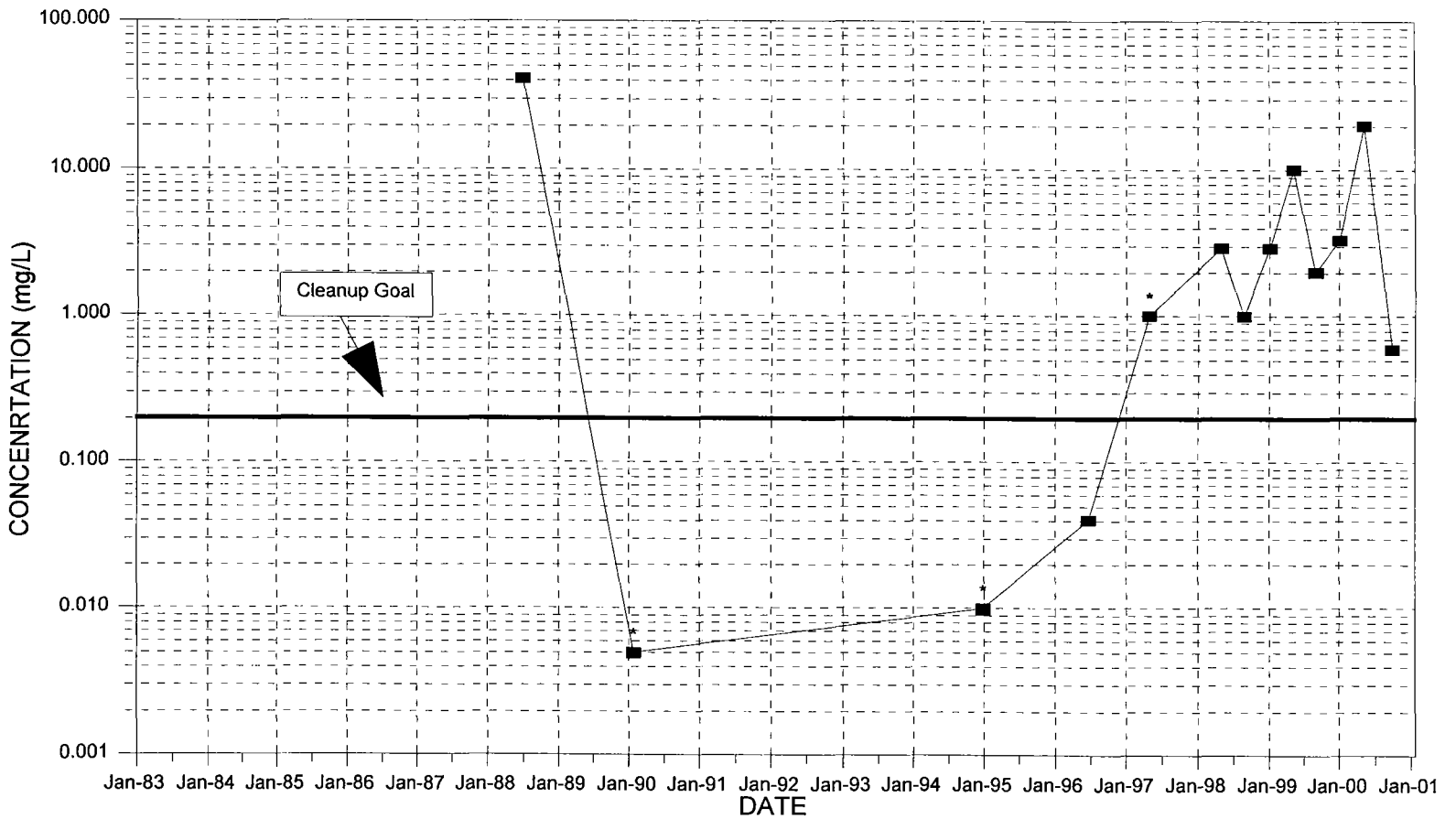


* = Below detection. Value plotted is detection limit.



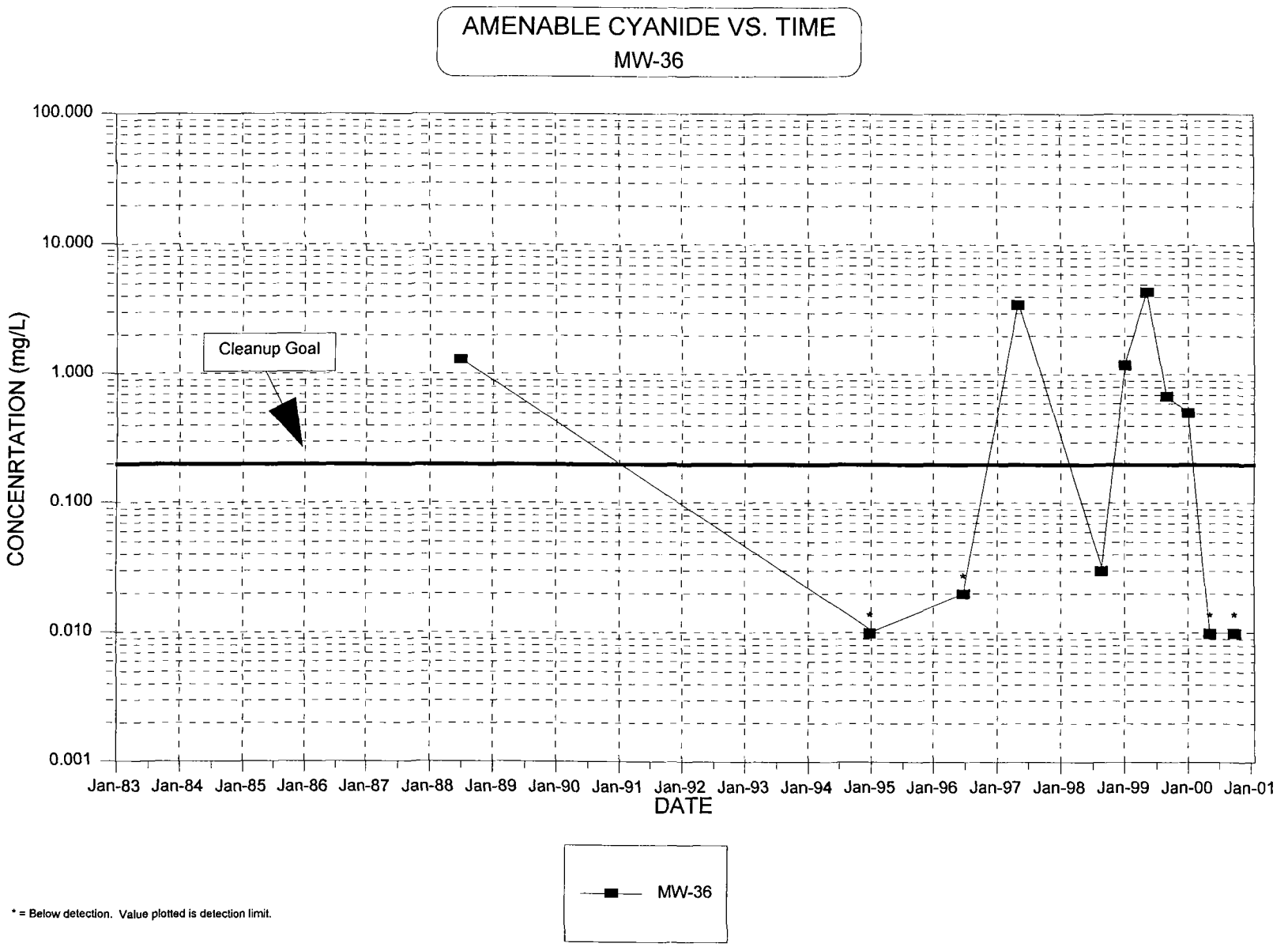
* = Below detection. Value plotted is detection limit.

AMENABLE CYANIDE VS. TIME
MW-35

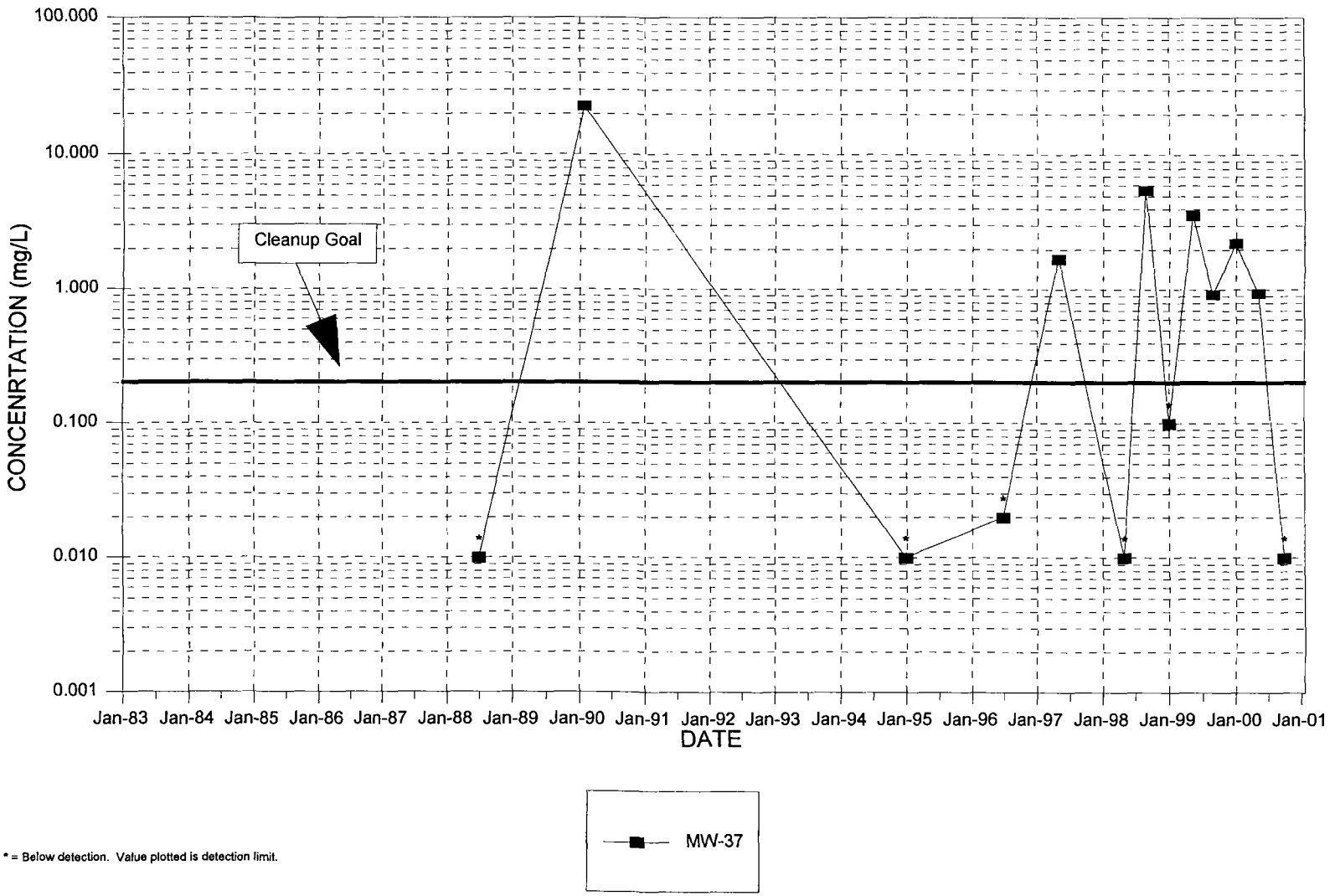


MW-35

* = Below detection. Value plotted is detection limit.



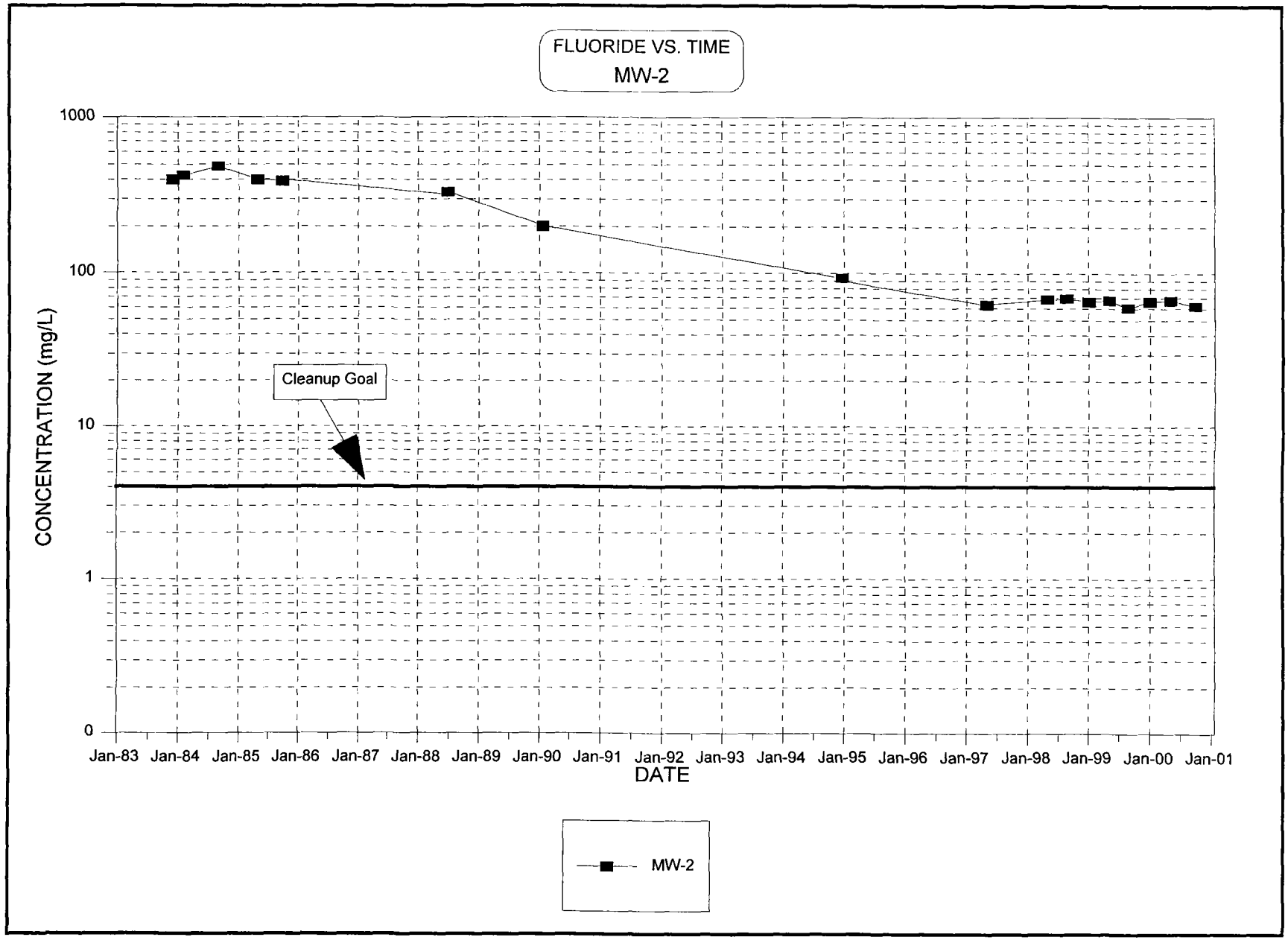
* = Below detection. Value plotted is detection limit.

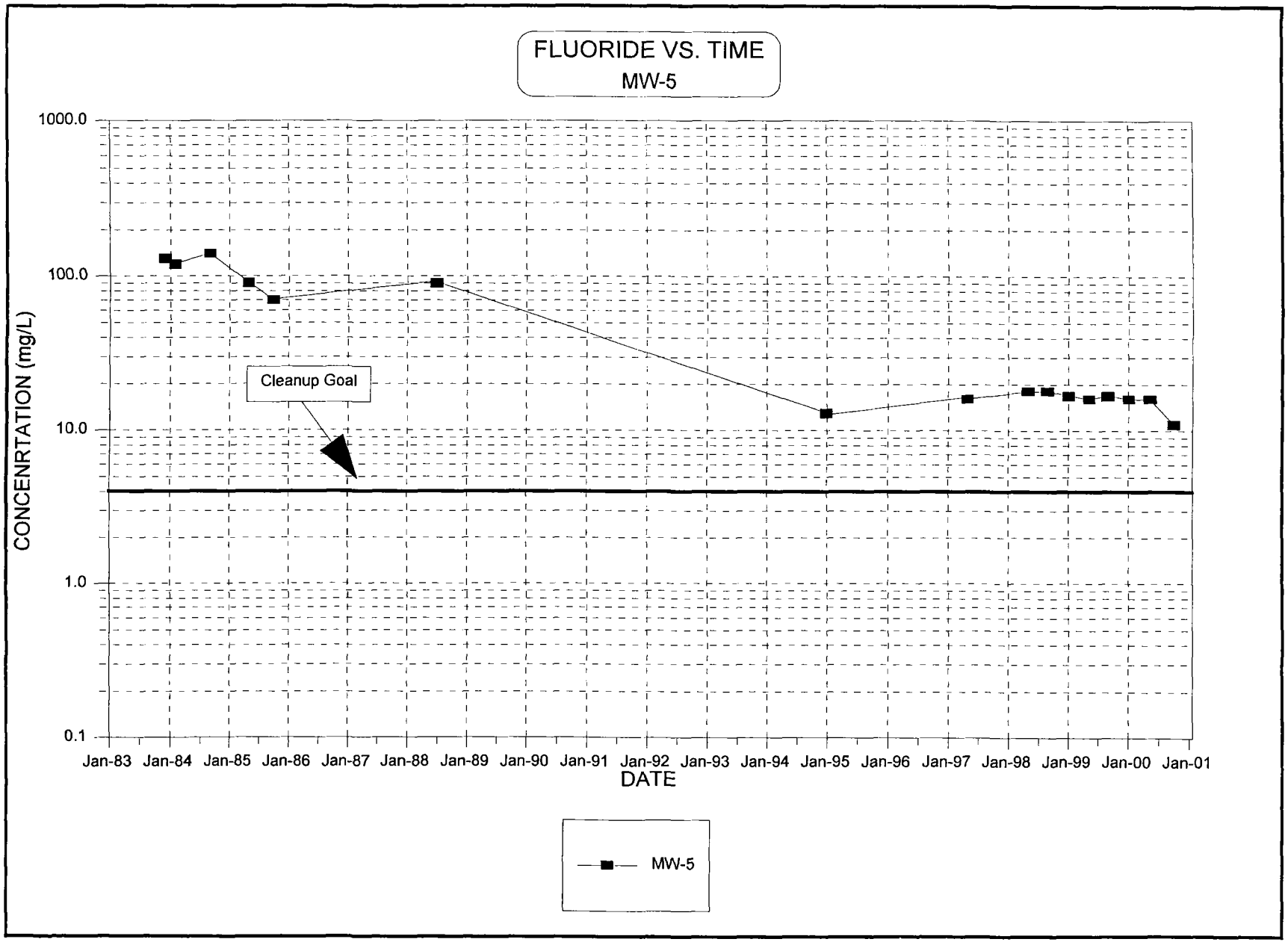


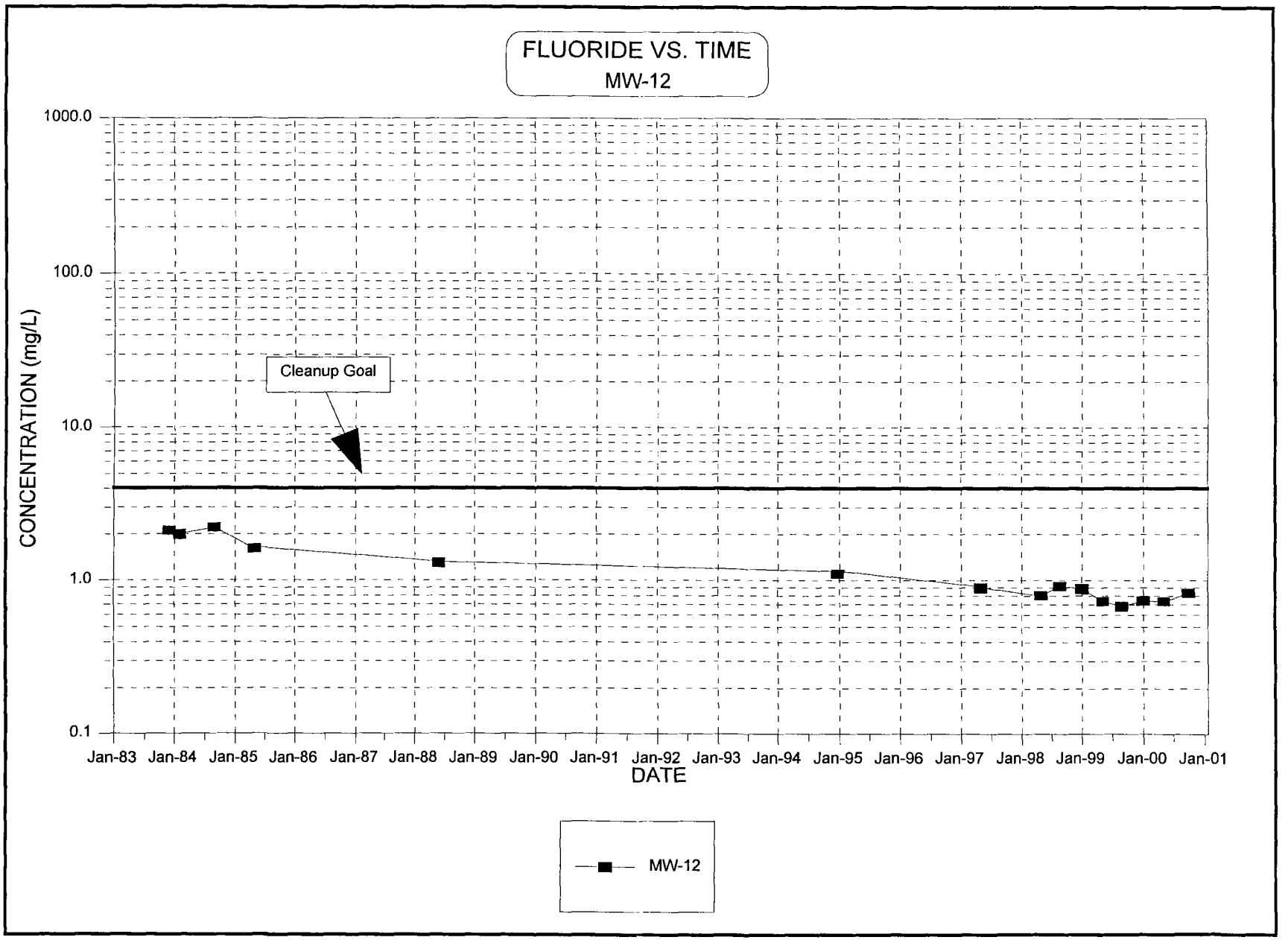
* = Below detection. Value plotted is detection limit.

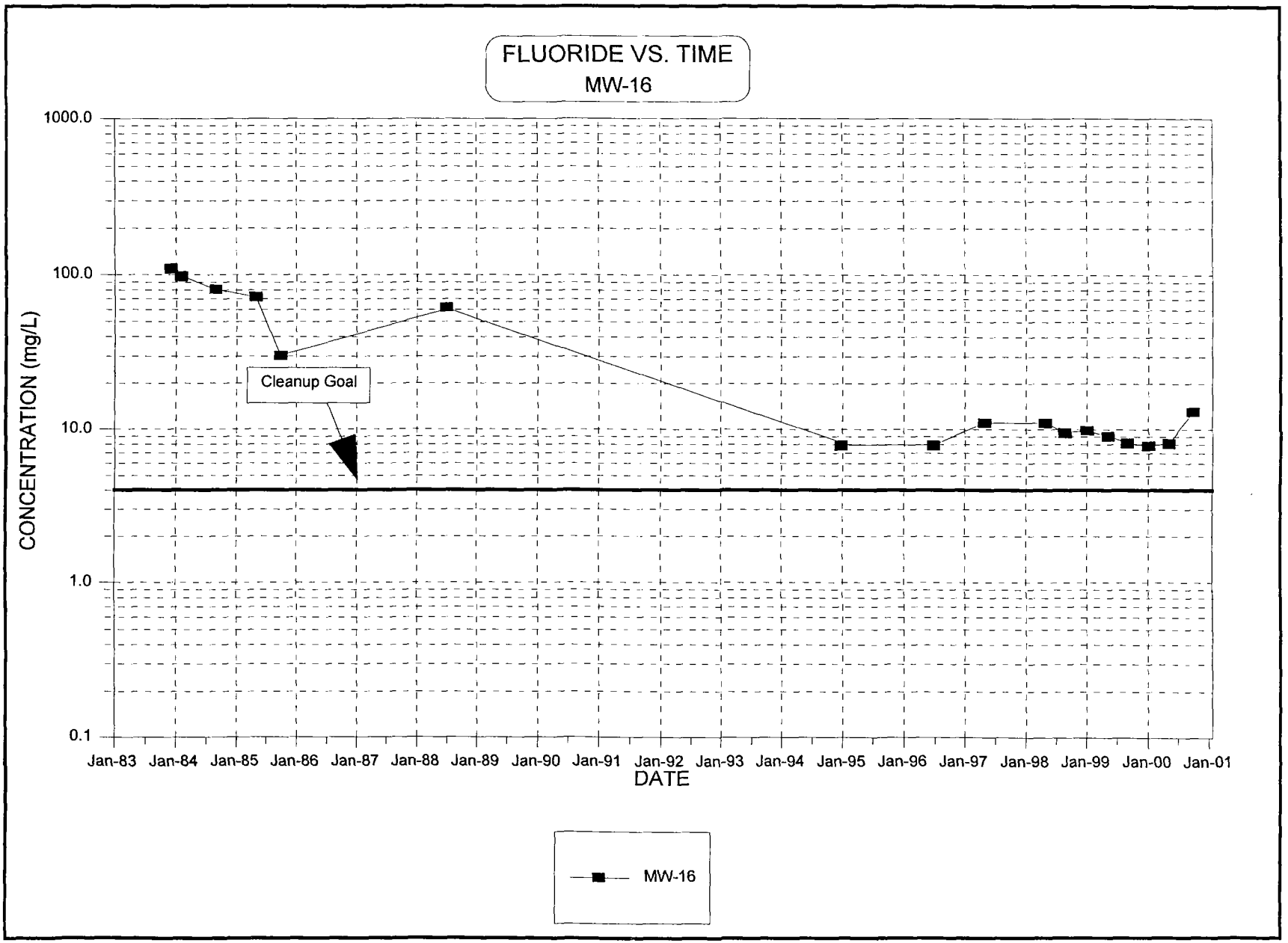
APPENDIX D-3

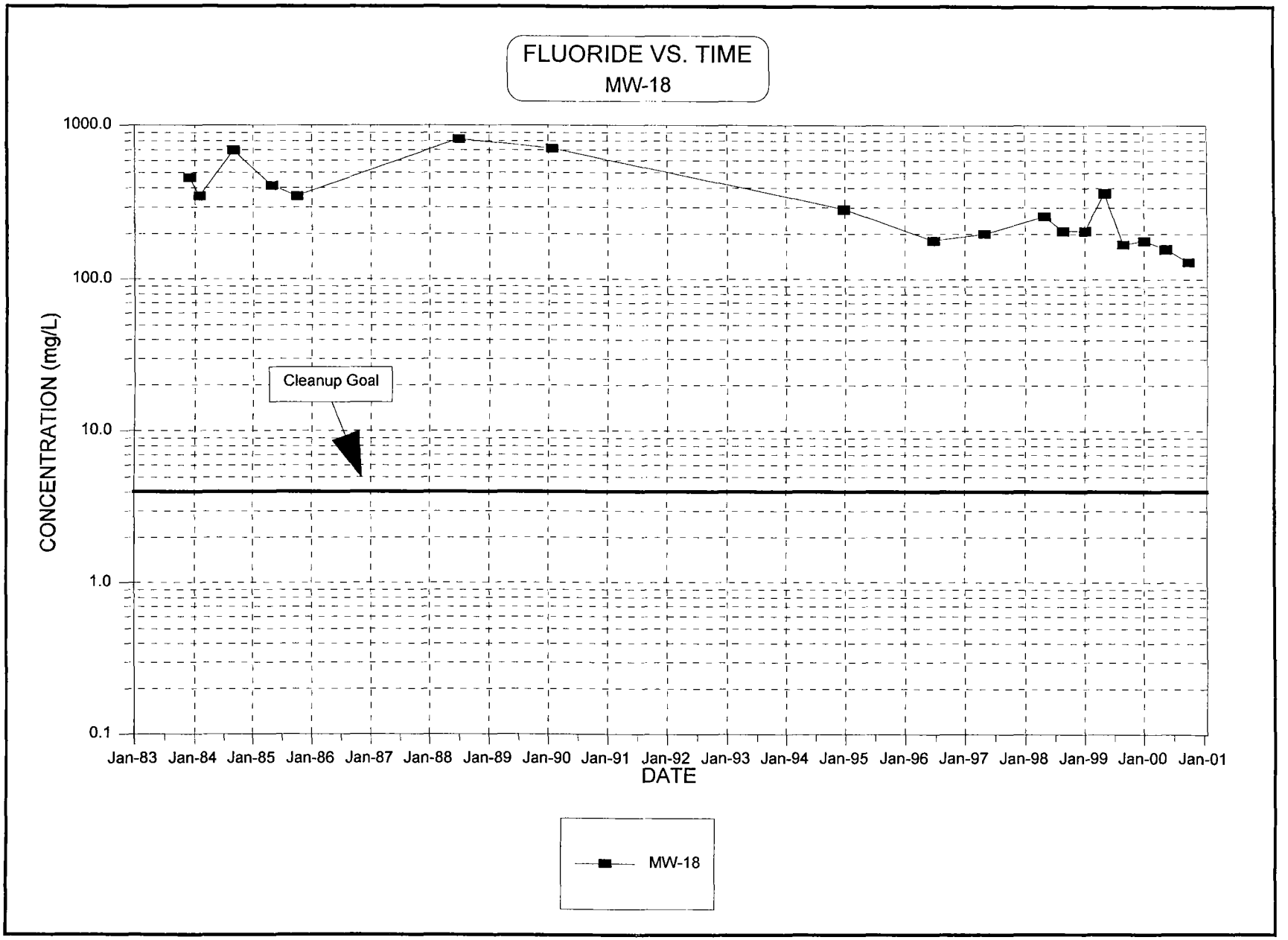
FLUORIDE

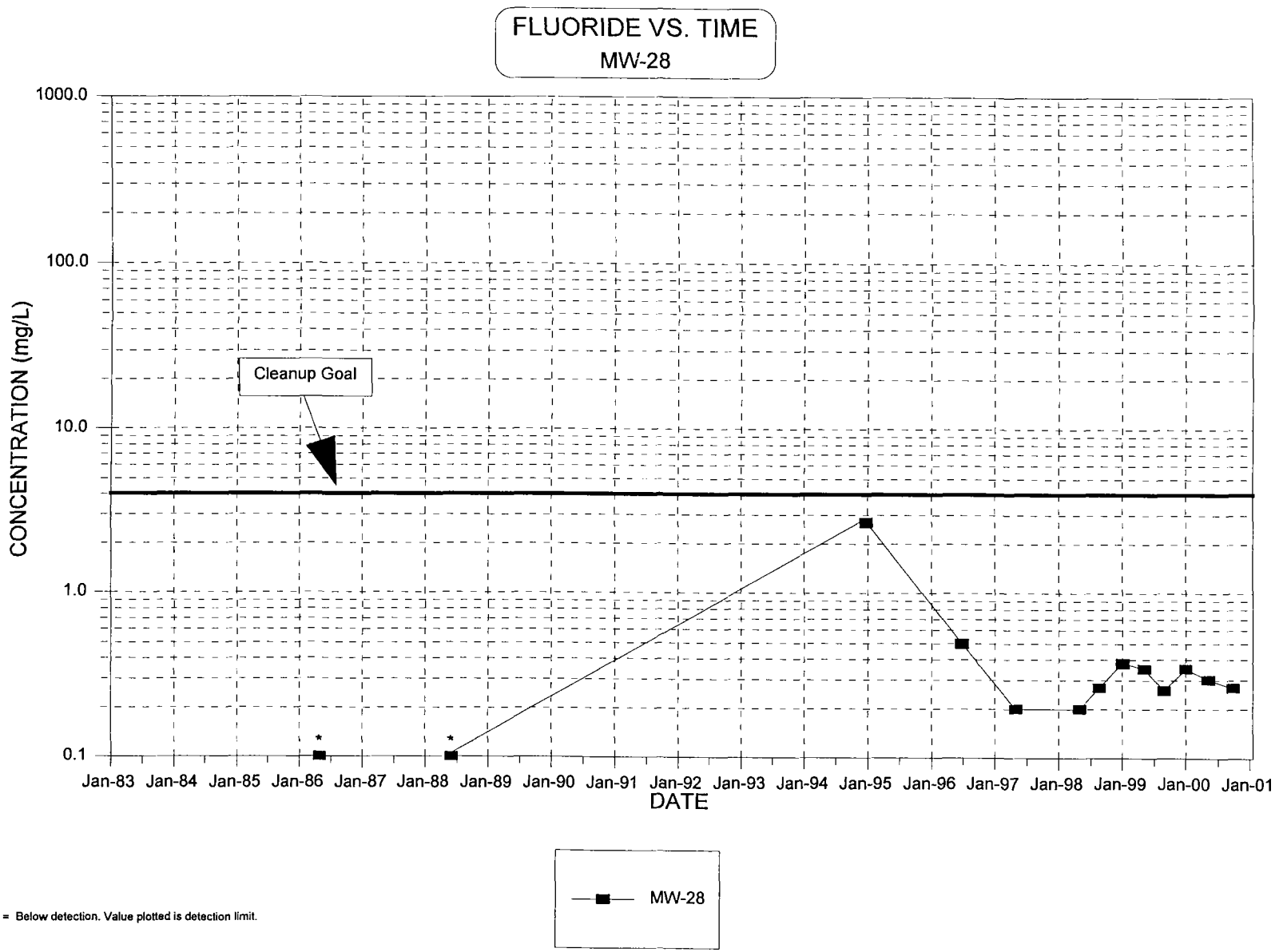

FLUORIDE VS. TIME
MW-2
1000
100
10
1
0
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-2


FLUORIDE VS. TIME
MW-5
1000.0
100.0
10.0
1.0
0.1
CONCENRTATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-5

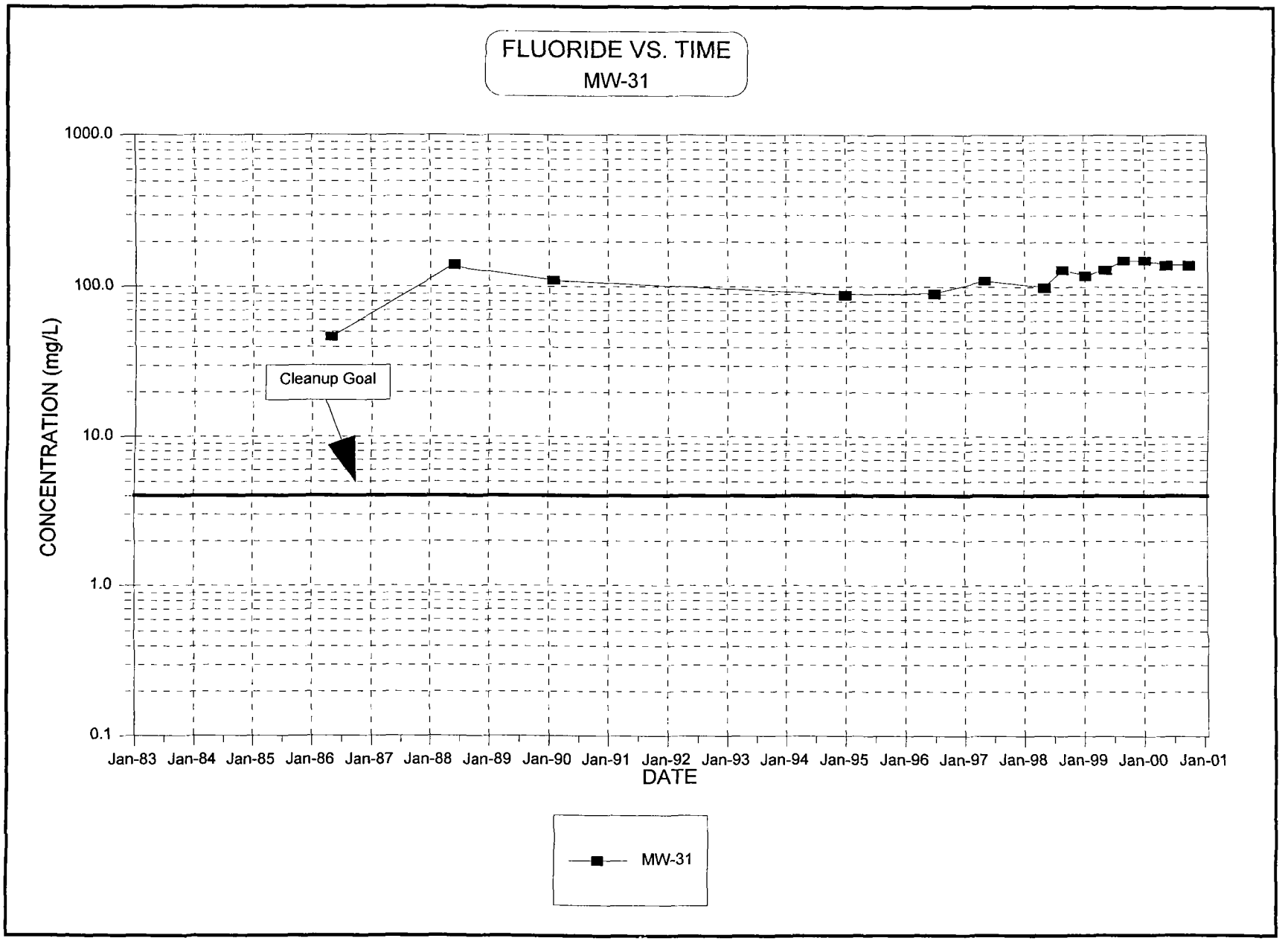

FLUORIDE VS. TIME
MW-12
1000.0
100.0
10.0
1.0
0.1
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-12

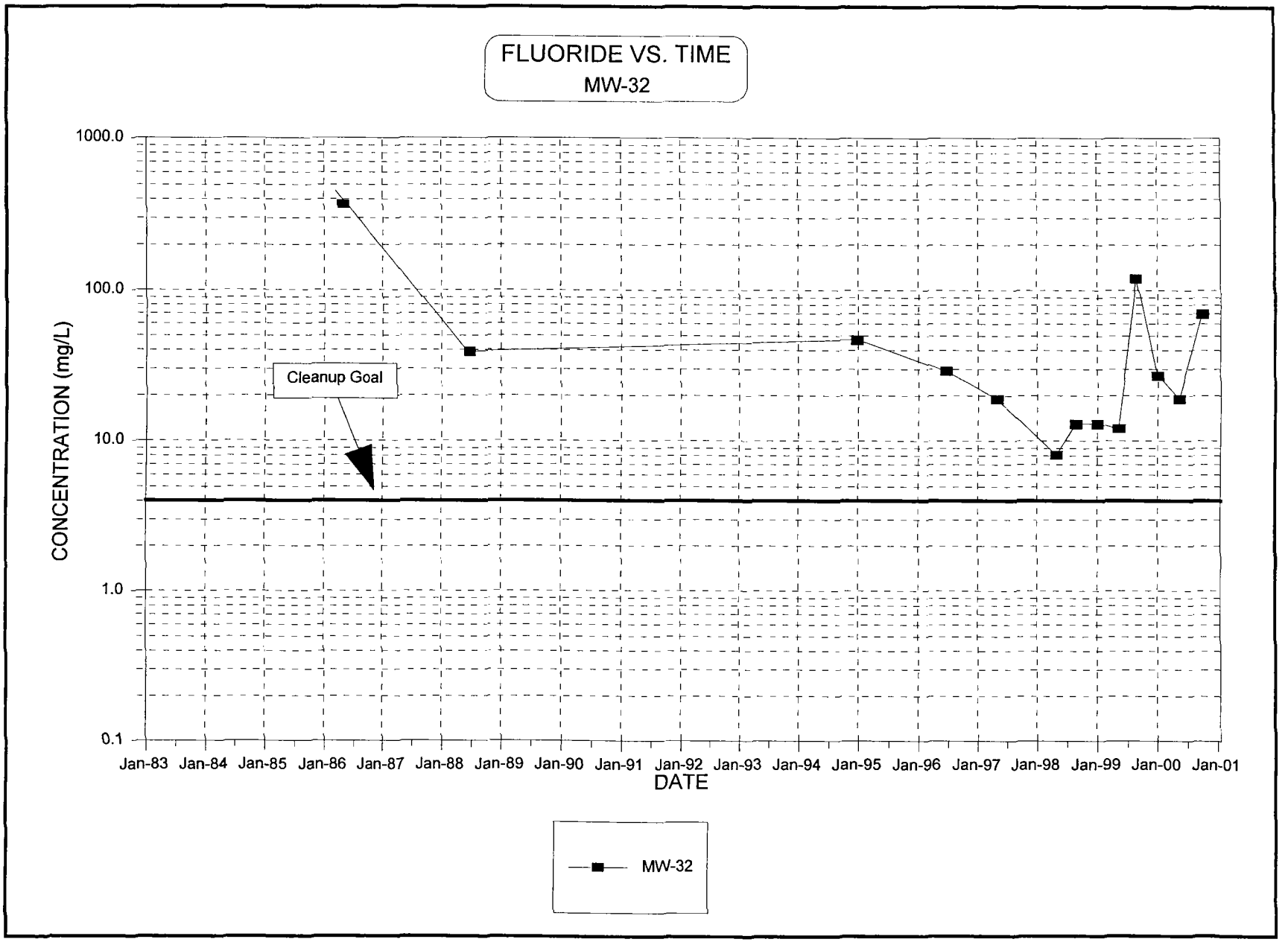

FLUORIDE VS. TIME
MW-16
1000.0
100.0
10.0
1.0
0.1
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-16

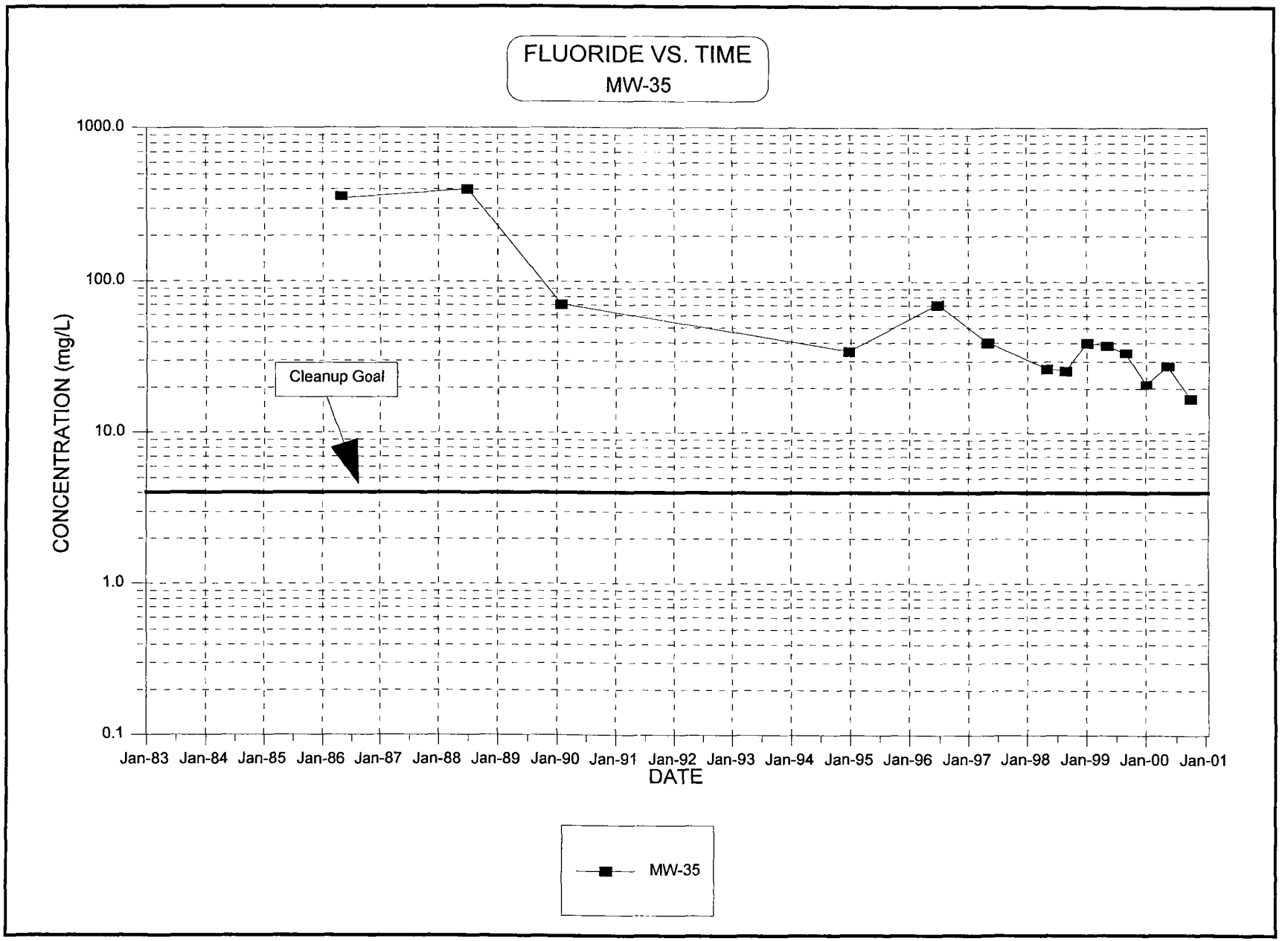

FLUORIDE VS. TIME
MW-18
1000.0
100.0
10.0
1.0
0.1
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-18

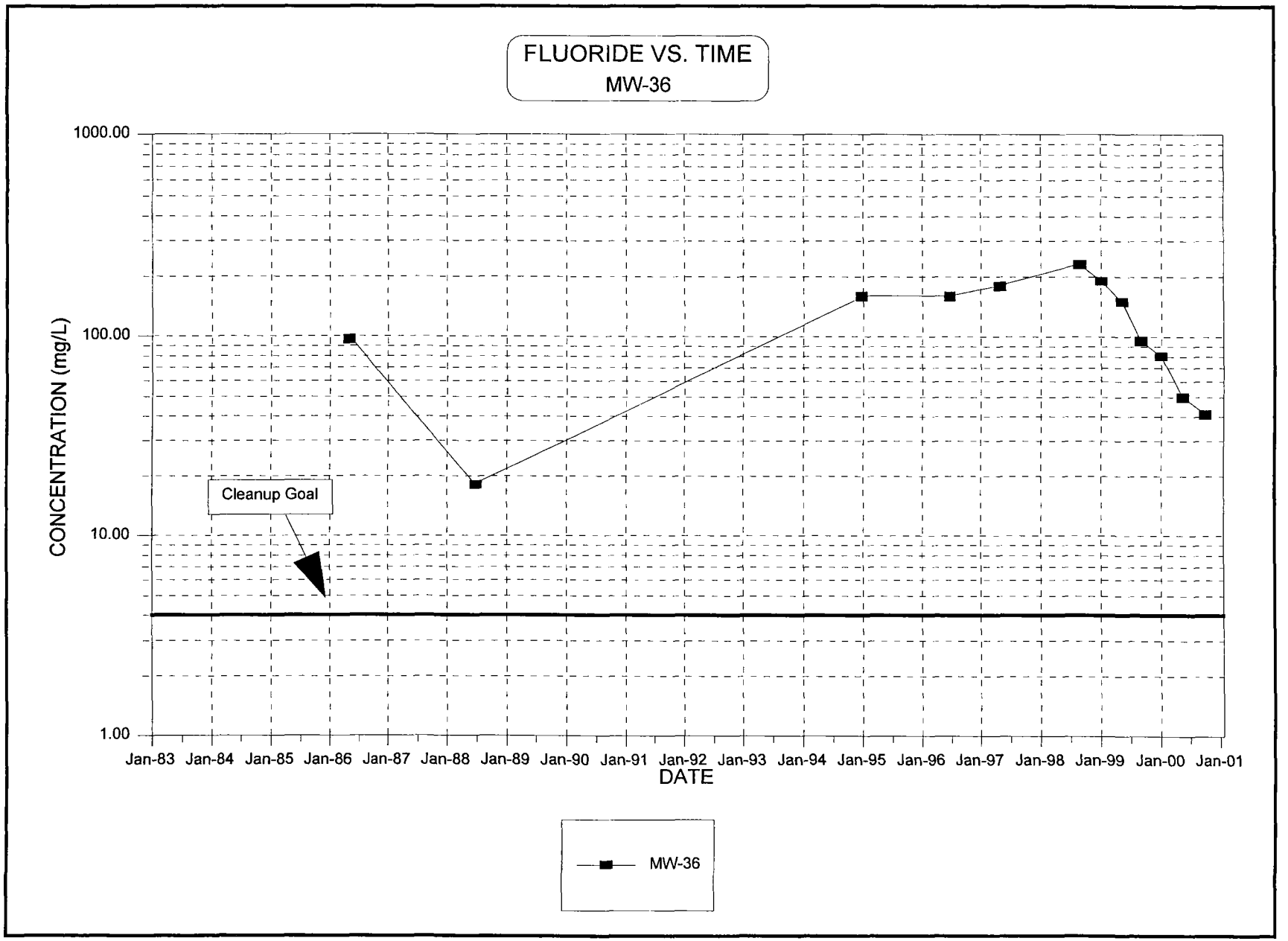


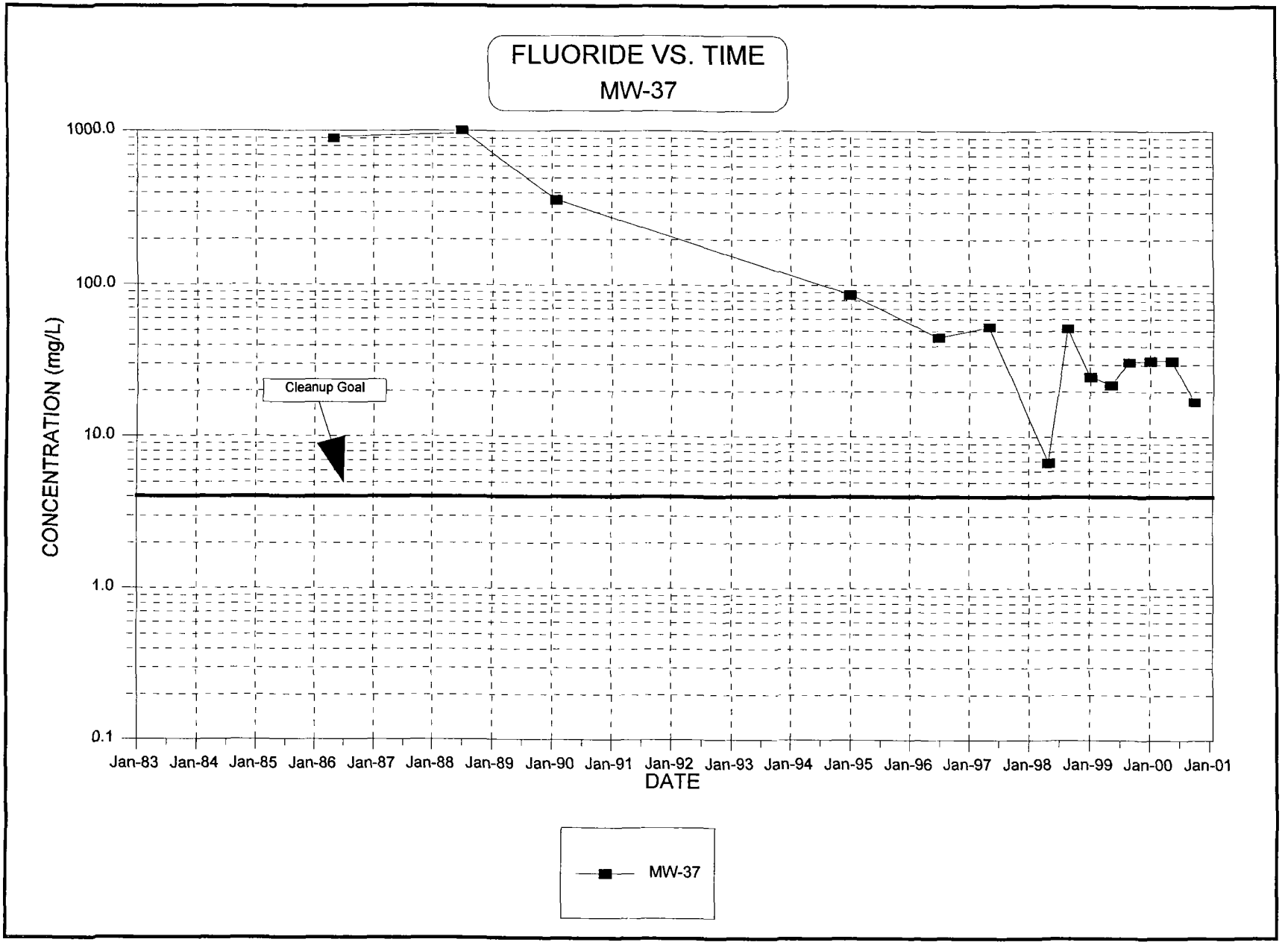
* = Below detection. Value plotted is detection limit.


FLUORIDE VS. TIME
MW-31
1000.0
100.0
10.0
1.0
0.1
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-31


FLUORIDE VS. TIME
MW-32
1000.0
100.0
10.0
1.0
0.1
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-32

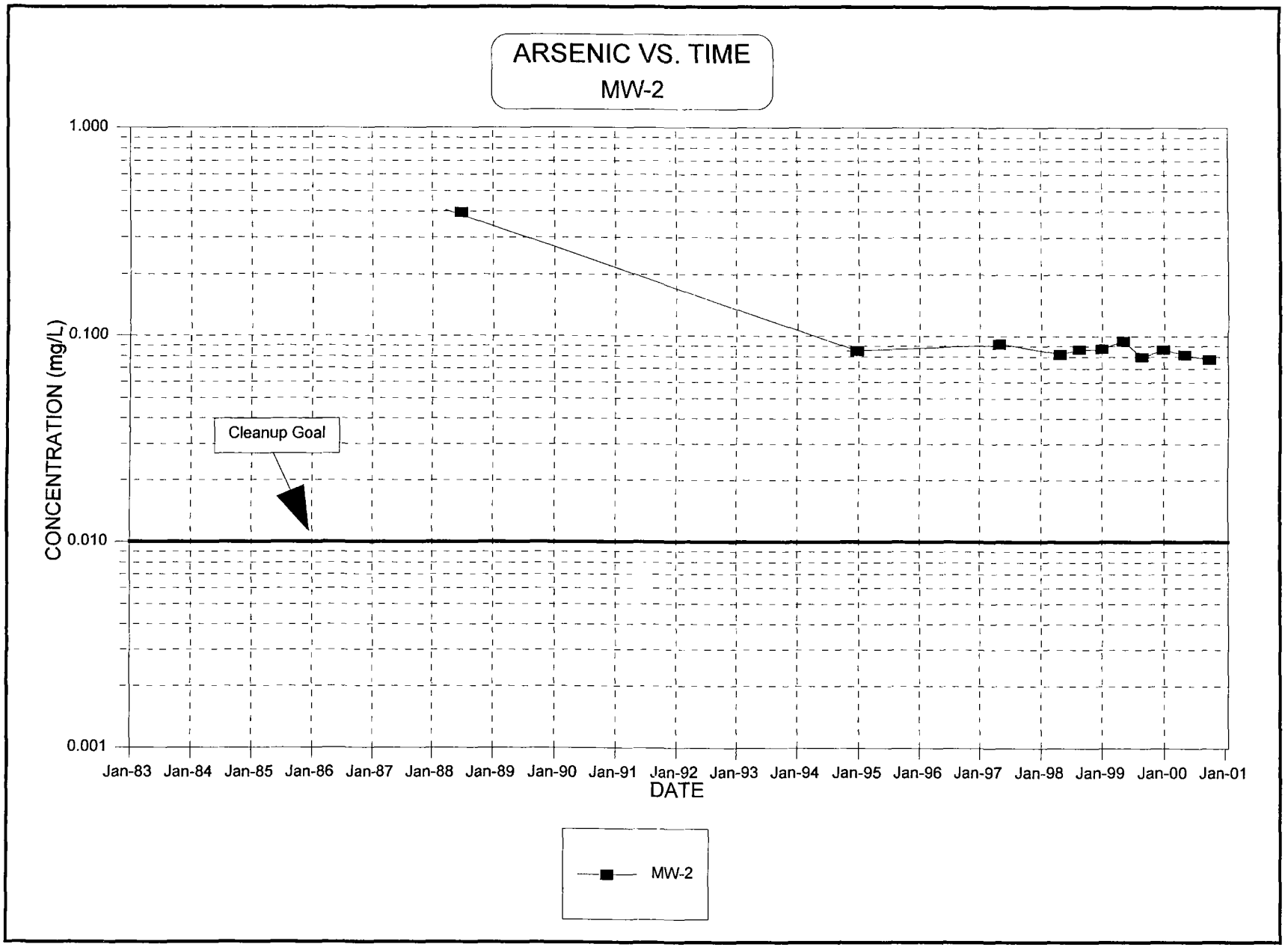

FLUORIDE VS. TIME
MW-35
1000.0
100.0
10.0
1.0
0.1
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-35

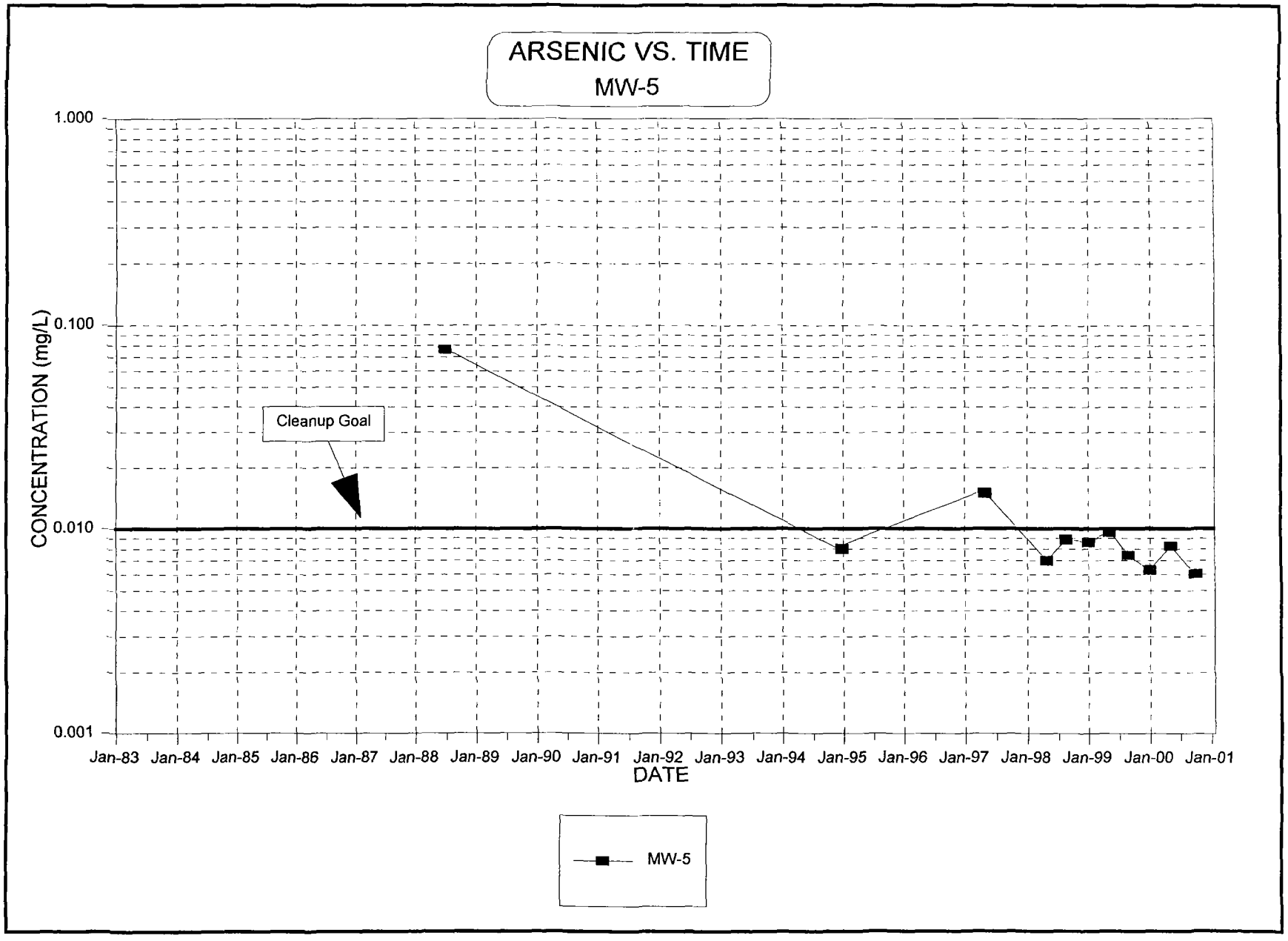

FLUORIDE VS. TIME
MW-36
1000.00
100.00
10.00
1.00
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-36

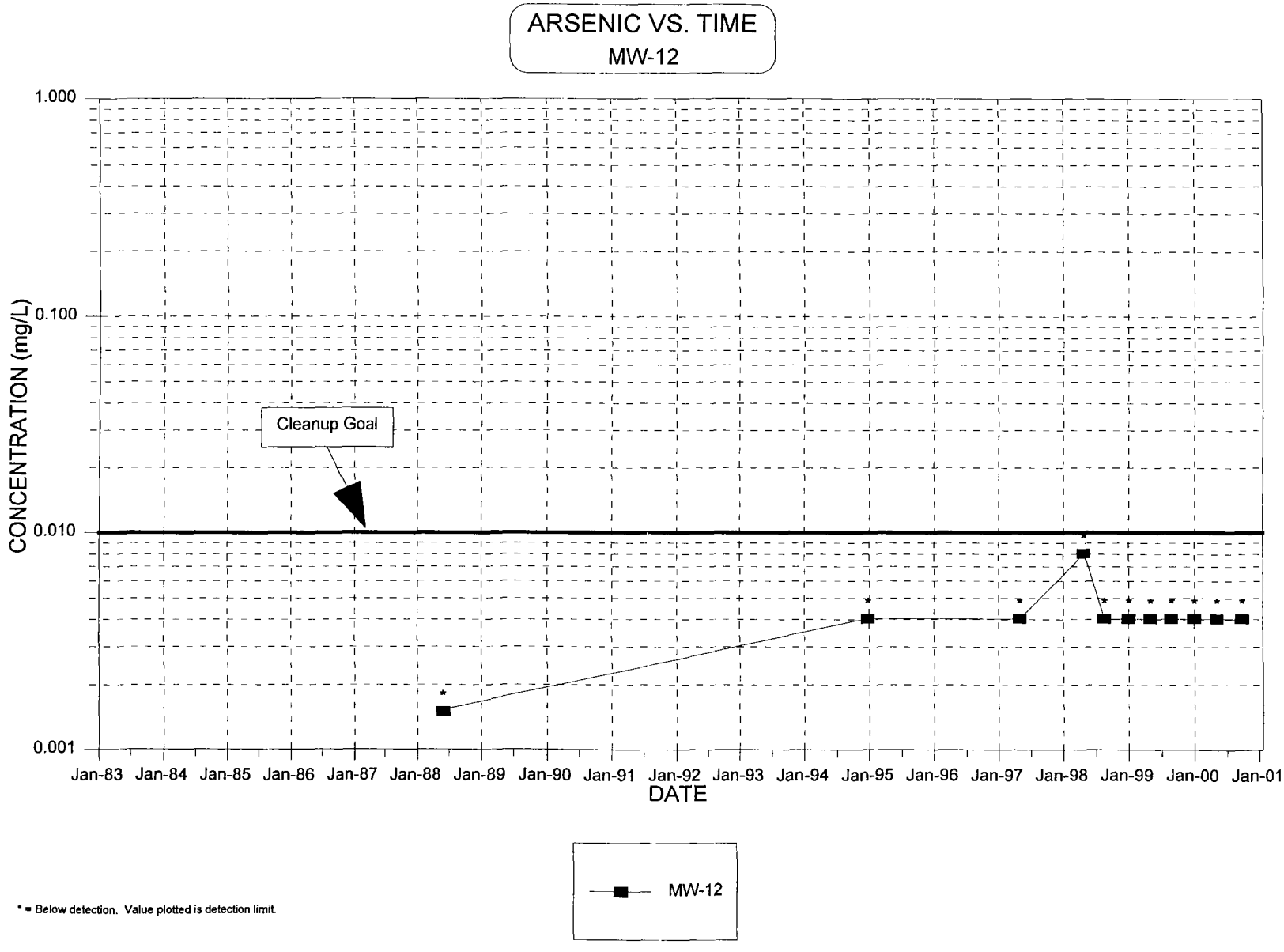

FLUORIDE VS. TIME
MW-37
1000.0
100.0
10.0
1.0
0.1
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-37

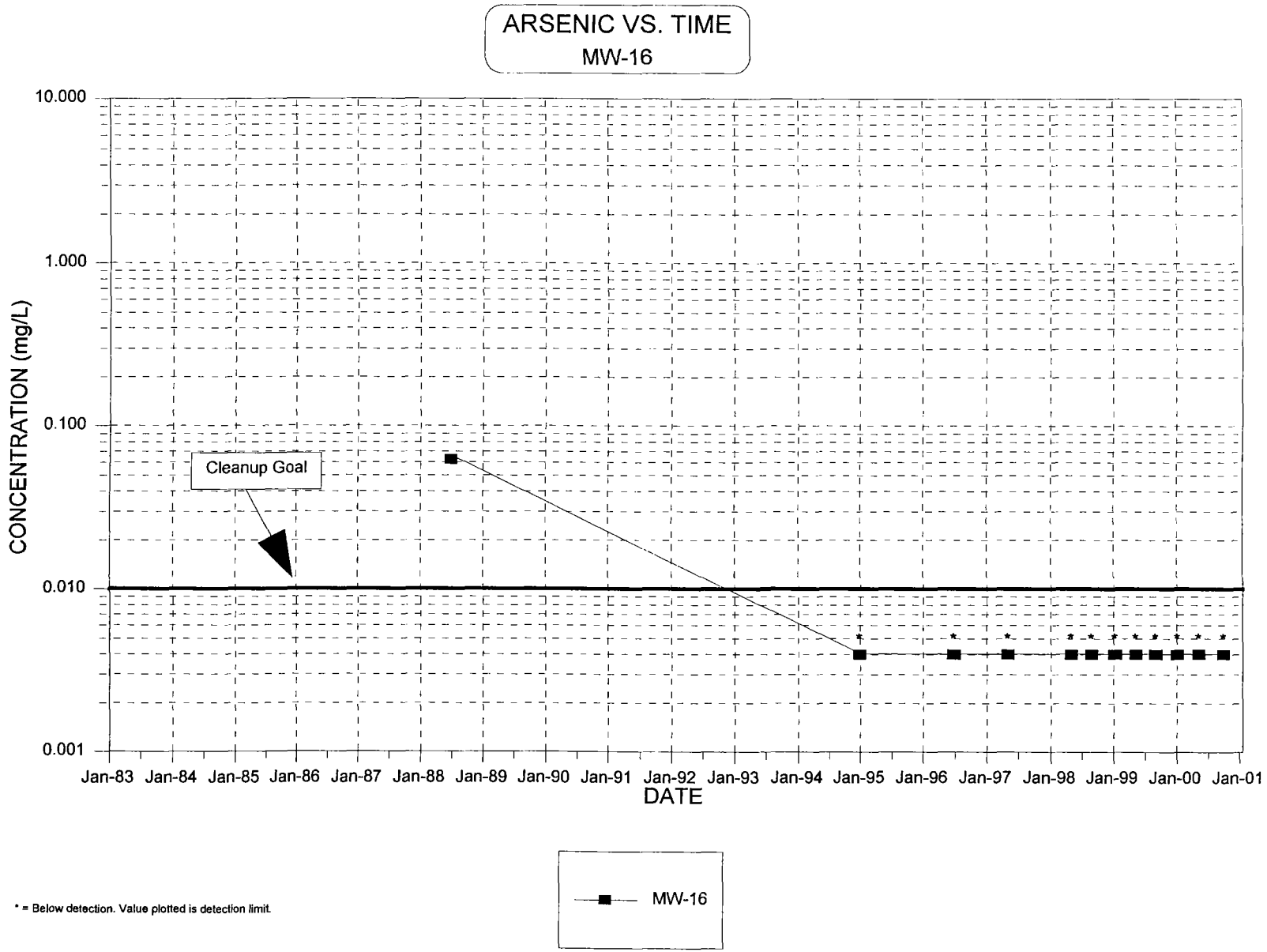
APPENDIX D-4

ARSENIC

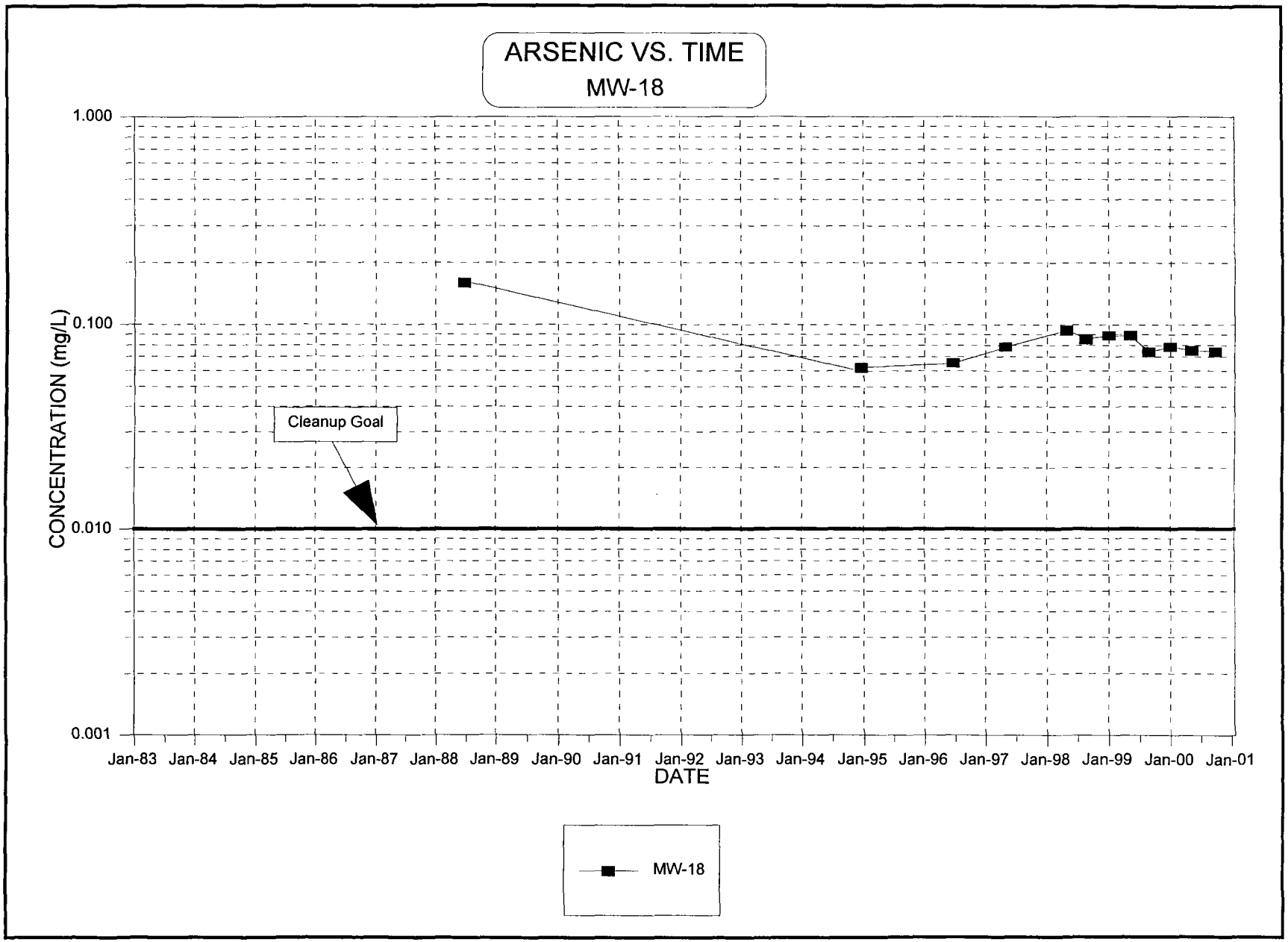

ARSENIC VS. TIME
MW-2
1.000
0.100
0.010
0.001
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-2

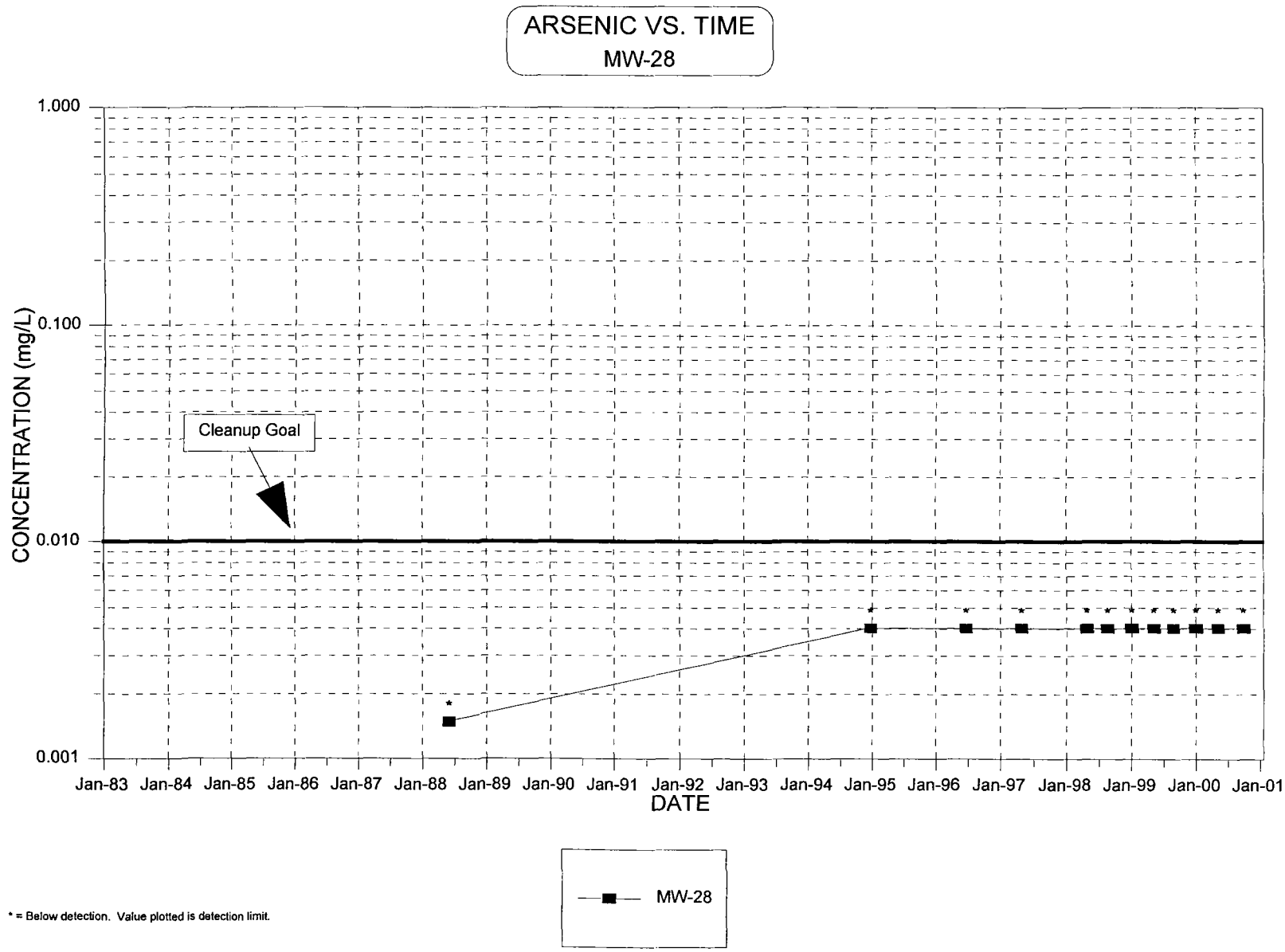

ARSENIC VS. TIME
MW-5
1.000
0.100
0.010
0.001
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-5


ARSENIC VS. TIME
MW-12
1.000
0.100
0.010
0.001
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-12
* = Below detection. Value plotted is detection limit.

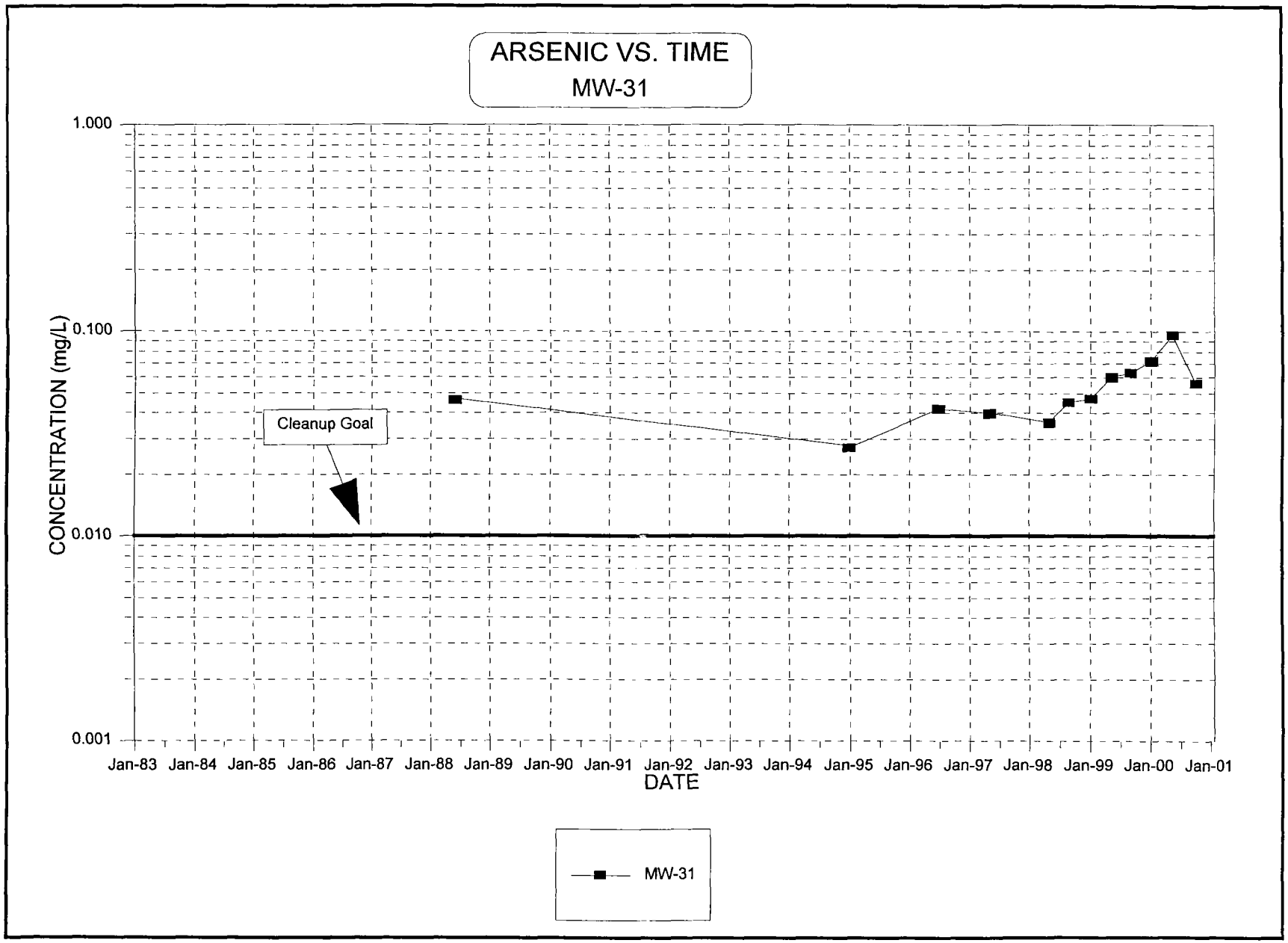


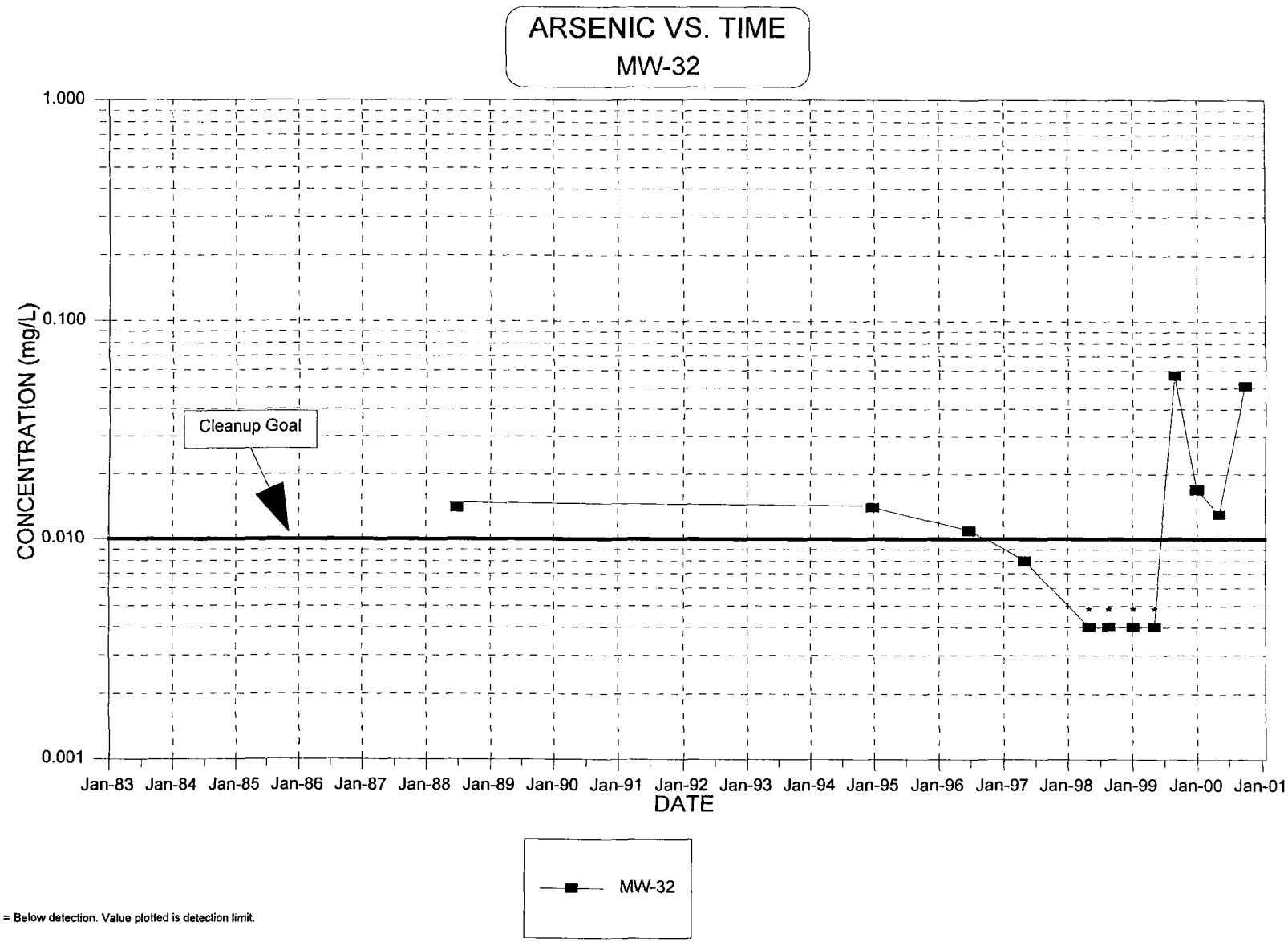
* = Below detection. Value plotted is detection limit.


ARSENIC VS. TIME
MW-18
1.000
0.100
0.010
0.001
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-18

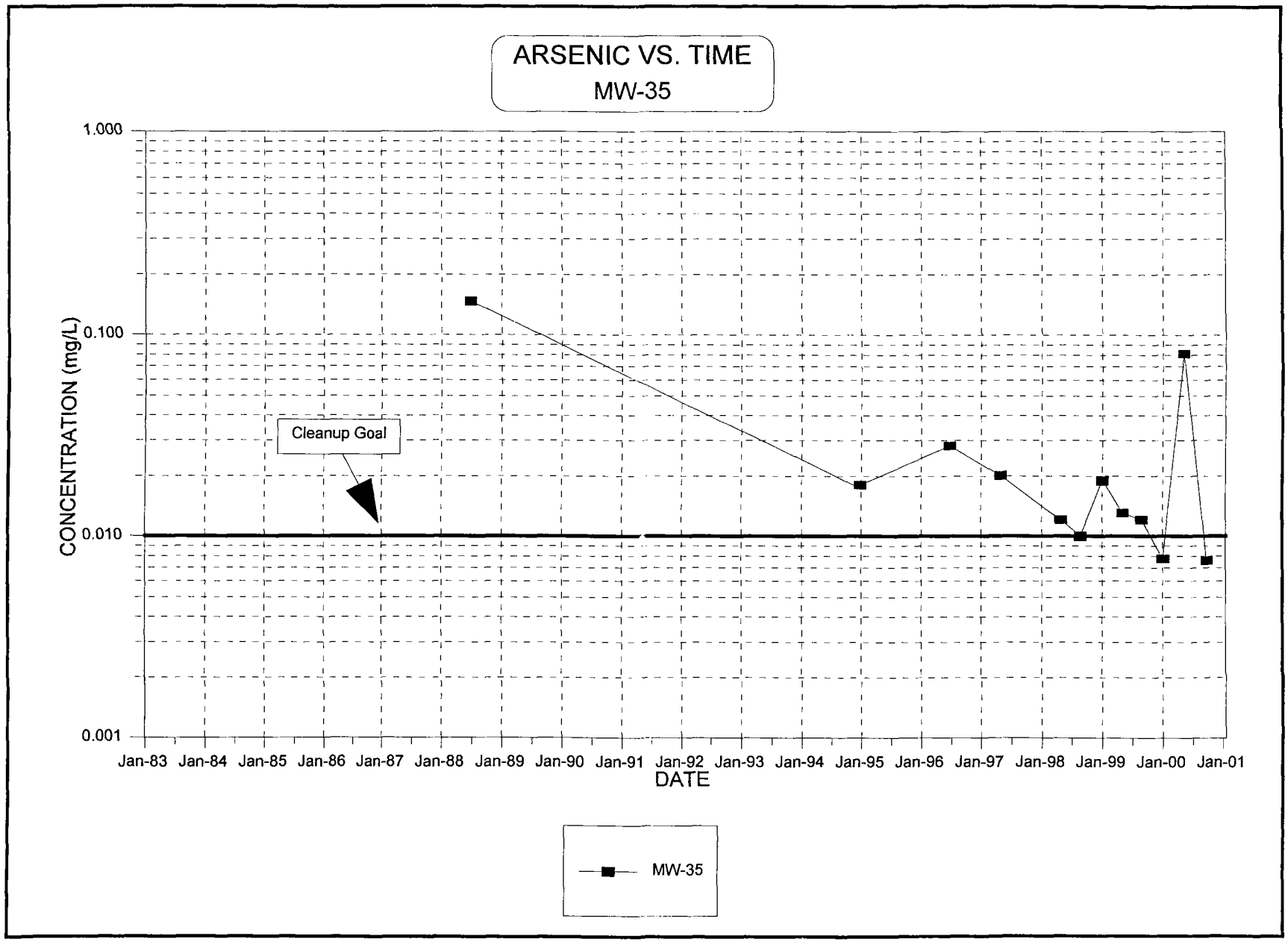


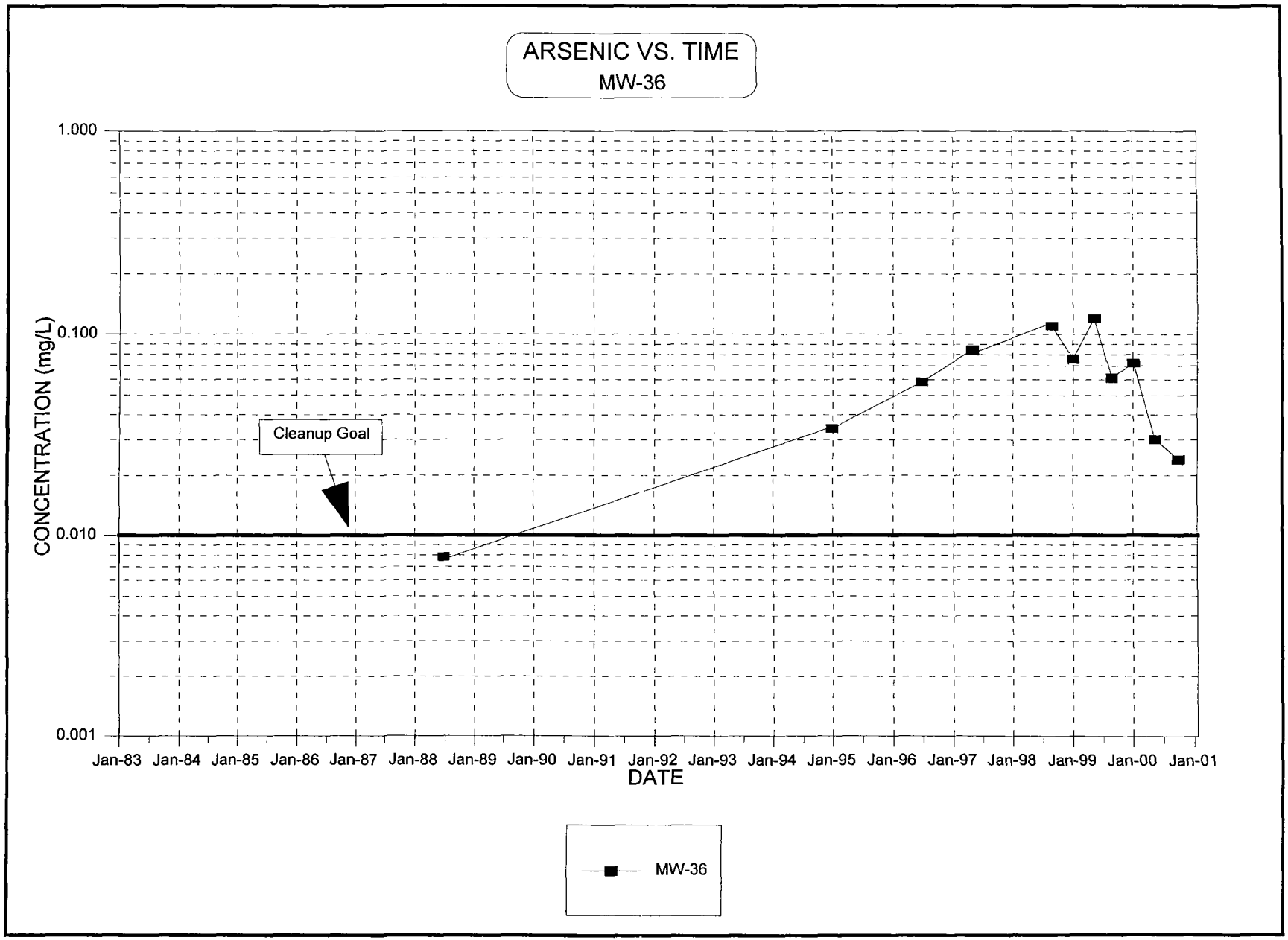
* = Below detection. Value plotted is detection limit.

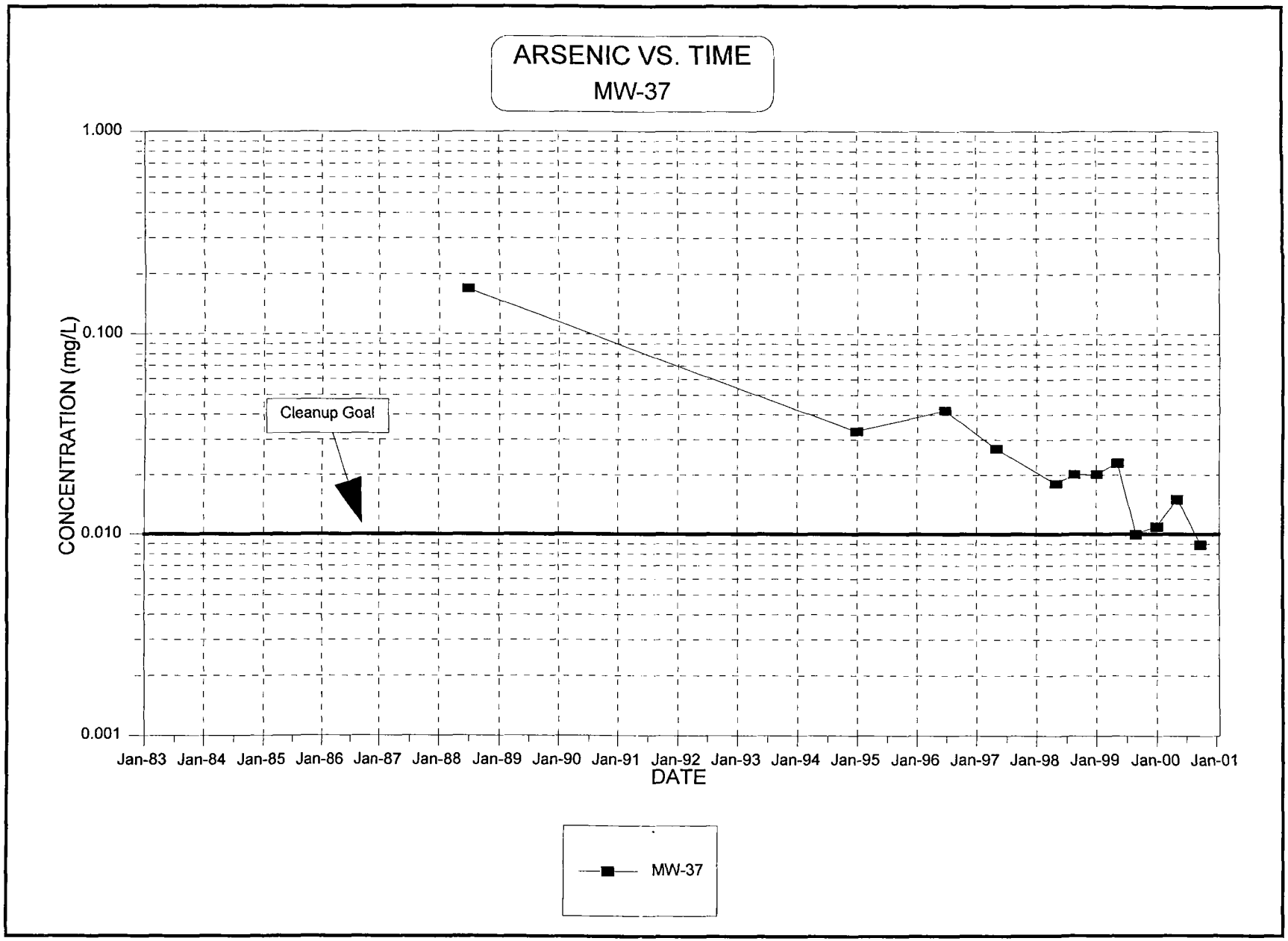

ARSENIC VS. TIME
MW-31
1.000
0.100
0.010
0.001
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-31



* = Below detection. Value plotted is detection limit.

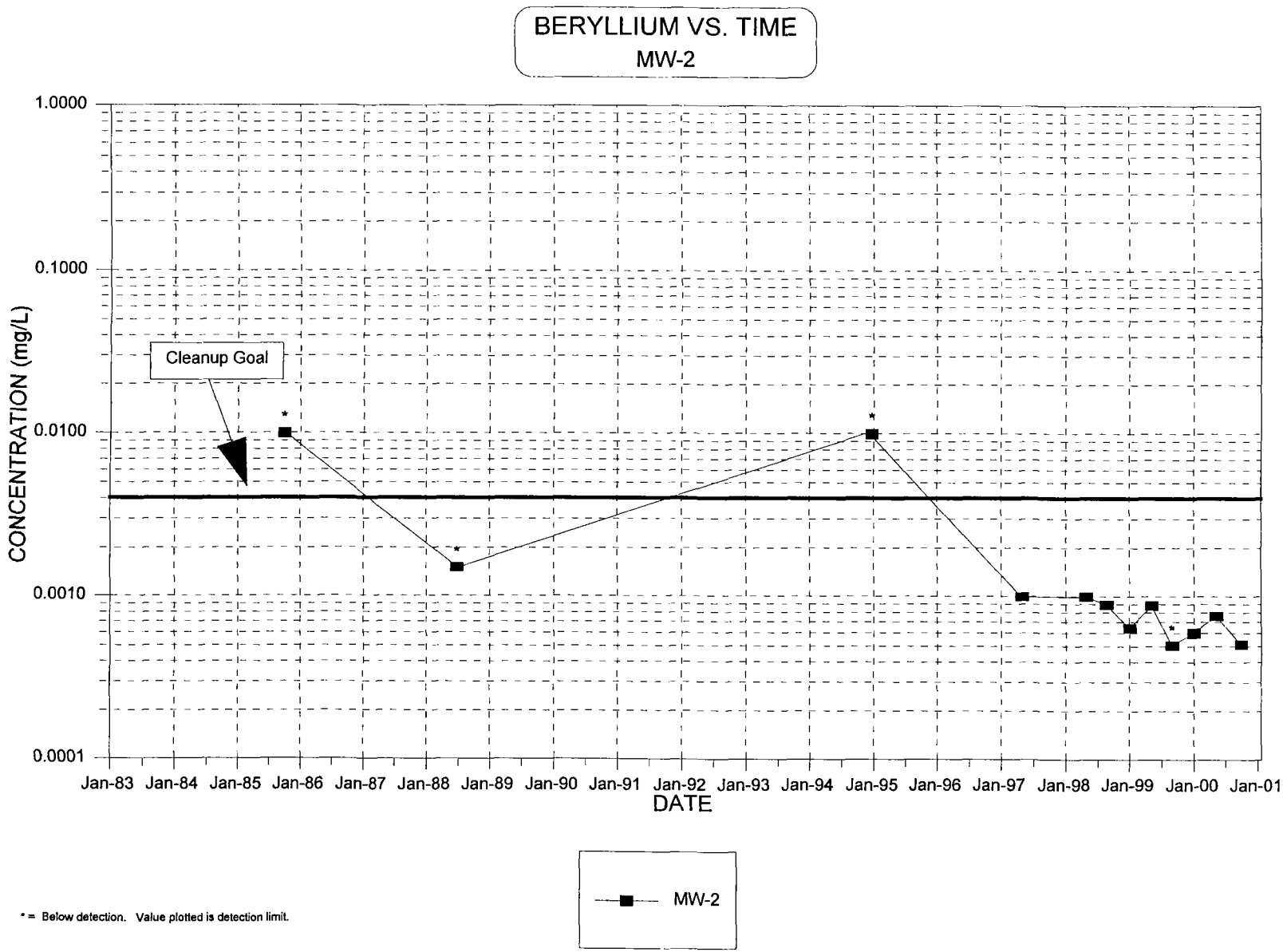

ARSENIC VS. TIME
MW-35
1.000
0.100
0.010
0.001
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-35


ARSENIC VS. TIME
MW-36
1.000
0.100
0.010
0.001
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-36

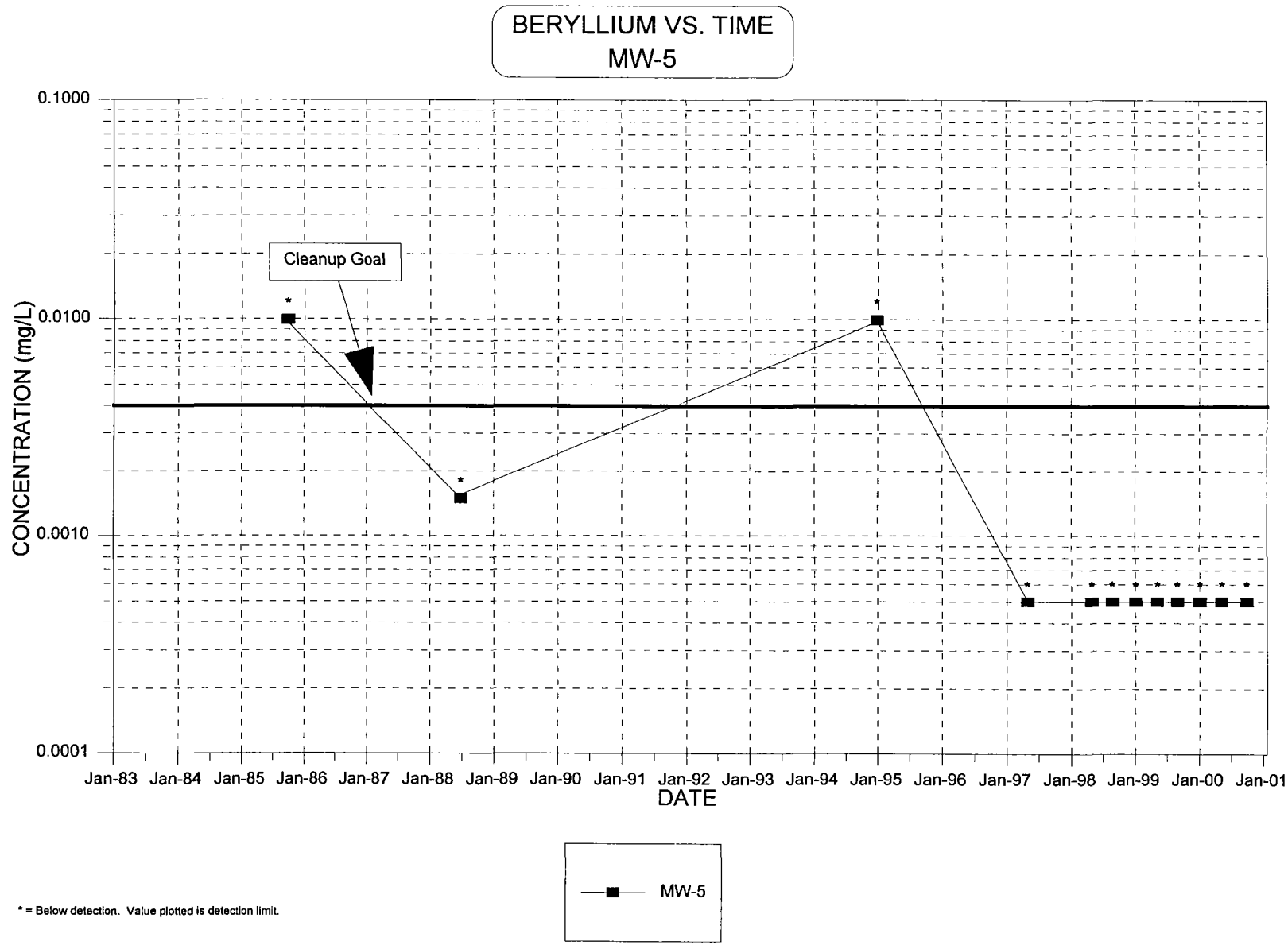

ARSENIC VS. TIME
MW-37
1.000
0.100
0.010
0.001
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-37

APPENDIX D-5

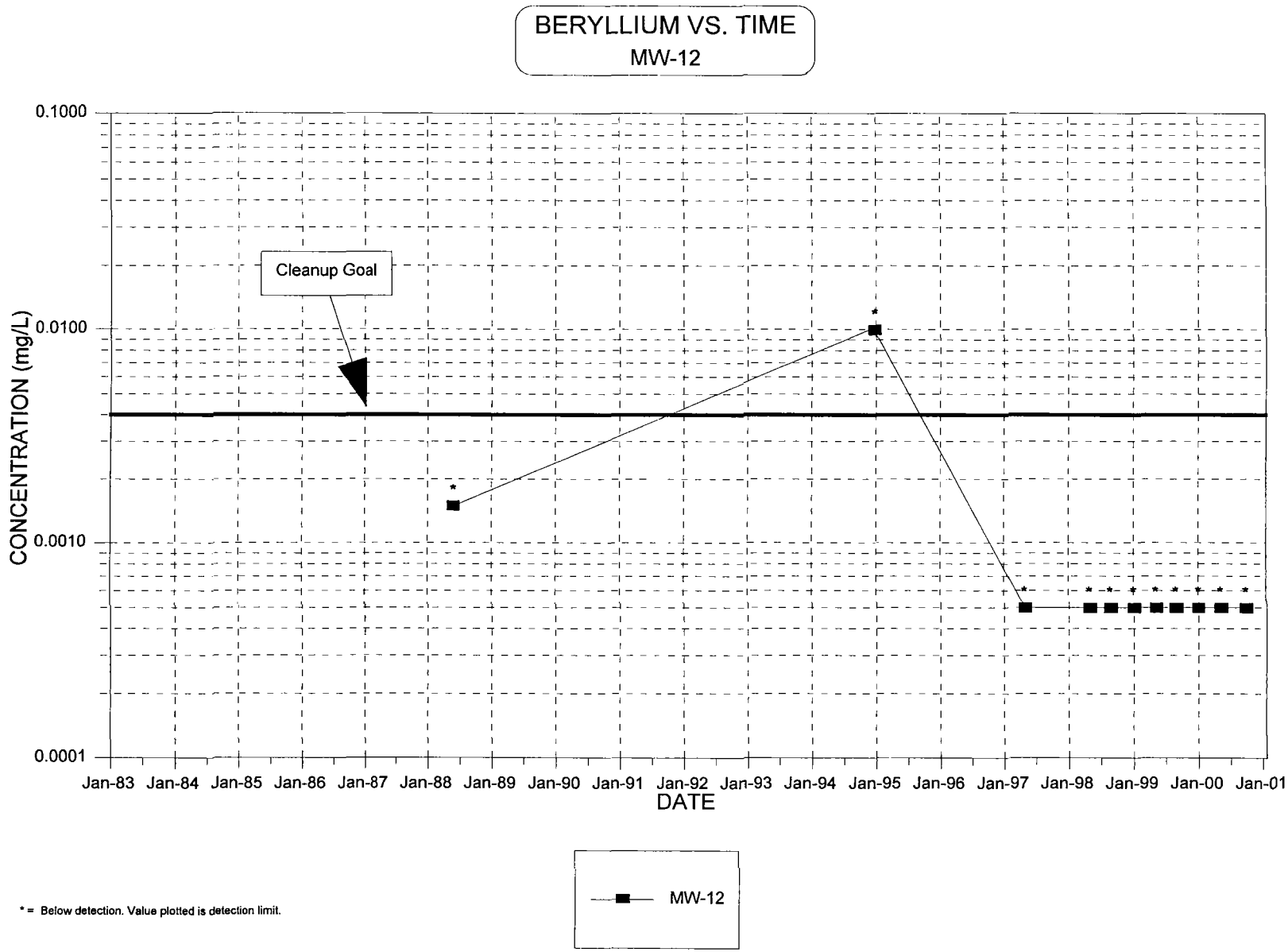
BERYLLIUM



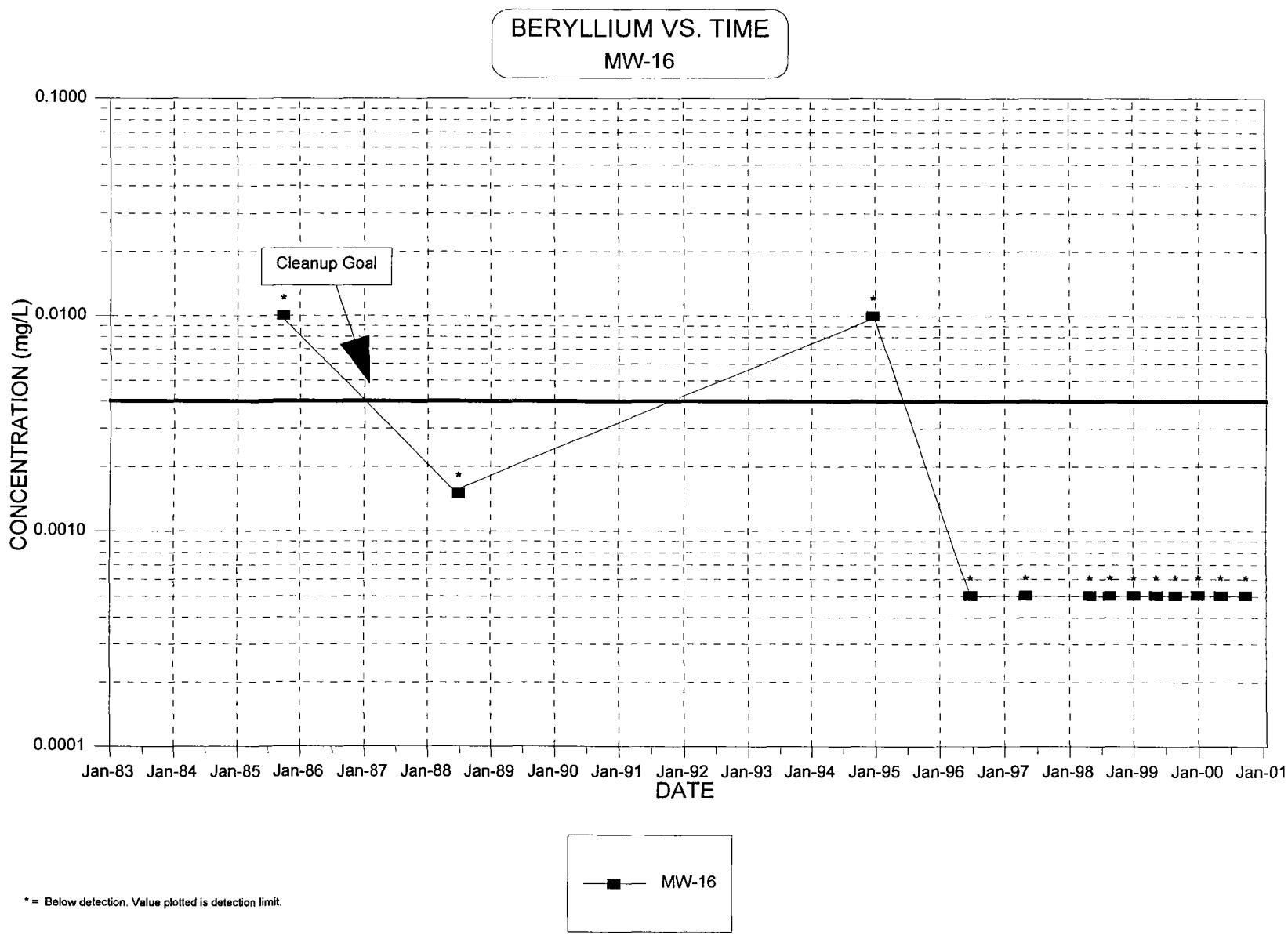
* = Below detection. Value plotted is detection limit.



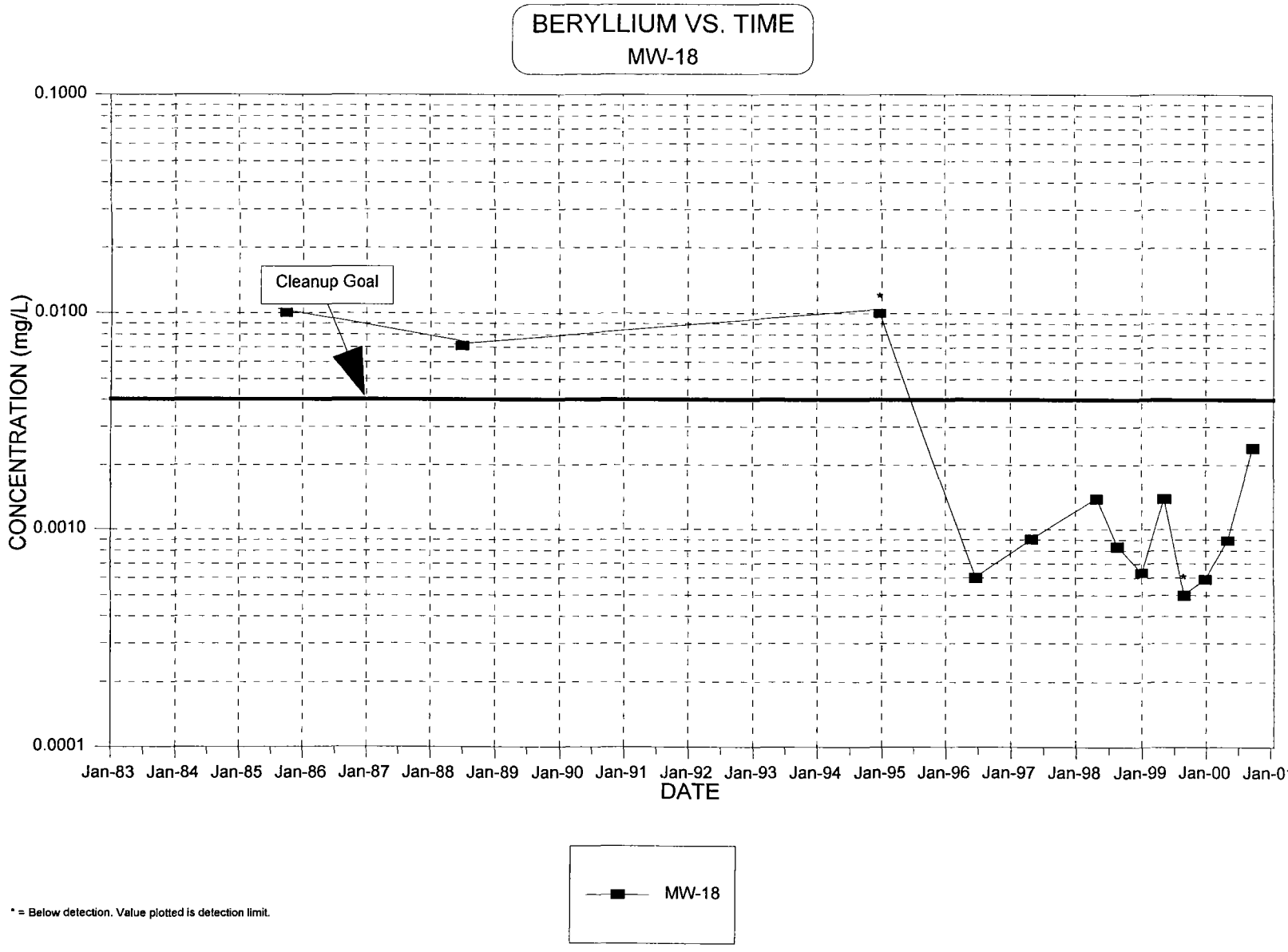
* = Below detection. Value plotted is detection limit.



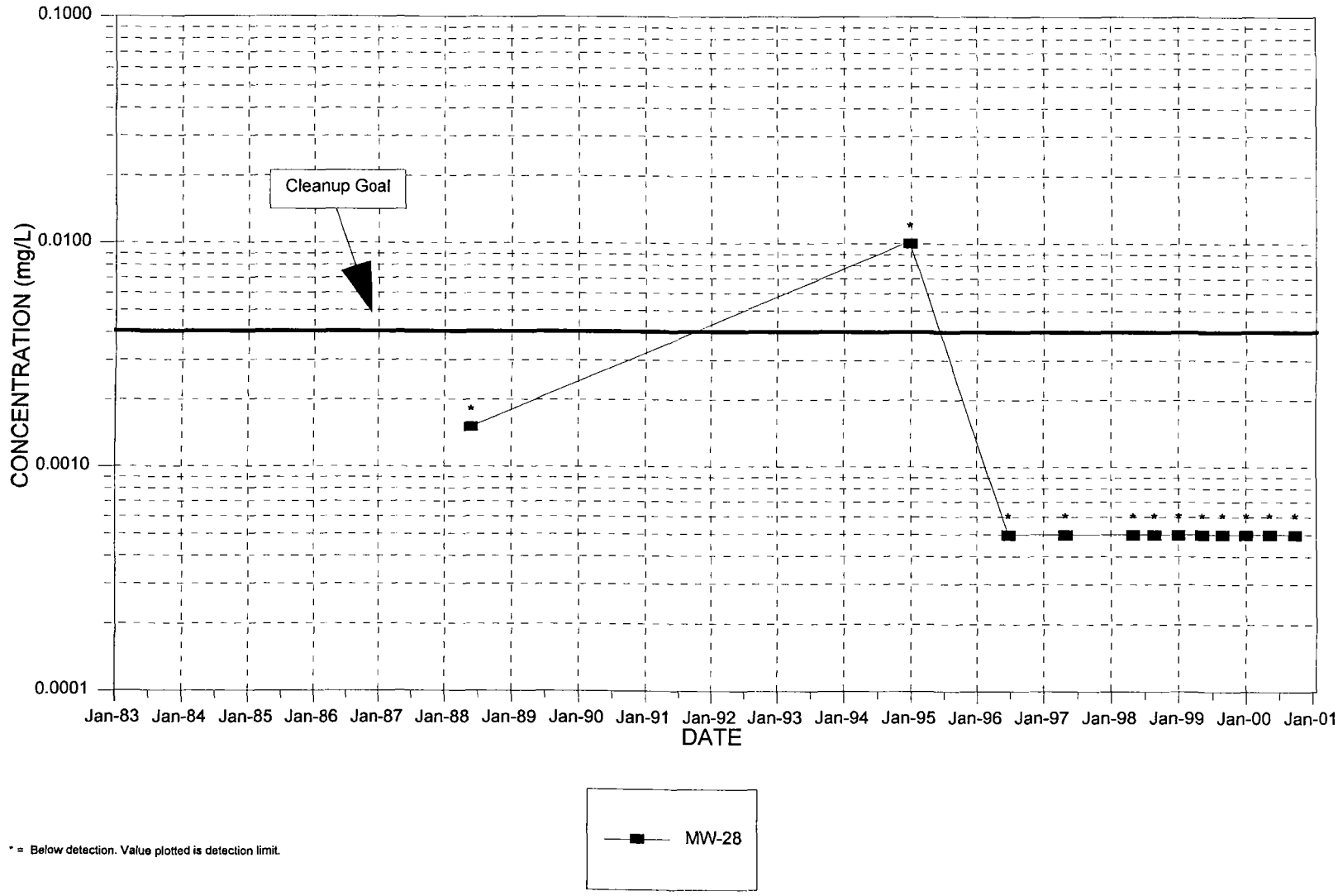
* = Below detection. Value plotted is detection limit.



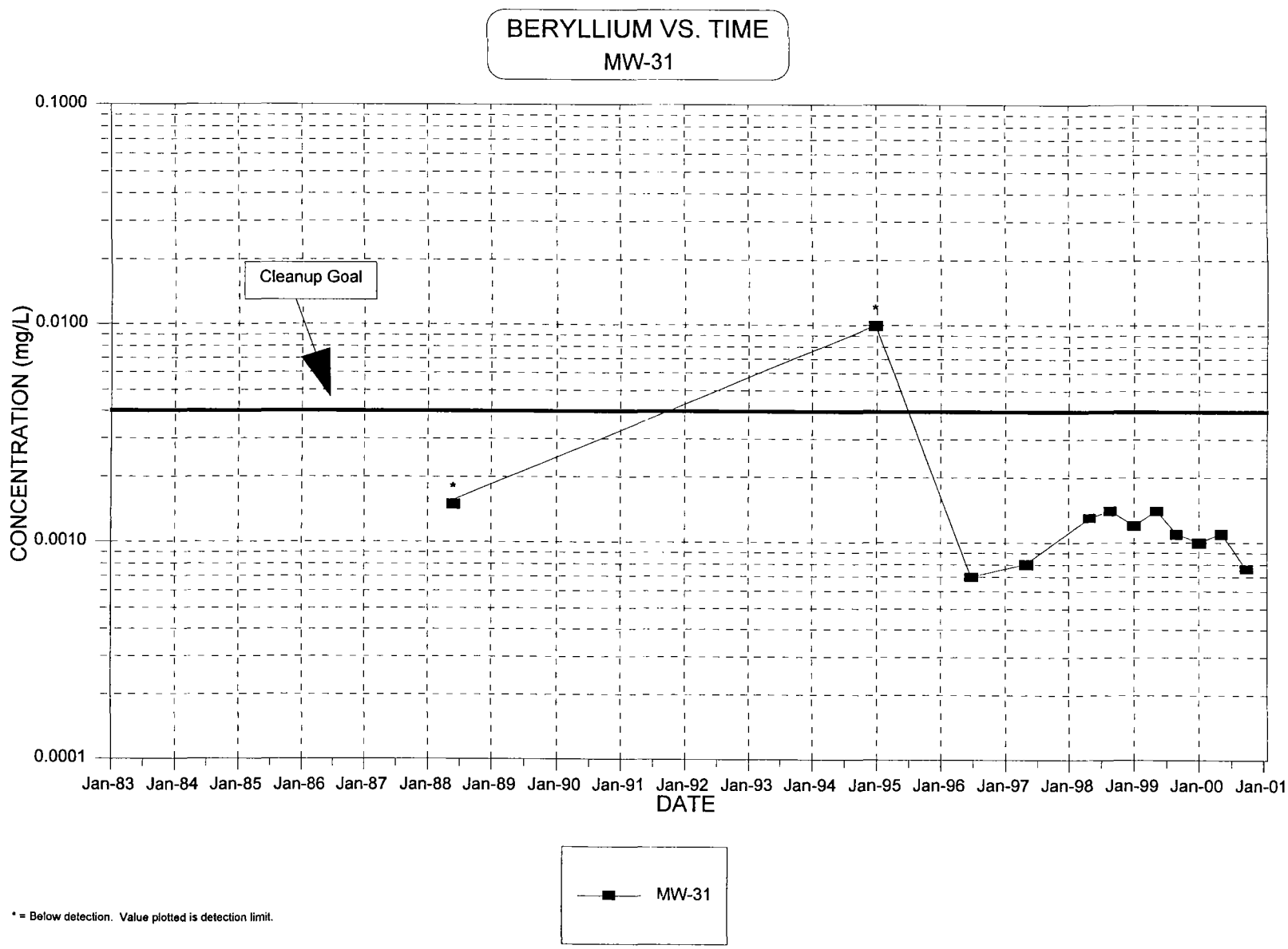
* = Below detection. Value plotted is detection limit.



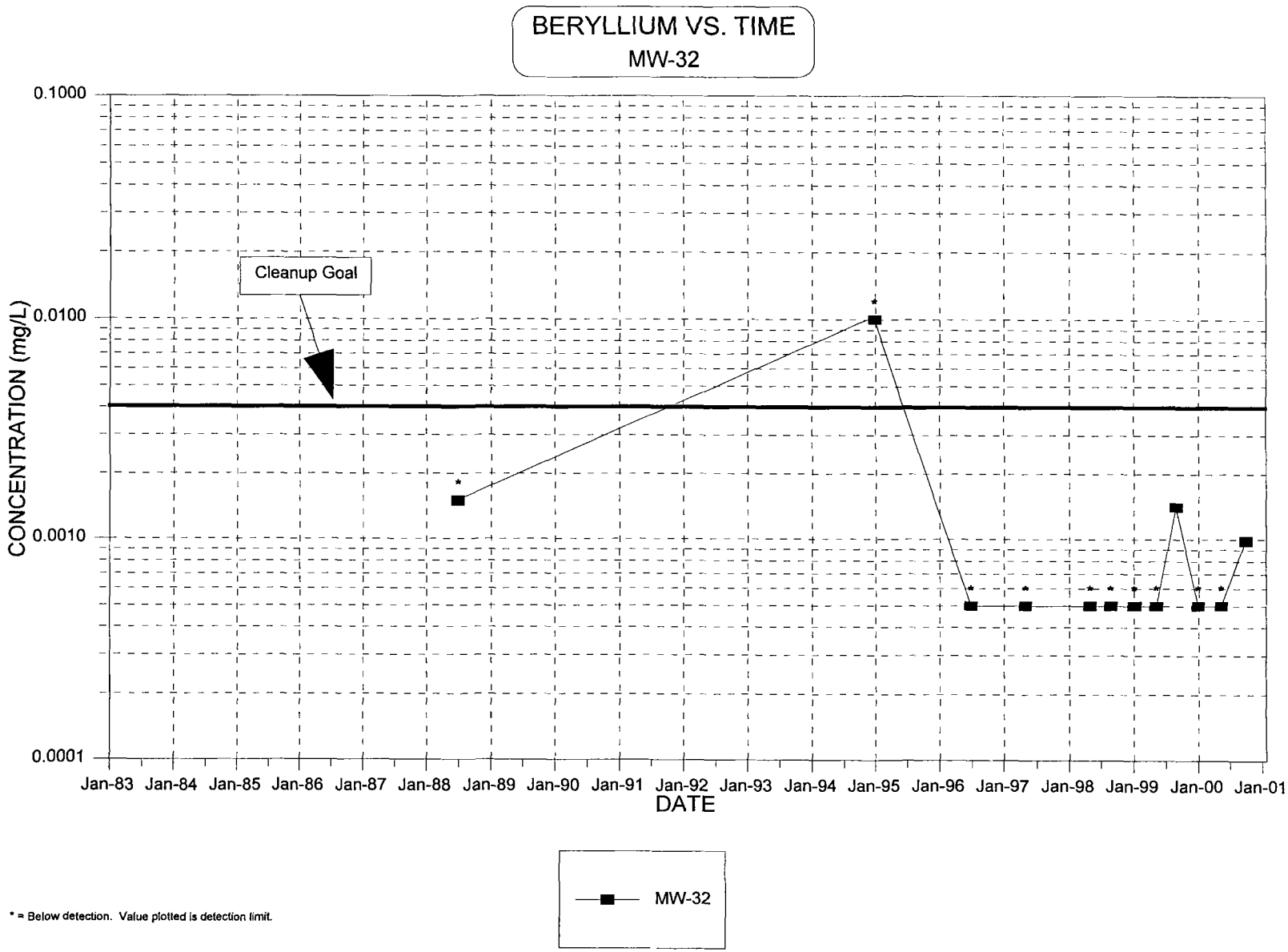
* = Below detection. Value plotted is detection limit.



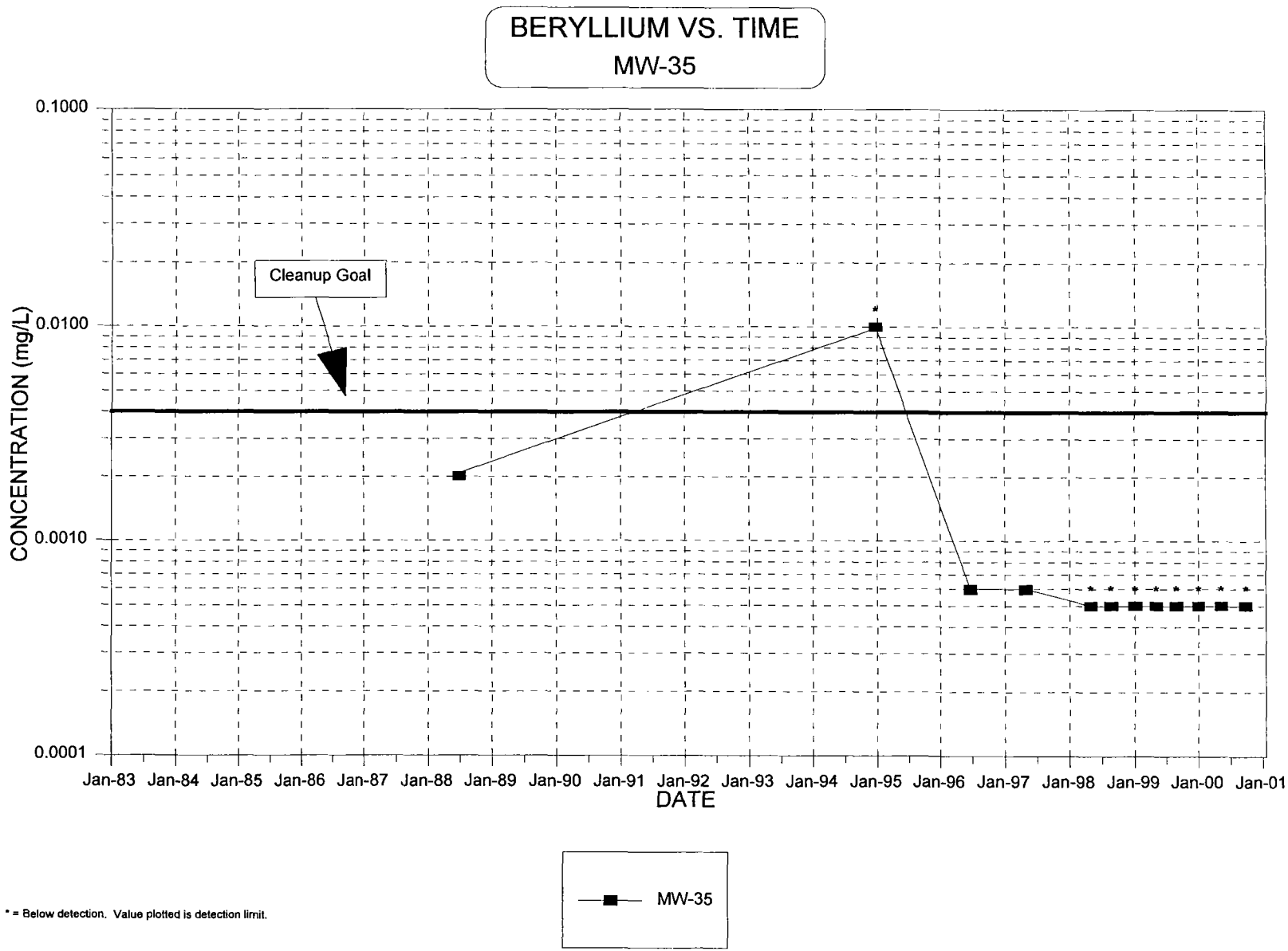
* = Below detection. Value plotted is detection limit.



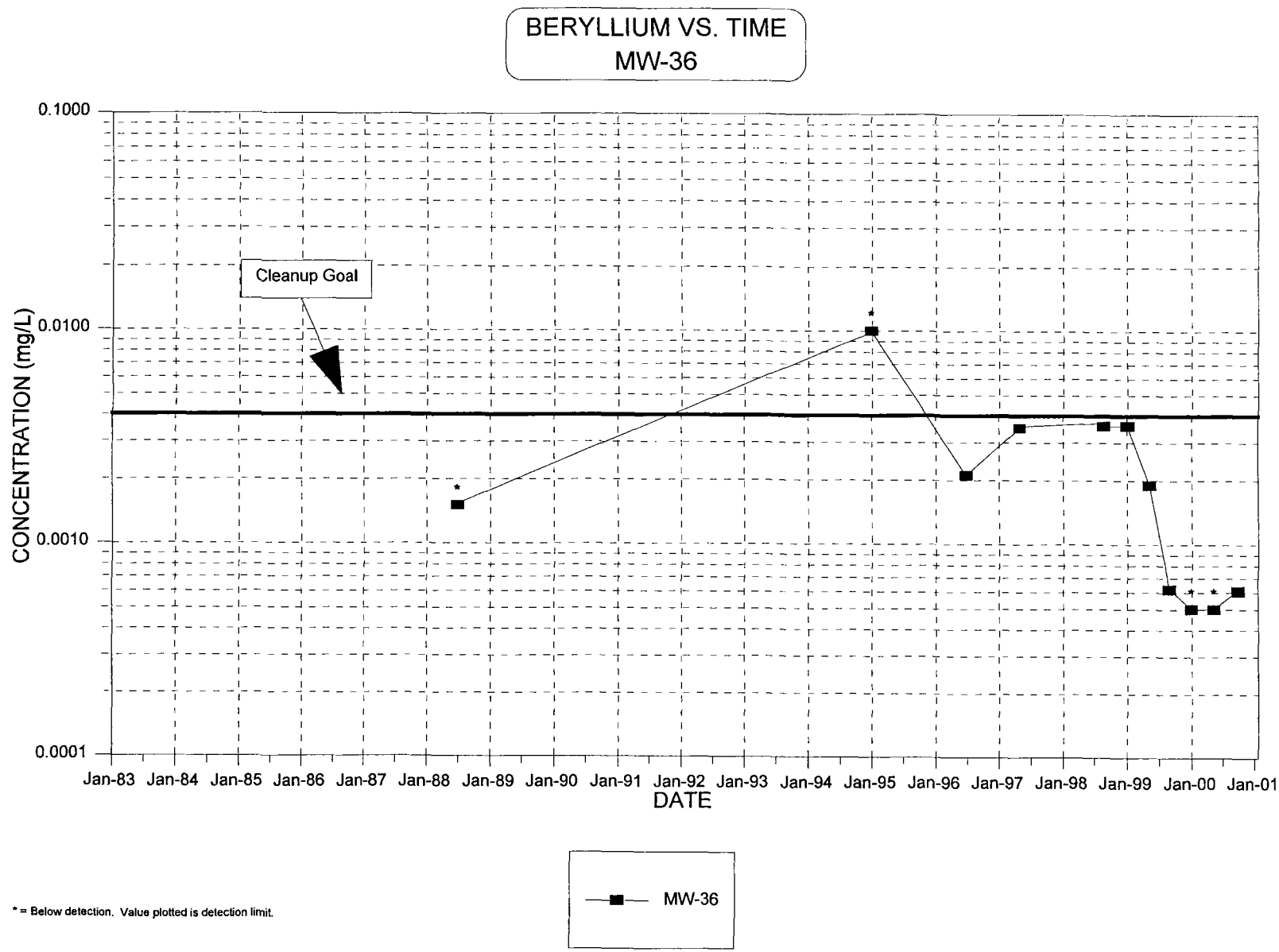
* = Below detection. Value plotted is detection limit.



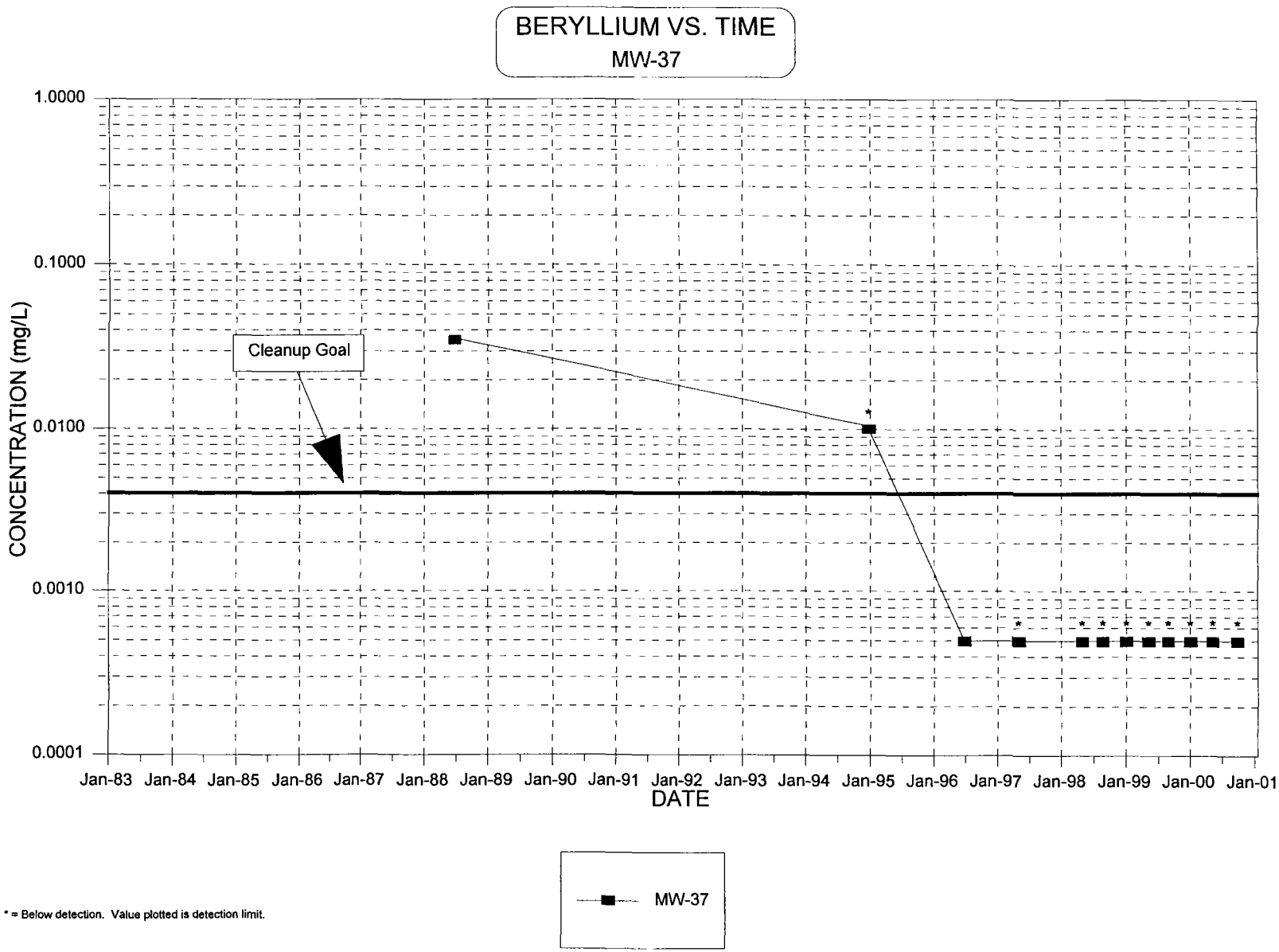
* = Below detection. Value plotted is detection limit.



* = Below detection. Value plotted is detection limit.



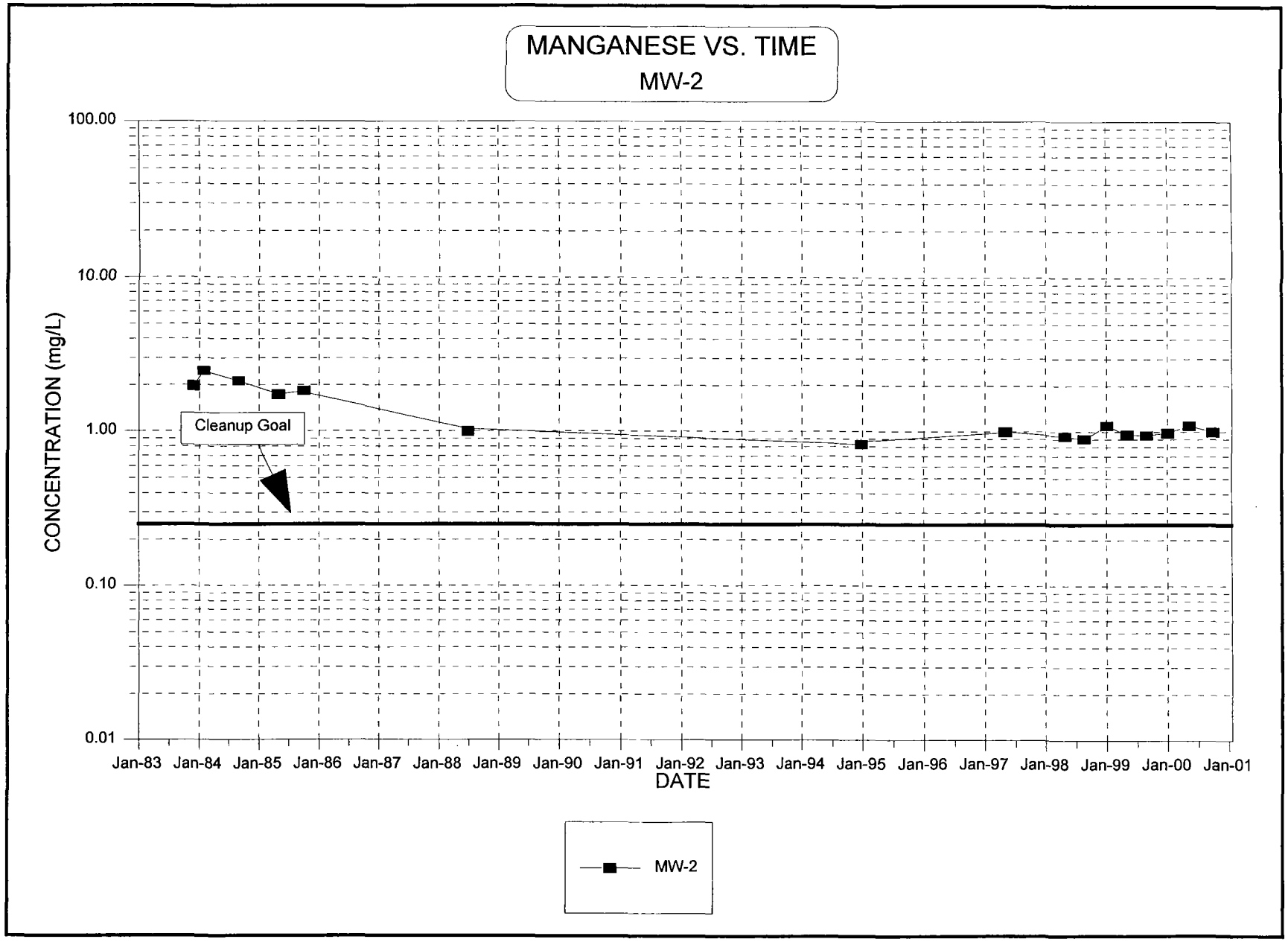
* = Below detection. Value plotted is detection limit.

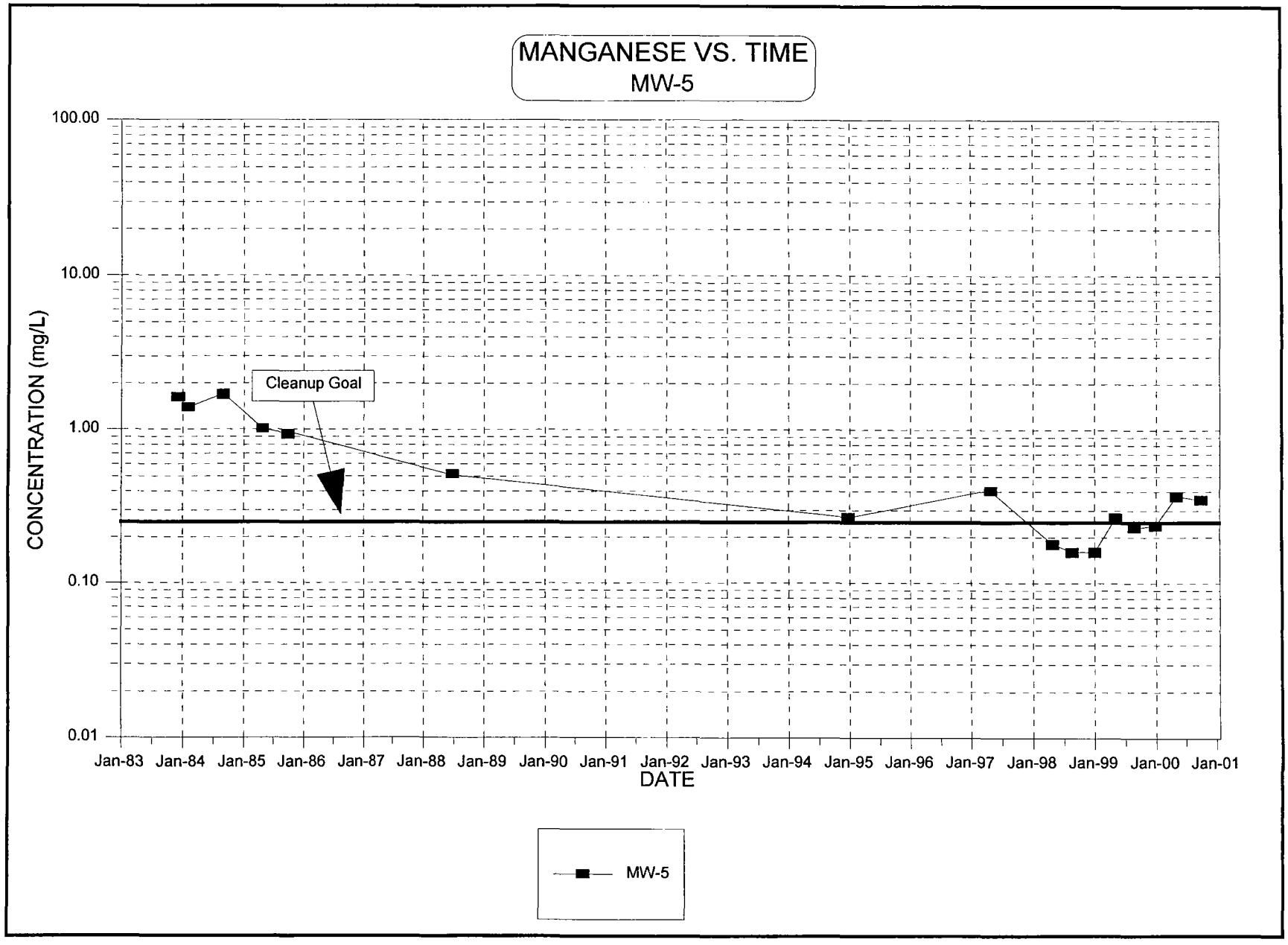


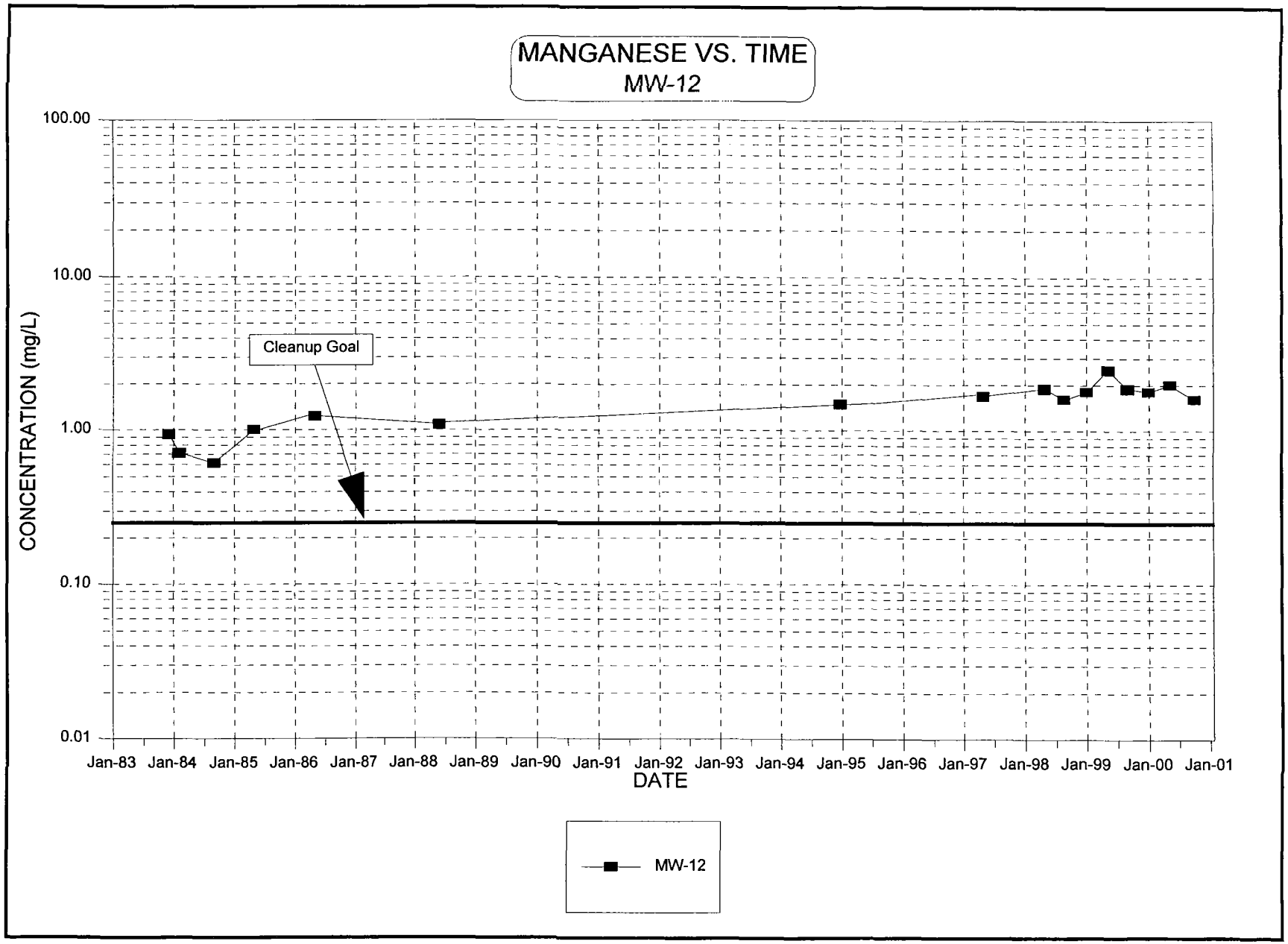
* = Below detection. Value plotted is detection limit.

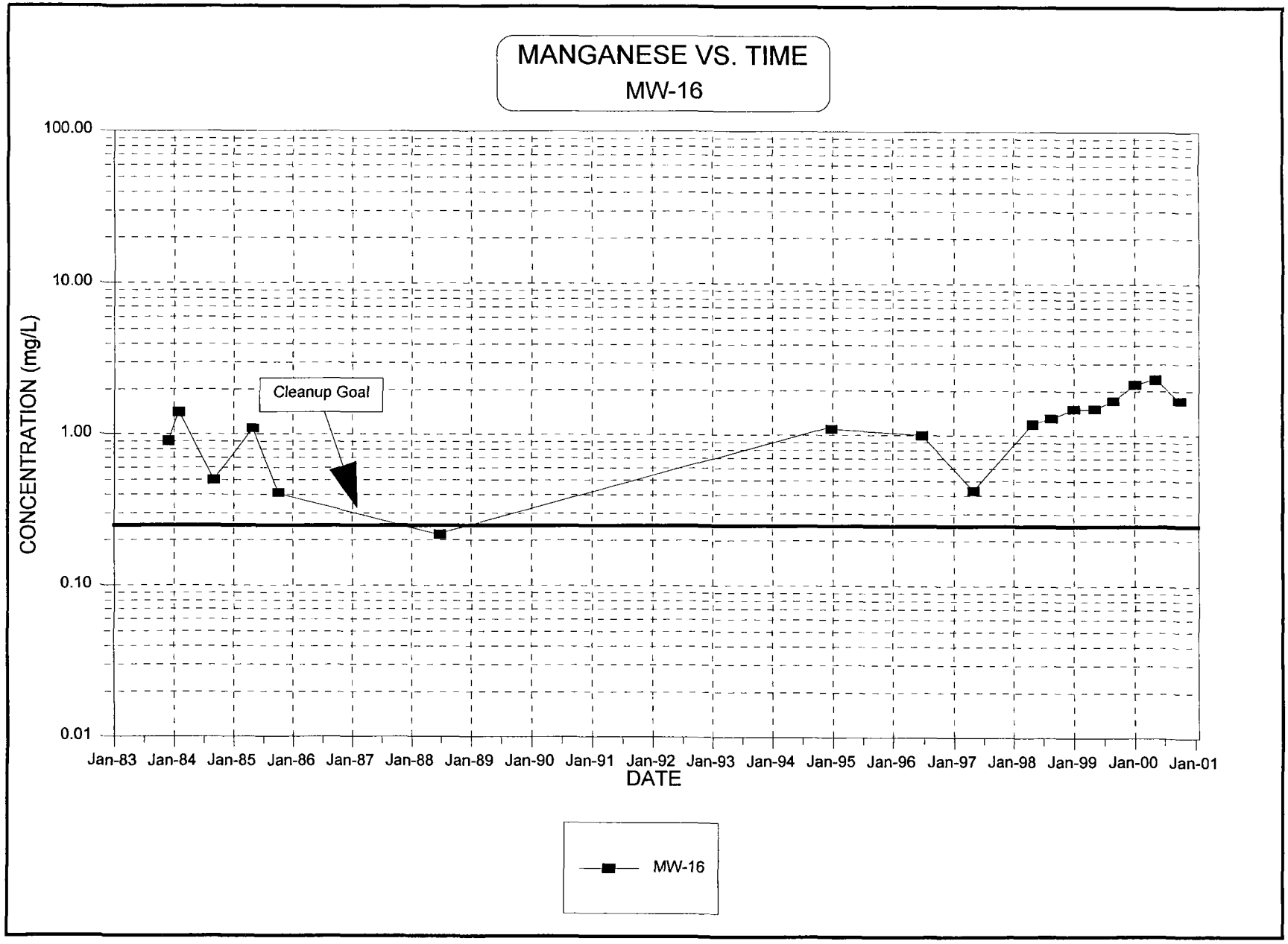
APPENDIX D-6

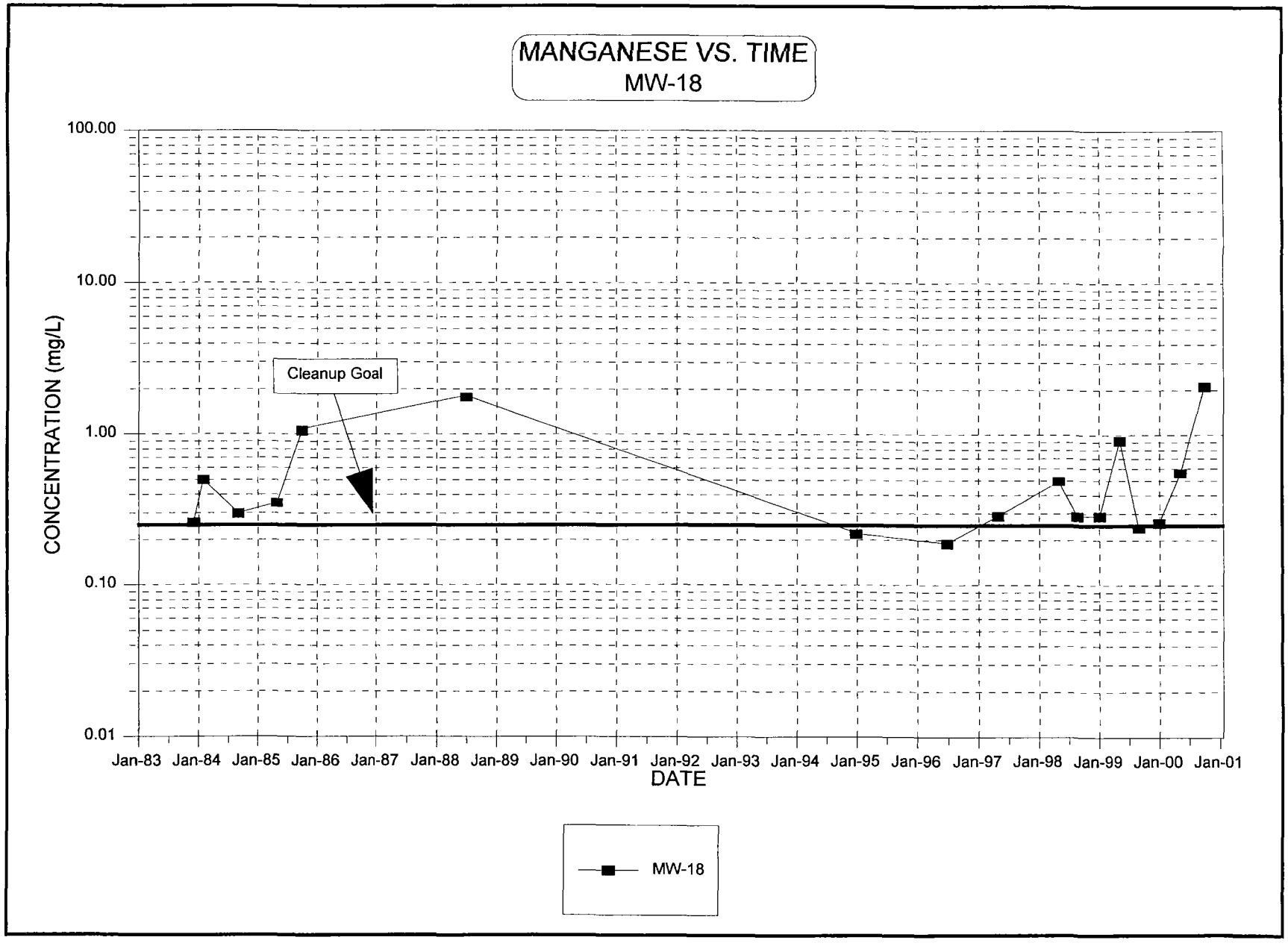
MANGANESE

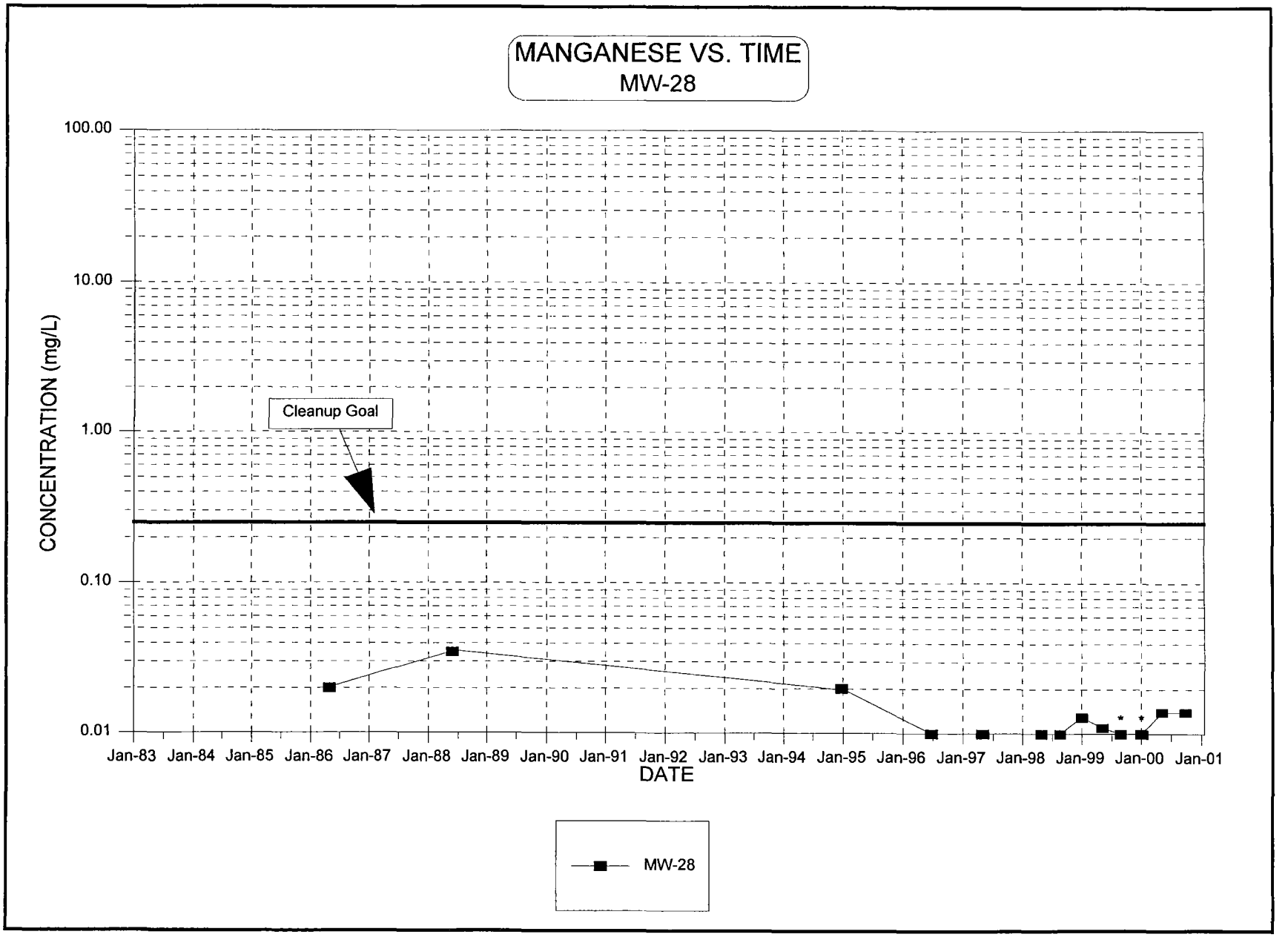

MANGANESE VS. TIME
MW-2
100.00
10.00
1.00
0.10
0.01
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-2

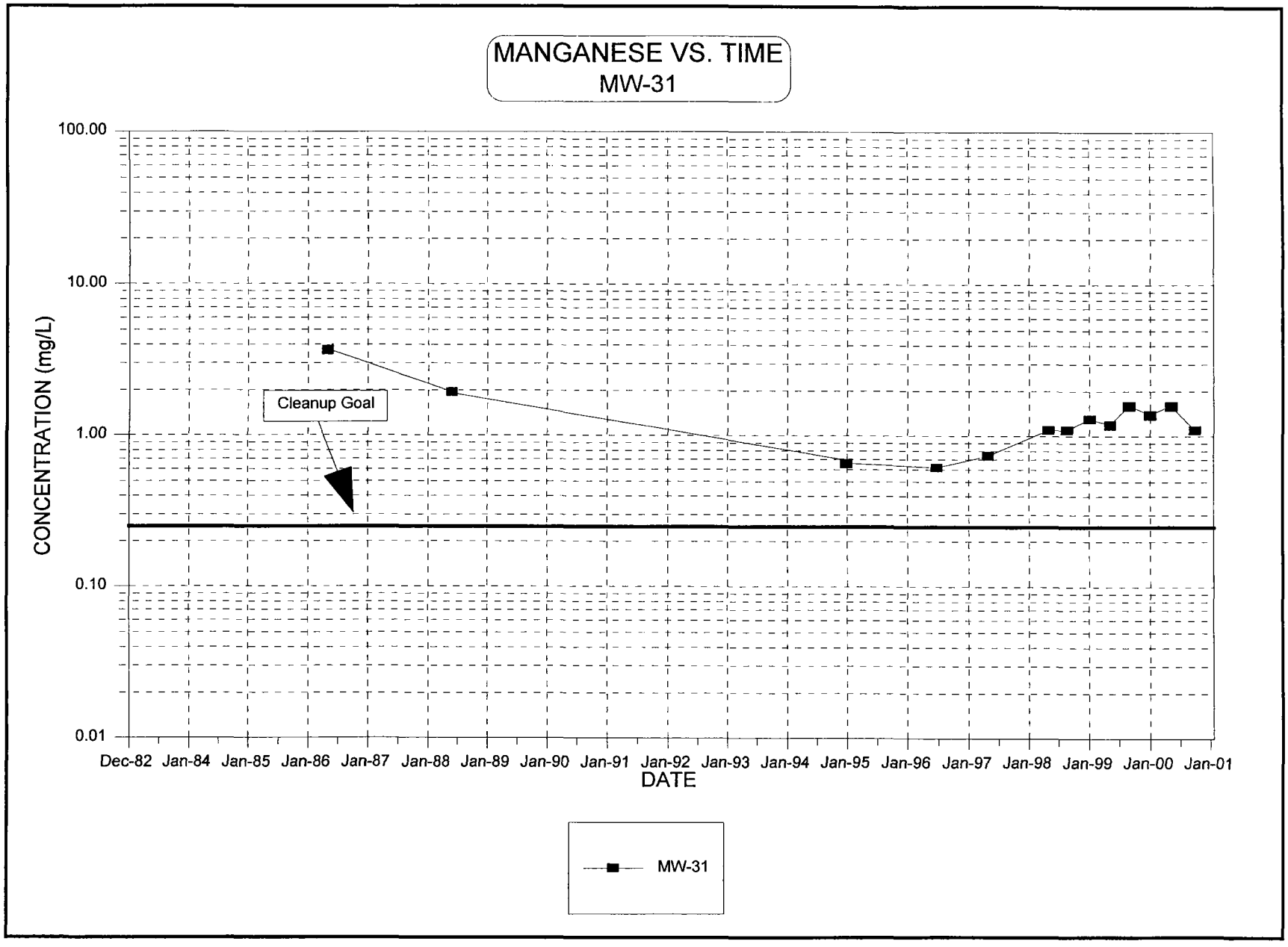

MANGANESE VS. TIME
MW-5
100.00
10.00
1.00
0.10
0.01
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-5

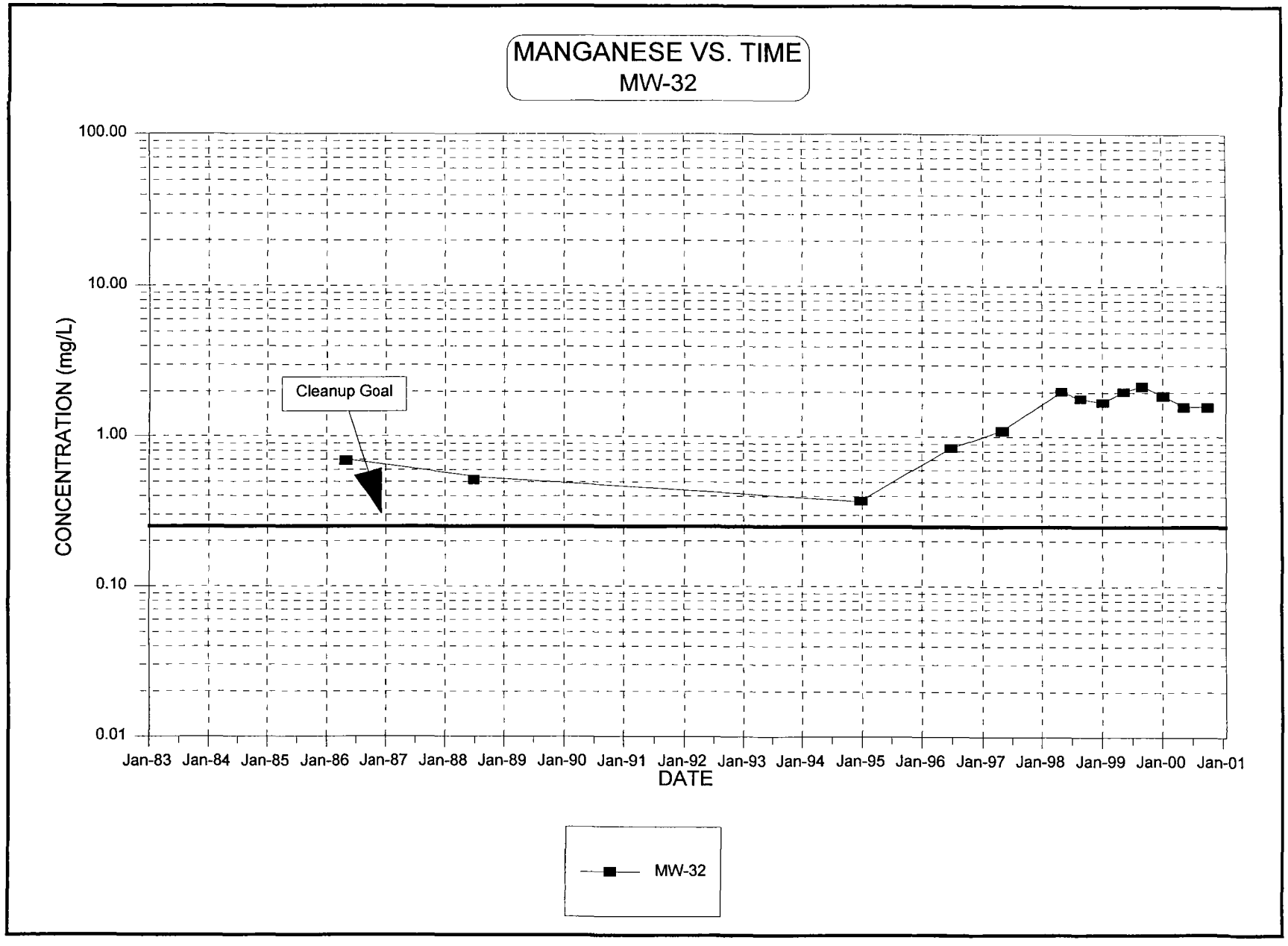

MANGANESE VS. TIME
MW-12
100.00
10.00
1.00
0.10
0.01
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-12

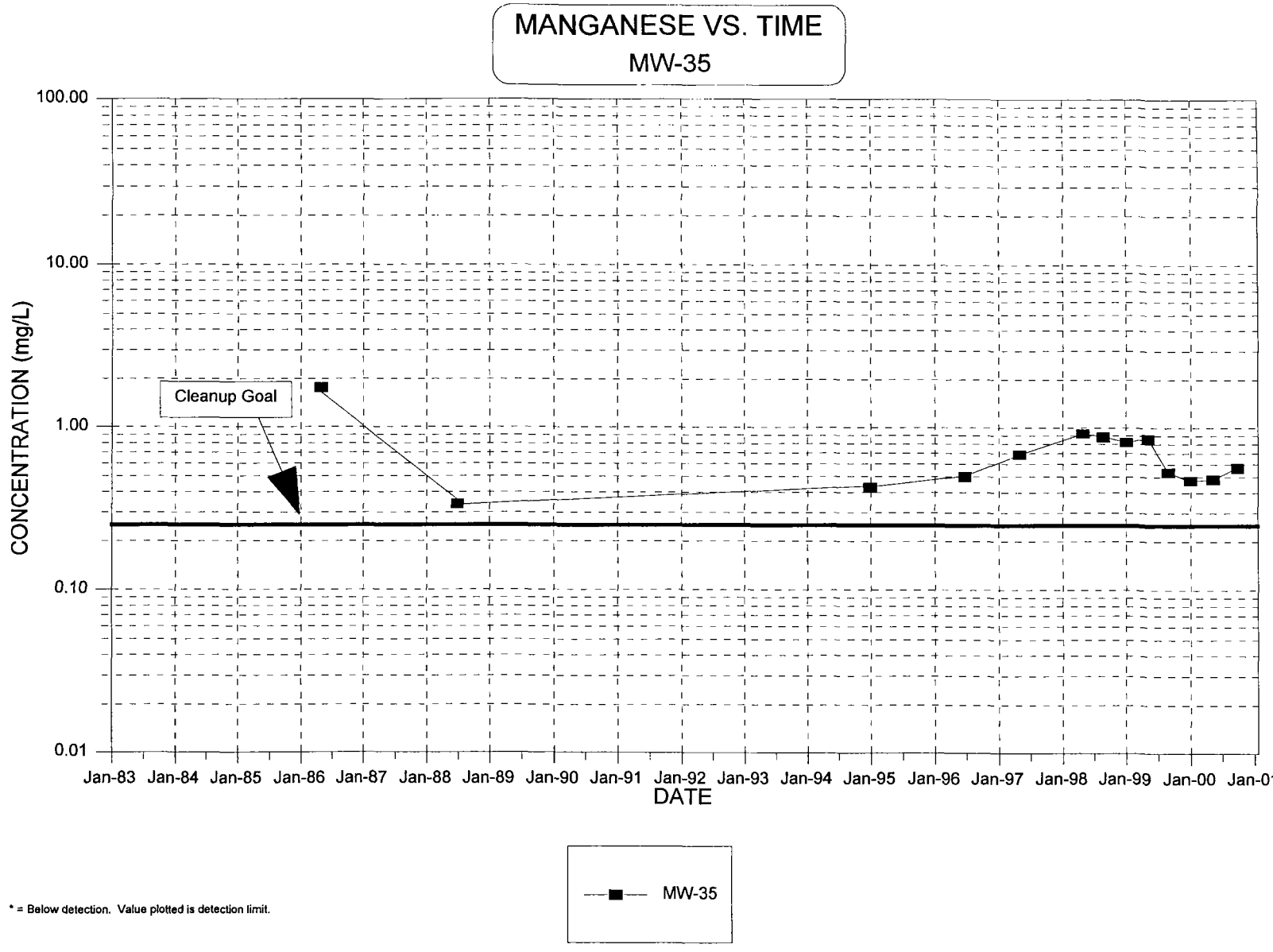

MANGANESE VS. TIME
MW-16
100.00
10.00
1.00
0.10
0.01
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-16


MANGANESE VS. TIME
MW-18
100.00
10.00
1.00
0.10
0.01
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-18

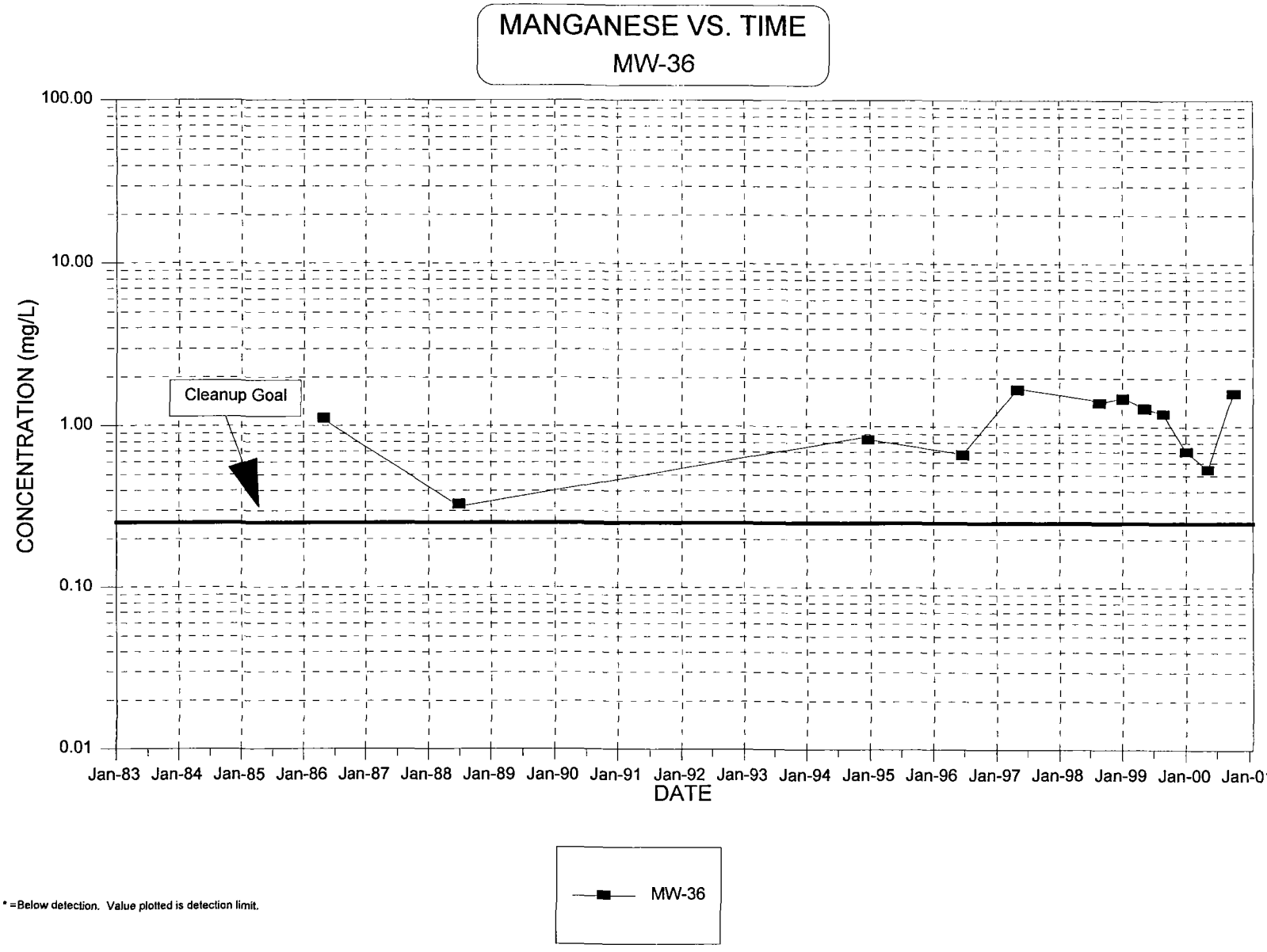

MANGANESE VS. TIME
MW-28
100.00
10.00
1.00
0.10
0.01
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-28


MANGANESE VS. TIME
MW-31
100.00
10.00
1.00
0.10
0.01
CONCENTRATION (mg/L)
Cleanup Goal
Dec-82
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-31

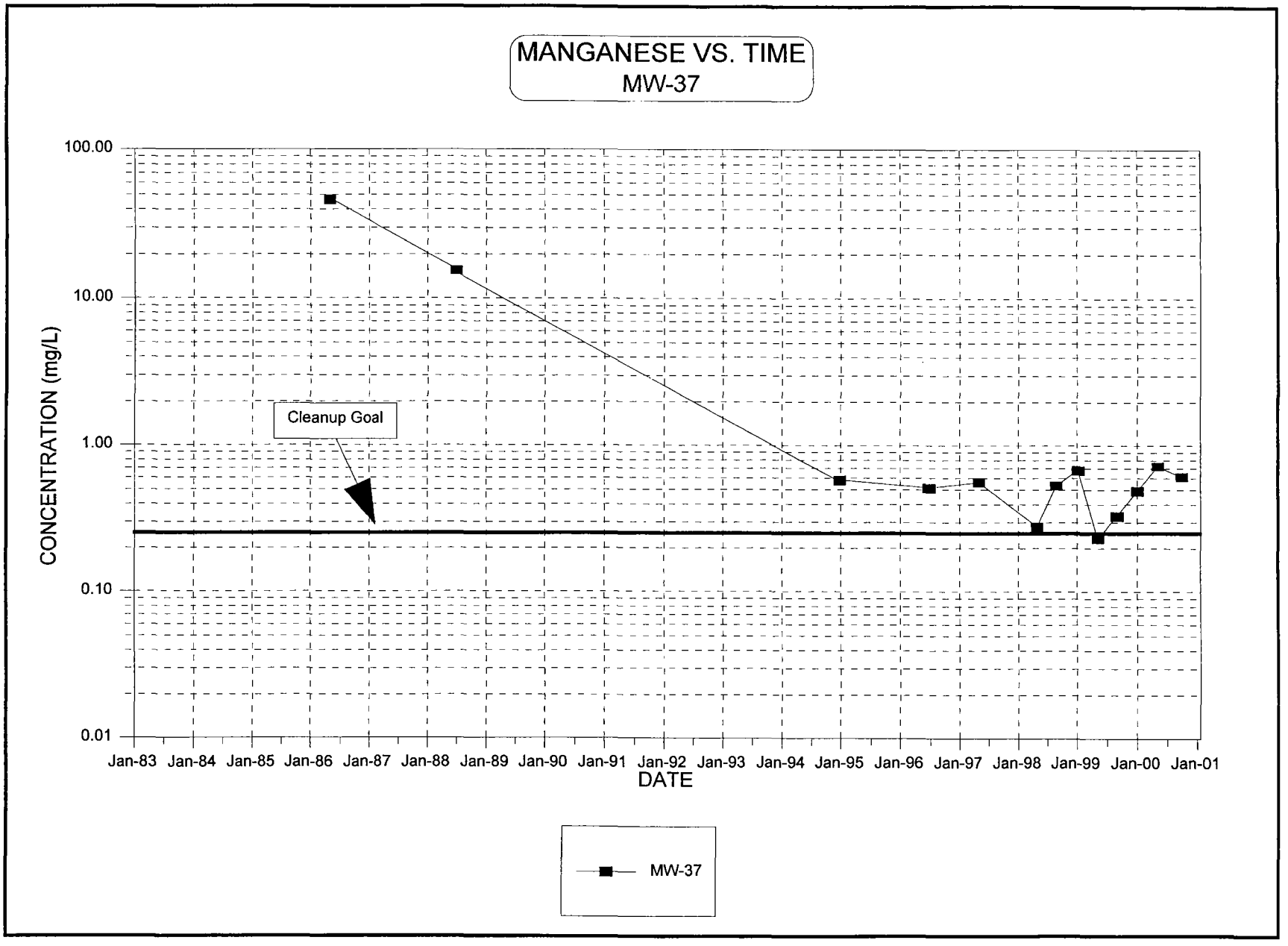

MANGANESE VS. TIME
MW-32
100.00
10.00
1.00
0.10
0.01
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-32



* = Below detection. Value plotted is detection limit.

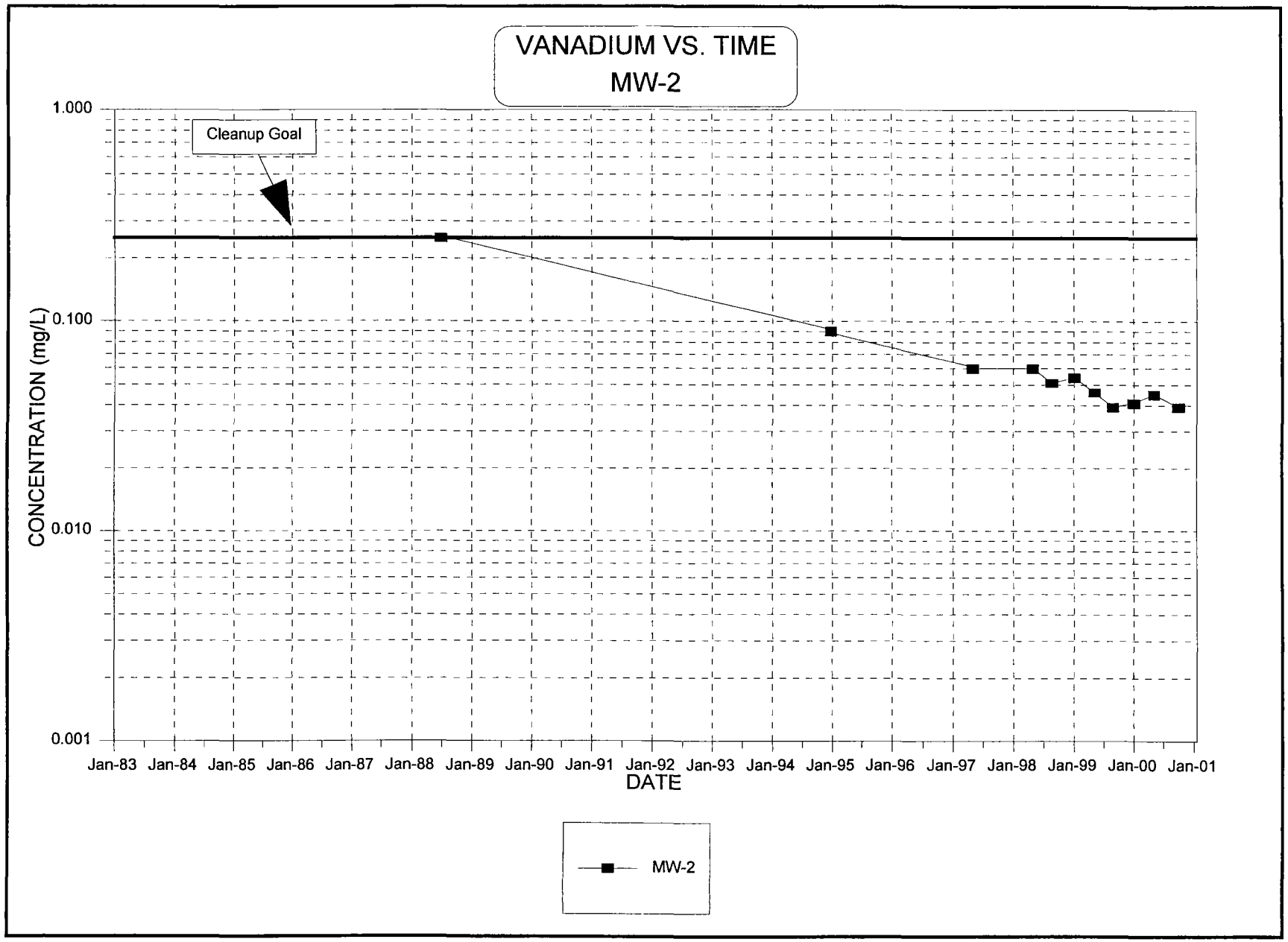


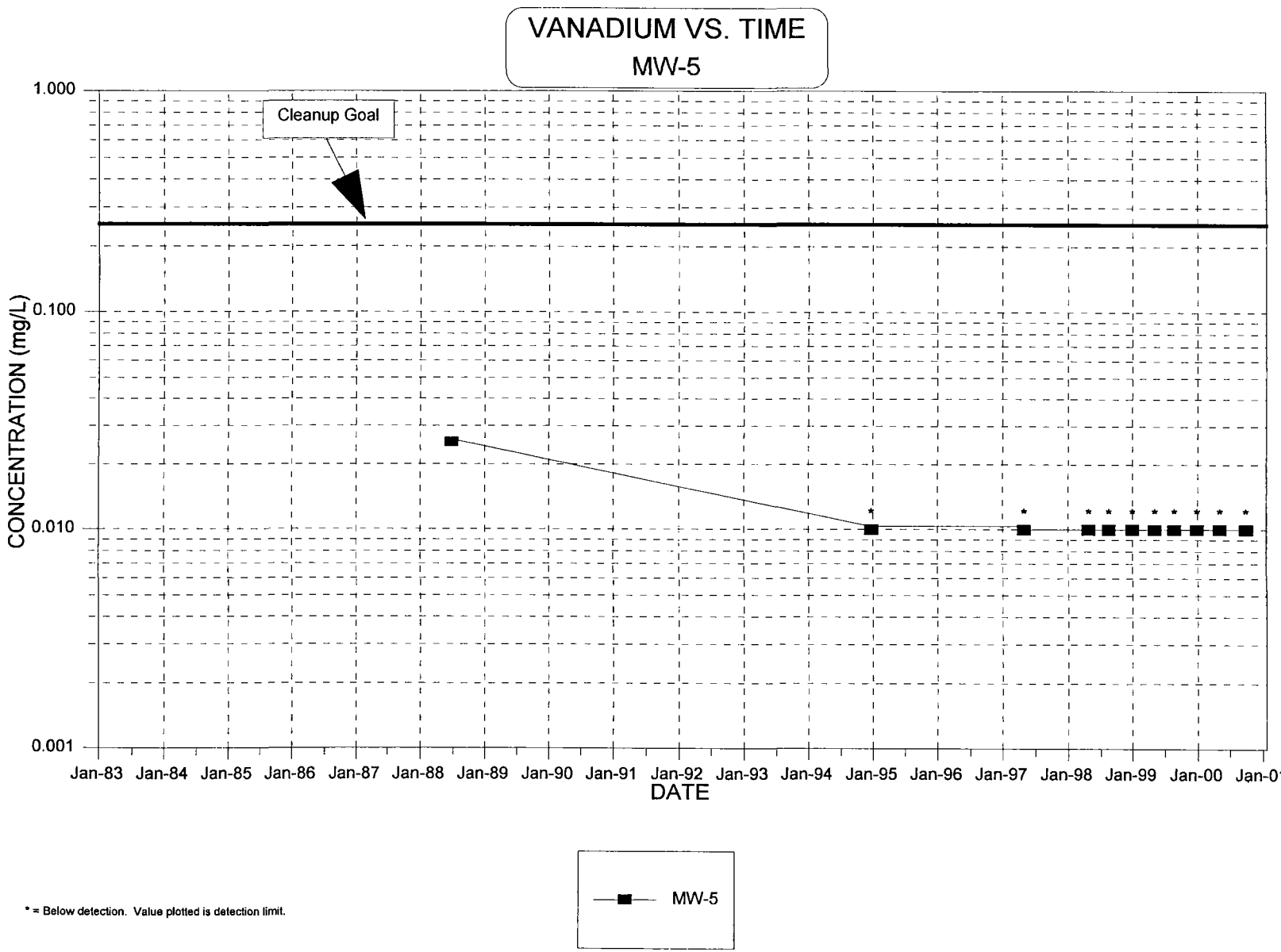
* =Below detection. Value plotted is detection limit.


MANGANESE VS. TIME
MW-37
100.00
10.00
1.00
0.10
0.01
CONCENTRATION (mg/L)
Cleanup Goal
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-37

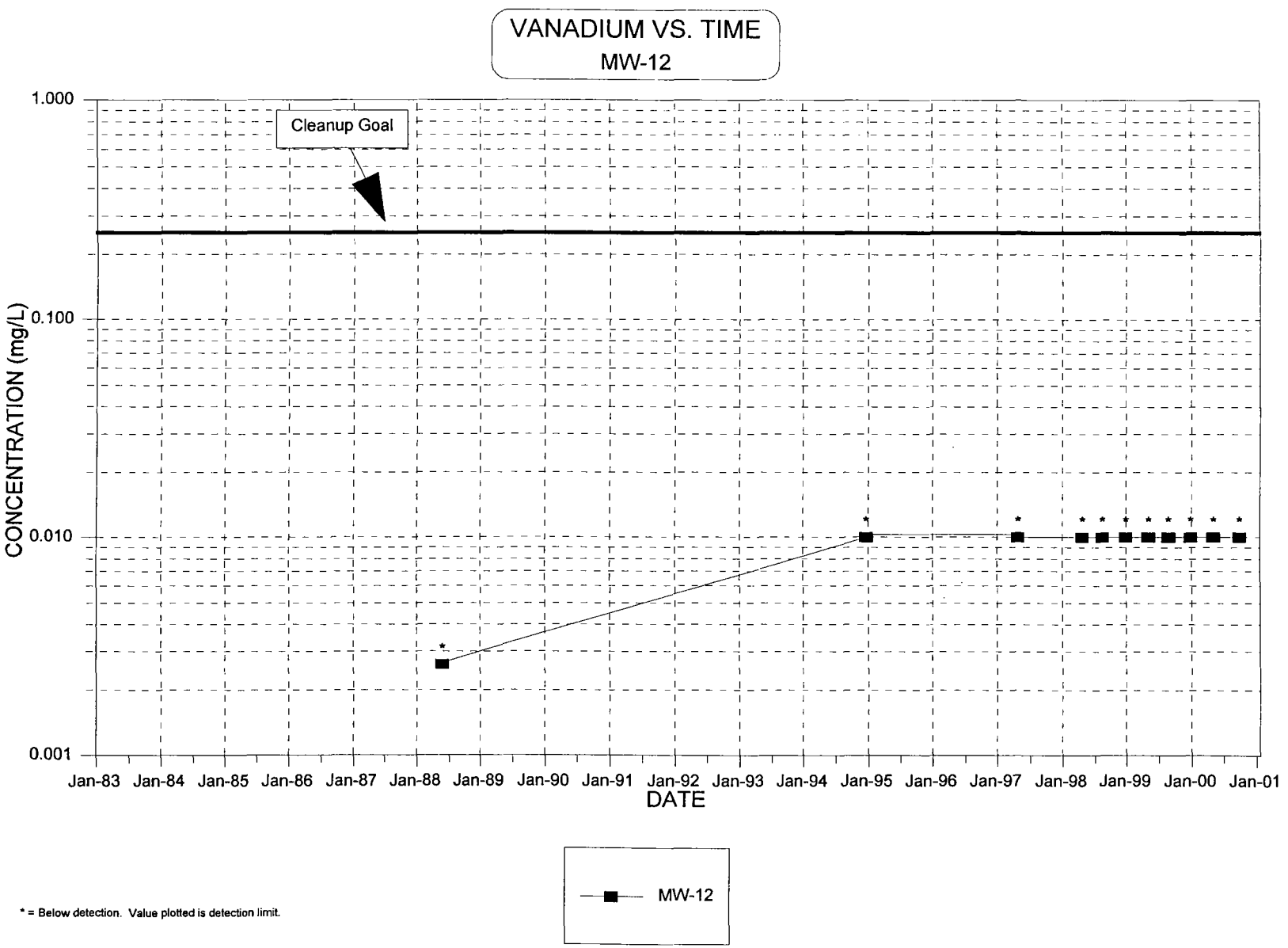
APPENDIX D-7

VANADIUM

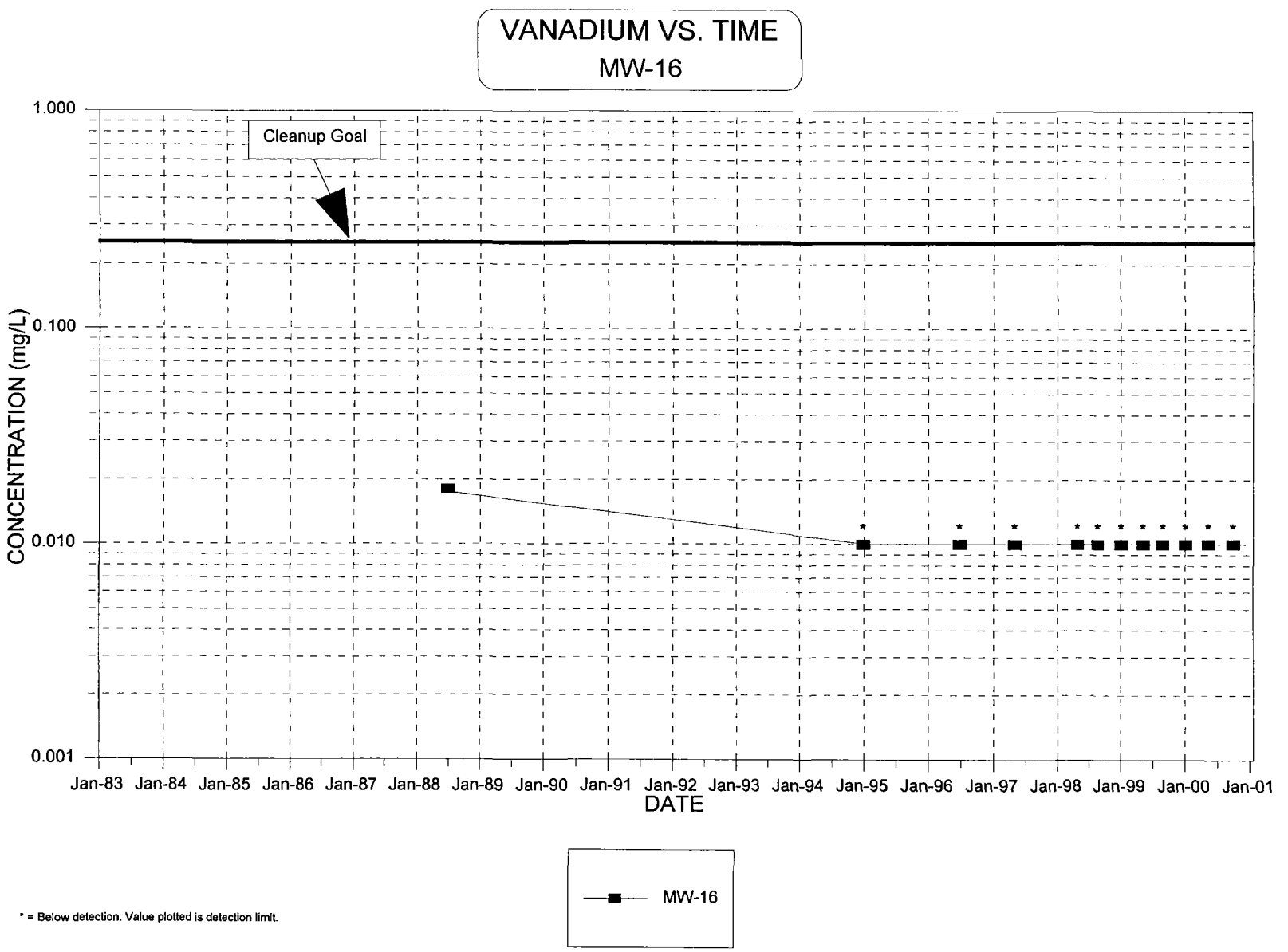

VANADIUM VS. TIME
MW-2
Cleanup Goal
1.000
0.100
0.010
0.001
CONCENTRATION (mg/L)
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-2



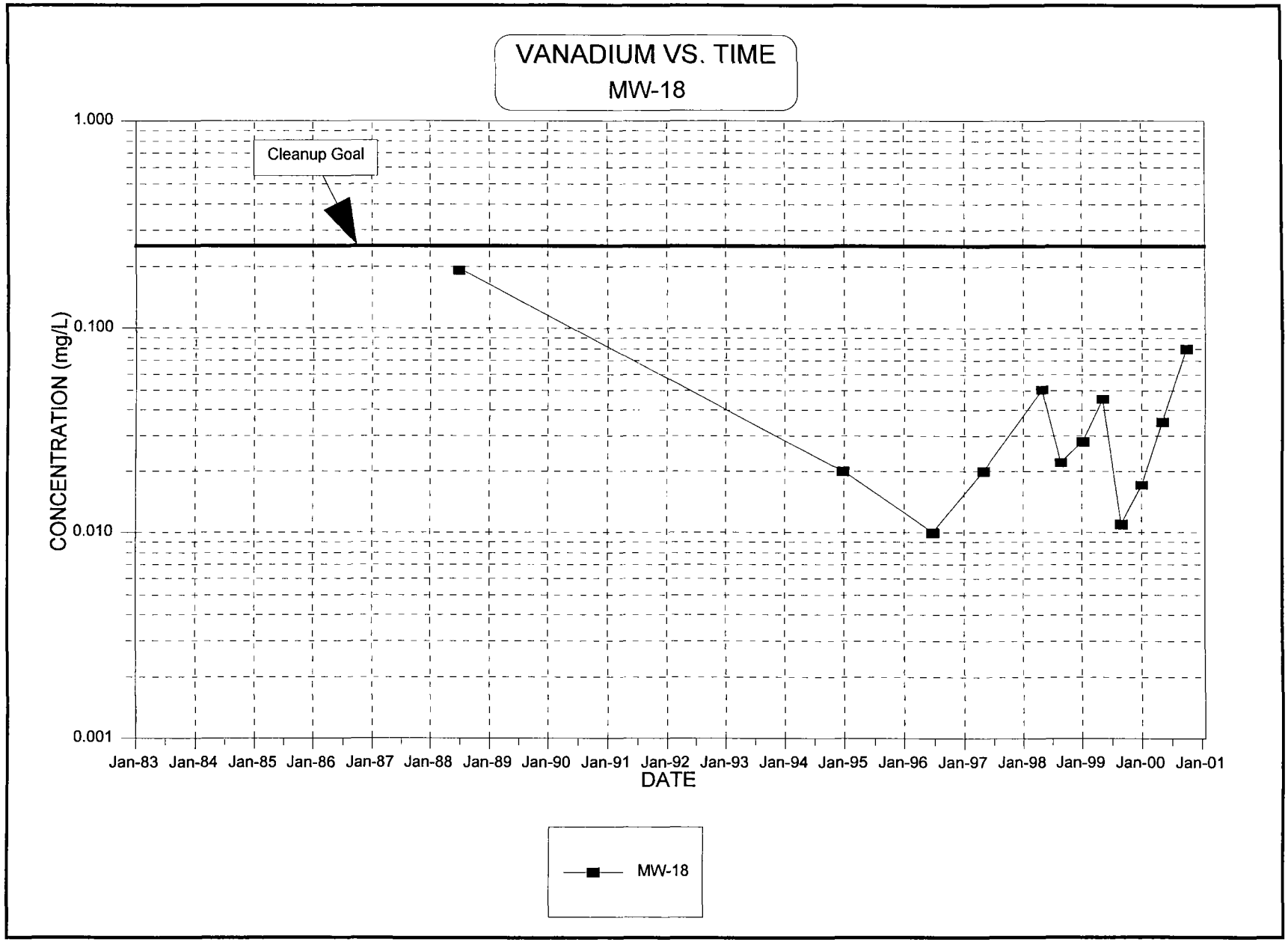
* = Below detection. Value plotted is detection limit.



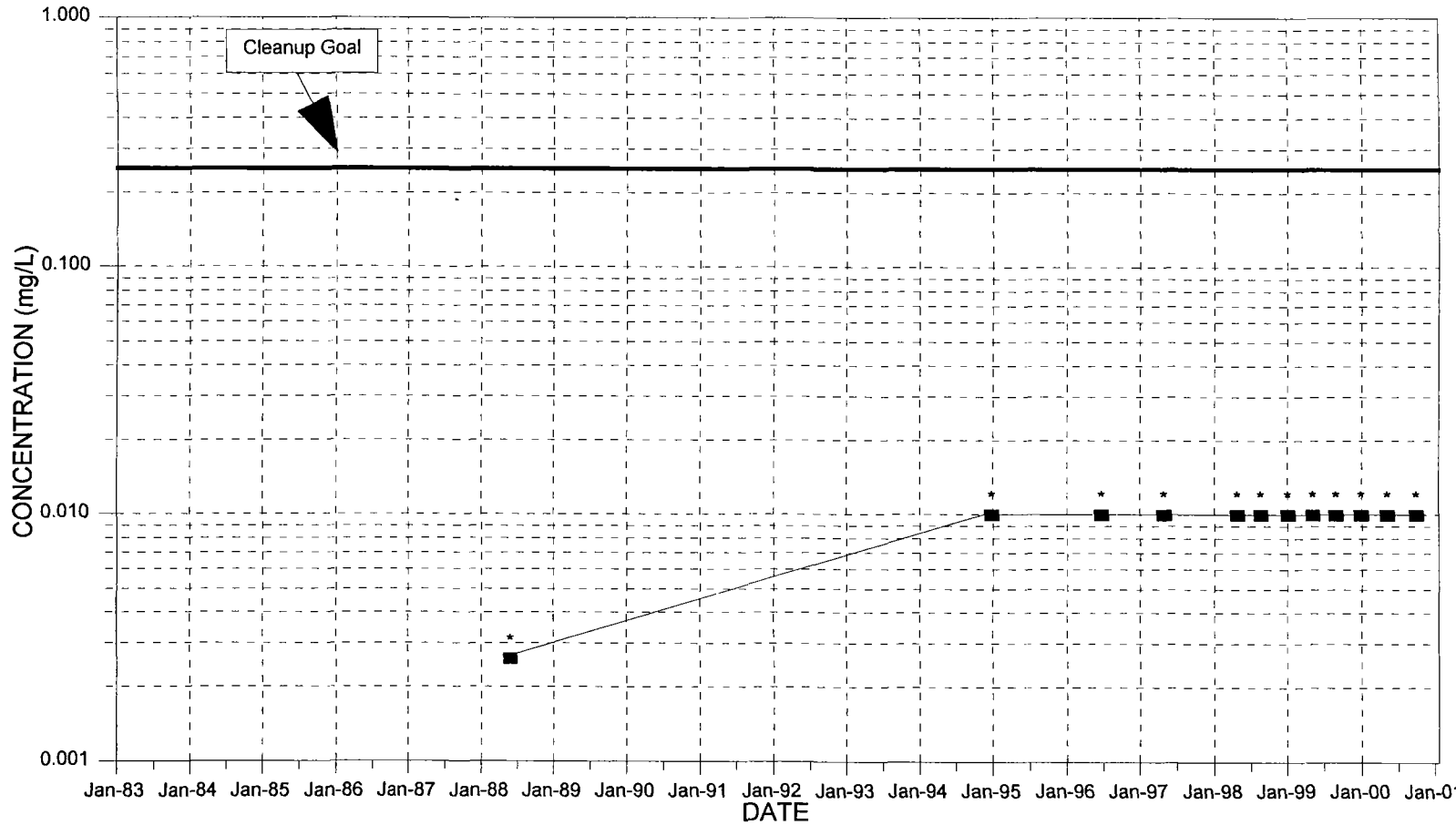
* = Below detection. Value plotted is detection limit.



* = Below detection. Value plotted is detection limit.

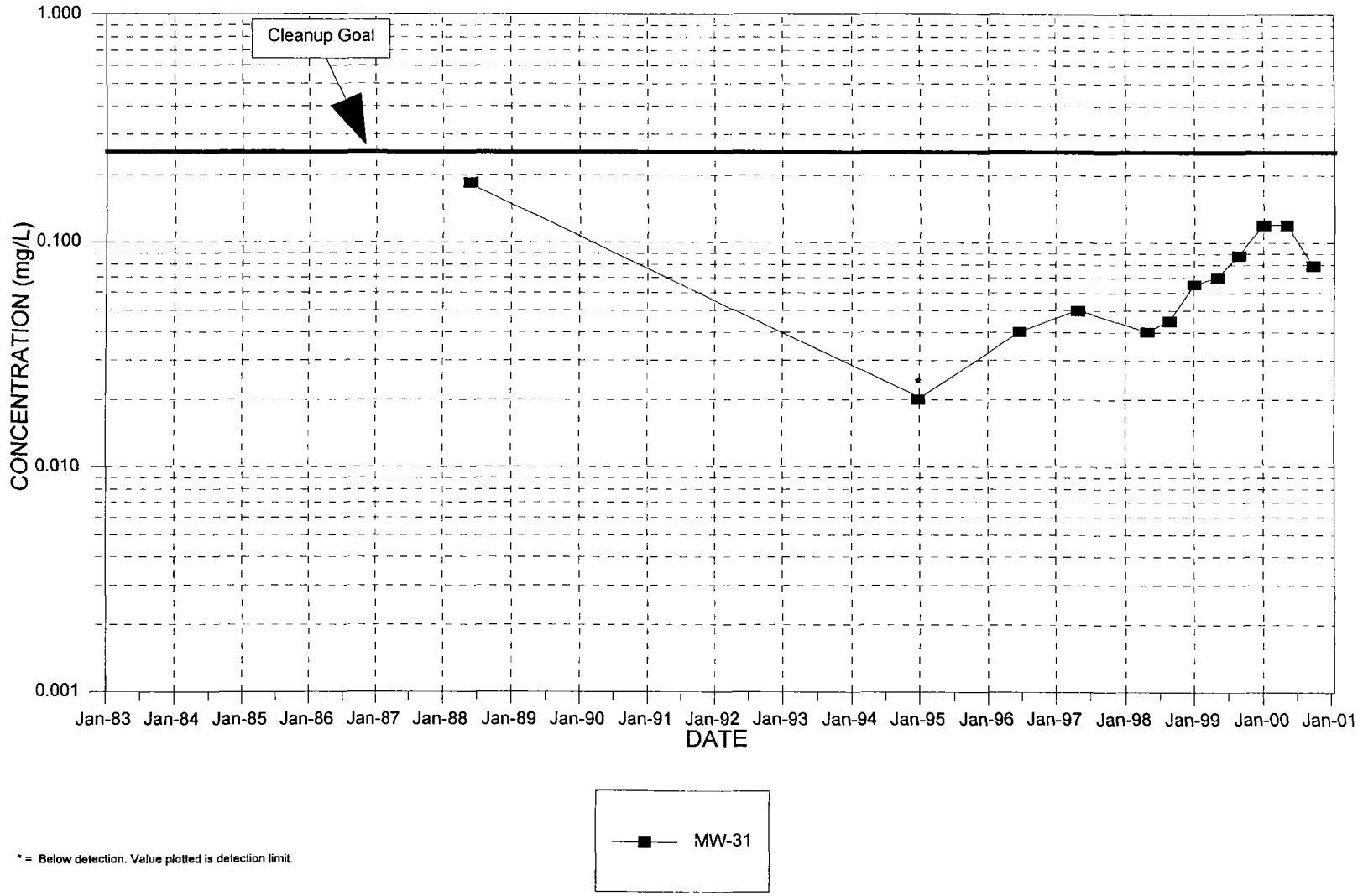

VANADIUM VS. TIME
MW-18
Cleanup Goal
1.000
0.100
0.010
0.001
CONCENTRATION (mg/L)
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-18

VANADIUM VS. TIME
MW-28

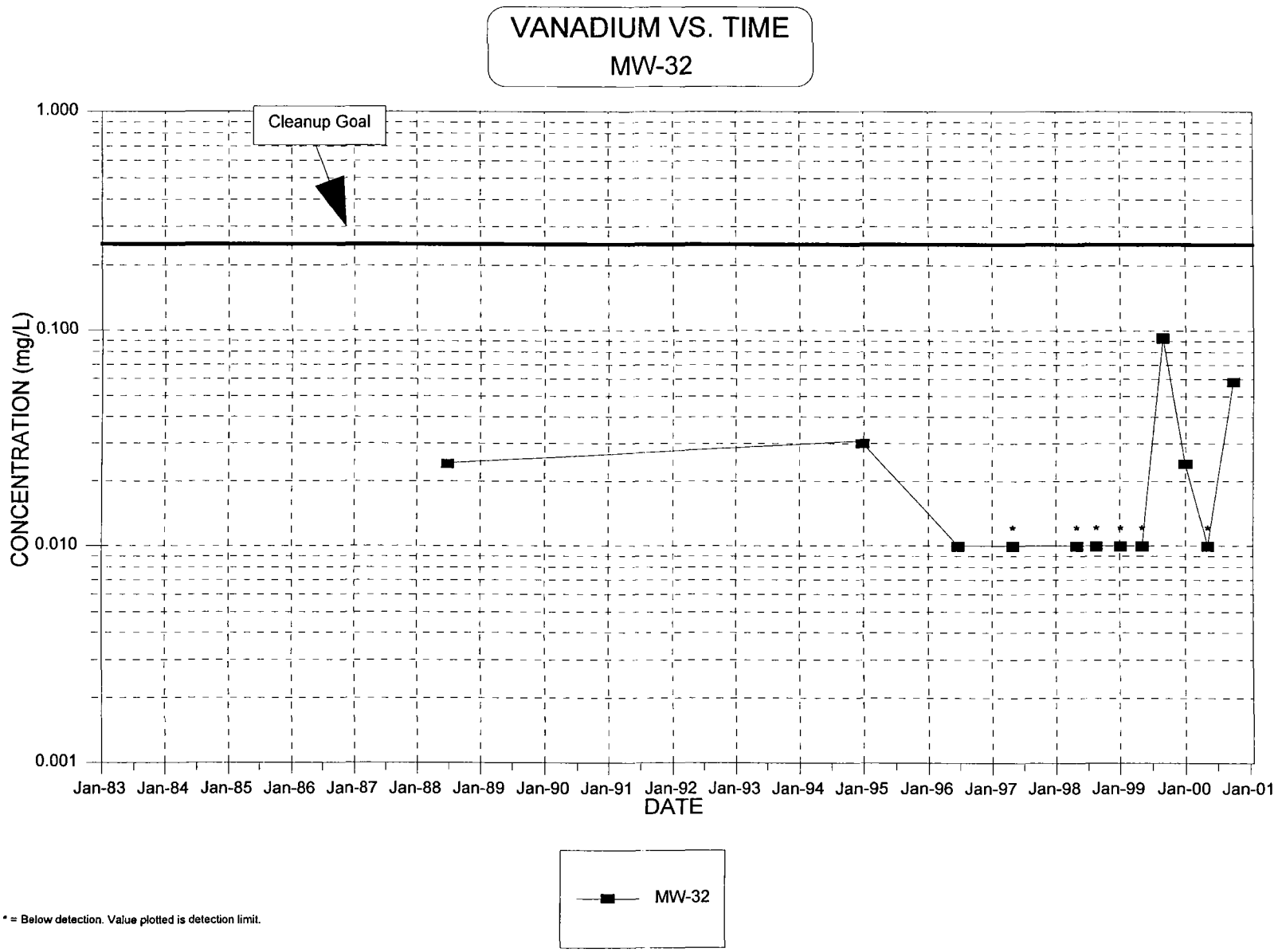


MW-28

* = Below detection. Value plotted is detection limit.

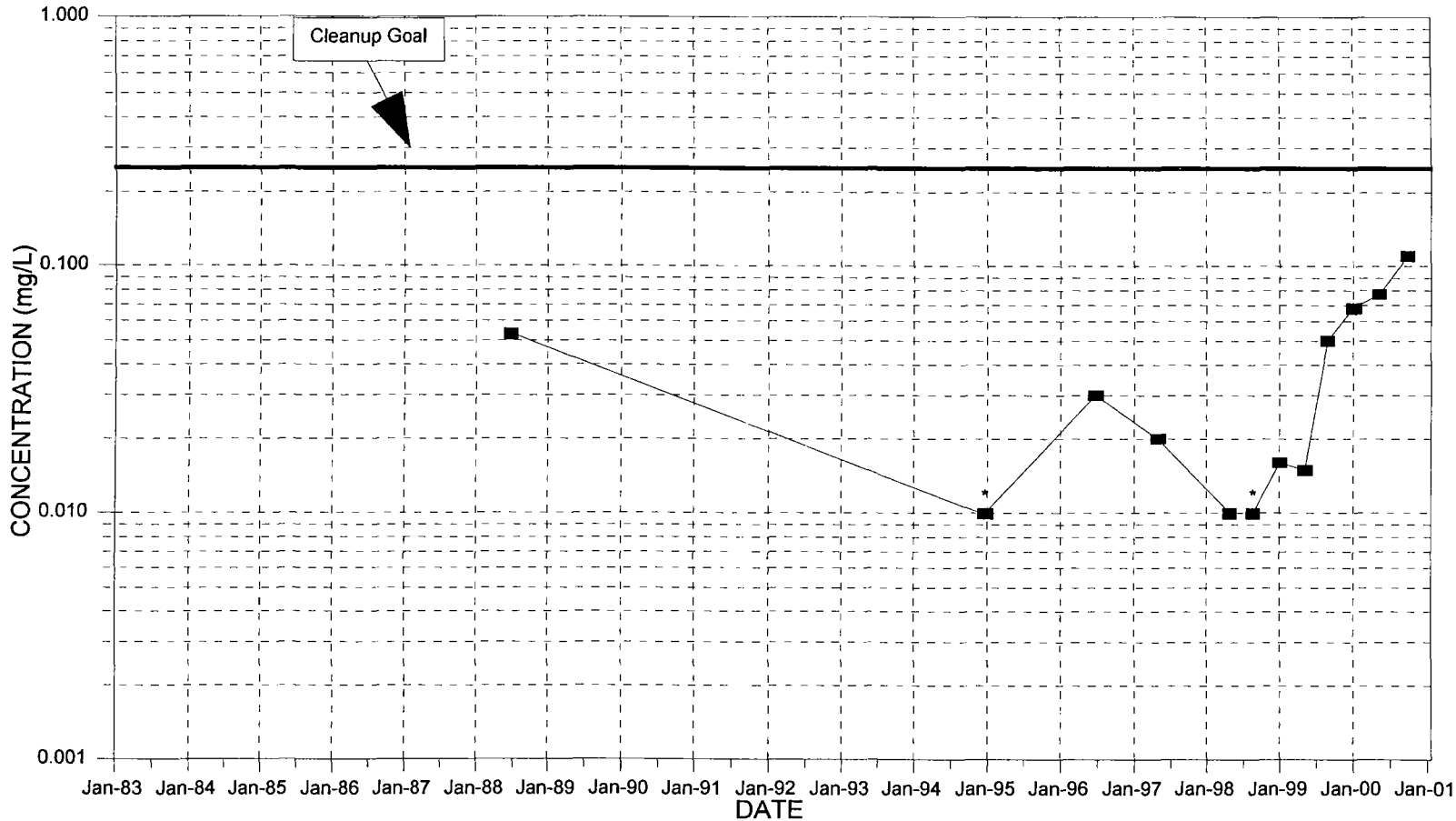


* = Below detection. Value plotted is detection limit.

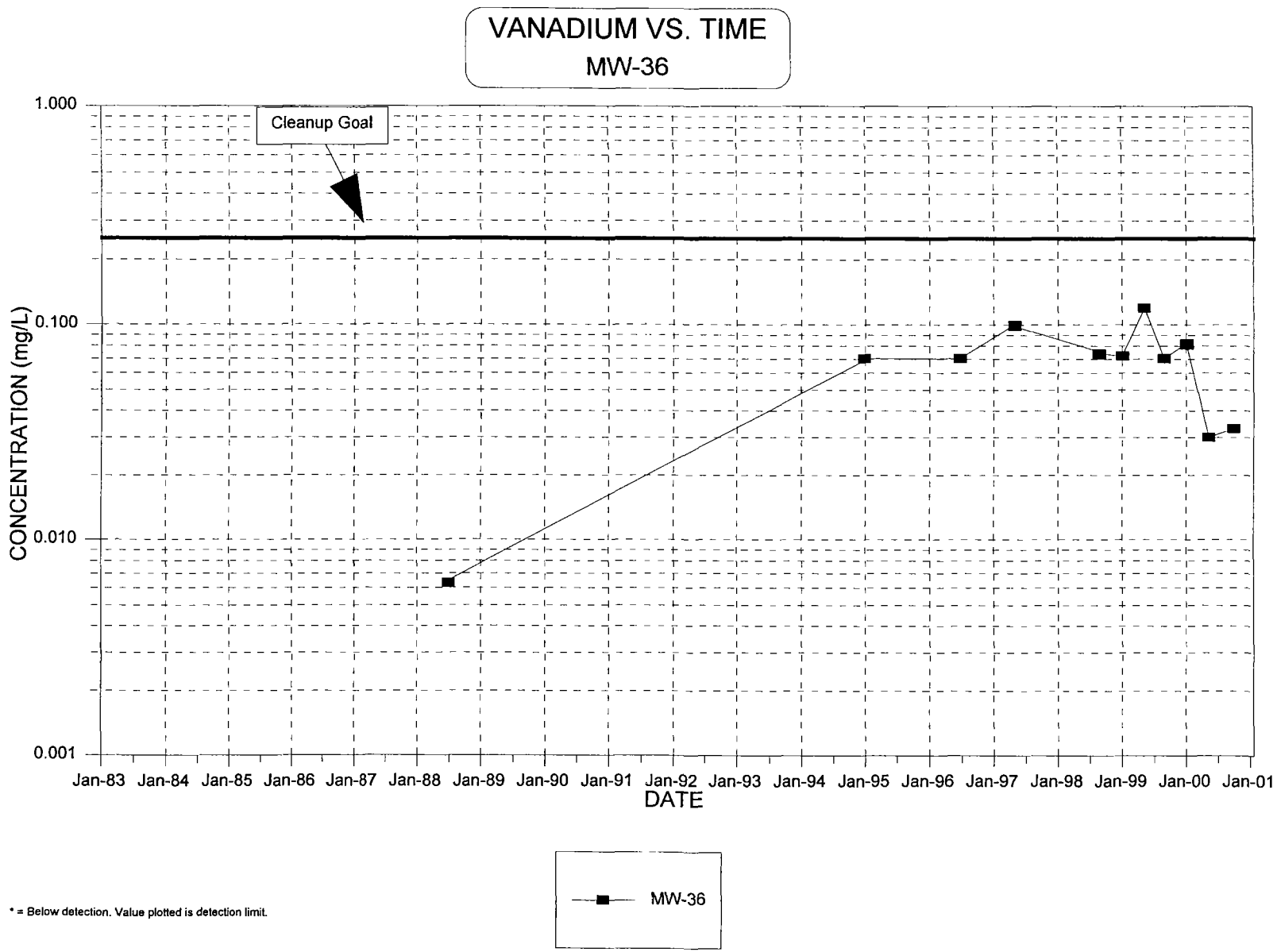


* = Below detection. Value plotted is detection limit.

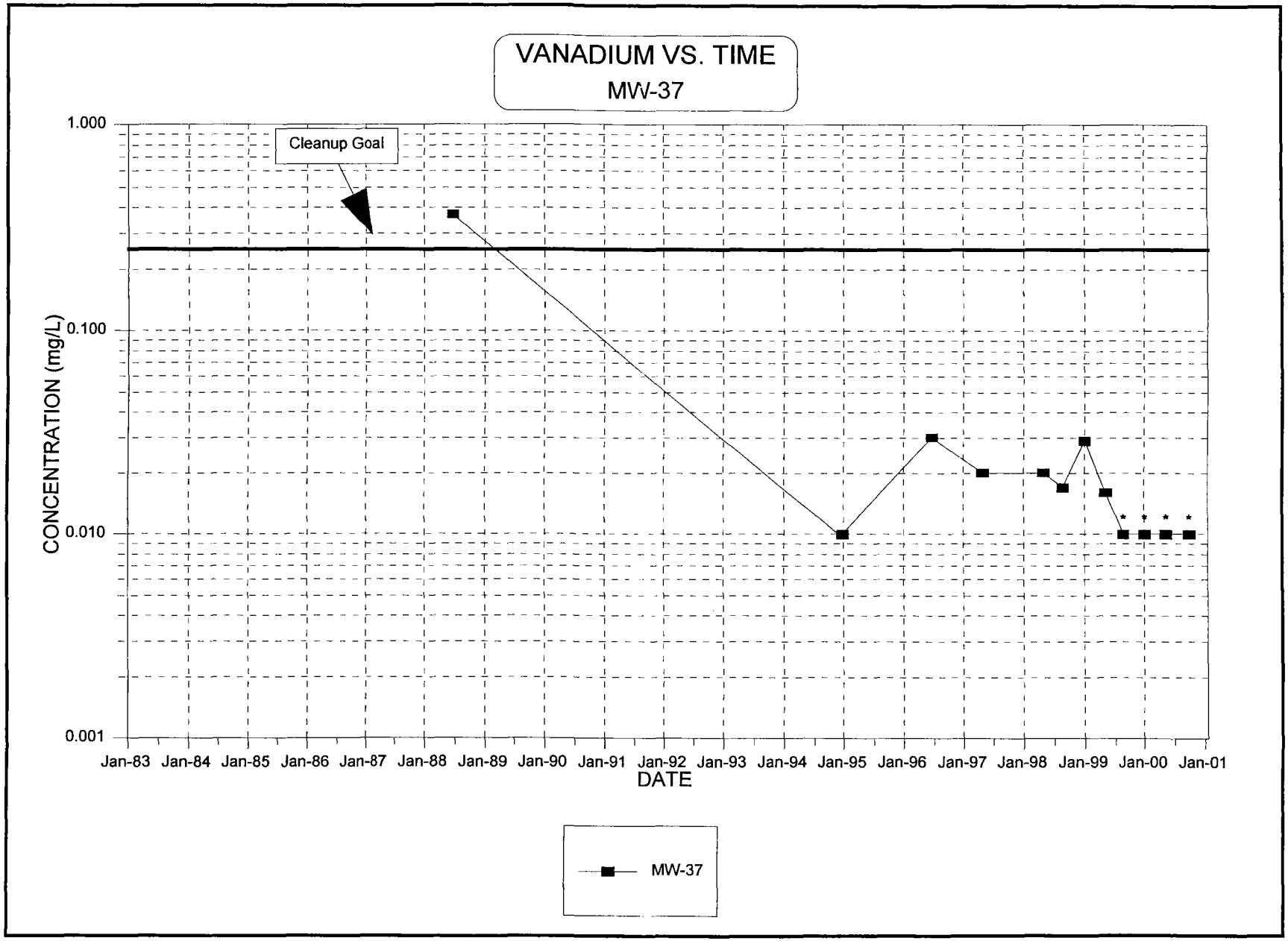
VANADIUM VS. TIME
MW-35



* = Below detection. Value plotted is detection limit.

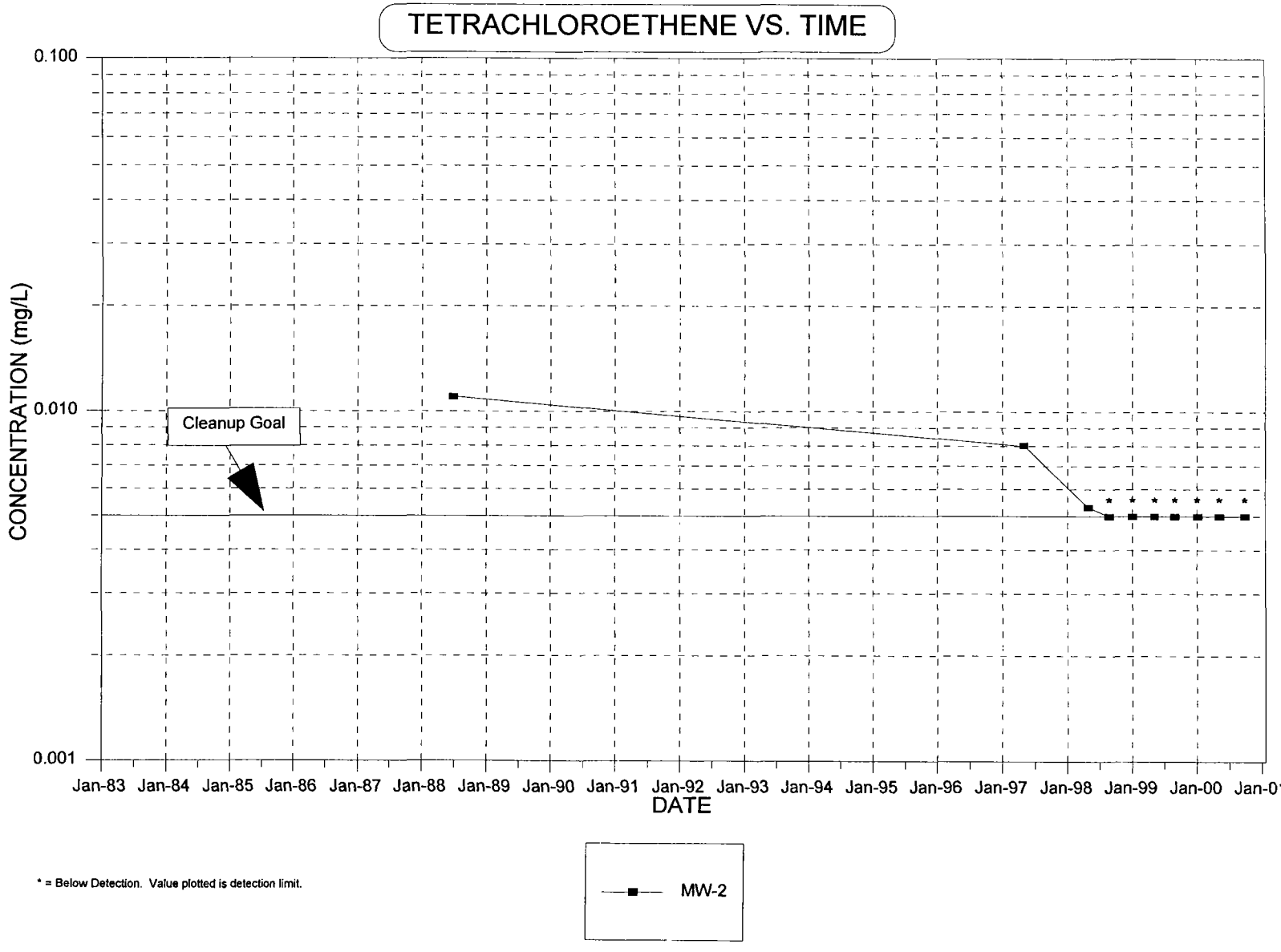


* = Below detection. Value plotted is detection limit.

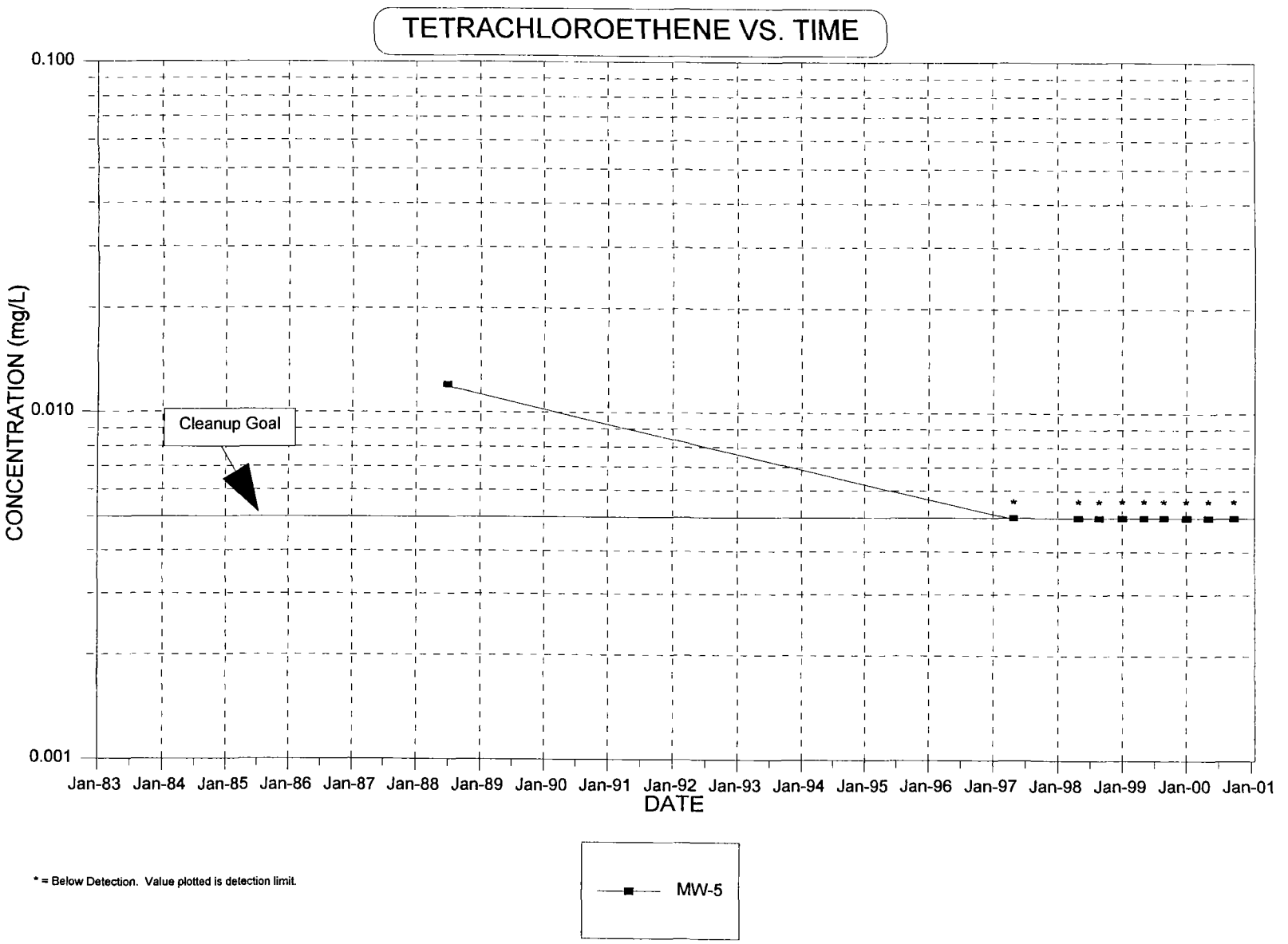

VANADIUM VS. TIME
MW-37
Cleanup Goal
1.000
0.100
0.010
0.001
CONCENTRATION (mg/L)
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-37

APPENDIX D-8

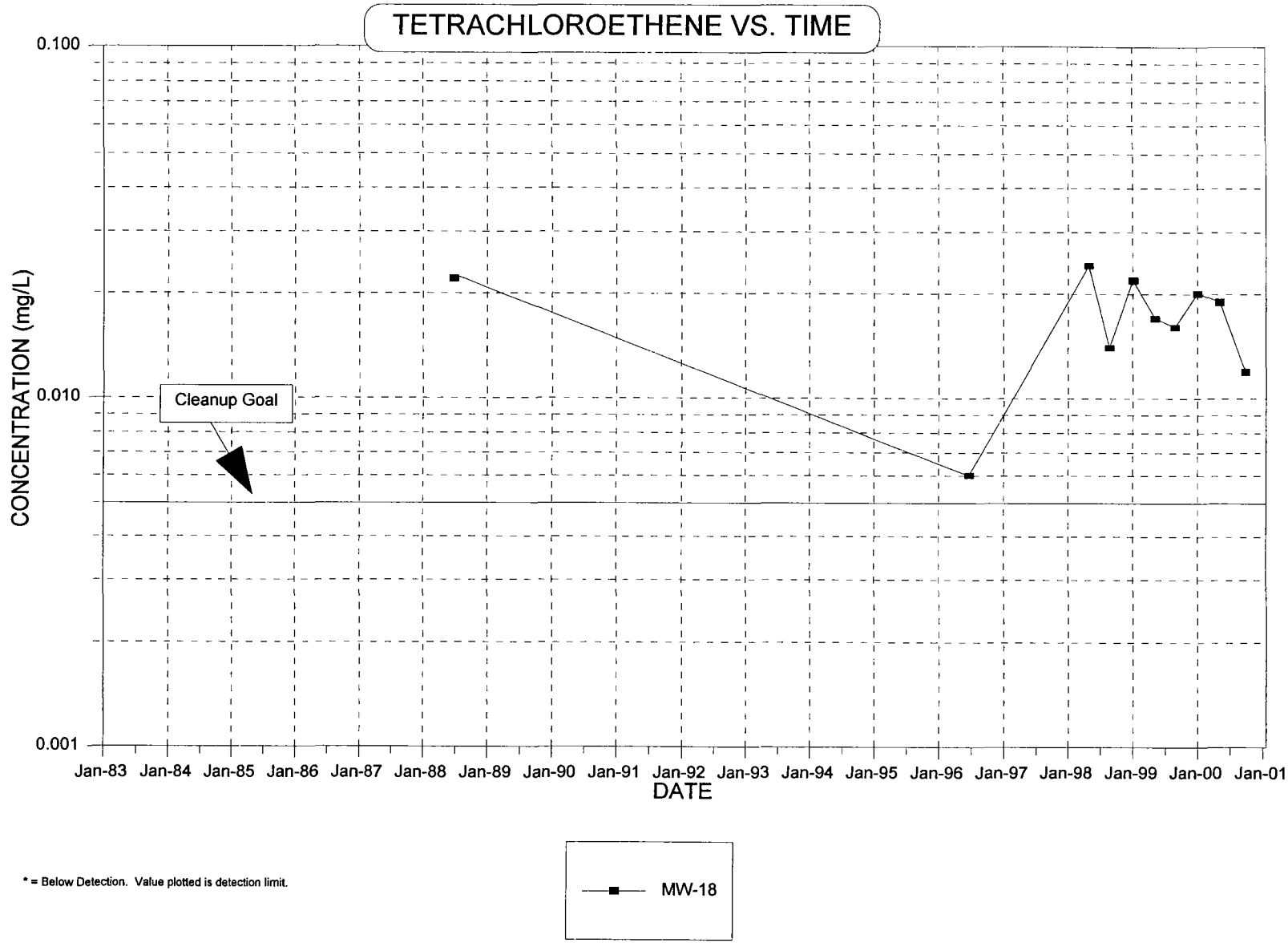
TETRACHLOROETHENE



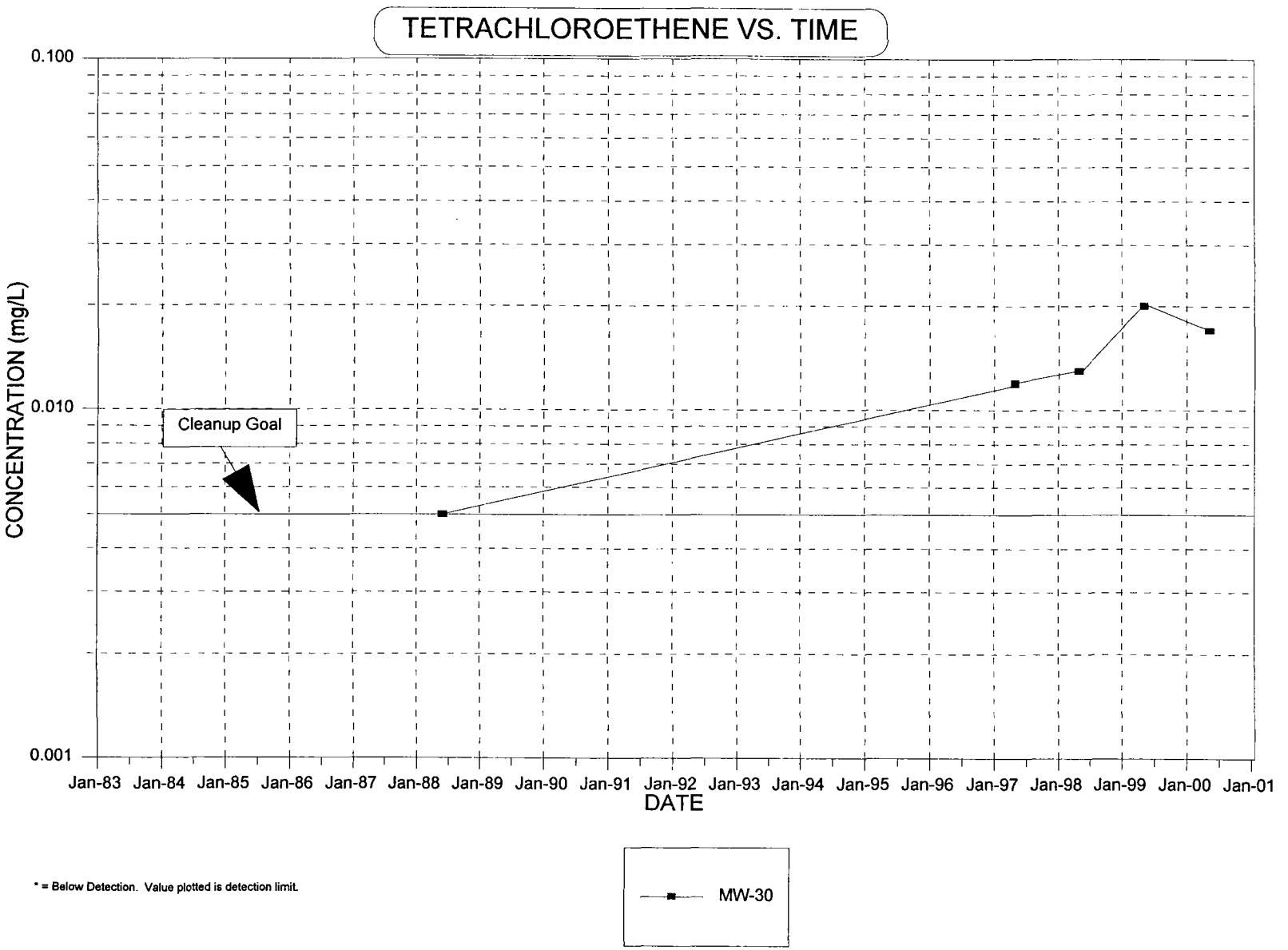
* = Below Detection. Value plotted is detection limit.



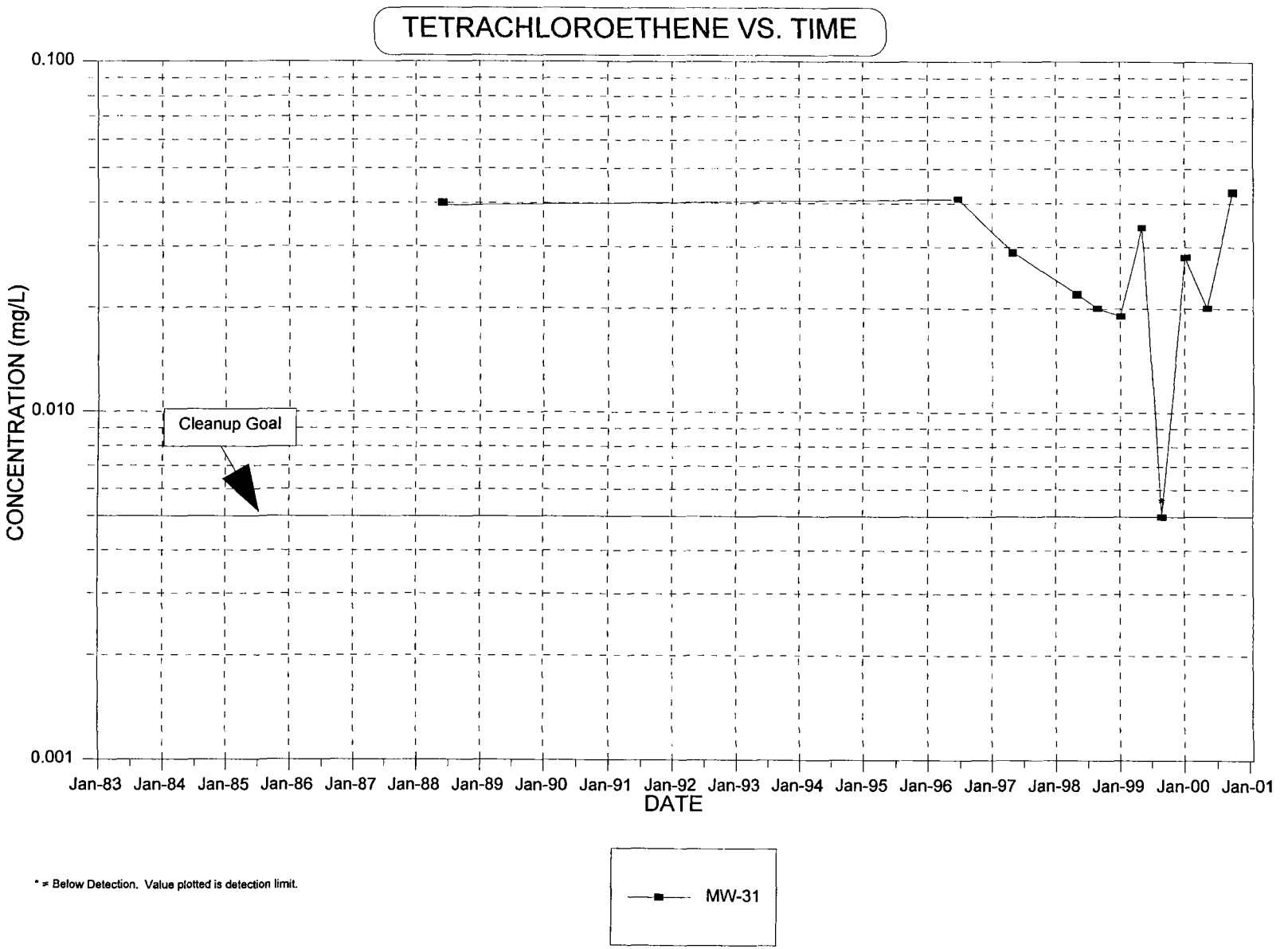
* = Below Detection. Value plotted is detection limit.



* = Below Detection. Value plotted is detection limit.



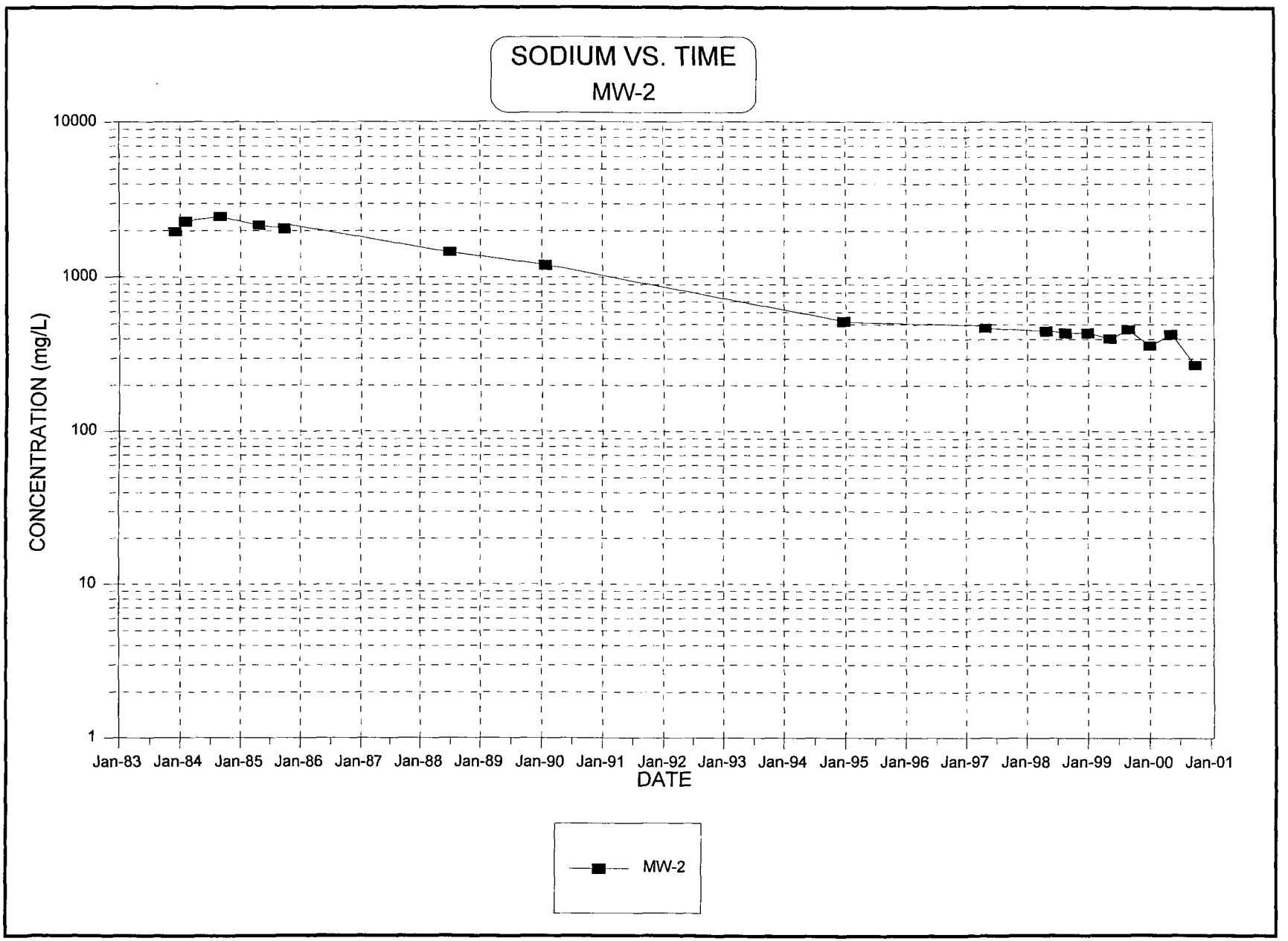
* = Below Detection. Value plotted is detection limit.

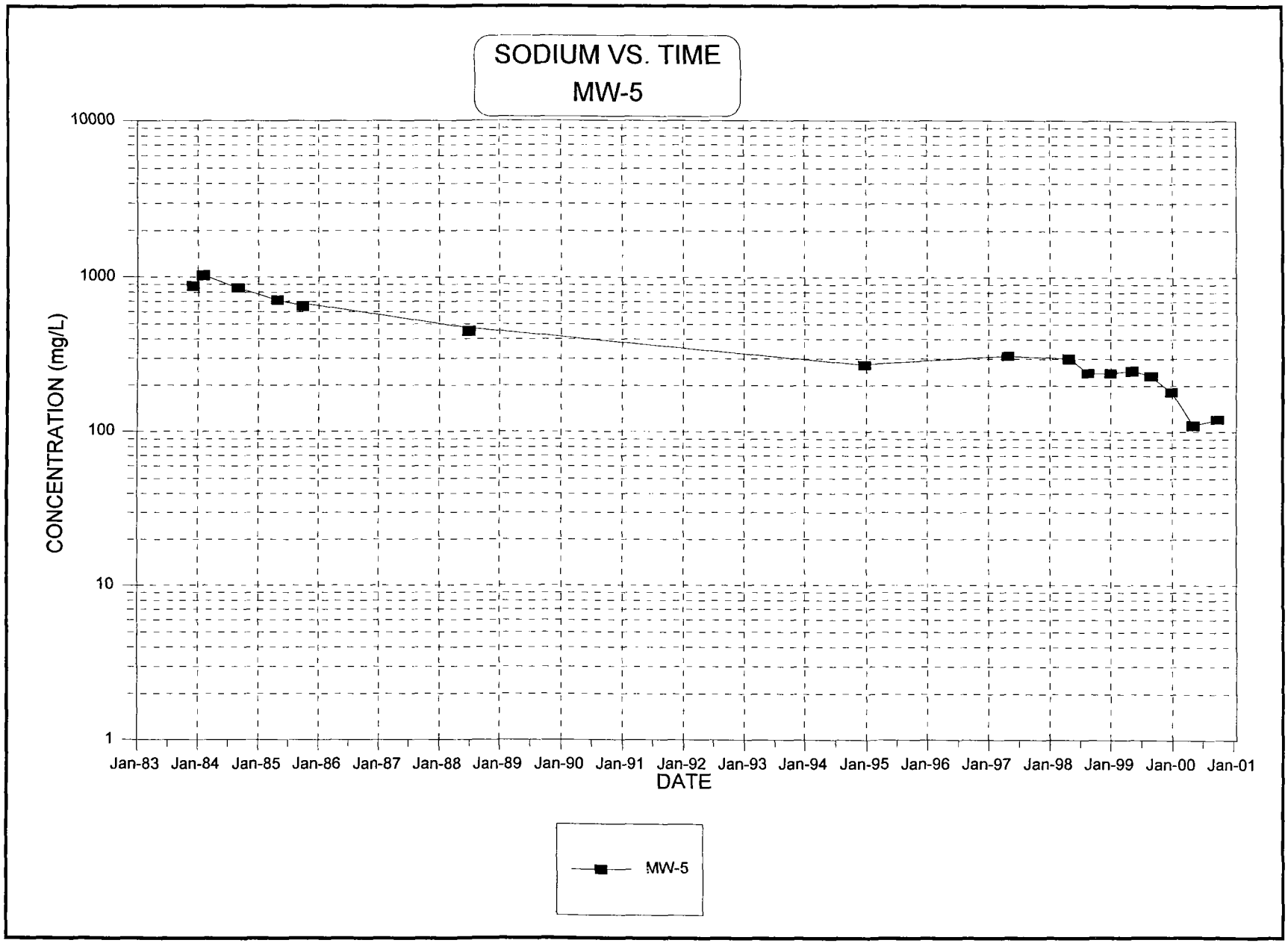


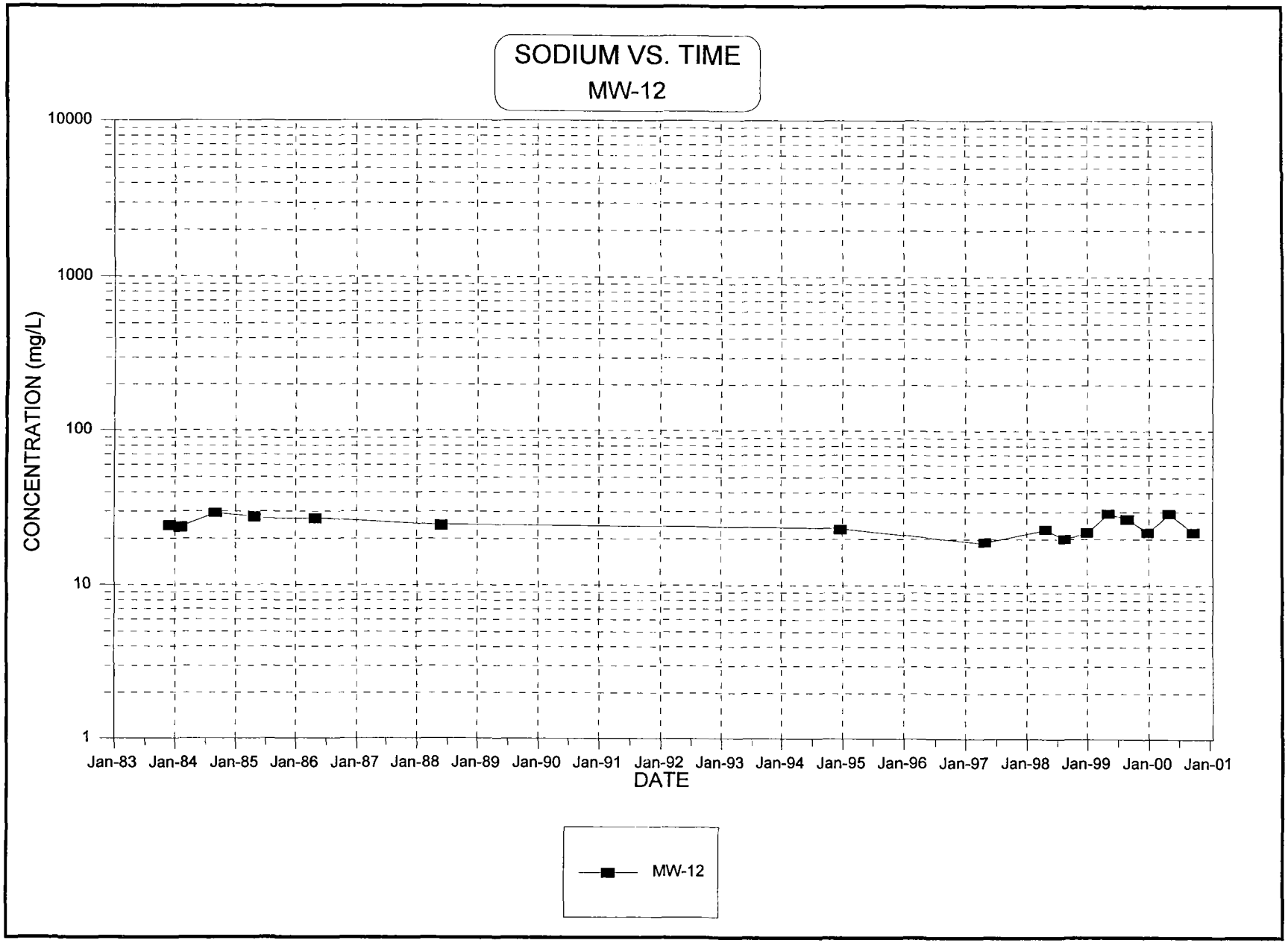
* = Below Detection. Value plotted is detection limit.

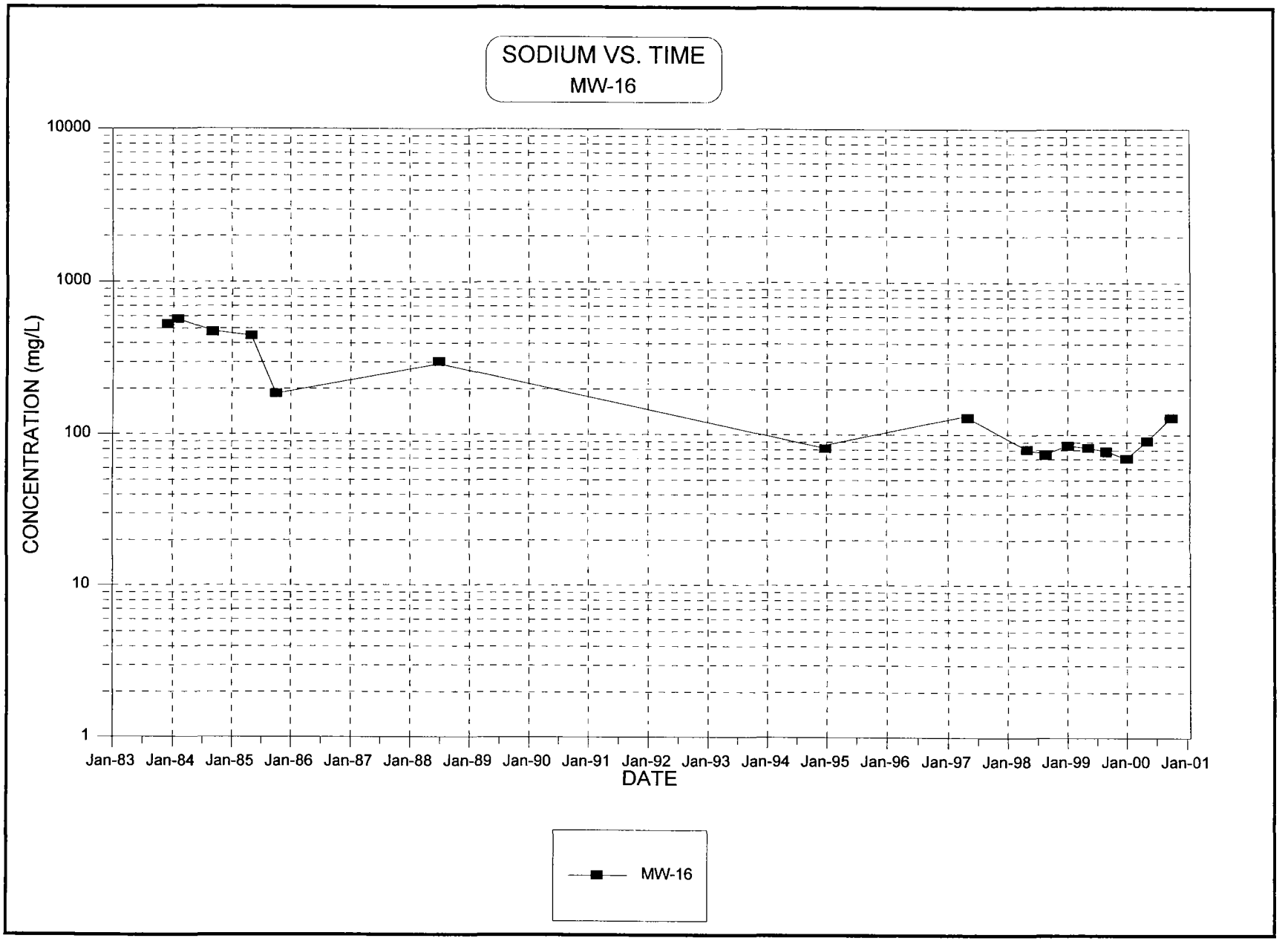
APPENDIX D-9

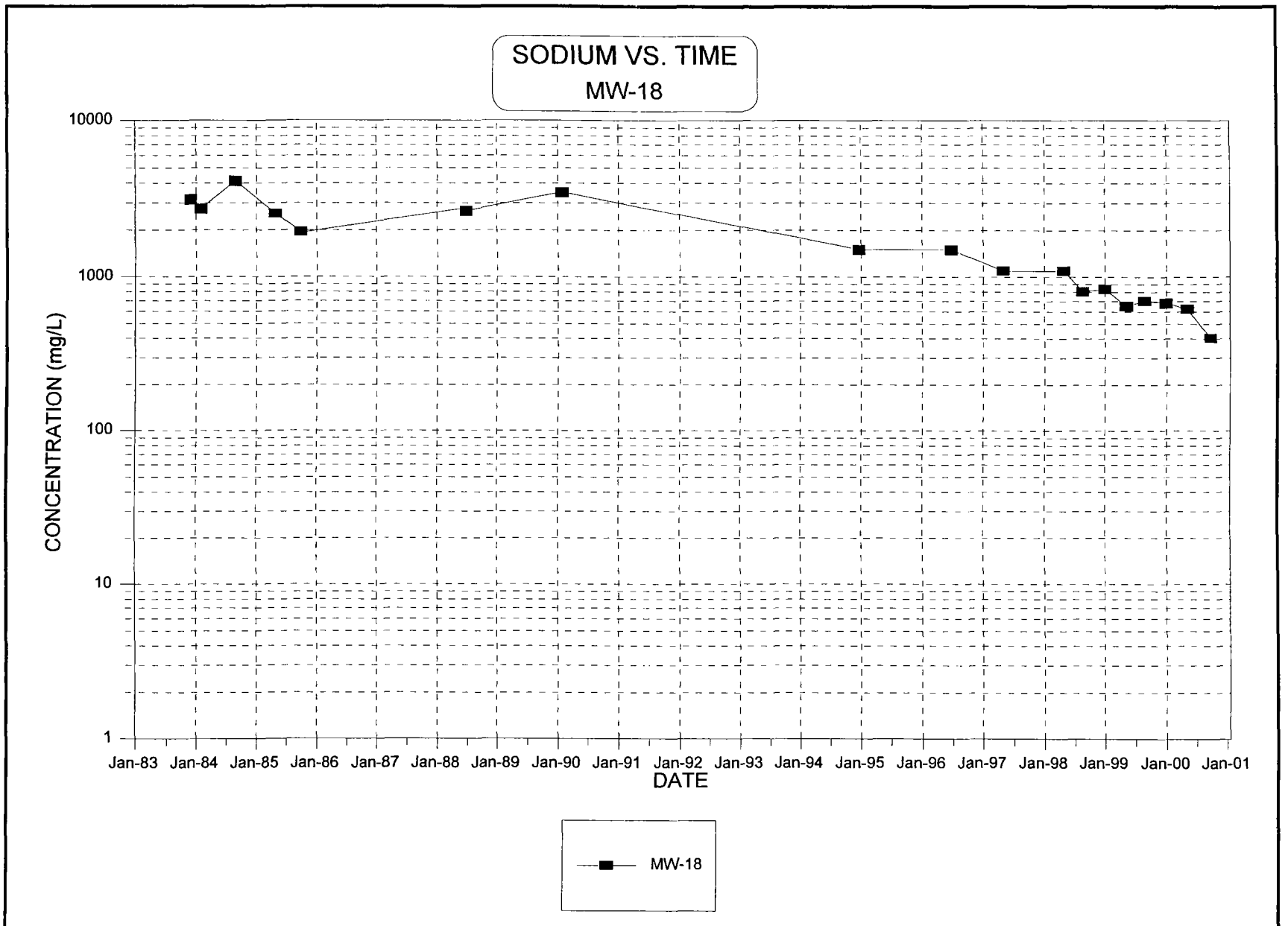
SODIUM

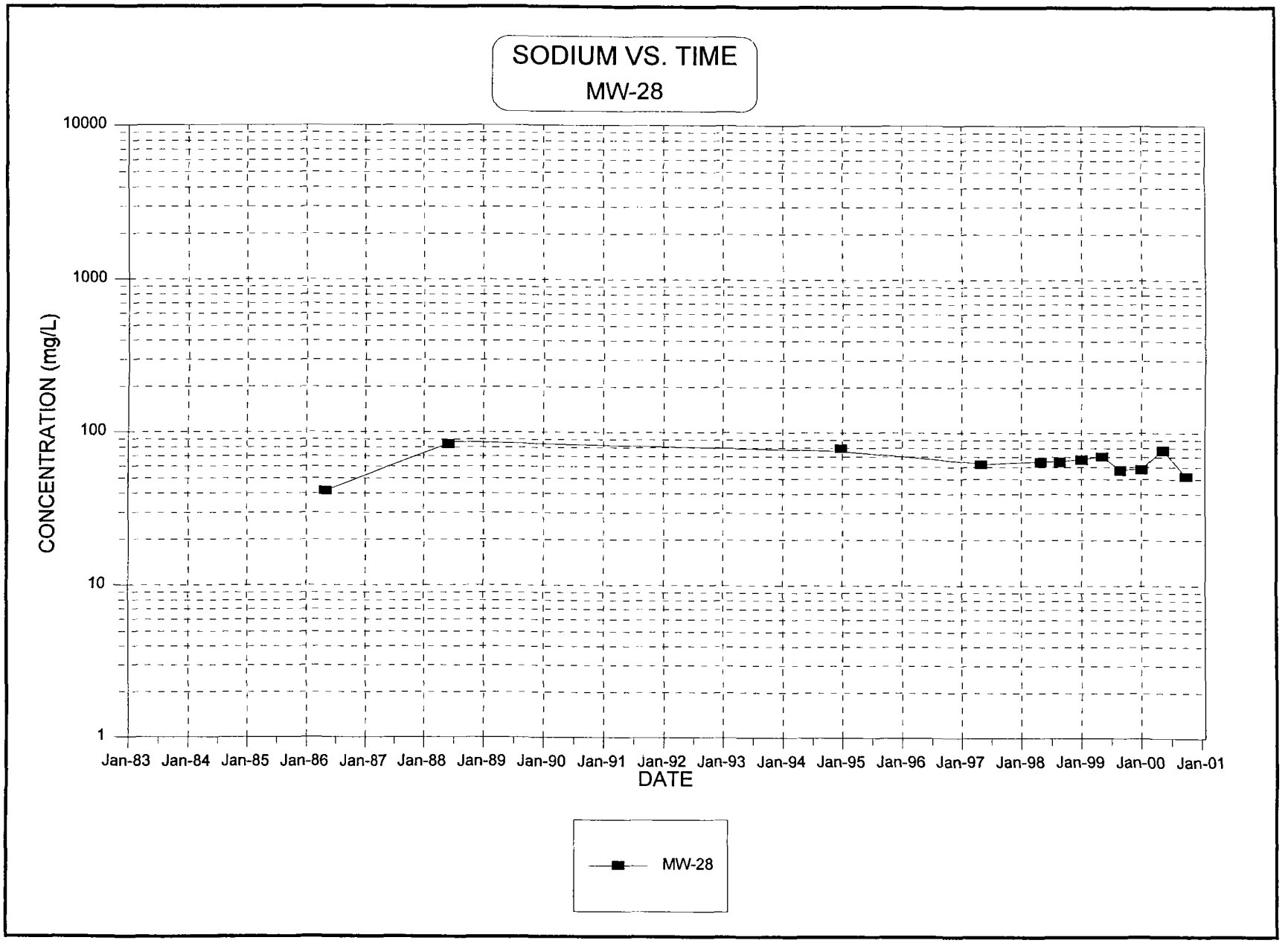

SODIUM VS. TIME
MW-2
CONCENTRATION (mg/L)
10000
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-2

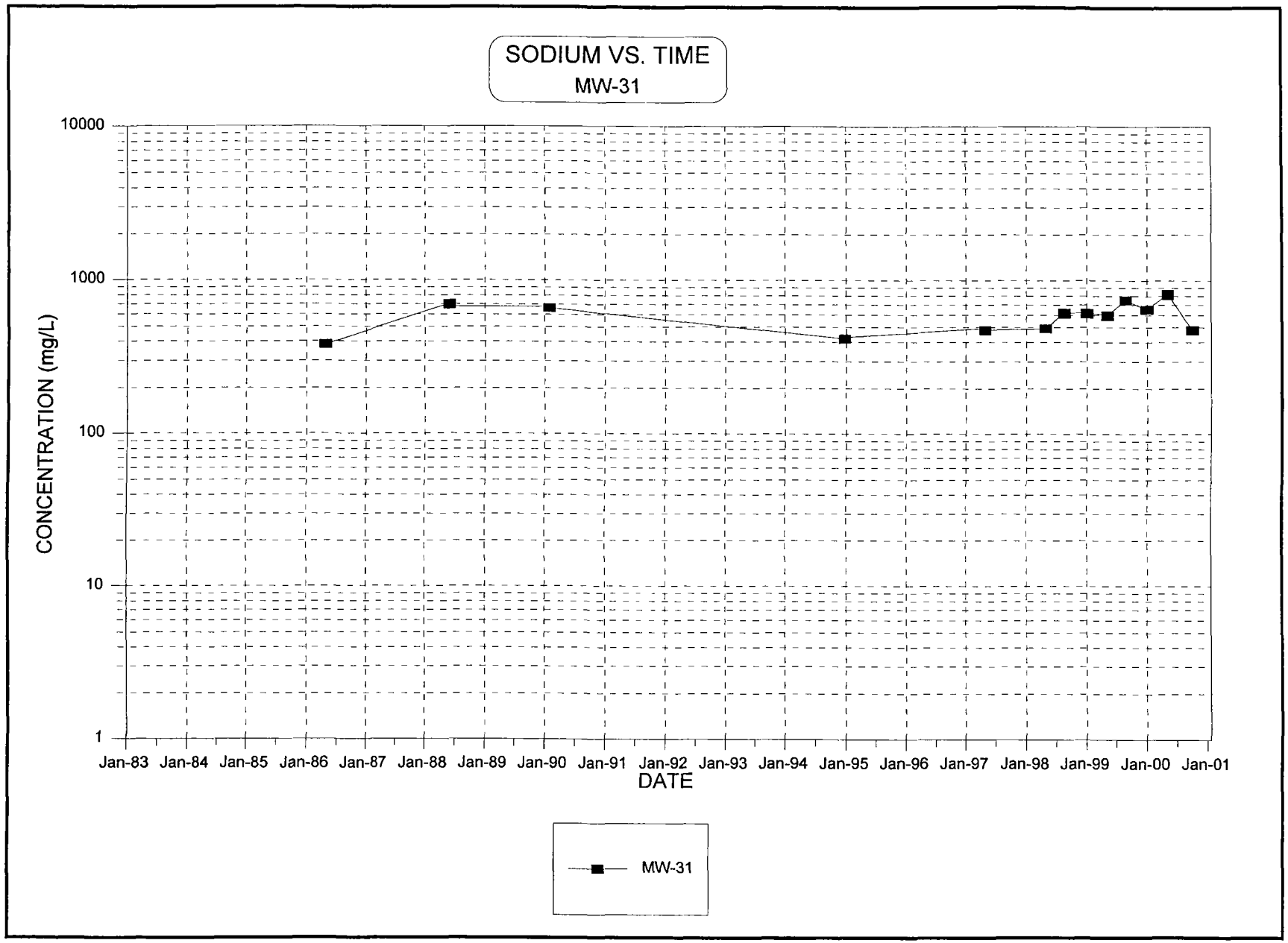

SODIUM VS. TIME
MW-5
10000
1000
100
10
1
CONCENTRATION (mg/L)
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-5

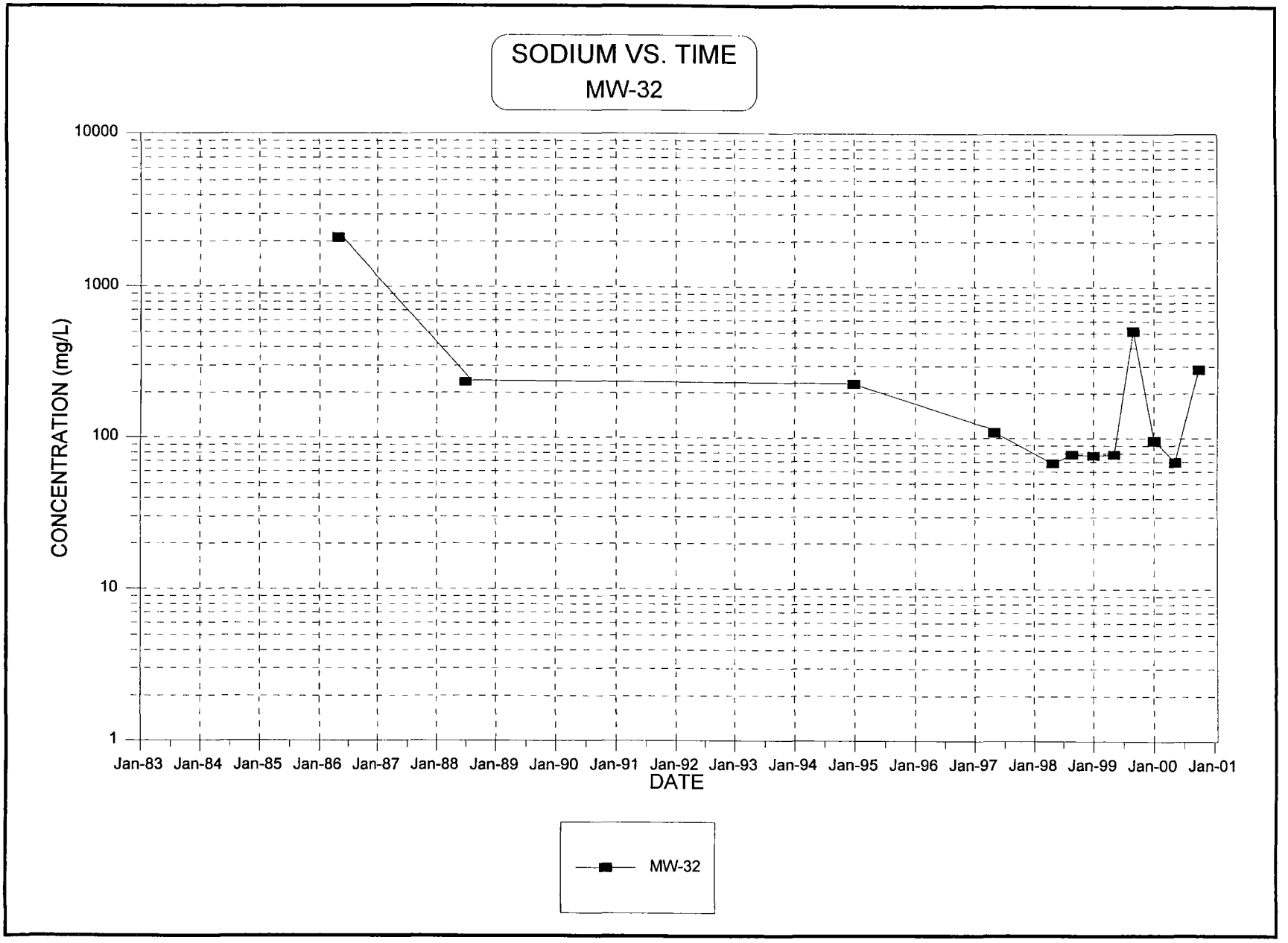

SODIUM VS. TIME
MW-12
10000
1000
100
10
1
CONCENTRATION (mg/L)
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-12

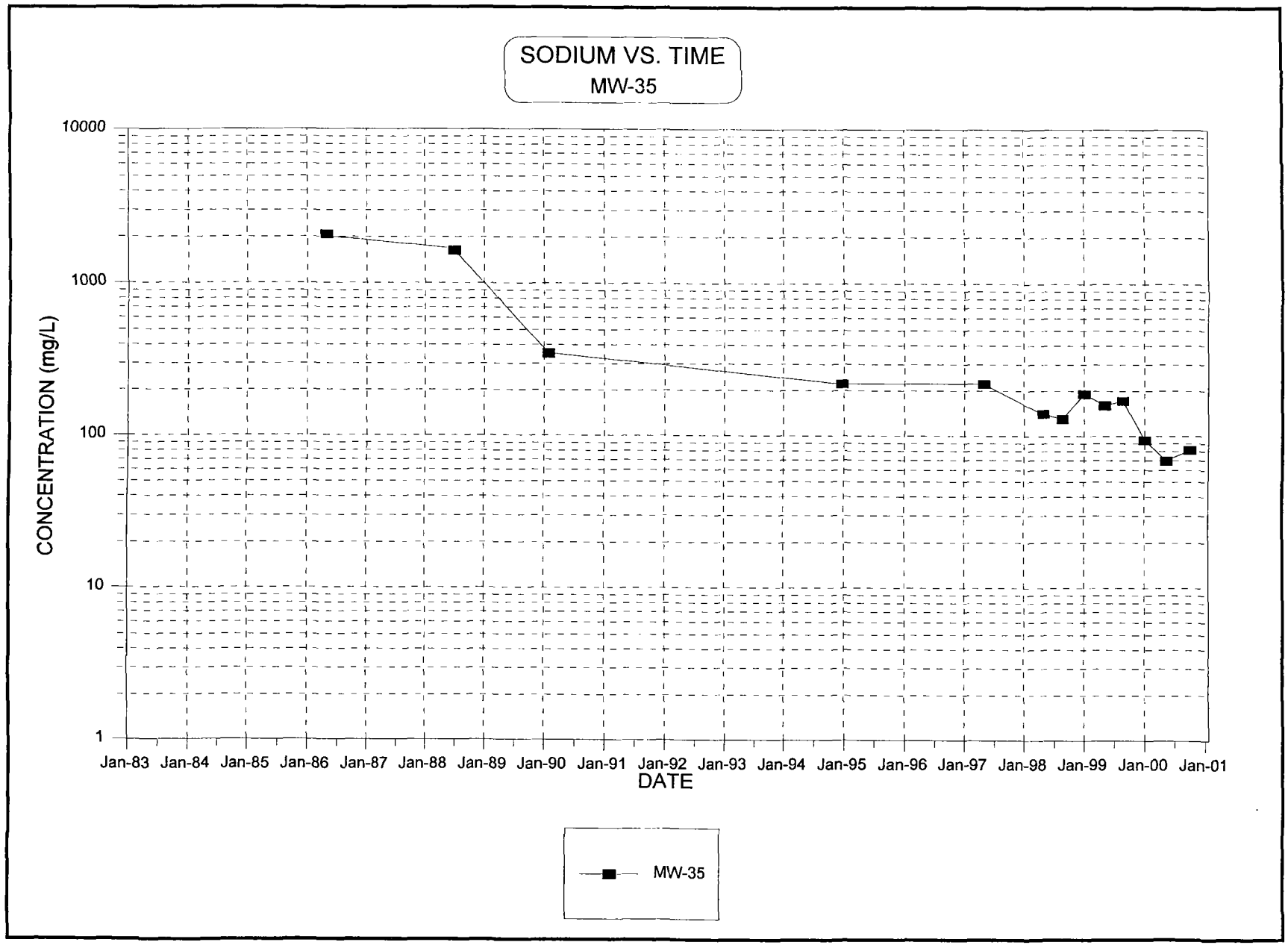

SODIUM VS. TIME
MW-16
CONCENTRATION (mg/L)
10000
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-16

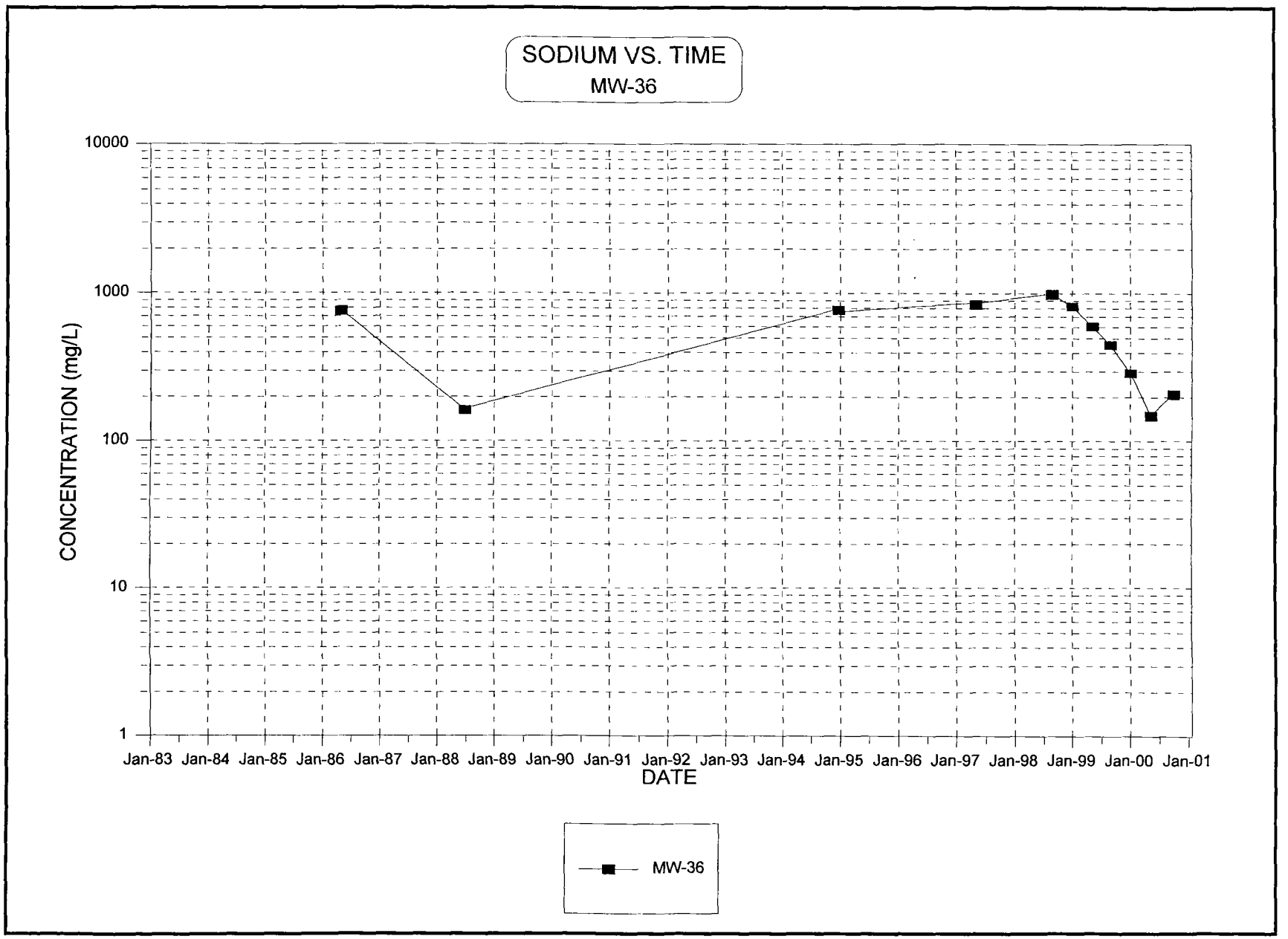

SODIUM VS. TIME
MW-18
CONCENTRATION (mg/L)
10000
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-18

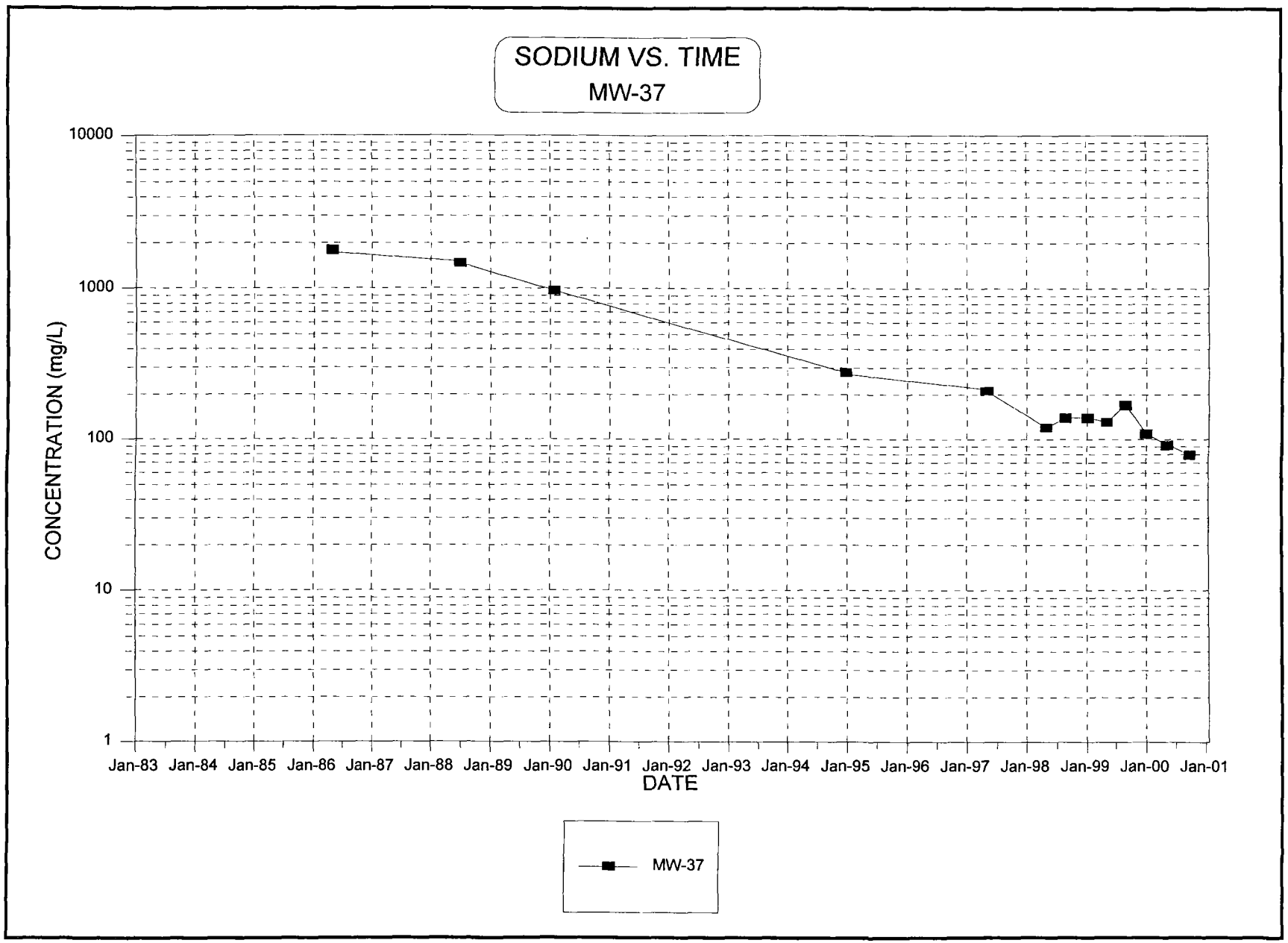

SODIUM VS. TIME
MW-28
10000
1000
100
10
1
CONCENTRATION (mg/L)
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-28


SODIUM VS. TIME
MW-31
CONCENTRATION (mg/L)
10000
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-31


SODIUM VS. TIME
MW-32
CONCENTRATION (mg/L)
10000
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-32


SODIUM VS. TIME
MW-35
CONCENTRATION (mg/L)
10000
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-35


SODIUM VS. TIME
MW-36
10000
1000
100
10
1
CONCENTRATION (mg/L)
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-36


SODIUM VS. TIME
MW-37
10000
1000
100
10
1
CONCENTRATION (mg/L)
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
DATE
MW-37

APPENDIX E

APPENDIX E

CONTAMINANT MASS-IN-PLACE ESTIMATION SUPPORTING DATA

MAY 2000 MONITORING EVENT

APPENDIX E-1
ANALYTICAL RESULTS FOR GROUND-WATER SAMPLES
COLLECTED MAY 2000

ORMET CORPORATION
HANNIBAL, OHIO

SAMPLE I.D.:	MW-2	MW-5	MW-7	MW-8	MW-10	MW-11	MW-12	MW-15	MW-16	MW-17
Cyanide, Total	18/18	2.3	<0.01	0.026	<0.01	0.013	<0.01	12	12/12	0.53
Fluoride	66/67	16	0.14	2.2	0.48	1.4	0.73	25	7.9/8.1	2.9

SAMPLE I.D.:	MW-18	MW-19	MW-28	MW-29S	MW-29D	MW-30	MW-31	MW-32	MW-34S	MW-34D
Cyanide, Total	84/64	<0.01	1.0	0.17	0.15	0.026	21	3.9	1.1	0.063
Fluoride	160/160	1.2	0.30	16	3.1	0.12	140	19	11	4.2

SAMPLE I.D.:	MW-35	MW-36	MW-37	MW-39S	MW-39D	MW-40S	MW-40D	MW-41	MW-42S	MW-42D
Cyanide, Total	27	1.6	5.2	3.5	0.027	0.25	0.25	<0.01	0.66	0.027
Fluoride	28	50	32	110	3.2	14	11	0.25	28	3.0

NOTE: All results in mg/L.

00-E1a.123

APPENDIX E-1 (CONT.)
PLUME CONTOUR AREA CALCULATIONS
FOR TOTAL CYANIDE AND FLUORIDE
BASED ON RESULTS OF SAMPLING CONDUCTED MAY 2000

ORMET CORPORATION
HANNIBAL, OHIO

TOTAL CYANIDE	CONTOUR INTERVAL (from Figure 6)	CONTOUR AREA in sqare feet (estimated using CAD* software)
	>50 mg/L	4,321.50
	40-50 mg/L	12,970.99
	30-40 mg/L	89,348.23
	20-30 mg/L	226,777.73
	10-20 mg/L	496,597.81
	>10 mg/L	11,880.26
	1-10 mg/L	1,012,668.46
	>1 mg/L	22,899.20
	0.2-1 mg/L	1,591,233.88

TOTAL FLUORIDE	CONTOUR INTERVAL (from Figure 5)	CONTOUR AREA in sqare feet (estimated using CAD* software)
	>150 mg/L	14,735.25
	100-150 mg/L	95,411.70
	>100 mg/L	22,109.75
	50-100 (center) mg/L	266,899.93
	50-100 (bt/rt) mg/L	45,359.98
	10-50 mg/L	1,474,067.06
	4-10 mg/L	1,811,310.71

* CAD - Computer Aided Drafting

00-E1b.123

APPENDIX E-1 (CONT.)
AVERAGE AQUIFER THICKNESS CALCULATIONS
WITHIN EACH PLUME CONTOUR INTERVAL
BASED ON RESULTS OF SAMPLING CONDUCTED MAY 2000

ORMET CORPORATION
HANNIBAL, OHIO

TOTAL CYANIDE

CONTOUR INTERVAL (from Figure 6)	MONITORING WELL ID	AQUIFER THICKNESS (in feet)	AVERAGE AQUIFER THICKNESS (b, in feet)
>50 mg/L	MW-18	21	21
40-50 mg/L	MW-18	21	21
30-40 mg/L	MW-18	21	21
20-30 mg/L	MW-2 MW-18 MW-31 MW-35	26 21 19 11	19
10-20 mg/L	MW-2 MW-16 MW-31 MW-35	26 33 19 11	22
>10 mg/L	MW-15	20	20
1-10 mg/L	MW-5 MW-16 MW-28 MW-32 MW-34 MW-36 MW-37	23 33 26 16 31 13 17	23
>1 mg/L	MW-39	40	40
0.2-1 mg/L	MW-17 MW-28 MW-40 MW-42	40 26 36 44	37

99-E1c.123

APPENDIX E-1 (CONT.)
AVERAGE AQUIFER THICKNESS CALCULATIONS
WITHIN EACH PLUME CONTOUR INTERVAL
BASED ON RESULTS OF SAMPLING CONDUCTED MAY 2000

ORMET CORPORATION
HANNIBAL, OHIO

FLUORIDE

CONTOUR INTERVAL (from Figure 5)	MONITORING WELL ID	AQUIFER THICKNESS (in feet)	AVERAGE AQUIFER THICKNESS (b, in feet)
>150 mg/L	MW-18	21	21
100-150 mg/L	MW-18 MW-31	21 19	20
>100 mg/L	MW-39	40	40
50-100 (center) mg/L	MW-2	26	26
50-100 (bt-rt) mg/L	MW-39	40	40
10-50 mg/L	MW-5 MW-15 MW-29 MW-32 MW-34 MW-35 MW-36 MW-40 MW-42	23 20 40 16 31 11 13 36 44	26
4-10 mg/L	MW-16	33	33

00-E1d.123

APPENDIX E-1 (CONT.)
TOTAL CYANIDE AND FLUORIDE MASS-IN-PLACE
CALCULATION WORKSHEET
BASED ON RESULTS OF SAMPLING CONDUCTED MAY 2000

ORMET CORPORATION
HANNIBAL, OHIO

	Contour Interval (from Figure 6)	Contour Interval Area (in square feet) A	Average Aquifer Thickness (in feet) b	1. Aquifer Volume (in cubic feet) VA	Aquifer Porosity n	2. Volume of Ground Water (in cubic feet) Vgw	3. Volume of Ground Water (in Liters) Vgw	Average Concentration (mg/L) Cwi	4. Mass-in-Place for each interval (in mg) Mi	5. Mass-in-Place for each interval (in lbs) Mi
TOTAL CYANIDE	>50 mg/L	4,322	21	90,762	0.25	22,691	642,609	67	43,054,803	95
	40-50 mg/L	8,649	21	181,629	0.25	45,407	1,285,926	45	57,866,670	128
	30-40 mg/L	76,378	21	1,603,938	0.25	400,985	11,355,895	35	397,456,325	876
	20-30 mg/L	137,429	19	2,611,151	0.25	652,788	18,486,956	25	462,173,900	1,019
	10-20 mg/L	269,820	22	5,936,040	0.25	1,484,010	42,027,163	15	630,407,445	1,390
	>10 mg/L	11,880	20	237,600	0.25	59,400	1,682,208	11	18,504,288	41
	1-10 mg/L	504,190	23	11,596,370	0.25	2,899,093	82,102,314	5	410,511,570	905
	>1 mg/L	22,899	40	915,960	0.25	228,990	6,484,997	2.25	14,591,243	32
	0.2-1 mg/L	555,666	37	20,559,642	0.25	5,139,911	145,562,280	0.6	87,337,368	193
									Total Cyanide Mw:	4,679
	(from Figure 5)									
FLUORIDE	>150 mg/L	14,735	21	309,435	0.25	77,359	2,190,807	155	339,575,085	749
	100-150 mg/L	80,676	20	1,613,520	0.25	403,380	11,423,722	125	1,427,965,250	3,149
	>100 mg/L	22,899	40	915,960	0.25	228,990	6,484,997	105	680,924,685	1,501
	50-100 (center) mg/L	171,488	26	4,458,688	0.25	1,114,672	31,567,511	75	2,367,563,325	5,220
	50-100 (bt-rt) mg/L	23,250	40	930,000	0.25	232,500	6,584,400	75	493,830,000	1,089
	10-50 mg/L	1,161,807	26	30,206,982	0.25	7,551,746	213,865,447	30	6,415,963,410	14,147
	4-10 mg/L	337,243	33	11,129,019	0.25	2,782,255	78,793,462	7	551,554,234	1,216
									TOTAL Fluoride Mw:	27,071

1. VA = A x b
2. Vgw = VA x n
3. Vgw in ft3 multiplied by 28.32 L/ft3 = Vgw in Liters
4. Mi = Vgw x Cwi
5. Mi in mg divided by 1000 mg/g multiplied by 2.205x10-3 lb/g = Mi in pounds

00-E1e.123