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MET LAB (HWMF) GROUNDWATER MONITORING REPORT–SECOND QUARTER 1994

by

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Aiken, South Carolina 29808

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METALLURGICAL LABORATORY HAZARDOUS WASTE MANAGEMENT FACILITY GROUNDWATER MONITORING REPORT (U)

SECOND QUARTER 1994

Publication Date: September 1994

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Abstract

During second quarter 1994, samples from AMB groundwater monitoring wells at the Metallurgical Laboratory Hazardous Waste Management Facility were analyzed for selected heavy metals, indicator parameters, radionuclides, volatile organic compounds, and other constituents. Three parameters exceeded standards during the quarter.

As in previous quarters, tetrachloroethylene and trichloroethylene exceeded final Primary Drinking Water Standards. Total organic halogens exceeded the Savannah River Site (SRS) Flag 2 criteria in two of the wells.

Groundwater flow direction and rate in the M-Area Aquifer Zone were similar to previous quarters. Conditions affecting determination of groundwater flow directions and rates in the Upper Lost Lake Aquifer Zone, Lower Lost Lake Aquifer Zone, and the Middle Sand Aquifer Zone of the Crouch Branch Confining Unit were also similar to previous quarters.

During second quarter 1994, SRS received SCDHEC approval for five point-of-compliance wells and two plume definition wells near the Met Lab HWMF. Field work has begun on this project.

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Contents

List of Figures

List of Tables

Executive Summary

The 18 AMB wells at the Metallurgical Laboratory Hazardous Waste Management Facility (Met Lab HWMF) are monitored for selected constituents to comply with the Natural Resources Defense Council et al. Consent Decree of May 1988 that identifies the Met Lab HWMF as subject to the Resource Conservation and Recovery Act. In addition, the wells are monitored as requested for other constituents as part of the Savannah River Site (SRS) Groundwater Monitoring Program.

During second quarter 1994, all 18 wells were monitored at the facility. Well screen zone nomenclature was revised fourth quarter 1993 using the following hydrostratigraphic assignments: wells AMB 4D, 5, 6, 7, 8D, 9D, 10D, 11D, and 12D monitor the M-Area Aquifer Zone (previously Water Table unit); well AMB 11B monitors the Upper Lost Lake Aquifer Zone (previously upper portion of the Congaree unit); wells AMB 4B, 7B, and 10B monitor the Lower Lost Lake Aquifer Zone (previously lower portion of the Congaree unit); wells AMB 4A, 7A, 10A, and 13AR monitor the Middle Sand Aquifer Zone of the Crouch Branch Confining Unit (CBCU) (previously Ellenton Sand unit); and well AMB 10DD monitors a perched groundwater zone beneath the Met Lab HWMF.

Samples from these wells were analyzed for alkalinity, heavy metals, pH, total alpha-emitting radium, specific conductance, volatile organic compounds, and other constituents. These constituents are listed in Table 3. This report describes the results that exceeded final Primary Drinking Water Standards (PDWS) and SRS flagging criteria.

As in previous quarters, tetrachloroethylene and trichloroethylene exceeded the final PDWS. Tetrachloroethylene exceeded standards in wells AMB 4A and 7A; trichloroethylene exceeded standards in wells AMB 4A, 4B, 4D, 5, 6, and 7A. Total organic halogens exceeded the Flag 2 criteria in wells AMB 4A and 7A. No constituents exceeded either the final PDWS or the Flag 2 criteria in upgradient wells AMB 11D and 12D or in downgradient wells AMB 7, 7B, 8D, 9D, 10A, 10B, 10D, 10DD, 11B, and 13AR. Unlike previous quarters, dichloromethane (methylene chloride), a common laboratory contaminant, did not exceed the final PDWS in any AMB well.

Groundwater flow direction and rate in the M-Area Aquifer Zone were similar to previous quarters. Reliable estimates of flow directions and rates in the Upper and Lower Lost Lake Aquifer Zones and in the Middle Sand Aquifer Zone of the CBCU could not be calculated because of the low horizontal gradient or the near-linear distribution of the monitoring wells.

In response to the January 28, 1994, Notice of Deficiency (NOD) issued by SCDHEC on Revision 0 of the 1992 Met Lab HWMF Part B Permit Renewal Application, SRS plans to obtain additional hydrogeologic and groundwater quality data to further define the groundwater contaminant plume near the Met Lab HWMF and plans to construct additional point-of-compliance wells. During 1994, seven groundwater monitoring wells will be constructed under the Phase X Drilling Project. During second quarter 1994, SRS received approval for constructing the proposed Met Lab HWMF monitoring wells. Field work has begun on this project.

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Introduction

The Metallurgical Laboratory Hazardous Waste Management Facility (Met Lab HWMF) is located in the eastern section of A/M Areas at the Savannah River Site (SRS) (Figures 1 and 2, Appendix C). The facility consists of the process sewer line leading to the Metallurgical Laboratory Basin, the Metallurgical Laboratory Basin, the drainage outfall to a nearby Carolina bay, and the Carolina bay. The following description outlines important events at the facility:

- The Metallurgical Laboratory Basin was constructed and began receiving waste water effluent from the Metallurgical Laboratory Building in 1956 (WSRC, 1992a; WSRC, 1992c). Waste water released to the basin consisted of laboratory wastes from metallographic sample preparation and corrosion testing of stainless steel-based and nickel-based alloys. The quantity of waste water discharged to the basin was small, averaging approximately 1,000 gal per day (Heffner and Exploration Resources, 1991).

- Release of hazardous waste from the Metallurgical Laboratory Building to the basin was discontinued in 1983 (WSRC, 1992a; WSRC, 1992c).

- Quarterly groundwater sampling began first quarter 1984 (WSRC, 1992a; WSRC, 1992c).

- Waste water flow to the Met Lab HWMF was terminated November 8, 1985 (WSRC, 1992a; WSRC, 1992c).

- The Met Lab HWMF was named in Section III of the Natural Resources Defense Council et al. Consent Decree, May 26, 1988 (Civil Action 1:85-2583-6, U.S. District Court, District of South Carolina, Aiken Division), thus becoming subject to the requirements of Subtitle C of the Resource Conservation and Recovery Act (RCRA).

- Revision 0 of the facility's RCRA Part B post-closure care permit application (WSRC, 1989) was submitted to the South Carolina Department of Health and Environmental Control (SCDHEC) August 18, 1989.

- A groundwater quality assessment plan (Jerome, 1990) was submitted to SCDHEC in October 1990.

- A revised groundwater quality assessment plan was submitted to SCDHEC in March 1991 and approved by SCDHEC in June 1991 (Jerome, 1991). The plan lists the selected heavy metals, indicator parameters, radionuclides, volatile organic compounds, and other constituents that currently require monitoring.

- In September 1991, a phased closure plan for the Met Lab HWMF was approved by SCDHEC, and construction to close the basin was begun (WSRC, 1992c).

- Revision 1 of the RCRA Part B post-closure care permit application (WSRC, 1991) was submitted to SCDHEC December 16, 1991.

- Closure construction of the basin was completed May 1, 1992; official closure for the basin was completed May 11, 1992; and closure certification of the basin was submitted to

SCDHEC July 10, 1992 (letter from J. Gray, ERC, to R. Sentelle, ERC, June 11, 1992). No decision has been made on closure of the Carolina bay.

- Revision 0 of the 1992 RCRA Part B post-closure permit renewal application (WSRC, 1992c) was submitted to SCDHEC in September 1992 in accordance with the regulatory requirement to update and resubmit permit applications every five years.

- Revision 1 of the 1992 RCRA Part B post-closure permit renewal application (WSRC, 1992c) was resubmitted to SCDHEC in March 1994. Revision 1 incorporated changes requested by SCDHEC.

- Revision 2 of the 1992 RCRA Part B post-closure permit renewal application (WSRC, 1992a) was submitted to SCDHEC in July 1994. Revision 2 incorporated changes requested by SCDHEC.

Presently, the Environmental Protection Department/Environmental Monitoring Section (EPD/EMS) samples the 18 AMB wells each quarter, and the Environmental Restoration Department reports the results of this sampling to SCDHEC to meet the requirements of the South Carolina Hazardous Waste Management Regulations (SCDHEC, 1990).

Discussion

Groundwater Monitoring Data

The EPD/EMS sampling procedure (EPD/EMS, 1992) requires evacuation of a minimum of two well volumes and stabilization of pH, specific conductance, and turbidity prior to sample collection. Stability is established when a minimum of three successive measurements, taken within a given time period, are within a specified tolerance range. If a well pumps dry before two well volumes are purged or before stabilization is achieved, it must be revisited within 24 hours for the data to be considered from a single sampling event. On the second visit within 24 hours, samples are taken without purging or stability measurements; thus, these samples may not be representative of groundwater quality.

During second quarter 1994, the groundwater samples were analyzed by General Engineering Laboratories of Charleston, South Carolina, and Roy F. Weston, Inc., of Lionville, Pennsylvania, for selected heavy metals, indicator parameters, total alpha-emitting radium, volatile organic compounds, and other constituents. This report describes the monitoring results that equaled or exceeded the Safe Drinking Water Act final Primary Drinking Water Standards (PDWS) or drinking water screening levels, as established by the U.S. Environmental Protection Agency (EPA) (Appendix A); the South Carolina final PDWS for lead (Appendix A); or SRS flagging criteria that are based on final PDWS, Secondary Drinking Water Standards, and method detection limits (Appendix B). For simplicity, results that equaled or exceeded final PDWS or SRS Flag 2 criteria are described as *exceeding* or *above standards* or as *elevated*.

The final PDWS for individual analytes provided in Appendix A may not always match the SRS flagging criteria provided in Appendix B. The final PDWS are used as guidelines in this compliance report to meet regulatory requirements; the flagging criteria are used by EPD/EMS to identify relative levels of constituents in the groundwater and as guides for scheduling groundwater sampling.

Integrity of the Monitoring Well Network

The groundwater monitoring well network at the Met Lab HWMF has been developed during the past decade as described below (EPD/EMS, 1993):

- Groundwater monitoring wells AMB 1, 2, and 3 were installed in 1983.
- Wells AMB 1 and 3 were abandoned and replaced by wells AMB 1A and 3A in 1984.
- In 1988, wells AMB 4, 5, 6, and 7 were installed, and wells AMB 1A, 2, and 3A were abandoned.
- In 1989, wells AMB 8, 8D, 9, 9D, 10, 10D, 10DD, 11D, and 12D were installed. Subsequently that year, wells AMB 8, 9, and 10 were abandoned.
- In 1991, wells AMB 4A, 4B, 4D, 7A, 7B, 10A, 10B, 11B, and 13AR were installed, and well AMB 4 was abandoned.

In response to the January 28, 1994, Notice of Deficiency issued by SCDHEC on Revision 0 of the 1992 Met Lab HWMF Part B Permit Renewal Application, SRS plans to obtain additional hydrogeologic and groundwater quality data to further define the groundwater contaminant plume near the Met Lab HWMF, and plans to construct additional point-of-compliance (POC) wells. During 1994, seven groundwater monitoring wells will be constructed under the Phase X Drilling Project. The monitoring wells to be installed under the Phase X Drilling Project are as follows:

- M-Area Aquifer Zone
  - POC well: 1
  - plume definition wells: 2
- Lost Lake Aquifer Zone
  - POC wells: 2
- Middle Sand Aquifer Zone of the Crouch Branch Confining Unit (CBCU)
  - POC wells: 2

The positions of the proposed wells are based on present groundwater flow information in the respective aquifers. The proposed locations will provide three additional downgradient M-Area aquifer zone monitoring wells for the Met Lab Basin; one additional well downgradient to the Basin; one downgradient well immediately south of the Carolina bay in the Lost Lake Aquifer Zone; and two additional downgradient wells to the Met Lab Basin in the Middle Sand Aquifer Zone of the CBCU. Cone penetrometer technology (e.g., hydrocone sampling) will be used to optimally place the plume definition wells.

During second quarter 1994, SRS received approval for constructing the proposed Met Lab HWMF monitoring wells. This project began in July 1994.

Well designations: Hydrostratigraphic nomenclature and well screen zone assignments (Lewis and Aadland, 1993) were revised fourth quarter 1993. Appendix D provides previous nomenclature and definitions for the screen zone abbreviations, and Table 3 (Appendix D) indicates the screen zone assignment for each well.

According to the revised nomenclature, the current groundwater monitoring well network at the Met Lab HWMF (Figures 3, 4, 5, and 6, Appendix C) comprises the following: wells AMB 4D, 5, 6, 7, 8D, 9D, 10D, 11D, and 12D screened within the M-Area Aquifer Zone; well AMB 11B screened within the Upper Lost Lake Aquifer Zone; wells AMB 4B, 7B, and 10B screened within the Lower Lost Lake Aquifer Zone; wells AMB 4A, 7A, 10A, and 13AR screened within the Middle Sand Aquifer Zone of the CBCU; and well AMB 10DD screened within a perched groundwater zone beneath the Met Lab HWMF. Figure 7 (Lewis and Aadland, 1993) illustrates the hydrostratigraphy of A/M Areas.

Background wells for the facility were proposed in the recent Part B post-closure permit renewal application (WSRC, 1992c).

Well purging: Table 3 (Appendix D) lists the number of well volumes purged from each well during second quarter 1994 and provides sampling statements that describe incomplete or unsuccessful sampling events. Wells AMB 6, 7, 10A, and 13AR went dry during purging and were sampled after they recovered. Thus, the samples from these wells may not be representative of the groundwater quality at the Met Lab HWMF.

Analytical Results Exceeding Standards

Results for analytes that exceeded the final PDWS (see Appendix A) during second quarter 1994 are provided in Table 1 (Appendix D). Tetrachloroethylene exceeded the final PDWS in wells AMB 4A and 7A, with a maximum concentration of 58 μg/L in well AMB 4A. Trichloroethylene was elevated in wells AMB 4A, 4B, 4D, 5, 6, and 7A, with a maximum concentration of 600 μg/L in well AMB 4A.

Constituents that exceeded other Flag 2 criteria (see Appendix B) during second quarter 1994 are summarized in Table 2 (Appendix D). Total organic halogens exceeded the Flag 2 criterion in wells AMB 4A and 7A, with a maximum concentration of 201 μg/L in well AMB 7A.

Table 3 (Appendix D) presents all the results for individual wells and indicates the analytical laboratories that conducted the analyses and those analyses that received modifiers (which help identify laboratory accuracy and precision) or that exceeded the EPA-approved holding times during second quarter 1994. Constituent results in Table 3 that appear to equal the final PDWS but are not marked in the *D* column (exceeded final PDWS or screening level) are below the final PDWS in the database. Database results, the results that are compared to the final PDWS, are entered with more significant digits than the results given in this report. Apparent discrepancies are the result of the rounding of reported results.

Appendix D provides definitions of the abbreviations and the modifiers used in the results tables as well as descriptions of holding times, data rounding, and data qualification practices. Appendix E provides a general assessment of the quality and useability of the data provided by EPD/EMS.

Time Series Results

Time series plots of field pH, field specific conductance, tetrachloroethylene, total alpha-emitting radium, total organic carbon, total organic halogens, and trichloroethylene for the 18 AMB wells are shown in Appendix F. Trends for these indicator parameters are as follows:

pH: Field pH values for most of the AMB wells have ranged between approximately pH 5 and 7 since sampling began. However, the pH in well AMB 10A consistently has exceeded the alkaline Flag 2 criterion of pH 10; during second quarter 1994, it was pH 10.1. The pH in well AMB 11D has usually fluctuated around neutral, but occasionally it has risen to greater than pH 9. The pH level in well AMB 13AR has exceeded the alkaline Flag 2 criterion during recent quarters; during second quarter 1994, it was pH 11.1.

Specific conductance: With few exceptions, field specific conductance for well AMB 10A consistently has exceeded the Flag 2 criterion of 500 μS/cm since sampling began; during second quarter 1994, specific conductance in well AMB 10A was 863 μS/cm. Specific conductance has ranged between approximately 25 and 300 μS/cm in the remaining wells in recent years.

Tetrachloroethylene: Tetrachloroethylene concentrations for most of the AMB wells have been near or below the final PDWS of 5 μg/L since sampling began. Concentrations in well AMB 5 have been above the final PDWS since mid-1989, except during third quarter 1993 when the tetrachloroethylene concentration was less than the detection limit. During second quarter 1994, the tetrachloroethylene concentration in well AMB 5 was below the Flag 2 criterion limit. Concentrations above the final PDWS have been found in well AMB 4D during recent quarters, but during third quarter 1993 the tetrachloroethylene concentration was

below the detection limit. Concentrations in wells AMB 4A and 7A have consistently exceeded the final PDWS.

Total alpha-emitting radium: All of the AMB wells have consistently exhibited total alpha-emitting radium activities below the Flag 2 criterion of 20 pCi/L.

Total organic carbon: Total organic carbon concentrations in the AMB well series have been consistently less than the Flag 2 criterion of 10,000 μg/L since shortly after sampling began, except for a few isolated analyses in different wells during late 1989 through early 1990.

Total organic halogens: Most of the AMB wells have exhibited total organic halogen concentrations less than the Flag 2 criterion of 50 μg/L since sampling began. However, concentrations in wells AMB 4A, 5, and 7A have exceeded this standard during most quarters that samples were analyzed. During second quarter 1994, concentrations exceeded standards for wells AMB 4A and 7A. The concentration of total organic halogens in well AMB 4D has fluctuated around the Flag 2 criterion, except during second quarter 1993 when it exceeded 100 μg/L.

Trichloroethylene: Trichloroethylene concentrations in wells AMB 4A, 4B, 4D, 5, and 7A have consistently exceeded the final PDWS of 5 μg/L since sampling began. Concentrations in wells AMB 6, 7, 7B, and 8D have fluctuated around the final PDWS. Concentrations in the remaining AMB wells have consistently been less than the final PDWS or the detection limit.

Groundwater Elevations, Flow Directions, and Flow Rates

Figure 2 (Appendix C) provides water-elevation contours for the M-Area Aquifer Zone in A/M Areas. Figures 3 through 6 (Appendix C) present water-elevation data for the M-Area Aquifer Zone, the Upper Lost Lake Aquifer Zone, the Lower Lost Lake Aquifer Zone, and the Middle Sand Aquifer Zone of the CBCU beneath the Met Lab HWMF. Hydrographs for the AMB wells are in Appendix G, and large-scale water elevation and potentiometric maps of the M-Area Aquifer Zone, the Upper Lost Lake Aquifer Zone, the Lower Lost Lake Aquifer Zone, and the Middle Sand Aquifer Zone of the CBCU are in Appendix H. Water-elevation figures in Appendix C are oriented to true north using universal transverse Mercator coordinates (UTM), while figures in Appendix H are oriented to true north using latitude-longitude coordinates.

Historically, using UTM coordinates, the horizontal groundwater flow in the M-Area Aquifer Zone beneath the Met Lab HWMF is to the west-northwest, the flow in the Upper Lost Lake Aquifer Zone is to the south, the flow in the Lower Lost Lake Aquifer Zone is to the south-southwest, and the flow in the Middle Sand Aquifer Zone of the CBCU is to the southwest. During second quarter 1994, horizontal flow in the M-Area Aquifer Zone was to the west-northwest (Figure 3, Appendix C). The Upper Lost Lake Aquifer Zone was not contoured because it is monitored by only one well. Potentiometric surfaces in the Lower Lost Lake Aquifer Zone and in the Middle Sand Aquifer Zone of the CBCU were not contoured because of the low horizontal gradient or the near-linear distribution of the monitoring wells.

Estimated horizontal flow rates for the hydrostratigraphic divisions during the past four quarters are provided below.

Horizontal Groundwater Flow Rates (ft/yr) in the Hydrostratigraphic Divisions beneath the Met Lab HWMF

Division	3Q93	4Q93	1Q94	2Q94
M-Area Aquifer Zone	160	160	130	150
Upper Lost Lake Aquifer Zone	N[a]	N	N	N
Lower Lost Lake Aquifer Zone	N	N	N	N
Middle Sand Aquifer Zone of the CBCU	NA[b]	N	N	N

[a] N = Horizontal gradient too low, well orientation too linear, or not enough data points to determine the flow rate.

[b] NA = Prior to fourth quarter 1993, no well screens were assigned to the Middle Sand Aquifer Zone of the CBCU.

The groundwater flow rate beneath the Met Lab HWMF is estimated using the following equation:

$$\text{Flow (ft/day)} = \frac{\text{Hydraulic Conductivity (ft/day)}}{\text{Porosity (unitless)}} \times \frac{dh\ \text{(ft)}}{dl\ \text{(ft)}}$$

Hydraulic conductivity constants estimated for the M-Area Aquifer Zone, the Upper Lost Lake Aquifer Zone, the Lower Lost Lake Aquifer Zone, and the Middle Sand Aquifer Zone of the CBCU are 27, 45, 45, and 45 ft/day, respectively; the effective porosity value for each is 20% (Lewis and Aadland, 1992). The value *dh* is the difference in head, and *dl* is the length of the flow path.

Flow path length is calculated to the nearest 50 ft for each hydrostratigraphic unit. Flow rate per day is calculated to two significant figures, then multiplied by 365 and rounded to two significant figures for the flow rate per year. Flow rate estimates vary depending on the vertical gradient between wells, the size of the area under consideration, and the number of data points. The values presented here are useful as order of magnitude estimates only.

The flow rate estimate for groundwater in the M-Area Aquifer Zone beneath the Met Lab HWMF during second quarter 1994 is as follows (Figure 3, Appendix C):

$$\frac{27}{0.20} \times \frac{2.0}{650} = 0.42\ \text{ft/day}$$

$$0.42\ \text{ft/day} \times 365\ \text{days} \approx 150\ \text{ft/yr}$$

Upgradient vs. Downgradient Results

M-Area Aquifer Zone wells AMB 11D and 12D are upgradient relative to the Met Lab HWMF. No AMB wells monitor upgradient groundwater quality in the Upper and Lower Lost Lake Aquifer Zones or the Middle Sand Aquifer Zone of the CBCU. The 1992 RCRA Part B post-closure permit renewal application proposes to identify upgradient wells for these units (WSRC, 1992c) after data are received from the Phase X Drilling Project. Until new upgradient wells are selected and installed, MSB 29 and 43 will be used as upgradient wells.

During second quarter 1994, no elevated constituents were found in the upgradient wells in the M-Area Aquifer Zone. Downgradient M-Area Aquifer Zone wells AMB 4D, 5, and 6 contained elevated levels of trichloroethylene.

Downgradient well AMB 11B, in the Upper Lost Lake Aquifer Zone, did not contain elevated levels of aluminum as during first quarter 1994. In the Lower Lost Lake Aquifer Zone, downgradient well AMB 4B contained elevated levels of trichloroethylene. Downgradient wells AMB 4A and 7A in the Middle Sand Aquifer Zone of the CBCU contained elevated levels of tetrachloroethylene, total organic halogens, and trichloroethylene.

Quality Control Results

Well AMB 7A was selected to receive duplicate and blind replicate analyses during second quarter 1994. Blind replicate analyses, representing approximately 5% of the quarter's total groundwater samples, are performed by the analytical laboratories each quarter for wells selected by EPD/EMS as part of the EPD/EMS quality assurance program (see Appendix E). The results of the analyses are used for both intralaboratory and interlaboratory comparisons. **The Savannah River Site's Groundwater Monitoring Program, First Quarter 1994 (U)** (EPD/EMS, 1994) provides full replicate results and statistical comparisons of both blind replicate and duplicate results.

As a part of intralaboratory quality assurance procedures, certain analyses were duplicated by the laboratory. These results are reported in Table 3, Appendix D.

Conclusions

During second quarter 1994, as in previous quarters, tetrachloroethylene and trichloroethylene exceeded the final PDWS in several AMB wells. Tetrachloroethylene exceeded standards in wells AMB 4A and 7A, with values of 58 μg/L and 15 μg/L, respectively. Trichloroethylene exceeded standards in wells AMB 4A, 4B, 4D, 5, 6, and 7A, with values of 600 μg/L, 5.2 μg/L, 62 μg/L, 39 μg/L, 8.4 μg/L, and 320 μg/L, respectively. Dichloromethane, a common laboratory contaminant, did not exceed the final PDWS, as it has done in previous quarters. Gross alpha and lead, which exceeded final PDWS in one well each during first quarter 1994, were not analyzed for during second quarter 1994. The RCRA Part B post-closure care permit application for the Met Lab HWMF (WSRC, 1991) indicates that a small, isolated plume of tetrachloroethylene and trichloroethylene, located in the M-Area Aquifer Zone near the Met Lab HWMF, is from the Metallurgical Laboratory Basin. The permit application also indicates that the primary source of the contamination in the deeper units near the Met Lab HWMF is the extensive organic halogens plume resulting from M-Area operations. SRS is addressing the effects of organic halogens near the Met Lab HWMF under the provisions of the corrective action program of the M-Area HWMF Part B post-closure permit renewal application (WSRC, 1992b; WSRC, 1992c).

Similar to past quarters, pH, specific conductance, and total organic halogens exceeded the Flag 2 criteria in one or more of the AMB wells during second quarter 1994. Specific conductance exceeded standards with a value of 863 μS/cm in well AMB 10A. Maximum levels for pH and total organic halogens were found in wells screened in the Middle Sand Aquifer Zone of the CBCU; pH had a maximum value of 11.1 pH in well AMB 13AR and total organic halogens had a maximum value of 201 μg/L in well AMB 7A. Aluminum, iron, and manganese, all of which exceeded Flag 2 criteria in several wells during first quarter 1994, were not analyzed for during second quarter 1994.

During second quarter 1994, no elevated constituents were detected in upgradient wells AMB 11D and 12D. Also, elevated constituents were not found in downgradient wells AMB 7, 7B, 8D, 9D, 10B, 10D, 10DD, and 11B.

During second quarter 1994, SRS received SCDHEC approval to install five point-of-compliance wells and two plume definition wells near the Met Lab HWMF. Field work has begun on this project.

Historically and currently, the horizontal flow direction in the M-Area Aquifer Zone beneath the Met Lab HWMF is to the west-northwest (UTM coordinates). Historically, the flow direction in the Upper Lost Lake Aquifer Zone is to the south-southeast, the flow in the Lower Lost Lake Aquifer Zone is to the south-southwest, and the flow in the Middle Sand Aquifer Zone of the CBCU is to the southwest. During second quarter 1994, the low horizontal gradient and near-linear arrangement of the monitoring wells in the Lower Lost Lake Aquifer Zone and in the Middle Sand Aquifer Zone of the CBCU prevented determination of reliable flow directions and rates in these hydrostratigraphic divisions. Data were insufficient to determine the flow direction and rate in the Upper Lost Lake Aquifer Zone. The flow rate estimate for groundwater in the M-Area Aquifer Zone during the quarter was 150 ft/yr.

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Errata

In tables with four quarters of data (Table 1, Appendix D), some values for earlier quarters may differ from values for those same quarters presented in earlier reports because some reanalyses may have been performed by the laboratories after the reports were printed. Also, samples for field data are collected once each quarter but samples for analytical data may be collected more than once each quarter. Thus, because the results tables present the highest analytical results for the quarter, a reported analytical result may be from a sample collected on a different date than the date the field data sample was collected.

Second Quarter 1993:

- Page D-5, Table 1, Appendix D: The modifier column was incorrectly omitted from the table. None of the constituents listed had analytical modifiers.

Third Quarter 1993:

- No errata have been reported.

Fourth Quarter 1993:

- Page 5, Discussion, Groundwater Monitoring Data: Roy F. Weston, Inc., was omitted from the paragraph discussing the laboratories that analyzed groundwater samples for the quarter.

First Quarter 1994:

- No errata have been reported.

Appendix A

Final Primary Drinking Water Standards

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Final Primary Drinking Water Standards

Analyte	Unit	Level	Status	Source
Alachlor	µg/L	2	Final	EPA, 1993
Aldicarb[a]	µg/L	3	Final	EPA, 1993
Aldicarb sulfone[a]	µg/L	2	Final	EPA, 1993
Aldicarb sulfoxide[a]	µg/L	4	Final	EPA, 1993
Antimony	µg/L	6	Final	EPA, 1993
Antimony, dissolved	µg/L	6	Final	EPA, 1993
Antimony, total recoverable	µg/L	6	Final	EPA, 1993
Arsenic	µg/L	50	Final	EPA, 1993
Arsenic, dissolved	µg/L	50	Final	EPA, 1993
Arsenic, total recoverable	µg/L	50	Final	EPA, 1993
Asbestos	Fibers/L	7,000,000	Final	EPA, 1993
Atrazine	µg/L	3	Final	EPA, 1993
Barium	µg/L	2,000	Final	EPA, 1993
Barium, dissolved	µg/L	2,000	Final	EPA, 1993
Barium, total recoverable	µg/L	2,000	Final	EPA, 1993
Benzene	µg/L	5	Final	EPA, 1993
Benzo[a]pyrene	µg/L	0.2	Final	EPA, 1993
Beryllium	µg/L	4	Final	EPA, 1993
Beryllium, dissolved	µg/L	4	Final	EPA, 1993
Beryllium, total recoverable	µg/L	4	Final	EPA, 1993
Bis(2-ethylhexyl) phthalate	µg/L	6	Final	EPA, 1993
Bromodichloromethane	µg/L	100	Final	EPA, 1993
Bromoform	µg/L	100	Final	EPA, 1993
2-sec-Butyl-4,6-dinitrophenol	µg/L	7	Final	EPA, 1993
Cadmium	µg/L	5	Final	EPA, 1993
Cadmium, dissolved	µg/L	5	Final	EPA, 1993
Cadmium, total recoverable	µg/L	5	Final	EPA, 1993
Carbofuran	µg/L	40	Final	EPA, 1993
Carbon tetrachloride	µg/L	5	Final	EPA, 1993
Chlordane	µg/L	2	Final	EPA, 1993
Chlorobenzene	µg/L	100	Final	EPA, 1993
Chloroethene (Vinyl chloride)	µg/L	2	Final	EPA, 1993
Chloroform	µg/L	100	Final	EPA, 1993
Chromium	µg/L	100	Final	EPA, 1993
Chromium, dissolved	µg/L	100	Final	EPA, 1993
Chromium, total recoverable	µg/L	100	Final	EPA, 1993
Copper	µg/L	1,300	Final	EPA, 1993
Copper, dissolved	µg/L	1,300	Final	EPA, 1993
Copper, total recoverable	µg/L	1,300	Final	EPA, 1993
Cyanide	µg/L	200	Final	EPA, 1993
Dalapon[a]	µg/L	200	Final	EPA, 1993
Dibromochloromethane	µg/L	100	Final	EPA, 1993
1,2-Dibromo-3-chloropropane	µg/L	0.2	Final	EPA, 1993
1,2-Dibromoethane	µg/L	0.05	Final	EPA, 1993
1,2-Dichlorobenzene	µg/L	600	Final	EPA, 1993
1,4-Dichlorobenzene	µg/L	75	Final	EPA, 1993
1,2-Dichloroethane	µg/L	5	Final	EPA, 1993
1,1-Dichloroethylene	µg/L	7	Final	EPA, 1993
1,2-Dichloroethylene	µg/L	50	Final	EPA, 1993
cis-1,2-Dichloroethylene	µg/L	70	Final	EPA, 1993
trans-1,2-Dichloroethylene	µg/L	100	Final	EPA, 1993
Dichloromethane (Methylene chloride)	µg/L	5	Final	EPA, 1993
2,4-Dichlorophenoxyacetic acid	µg/L	70	Final	EPA, 1993

Analyte	Unit	Level	Status	Source
1,2-Dichloropropane	µg/L	5	Final	EPA, 1993
Di(2-ethylhexyl) adipate[a]	µg/L	400	Final	EPA, 1993
Diquat dibromide[a]	µg/L	20	Final	EPA, 1993
Endothall[a]	µg/L	100	Final	EPA, 1993
Endrin	µg/L	2	Final	EPA, 1993
Ethylbenzene	µg/L	700	Final	EPA, 1993
Fluoride	µg/L	4,000	Final	EPA, 1993
Glyphosate[a]	µg/L	700	Final	EPA, 1993
Gross alpha[b]	pCi/L	1.5E+01	Final	EPA, 1993
Heptachlor	µg/L	0.4	Final	EPA, 1993
Heptachlor epoxide	µg/L	0.2	Final	EPA, 1993
Hexachlorobenzene	µg/L	1	Final	EPA, 1993
Hexachlorocyclopentadiene	µg/L	50	Final	EPA, 1993
Lead	µg/L	50	Final	SCDHEC, 1981
Lead, dissolved	µg/L	50	Final	SCDHEC, 1981
Lead, total recoverable	µg/L	50	Final	SCDHEC, 1981
Lindane	µg/L	0.2	Final	EPA, 1993
Mercury	µg/L	2	Final	EPA, 1993
Mercury, dissolved	µg/L	2	Final	EPA, 1993
Mercury, total recoverable	µg/L	2	Final	EPA, 1993
Methoxychlor	µg/L	40	Final	EPA, 1993
Nickel	µg/L	100	Final	EPA, 1993
Nickel, dissolved	µg/L	100	Final	EPA, 1993
Nickel, total recoverable	µg/L	100	Final	EPA, 1993
Nitrate as nitrogen	µg/L	10,000	Final	EPA, 1993
Nitrate-nitrite as nitrogen	µg/L	10,000	Final	EPA, 1993
Nitrite as nitrogen	µg/L	1,000	Final	EPA, 1993
Nonvolatile beta	pCi/L	5E+01	Interim Final	EPA, 1977
Oxamyl[a]	µg/L	200	Final	EPA, 1993
PCB 1016	µg/L	0.5	Final	EPA, 1993
PCB 1221	µg/L	0.5	Final	EPA, 1993
PCB 1232	µg/L	0.5	Final	EPA, 1993
PCB 1242	µg/L	0.5	Final	EPA, 1993
PCB 1248	µg/L	0.5	Final	EPA, 1993
PCB 1254	µg/L	0.5	Final	EPA, 1993
PCB 1260	µg/L	0.5	Final	EPA, 1993
PCB 1262	µg/L	0.5	Final	EPA, 1993
Pentachlorophenol	µg/L	1	Final	EPA, 1993
Picloram[a]	µg/L	500	Final	EPA, 1993
Selenium	µg/L	50	Final	EPA, 1993
Selenium, dissolved	µg/L	50	Final	EPA, 1993
Selenium, total recoverable	µg/L	50	Final	EPA, 1993
Simazine[a]	µg/L	4	Final	EPA, 1993
Strontium-89/90[c]	pCi/L	8E+00	Final	EPA, 1993
Strontium-90	pCi/L	8E+00	Final	EPA, 1993
Styrene	µg/L	100	Final	EPA, 1993
2,3,7,8-TCDD	µg/L	0.00003	Final	EPA, 1993
Tetrachloroethylene	µg/L	5	Final	EPA, 1993
Thallium	µg/L	2	Final	EPA, 1993
Thallium, dissolved	µg/L	2	Final	EPA, 1993
Thallium, total recoverable	µg/L	2	Final	EPA, 1993
Toluene	µg/L	1,000	Final	EPA, 1993
Toxaphene	µg/L	3	Final	EPA, 1993
2,4,5-TP (Silvex)	µg/L	50	Final	EPA, 1993
1,2,4-Trichlorobenzene	µg/L	70	Final	EPA, 1993

Analyte	Unit	Level	Status	Source
1,1,1-Trichloroethane	µg/L	200	Final	EPA, 1993
1,1,2-Trichloroethane	µg/L	5	Final	EPA, 1993
Trichloroethylene	µg/L	5	Final	EPA, 1993
Tritium	pCi/mL	2E+01	Final	EPA, 1993
Xylenes	µg/L	10,000	Final	EPA, 1993

Note: Final PDWS were assigned to alachlor, aldicarb, aldicarb sulfone, aldicarb sulfoxide, atrazine, carbofuran, dalapon, di(2-ethylhexyl) adipate, diquat dibromide, endothall, glyphosate, oxamyl, picloram, and simazine in the SRS Groundwater Monitoring Program for the first time beginning first quarter 1994.

[a] At present, EMS does not perform this analysis because the constituent is not in the current contract.
[b] The standard given is for gross alpha including radium-226 but excluding radon and uranium.
[c] For double radionuclide analyses where each separate radionuclide has its own standard, the more stringent standard is used.

References

EPA (U.S. Environmental Protection Agency), 1977. **National Interim Primary Drinking Water Regulations**, EPA-570/9-76-003. Washington, DC.

EPA (U.S. Environmental Protection Agency), 1993. *National Primary Drinking Water Regulations,* **Code of Federal Regulations**, Section 40, Part 141, pp. 592–732. Washington, DC.

SCDHEC (South Carolina Department of Health and Environmental Control), 1981. **State Primary Drinking Water Regulations**, R.61–58.5. Columbia, SC.

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Appendix B

Flagging Criteria

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Flagging Criteria

The Savannah River Site Environmental Protection Department/Environmental Monitoring Section (EPD/EMS) flagging criteria are as follows:

- Flag 2 criteria for constituents equal the Safe Drinking Water Act (SDWA) final Primary Drinking Water Standard (PDWS), the SDWA proposed PDWS, or the SDWA Secondary Drinking Water Standard (SDWS). If a constituent does not have a drinking water standard, the Flag 2 criterion equals 10 times the method detection limit (MDL) calculated as the 90th percentile detection limit obtained recently by one of the primary analytical laboratories.

- Flag 1 criteria for constituents equal one-half of the final PDWS, one-half the proposed PDWS, or one-half the SDWS. If a constituent does not have a drinking water standard, the Flag 1 criterion equals 5 times the MDL calculated as the 90th percentile detection limit obtained recently by one of the primary analytical laboratories.

- Flag 0 criteria are assigned to constituent levels below Flag 1 criteria, constituent levels below the sample detection limits, or constituents having no flagging criteria.

The following parameters are exceptions to the flagging rules:

- EPD/EMS sets flagging criteria for specific conductance and pH. No flags are set for alkalinity, calcium, carbonate, magnesium, potassium, silica, sodium, total dissolved solids, total phosphates (as P), and total phosphorus. Analyses for these parameters are conducted as part of the biennial comprehensive analyses or by special request.

- Aesthetic parameters such as color, corrosivity, Eh, odor, surfactants, and turbidity are not assigned flagging criteria but are analyzed by special request.

- Common laboratory contaminants and cleaners such as dichloromethane (methylene chloride), ketones, phthalates, and toluene are not assigned flagging criteria unless they have primary drinking water standards. These constituents are analyzed by special request.

Analyte	Unit	Flag 1	Flag 2	Source[a]
Acenaphthene	µg/L	50	100	EPA Method 8270
Acenaphthylene	µg/L	50	100	EPA Method 8270
Acetone	µg/L	500	1,000	EPA Method 8240
Acetonitrile (Methyl cyanide)	µg/L	500	1,000	EPA Method 8240
Acetophenone	µg/L	50	100	EPA Method 8270
2-Acetylaminofluorene	µg/L	50	100	EPA Method 8270
Acrolein	µg/L	100	200	EPA Method 8240
Acrylonitrile	µg/L	100	200	EPA Method 8240
Actinium-228	pCi/L	1.64E+03	3.27E+03	Proposed PDWS (EPA, 1991)
Alachlor	µg/L	1	2	Final PDWS (EPA, 1993a)
Aldicarb[b]	µg/L	1.5	3	Final PDWS (EPA, 1993a)
Aldicarb sulfone[b]	µg/L	1	2	Final PDWS (EPA, 1993a)
Aldicarb sulfoxide[b]	µg/L	2	4	Final PDWS (EPA, 1993a)
Aldrin	µg/L	0.25	0.5	EPA Method 8080
Alkalinity (as $CaCO_3$)		No flag	No flag	Set by EPD/EMS
Allyl chloride	µg/L	250	500	EPA Method 8240
Aluminum	µg/L	25	50	SDWS (EPA, 1993b)
Aluminum, dissolved	µg/L	25	50	SDWS (EPA, 1993b)
Aluminum, total recoverable	µg/L	25	50	SDWS (EPA, 1993b)

Analyte	Unit	Flag 1	Flag 2	Source
Americium-241	pCi/L	3.17E+00	6.34E+00	Proposed PDWS (EPA, 1991)
Americium-243	pCi/L	3.19E+00	6.37E+00	Proposed PDWS (EPA, 1991)
4-Aminobiphenyl	µg/L	50	100	EPA Method 8270
Ammonia	µg/L	500	1,000	APHA Method 417B
Ammonia nitrogen	µg/L	500	1,000	EPA Method 350.1
Aniline	µg/L	50	100	EPA Method 8270
Anthracene	µg/L	50	100	EPA Method 8270
Antimony	µg/L	3	6	Final PDWS (EPA, 1993a)
Antimony, dissolved	µg/L	3	6	Final PDWS (EPA, 1993a)
Antimony, total recoverable	µg/L	3	6	Final PDWS (EPA, 1993a)
Antimony-125	pCi/L	1.5E+02	3E+02	Interim Final PDWS (EPA, 1977)
Aramite	µg/L	50	100	EPA Method 8270
Arsenic	µg/L	25	50	Final PDWS (EPA, 1993a)
Arsenic, dissolved	µg/L	25	50	Final PDWS (EPA, 1993a)
Arsenic, total recoverable	µg/L	25	50	Final PDWS (EPA, 1993a)
Asbestos	Fibers/L	3,500,000	7,000,000	Final PDWS (EPA, 1993a)
Atrazine	µg/L	1.5	3	Final PDWS (EPA, 1993a)
Azobenzene	µg/L	50	100	EPA Method 625
Barium	µg/L	1,000	2,000	Final PDWS (EPA, 1993a)
Barium, dissolved	µg/L	1,000	2,000	Final PDWS (EPA, 1993a)
Barium, total recoverable	µg/L	1,000	2,000	Final PDWS (EPA, 1993a)
Barium-140[c]	pCi/L	4.5E+01	9E+01	Interim Final PDWS (EPA, 1977)
Benzene	µg/L	2.5	5	Final PDWS (EPA, 1993a)
alpha-Benzene hexachloride	µg/L	0.25	0.5	EPA Method 8080
beta-Benzene hexachloride	µg/L	0.25	0.5	EPA Method 8080
delta-Benzene hexachloride	µg/L	0.25	0.5	EPA Method 8080
Benzidine	µg/L	250	500	EPA Method 8270
Benzo[*a*]anthracene	µg/L	0.05	0.1	Proposed PDWS (EPA, 1990)
Benzo[*b*]fluoranthene	µg/L	0.1	0.2	Proposed PDWS (EPA, 1990)
Benzo[*k*]fluoranthene	µg/L	0.1	0.2	Proposed PDWS (EPA, 1990)
Benzoic acid	µg/L	250	500	EPA Method 8270
Benzo[*g,h,i*]perylene	µg/L	50	100	EPA Method 8270
Benzo[*a*]pyrene	µg/L	0.1	0.2	Final PDWS (EPA, 1993a)
1,4-Benzoquinone	µg/L	50	100	EPA Method 8270
Benzyl alcohol	µg/L	50	100	EPA Method 8270
Beryllium	µg/L	2	4	Final PDWS (EPA, 1993a)
Beryllium, dissolved	µg/L	2	4	Final PDWS (EPA, 1993a)
Beryllium, total recoverable	µg/L	2	4	Final PDWS (EPA, 1993a)
Beryllium-7	pCi/L	3E+03	6E+03	Interim Final PDWS (EPA, 1977)
Bis(2-chloroethoxy) methane	µg/L	50	100	EPA Method 8270
Bis(2-chloroethyl) ether	µg/L	50	100	EPA Method 8270
Bis(2-chloroisopropyl) ether	µg/L	50	100	EPA Method 8270
Bis(chloromethyl) ether	µg/L	50	100	EPA Method 8270
Bis(2-ethylhexyl) phthalate	µg/L	3	6	Final PDWS (EPA, 1993a)
Bismuth-214	pCi/L	9.4E+03	1.89E+04	Proposed PDWS (EPA, 1991)
Boron	µg/L	150	300	EPA Method 6010
Boron, dissolved	µg/L	150	300	EPA Method 6010
Boron, total recoverable	µg/L	150	300	EPA Method 6010
Bromide	µg/L	5,000	10,000	EPA Method 300.0
Bromodichloromethane	µg/L	50	100	Final PDWS (EPA, 1993a)
Bromoform	µg/L	50	100	Final PDWS (EPA, 1993a)
Bromomethane (Methyl bromide)	µg/L	5	10	EPA Method 8240
4-Bromophenyl phenyl ether	µg/L	50	100	EPA Method 8270
2-sec-Butyl-4,6-dinitrophenol	µg/L	3.5	7	Final PDWS (EPA, 1993a)
Butylbenzyl phthalate		No flag	No flag	Set by EPD/EMS

Analyte	Unit	Flag 1	Flag 2	Source
Cadmium	µg/L	2.5	5	Final PDWS (EPA, 1993a)
Cadmium, dissolved	µg/L	2.5	5	Final PDWS (EPA, 1993a)
Cadmium, total recoverable	µg/L	2.5	5	Final PDWS (EPA, 1993a)
Calcium		No flag	No flag	Set by EPD/EMS
Calcium, dissolved		No flag	No flag	Set by EPD/EMS
Calcium, total recoverable		No flag	No flag	Set by EPD/EMS
Carbon disulfide	µg/L	5	10	EPA Method 8240
Carbofuran	µg/L	20	40	Final PDWS (EPA, 1993a)
Carbon tetrachloride	µg/L	2.5	5	Final PDWS (EPA, 1993a)
Carbon-14	pCi/L	1E+03	2E+03	Interim Final PDWS (EPA, 1977)
Carbonate		No flag	No flag	Set by EPD/EMS
Cerium-141[c]	pCi/L	1.5E+02	3E+02	Interim Final PDWS (EPA, 1977)
Cerium-144	pCi/L	1.31E+02	2.61E+02	Proposed PDWS (EPA, 1991)
Cesium-134[d]	pCi/L	4.07E+01	8.13E+01	Proposed PDWS (EPA, 1991)
Cesium-137	pCi/L	1E+02	2E+02	Interim Final PDWS (EPA, 1977)
Chlordane	µg/L	1	2	Final PDWS (EPA, 1993a)
Chloride	µg/L	125,000	250,000	SDWS (EPA, 1993b)
4-Chloroaniline	µg/L	50	100	EPA Method 8270
Chlorobenzene	µg/L	50	100	Final PDWS (EPA, 1993a)
Chlorobenzilate	µg/L	50	100	EPA Method 8270
Chloroethane	µg/L	5	10	EPA Method 8240
Chloroethene (Vinyl chloride)	µg/L	1	2	Final PDWS (EPA, 1993a)
Chloroethyl vinyl ether	µg/L	5	10	EPA Method 8240
2-Chloroethyl vinyl ether	µg/L	5	10	EPA Method 8240
Chloroform	µg/L	50	100	Final PDWS (EPA, 1993a)
4-Chloro-m-cresol	µg/L	50	100	EPA Method 8270
Chloromethane (Methyl chloride)	µg/L	5	10	EPA Method 8240
2-Chloronaphthalene	µg/L	50	100	EPA Method 8240
2-Chlorophenol	µg/L	50	100	EPA Method 8270
4-Chlorophenyl phenyl ether	µg/L	50	100	EPA Method 8270
Chloroprene	µg/L	1,000	2,000	EPA Method 8240
Chromium	µg/L	50	100	Final PDWS (EPA, 1993a)
Chromium, dissolved	µg/L	50	100	Final PDWS (EPA, 1993a)
Chromium, total recoverable	µg/L	50	100	Final PDWS (EPA, 1993a)
Chromium-51[c]	pCi/L	3E+03	6E+03	Interim Final PDWS (EPA, 1977)
Chrysene	µg/L	0.1	0.2	Proposed PDWS (EPA, 1990)
Cobalt	µg/L	20	40	EPA Method 6010
Cobalt, dissolved	µg/L	20	40	EPA Method 6010
Cobalt, total recoverable	µg/L	20	40	EPA Method 6010
Cobalt-57	pCi/L	5E+02	1E+03	Interim Final PDWS (EPA, 1977)
Cobalt-58[d]	pCi/L	4.5E+03	9E+03	Interim Final PDWS (EPA, 1977)
Cobalt-60	pCi/L	5E+01	1E+02	Interim Final PDWS (EPA, 1977)
Color		No flag	No flag	Set by EPD/EMS
Copper	µg/L	500	1,000	Final PDWS (SCDHEC, 1981)
Copper, dissolved	µg/L	500	1,000	Final PDWS (SCDHEC, 1981)
Copper, total recoverable	µg/L	500	1,000	Final PDWS (SCDHEC, 1981)
Corrosivity		No flag	No flag	Set by EPD/EMS
m-Cresol (3-Methylphenol)	µg/L	50	100	EPA Method 8270
o-Cresol (2-Methylphenol)	µg/L	50	100	EPA Method 8270
p-Cresol (4-Methylphenol)	µg/L	50	100	EPA Method 8270
Curium-242	pCi/L	6.65E+01	1.33E+02	Proposed PDWS (EPA, 1991)
Curium-243	pCi/L	4.15E+00	8.3E+00	Proposed PDWS (EPA, 1991)
Curium-243/244[e]	pCi/L	4.15E+00	8.3E+00	Proposed PDWS (EPA, 1991)
Curium-244	pCi/L	4.92E+00	9.84E+00	Proposed PDWS (EPA, 1991)
Curium-245/246[e]	pCi/L	3.12E+00	6.23E+00	Proposed PDWS (EPA, 1991)

Analyte	Unit	Flag 1	Flag 2	Source
Curium-246	pCi/L	3.14E+00	6.27E+00	Proposed PDWS (EPA, 1991)
Cyanide	µg/L	100	200	Final PDWS (EPA, 1993a)
Dalapon[b]	µg/L	100	200	Final PDWS (EPA, 1993a)
p,p'-DDD	µg/L	0.5	1	EPA Method 8080
p,p'-DDE	µg/L	0.5	1	EPA Method 8080
p,p'-DDT	µg/L	0.5	1	EPA Method 8080
Di-n-butyl phthalate		No flag	No flag	Set by EPD/EMS
Di-n-octyl phthalate		No flag	No flag	Set by EPD/EMS
Diallate	µg/L	50	100	EPA Method 8270
Dibenz[*a,h*]anthracene	µg/L	0.15	0.3	Proposed PDWS (EPA, 1990)
Dibenzofuran	µg/L	50	100	EPA Method 8270
Dibromochloromethane	µg/L	50	100	Final PDWS (EPA, 1993a)
1,2-Dibromo-3-chloropropane	µg/L	0.1	0.2	Final PDWS (EPA, 1993a)
1,2-Dibromoethane	µg/L	0.025	0.05	Final PDWS (EPA, 1993a)
Dibromomethane (Methylene bromide)	µg/L	5	10	EPA Method 8240
1,2-Dichlorobenzene	µg/L	300	600	Final PDWS (EPA, 1993a)
1,3-Dichlorobenzene	µg/L	50	100	EPA Method 8270
1,4-Dichlorobenzene	µg/L	37.5	75	Final PDWS (EPA, 1993a)
3,3'-Dichlorobenzidine	µg/L	50	100	EPA Method 8270
trans-1,4-Dichloro-2-butene	µg/L	150	300	EPA Method 8240
Dichlorodifluoromethane	µg/L	5	10	EPA Method 8240
1,1-Dichloroethane	µg/L	5	10	EPA Method 8240
1,2-Dichloroethane	µg/L	2.5	5	Final PDWS (EPA, 1993a)
1,1-Dichloroethylene	µg/L	3.5	7	Final PDWS (EPA, 1993a)
1,2-Dichloroethylene	µg/L	25	50	Final PDWS (EPA, 1993a)
cis-1,2-Dichloroethylene	µg/L	35	70	Final PDWS (EPA, 1993a)
trans-1,2-Dichloroethylene	µg/L	50	100	Final PDWS (EPA, 1993a)
Dichloromethane (Methylene chloride)	µg/L	2.5	5	Final PDWS (EPA, 1993a)
2,4-Dichlorophenol	µg/L	50	100	EPA Method 8270
2,6-Dichlorophenol	µg/L	50	100	EPA Method 8270
2,4-Dichlorophenoxyacetic acid	µg/L	35	70	Final PDWS (EPA, 1993a)
1,2-Dichloropropane	µg/L	2.5	5	Final PDWS (EPA, 1993a)
cis-1,3-Dichloropropene	µg/L	5	10	EPA Method 8240
trans-1,3-Dichloropropene	µg/L	5	10	EPA Method 8240
Di(2-ethylhexyl) adipate	µg/L	200	400	Final PDWS (EPA, 1993a)
Dieldrin	µg/L	2.5	5	EPA Method 8080
Diethyl phthalate		No flag	No flag	Set by EPD/EMS
Dimethoate	µg/L	50	100	EPA Method 8270
p-Dimethylaminoazobenzene	µg/L	50	100	EPA Method 8270
p-(Dimethylamino)ethylbenzene	µg/L	50	100	EPA Method 8270
7,12-Dimethylbenz[*a*]anthracene	µg/L	50	100	EPA Method 8270
3,3'-Dimethylbenzidine	µg/L	50	100	EPA Method 8270
a,a-Dimethylphenethylamine	µg/L	50	100	EPA Method 8270
2,4-Dimethyl phenol	µg/L	50	100	EPA Method 8270
Dimethyl phthalate		No flag	No flag	Set by EPD/EMS
1,3-Dinitrobenzene	µg/L	50	100	EPA Method 8270
2,4-Dinitrophenol	µg/L	250	500	EPA Method 8270
2,4-Dinitrotoluene	µg/L	50	100	EPA Method 8270
2,6-Dinitrotoluene	µg/L	50	100	EPA Method 8270
Diquat dibromide[b]	µg/L	10	20	Final PDWS (EPA, 1993a)
1,4-Dioxane	µg/L	50	100	EPA Method 8270
Diphenylamine	µg/L	50	100	EPA Method 8270
1,2-Diphenylhydrazine	µg/L	50	100	EPA Method 8270

Analyte	Unit	Flag 1	Flag 2	Source
Dissolved organic carbon	µg/L	5,000	10,000	EPA Method 9060
Disulfoton	µg/L	50	100	EPA Method 8270
Eh		No flag	No flag	Set by EPD/EMS
Endosulfan I	µg/L	0.5	1	EPA Method 8080
Endosulfan II	µg/L	0.5	1	EPA Method 8080
Endosulfan sulfate	µg/L	0.5	1	EPA Method 8080
Endothall[b]	µg/L	50	100	Final PDWS (EPA, 1993a)
Endrin	µg/L	1	2	Final PDWS (EPA, 1993a)
Endrin aldehyde	µg/L	0.5	1	EPA Method 8080
Endrin ketone		No flag	No flag	Set by EPD/EMS
Ethylbenzene	µg/L	350	700	Final PDWS (EPA, 1993a)
Ethyl methacrylate	µg/L	50	100	EPA Method 8270
Ethyl methanesulfonate	µg/L	50	100	EPA Method 8270
Europium-152	pCi/L	3E+01	6E+01	Interim Final PDWS (EPA, 1977)
Europium-154	pCi/L	1E+02	2E+02	Interim Final PDWS (EPA, 1977)
Europium-155	pCi/L	3E+02	6E+02	Interim Final PDWS (EPA, 1977)
Famphur	µg/L	50	100	EPA Method 8270
Fluoranthene	µg/L	50	100	EPA Method 8270
Fluorene	µg/L	50	100	EPA Method 8270
Fluoride	µg/L	2,000	4,000	Final PDWS (EPA, 1993a)
Glyphosate[b]	µg/L	350	700	Final PDWS (EPA, 1993a)
Gross alpha	pCi/L	7.5E+00	1.5E+01	Final PDWS (EPA, 1993a)
Heptachlor	µg/L	0.2	0.4	Final PDWS (EPA, 1993a)
Heptachlor epoxide	µg/L	0.1	0.2	Final PDWS (EPA, 1993a)
Heptachlorodibenzo-p-dioxin isomers	µg/L	0.00325	0.0065	EPA Method 8280
1,2,3,4,6,7,8-HPCDD	µg/L	0.00325	0.0065	EPA Method 8280
Heptachlorodibenzo-p-furan isomers	µg/L	0.00225	0.0045	EPA Method 8280
1,2,3,4,6,7,8-HPCDF	µg/L	0.00225	0.0045	EPA Method 8280
Hexachlorobenzene	µg/L	0.5	1	Final PDWS (EPA, 1993a)
Hexachlorobutadiene	µg/L	50	100	EPA Method 8270
Hexachlorocyclopentadiene	µg/L	25	50	Final PDWS (EPA, 1993a)
Hexachlorodibenzo-p-dioxin isomers	µg/L	0.00225	0.0045	EPA Method 8280
1,2,3,4,7,8-HXCDD	µg/L	0.00225	0.0045	EPA Method 8280
Hexachlorodibenzo-p-furan isomers	µg/L	0.002	0.004	EPA Method 8280
1,2,3,4,7,8-HXCDF	µg/L	0.002	0.004	EPA Method 8280
Hexachloroethane	µg/L	50	100	EPA Method 8270
Hexachlorophene	µg/L	250	500	EPA Method 8270
Hexachloropropene	µg/L	50	100	EPA Method 8270
2-Hexanone	µg/L	50	100	EPA Method 8240
Indeno[1,2,3-*c,d*]pyrene	µg/L	50	100	EPA Method 8270
Iodine	µg/L	250	500	APHA Method 415A
Iodine-129	pCi/L	5E−01	1E+00	Interim Final PDWS (EPA, 1977)
Iodine-131[c]	pCi/L	1.5E+00	3E+00	Interim Final PDWS (EPA, 1977)
Iodomethane (Methyl iodide)	µg/L	75	150	EPA Method 8240
Iron	µg/L	150	300	SDWS (EPA, 1993b)
Iron, dissolved	µg/L	150	300	SDWS (EPA, 1993b)
Iron, total recoverable	µg/L	150	300	SDWS (EPA, 1993b)
Iron-55[c]	pCi/L	1E+03	2E+03	Interim Final PDWS (EPA, 1977)
Iron-59[c]	pCi/L	1E+02	2E+02	Interim Final PDWS (EPA, 1977)
Isobutyl alcohol	µg/L	500	1,000	EPA Method 8240
Isodrin	µg/L	50	100	EPA Method 8270

Analyte	Unit	Flag 1	Flag 2	Source
Isophorone	µg/L	50	100	EPA Method 8270
Isosafrole	µg/L	50	100	EPA Method 8270
Kepone	µg/L	50	100	EPA Method 8270
Lanthanum-140[c]	pCi/L	3E+01	6E+01	Interim Final PDWS (EPA, 1977)
Lead	µg/L	25	50	Final PDWS (SCDHEC, 1981)
Lead, dissolved	µg/L	25	50	Final PDWS (SCDHEC, 1981)
Lead, total recoverable	µg/L	25	50	Final PDWS (SCDHEC, 1981)
Lead-212	pCi/L	6.2E+01	1.23E+02	Proposed PDWS (EPA, 1991)
Lindane	µg/L	0.1	0.2	Final PDWS (EPA, 1993a)
Lithium	µg/L	25	50	EPA Method 6010
Lithium, dissolved	µg/L	25	50	EPA Method 6010
Lithium, total recoverable	µg/L	25	50	EPA Method 6010
Magnesium		No flag	No flag	Set by EPD/EMS
Magnesium, dissolved		No flag	No flag	Set by EPD/EMS
Magnesium, total recoverable		No flag	No flag	Set by EPD/EMS
Manganese	µg/L	25	50	SDWS (EPA, 1993b)
Manganese, dissolved	µg/L	25	50	SDWS (EPA, 1993b)
Manganese, total recoverable	µg/L	25	50	SDWS (EPA, 1993b)
Manganese-54	pCi/L	1.5E+02	3E+02	Interim Final PDWS (EPA, 1977)
Mercury	µg/L	1	2	Final PDWS (EPA, 1993a)
Mercury, dissolved	µg/L	1	2	Final PDWS (EPA, 1993a)
Mercury, total recoverable	µg/L	1	2	Final PDWS (EPA, 1993a)
Methacrylonitrile	µg/L	250	500	EPA Method 8240
Methapyrilene	µg/L	50	100	EPA Method 8270
Methoxychlor	µg/L	20	40	Final PDWS (EPA, 1993a)
3-Methylcholanthrene	µg/L	50	100	EPA Method 8270
2-Methyl-4,6-dinitrophenol	µg/L	250	500	EPA Method 8270
Methyl ethyl ketone		No flag	No flag	Set by EPD/EMS
Methyl isobutyl ketone		No flag	No flag	Set by EPD/EMS
Methyl methacrylate	µg/L	50	100	EPA Method 8270
Methyl methanesulfonate	µg/L	50	100	EPA Method 8270
2-Methylnaphthalene	µg/L	50	100	EPA Method 8270
Molybdenum	µg/L	250	500	EPA Method 6010
Molybdenum, dissolved	µg/L	250	500	EPA Method 6010
Molybdenum, total recoverable	µg/L	250	500	EPA Method 6010
Naphthalene	µg/L	50	100	EPA Method 8270
1,4-Naphthoquinone	µg/L	50	100	EPA Method 8270
1-Naphthylamine	µg/L	50	100	EPA Method 8270
2-Naphthylamine	µg/L	50	100	EPA Method 8270
Neptunium-237	pCi/L	3.53E+00	7.06E+00	Proposed PDWS (EPA, 1991)
Nickel	µg/L	50	100	Final PDWS (EPA, 1993a)
Nickel, dissolved	µg/L	50	100	Final PDWS (EPA, 1993a)
Nickel, total recoverable	µg/L	50	100	Final PDWS (EPA, 1993a)
Nickel-59[c]	pCi/L	1.5E+02	3E+02	Interim Final PDWS (EPA, 1977)
Nickel-63[c]	pCi/L	2.5E+01	5E+01	Interim Final PDWS (EPA, 1977)
Niobium-95[c]	pCi/L	1.5E+02	3.E+02	Interim Final PDWS (EPA, 1977)
Nitrate as nitrogen	µg/L	5,000	10,000	Final PDWS (EPA, 1993a)
Nitrate-nitrite as nitrogen	µg/L	5,000	10,000	Final PDWS (EPA, 1993a)
Nitrite as nitrogen	µg/L	500	1,000	Final PDWS (EPA, 1993a)
m-Nitroaniline	µg/L	50	100	EPA Method 8270
o-Nitroaniline	µg/L	50	100	EPA Method 8270
p-Nitroaniline	µg/L	50	100	EPA Method 8270
Nitrobenzene	µg/L	50	100	EPA Method 8270
Nitrogen by Kjeldahl method	µg/L	500	1,000	EPA Method 351.2
2-Nitrophenol	µg/L	50	100	EPA Method 8270

Analyte	Unit	Flag 1	Flag 2	Source
4-Nitrophenol	µg/L	50	100	EPA Method 8270
4-Nitroquinoline-1-oxide	µg/L	50	100	EPA Method 8270
N-Nitrosodi-n-butylamine	µg/L	50	100	EPA Method 8270
N-Nitrosodiethylamine	µg/L	50	100	EPA Method 8270
N-Nitrosodimethylamine	µg/L	50	100	EPA Method 8270
N-Nitrosodiphenylamine	µg/L	50	100	EPA Method 8270
N-Nitrosodipropylamine	µg/L	50	100	EPA Method 8270
N-Nitrosomethylethylamine	µg/L	50	100	EPA Method 8270
N-Nitrosomorpholine	µg/L	50	100	EPA Method 8270
N-Nitrosopiperidine	µg/L	50	100	EPA Method 8270
N-Nitrosopyrrolidine	µg/L	50	100	EPA Method 8270
5-Nitro-o-toluidine	µg/L	50	100	EPA Method 8270
Nonvolatile beta	pCi/L	2.5E+01	5E+01	Interim Final PDWS (EPA, 1977)
Octachlorodibenzo-p-dioxin isomers	µg/L	0.005	0.01	EPA Method 8280
Octachlorodibenzo-p-furan isomers	µg/L	0.005	0.01	EPA Method 8280
Odor		No flag	No flag	Set by EPD/EMS
Oil & Grease	µg/L	5,000	10,000	EPA Method 413.1
Oxamyl[b]	µg/L	100	200	Final PDWS (EPA, 1993a)
Parathion	µg/L	0.25	0.5	EPA Method 8080
Parathion methyl	µg/L	0.25	0.5	EPA Method 8080
PCB 1016	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
PCB 1221	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
PCB 1232	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
PCB 1242	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
PCB 1248	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
PCB 1254	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
PCB 1260	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
PCB 1262	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
Pentachlorobenzene	µg/L	50	100	EPA Method 8270
Pentachlorodibenzo-p-dioxin isomers	µg/L	0.00275	0.0055	EPA Method 8280
1,2,3,7,8-PCDD	µg/L	0.00275	0.0055	EPA Method 8280
Pentachlorodibenzo-p-furan isomers	µg/L	0.00275	0.0055	EPA Method 8280
1,2,3,7,8-PCDF	µg/L	0.00275	0.0055	EPA Method 8280
Pentachloroethane	µg/L	50	100	EPA Method 8270
Pentachloronitrobenzene	µg/L	50	100	EPA Method 8270
Pentachlorophenol	µg/L	0.5	1	Final PDWS (EPA, 1993a)
pH	pH	8	10	Set by EPD/EMS
pH	pH	4	3	Set by EPD/EMS
Phenacetin	µg/L	50	100	EPA Method 8270
Phenanthrene	µg/L	50	100	EPA Method 8270
Phenol	µg/L	50	100	EPA Method 8270
Phenols	µg/L	25	50	EPA Method 420.1
p-Phenylenediamine	µg/L	50	100	EPA Method 8270
Phorate	µg/L	0.5	1	EPA Method 8080
Picloram[b]	µg/L	250	500	Final PDWS (EPA, 1993a)
2-Picoline	µg/L	50	100	EPA Method 8270
Plutonium-238	pCi/L	3.51E+00	7.02E+00	Proposed PDWS (EPA, 1991)
Plutonium-239	pCi/L	3.11E+01	6.21E+01	Proposed PDWS (EPA, 1991)
Plutonium-239/240[e]	pCi/L	3.11E+01	6.21E+01	Proposed PDWS (EPA, 1991)
Plutonium-240	pCi/L	3.11E+01	6.22E+01	Proposed PDWS (EPA, 1991)
Plutonium-241[c]	pCi/L	3.13E+01	6.26E+01	Proposed PDWS (EPA, 1991)

Analyte	Unit	Flag 1	Flag 2	Source
Plutonium-242[c]	pCi/L	3.27E+01	6.54E+01	Proposed PDWS (EPA, 1991)
Potassium		No flag	No flag	Set by EPD/EMS
Potassium, dissolved		No flag	No flag	Set by EPD/EMS
Potassium, total recoverable		No flag	No flag	Set by EPD/EMS
Potassium-40	pCi/L	1.5E+02	3E+02	Proposed PDWS (EPA, 1986)
Promethium-144	pCi/L	5E+01	1E+02	EPA Method 901.1
Promethium-146	pCi/L	5E+01	1E+02	EPA Method 901.1
Promethium-147	pCi/L	5.24E+03	5.24E+03	Proposed PDWS (EPA, 1991)
Pronamid	µg/L	50	100	EPA Method 8270
Propionitrile	µg/L	1,000	2,000	EPA Method 8240
Pyrene	µg/L	50	100	EPA Method 8270
Pyridine	µg/L	50	100	EPA Method 8270
Radium (alpha-emitting)[f]	pCi/L	1E+01	2E+01	Proposed PDWS (EPA, 1991)
Radium-226	pCi/L	1E+01	2E+01	Proposed PDWS (EPA, 1991)
Radium-228	pCi/L	1E+01	2E+01	Proposed PDWS (EPA, 1991)
Radon-222	pCi/L	1.5E+02	3E+02	Proposed PDWS (EPA, 1991)
Ruthenium-103[c]	pCi/L	1E+02	2E+02	Interim Final PDWS (EPA, 1977)
Ruthenium-106	pCi/L	1.5E+01	3E+01	Interim Final PDWS (EPA, 1977)
Safrole	µg/L	50	100	EPA Method 8270
Selenium	µg/L	25	50	Final PDWS (EPA, 1993a)
Selenium, dissolved	µg/L	25	50	Final PDWS (EPA, 1993a)
Selenium, total recoverable	µg/L	25	50	Final PDWS (EPA, 1993a)
Silica		No flag	No flag	Set by EPD/EMS
Silica, dissolved		No flag	No flag	Set by EPD/EMS
Silica, total recoverable		No flag	No flag	Set by EPD/EMS
Silver	µg/L	50	100	SDWS (EPA, 1993b)
Silver, dissolved	µg/L	50	100	SDWS (EPA, 1993b)
Silver, total recoverable	µg/L	50	100	SDWS (EPA, 1993b)
Simazine[b]	µg/L	2	4	Final PDWS (EPA, 1993a)
Sodium		No flag	No flag	Set by EPD/EMS
Sodium, dissolved		No flag	No flag	Set by EPD/EMS
Sodium, total recoverable		No flag	No flag	Set by EPD/EMS
Sodium-22	pCi/L	2.33E+02	4.66E+02	Proposed PDWS (EPA, 1991)
Specific conductance	µS/cm	250	500	Set by EPD/EMS
Strontium-89	pCi/L	1E+01	2E+01	Interim Final PDWS (EPA, 1977)
Strontium-89/90[e]	pCi/L	4E+00	8E+00	Final PDWS (EPA, 1993a)
Strontium-90	pCi/L	4E+00	8E+00	Final PDWS (EPA, 1993a)
Styrene	µg/L	50	100	Final PDWS (EPA, 1993a)
Sulfate	µg/L	200,000	400,000	Proposed PDWS (EPA, 1990)
Sulfide	µg/L	5,000	10,000	EPA Method 9030
Sulfotepp	µg/L	50	100	EPA Method 8270
Surfactants		No flag	No flag	Set by EPD/EMS
2,3,7,8-TCDD	µg/L	0.000015	0.00003	Final PDWS (EPA, 1993a)
2,3,7,8-TCDF	µg/L	0.002	0.004	EPA Method 8280
Technetium-99	pCi/L	4.5E+02	9E+02	Interim Final PDWS (EPA, 1977)
1,2,4,5-Tetrachlorobenzene	µg/L	50	100	EPA Method 8270
Tetrachlorodibenzo-p-dioxin isomers	µg/L	0.00225	0.0045	EPA Method 8280
Tetrachlorodibenzo-p-furan isomers	µg/L	0.002	0.004	EPA Method 8280
1,1,1,2-Tetrachloroethane	µg/L	5	10	EPA Method 8240
1,1,2,2-Tetrachloroethane	µg/L	5	10	EPA Method 8240
Tetrachloroethylene	µg/L	2.5	5	Final PDWS (EPA, 1993a)
2,3,4,6-Tetrachlorophenol	µg/L	50	100	EPA Method 8270
Thallium	µg/L	1	2	Final PDWS (EPA, 1993a)

Analyte	Unit	Flag 1	Flag 2	Source
Thallium, dissolved	µg/L	1	2	Final PDWS (EPA, 1993a)
Thallium, total recoverable	µg/L	1	2	Final PDWS (EPA, 1993a)
Thionazin	µg/L	50	100	EPA Method 8270
Thorium-228	pCi/L	6.25E+01	1.25E+02	Proposed PDWS (EPA, 1991)
Thorium-230	pCi/L	3.96E+01	7.92E+01	Proposed PDWS (EPA, 1991)
Thorium-232	pCi/L	4.4E+01	8.8E+01	Proposed PDWS (EPA, 1991)
Thorium-234	pCi/L	2E+02	4.01E+02	Proposed PDWS (EPA, 1991)
Tin	µg/L	10	20	EPA Method 282.2
Tin, dissolved	µg/L	10	20	EPA Method 282.2
Tin, total recoverable	µg/L	10	20	EPA Method 282.2
Tin-113[c]	pCi/L	1.5E+02	3E+02	Interim Final PDWS (EPA, 1977)
Toluene	µg/L	500	1,000	Final PDWS (EPA, 1993a)
o-Toluidine	µg/L	50	100	EPA Method 8270
Total carbon	µg/L	5,000	10,000	EPA Method 9060
Total coliform		0	0	Final PDWS (EPA, 1993a)
Total dissolved solids		No flag	No flag	Set by EPD/EMS
Total hydrocarbons	µg/L	5,000	10,000	EPA Method 418.1
Total inorganic carbon	µg/L	5,000	10,000	EPA Method 9060
Total organic carbon	µg/L	5,000	10,000	EPA Method 9060
Total organic halogens	µg/L	25	50	EPA Method 9020
Total organic nitrogen	µg/L	500	1,000	APHA Method 420
Total petroleum hydrocarbons	µg/L	5,000	10,000	EPA Method 418.1
Total phosphates (as P)		No flag	No flag	Set by EPD/EMS
Total phosphorus		No flag	No flag	Set by EPD/EMS
Toxaphene	µg/L	1.5	3	Final PDWS (EPA, 1993a)
2,4,5-TP (Silvex)	µg/L	25	50	Final PDWS (EPA, 1993a)
Tributyl phosphate	µg/L	50	100	EPA Method 8270
1,2,4-Trichlorobenzene	µg/L	35	70	Final PDWS (EPA, 1993a)
1,1,1-Trichloroethane	µg/L	100	200	Final PDWS (EPA, 1993a)
1,1,2-Trichloroethane	µg/L	2.5	5	Final PDWS (EPA, 1993a)
Trichloroethylene	µg/L	2.5	5	Final PDWS (EPA, 1993a)
Trichlorofluoromethane	µg/L	5	10	EPA Method 8240
2,4,5-Trichlorophenol	µg/L	50	100	EPA Method 8270
2,4,6-Trichlorophenol	µg/L	50	100	EPA Method 8270
2,4,5-Trichlorophenoxyacetic acid	µg/L	2.5	5	EPA Method 8150
1,2,3-Trichloropropane	µg/L	5	10	EPA Method 8240
O,O,O-Triethyl phosphorothioate	µg/L	50	100	EPA Method 8270
1,3,5-Trinitrobenzene	µg/L	50	100	EPA Method 8270
Tritium	pCi/mL	1E+01	2E+01	Final PDWS (EPA, 1993a)
Turbidity[g]		No flag	No flag	Set by EPD/EMS
Uranium	µg/L	10	20	Proposed PDWS (EPA, 1991)
Uranium, dissolved	µg/L	10	20	Proposed PDWS (EPA, 1991)
Uranium, total recoverable	µg/L	10	20	Proposed PDWS (EPA, 1991)
Uranium alpha activity	pCi/L	1.5E+01	3E+01	Proposed PDWS (EPA, 1991)
Uranium-233/234[e]	pCi/L	6.9E+00	1.38E+01	Proposed PDWS (EPA, 1991)
Uranium-234	pCi/L	6.95E+00	1.39E+01	Proposed PDWS (EPA, 1991)
Uranium-235	pCi/L	7.25E+00	1.45E+01	Proposed PDWS (EPA, 1991)
Uranium-238	pCi/L	7.3E+00	1.46E+01	Proposed PDWS (EPA, 1991)
Vanadium	µg/L	40	80	EPA Method 6010
Vanadium, dissolved	µg/L	40	80	EPA Method 6010
Vanadium, total recoverable	µg/L	40	80	EPA Method 6010
Vinyl acetate	µg/L	5	10	EPA Method 8240

Analyte	Unit	Flag 1	Flag 2	Source
Xylenes	µg/L	5,000	10,000	Final PDWS (EPA, 1993a)
Yttrium-88	pCi/L	5E+01	1E+02	EPA Method 901.1
Zinc	µg/L	2,500	5,000	SDWS (EPA, 1993b)
Zinc, dissolved	µg/L	2,500	5,000	SDWS (EPA, 1993b)
Zinc, total recoverable	µg/L	2,500	5,000	SDWS (EPA, 1993b)
Zinc-65	pCi/L	1.5E+02	3E+02	Interim Final PDWS (EPA, 1977)
Zirconium-95[c]	pCi/L	1E+02	2E+02	Interim Final PDWS (EPA, 1977)
Zirconium/Niobium-95[c]	pCi/L	1E+02	2E+02	Interim Final PDWS (EPA, 1977)

[a] References for methods are in Appendix E; references for dated sources are at the end of this appendix.
[b] EMS is currently unable to perform this analysis.
[c] EMS discontinued monitoring this radionuclide because it is inappropriate for the SRS Groundwater Monitoring Program.
[d] EPD/EMS set this flagging criterion using the 1991 proposed PDWS because the final PDWS in 1977 may have been in error.
[e] For double radionuclide analyses where each separate radionuclide has its own standard, the more stringent standard is used.
[f] The applied standard is for radium-226.
[g] The primary maximum contaminant level range for turbidity is 1–5 NTU, which is inappropriate for the SRS Groundwater Monitoring Program.

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EPA (U.S. Environmental Protection Agency), 1993b. *National Secondary Drinking Water Regulations.* **Code of Federal Regulations**, Section 40, Part 143, pp. 774–777. Washington, DC.

SCDHEC (South Carolina Department of Health and Environmental Control), 1981. **State Primary Drinking Water Regulations**, R.61–58.5. Columbia, SC.

Appendix C

Figures

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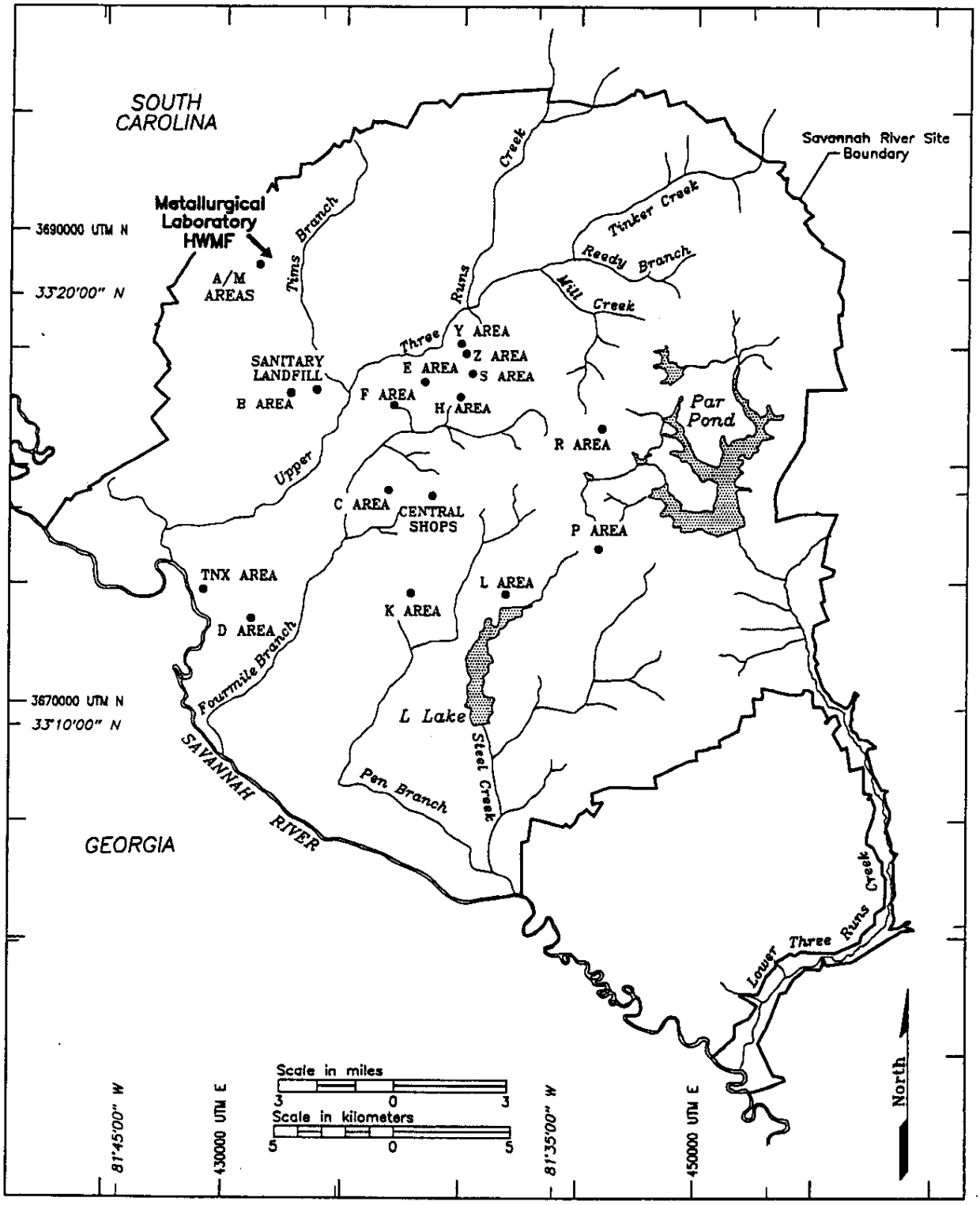

Figure 1. Location of the Metallurgical Laboratory HWMF at the Savannah River Site

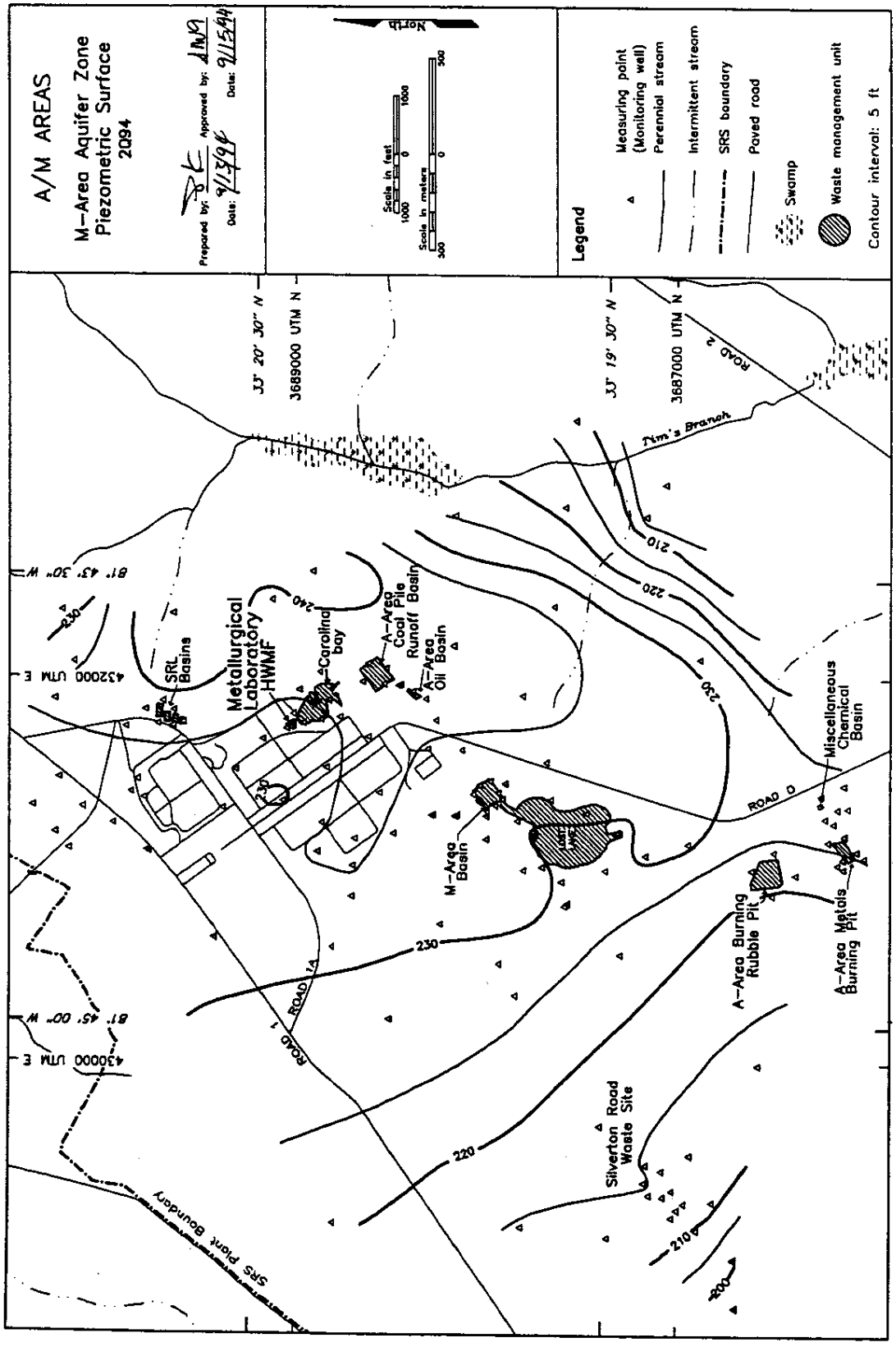

Figure 2. Piezometric Surface Map of the M-Area Aquifer Zone in A/M Areas

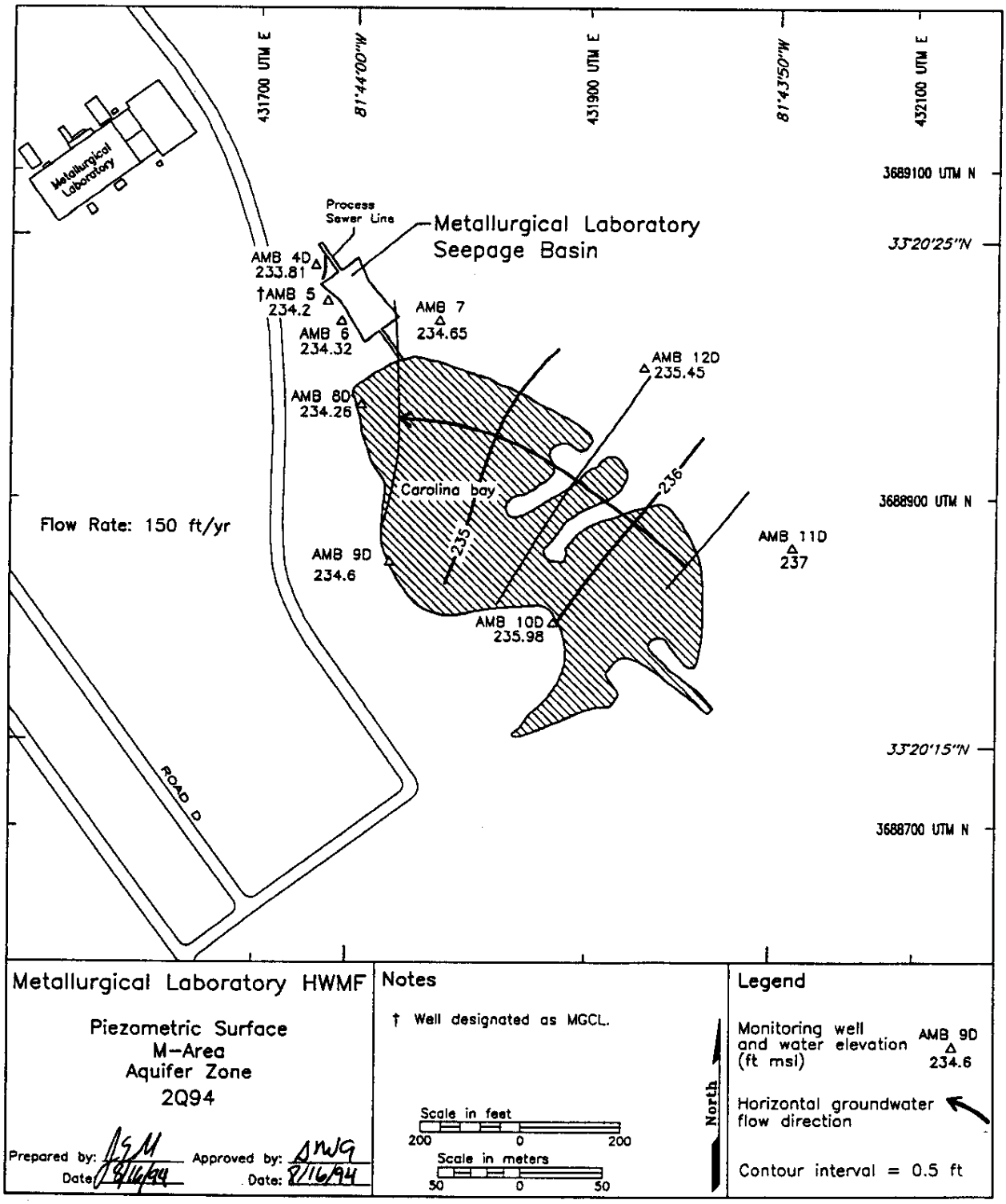

Figure 3. Piezometric Surface Map and Location of the M-Area Aquifer Zone Wells at the Metallurgical Laboratory HWMF

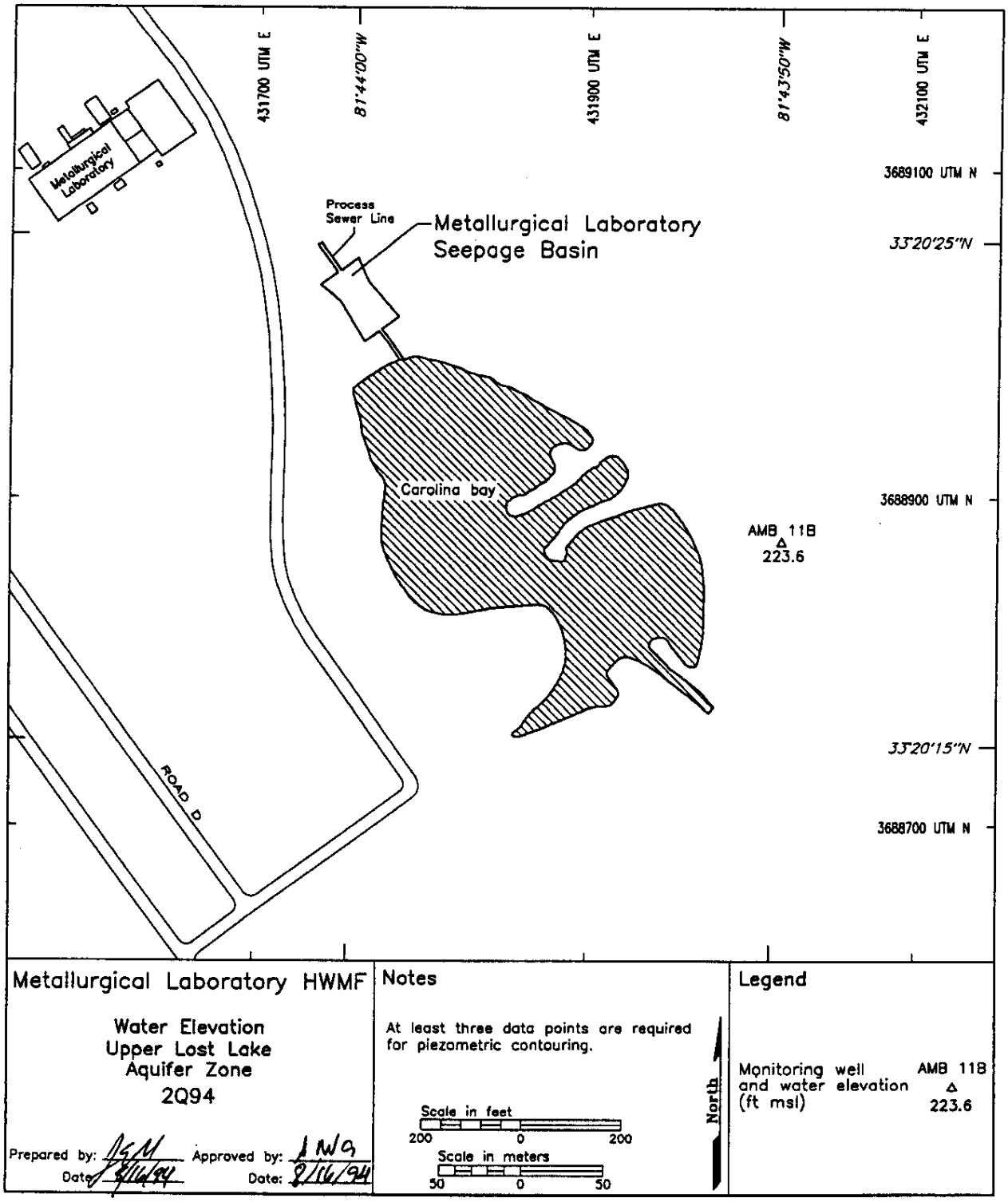

Figure 4. Water-Elevation Map and Location of Monitoring Wells in the Upper Lost Lake Aquifer Zone at the Metallurgical Laboratory HWMF

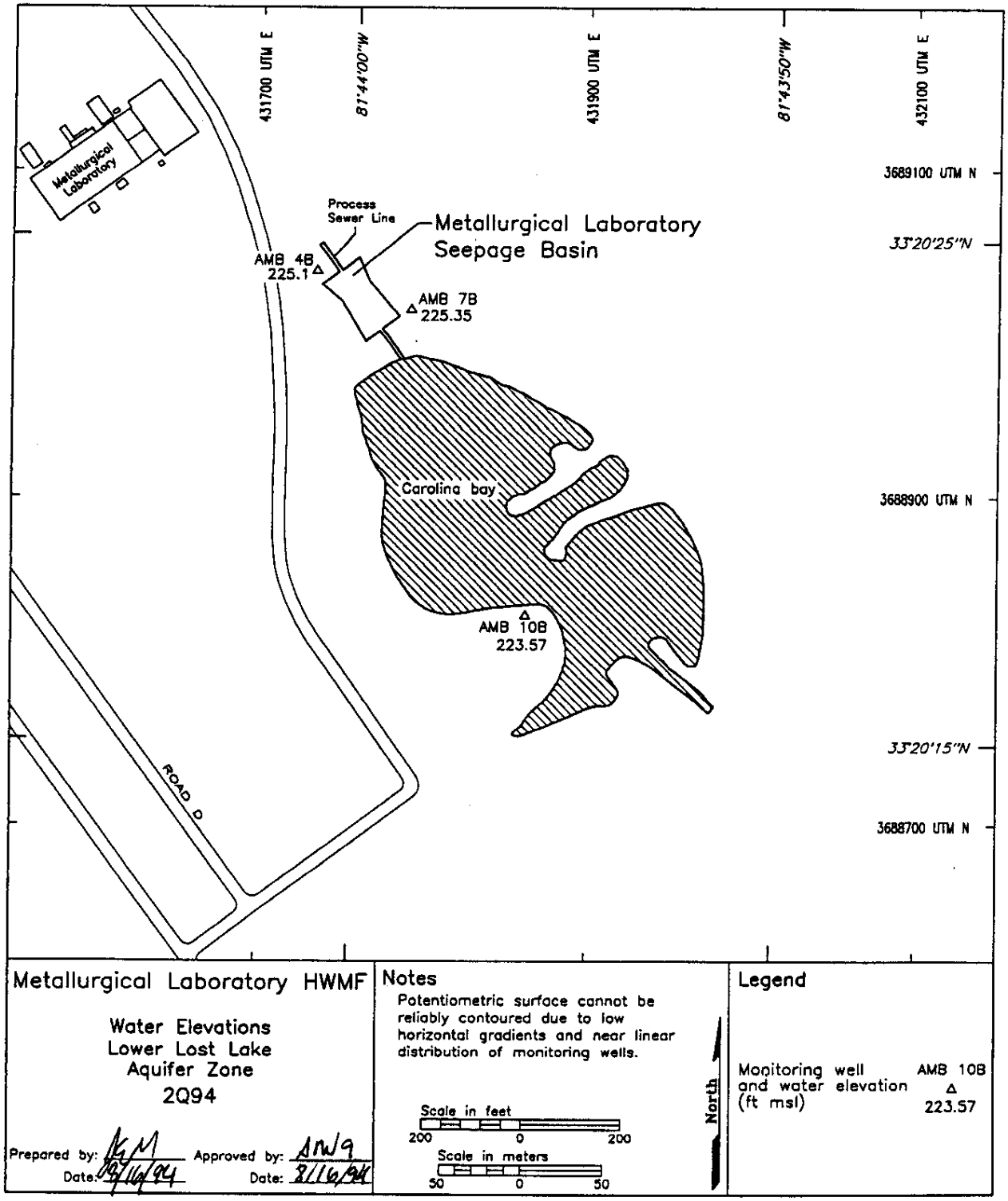

Figure 5. Water-Elevation Map and Location of Monitoring Wells in the Lower Lost Lake Aquifer Zone at the Metallurgical Laboratory HWMF

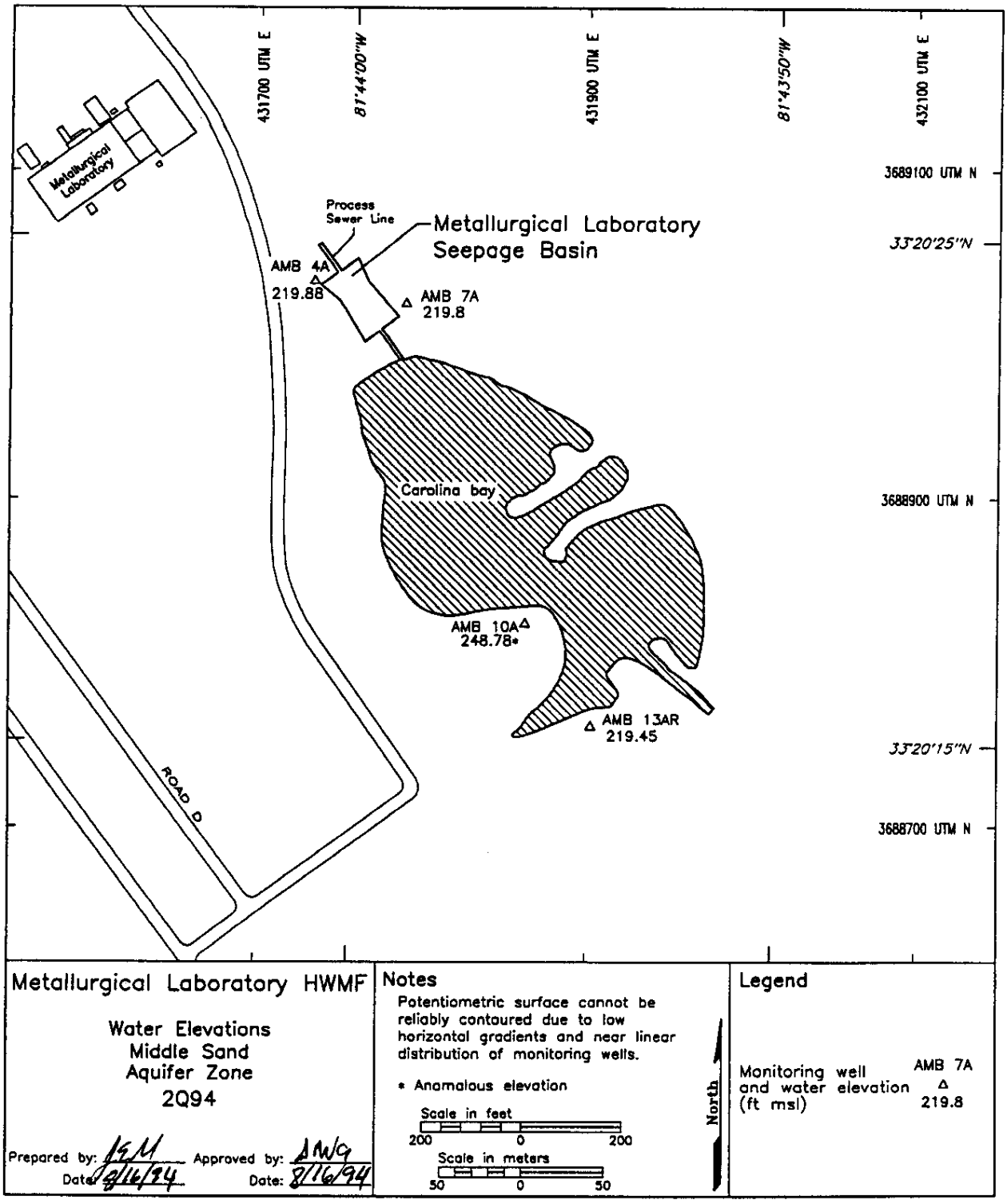

Figure 6. Water-Elevation Map and Location of Monitoring Wells in the Middle Sand Aquifer Zone of the Crouch Branch Confining Unit at the Metallurgical Laboratory HWMF

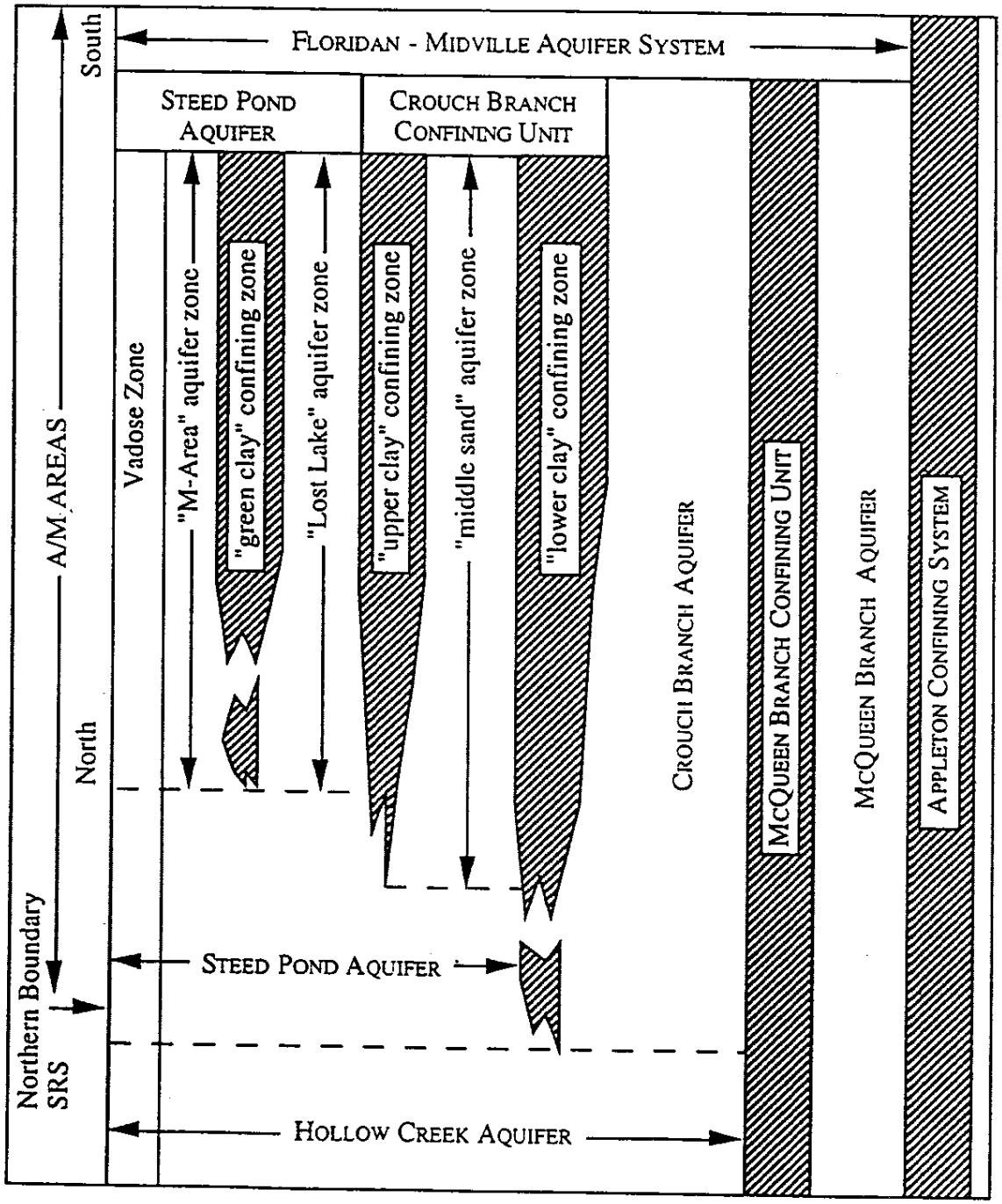

Figure 7. Hydrostratigraphy of A/M Areas

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Appendix D

Groundwater Monitoring Results Tables

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Key to Reading the Tables

The following abbreviations may appear in the data tables:

Constituents

1,2,3,4,6,7,8-HPCDD	1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin
1,2,3,4,6,7,8-HPCDF	1,2,3,4,6,7,8-heptachlorodibenzo-p-furan
1,2,3,4,7,8-HXCDD	1,2,3,4,7,8-hexachlorodibenzo-p-dioxin
1,2,3,4,7,8-HXCDF	1,2,3,4,7,8-hexachlorodibenzo-p-furan
Lindane	gamma-benzene hexachloride
PCB	polychlorinated biphenyl
1,2,3,7,8-PCDD	1,2,3,7,8-pentachlorodibenzo-p-dioxin
1,2,3,7,8-PCDF	1,2,3,7,8-pentachlorodibenzo-p-furan
Sp. conductance	specific conductance
TCDD	tetrachlorodibenzo-p-dioxin
TCDF	tetrachlorodibenzo-p-furan

Laboratories

CN	Clemson Technical Center, Inc.
EM	Environmental Protection Department/Environmental Monitoring Section (EPD/EMS) Laboratory
GE and GP	General Engineering Laboratories
SC	Savannah River Technology Center
SP	Spencer Testing Services, Inc.
TM	TMA/Eberline
WA and WS	Roy F. Weston, Inc.

Miscellaneous

CS	carbon steel
D	exceeded final Primary Drinking Water Standard (PDWS) or screening level column in data tables
DF	dilution factor column in data tables
GS	groundwater protection standard column in data tables
H	holding time column in data tables
Mod	modifier column in data tables
PDWS	primary drinking water standard
PVC	polyvinyl chloride
SZ	screen zone column in data tables
TOC	top of casing

Nomenclature

AZ	Aquifer Zone
Crouch Branch AZ	previously Black Creek
• CBA	Crouch Branch Aquifer
• CBC or CBCU	Crouch Branch Confining Unit
• LCBC	Lost Lake AZ - CBCU
CZ	Confining Zone

Nomenclature (cont.)

Lower Lost Lake AZ	previously Lower Congaree
• L	Lost Lake (Undifferentiated) AZ
• LL	Lower Lost Lake AZ
• (LL)L/MCBC	Lower Lost Lake/Middle Sand AZ of the CBCU
M-Area AZ	previously Water Table
• GC	Green Clay CZ
• GCL	Green Clay - Lost Lake
• M	M-Area AZ
• MGC	M-Area AZ - Green Clay CZ
Middle Sand AZ of the CBCU	previously Ellenton Sand
• MCBC	Middle Sand AZ of the CBCU
Upper Lost Lake AZ	previously Upper Congaree
• UL	Upper Lost Lake AZ
Miscellaneous Nomenclature	
• MGCL	M-Area AZ - Green Clay CZ - Lost Lake AZ
• UD	Undifferentiated
• VZ	Vadose Zone

Sampling Codes

B	blank sample was collected
C	well was pumping continuously
D	well was dry
E	equipment blank was collected
I	well went dry during sampling; insufficient water to collect all samples
L	well went dry before sampling began; only depth to water can be determined
P	inaccessibility or mechanical failure prevented sample collection and field analysis of the water
S	no water in standpipe; for water level events only
X	well went dry during purging; samples collected after well recovered

Sampling Methods

B	sample collected using an open-bucket bailer
P	sample collected using a bladder pump
S	sample collected using a single-speed centrifugal downhole pump
V	sample collected using a variable-speed pump

Units

E	exponential notation (e.g., 1.1E-09 = 1.1×10^{-9} = 0.0000000011)
mg/L	milligrams per liter
msl	mean sea level
MSL	million structures per liter
NTU	turbidity unit

Units (cont.)

pCi/L	picocuries per liter
pCi/mL	picocuries per milliliter
pH	pH unit
µg/L	micrograms per liter
µS/cm	microsiemens per centimeter

Holding Times

Standard analytical methods include a limit, called holding time, on the maximum elapsed time between sample collection and extraction or analysis by the laboratory. In the data tables, a large bullet (•) in the *H* (holding time) column indicates that holding time was exceeded. Analyses performed beyond holding times may not yield valid results.

The South Carolina Department of Health and Environmental Control allows only 15 minutes to elapse between sampling and analysis for pH. Thus, only field pH measurements can meet the holding time criterion; laboratory pH analyses always will exceed it.

The laboratory procedure used for the determination of specific conductance allows one day to elapse between sampling and analysis. Thus, laboratory specific conductance measurements may exceed the holding time criterion.

Data Rounding

Constituent results in analytical results tables that appear to equal the final PDWS but are not marked in the *D* (exceeded the final PDWS or screening level) column are below the final PDWS in the database. Values stored in the database contain more significant digits than the reported results. Apparent discrepancies in the tables are due to the rounding of reported results.

Data Qualification

The contract laboratories continually assess their own accuracy and precision according to U.S. Environmental Protection Agency (EPA) guidelines. They submit sample- or batch-specific quality assurance/quality control information either at the same time as analytical results or in a quarterly summary. Properly defined and used result modifiers (also referred to as qualifiers) can be a key component in assessing data useability. Result modifiers designed by the Environmental Protection Department/Environmental Monitoring Section and provided to the primary laboratories are defined below. These modifiers appear in the data tables under the column *Mod*. The lettered modifiers are based on EPA's STORET codes.

Result modifier

(Blank)	Data are not qualified. Numbers should be interpreted exactly as reported.
J	Value is estimated because quantitation in the sample or in associated quality control samples did not meet specifications.
I	The value in the result field is the instrument reading, not the sample quantification limit. Always used with the result qualifier *U*.

Result modifier	
L	Value is off-scale high. The actual value is not known but is known to be greater than the value shown.
M	Presence of the analyte is verified but not quantified.
R	Result was rejected because performance requirements in the sample analysis or associated quality control analyses were not met.
T	Analyte was not detected; if present, it was below the criteria for detection.
U	Material analyzed for but not detected. Analytical result reported is less than the sample quantitation limit.
V	Analyte was detected in an associated method blank.
Y	Result was obtained from an unpreserved or improperly preserved sample. Data may not be accurate.
1	Result may be an underestimation of the true value due to analytical bias.
2	Result may be an overestimation of the true value due to analytical bias.
3	The associated result may be of poor precision (high variability) due to analytical bias.
4	Result is associated with QA results indicating matrix interference.
6	The associated result is from a reanalysis performed out of holding time due to problems with an earlier analysis.

Table 1. Maximum Levels of Constituents Exceeding the Final Primary Drinking Water Standards

M-Area Aquifer Zone

Well	Constituent	Unit	3Q93	4Q93	1Q94	2Q94	Mod
AMB 4D	Tetrachloroethylene	µg/L	–[a]	6.4	5.5	–	
	Trichloroethylene	µg/L	63	78	83	62	Y
AMB 5	Tetrachloroethylene	µg/L	–	9.0	7.9	–	
	Trichloroethylene	µg/L	99	160	111	39	
	Gross alpha	pCi/L	–	NA[b]	2.5E+01	NA	
AMB 6	Lead	µg/L	–	NA	57	NA	
	Trichloroethylene	µg/L	–	6.1	10	8.4	

Upper Lost Lake Aquifer Zone

Well	Constituent	Unit	3Q93	4Q93	1Q94	2Q94	Mod
N[c]	None		N	N	N	N	

Lower Lost Lake Aquifer Zone

Well	Constituent	Unit	3Q93	4Q93	1Q94	2Q94	Mod
AMB 4B	Trichloroethylene	µg/L	5.7	5.2	–	5.2	

Middle Sand Aquifer Zone of the CBCU

Well	Constituent	Unit	3Q93	4Q93	1Q94	2Q94	Mod
AMB 4A	Dichloromethane	µg/L	–	88	–	–	
	Tetrachloroethylene	µg/L	50	46	35	58	
	Trichloroethylene	µg/L	588	508	429	600	
AMB 7A	Dichloromethane	µg/L	–	17	–	–	
	Tetrachloroethylene	µg/L	12	11	12	15	
	Trichloroethylene	µg/L	312	311	250	320	

Note: The modifier column applies to second quarter 1994 data only.

[a] – = analyzed but not above the final PDWS.
[b] NA = not analyzed.
[c] N = not applicable.

Table 2. Maximum Levels of Constituents Exceeding Other Flag 2 Criteria

M-Area Aquifer Zone

Well	Constituent	Unit	2Q94	Mod
N[a]	None		N	

Upper Lost Lake Aquifer Zone

Well	Constituent	Unit	2Q94	Mod
N	None		N	

Lower Lost Lake Aquifer Zone

Well	Constituent	Unit	2Q94	Mod
N	None		N	

Middle Sand Aquifer Zone of the CBCU

Well	Constituent	Unit	2Q94	Mod
AMB 4A	Total organic halogens	µg/L	190	
AMB 7A	Total organic halogens	µg/L	201	

Notes: These results do not include field data.
Flags are established by EPD/EMS and are based on final PDWS, Secondary Drinking Water Standards, or method detection limits (see Appendix B).

[a] N = not applicable.

Table 3. Groundwater Monitoring Results for Individual Wells

WELL AMB 4A

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N104131.6 E51469.8	33.340041 °N 81.733589 °W	126.3-121.3 ft msl	380.5 ft msl	4" PVC	S	MCBC

FIELD MEASUREMENTS

Sample date: 05/04/94
Depth to water: 160.32 ft (48.87 m) below TOC
Water elevation: 220.18 ft (67.11 m) msl
Sp. conductance: 48 µS/cm
Turbidity: 0.9 NTU
Water evacuated before sampling: 191 gal

Time: 13:11
pH: 6.6
Alkalinity: 7 mg/L
Water temperature: 18.9 °C

Volumes purged: 2.9 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<10	10		µg/L	0	GE
		Bromodichloromethane	<10	10		µg/L	0	GE
		Bromoform	<10	10		µg/L	0	GE
		Bromomethane (Methyl bromide)	<10	10		µg/L	0	GE
		Carbon tetrachloride	<10	10		µg/L	0	GE
		Chloride	1,950	1		µg/L	0	GE
		Chlorobenzene	<10	10		µg/L	0	GE
		Chloroethane	<10	10		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<10	10		µg/L	0	GE
		2-Chloroethyl vinyl ether	<10	10		µg/L	0	GE
		Chloroform	<10	10		µg/L	0	GE
		Chloromethane (Methyl chloride)	<10	10		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<10	10		µg/L	0	GE
		1,1-Dichloroethane	<10	10		µg/L	0	GE
		1,2-Dichloroethane	<10	10		µg/L	0	GE
		1,1-Dichloroethylene	<10	10		µg/L	0	GE
		trans-1,2-Dichloroethylene	<10	10		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<10	10		µg/L	0	GE
		1,2-Dichloropropane	<10	10		µg/L	0	GE
		cis-1,3-Dichloropropene	<10	10		µg/L	0	GE
		trans-1,3-Dichloropropene	<10	10		µg/L	0	GE
		Ethylbenzene	<10	10		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	960	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<10	10		µg/L	0	GE
	■	Tetrachloroethylene	58	10		µg/L	2	GE
		Toluene	<10	10		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic halogens	190	1		µg/L	2	GE
		1,1,1-Trichloroethane	<10	10		µg/L	0	GE
		1,1,2-Trichloroethane	<10	10		µg/L	0	GE
	■	Trichloroethylene	600	10		µg/L	2	GE
		Trichlorofluoromethane	<10	10		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 4A collected on 05/04/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Radium, total alpha-emitting	1.0E-01	1	UI	pCi/L	0	GP
		Radium, total alpha-emitting	0.0E+00	1	UI	pCi/L	0	GP

WELL AMB 4B

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N104145.6 E51482.7	33.340093 °N 81.733582 °W	157.3-152.3 ft msl	380.4 ft msl	4" PVC	S	LL

FIELD MEASUREMENTS

Sample date: 04/22/94
Depth to water: 155.24 ft (47.32 m) below TOC
Water elevation: 225.16 ft (68.63 m) msl
Sp. conductance: 33 µS/cm
Turbidity: 0.2 NTU
Water evacuated before sampling: 189 gal

Time: 10:08
pH: 4.8
Alkalinity: 0 mg/L
Water temperature: 18.9 °C

Volumes purged: 4.0 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	4,060	1		µg/L	0	GE
		Chloride	3,920	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	680	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 4B collected on 04/22/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Total organic halogens	<5.0	1		µg/L	0	GE
		Total organic halogens	5.1	1	J	µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
	■	Trichloroethylene	5.2	1		µg/L	2	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	5.0E-01	1	J	pCi/L	0	GP

WELL AMB 4D

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N104154.7 E51489.0	33.340124 °N 81.733584 °W	233.4-213.4 ft msl	380.3 ft msl	4" PVC	S	M

FIELD MEASUREMENTS

Sample date: 04/22/94
Depth to water: 146.20 ft (44.56 m) below TOC
Water elevation: 234.10 ft (71.35 m) msl
Sp. conductance: 38 µS/cm
Turbidity: 1.5 NTU
Water evacuated before sampling: 64 gal

Time: 10:44
pH: 5.2
Alkalinity: 6 mg/L
Water temperature: 19.2 °C

Volumes purged: 4.7 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1	Y	µg/L	0	GE
		Bromodichloromethane	<1.0	1	Y	µg/L	0	GE
		Bromoform	<1.0	1	Y	µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1	Y	µg/L	0	GE
		Carbon tetrachloride	<1.0	1	Y	µg/L	0	GE
		Chloride	2,610	1		µg/L	0	GE
		Chlorobenzene	<1.0	1	Y	µg/L	0	GE
		Chloroethane	<1.0	1	Y	µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1	Y	µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1	Y	µg/L	0	GE
		Chloroform	<1.0	1	Y	µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1	Y	µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1	Y	µg/L	0	GE
		1,1-Dichloroethane	<1.0	1	Y	µg/L	0	GE
		1,2-Dichloroethane	<1.0	1	Y	µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1	Y	µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1	Y	µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1	Y	µg/L	0	GE
		1,2-Dichloropropane	<1.0	1	Y	µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1	Y	µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1	Y	µg/L	0	GE
		Ethylbenzene	<1.0	1	Y	µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	920	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 4D collected on 04/22/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		1,1,2,2-Tetrachloroethane	<1.0	1	Y	µg/L	0	GE
		Tetrachloroethylene	4.6	1	Y	µg/L	1	GE
		Toluene	<1.0	1	Y	µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic halogens	45	1		µg/L	1	GE
		1,1,1-Trichloroethane	<1.0	1	Y	µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1	Y	µg/L	0	GE
	■	Trichloroethylene	62	1	Y	µg/L	2	GE
		Trichlorofluoromethane	<1.0	1	Y	µg/L	0	GE
		Radium, total alpha-emitting	2.9E+00	1		pCi/L	0	GP

WELL AMB 5

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N104083.4 E51467.2	33.339930 °N 81.733502 °W	242.1-222.1 ft msl	379.6 ft msl	4" PVC	S	MGCL

FIELD MEASUREMENTS

Sample date: 04/25/94
Depth to water: 145.20 ft (44.26 m) below TOC
Water elevation: 234.40 ft (71.45 m) msl
Sp. conductance: 53 µS/cm
Turbidity: 5.6 NTU
Water evacuated before sampling: 173 gal

Time: 10:58
pH: 5.3
Alkalinity: 4 mg/L
Water temperature: 19.7 °C

Volumes purged: 21.4 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	3,170	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 5 collected on 04/25/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	550	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	2.6	1		µg/L	1	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic halogens	35	1		µg/L	1	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
	■	Trichloroethylene	39	1		µg/L	2	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	2.9E+00	1		pCi/L	0	GP
		Radium, total alpha-emitting	2.5E+00	1		pCi/L	0	GP

WELL AMB 6

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N104034.1 E51466.0	33.339819 °N 81.733410 °W	242.6-222.6 ft msl	377.2 ft msl	4" PVC	S	GCL

FIELD MEASUREMENTS

Sample date: 04/26/94
Depth to water: 142.67 ft (43.49 m) below TOC
Water elevation: 234.53 ft (71.49 m) msl
Sp. conductance: 75 µS/cm
Turbidity: 5.6 NTU
Water evacuated before sampling: 3 gal
The well went dry during purging.

Time: 8:15
pH: 5.6
Alkalinity: 9 mg/L
Water temperature: 18.7 °C

Volumes purged: 0.4 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	2,870	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 6 collected on 04/26/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	240	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic halogens	<5.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
	■	Trichloroethylene	8.4	1		µg/L	2	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	1.1E+00	1		pCi/L	0	GP

WELL AMB 7

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103920.0 E51624.9	33.339827 °N 81.732769 °W	242.1-222.1 ft msl	369.9 ft msl	4" PVC	S	M

FIELD MEASUREMENTS

Sample date: 04/20/94
Depth to water: 134.97 ft (41.14 m) below TOC
Water elevation: 234.93 ft (71.61 m) msl
Sp. conductance: 115 µS/cm
Turbidity: 2.5 NTU
Water evacuated before sampling: 6 gal

Time: 12:55
pH: 6.6
Alkalinity: 42 mg/L
Water temperature: 22.6 °C

Volumes purged: 0.7 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 7 collected on 04/20/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
	■	Trichloroethylene	6.6	1		µg/L	2	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE

WELL AMB 7

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103920.0 E51624.9	33.339827 °N 81.732769 °W	242.1-222.1 ft msl	369.9 ft msl	4" PVC	S	M

FIELD MEASUREMENTS

Sample date: 04/21/94
Depth to water: 134.96 ft (41.14 m) below TOC
Water elevation: 234.94 ft (71.61 m) msl
Sp. conductance: 73 µS/cm
Turbidity: 9.9 NTU
Water evacuated before sampling: 10 gal
The well went dry during purging.

Time: 10:04
pH: 6.1
Alkalinity: 23 mg/L
Water temperature: 19.6 °C

Volumes purged: 1.2 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	2,140	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 7 collected on 04/21/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	4.9	1	J	µg/L	0	GE
		Nitrate-nitrite as nitrogen	250	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic halogens	<5.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		Trichloroethylene	4.3	1		µg/L	1	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	3.0E-01	1	J	pCi/L	0	GP

WELL AMB 7

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103920.0 E51624.9	33.339827 °N 81.732769 °W	242.1-222.1 ft msl	369.9 ft msl	4" PVC	S	M

FIELD MEASUREMENTS

Sample date: 04/21/94
Depth to water: 134.96 ft (41.14 m) below TOC
Water elevation: 234.94 ft (71.61 m) msl
Sp. conductance: 61 µS/cm
Turbidity: 2.6 NTU
Water evacuated before sampling: 15 gal
The well went dry during purging.

Time: 10:06
pH: 6.1
Alkalinity: 18 mg/L
Water temperature: 19.7 °C

Volumes purged: 1.8 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 7 collected on 04/21/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		Trichloroethylene	3.3	1		µg/L	1	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE

WELL AMB 7A

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103987.1 E51591.0	33.339920 °N 81.732989 °W	125.6-115.6 ft msl	373.6 ft msl	4" PVC	S	MCBC

FIELD MEASUREMENTS

Sample date: 04/25/94
Depth to water: 154.15 ft (46.99 m) below TOC
Water elevation: 219.45 ft (66.89 m) msl
Sp. conductance: 31 µS/cm
Turbidity: 0.5 NTU
Water evacuated before sampling: 358 gal

Time: 9:05
pH: 5.9
Alkalinity: 4 mg/L
Water temperature: 19.1 °C

Volumes purged: 5.3 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<5.0	5		µg/L	0	GE
		Benzene	<1.0	1		µg/L	0	GE
		Benzene	<10	2		µg/L	0	WA
		Benzene	<10	2		µg/L	0	WA
		Bromodichloromethane	<5.0	5		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<10	2		µg/L	0	WA
		Bromodichloromethane	<10	2		µg/L	0	WA
		Bromoform	<5.0	5		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromoform	<10	2		µg/L	0	WA
		Bromoform	<10	2		µg/L	0	WA
		Bromomethane (Methyl bromide)	<5.0	5		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<20	2		µg/L	0	WA
		Bromomethane (Methyl bromide)	<20	2		µg/L	0	WA
		Carbon tetrachloride	<5.0	5		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<10	2		µg/L	0	WA
		Carbon tetrachloride	<10	2		µg/L	0	WA
		Chloride	2,000	1		µg/L	0	GE
		Chloride	1,990	1		µg/L	0	GE
		Chloride	1,720	1		µg/L	0	WA
		Chloride	1,830	1		µg/L	0	WA
		Chlorobenzene	<5.0	5		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 7A collected on 04/25/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chlorobenzene	<10	2		µg/L	0	WA
		Chlorobenzene	<10	2		µg/L	0	WA
		Chloroethane	<5.0	5		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethane	<20	2		µg/L	0	WA
		Chloroethane	<20	2		µg/L	0	WA
		Chloroethene (Vinyl chloride)	<5.0	5		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<20	2		µg/L	0	WA
		Chloroethene (Vinyl chloride)	<20	2		µg/L	0	WA
		2-Chloroethyl vinyl ether	<5.0	5		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<20	2		µg/L	0	WA
		2-Chloroethyl vinyl ether	<20	2		µg/L	0	WA
		Chloroform	<5.0	5		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloroform	<10	2		µg/L	0	WA
		Chloroform	<10	2		µg/L	0	WA
		Chloromethane (Methyl chloride)	<5.0	5		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<20	2		µg/L	0	WA
		Chloromethane (Methyl chloride)	<20	2		µg/L	0	WA
		Cyanide	<5.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	WA
		Cyanide	<5.0	1		µg/L	0	WA
		Dibromochloromethane	<5.0	5		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		Dibromochloromethane	<10	2		µg/L	0	WA
		Dibromochloromethane	<10	2		µg/L	0	WA
		1,1-Dichloroethane	<5.0	5		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<10	2		µg/L	0	WA
		1,1-Dichloroethane	<10	2		µg/L	0	WA
		1,2-Dichloroethane	<5.0	5		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<10	2		µg/L	0	WA
		1,2-Dichloroethane	<10	2		µg/L	0	WA
		1,1-Dichloroethylene	<5.0	5		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<10	2		µg/L	0	WA
		1,1-Dichloroethylene	<10	2		µg/L	0	WA
		trans-1,2-Dichloroethylene	<5.0	5		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<10	2		µg/L	0	WA
		trans-1,2-Dichloroethylene	<10	2		µg/L	0	WA
		Dichloromethane (Methylene chloride)	<5.0	5		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<10	2		µg/L	0	WA
		Dichloromethane (Methylene chloride)	<10	2		µg/L	0	WA
		1,2-Dichloropropane	<5.0	5		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<10	2		µg/L	0	WA
		1,2-Dichloropropane	<10	2		µg/L	0	WA
		cis-1,3-Dichloropropene	<5.0	5		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 7A collected on 04/25/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<10	2		µg/L	0	WA
		cis-1,3-Dichloropropene	<10	2		µg/L	0	WA
		trans-1,3-Dichloropropene	<5.0	5		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<10	2		µg/L	0	WA
		trans-1,3-Dichloropropene	<10	2		µg/L	0	WA
		Ethylbenzene	<5.0	5		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<10	2		µg/L	0	WA
		Ethylbenzene	<10	2		µg/L	0	WA
		Fluoride	<100	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	WA
		Fluoride	<100	1		µg/L	0	WA
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	WA
		Nickel, total recoverable	<4.0	1		µg/L	0	WA
		Nitrate as nitrogen	817	1		µg/L	0	WA
		Nitrate as nitrogen	837	1		µg/L	0	WA
		Nitrate-nitrite as nitrogen	840	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	960	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	WA
		Silver, total recoverable	<2.0	1		µg/L	0	WA
		1,1,2,2-Tetrachloroethane	<5.0	5		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<10	2		µg/L	0	WA
		1,1,2,2-Tetrachloroethane	<10	2		µg/L	0	WA
	■	Tetrachloroethylene	15	5		µg/L	2	GE
	■	Tetrachloroethylene	12	1		µg/L	2	GE
	■	Tetrachloroethylene	10	2	J	µg/L	2	WA
	■	Tetrachloroethylene	11	2		µg/L	2	WA
		Toluene	<5.0	5		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Toluene	<10	2		µg/L	0	WA
		Toluene	<10	2		µg/L	0	WA
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	WA
		Total organic carbon	<1,000	1		µg/L	0	WA
		Total organic carbon	<1,000	1		µg/L	0	WA
		Total organic halogens	160	1		µg/L	2	GE
		Total organic halogens	142	1		µg/L	2	GE
		Total organic halogens	199	1		µg/L	2	WA
		Total organic halogens	201	1		µg/L	2	WA
		1,1,1-Trichloroethane	<5.0	5		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<10	2		µg/L	0	WA
		1,1,1-Trichloroethane	<10	2		µg/L	0	WA
		1,1,2-Trichloroethane	<5.0	5		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<10	2		µg/L	0	WA

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 7A collected on 04/25/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		1,1,2-Trichloroethane	<10	2		µg/L	0	WA
	■	Trichloroethylene	320	5		µg/L	2	GE
	■	Trichloroethylene	272	10		µg/L	2	GE
	■	Trichloroethylene	273	2		µg/L	2	WA
	■	Trichloroethylene	278	2		µg/L	2	WA
		Trichlorofluoromethane	<5.0	5		µg/L	0	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Trichlorofluoromethane	<10	2		µg/L	0	WA
		Trichlorofluoromethane	<10	2		µg/L	0	WA
		Radium-226	<1.5E-01	1		pCi/L	0	TM
		Radium-226	1.7E-01	1		pCi/L	0	TM
		Radium-226	1.9E-01	1		pCi/L	0	TM
		Radium-228	<3.7E-01	1		pCi/L	0	TM
		Radium-228	9.0E-01	1	UI	pCi/L	0	TM
		Radium-228	<2.0E-01	1		pCi/L	0	TM
		Radium, total alpha-emitting	1.0E-01	1	UI	pCi/L	0	GP
		Radium, total alpha-emitting	0.0E+00	1	UI	pCi/L	0	GP

WELL AMB 7B

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103972.0 E51590.3	33.339885 °N 81.732961 °W	162.9-152.9 ft msl	373 ft msl	4" PVC	S	LL

FIELD MEASUREMENTS

Sample date: 05/02/94
Depth to water: 147.55 ft (44.97 m) below TOC
Water elevation: 225.45 ft (68.72 m) msl
Sp. conductance: 29 µS/cm
Turbidity: 0.5 NTU
Water evacuated before sampling: 191 gal

Time: 8:14
pH: 5.2
Alkalinity: 1 mg/L
Water temperature: 18.4 °C

Volumes purged: 4.0 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	3,320	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE

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WELL AMB 7B collected on 05/02/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	350	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic halogens	8.6	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		Trichloroethylene	3.0	1		µg/L	1	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	3.0E-01	1	UI	pCi/L	0	GP

WELL AMB 8D

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103874.7 E51400.5	33.339360 °N 81.733272 °W	240.8-220.8 ft msl	369.6 ft msl	4" PVC	S	M

FIELD MEASUREMENTS

Sample date: 04/21/94
Depth to water: 135.00 ft (41.15 m) below TOC
Water elevation: 234.60 ft (71.51 m) msl
Sp. conductance: 61 µS/cm
Turbidity: 0.3 NTU
Water evacuated before sampling: 130 gal

Time: 15:32
pH: 5.6
Alkalinity: 7 mg/L
Water temperature: 19.2 °C

Volumes purged: 14.4 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	2,870	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 8D collected on 04/21/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	310	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	1,560	1	J	µg/L	0	GE
		Total organic halogens	<5.0	1		µg/L	0	GE
		Total organic halogens	<5.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		Trichloroethylene	<1.0	1		µg/L	0	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	2.0E-01	1	UI	pCi/L	0	GP

WELL AMB 9D

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103585.2 E51263.0	33.338496 °N 81.733071 °W	239.7-219.7 ft msl	367.9 ft msl	4" PVC	S	M

FIELD MEASUREMENTS

Sample date: 04/21/94
Depth to water: 132.92 ft (40.51 m) below TOC
Water elevation: 234.98 ft (71.62 m) msl
Sp. conductance: 43 µS/cm
Turbidity: 1.0 NTU
Water evacuated before sampling: 94 gal

Time: 16:01
pH: 5.5
Alkalinity: 4 mg/L
Water temperature: 18.5 °C

Volumes purged: 9.4 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE

~~•~~ = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 9D collected on 04/21/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Chloride	3,060	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	110	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	1,040	1	J	µg/L	0	GE
		Total organic halogens	<5.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		Trichloroethylene	<1.0	1		µg/L	0	GE
		Trichloroethylene	<1.0	1		µg/L	0	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	8.0E-01	1	J	pCi/L	0	GP

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 10A

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103326.4 E51410.0	33.338163 °N 81.732180 °W	111.4-106.4 ft msl	366.5 ft msl	4" PVC	S	MCBC

FIELD MEASUREMENTS

Sample date: 05/05/94
Depth to water: 147.40 ft (44.93 m) below TOC
Water elevation: 219.10 ft (66.78 m) msl
Sp. conductance: 863 µS/cm
Turbidity: 13.4 NTU
Water evacuated before sampling: 64 gal
The well went dry during purging.

Time: 9:15
pH: 10.1
Alkalinity: 349 mg/L
Water temperature: 14.1 °C

Volumes purged: 0.9 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	2,190	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<8.0	2		µg/L	0	GE
		Nitrate-nitrite as nitrogen	130	1		µg/L	0	GE
		Silver, total recoverable	<4.0	2		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	2,130	1		µg/L	0	GE
		Total organic halogens	<5.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		Trichloroethylene	<1.0	1		µg/L	0	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	4.0E-01	1	UI	pCi/L	0	GP

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 10B

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103337.3 E51418.3	33.338201 °N 81.732180 °W	154.3-149.3 ft msl	366.4 ft msl	4" PVC	S	LL

FIELD MEASUREMENTS

Sample date: 04/25/94
Depth to water: 142.87 ft (43.55 m) below TOC
Water elevation: 223.53 ft (68.13 m) msl
Sp. conductance: 63 µS/cm
Turbidity: 0.5 NTU
Water evacuated before sampling: 268 gal

Time: 12:24
pH: 6.2
Alkalinity: 18 mg/L
Water temperature: 19.0 °C

Volumes purged: 5.5 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	3,430	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	70	1	J	µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic halogens	<5.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		Trichloroethylene	<1.0	1		µg/L	0	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	1.0E-01	1	UI	pCi/L	0	GP

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 10D

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103293.4 E51456.0	33.338166 °N 81.731995 °W	239.4-219.4 ft msl	365.5 ft msl	4" PVC	S	M

FIELD MEASUREMENTS

Sample date: 04/25/94
Depth to water: 129.22 ft (39.39 m) below TOC
Water elevation: 236.28 ft (72.02 m) msl
Sp. conductance: 50 µS/cm
Turbidity: 0.4 NTU
Water evacuated before sampling: 198 gal

Time: 13:00
pH: 5.4
Alkalinity: 9 mg/L
Water temperature: 18.1 °C

Volumes purged: 17.9 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	3,200	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 10D collected on 04/25/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	80	1	J	µg/L	0	GE
		Nitrate-nitrite as nitrogen	100	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic halogens	<5.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		Trichloroethylene	<1.0	1		µg/L	0	GE
		Trichloroethylene	<1.0	1		µg/L	0	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	1.0E+00	1	J	pCi/L	0	GP

WELL AMB 10DD

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103278.7 E51456.0	33.338133 °N 81.731966 °W	358.6-338.6 ft msl	365.4 ft msl	4" PVC	S	M

FIELD MEASUREMENTS

Sample date: 04/25/94
Depth to water: 6.27 ft (1.91 m) below TOC
Water elevation: 359.13 ft (109.46 m) msl
Sp. conductance: 126 µS/cm
Turbidity: 0.9 NTU
Water evacuated before sampling: 187 gal

Time: 13:31
pH: 6.2
Alkalinity: 54 mg/L
Water temperature: 17.2 °C

Volumes purged: 13.9 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	2,540	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 10DD collected on 04/25/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	<50	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	1,490	1	J	µg/L	0	GE
		Total organic halogens	<5.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		Trichloroethylene	<1.0	1		µg/L	0	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	0.0E+00	1	UI	pCi/L	0	GP

WELL AMB 11B

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103154.2 E51919.5	33.338615 °N 81.730503 °W	184.5-174.5 ft msl	364.6 ft msl	4" PVC	S	UL

FIELD MEASUREMENTS

Sample date: 04/22/94
Depth to water: 140.85 ft (42.93 m) below TOC
Water elevation: 223.75 ft (68.20 m) msl
Sp. conductance: 51 µS/cm
Turbidity: 2.9 NTU
Water evacuated before sampling: 120 gal

Time: 14:03
pH: 5.9
Alkalinity: 22 mg/L
Water temperature: 18.3 °C

Volumes purged: 3.7 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 11B collected on 04/22/94, laboratory analyses (cont.)

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	3,810	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	300	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic halogens	<5.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		Trichloroethylene	<1.0	1		µg/L	0	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	5.0E-01	1	J	pCi/L	0	GP

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 11D

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103132.3 E51932.6	33.338588 °N 81.730426 °W	240.5-220.5 ft msl	364 ft msl	4" PVC	S	M

FIELD MEASUREMENTS

Sample date: 04/22/94
Depth to water: 126.67 ft (38.61 m) below TOC
Water elevation: 237.33 ft (72.34 m) msl
Sp. conductance: 62 µS/cm
Turbidity: 0.2 NTU
Water evacuated before sampling: 64 gal

Time: 13:17
pH: 6.0
Alkalinity: 10 mg/L
Water temperature: 18.9 °C

Volumes purged: 5.8 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	2,590	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	170	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic halogens	<5.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		Trichloroethylene	<1.0	1		µg/L	0	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	-1.0E-01	1	UI	pCi/L	0	GP

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 12D

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103602.4 E51901.6	33.339576 °N 81.731422 °W	239.4-219.4 ft msl	369.8 ft msl	4" PVC	S	M

FIELD MEASUREMENTS

Sample date: 04/22/94
Depth to water: 134.02 ft (40.85 m) below TOC
Water elevation: 235.78 ft (71.87 m) msl
Sp. conductance: 26 µS/cm
Turbidity: 0.2 NTU
Water evacuated before sampling: 63 gal

Time: 11:42
pH: 5.7
Alkalinity: 1 mg/L
Water temperature: 19.4 °C

Volumes purged: 5.9 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	1,460	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	780	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	<1,000	1		µg/L	0	GE
		Total organic halogens	<5.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		Trichloroethylene	<1.0	1		µg/L	0	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	2.0E-01	1	UI	pCi/L	0	GP

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

WELL AMB 13AR

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Formation
N103082.0 E51396.0	33.337600 °N 81.731742 °W	110.9-100.9 ft msl	365.1 ft msl	4" PVC	S	MCBC

FIELD MEASUREMENTS

Sample date: 04/26/94
Depth to water: 145.76 ft (44.43 m) below TOC
Water elevation: 219.34 ft (66.86 m) msl
Sp. conductance: 274 µS/cm
Turbidity: 2.5 NTU
Water evacuated before sampling: 61 gal
The well went dry during purging.

Time: 8:36
pH: 11.1
Alkalinity: 2 mg/L
Water temperature: 18.3 °C

Volumes purged: 0.8 well volumes

LABORATORY ANALYSES

H	D	Analyte	Result	DF	Mod	Unit	Flag	Lab
		Benzene	<1.0	1		µg/L	0	GE
		Bromodichloromethane	<1.0	1		µg/L	0	GE
		Bromoform	<1.0	1		µg/L	0	GE
		Bromomethane (Methyl bromide)	<1.0	1		µg/L	0	GE
		Carbon tetrachloride	<1.0	1		µg/L	0	GE
		Chloride	2,910	1		µg/L	0	GE
		Chlorobenzene	<1.0	1		µg/L	0	GE
		Chloroethane	<1.0	1		µg/L	0	GE
		Chloroethene (Vinyl chloride)	<1.0	1		µg/L	0	GE
		2-Chloroethyl vinyl ether	<1.0	1		µg/L	0	GE
		Chloroform	<1.0	1		µg/L	0	GE
		Chloromethane (Methyl chloride)	<1.0	1		µg/L	0	GE
		Cyanide	<5.0	1		µg/L	0	GE
		Dibromochloromethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethane	<1.0	1		µg/L	0	GE
		1,2-Dichloroethane	<1.0	1		µg/L	0	GE
		1,1-Dichloroethylene	<1.0	1		µg/L	0	GE
		trans-1,2-Dichloroethylene	<1.0	1		µg/L	0	GE
		Dichloromethane (Methylene chloride)	<1.0	1		µg/L	0	GE
		1,2-Dichloropropane	<1.0	1		µg/L	0	GE
		cis-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		trans-1,3-Dichloropropene	<1.0	1		µg/L	0	GE
		Ethylbenzene	<1.0	1		µg/L	0	GE
		Fluoride	<100	1		µg/L	0	GE
		Nickel, total recoverable	<4.0	1		µg/L	0	GE
		Nitrate-nitrite as nitrogen	1,050	1		µg/L	0	GE
		Silver, total recoverable	<2.0	1		µg/L	0	GE
		1,1,2,2-Tetrachloroethane	<1.0	1		µg/L	0	GE
		Tetrachloroethylene	<1.0	1		µg/L	0	GE
		Toluene	<1.0	1		µg/L	0	GE
		Total organic carbon	1,160	1	J	µg/L	0	GE
		Total organic halogens	<5.0	1		µg/L	0	GE
		1,1,1-Trichloroethane	<1.0	1		µg/L	0	GE
		1,1,2-Trichloroethane	<1.0	1		µg/L	0	GE
		Trichloroethylene	1.3	1	J	µg/L	0	GE
		Trichlorofluoromethane	<1.0	1		µg/L	0	GE
		Radium, total alpha-emitting	7.0E-01	1	J	pCi/L	0	GP

• = exceeded holding time. ■ = exceeded screening level or final primary drinking water standard.

Appendix E

Data Quality/Useability Assessment

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Data Quality/Useability Assessment

Quality assurance/quality control (QA/QC) procedures relating to accuracy and precision of analyses performed on groundwater samples are followed in the field and laboratory and are reviewed prior to publication of results. The review by the Environmental Protection Department/ Environmental Monitoring Section (EPD/EMS) of the volume of analytical data acquired each quarter and presented in various reports is an ongoing process; its review of the QA/QC data cannot be completed in time to meet the deadlines for the reports required by the Resource Conservation and Recovery Act and associated regulations. Other site and regulatory personnel can obtain further information on the data quality and useability in a variety of ways, including those described below.

Data Qualification

The contract laboratories continually assess their own accuracy and precision according to U.S. Environmental Protection Agency (EPA) guidelines. They submit sample- or batch-specific QA/QC information either at the same time as analytical results or in quarterly summaries. Properly defined and used result modifiers (also referred to as qualifiers) can be a key component in assessing data useability. Result modifiers designed by EPD/EMS and used by the primary laboratories are presented in Appendix D.

Assessment of Accuracy of the Data

Accuracy, or the nearness of the reported result to the true concentration of a constituent in a sample, can be assessed in several ways.

A laboratory's general accuracy can be judged by analysis of results obtained from known samples. The non-radionuclide contract laboratories analyze commercial reference samples every quarter at EPD/EMS' request. The results of these analyses are presented in the EPD/ EMS groundwater monitoring quarterly reports. The primary laboratories also seek or maintain state certification by participating periodically in performance studies; reference samples and analysis of results are provided by EPA. Results of these studies also are published in the EPD/EMS quarterly reports.

Analysis of blanks provides a tool for assessing the accuracy of both sampling and laboratory analysis. Results for all field blanks for the quarter can be found in the EPD/EMS quarterly reports. Any field or laboratory blanks that exceed established minimums are identified in the same reports, in tables associating them with groundwater samples analyzed in the same batches.

Surrogates, organic compounds similar in chemical behavior to the compounds of interest but not normally found in environmental samples, are used to monitor the effect of the matrix on the accuracy of analyses for organic parameters. For example, for analyses of volatile organics by EPA Method 8240, three surrogate compounds are added to all samples and blanks in each analytical batch. In analyses of semivolatile organics, three acid compounds and three base/neutral compounds are used. Two surrogates are used in organochlorine pesticides analyses. Percent recoveries for surrogate analyses are calculated by laboratory personnel, reported to EPD/EMS, reviewed, and entered into the database, but they are not published. If recoveries are not within specified limits, the laboratory is expected to reanalyze the samples or attach qualifiers to the data identifying the anomalous results.

Sample-specific accuracy for both organic and inorganic parameters can be assessed by examination of matrix spike/matrix spike duplicate results. A sample is analyzed unspiked to determine a baseline set of values. A second portion of the sample is spiked with known concentrations of compounds appropriate to the analyses being performed, typically five volatile organic compounds for volatile organics analyses, eleven semivolatile compounds for semivolatiles, six pesticide compounds for pesticides, all metals for metals analyses by SW-846 methods (EPA, 1986), and a known quantity of cyanide for cyanide analysis. The percentage of the spike compound that is recovered (i.e., measured in excess of the value obtained for the unspiked sample) is a direct measure of analytical accuracy. EPA requires matrix spike/matrix spike duplicates to be run at least once per 20 samples of similar matrix.

Matrix spike/matrix spike duplicate results are reported to EPD/EMS but are not published. For organic compounds, according to EPA guidelines, no action is taken on the basis of matrix spike/matrix spike duplicate data alone (i.e., no result modifiers are assigned solely on the basis of matrix spike results); however, the results can indicate if a laboratory is having a systematic problem in the analysis of one or more analytes.

In the case of inorganic compounds, such as metals, the matrix spike sample analysis provides information about the effect of each sample matrix on the digestion and measurement methodology. Data qualifiers assigned by the laboratories on the basis of the percentage of spike recovery are reported in the published results tables.

Assessment of Precision

Precision of the analyses, or agreement of a set of replicate results among themselves, is assessed through the use of duplicates initiated by the laboratory and blind replicates (provided by EPD/EMS). The results of duplicate and replicate analyses are presented in the results tables of these reports for the first, second, and third quarters of each year. Duplicate and replicate results are not presented in fourth-quarter reports; the results tables present instead only the highest result for each analyte for each quarter of the year.

The laboratories assess precision by calculating the relative percent difference, or RPD, for each pair of laboratory-initiated duplicate results. One of the contract laboratories uses a data qualifier (J3) to modify metals analyses when the RPD for laboratory duplicates is greater than 20%.

Additional statistical comparisons of laboratory duplicate and blind replicate results, both intra- and interlaboratory, are presented in the EPD/EMS quarterly reports. The calculation used for these reports is the MRD, or mean relative difference, which is similar to EPA's RPD except that the MRD provides a single value for all of the analyses of a particular compound, either intra- or interlaboratory, during one quarter. Because detection limits may vary among samples, the MRD requires calculation of a reference detection limit, which is the detection limit at the 90th percentile of the array of limits in the population of all duplicate and replicate analyses for a given analyte during a particular quarter. The MRD is not method-specific.

Method-Specific Accuracy and Precision

The contract laboratories' EPA-approved laboratory procedures include QA/QC requirements as an integral part of the methods. Thus, knowledge of the method used in obtaining data is an important component of determining data useability. EPA has conducted extensive research and development on the methods approved for the analysis of water and waste water; information on the accuracy and precision of a method is available from EPA publications, as is full information on required QA/QC procedures. A listing of the methods used by the primary laboratories during

fourth quarter 1993 is given below along with the source for the method description. Many, if not all, of these sources include presentations of representative accuracy and precision results.

METHODS USED BY THE CONTRACT LABORATORIES

Method	Used to Analyze	Source
EPA120.1	Specific conductance	EPA EMSL 1983
EPA150.1	pH	EPA EMSL 1983
EPA160.1	Total dissolved solids	EPA EMSL 1983
EPA160.2	Total dissolved solids, total suspended solids	EPA EMSL 1983
EPA180.1	Turbidity	EPA EMSL 1983
EPA200.7	Metals	EPA EMSL 1983
EPA204.2	Antimony	EPA EMSL 1983
EPA206.2	Arsenic	EPA EMSL 1983
EPA239.2	Lead	EPA EMSL 1983
EPA245.1	Mercury	EPA EMSL 1983
EPA270.2	Selenium	EPA EMSL 1983
EPA279.2	Thallium	EPA EMSL 1983
EPA300.0	Chloride, nitrite, sulfate	EPA EMSL 1991
EPA310.1	Alkalinity	EPA EMSL 1983
EPA325.2	Chloride	EPA EMSL 1983
EPA335.3	Cyanide	EPA EMSL 1983
EPA340.2	Fluoride	EPA EMSL 1983
EPA353.1	Nitrogen, nitrate-nitrite	EPA EMSL 1983
EPA353.2	Nitrogen, nitrate, nitrite, or combined	EPA EMSL 1983
EPA365.1	Phosphorus, all forms (reported as total phosphates)	EPA EMSL 1983
EPA365.2	Phosphorus, all forms (reported as total phosphates)	EPA EMSL 1983
EPA376.2	Sulfide	EPA EMSL 1983
EPA413.1	Oil & grease	EPA EMSL 1983
EPA415.1	Dissolved organic carbon, total inorganic carbon, total organic carbon	EPA EMSL 1983
EPA418.1	Total petroleum hydrocarbons	EPA EMSL 1983
EPA420.2	Phenols	EPA EMSL 1983
EPA900.0	Gross alpha, nonvolatile beta	EPA EMSL 1980
EPA900.1	Total alpha-emitting radium	EPA EMSL 1980
EPA906.0	Tritium	EPA EMSL 1980
EPA6010	Metals	EPA 1986
EPA7041	Antimony	EPA 1986
EPA7060	Arsenic	EPA 1986
EPA7421	Lead	EPA 1986
EPA7470	Mercury	EPA 1986
EPA7740	Selenium	EPA 1986
EPA7841	Thallium	EPA 1986
EPA8010	Chlorinated volatile organics	EPA 1986
EPA8080	Organochlorine pesticides and PCBs	EPA 1986
EPA8150	Chlorinated herbicides	EPA 1986
EPA8240	GCMS volatiles	EPA 1986
EPA8270	GCMS semivolatiles	EPA 1986
EPA8280	Dioxins and furans	EPA 1986
EPA9012	Cyanide	EPA 1986
EPA9020	Total organic halogens	EPA 1986
EPA9020A	Total organic halogens	EPA 1986
EPA9030	Sulfide	EPA 1986
EPA9060	Dissolved organic carbon, total inorganic carbon, total organic carbon	EPA 1986

An example of available method-specific QA/QC information is that for the analysis of metals by EPA Method 6010/200.7 (EPA, 1986/EPA EMSL, 1983). The primary laboratories, General Engineering Laboratories (GE) and Roy F. Weston, Inc. (Weston), use this inductively coupled plasma (ICP) atomic emission spectrometric method.

The following precision and accuracy data are based on the experience of seven laboratories that applied the ICP technique to acid-distilled water matrices that had been spiked with various metal concentrates. (Note: Not all seven laboratories analyzed all 14 elements.) The references give results for samples having three concentration ranges; the results here are for samples having the lowest values, similar to actual groundwater results for SRS.

ICP PRECISION AND ACCURACY DATA

Element	True value (µg/L)	Mean reported value (µg/L)	Mean percent RSD[a]
Aluminum	60	62	33
Arsenic	22	19	23
Beryllium	20	20	9.8
Cadmium	2.5	2.9	16
Chromium	10	10	18
Cobalt	20	20	4.1
Copper	11	11	40
Iron	20	19	15
Lead	24	30	32
Manganese	15	15	6.7
Nickel	30	28	11
Selenium	6	8.5	42
Vanadium	70	69	2.9
Zinc	16	19	45

[a] Relative standard deviation. In EPA (1986), the column heading is Mean Standard Deviation (%).

As another example, EPA Method 601/8010 (EPA, 1991/EPA, 1986) is used by both GE and Weston for analyses of halogenated volatile organics. In the presentation of the method in both references, the following table gives method-specific accuracy and precision as functions of concentration. Contract laboratories are expected to achieve or at least approach these limits.

ACCURACY AND PRECISION AS FUNCTIONS OF CONCENTRATION FOR EPA METHOD 601/8010

Parameter	Accuracy as recovery, X'[a] (µg/L)	Single analyst precision (µg/L)[b]	Overall precision (µg/L)[c]
Bromodichloromethane	$1.12C-1.02$[d]	$0.11\bar{X}+0.04$[e]	$0.20\bar{X}+1.00$
Bromoform	$0.96C-2.05$	$0.12\bar{X}+0.58$	$0.21\bar{X}+2.41$
Bromomethane	$0.76C-1.27$	$0.28\bar{X}+0.27$	$0.36\bar{X}+0.94$
Carbon tetrachloride	$0.98C-1.04$	$0.15\bar{X}+0.38$	$0.20\bar{X}+0.39$
Chlorobenzene	$1.00C-1.23$	$0.15\bar{X}-0.02$	$0.18\bar{X}+1.21$
Chloroethane	$0.99C-1.53$	$0.14\bar{X}-0.13$	$0.17\bar{X}+0.63$
2-Chloroethyl vinyl ether[f]	$1.00C$	$0.20\bar{X}$	$0.35\bar{X}$
Chloroform	$0.93C-0.39$	$0.13\bar{X}+0.15$	$0.19\bar{X}-0.02$
Chloromethane	$0.77C+0.18$	$0.28\bar{X}-0.31$	$0.52\bar{X}+1.31$
Dibromochloromethane	$0.94C+2.72$	$0.11\bar{X}+1.10$	$0.24\bar{X}+1.68$

Parameter	Accuracy as recovery, X' (µg/L)	Single analyst precision (µg/L)	Overall precision (µg/L)
1,2-Dichlorobenzene	$0.93C+1.70$	$0.20\overline{X}+0.97$	$0.13\overline{X}+6.13$
1,3-Dichlorobenzene	$0.95C+0.43$	$0.14\overline{X}+2.33$	$0.26\overline{X}+2.34$
1,4-Dichlorobenzene	$0.93C-0.09$	$0.15\overline{X}+0.29$	$0.20\overline{X}+0.41$
1,1-Dichloroethane	$0.95C-1.08$	$0.09\overline{X}+0.17$	$0.14\overline{X}+0.94$
1,2-Dichloroethane	$1.04C-1.06$	$0.11\overline{X}+0.70$	$0.15\overline{X}+0.94$
1,1-Dichloroethene	$0.98C-0.87$	$0.21\overline{X}-0.23$	$0.29\overline{X}-0.40$
trans-1,2-Dichloroethene	$0.97C-0.16$	$0.11\overline{X}+1.46$	$0.17\overline{X}+1.46$
Dichloromethane (Methylene chloride)	$0.91C-0.93$	$0.11\overline{X}+0.33$	$0.21\overline{X}+1.43$
1,2-Dichloropropane[f]	$1.00C$	$0.13\overline{X}$	$0.23\overline{X}$
cis-1,3-Dichloropropene[f]	$1.00C$	$0.18\overline{X}$	$0.32\overline{X}$
trans-1,3-Dichloropropene[f]	1.00C	$0.18\overline{X}$	$0.32\overline{X}$
1,1,2,2-Tetrachloroethane	$0.95C+0.19$	$0.14\overline{X}+2.41$	$0.23\overline{X}+2.79$
Tetrachloroethylene	$0.94C+0.06$	$0.14\overline{X}+0.38$	$0.18\overline{X}+2.21$
1,1,1-Trichloroethane	$0.90C-0.16$	$0.15\overline{X}+0.04$	$0.20\overline{X}+0.37$
1,1,2-Trichloroethane	$0.86C+0.30$	$0.13\overline{X}-0.14$	$0.19\overline{X}+0.67$
Trichloroethylene	$0.87C+0.48$	$0.13\overline{X}-0.03$	$0.23\overline{X}+0.30$
Trichlorofluoromethane	$0.89C-0.07$	$0.15\overline{X}+0.67$	$0.26\overline{X}+0.91$
Vinyl chloride	$0.97C-0.36$	$0.13\overline{X}+0.65$	$0.27\overline{X}+0.40$

[a] X' = expected recovery for one or more measurements of a sample containing a concentration of C, in µg/L.
[b] Expected single analyst standard deviation of measurements.
[c] Expected interlaboratory standard deviation of measurements.
[d] C = true value for the concentration, in µg/L.
[e] $\overline{X}$ = average recovery found for measurements of samples containing a concentration of C, in µg/L.
[f] Estimates based on performance of a single laboratory.

References

EPA (U.S. Environmental Protection Agency), 1986. **Test Methods for Evaluating Solid Waste (SW-846)**, Volumes IA–IC. Washington, DC.

EPA (U.S. Environmental Protection Agency), 1991. *Guidelines Establishing Test Procedures for the Analysis of Pollutants,* **Code of Federal Regulations**, Title 40, Part 136, Appendix A. Washington, DC.

EPA EMSL (U.S. Environmental Protection Agency, Environmental Monitoring and Systems Laboratory), 1980. **Prescribed Procedures for Measurement of Radioactivity in Drinking Water**, EPA-600/4-80-032. Cincinnati, OH.

EPA EMSL (U.S. Environmental Protection Agency, Environmental Monitoring and Systems Laboratory), 1983. **Methods for Chemical Analysis of Water and Wastes**. Cincinnati, OH.

EPA EMSL (U.S. Environmental Protection Agency, Environmental Monitoring and Systems Laboratory), 1991. **Test Method, The Determination of Inorganic Anions in Water by Ion Chromatography—Method 300.0**. Cincinnati, OH.

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Appendix F

Time Series Plots

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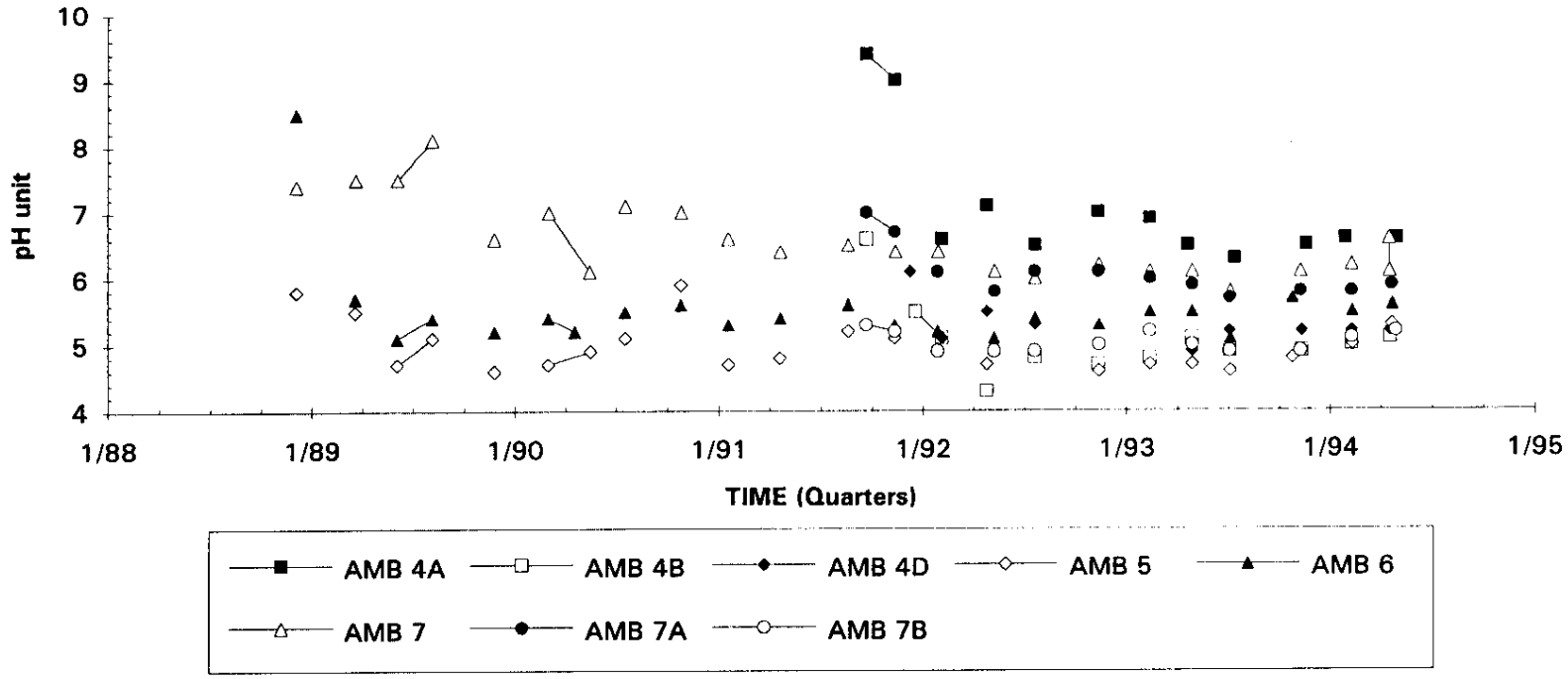
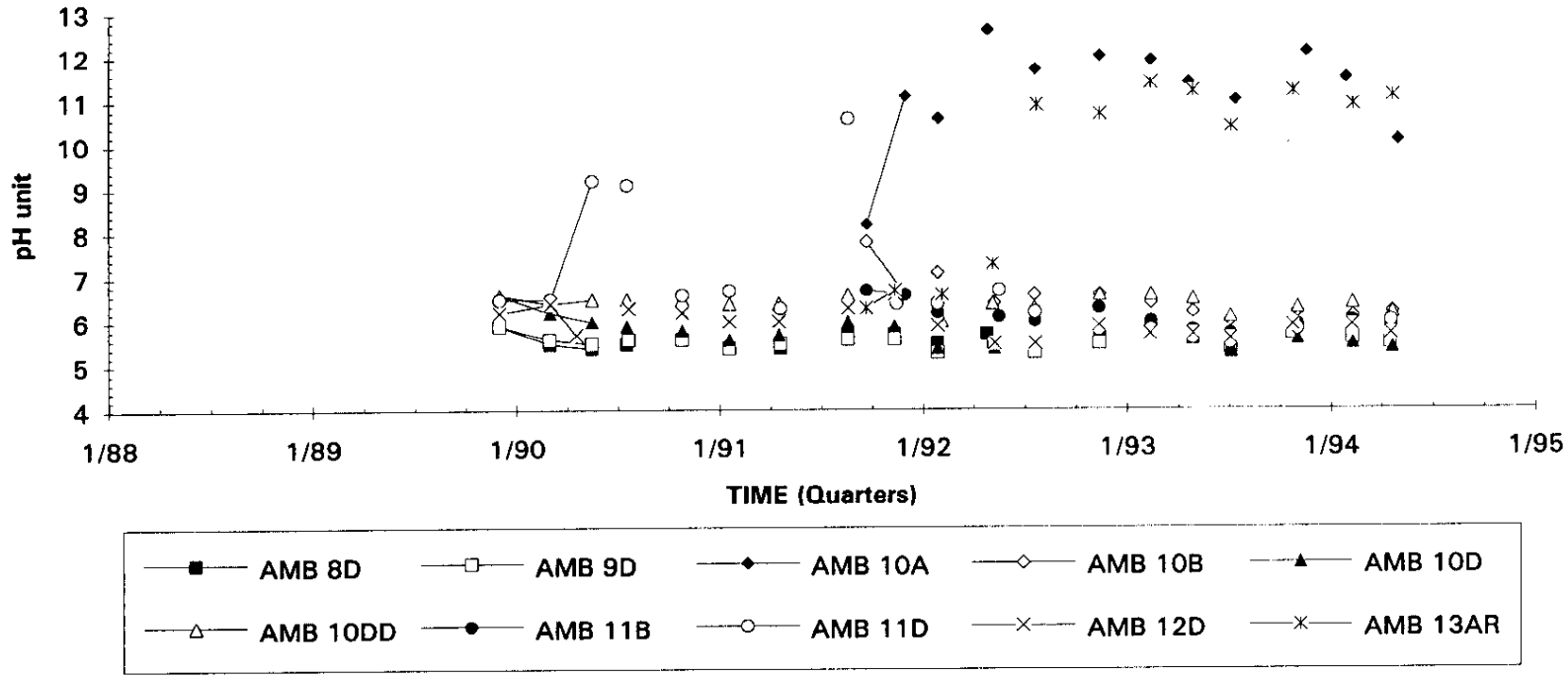
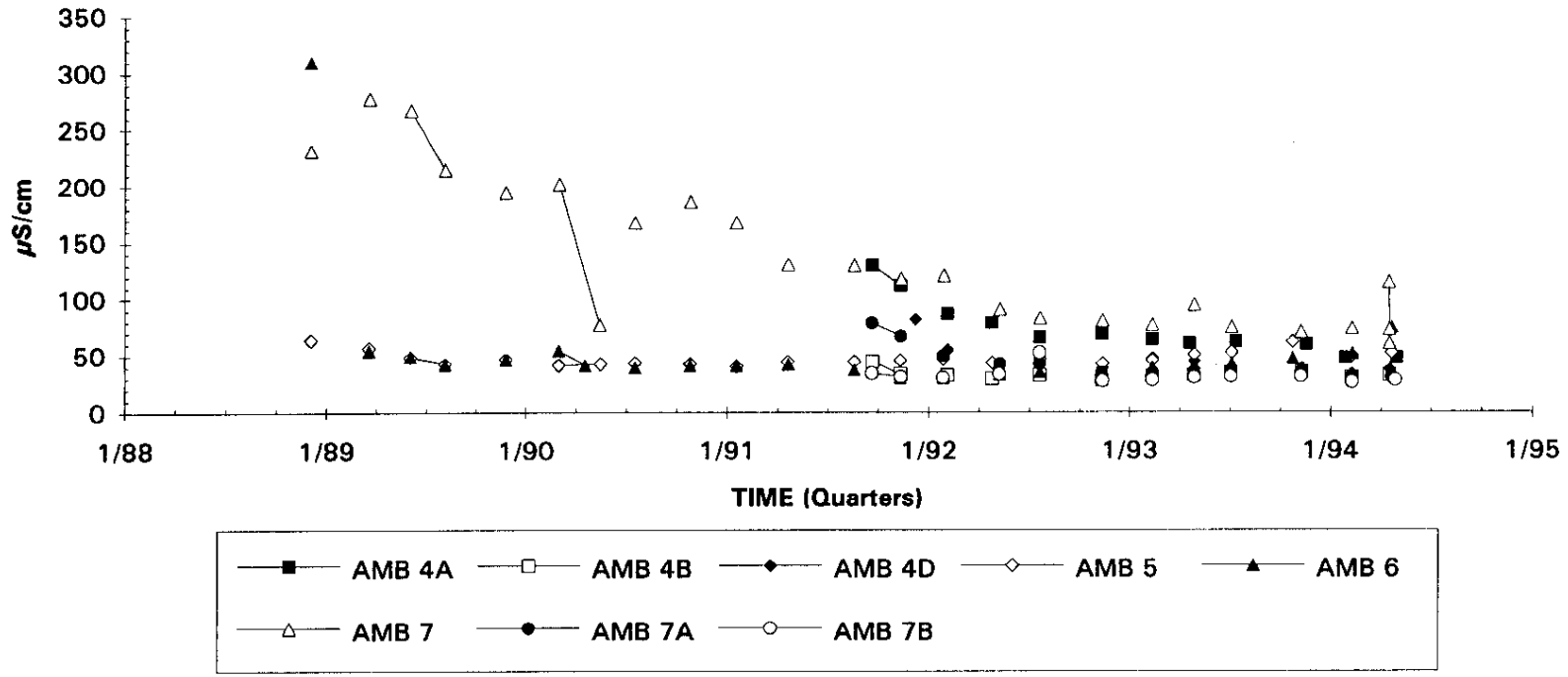
Field pH
Wells AMB 4A Through AMB 7B



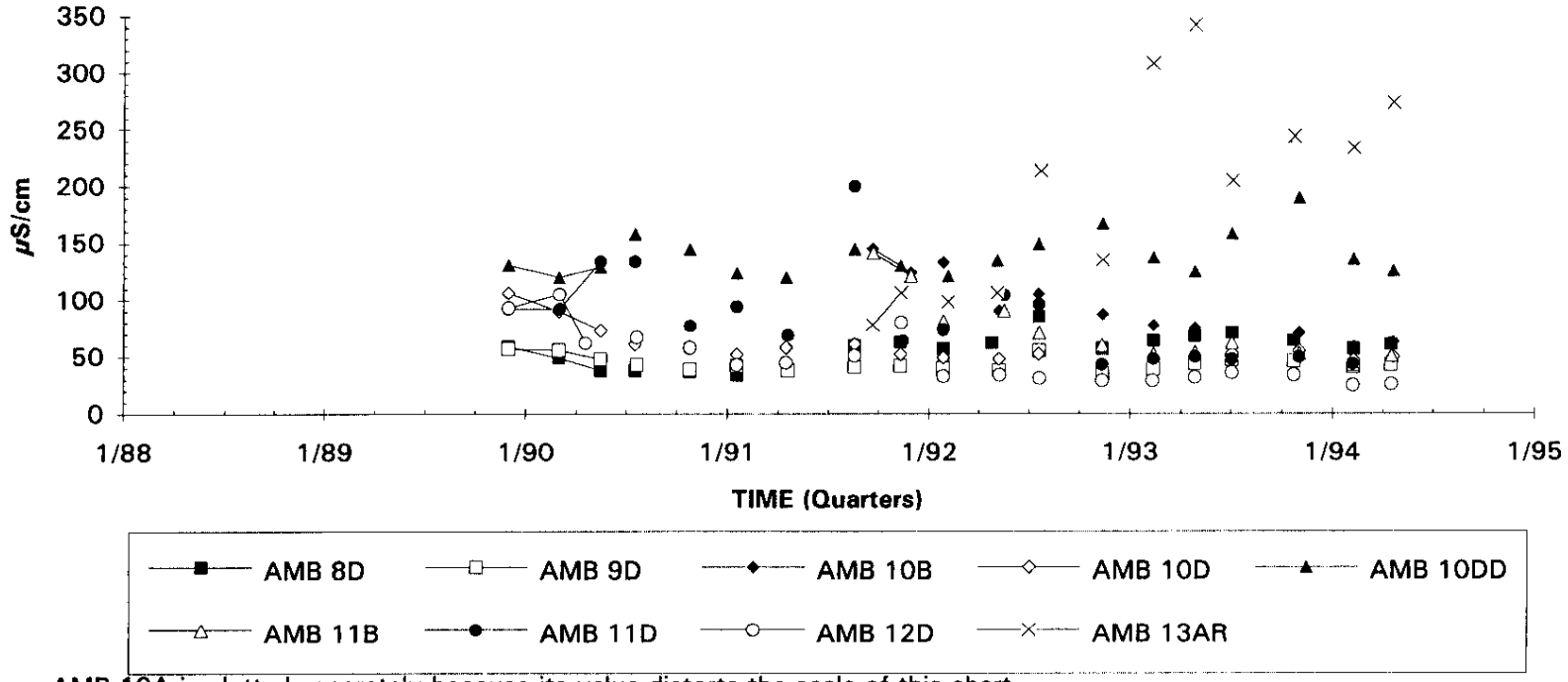
Field pH
Wells AMB 8D Through AMB 13AR



Field Specific Conductance
Wells AMB 4A Through AMB 7B

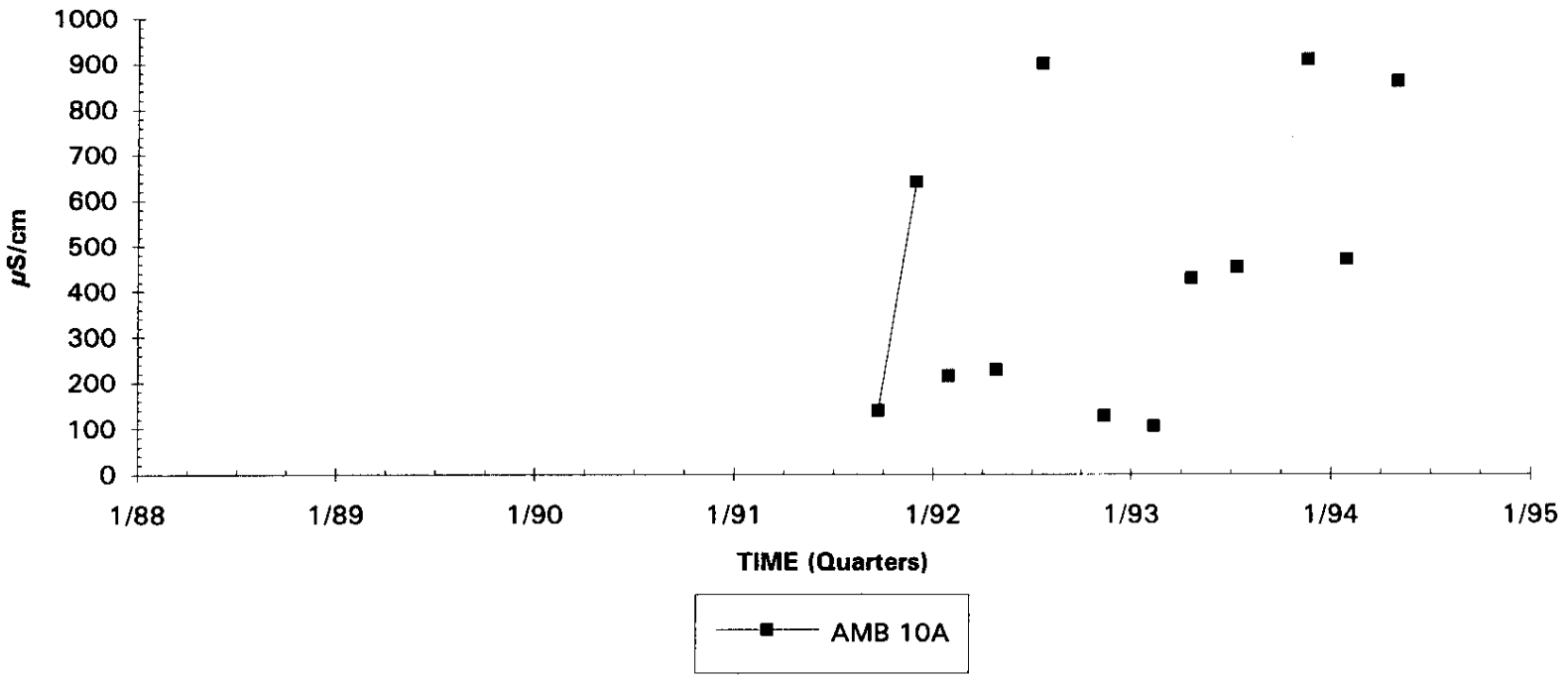


Field Specific Conductance
Wells AMB 8D Through AMB 13AR

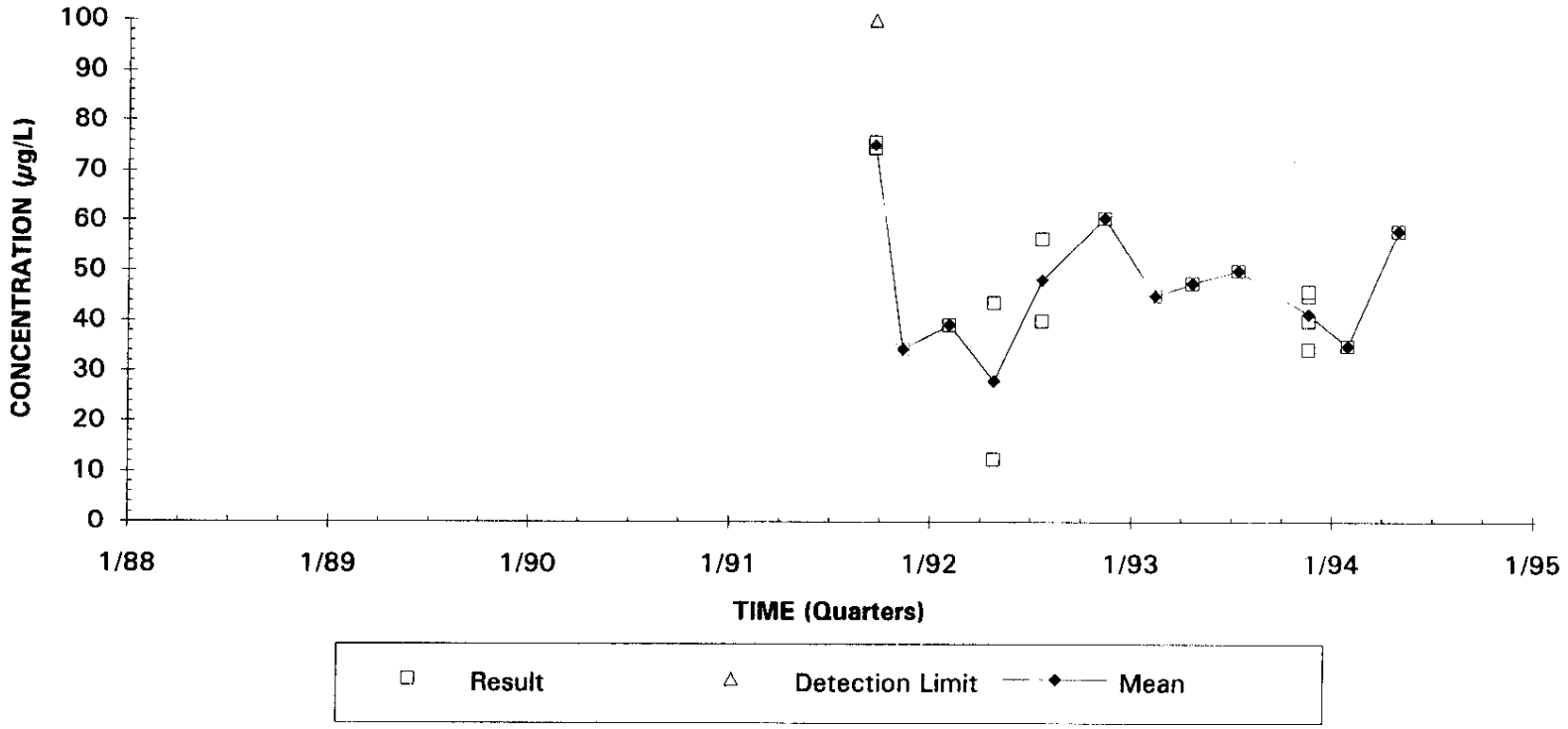


AMB 10A is plotted separately because its value distorts the scale of this chart.

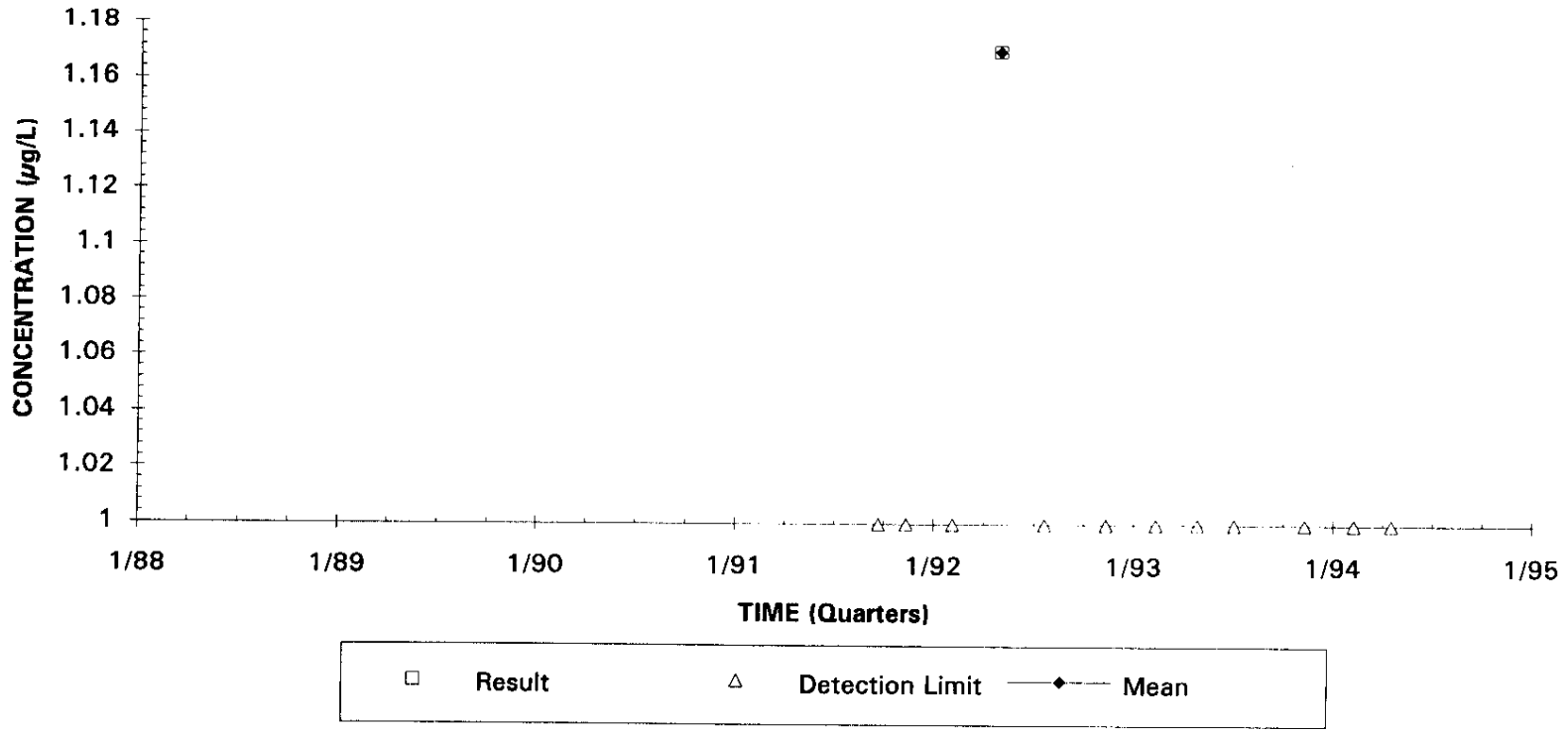
Field Specific Conductance
Well AMB 10A



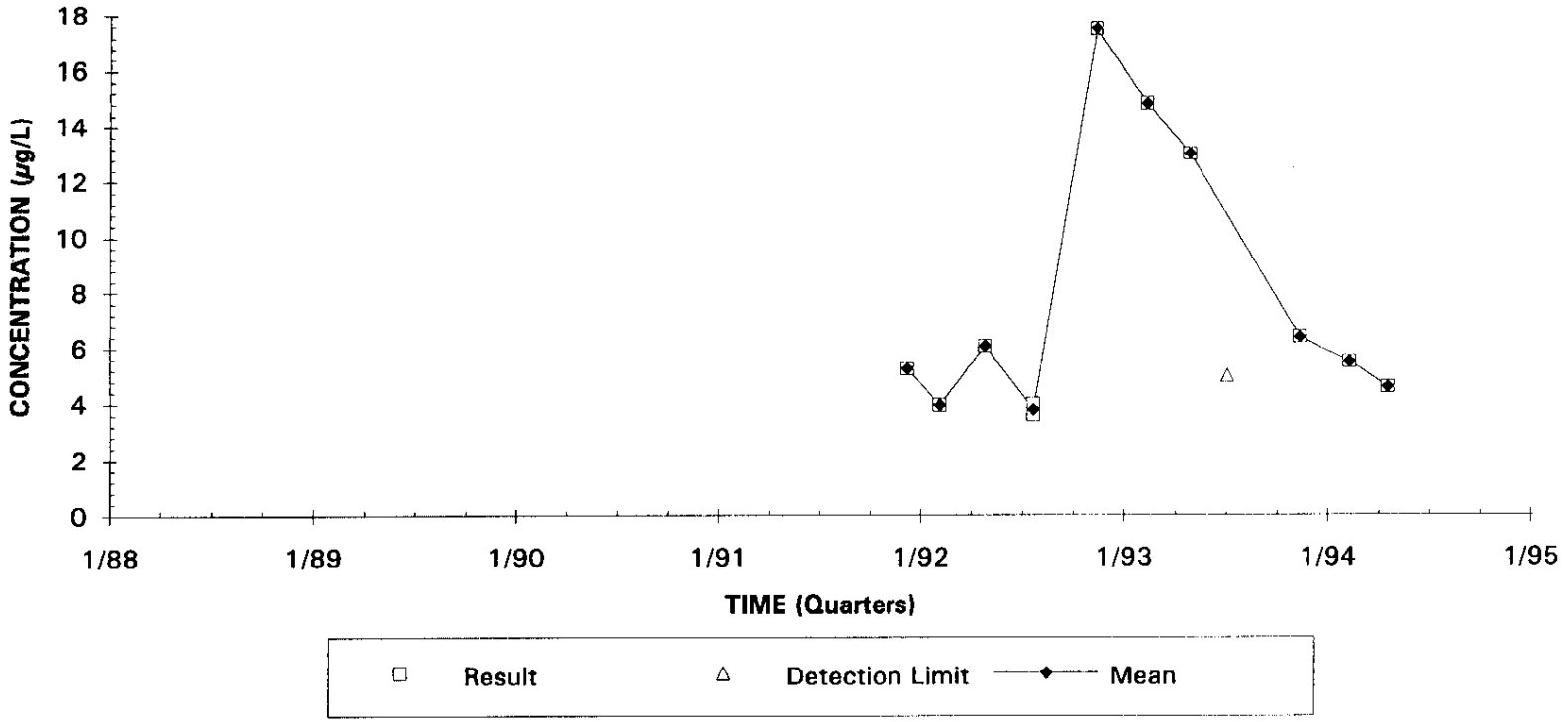
Tetrachloroethylene Concentrations
Well AMB 4A



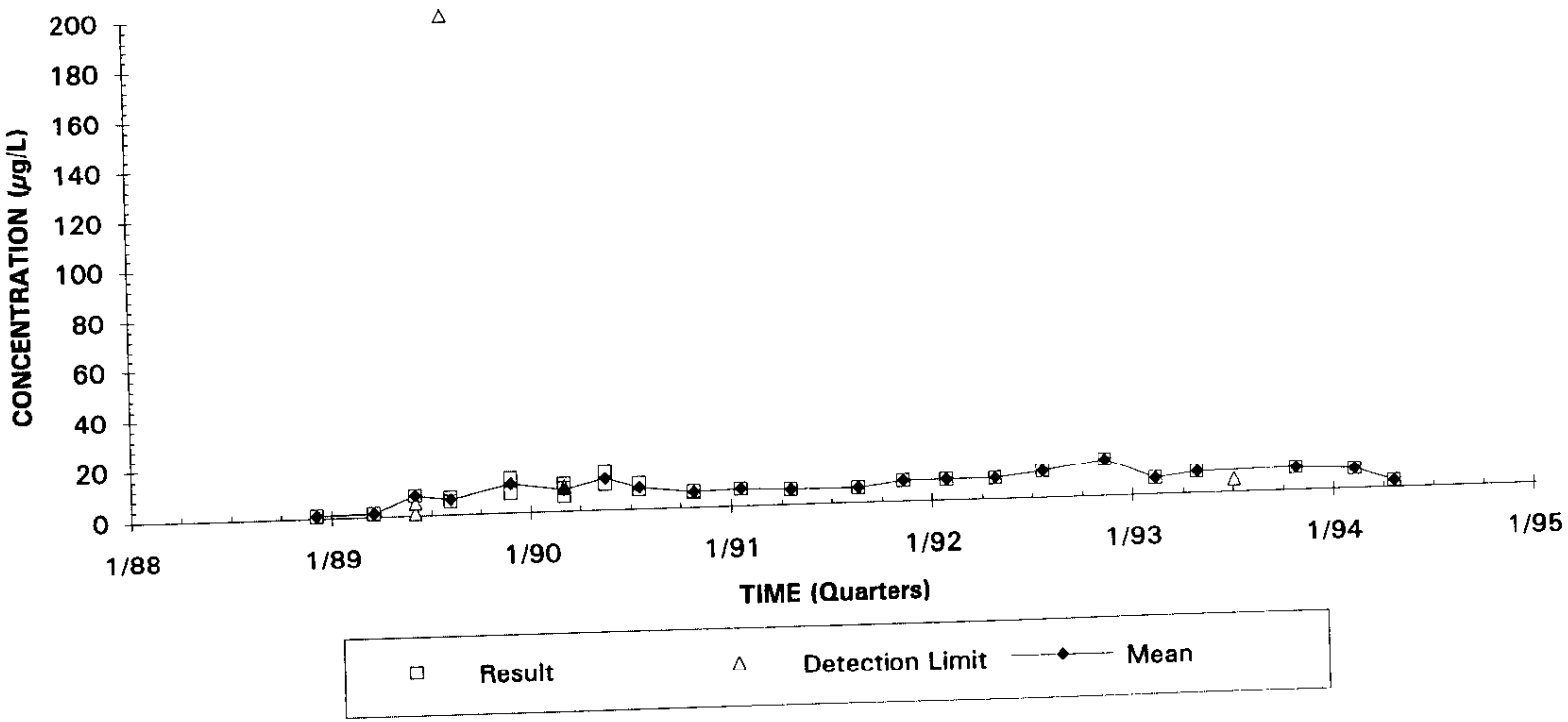
Tetrachloroethylene Concentrations
Well AMB 4B



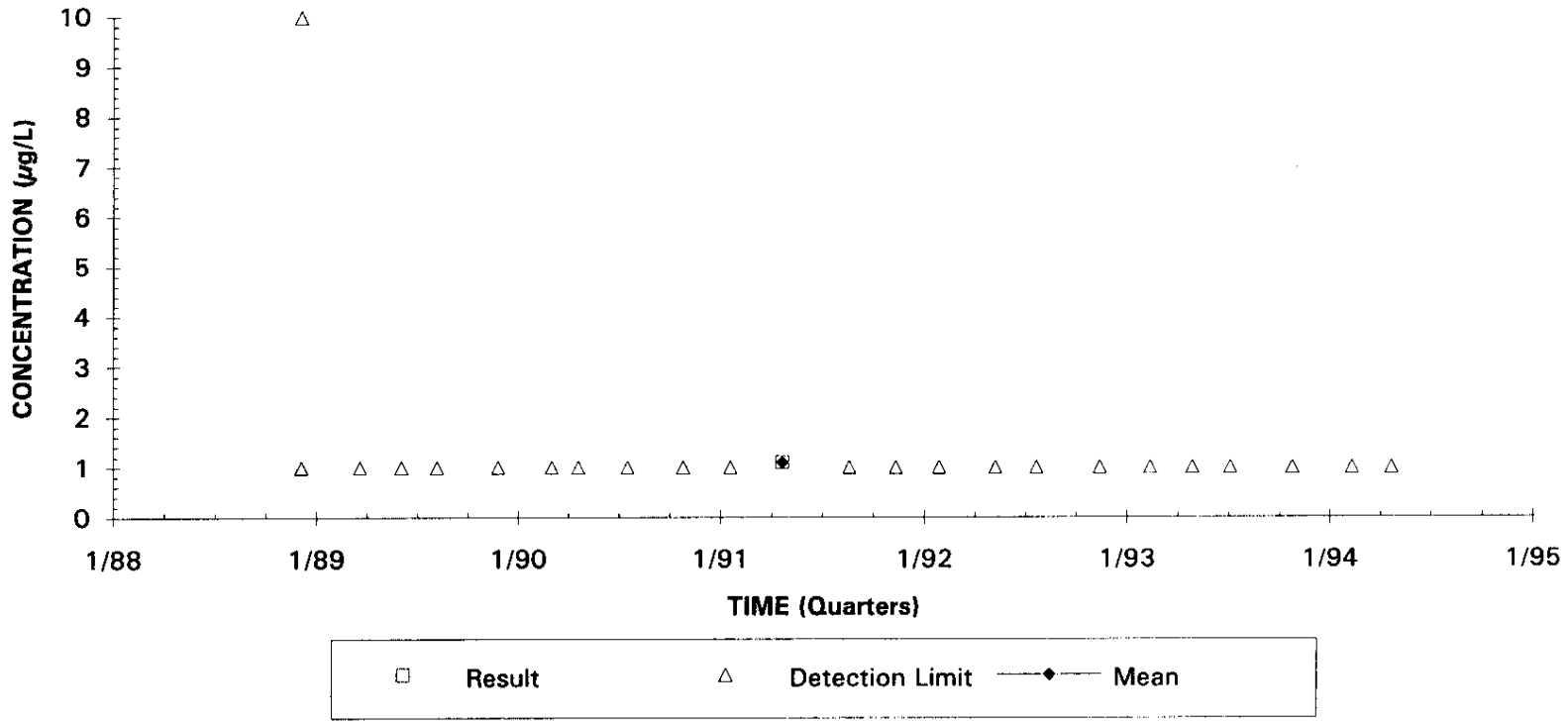
Tetrachloroethylene Concentrations
Well AMB 4D



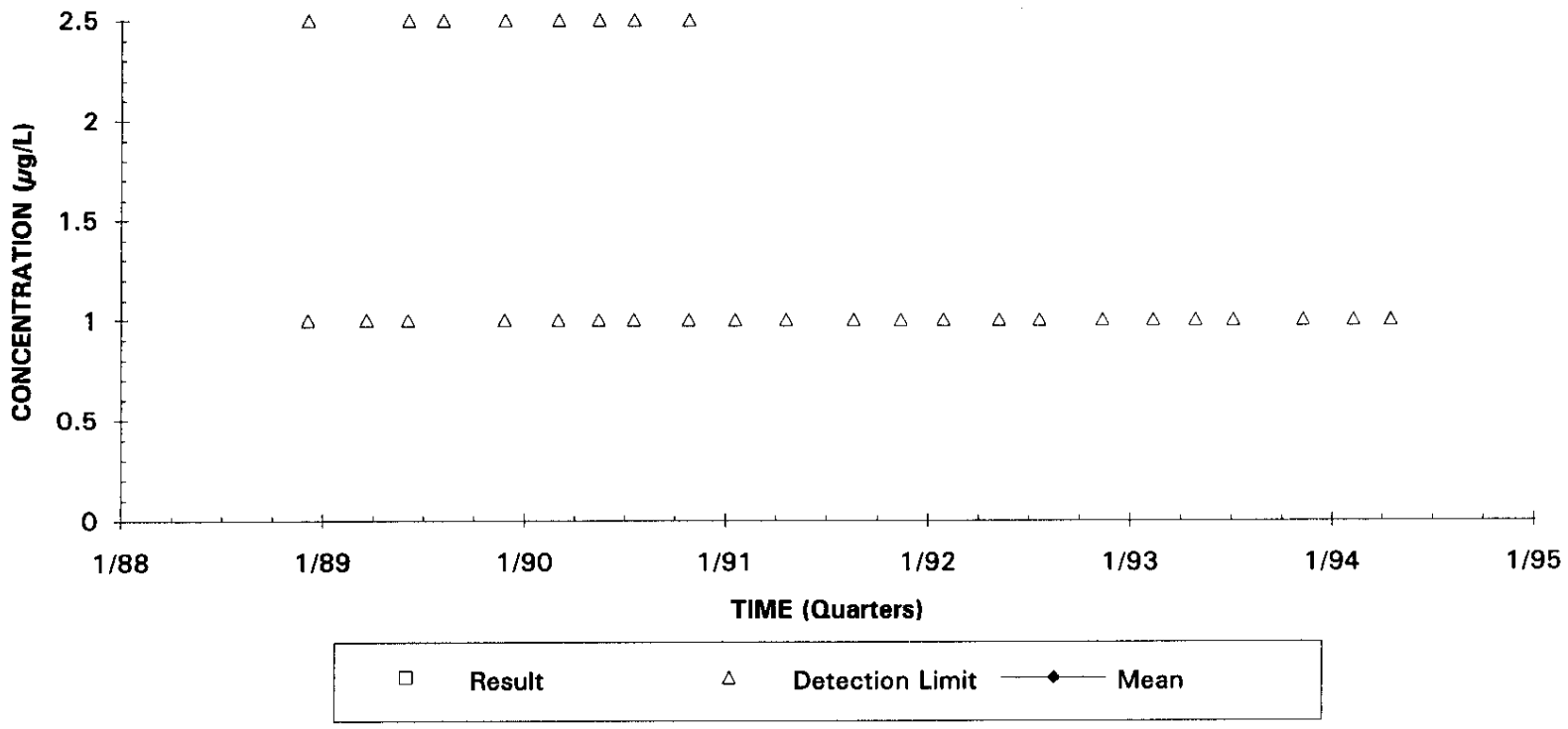
Tetrachloroethylene Concentrations
Well AMB 5



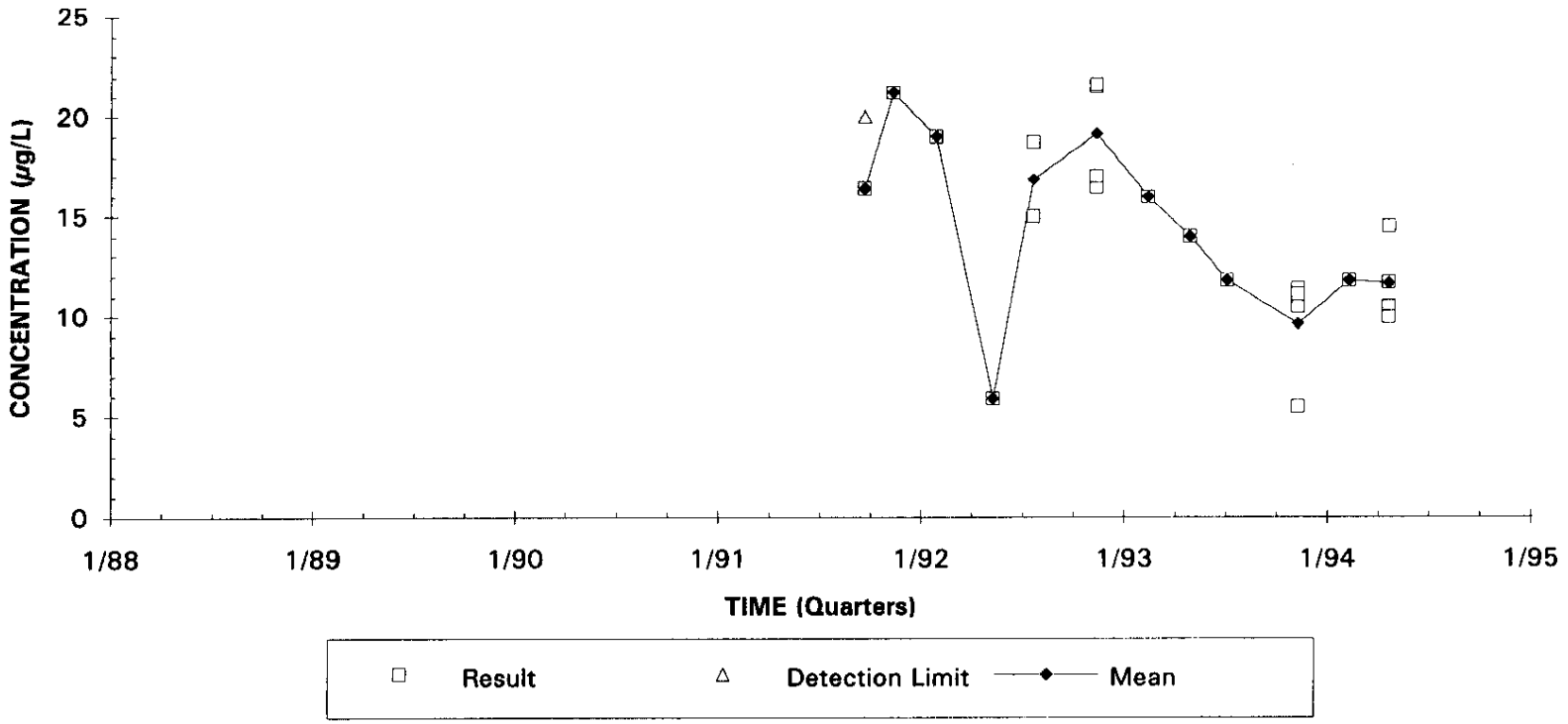
Tetrachloroethylene Concentrations
Well AMB 6



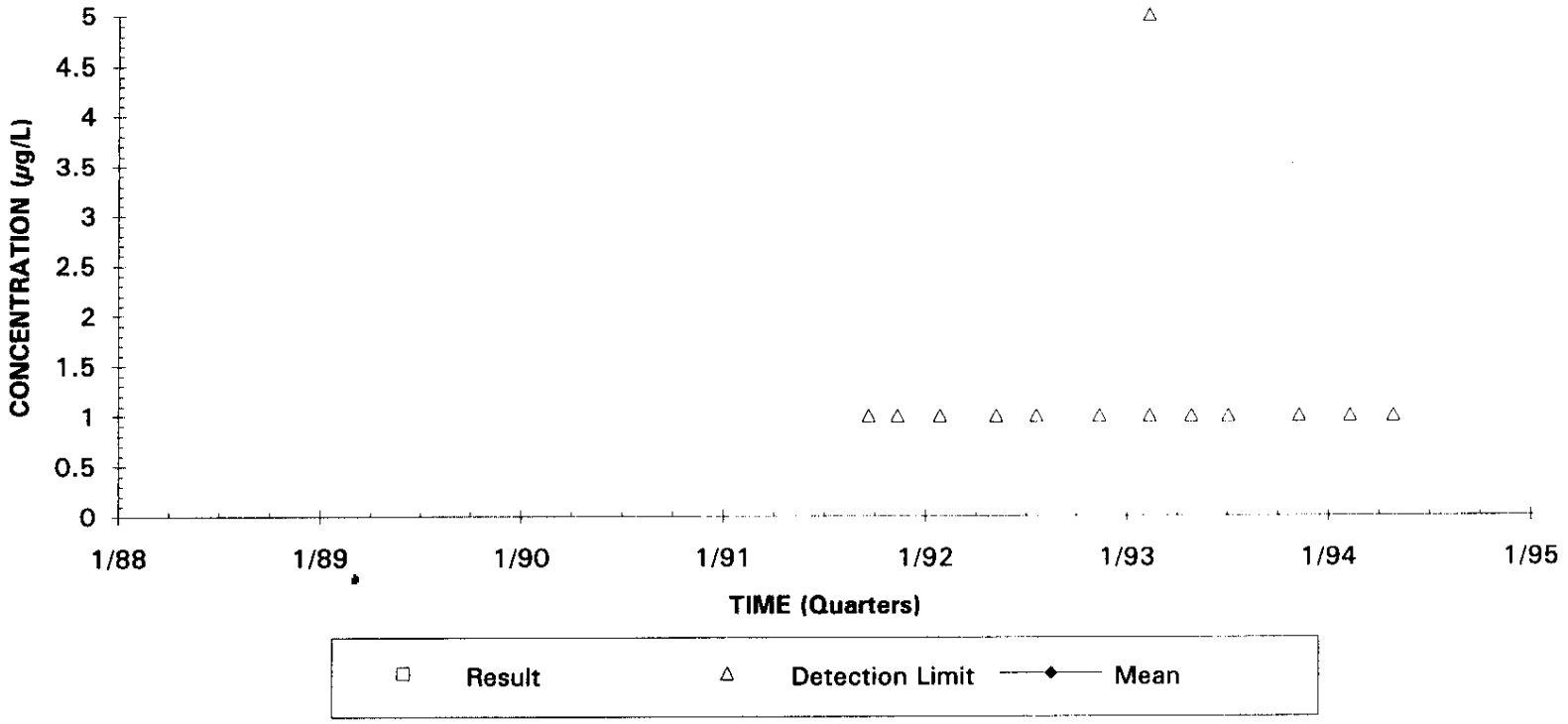
Tetrachloroethylene Concentrations
Well AMB 7



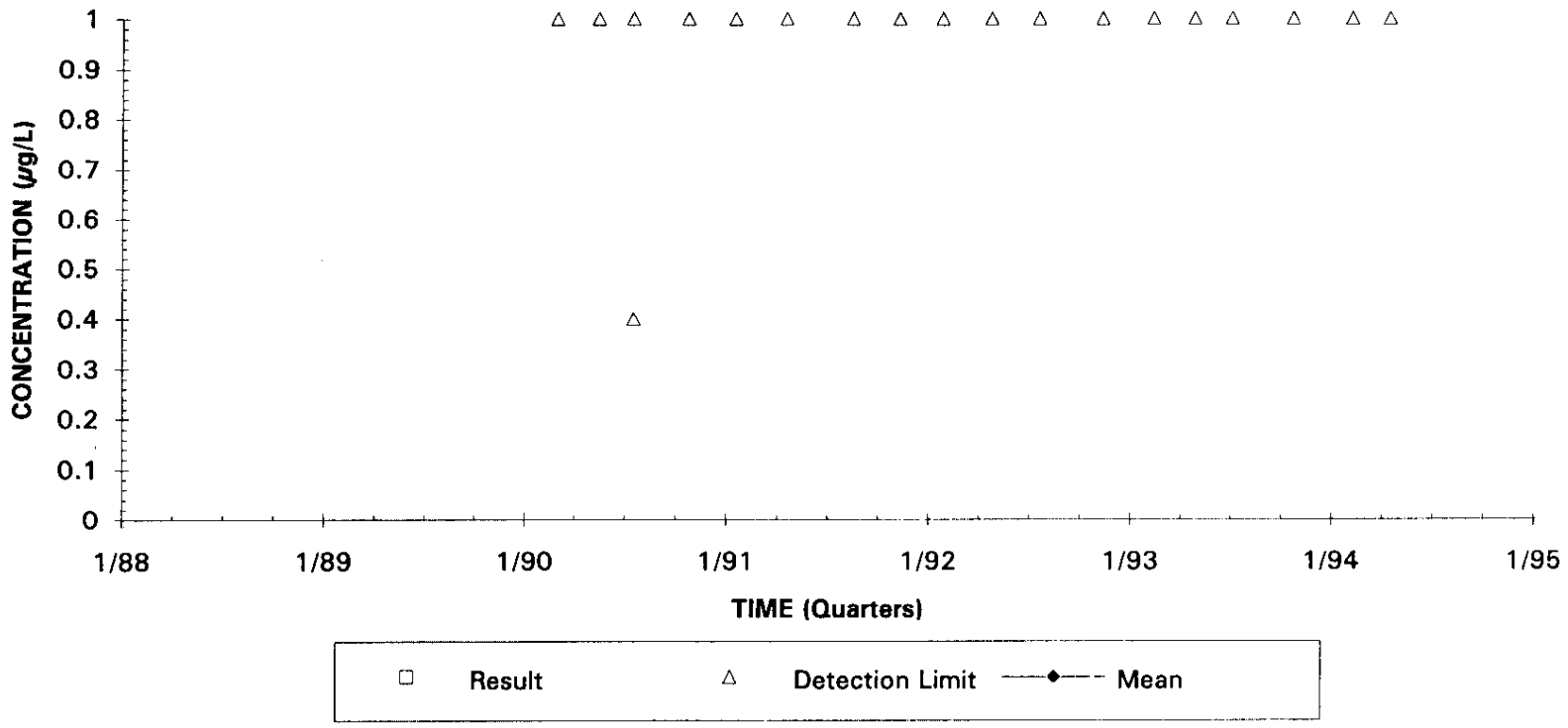
Tetrachloroethylene Concentrations
Well AMB 7A



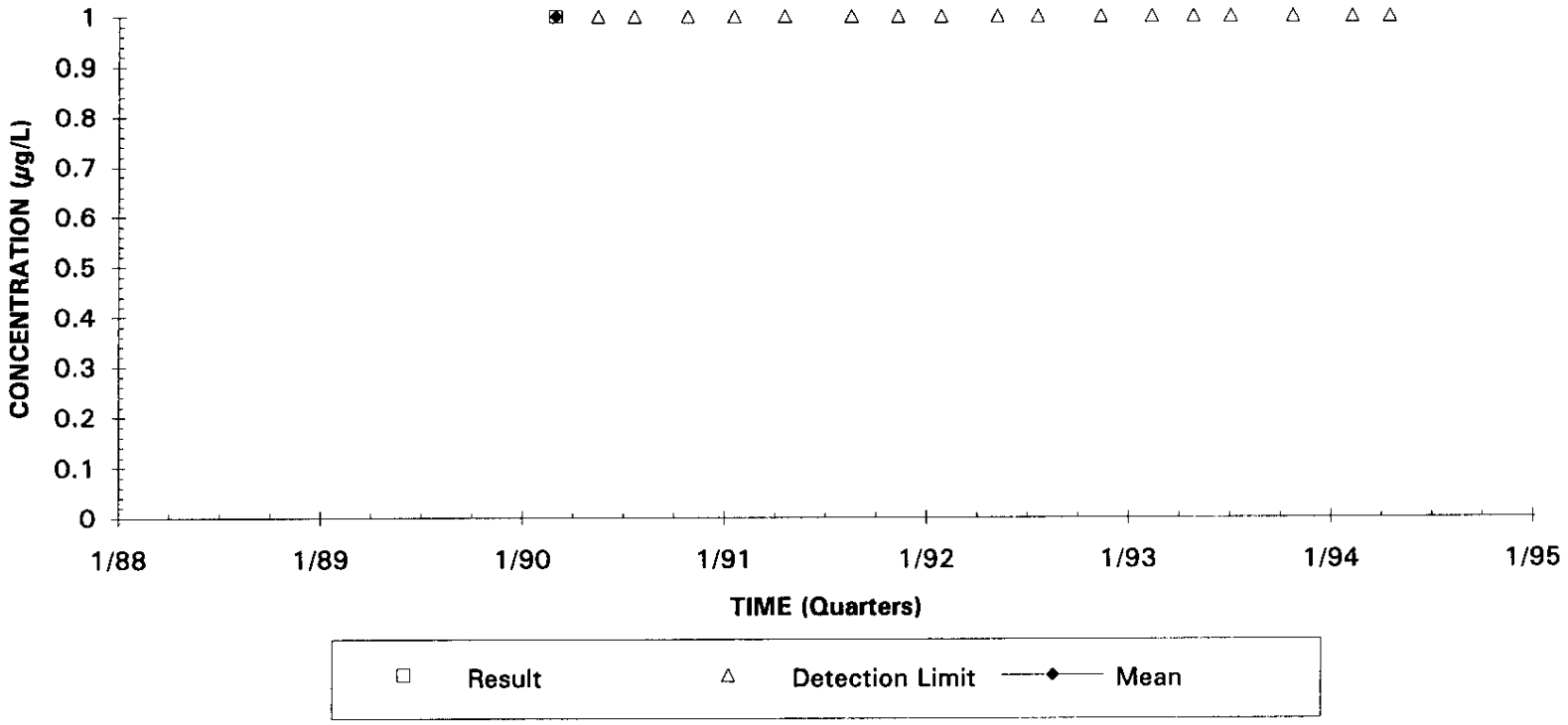
Tetrachloroethylene Concentrations
Well AMB 7B



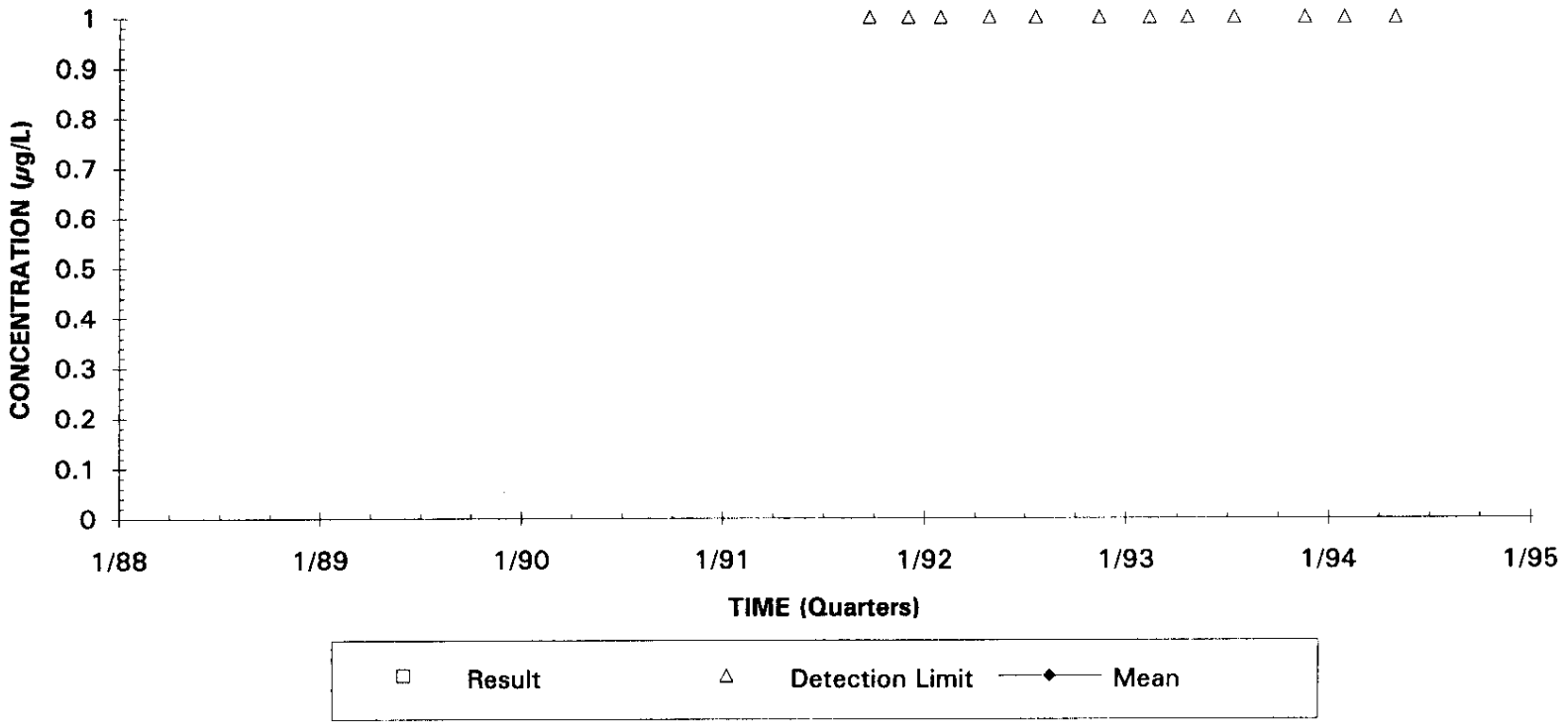
Tetrachloroethylene Concentrations
Well AMB 8D



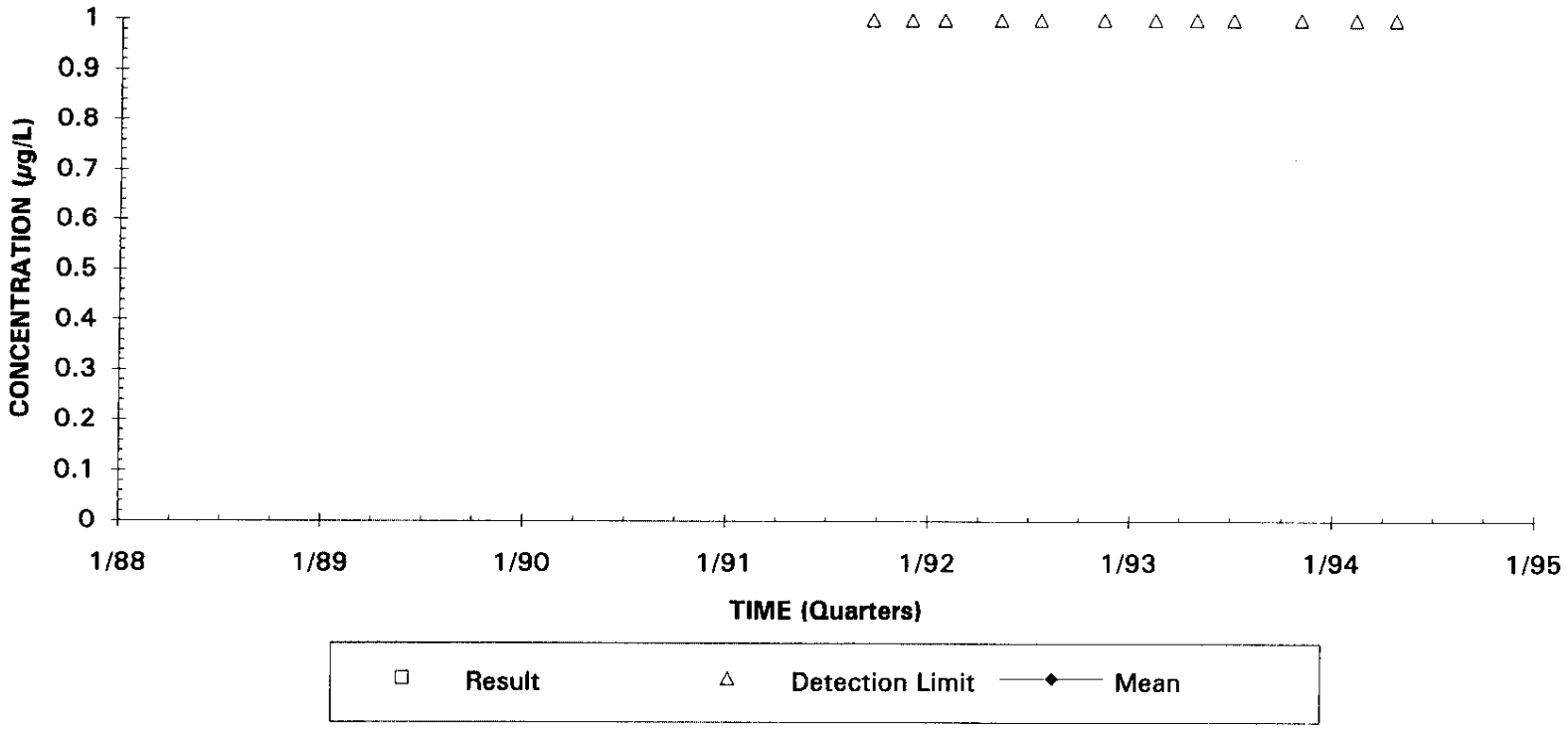
Tetrachloroethylene Concentrations
Well AMB 9D



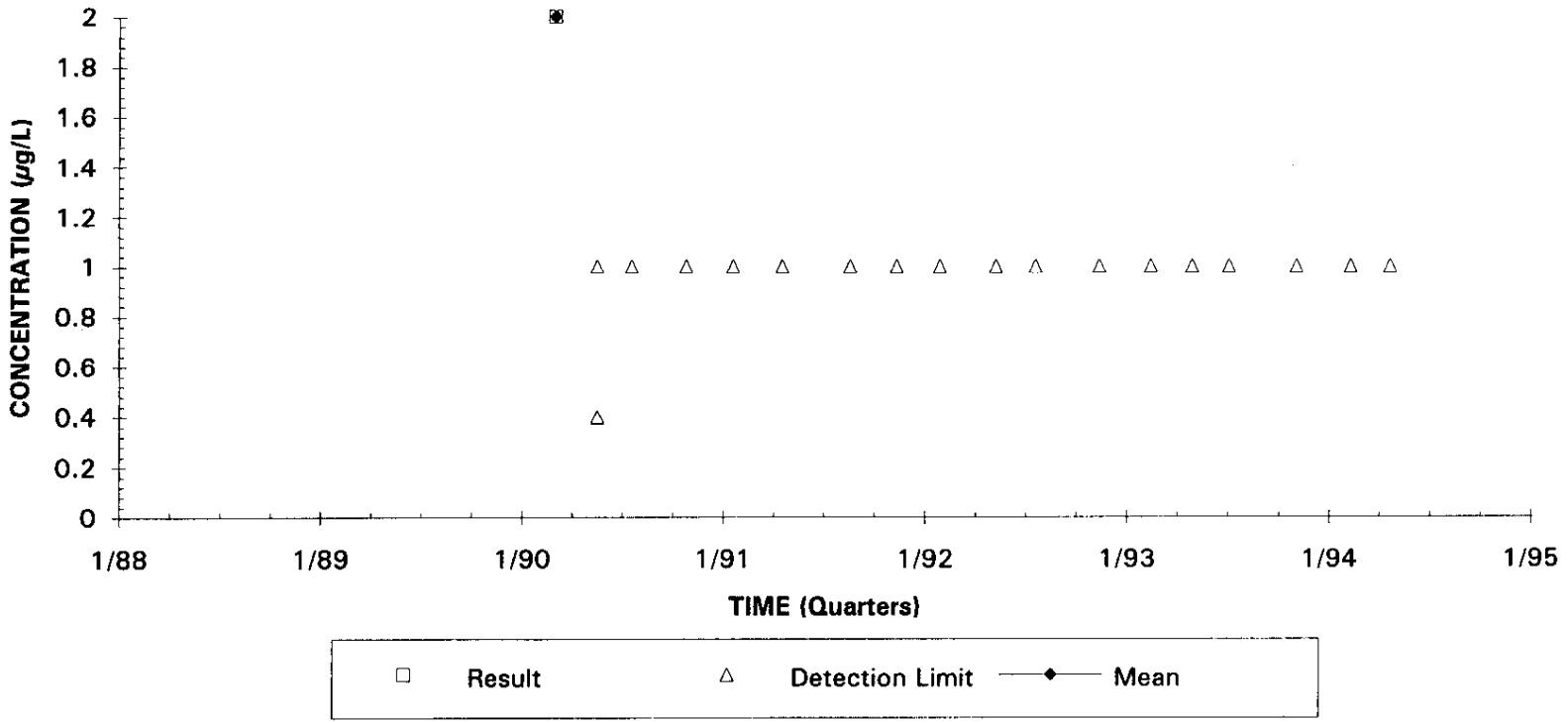
Tetrachloroethylene Concentrations
Well AMB 10A



Tetrachloroethylene Concentrations
Well AMB 10B



Tetrachloroethylene Concentrations
Well AMB 10D



Tetrachloroethylene Concentrations
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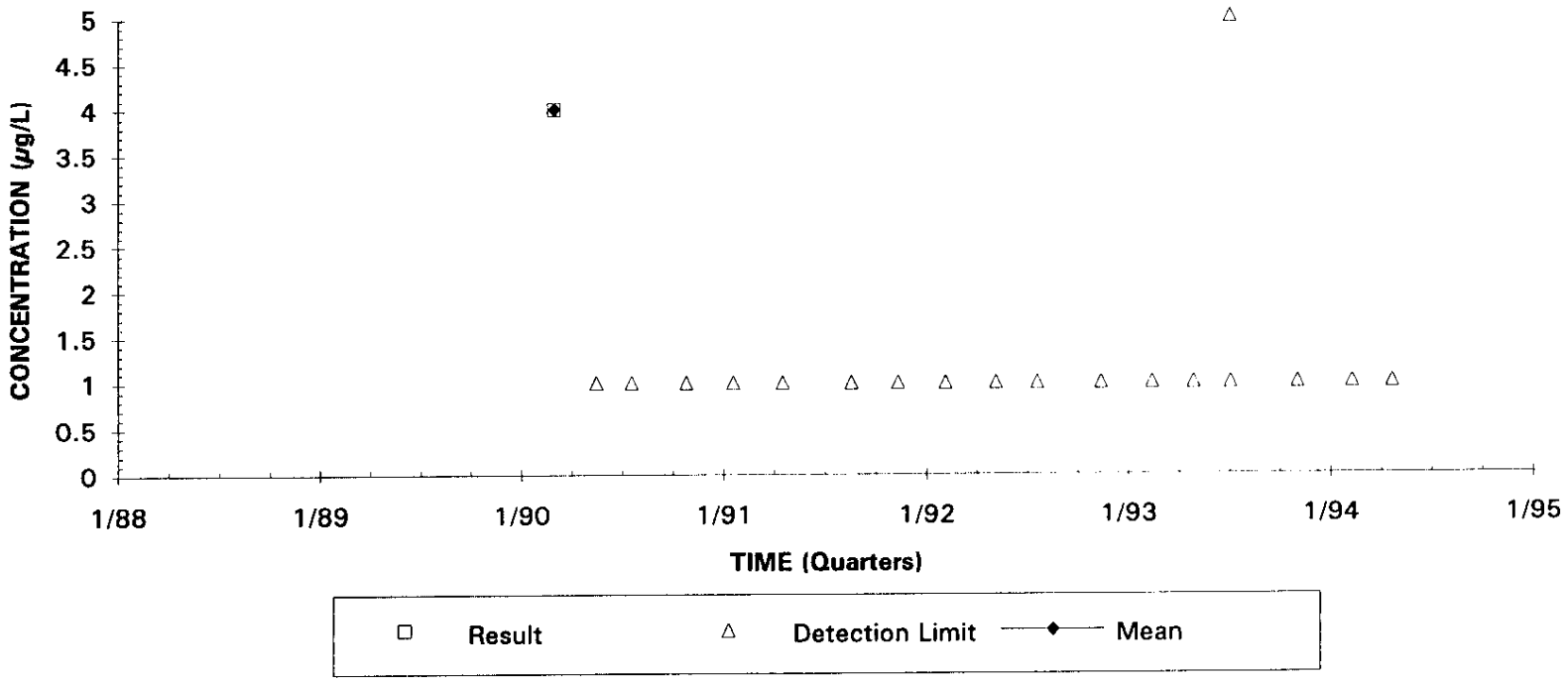
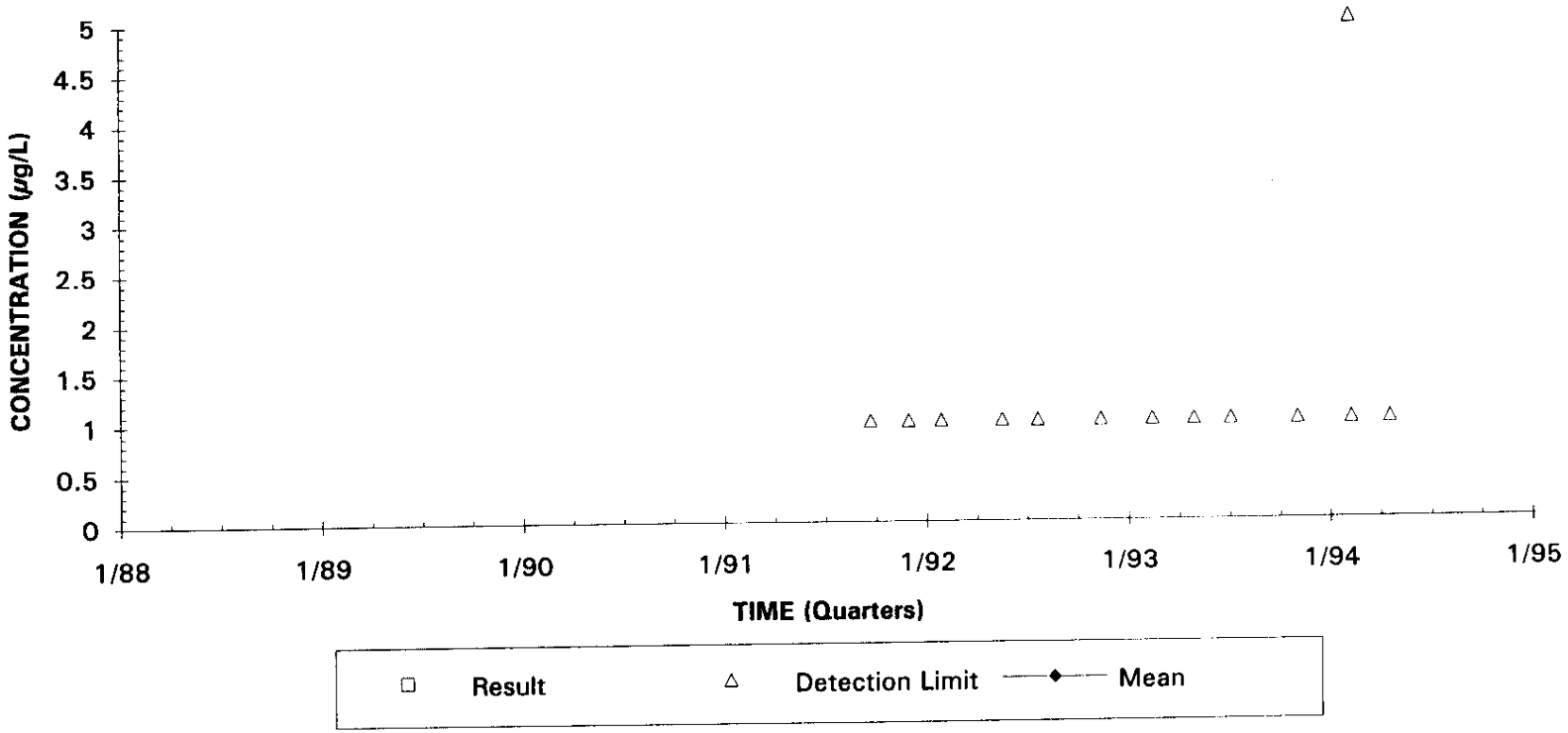
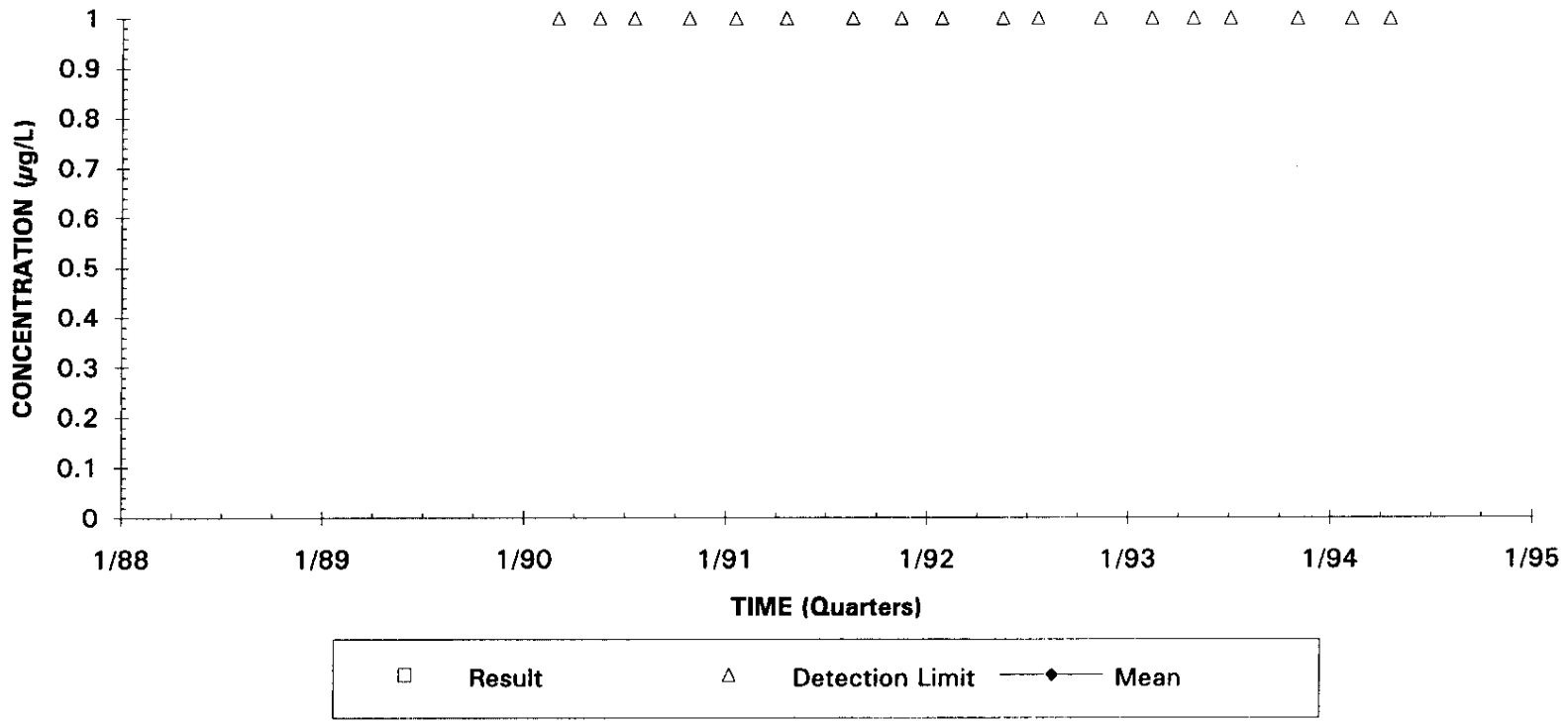


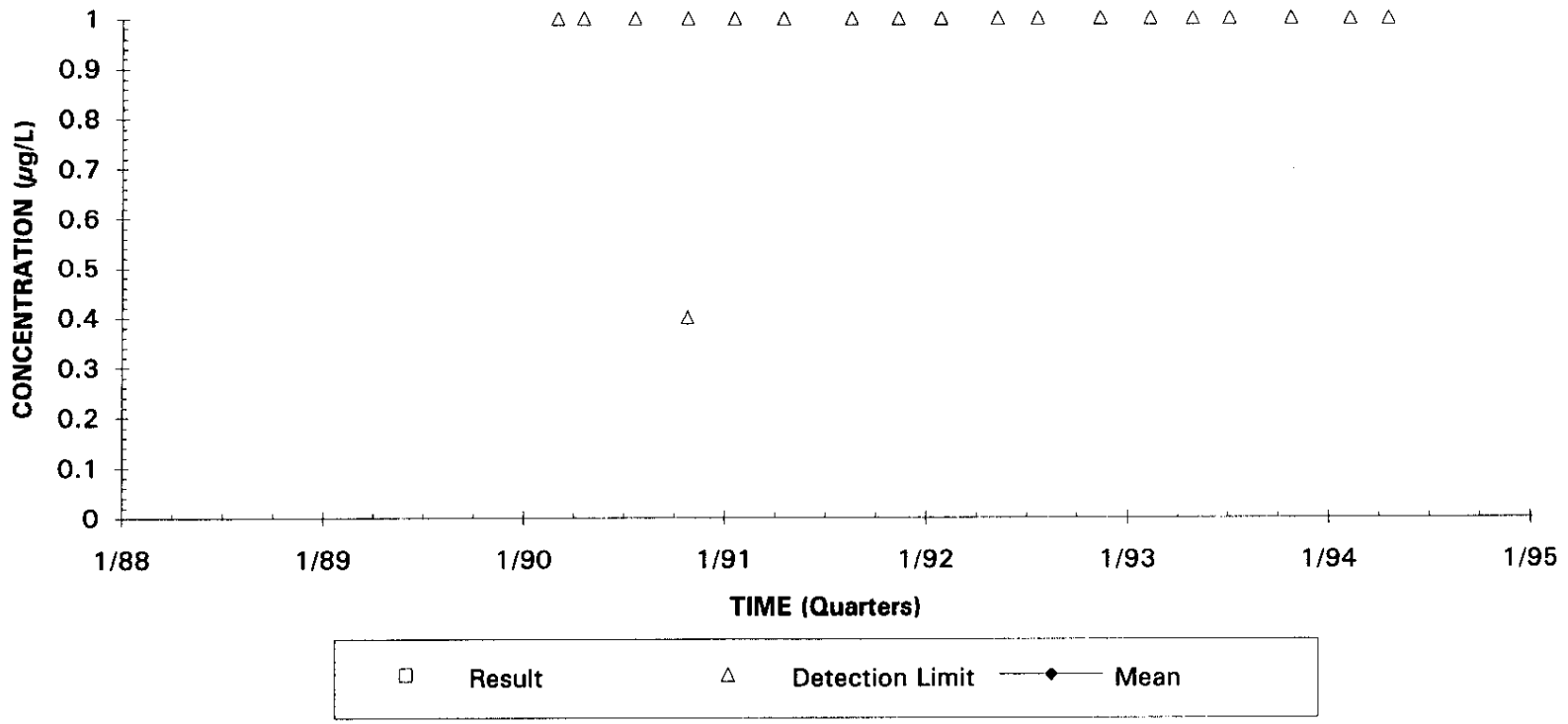
Tetrachloroethylene Concentrations
Well AMB 11B



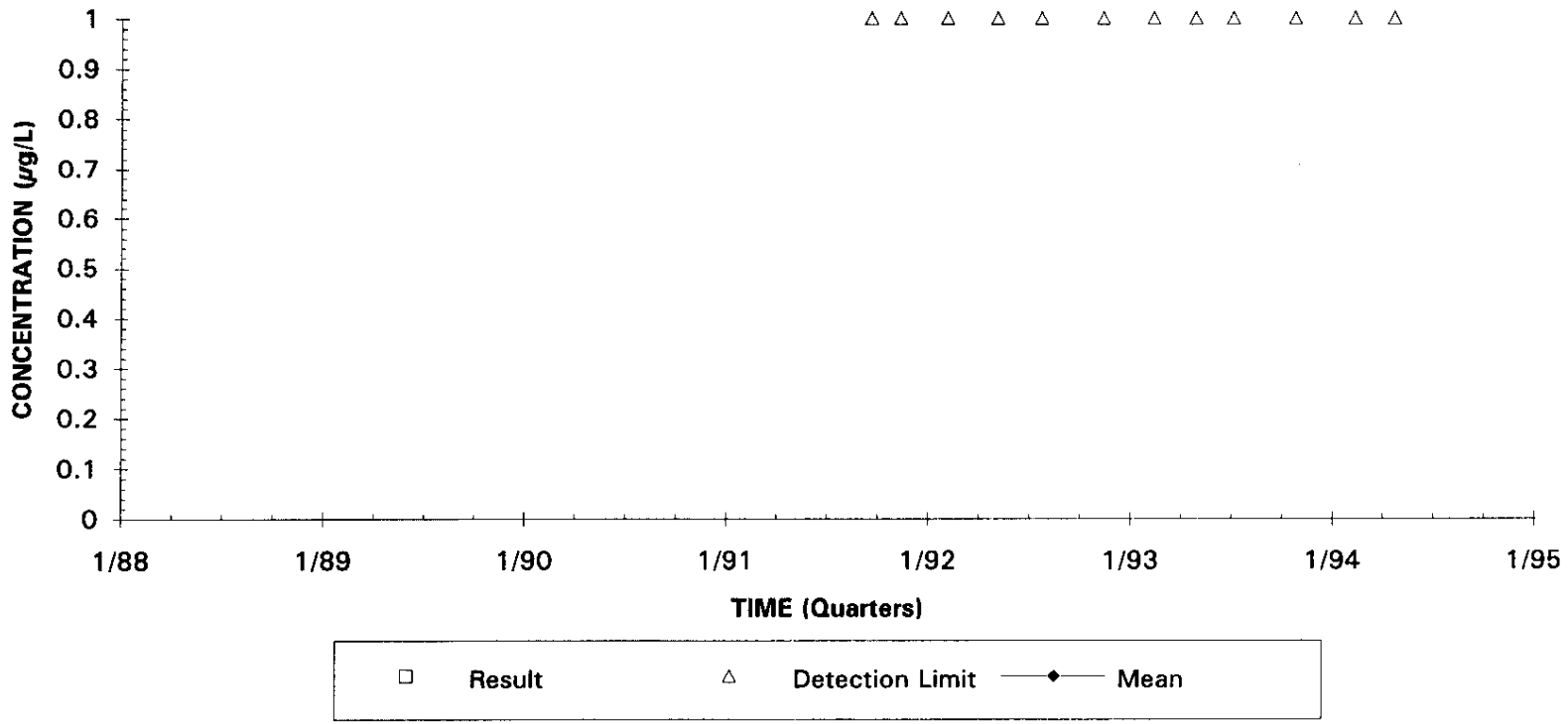
Tetrachloroethylene Concentrations
Well AMB 11D



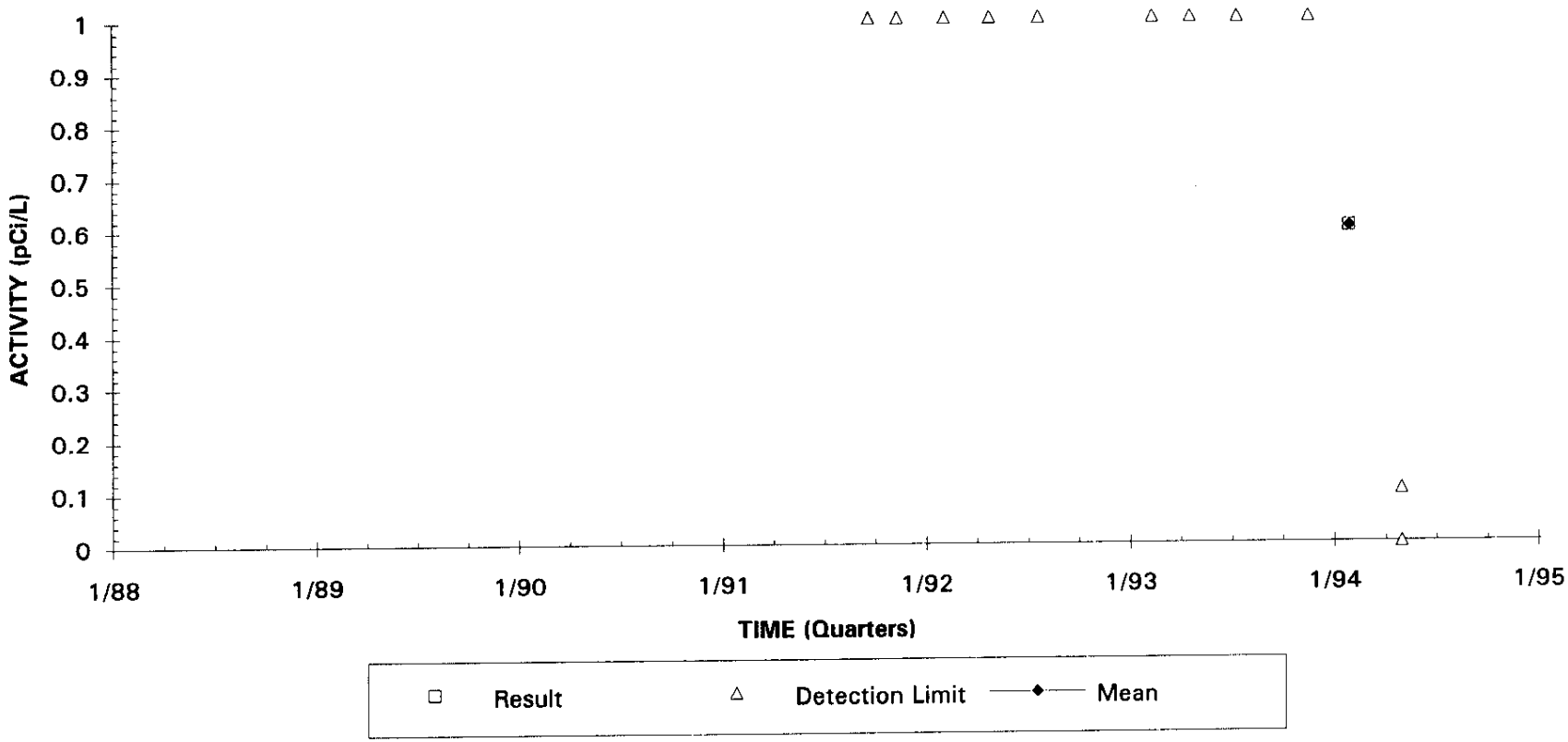
Tetrachloroethylene Concentrations
Well AMB 12D



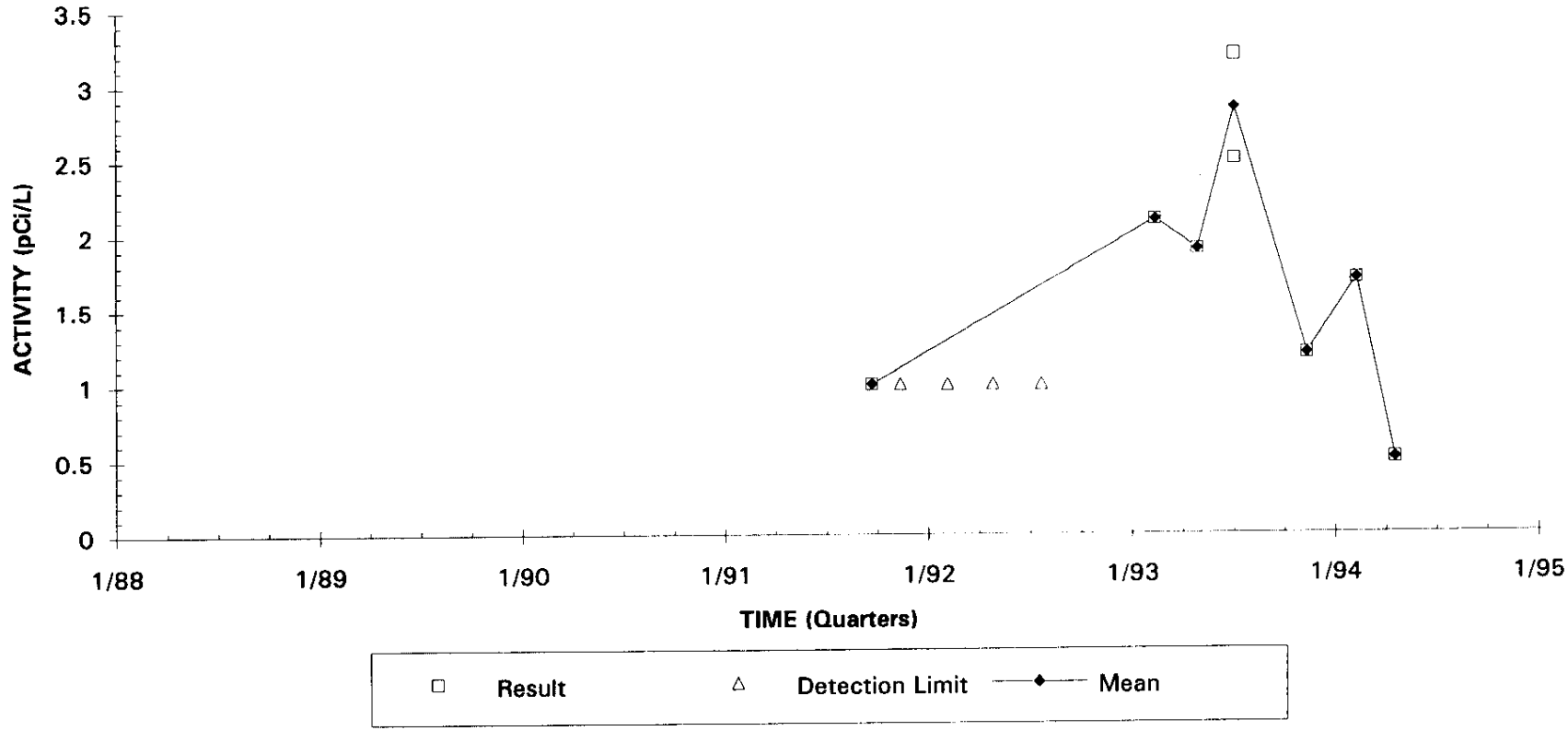
Tetrachloroethylene Concentrations
Well AMB 13AR



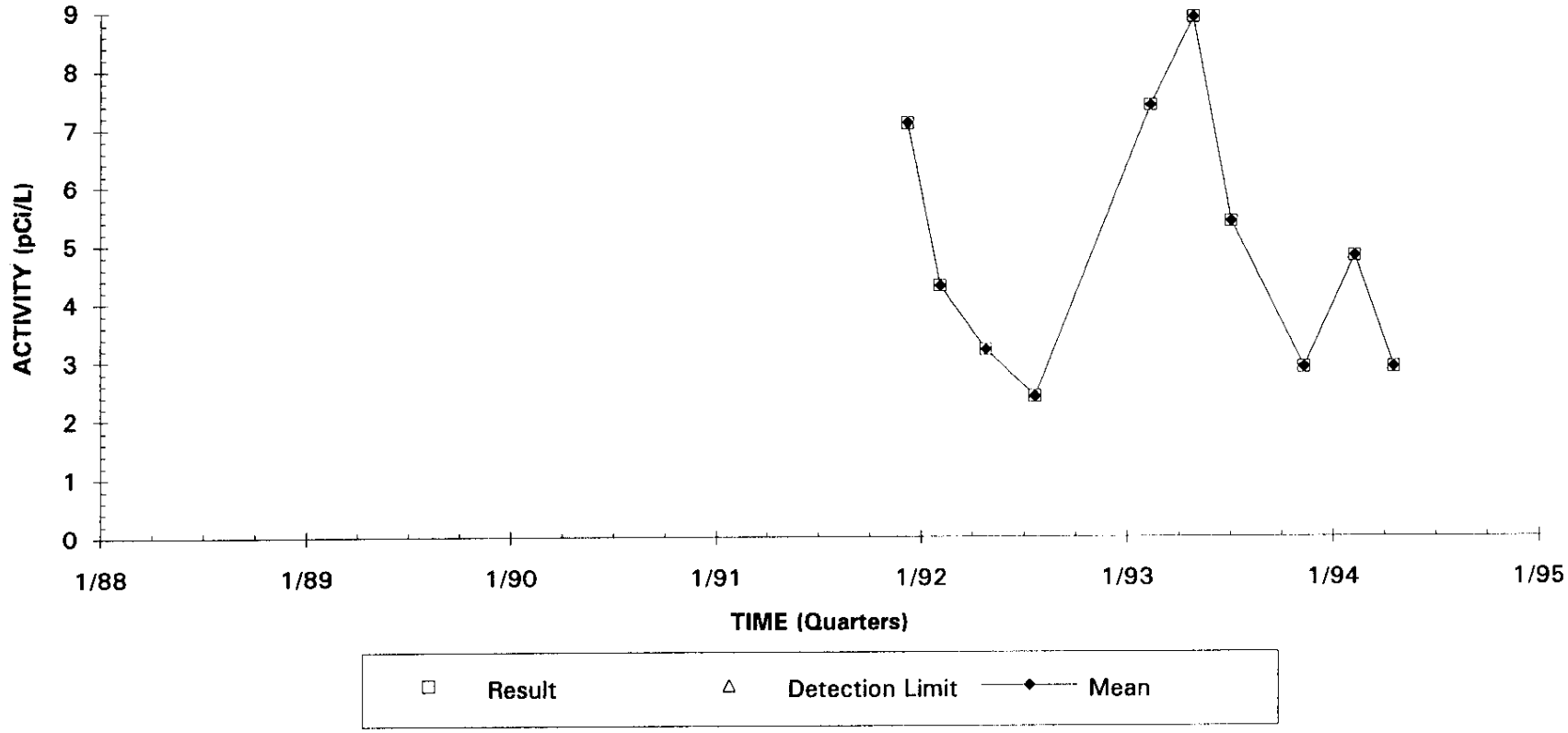
Total Alpha-Emitting Radium Activities
Well AMB 4A



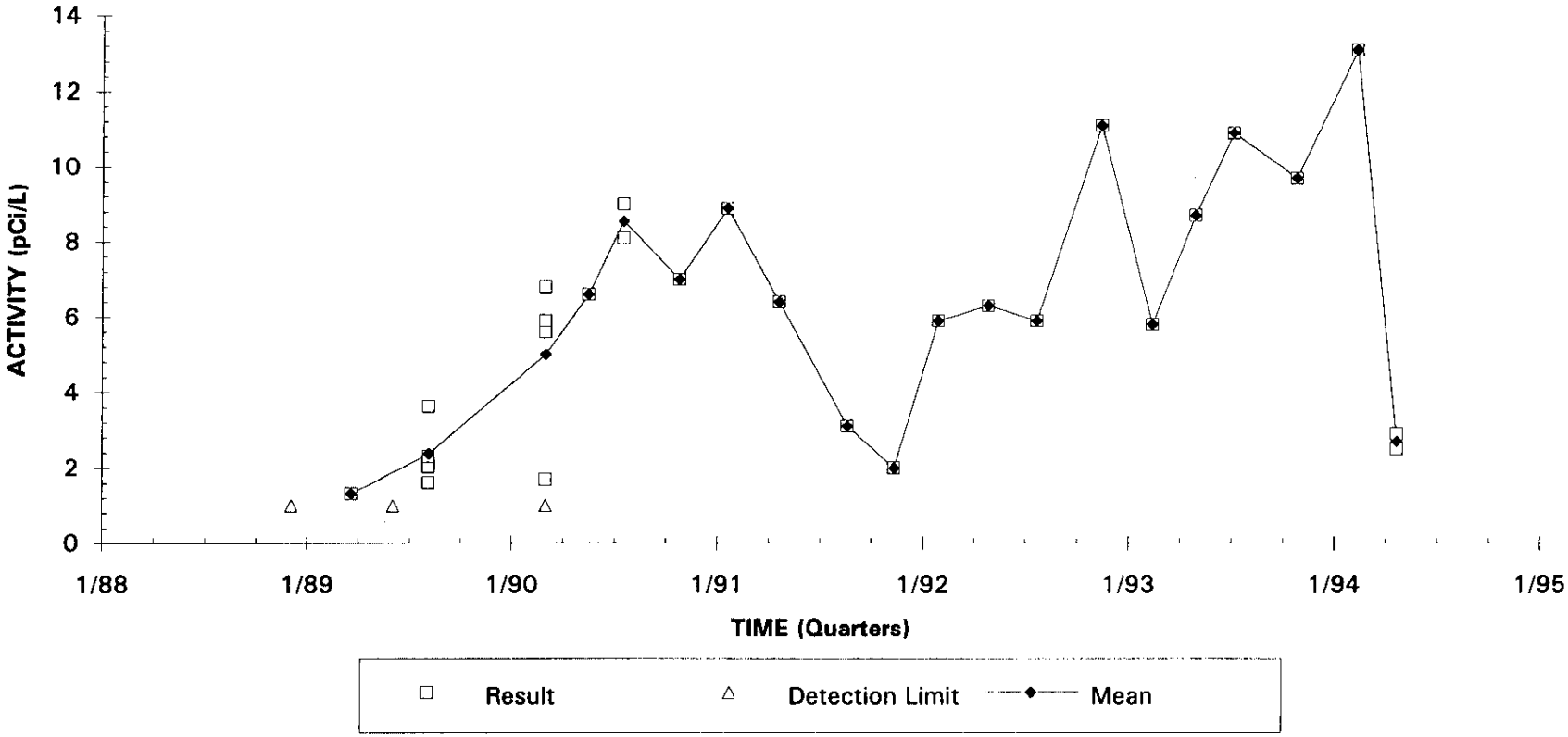
Total Alpha-Emitting Radium Activities
Well AMB 4B



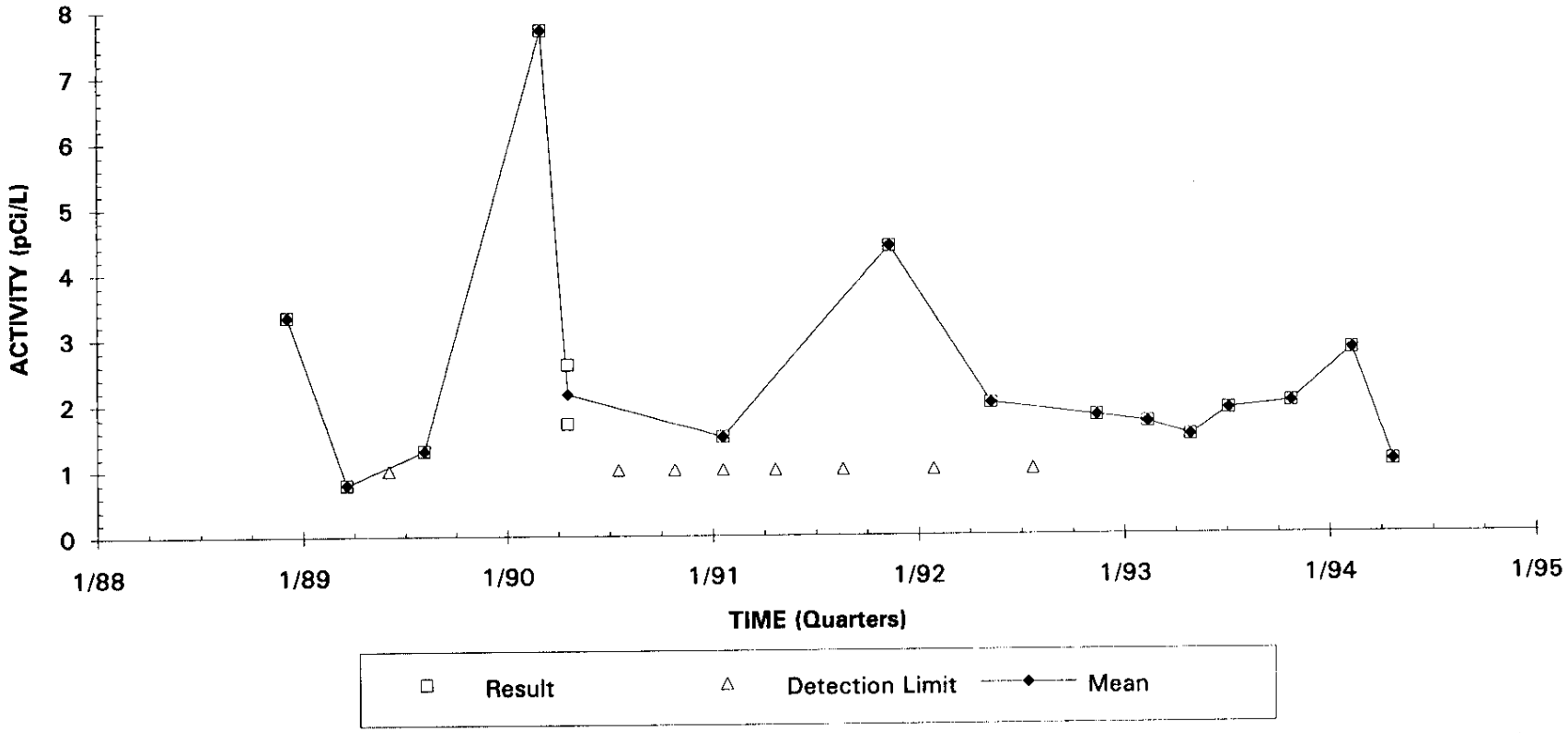
Total Alpha-Emitting Radium Activities
Well AMB 4D



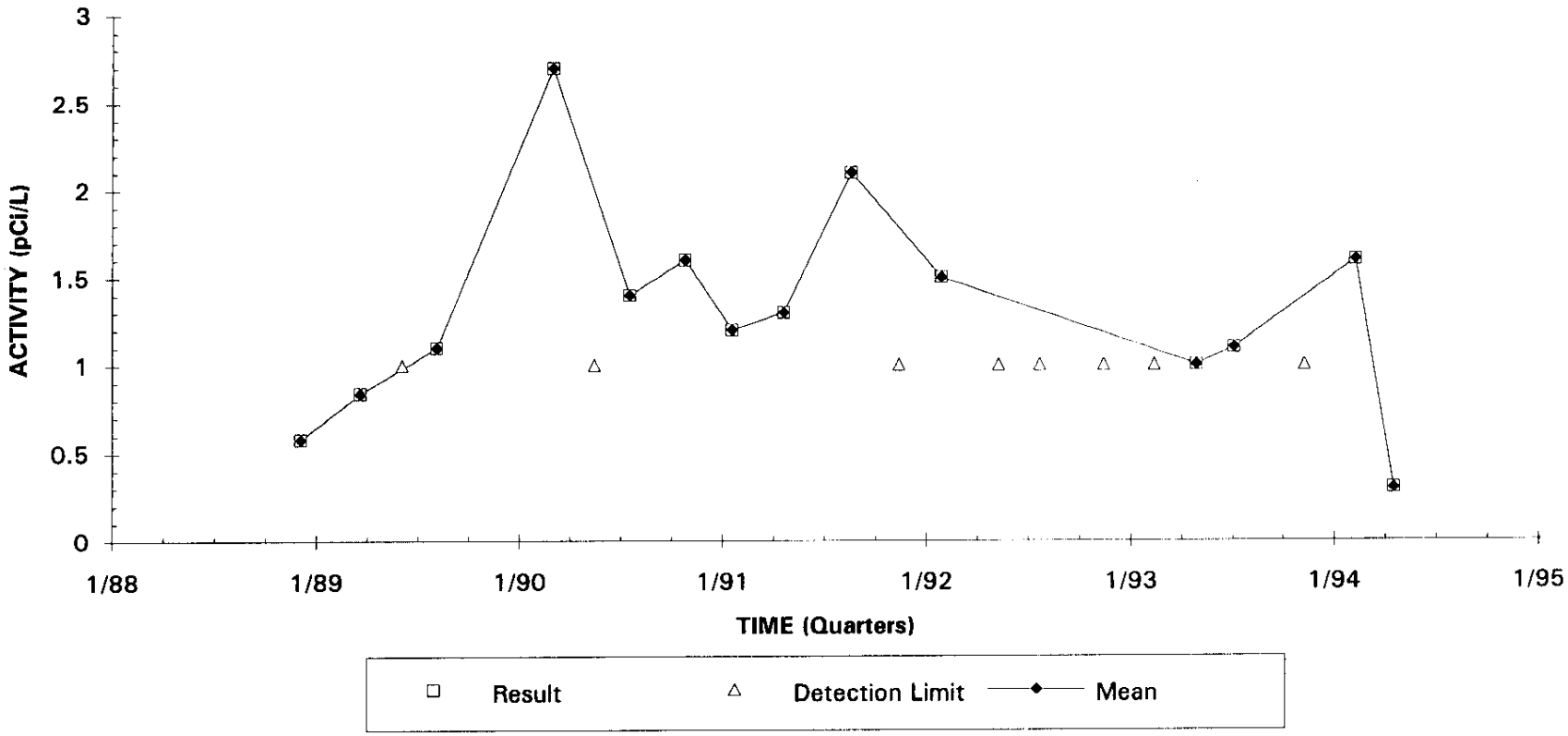
Total Alpha-Emitting Radium Activities
Well AMB 5



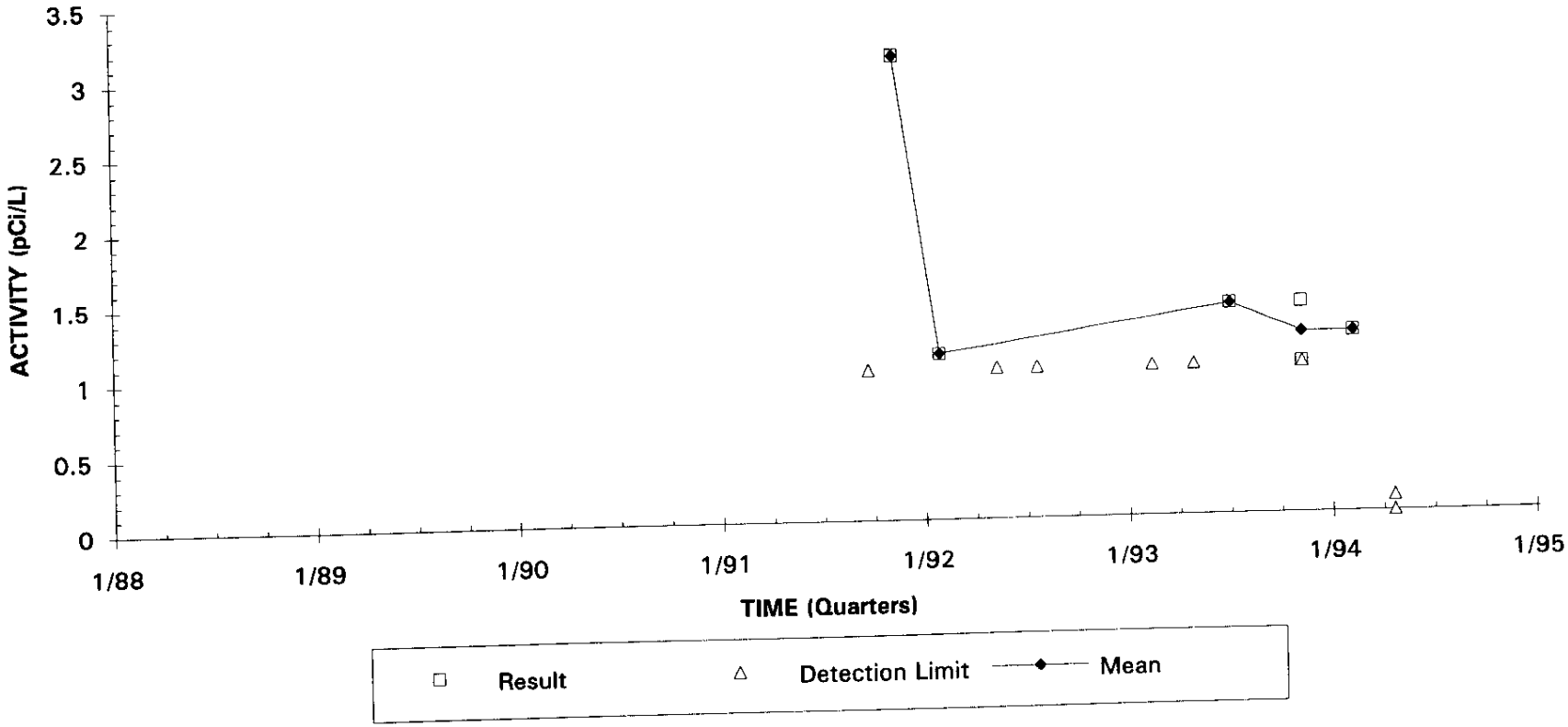
Total Alpha-Emitting Radium Activities
Well AMB 6



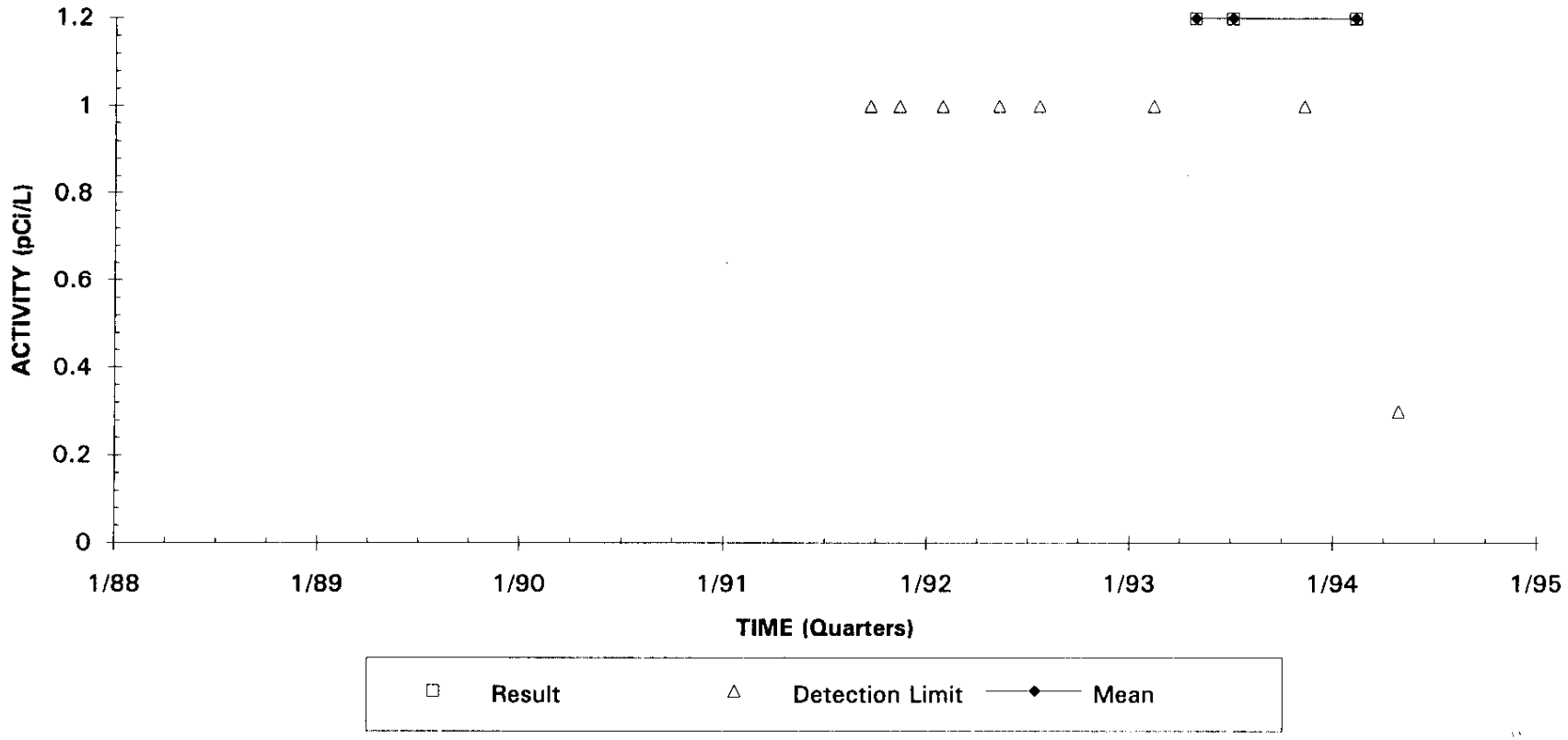
Total Alpha-Emitting Radium Activities
Well AMB 7



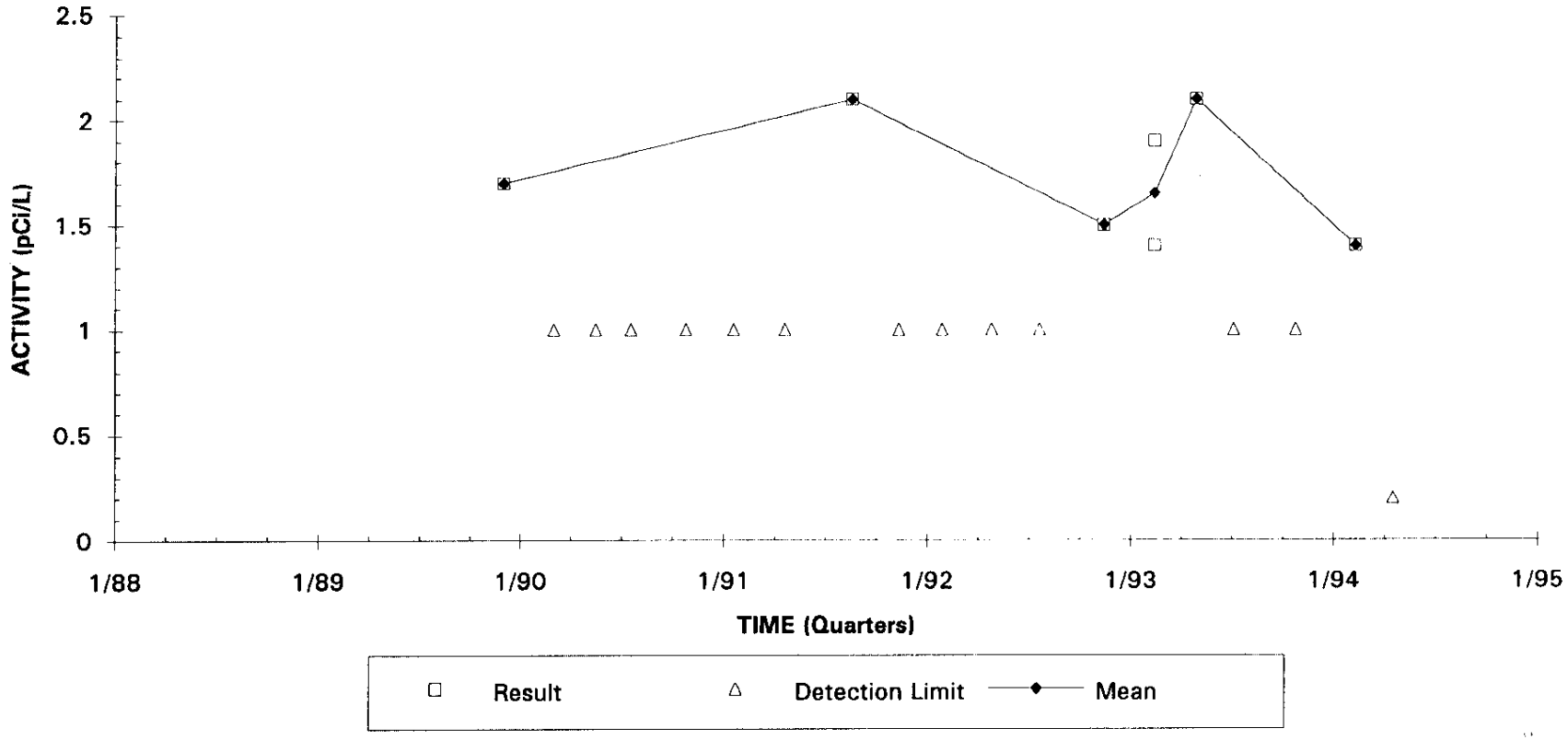
Total Alpha-Emitting Radium Activities
Well AMB 7A



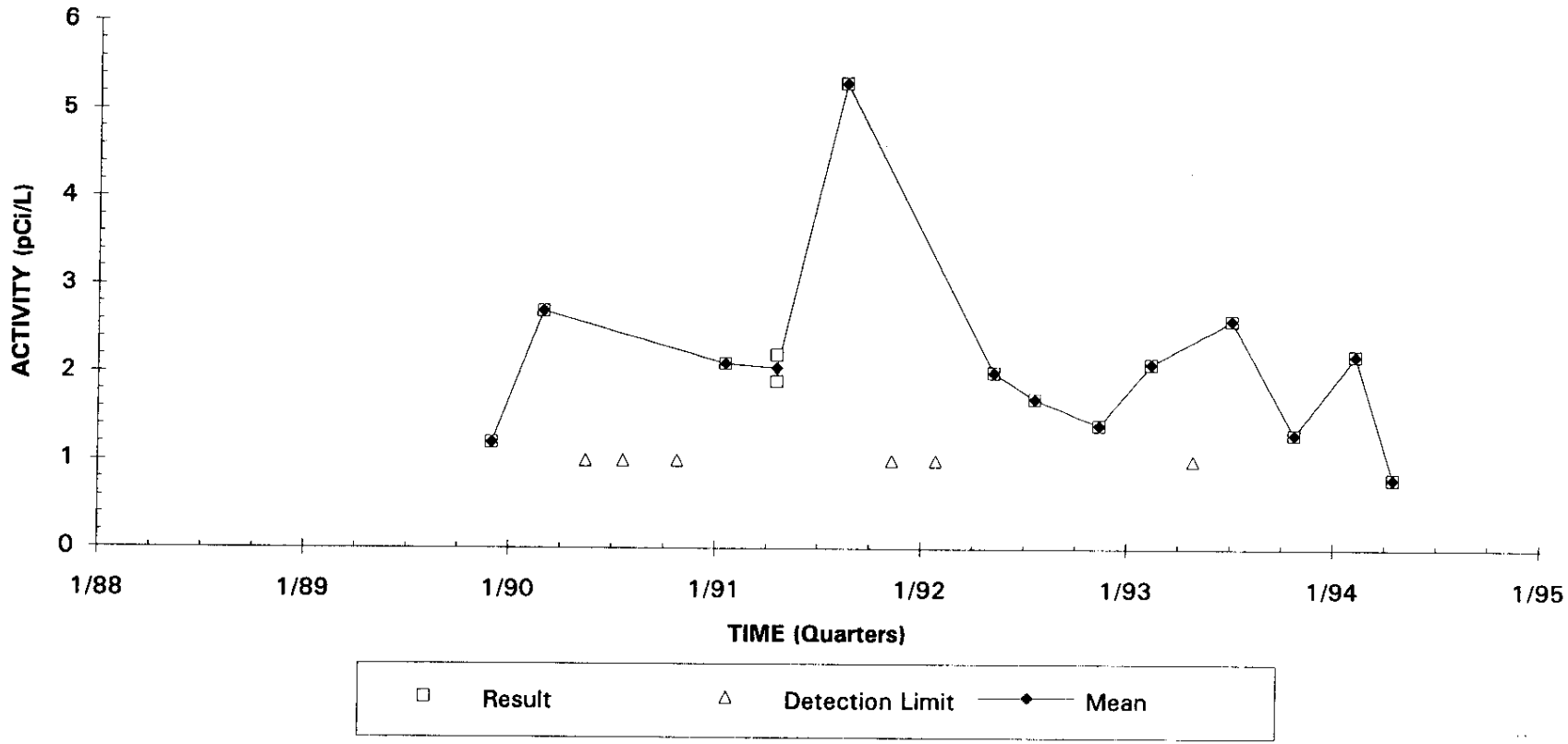
Total Alpha-Emitting Radium Activities
Well AMB 7B



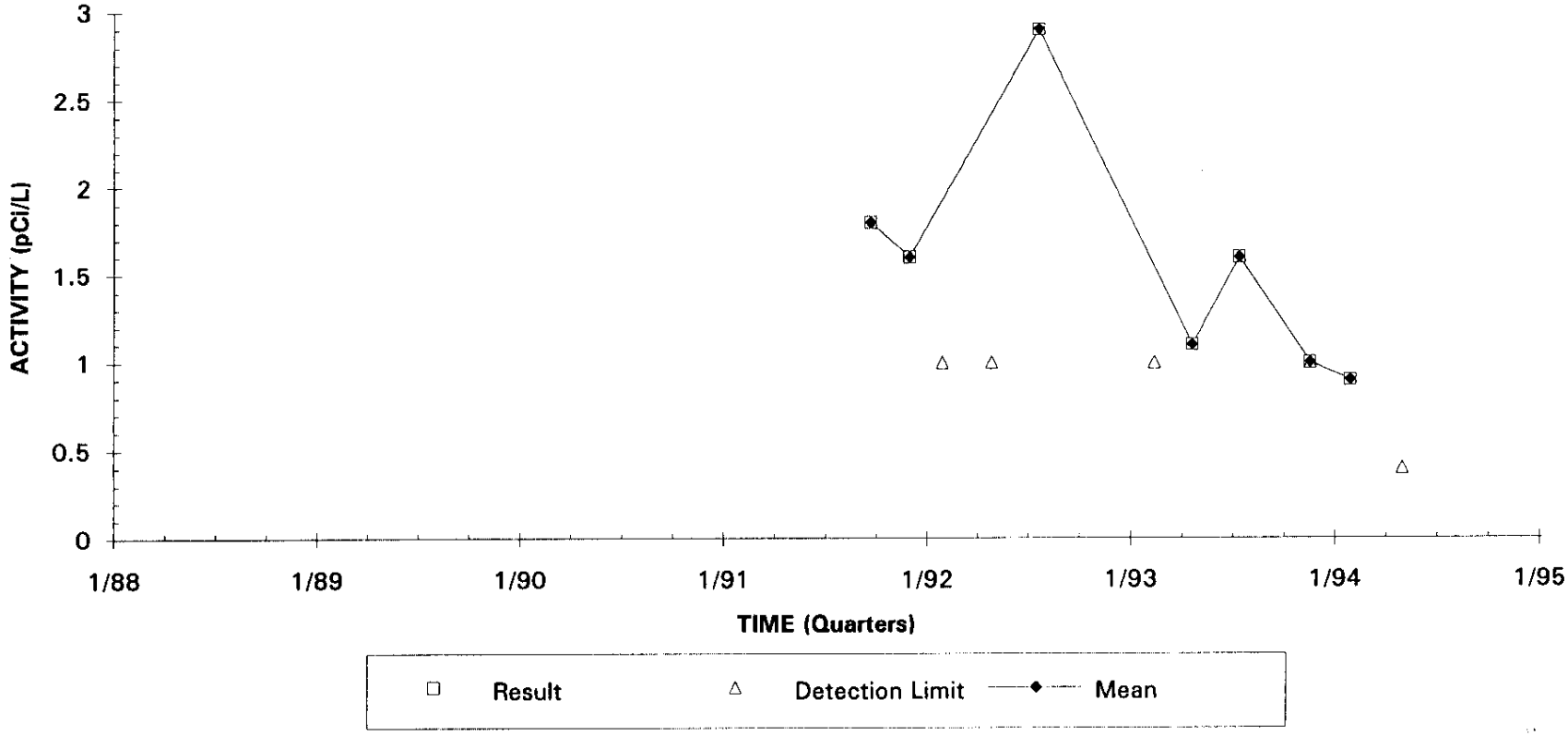
Total Alpha-Emitting Radium Activities
Well AMB 8D



Total Alpha-Emitting Radium Activities
Well AMB 9D



Total Alpha-Emitting Radium Activities
Well AMB 10A



Total Alpha-Emitting Radium Activities
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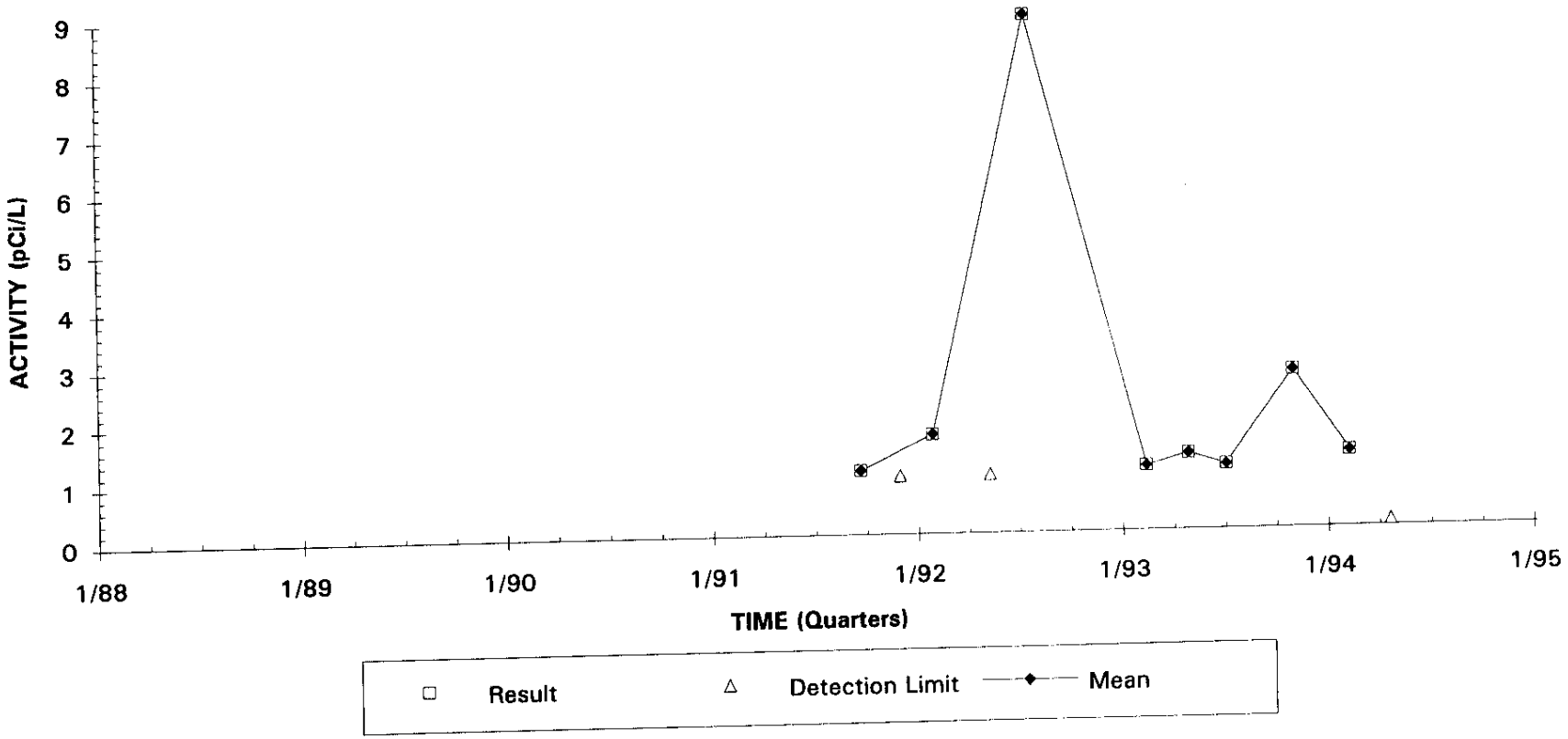

Total Alpha-Emitting Radium Activities
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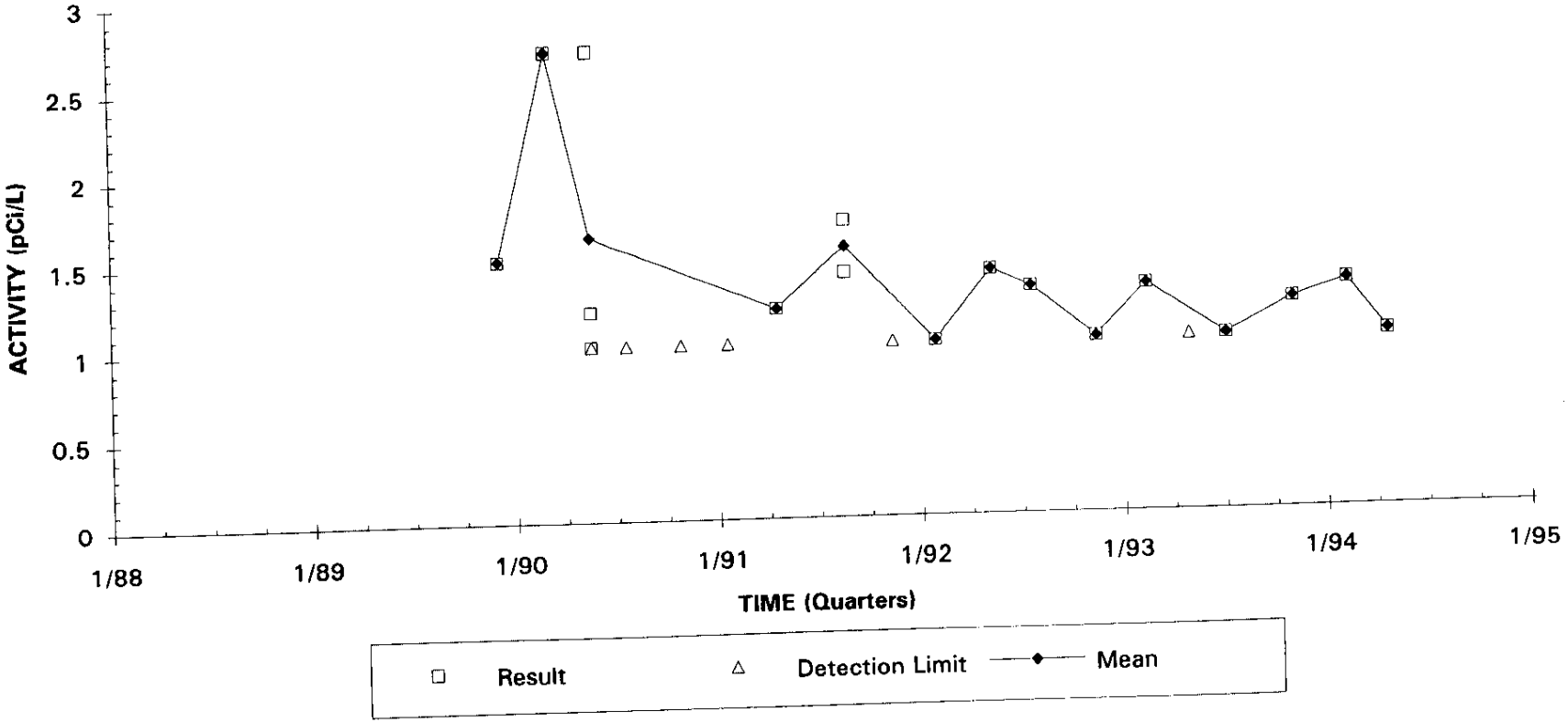
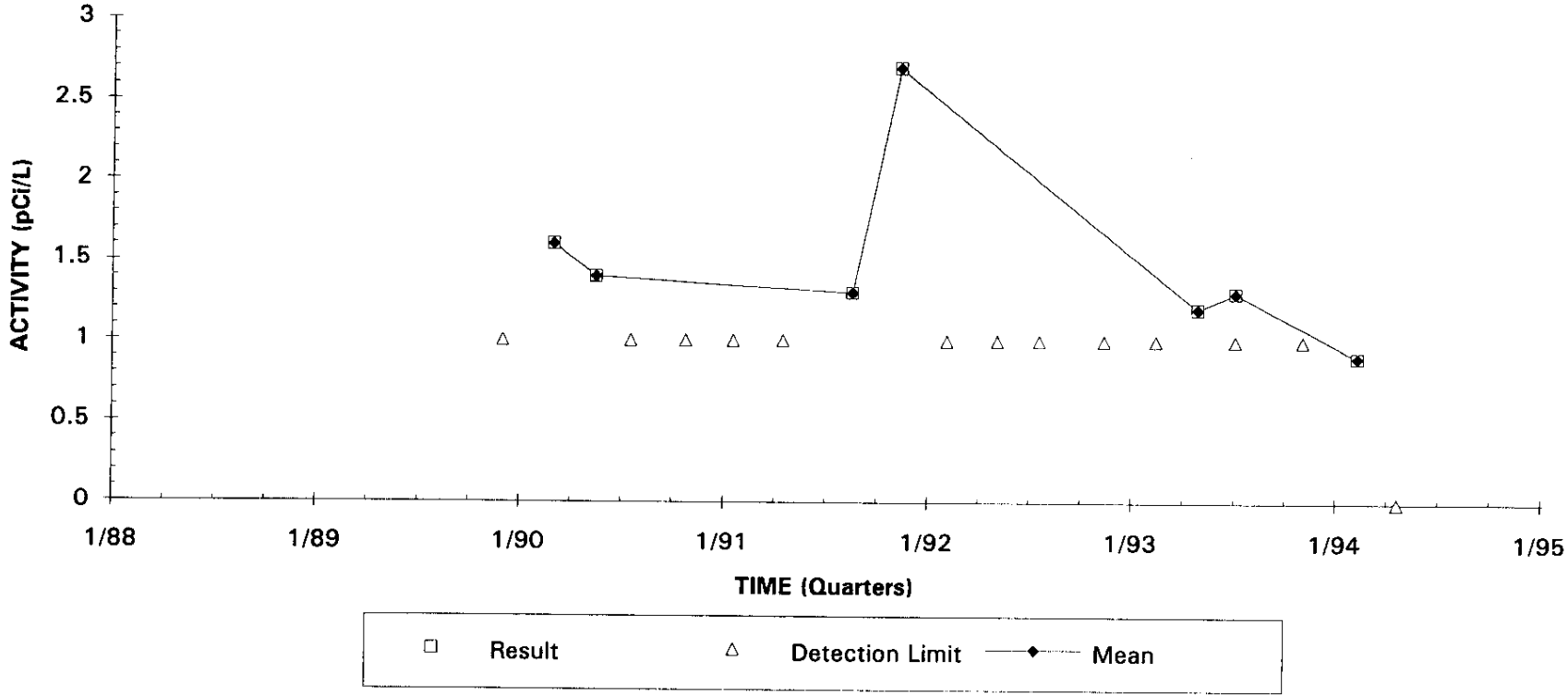


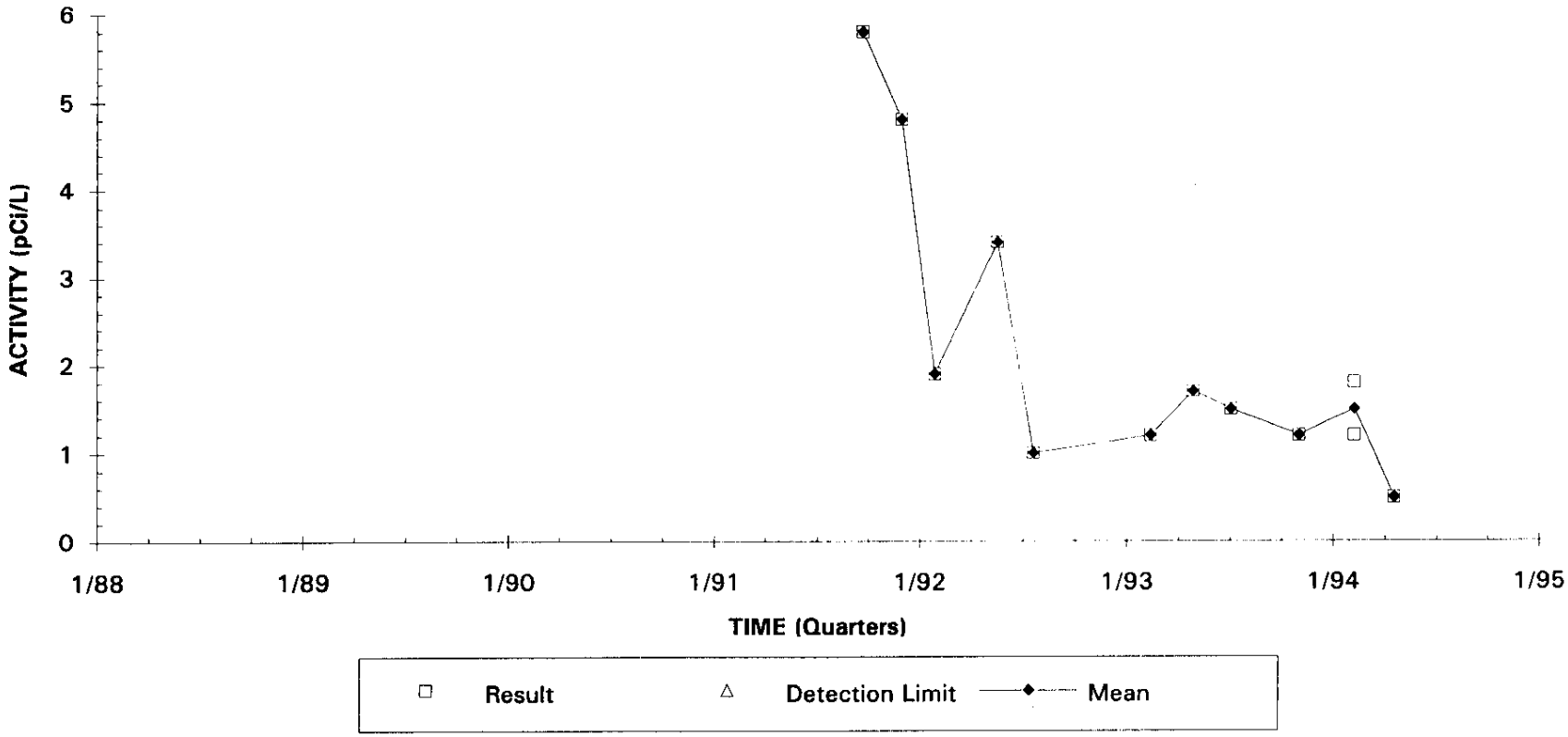
Second Quarter 1994

Metallurgical Laboratory HWMF

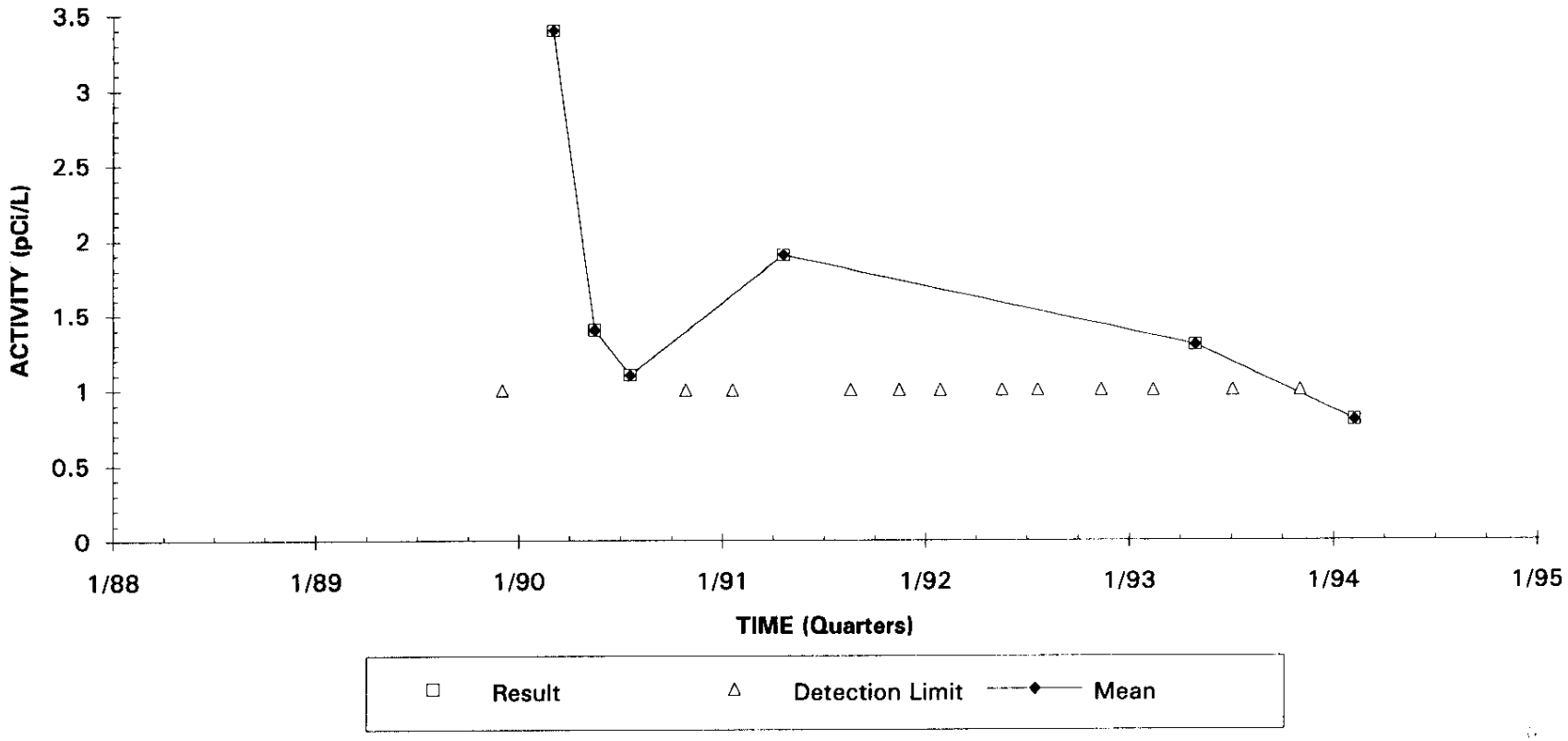
Total Alpha-Emitting Radium Activities
Well AMB 10DD



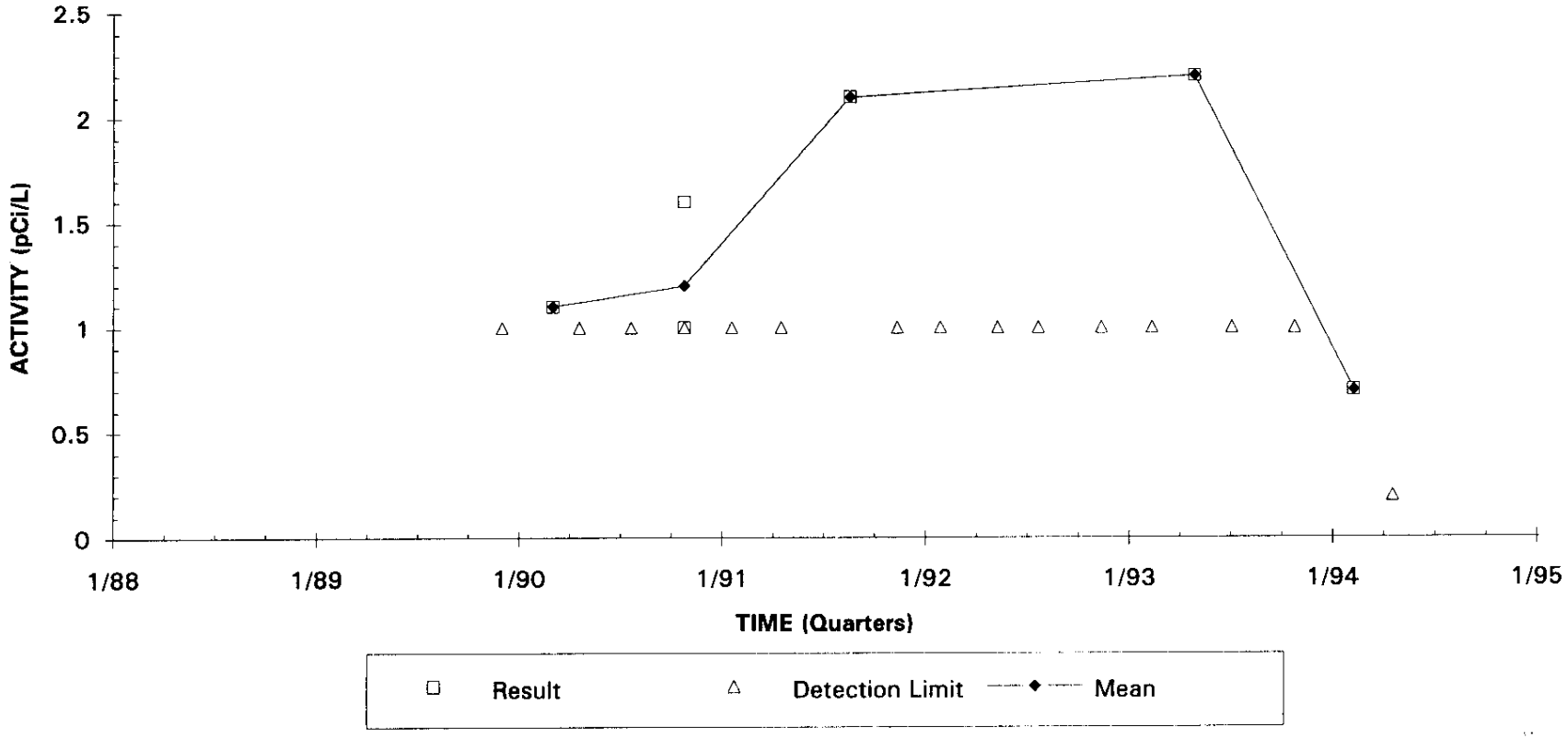
Total Alpha-Emitting Radium Activities
Well AMB 11B



Total Alpha-Emitting Radium Activities
Well AMB 11D



Total Alpha-Emitting Radium Activities
Well AMB 12D



Total Alpha-Emitting Radium Activities
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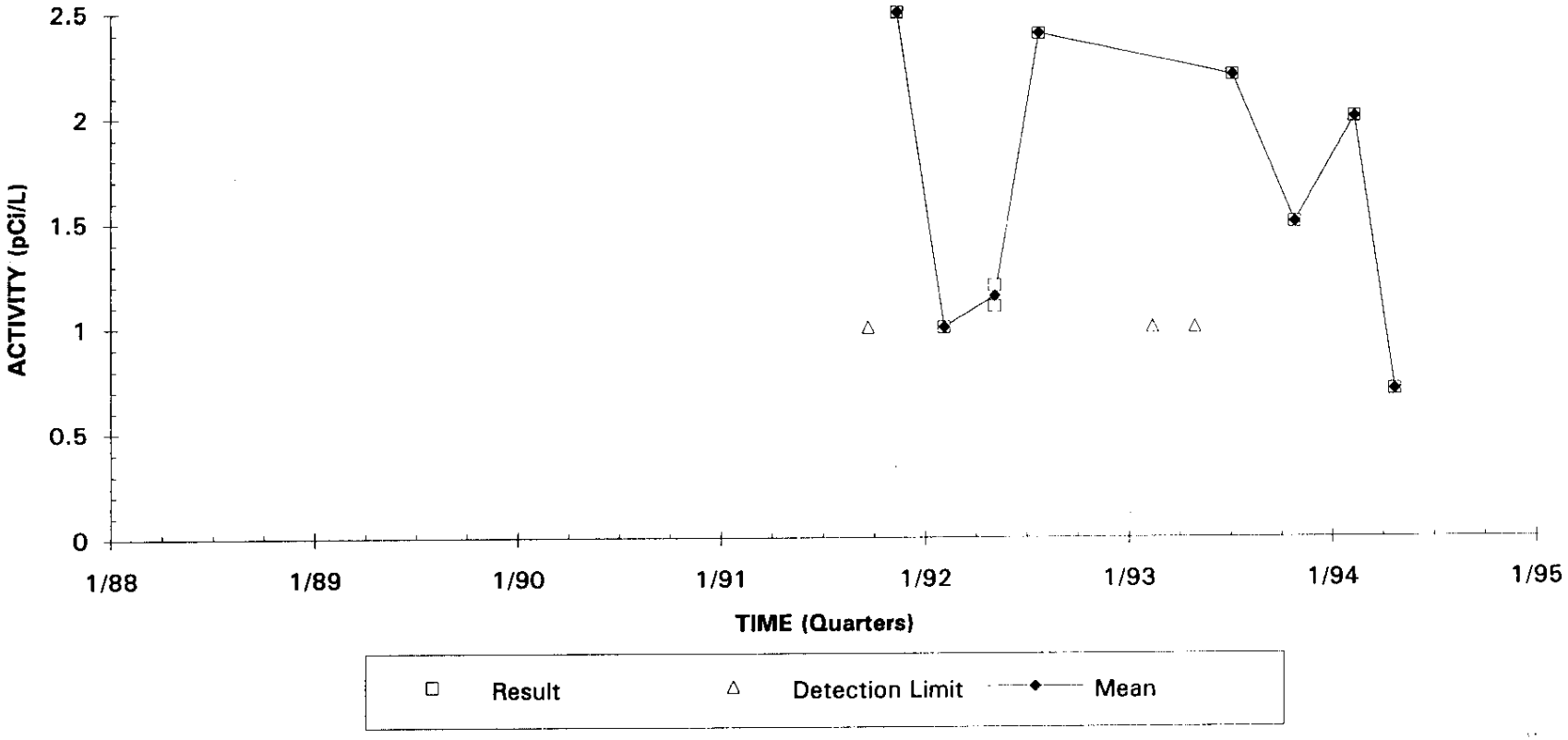
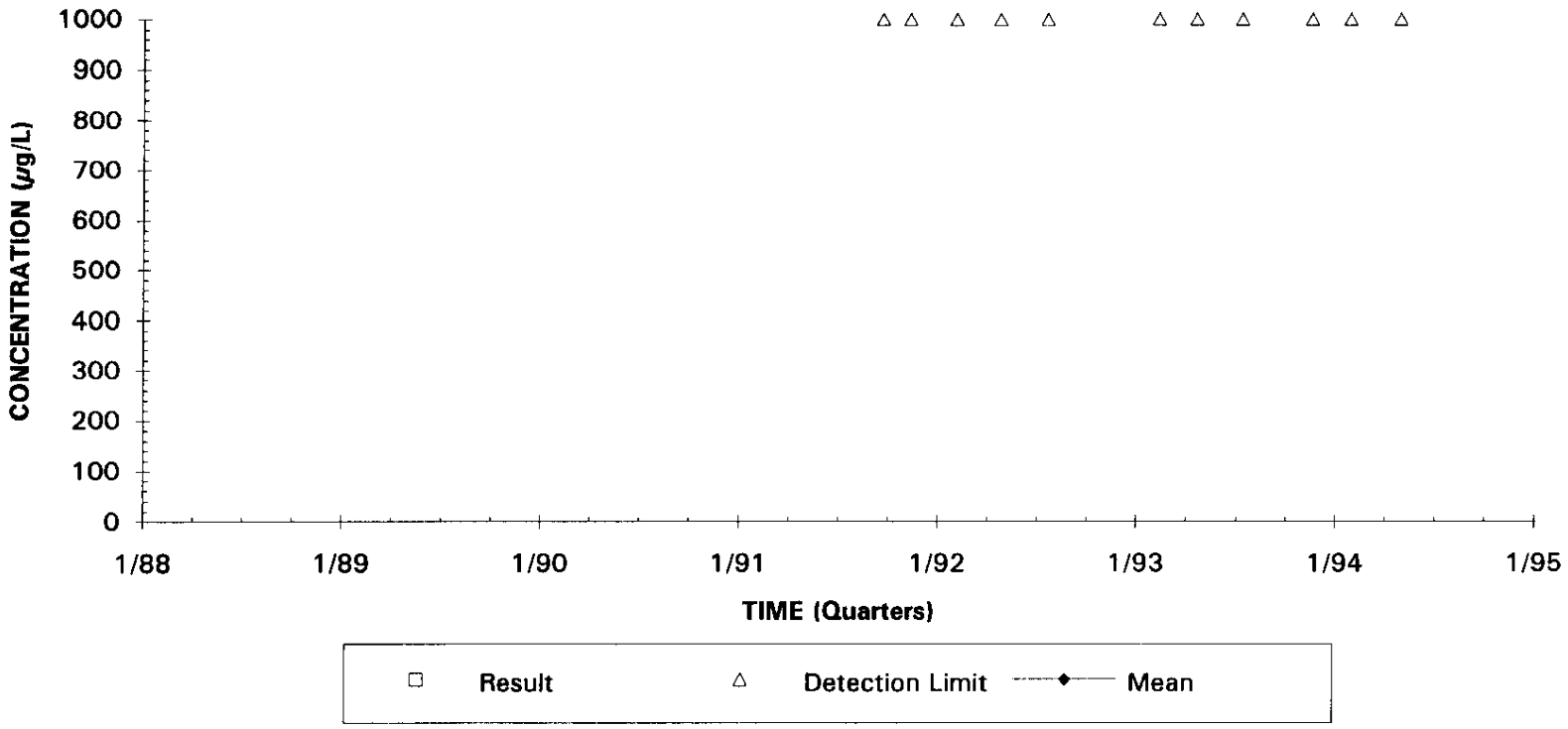
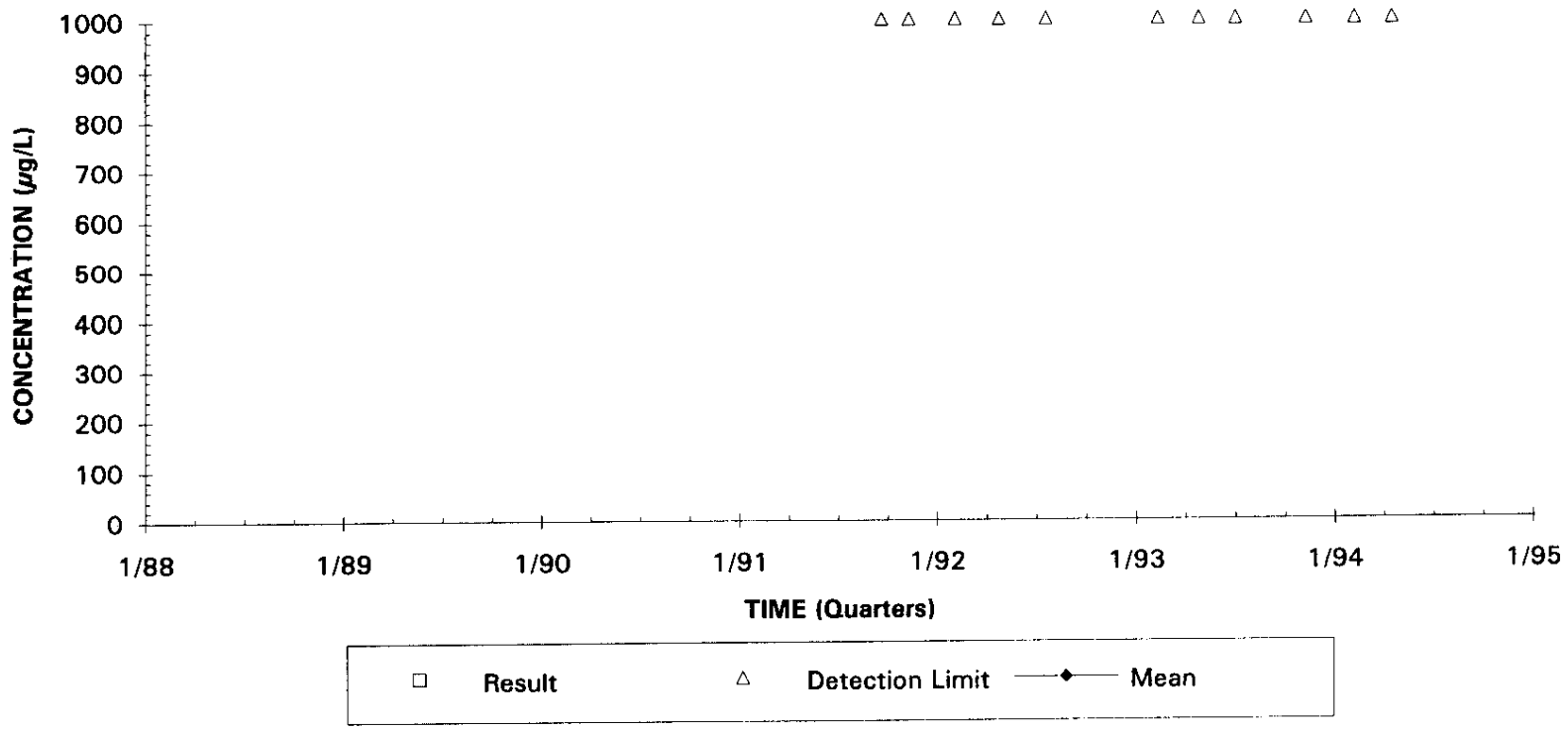


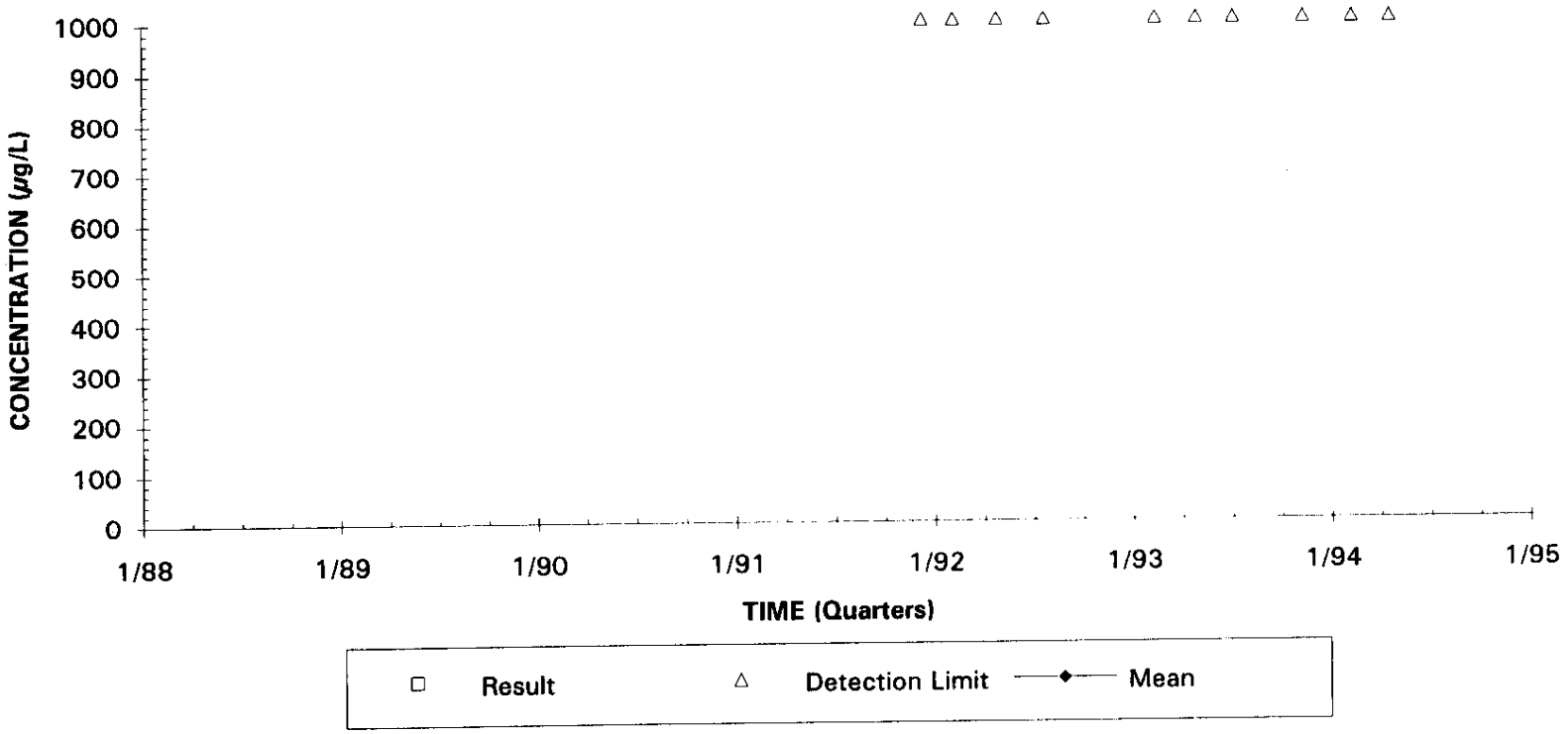
Total Organic Carbon Concentrations
Well AMB 4A



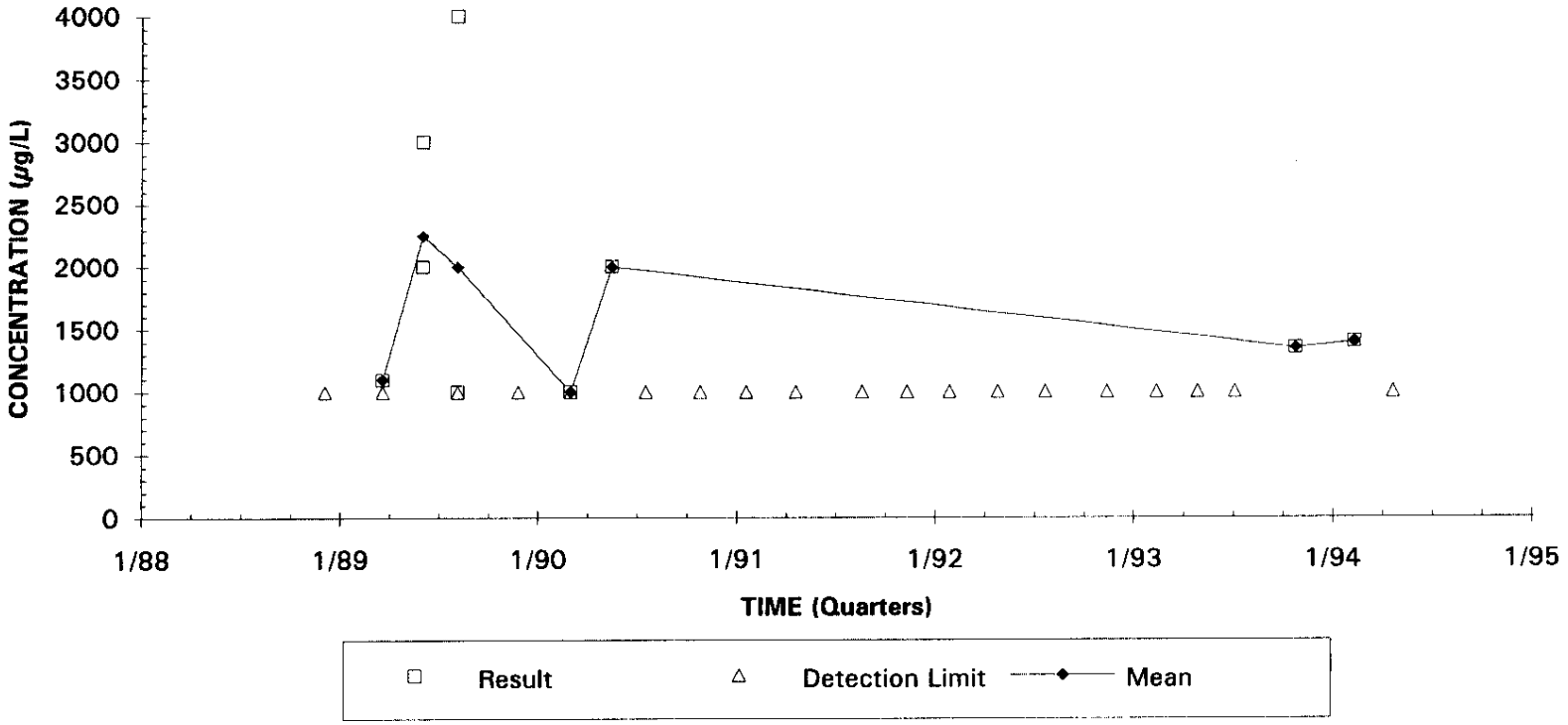
Total Organic Carbon Concentrations
Well AMB 4B



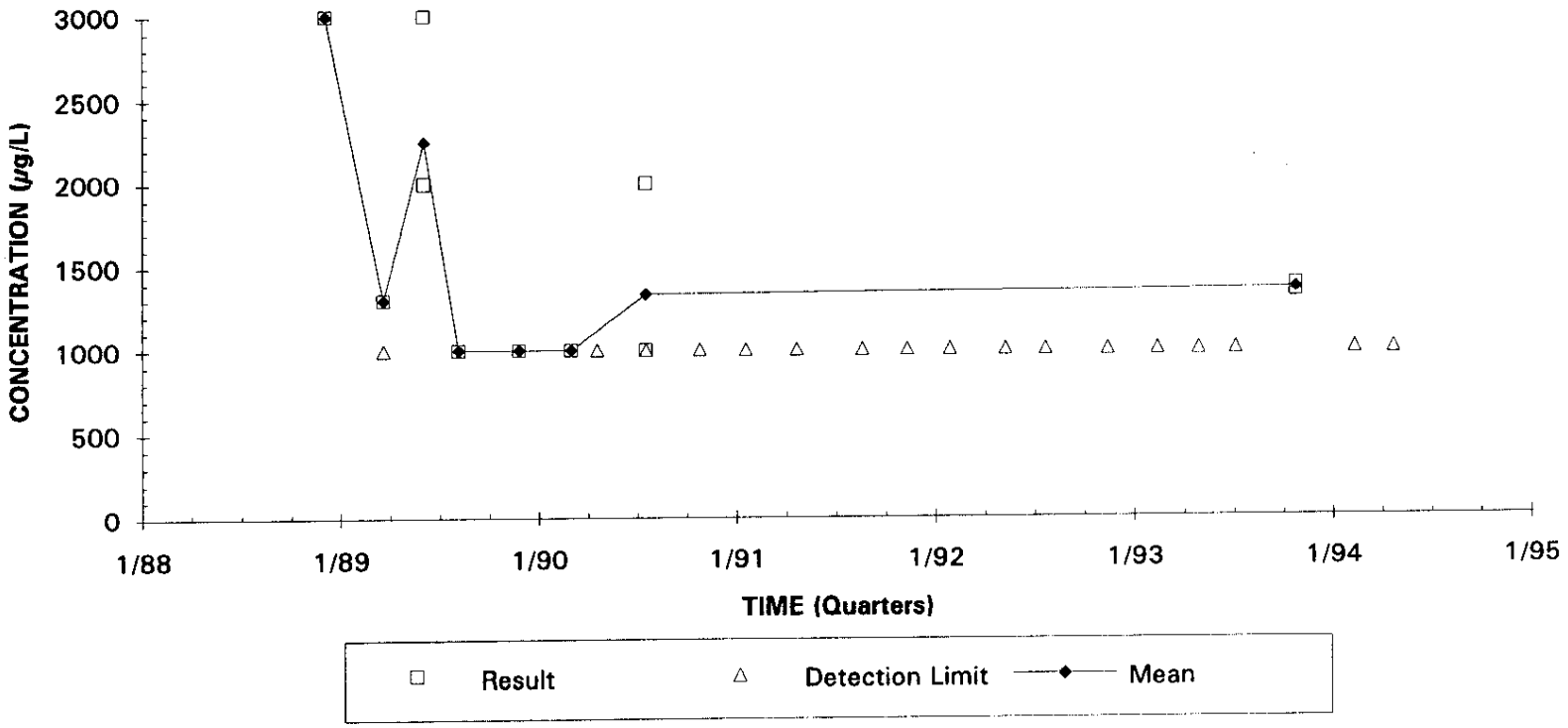
Total Organic Carbon Concentrations
Well AMB 4D



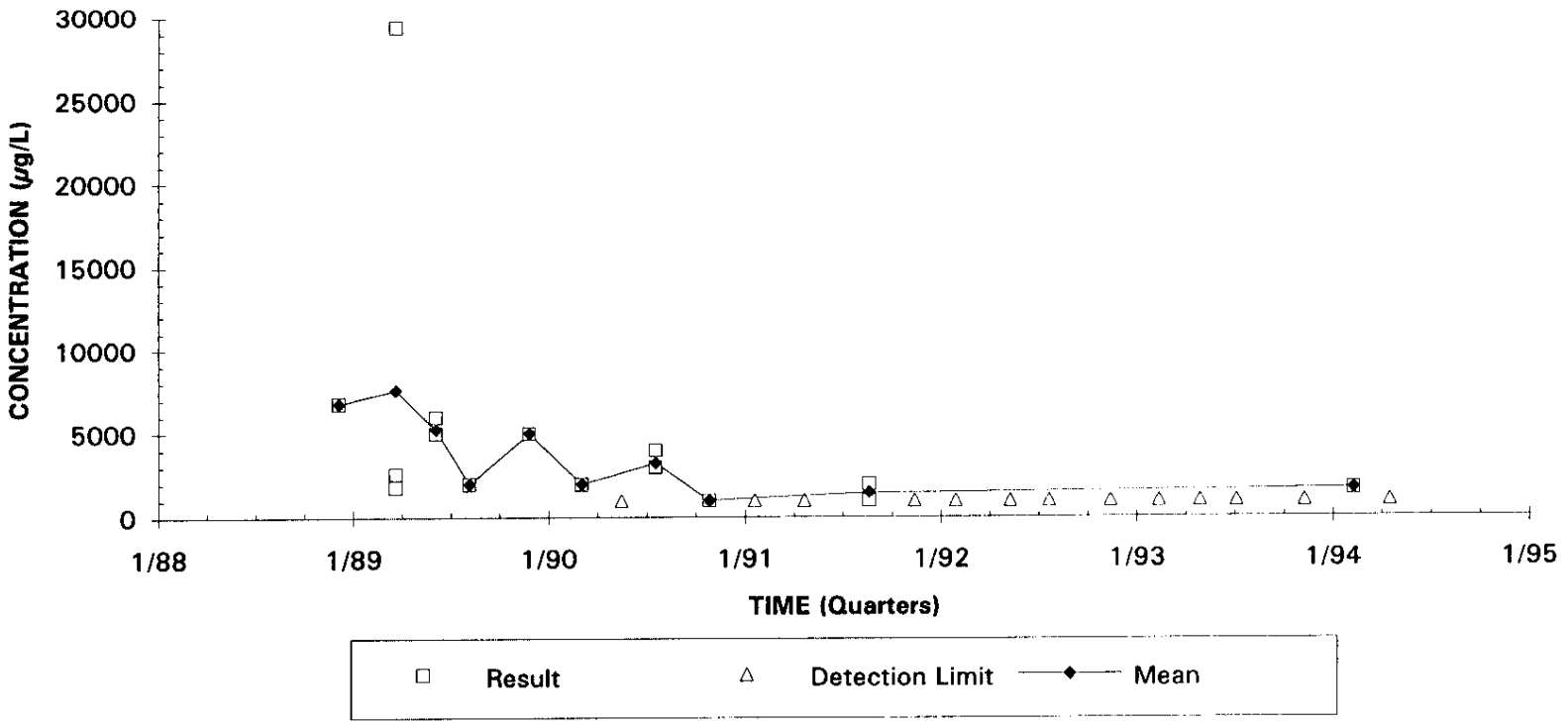
Total Organic Carbon Concentrations
Well AMB 5



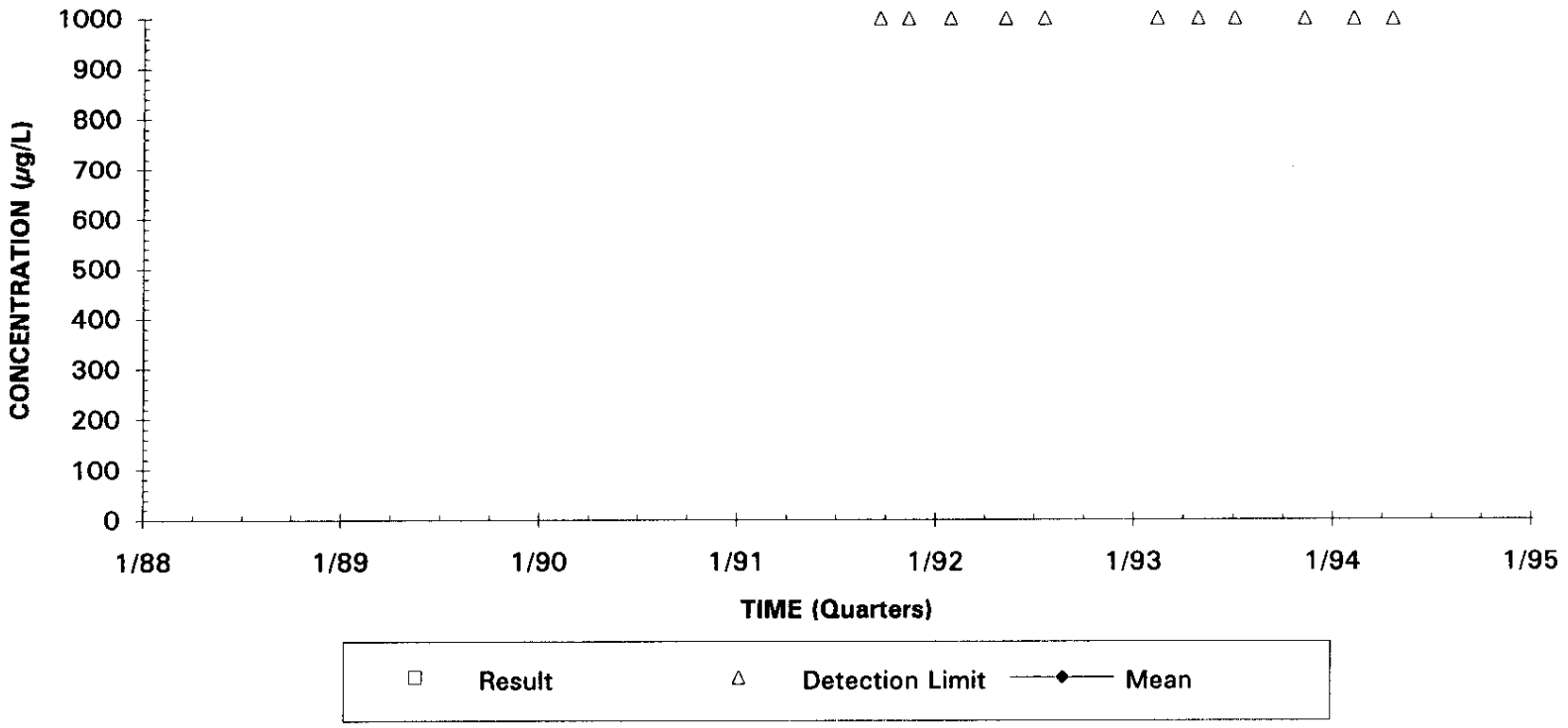
Total Organic Carbon Concentrations
Well AMB 6



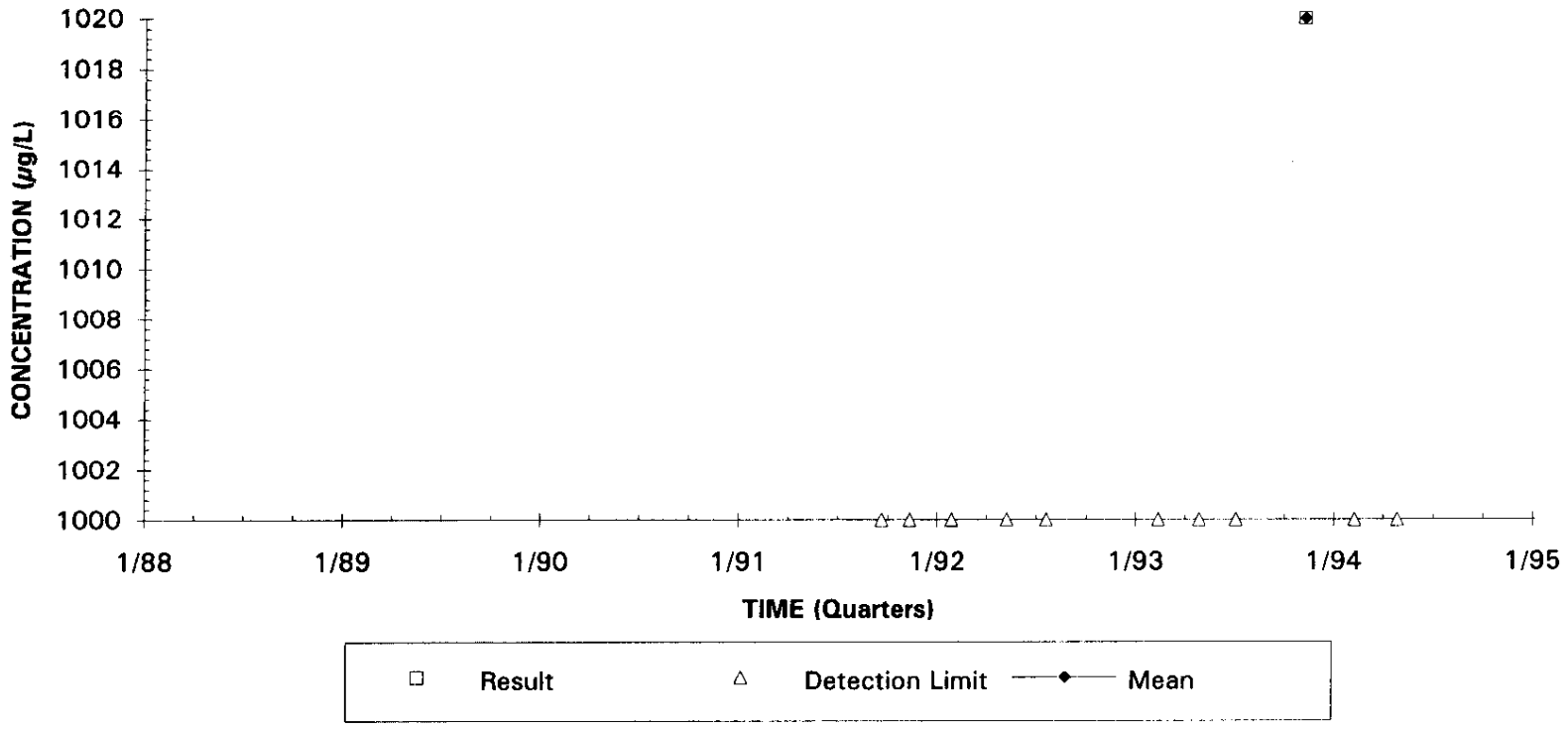
Total Organic Carbon Concentrations
Well AMB 7



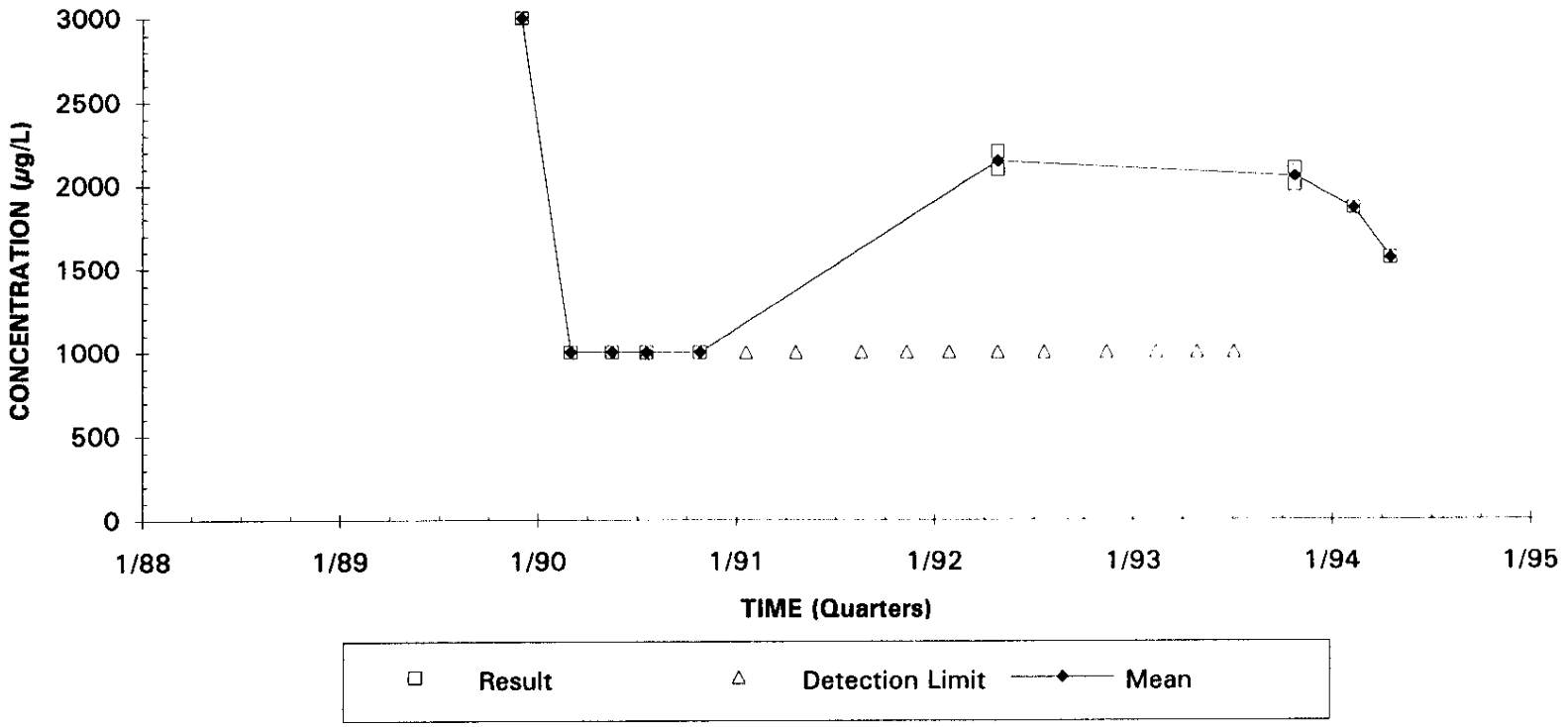
Total Organic Carbon Concentrations
Well AMB 7A



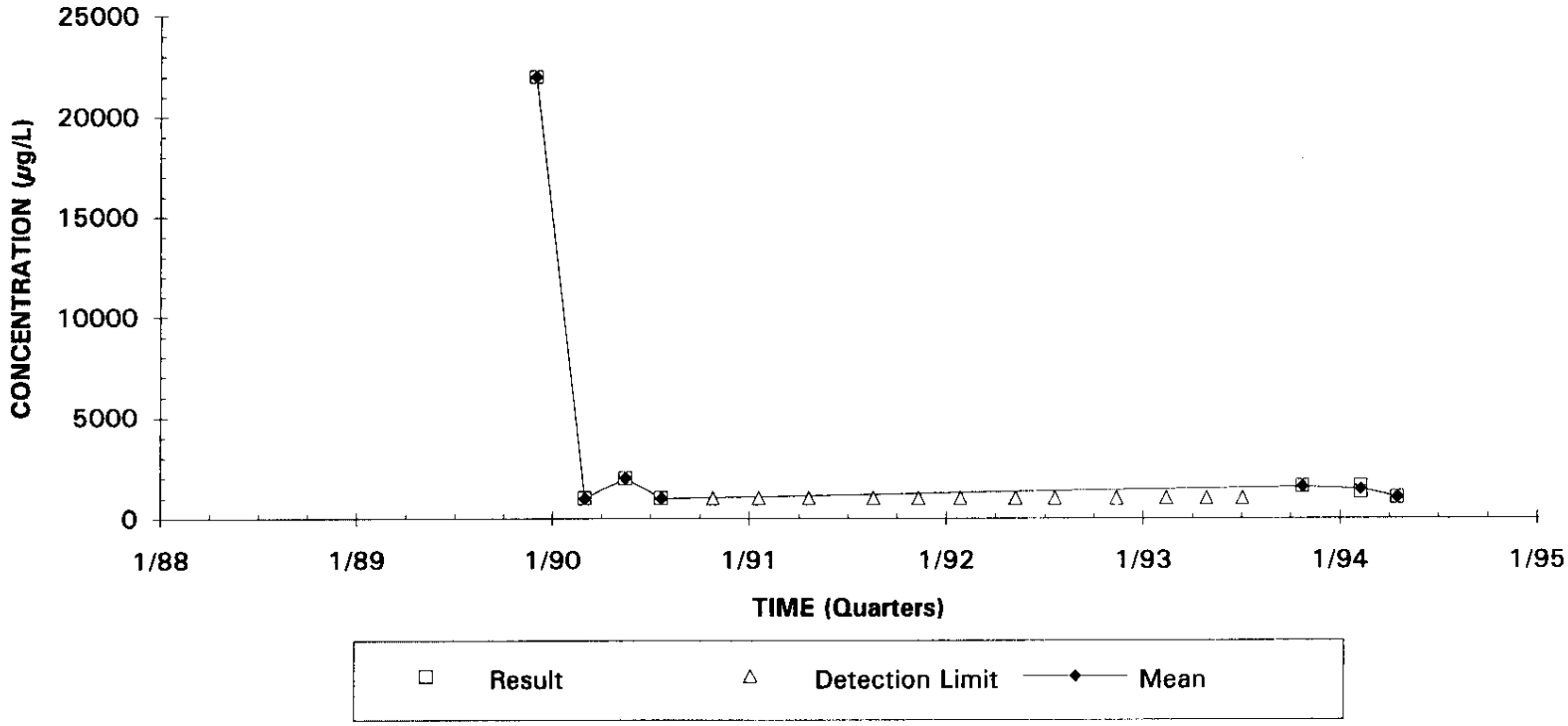
Total Organic Carbon Concentrations
Well AMB 7B



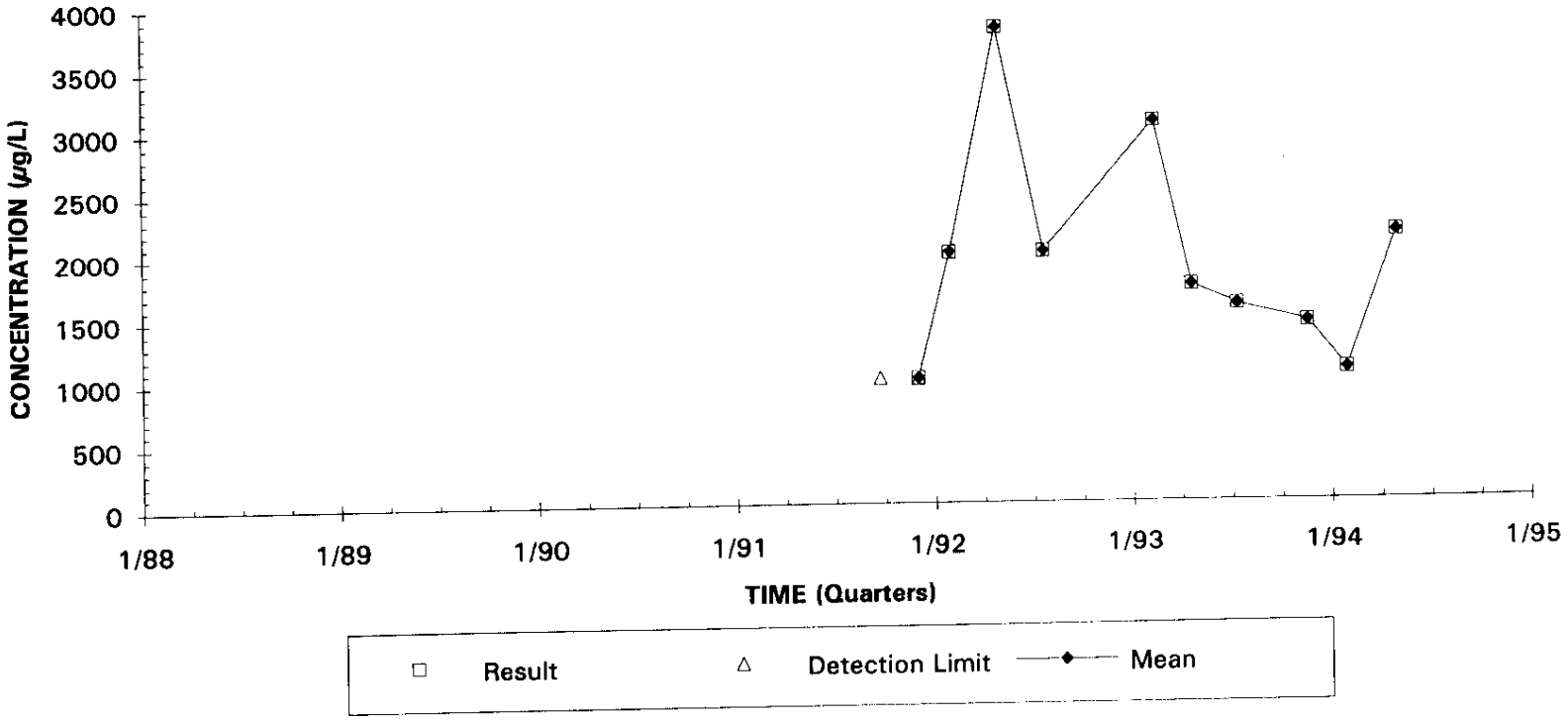
Total Organic Carbon Concentrations
Well AMB 8D



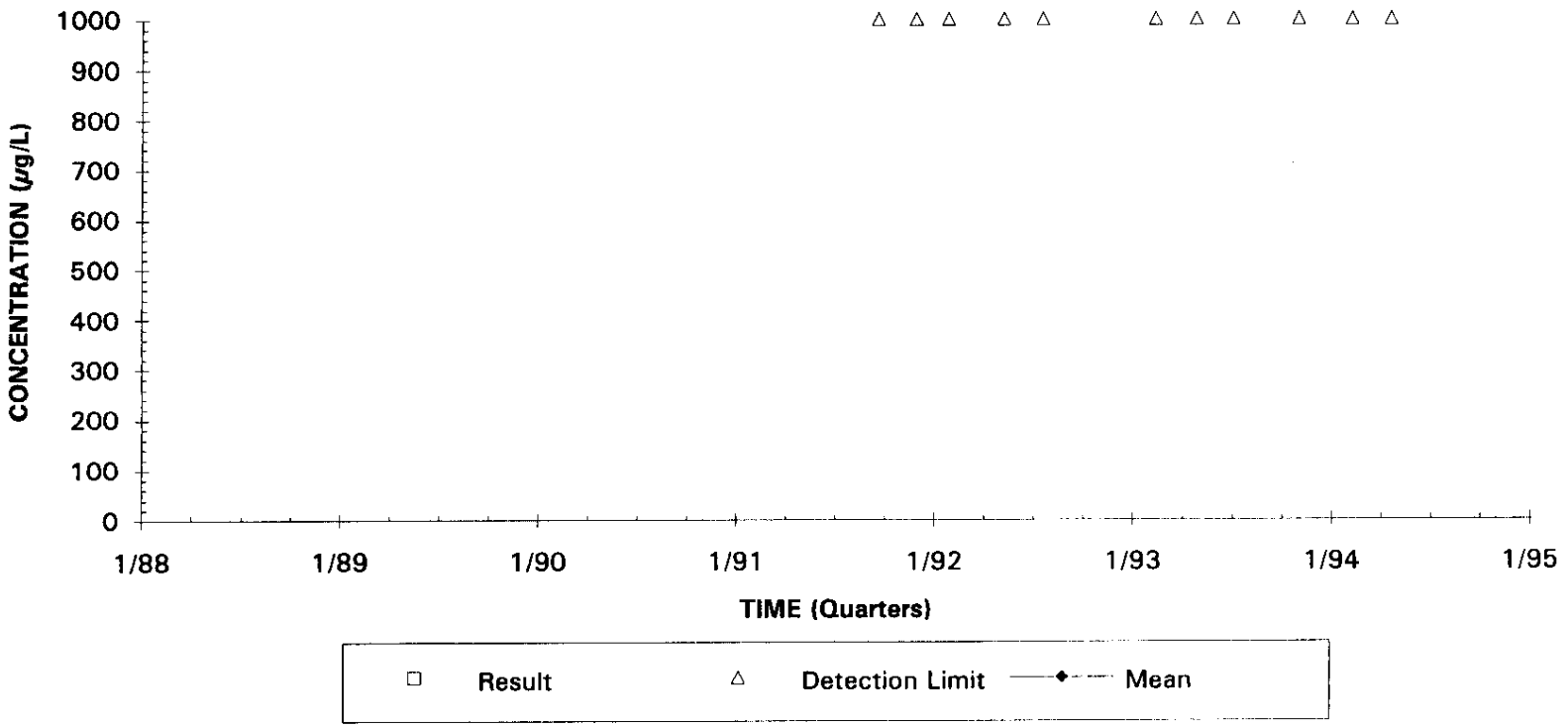
Total Organic Carbon Concentrations
Well AMB 9D



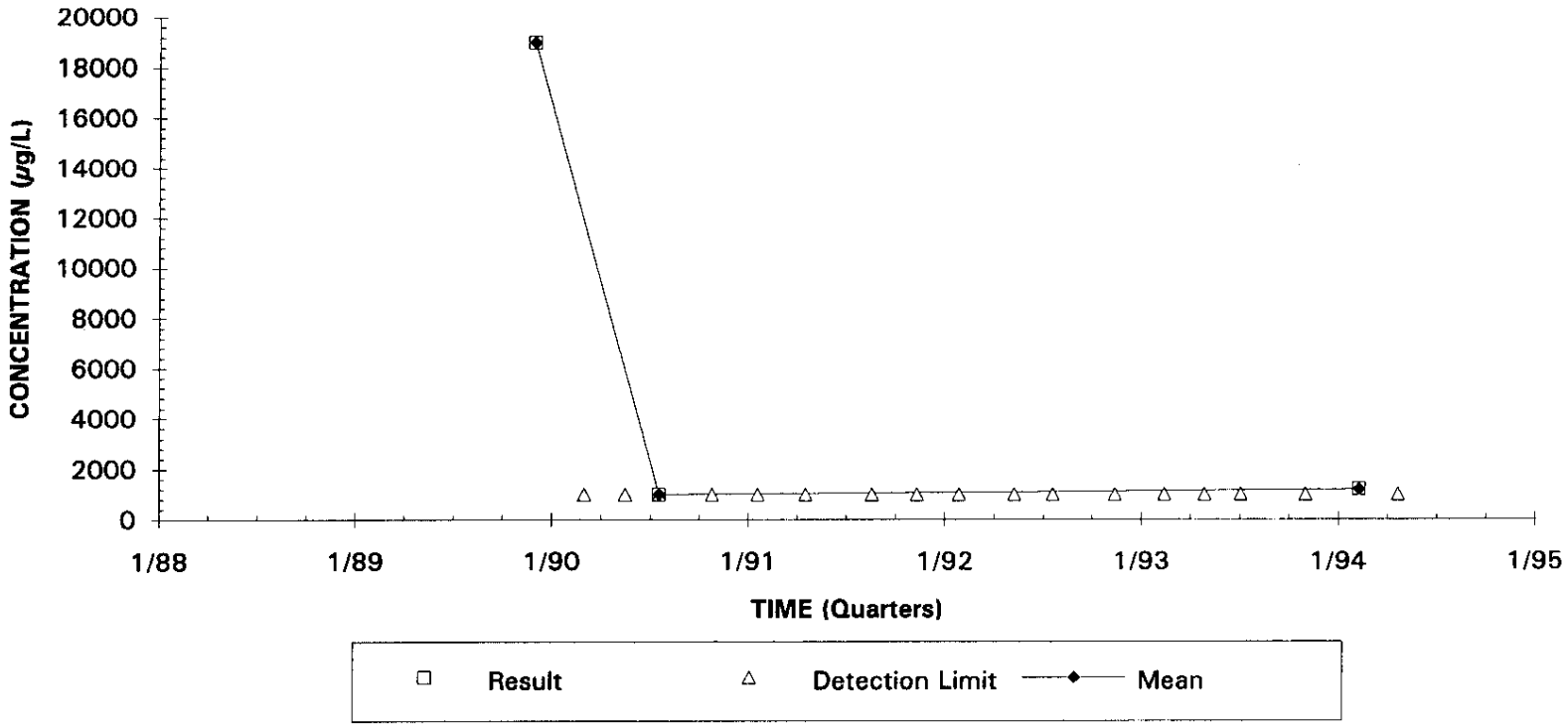
Total Organic Carbon Concentrations
Well AMB 10A



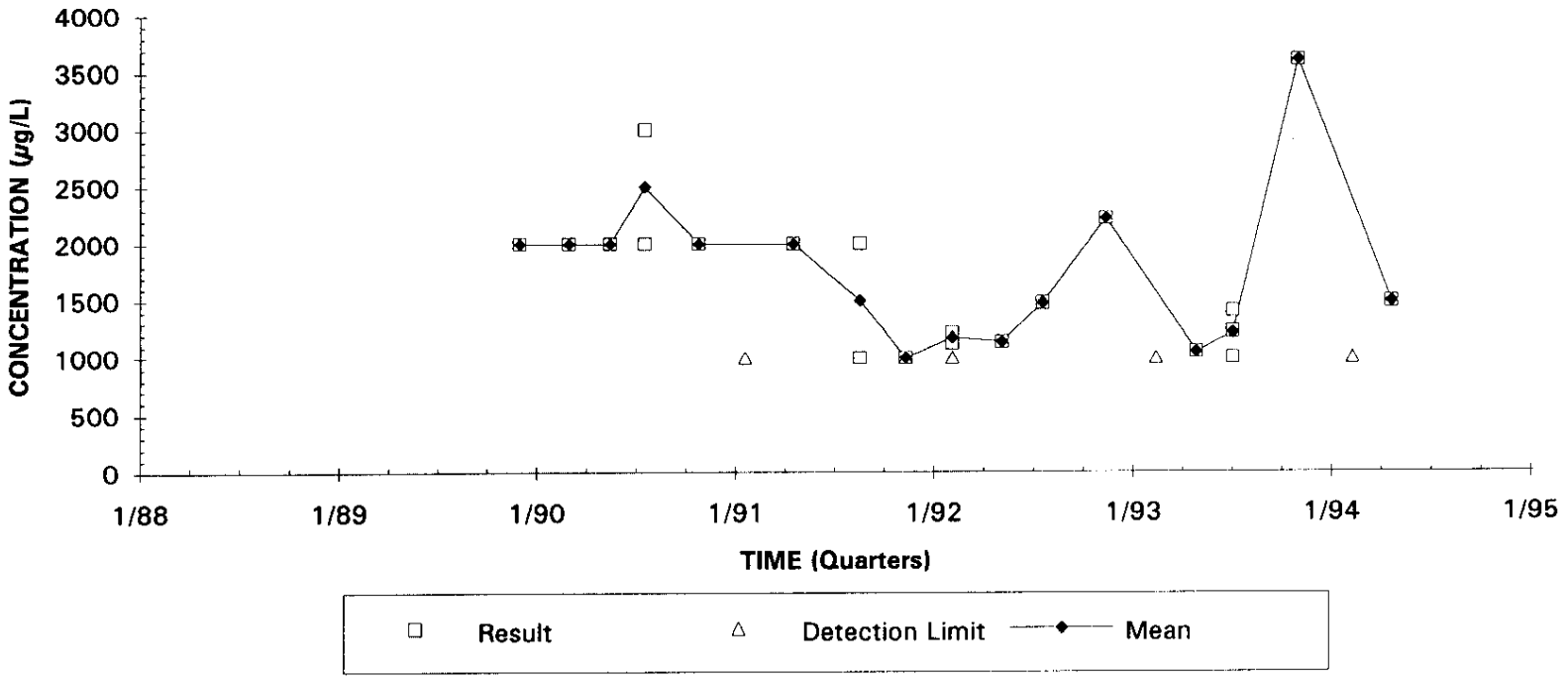
Total Organic Carbon Concentrations
Well AMB 10B



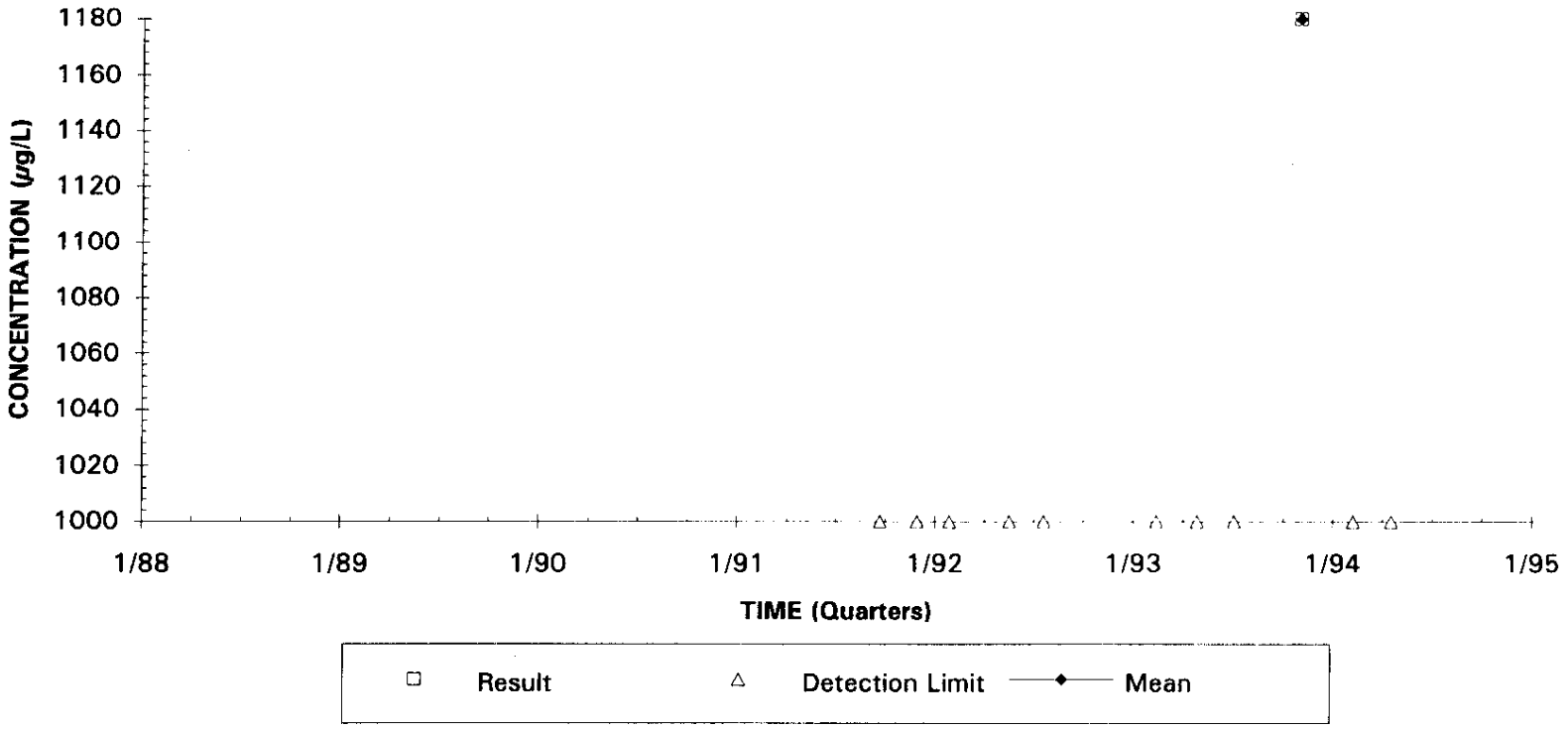
Total Organic Carbon Concentrations
Well AMB 10D



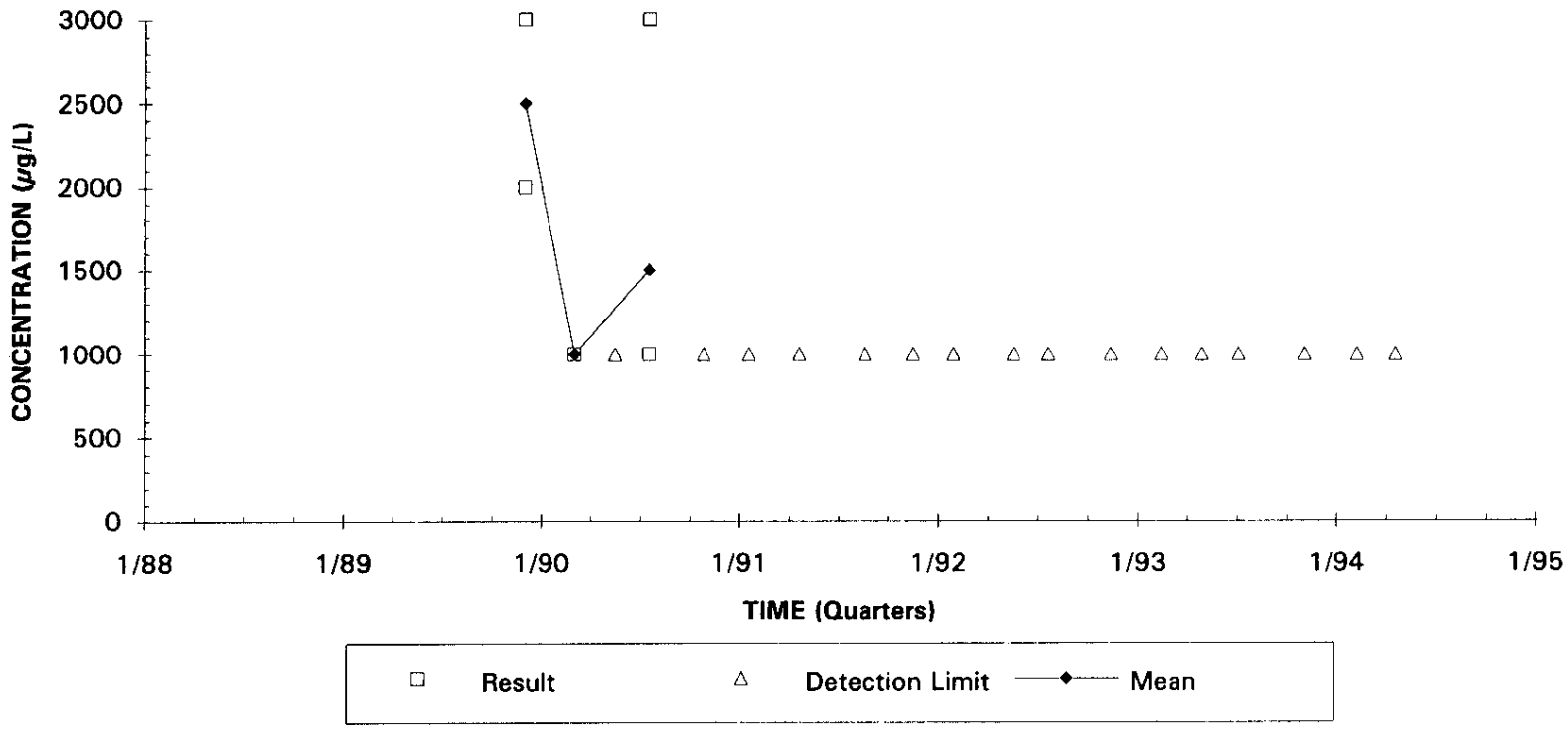
Total Organic Carbon Concentrations
Well AMB 10DD



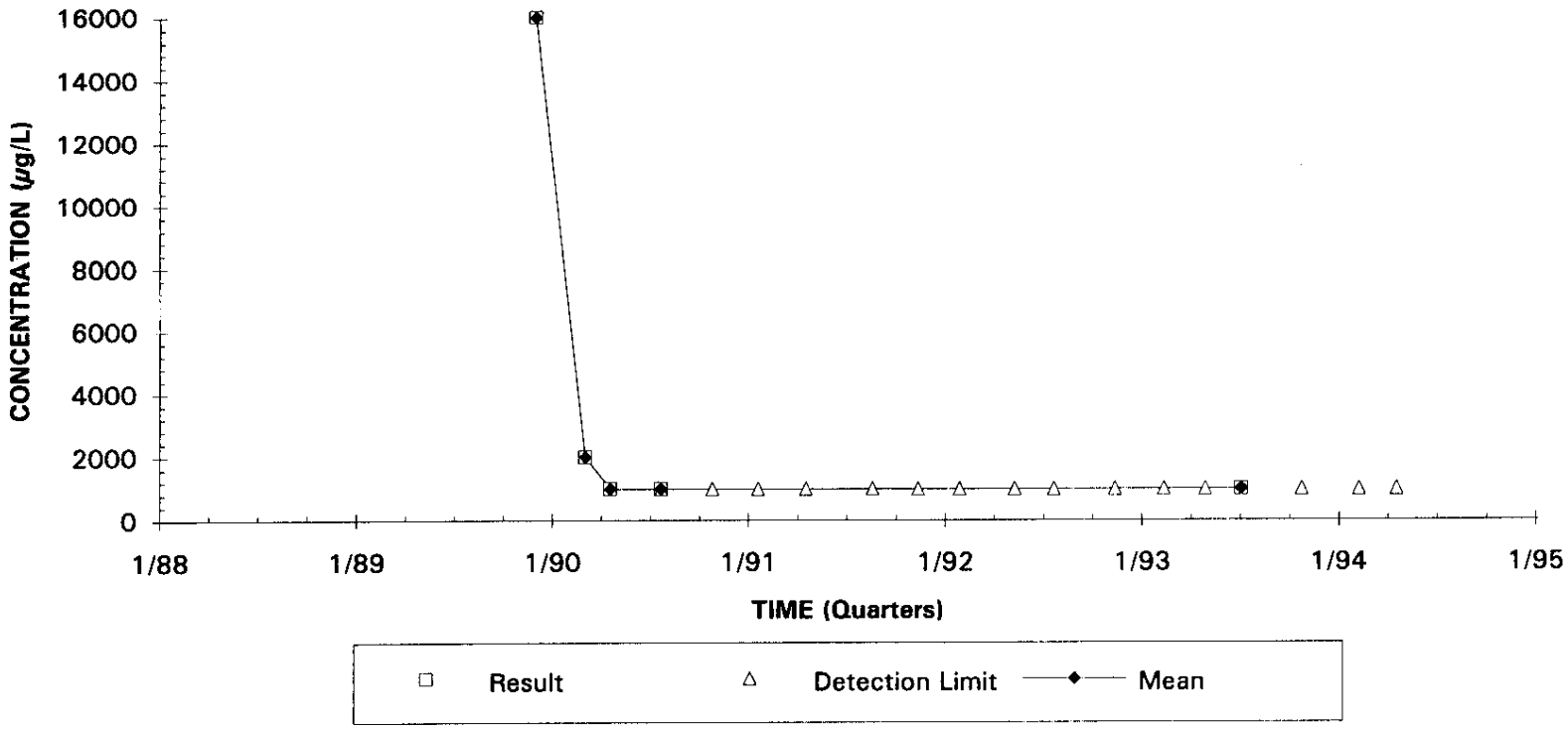
Total Organic Carbon Concentrations
Well AMB 11B



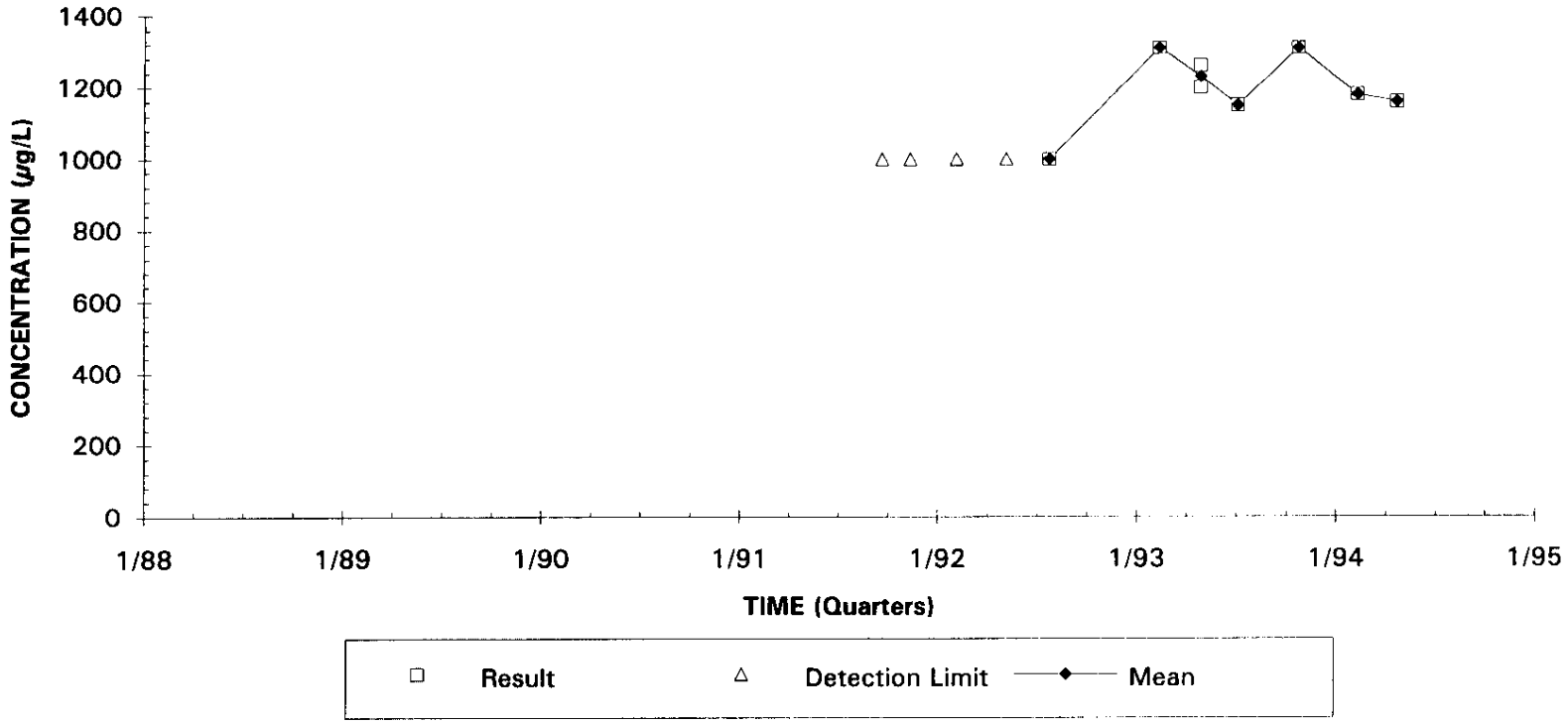
Total Organic Carbon Concentrations
Well AMB 11D



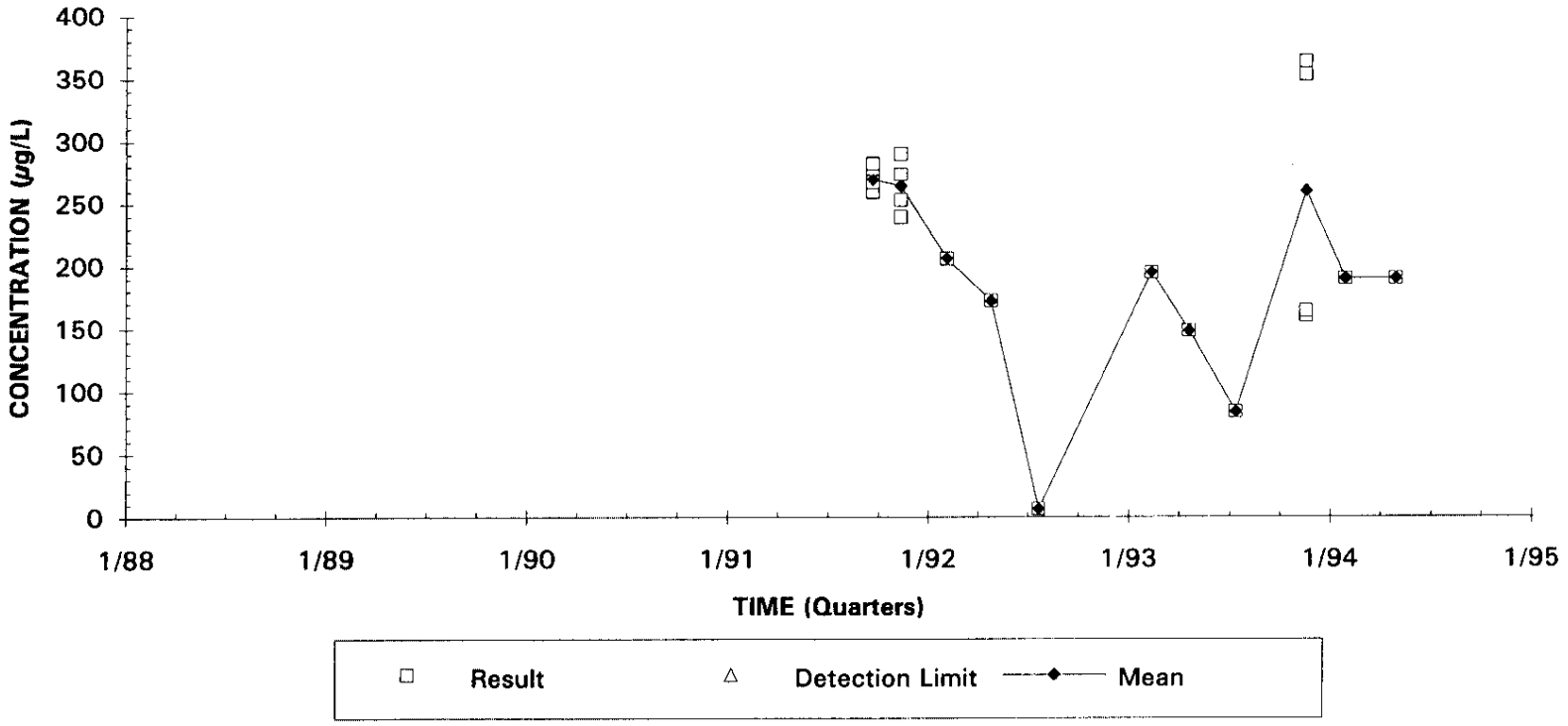
Total Organic Carbon Concentrations
Well AMB 12D



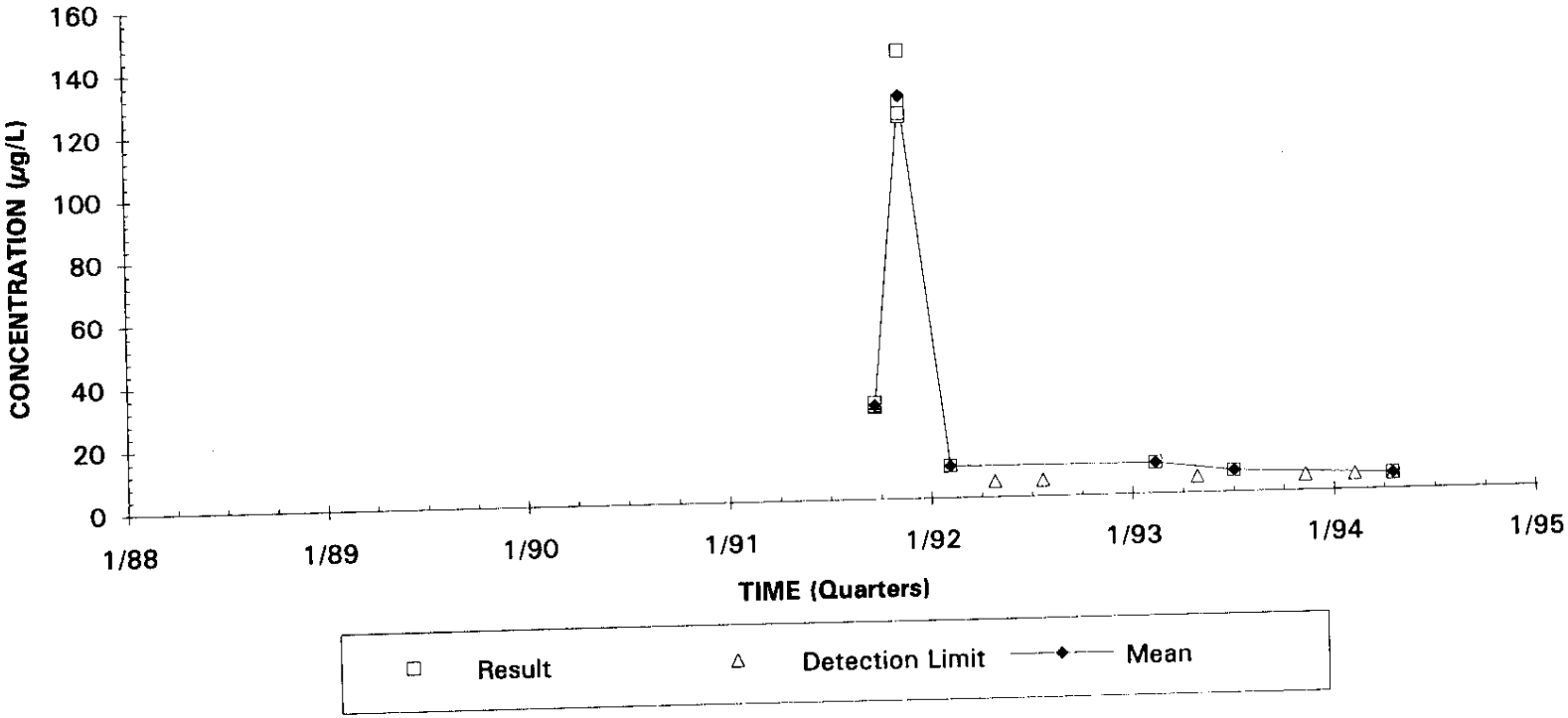
Total Organic Carbon Concentrations
Well AMB 13AR



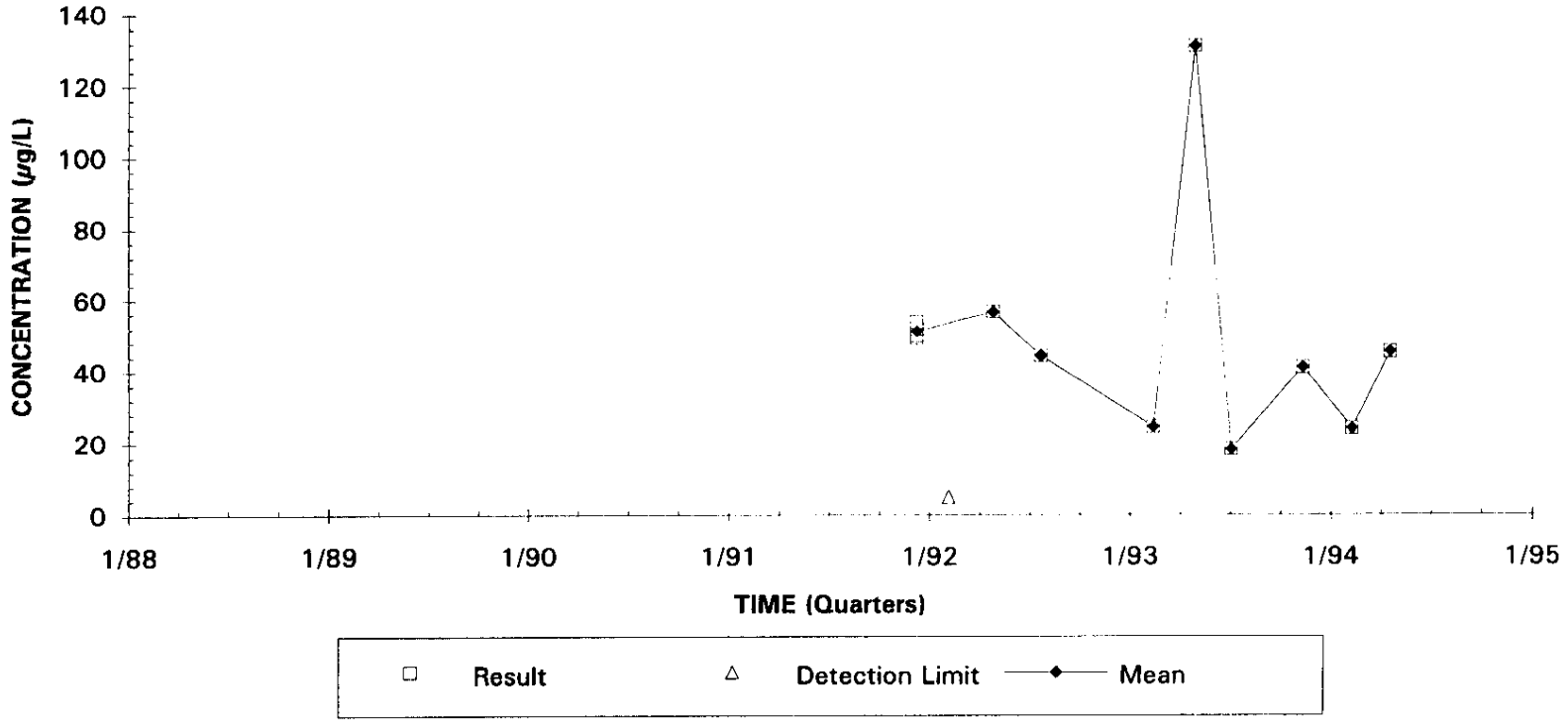
Total Organic Halogens Concentrations
Well AMB 4A



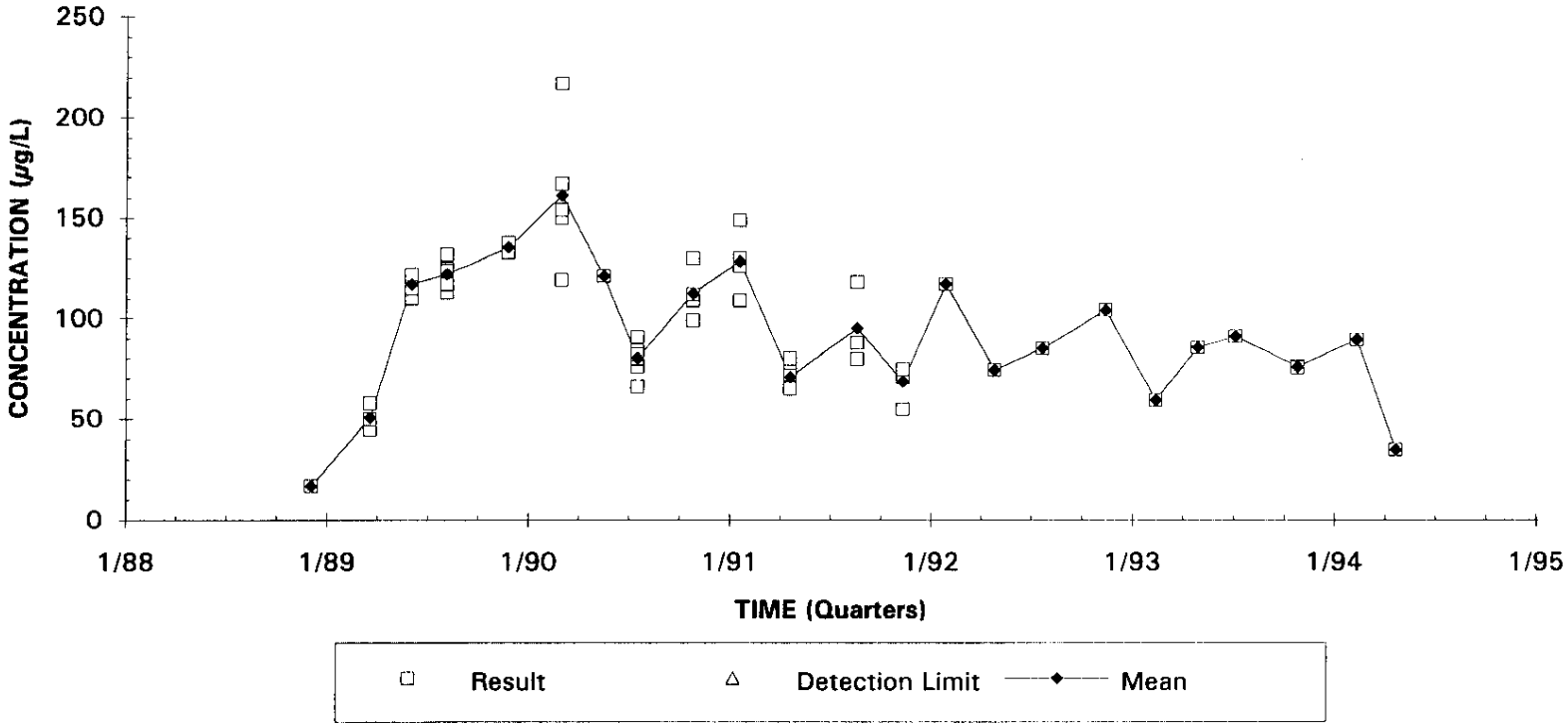
Total Organic Halogens Concentrations
Well AMB 4B



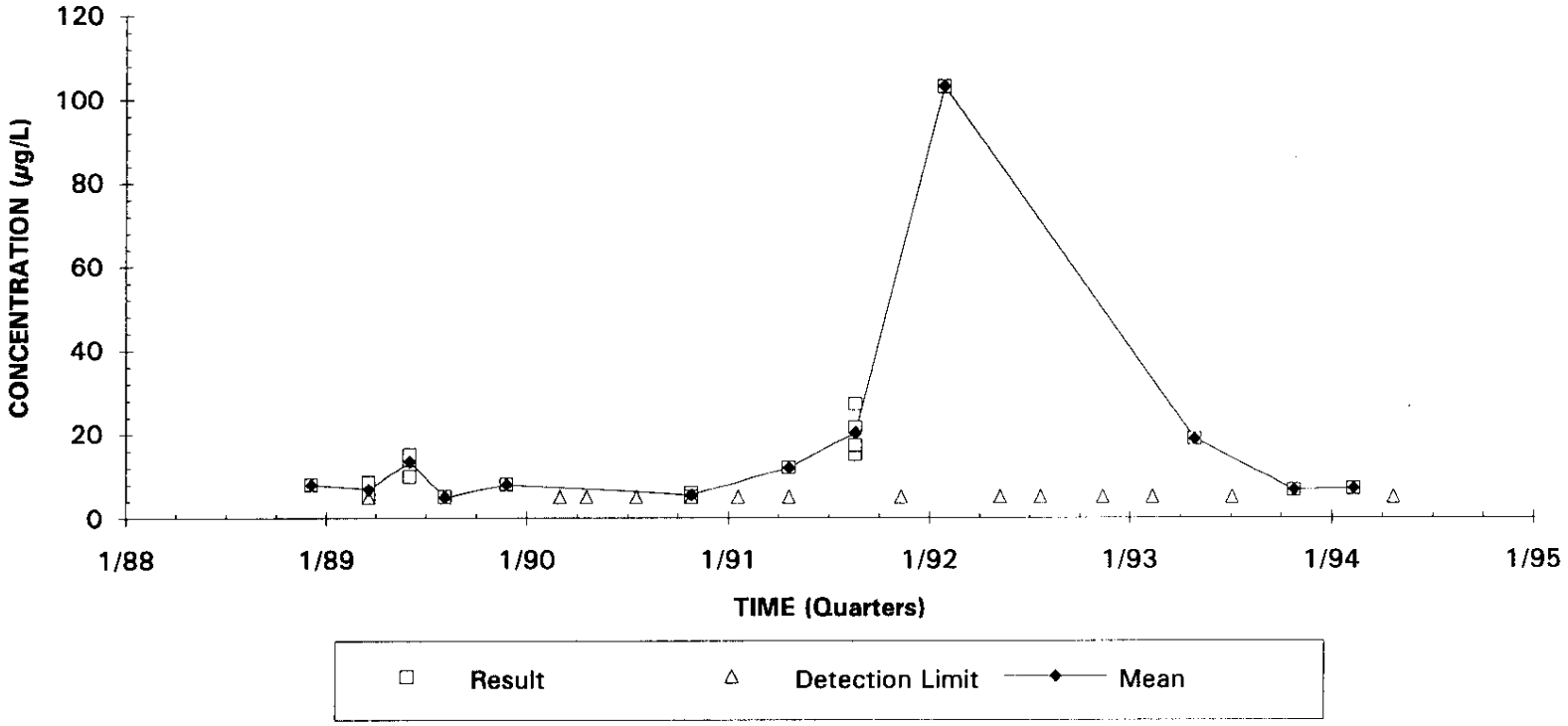
Total Organic Halogens Concentrations
Well AMB 4D



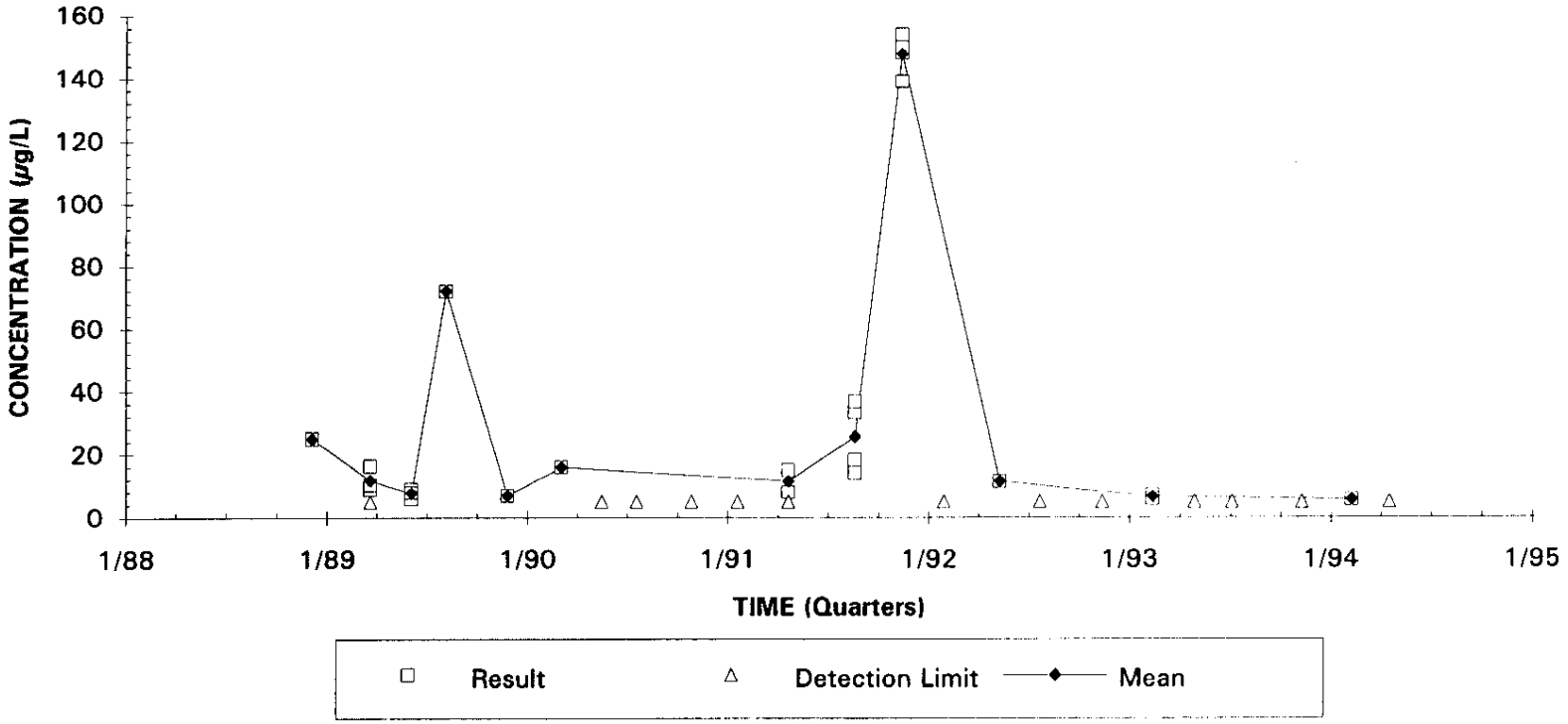
Total Organic Halogens Concentrations
Well AMB 5



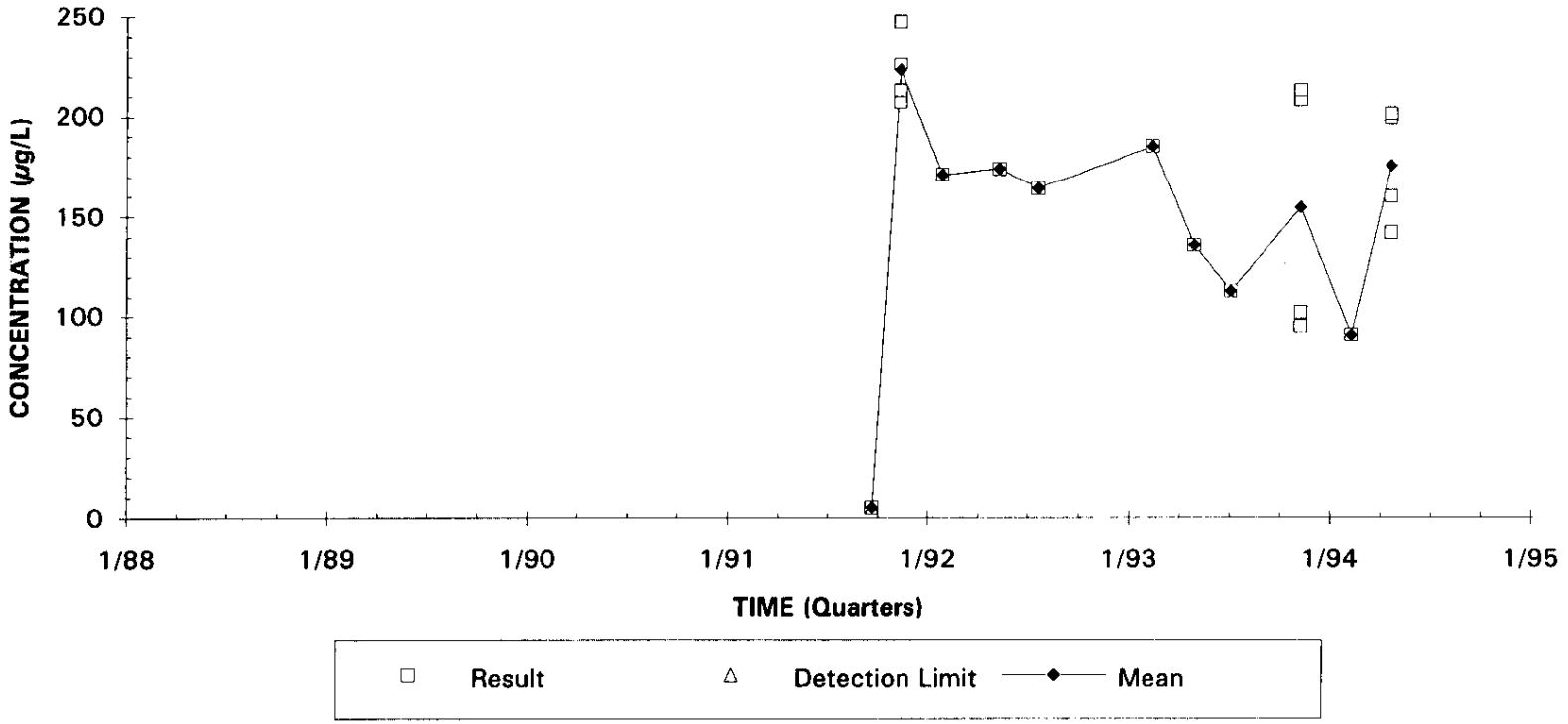
Total Organic Halogens Concentrations
Well AMB 6



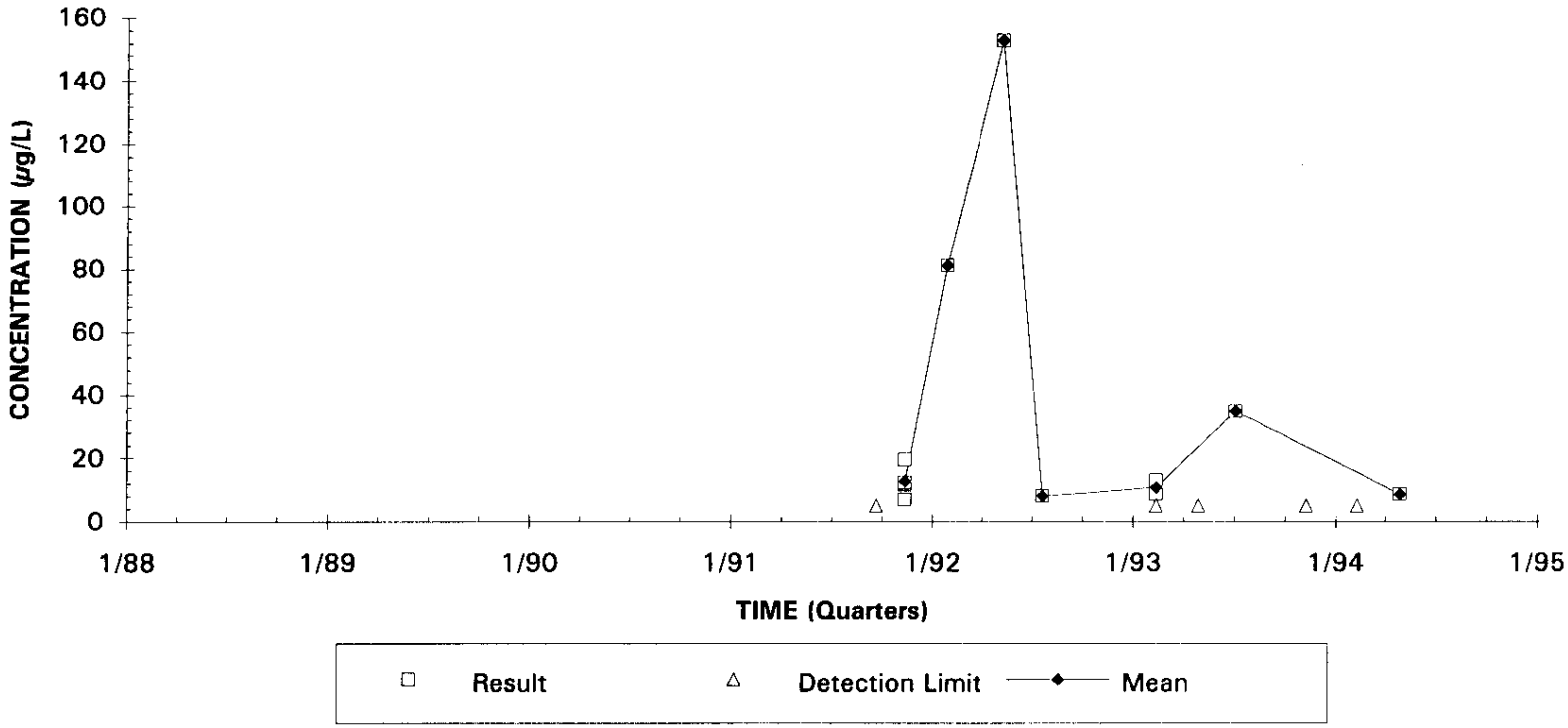
Total Organic Halogens Concentrations
Well AMB 7



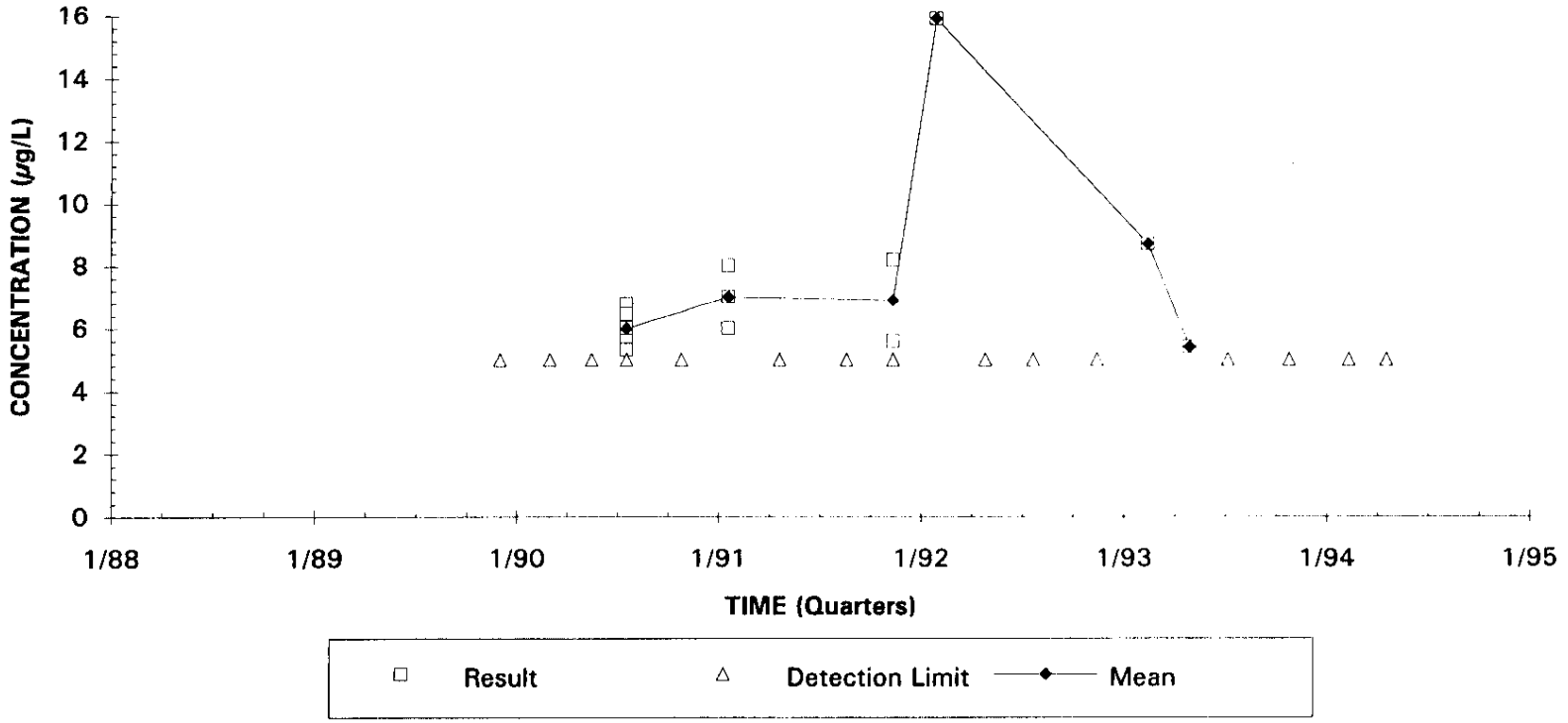
Total Organic Halogens Concentrations
Well AMB 7A



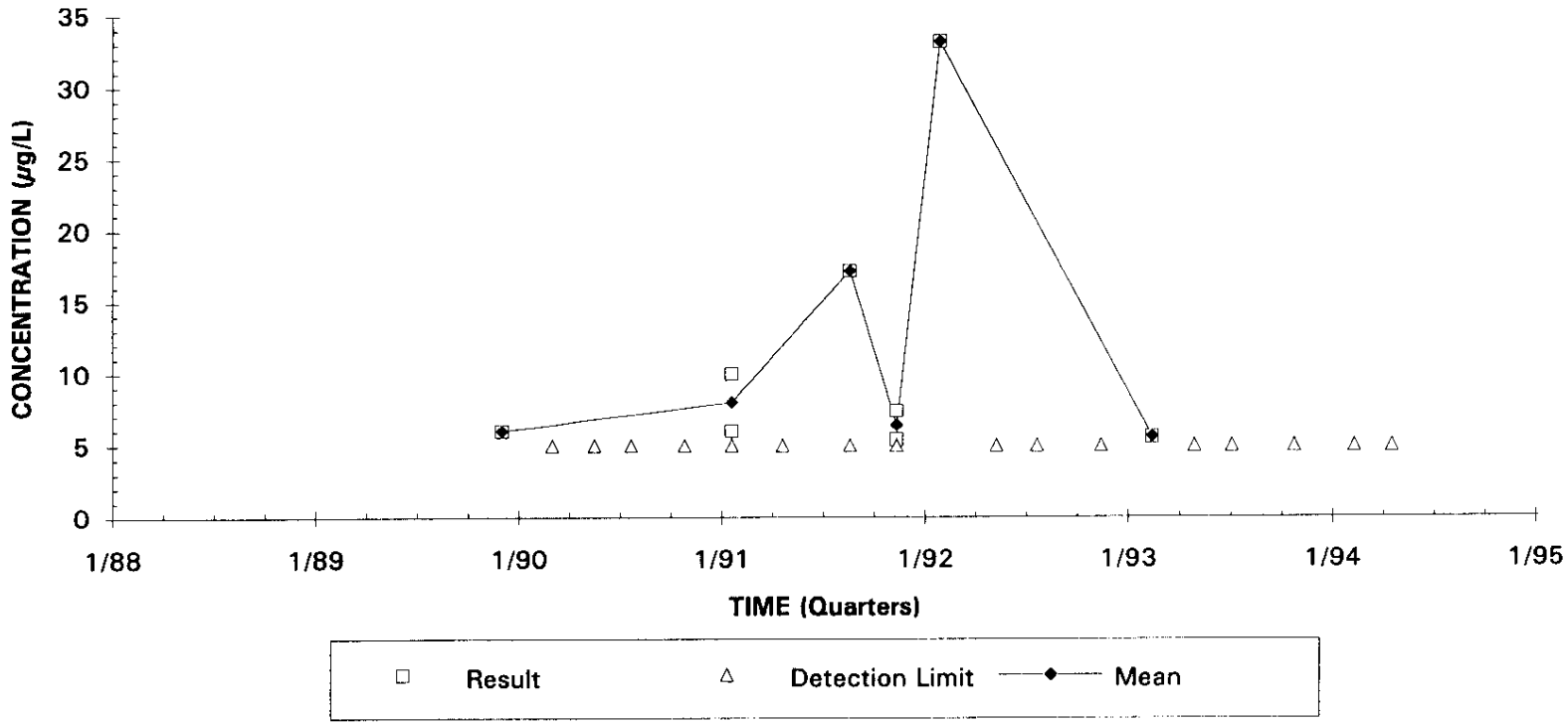
Total Organic Halogens Concentrations
Well AMB 7B



Total Organic Halogens Concentrations
Well AMB 8D



Total Organic Halogens Concentrations
Well AMB 9D



Total Organic Halogens Concentrations
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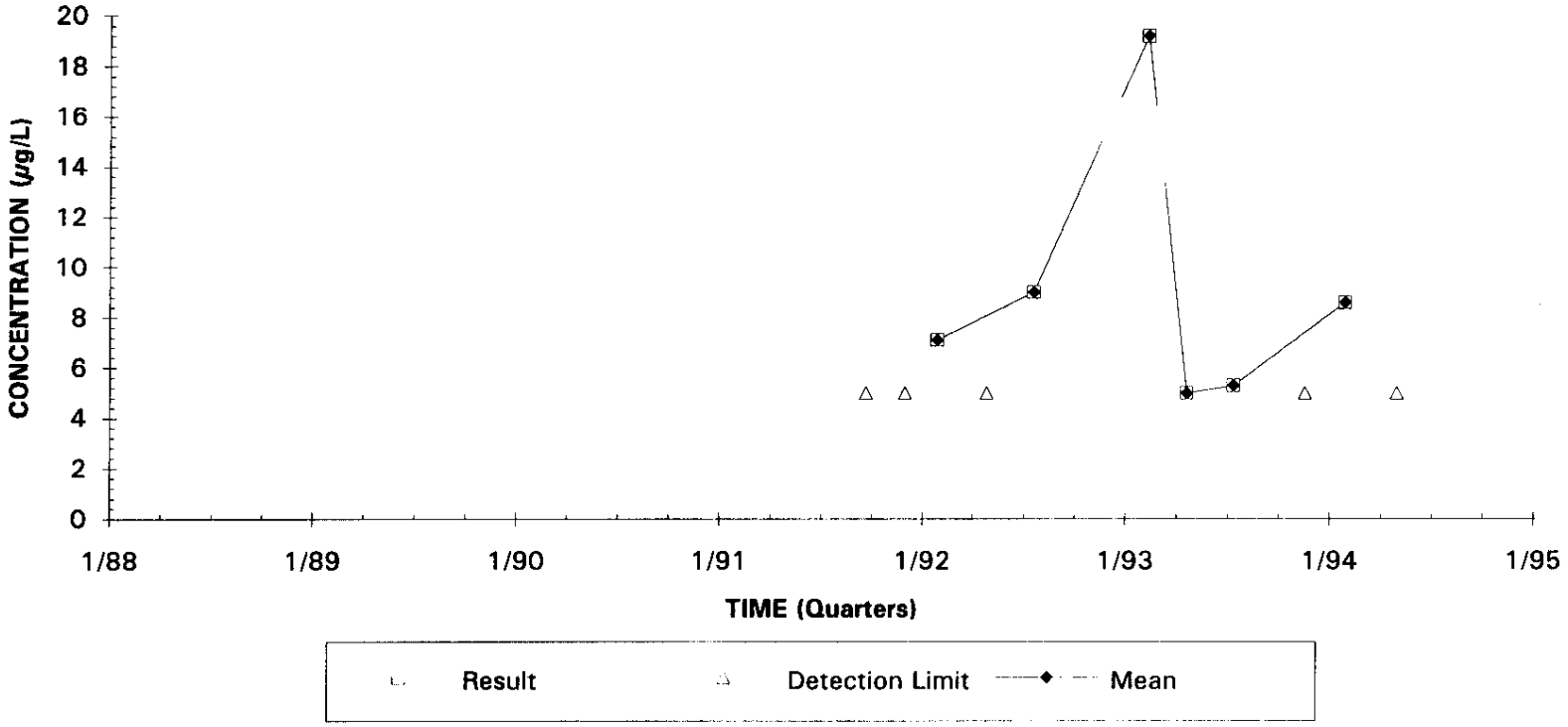

Total Organic Halogens Concentrations
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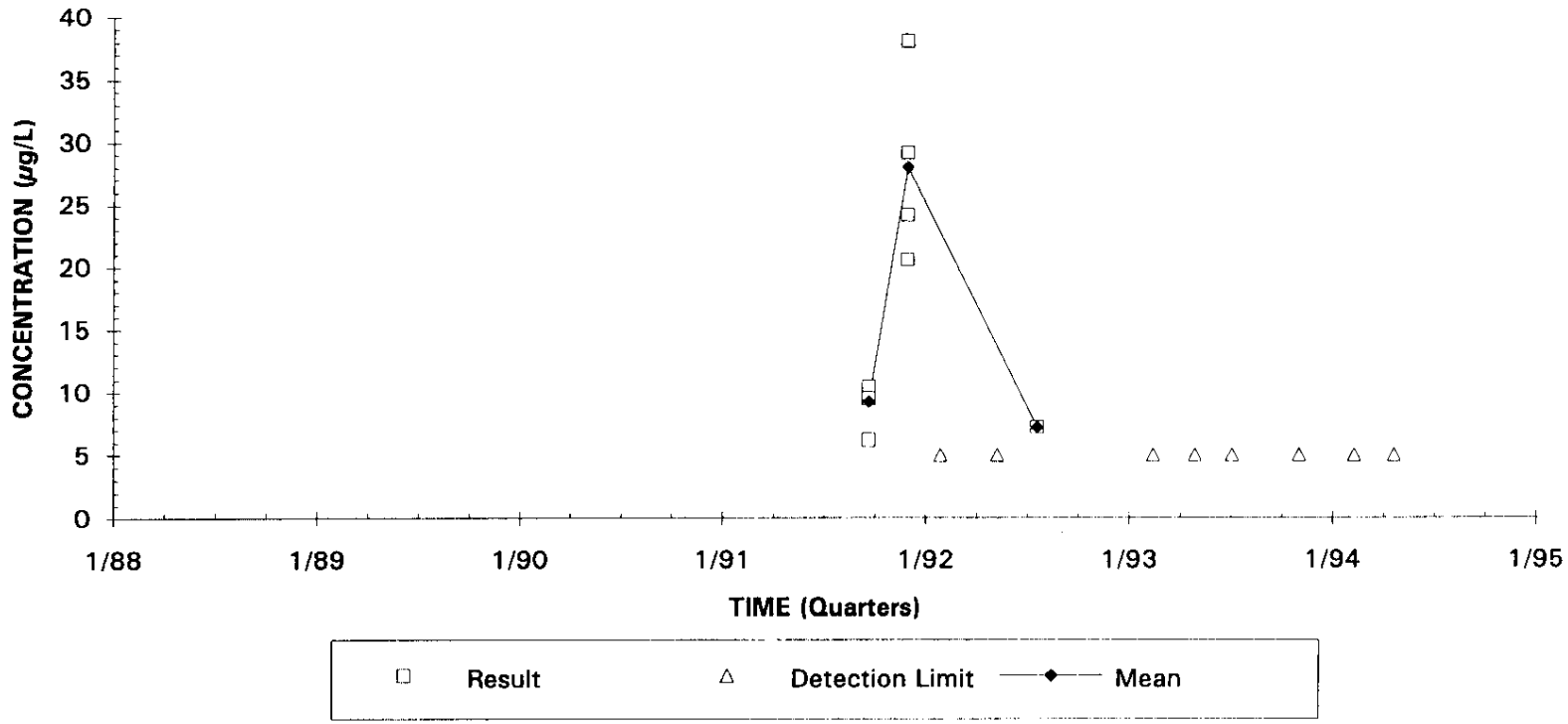

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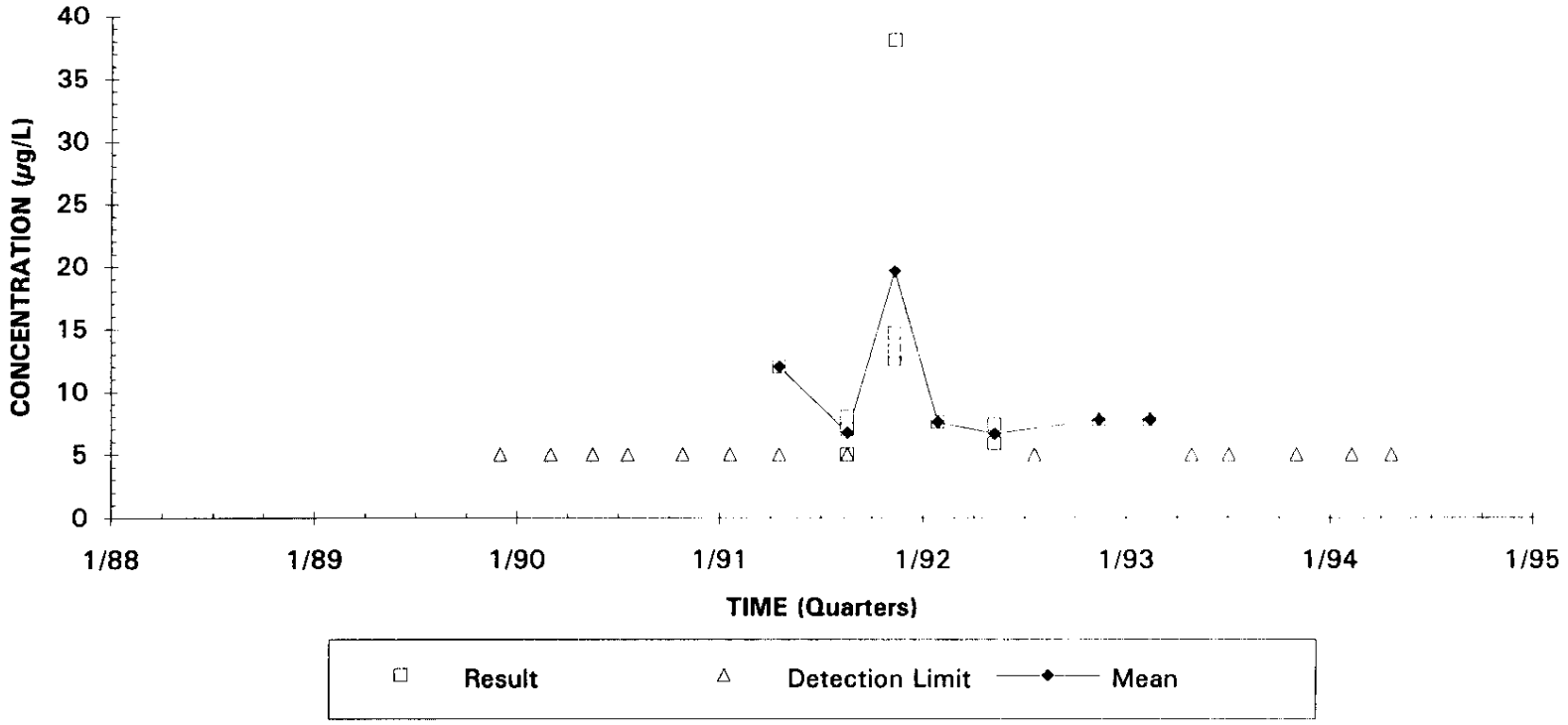

Total Organic Halogens Concentrations
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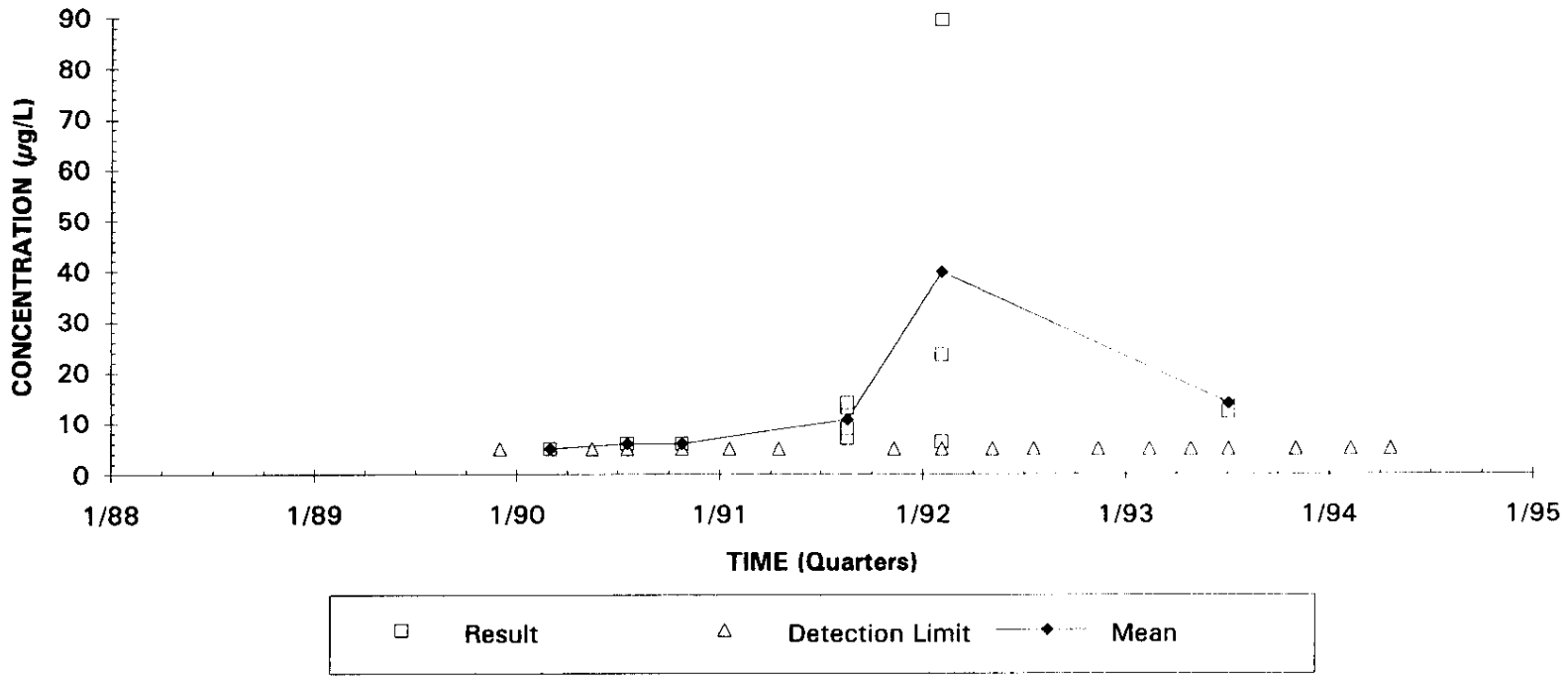
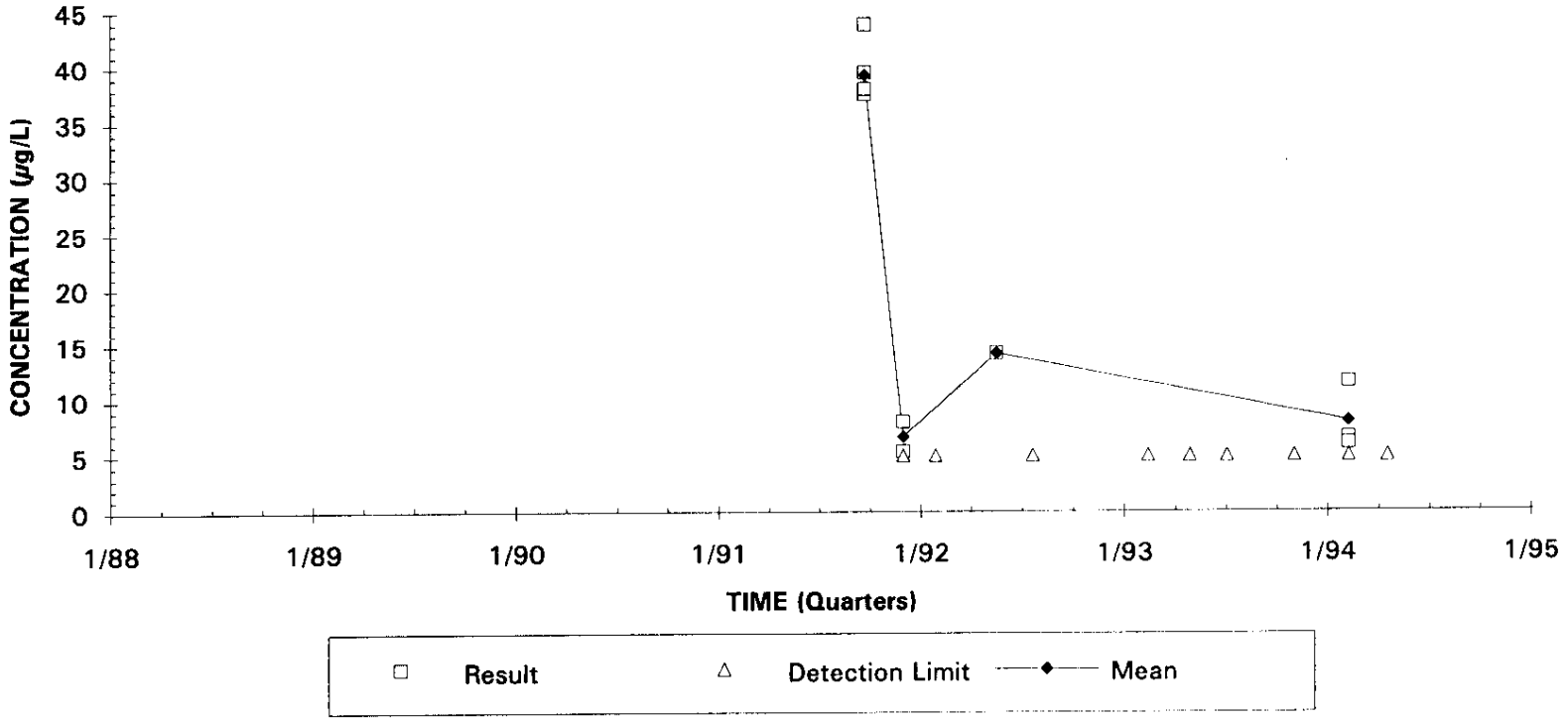


Total Organic Halogens Concentrations
Well AMB 11B



Total Organic Halogens Concentrations
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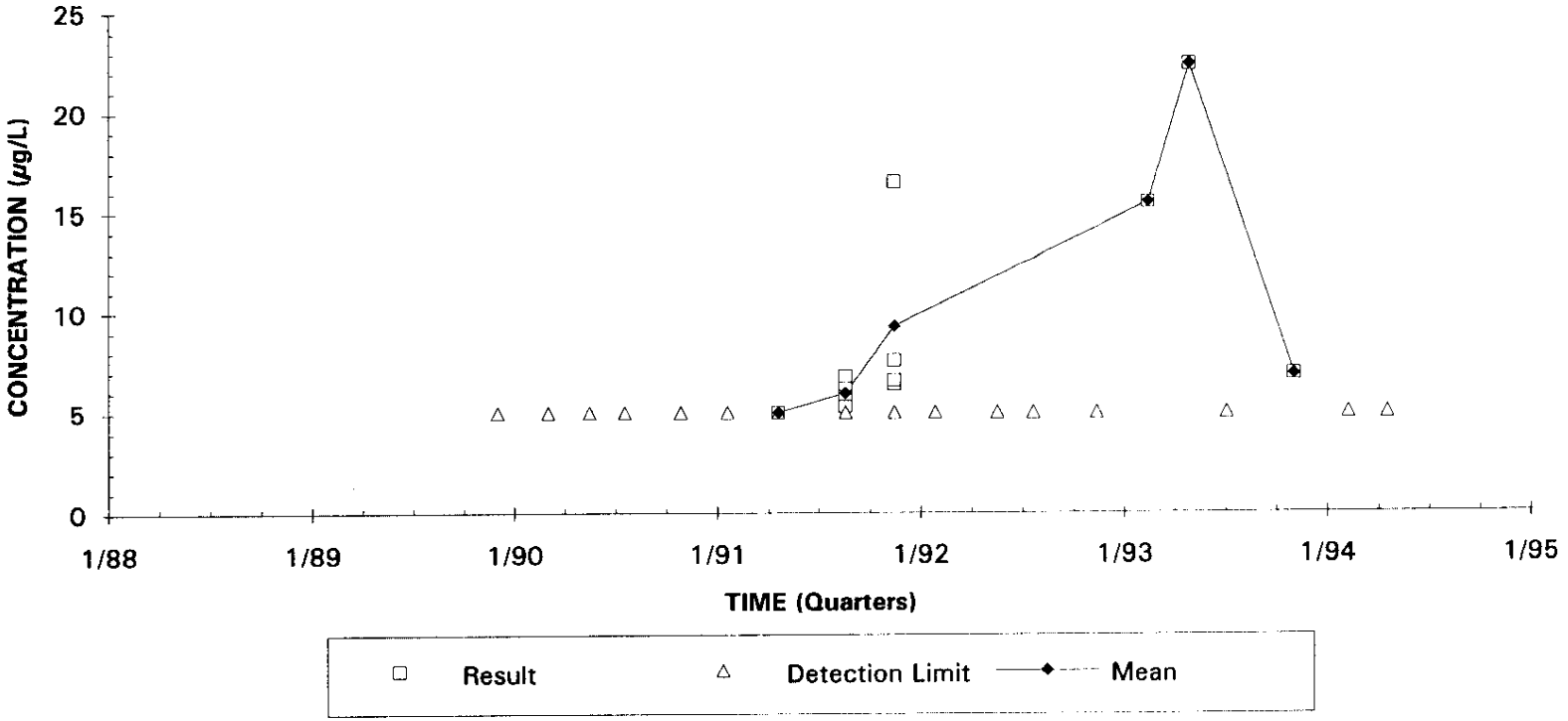

Total Organic Halogens Concentrations
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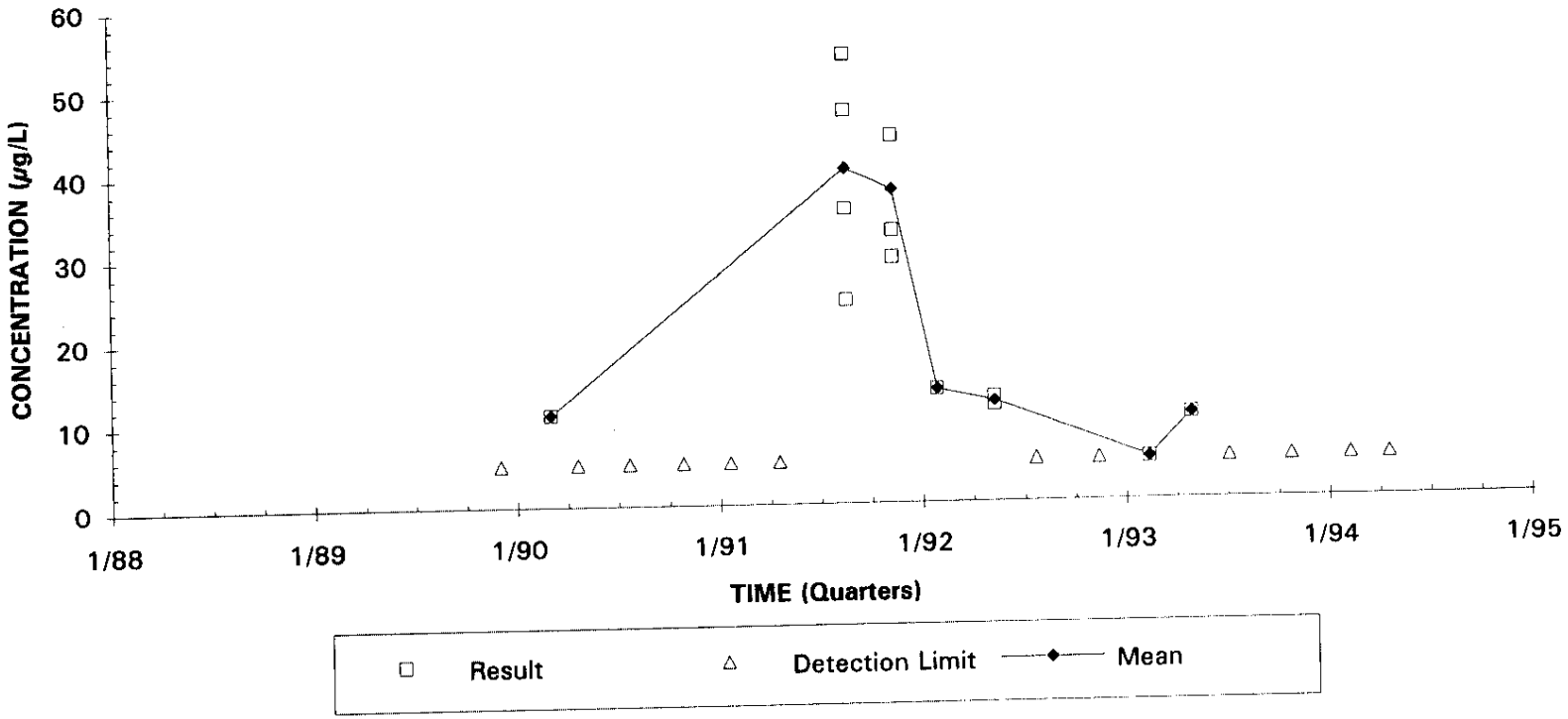
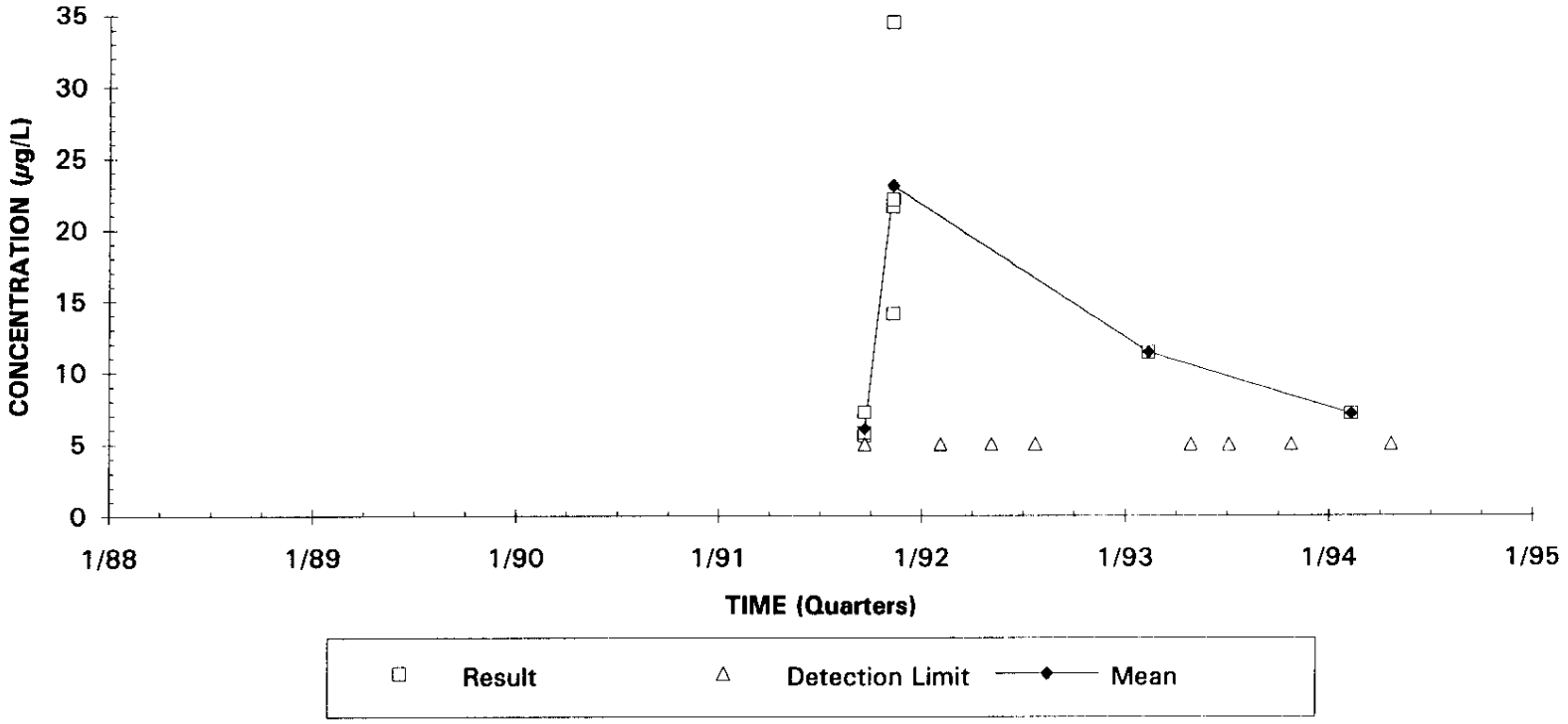
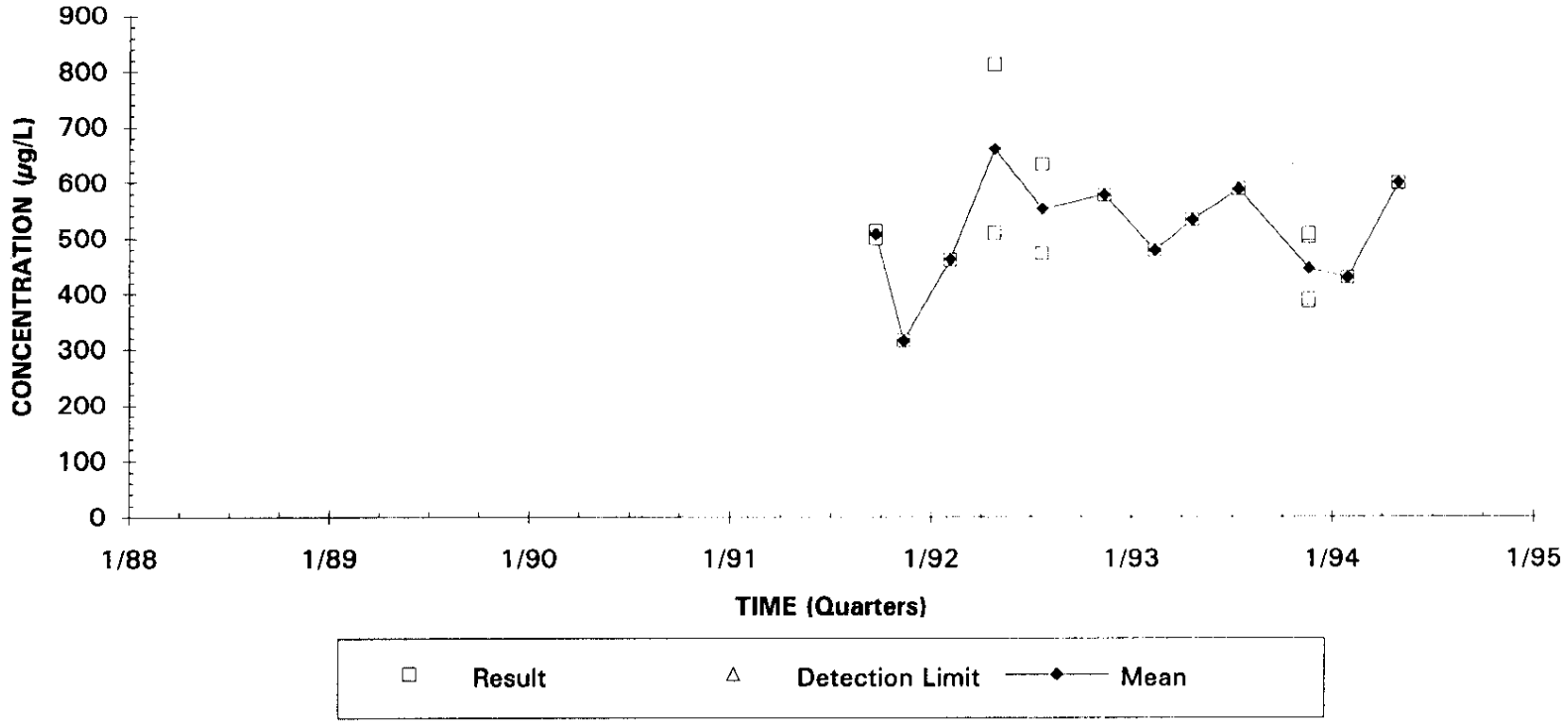


Total Organic Halogens Concentrations
Well AMB 13AR



Trichloroethylene Concentrations
Well AMB 4A



Trichloroethylene Concentrations
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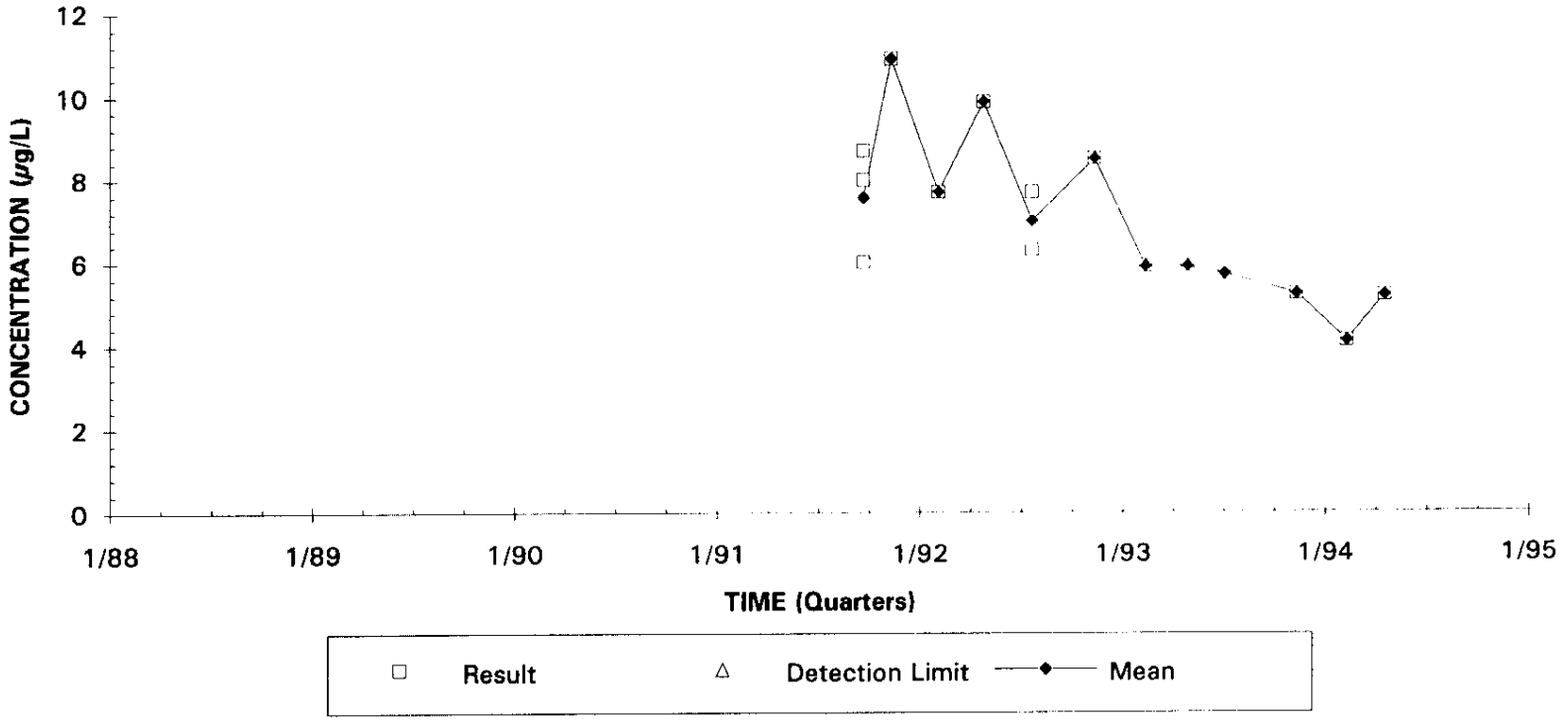

Trichloroethylene Concentrations
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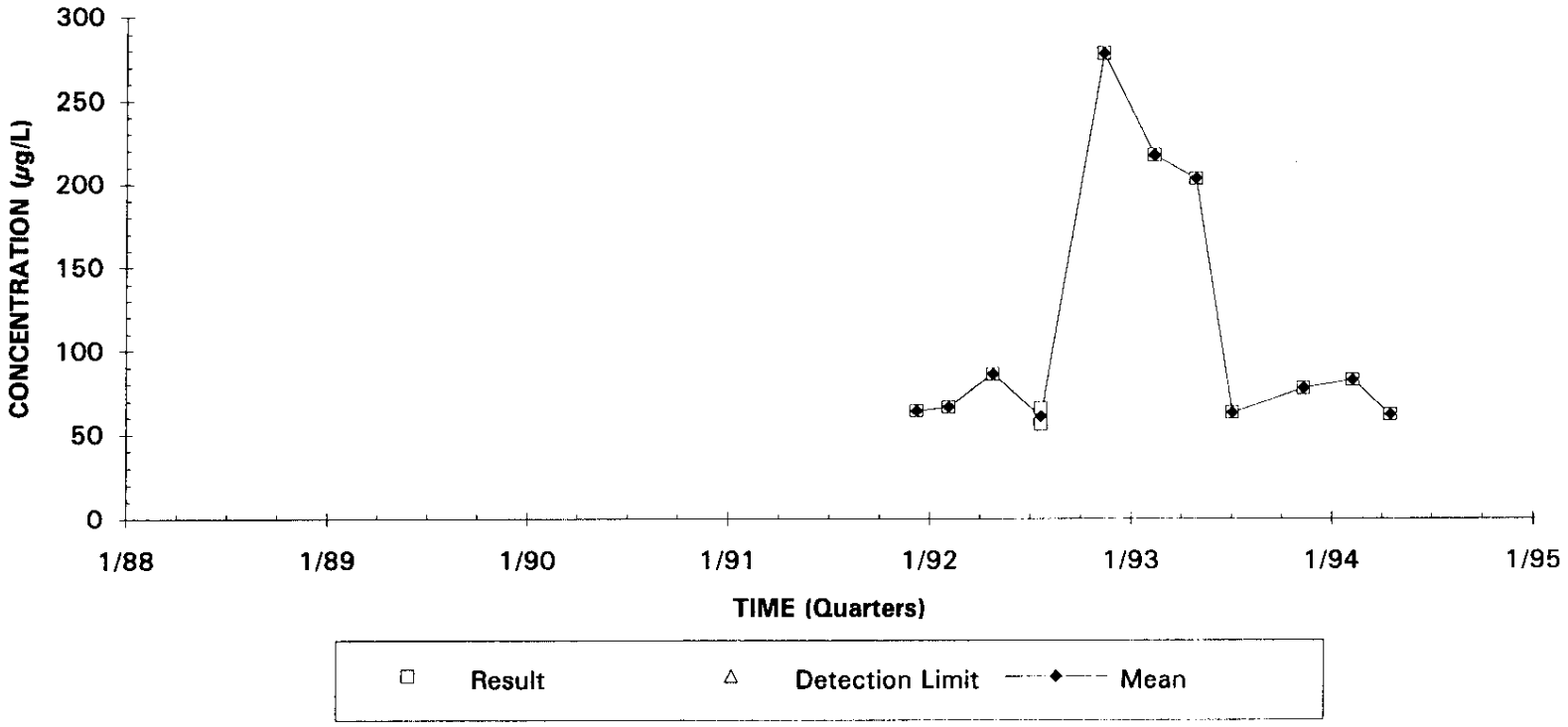
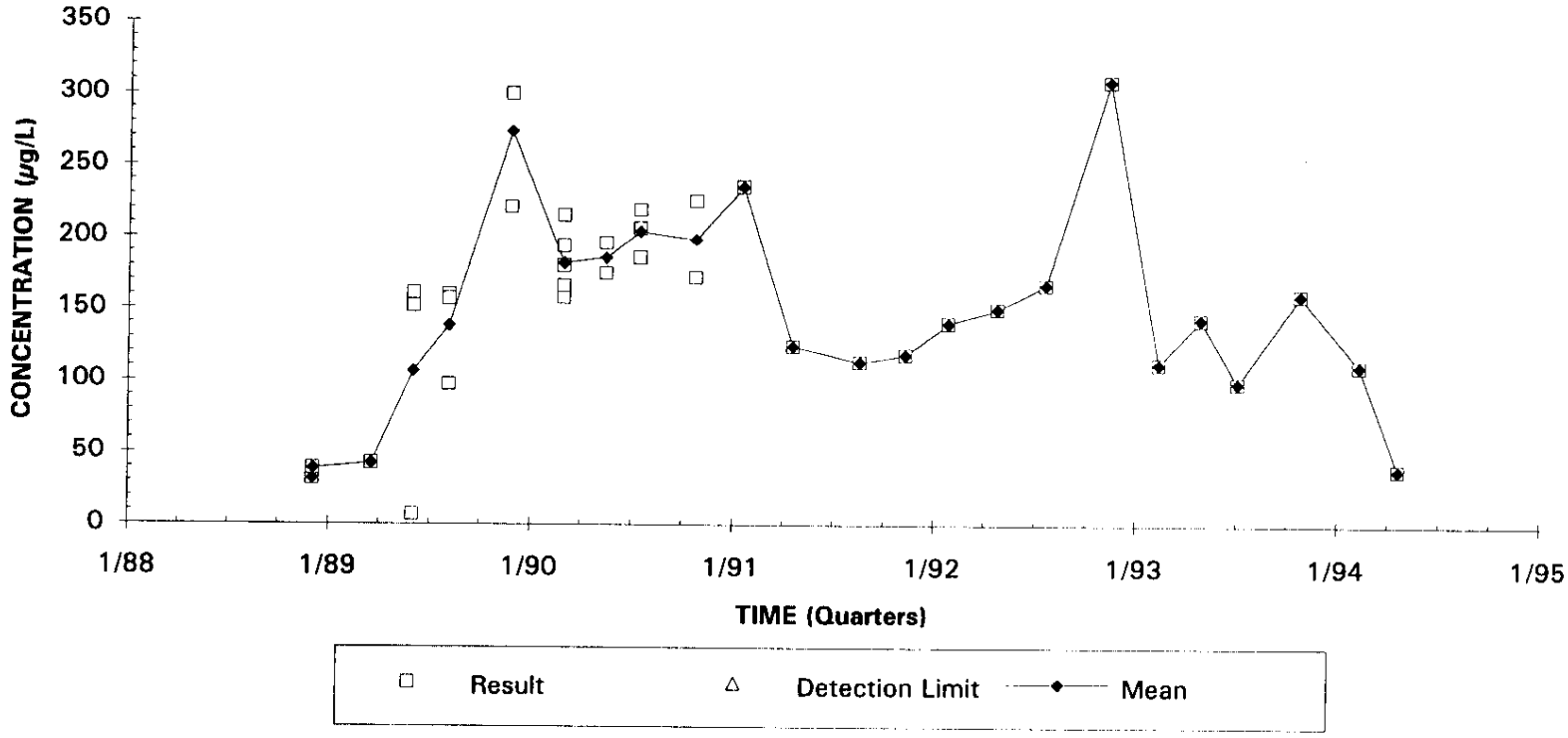


Trichloroethylene Concentrations
Well AMB 5



Trichloroethylene Concentrations
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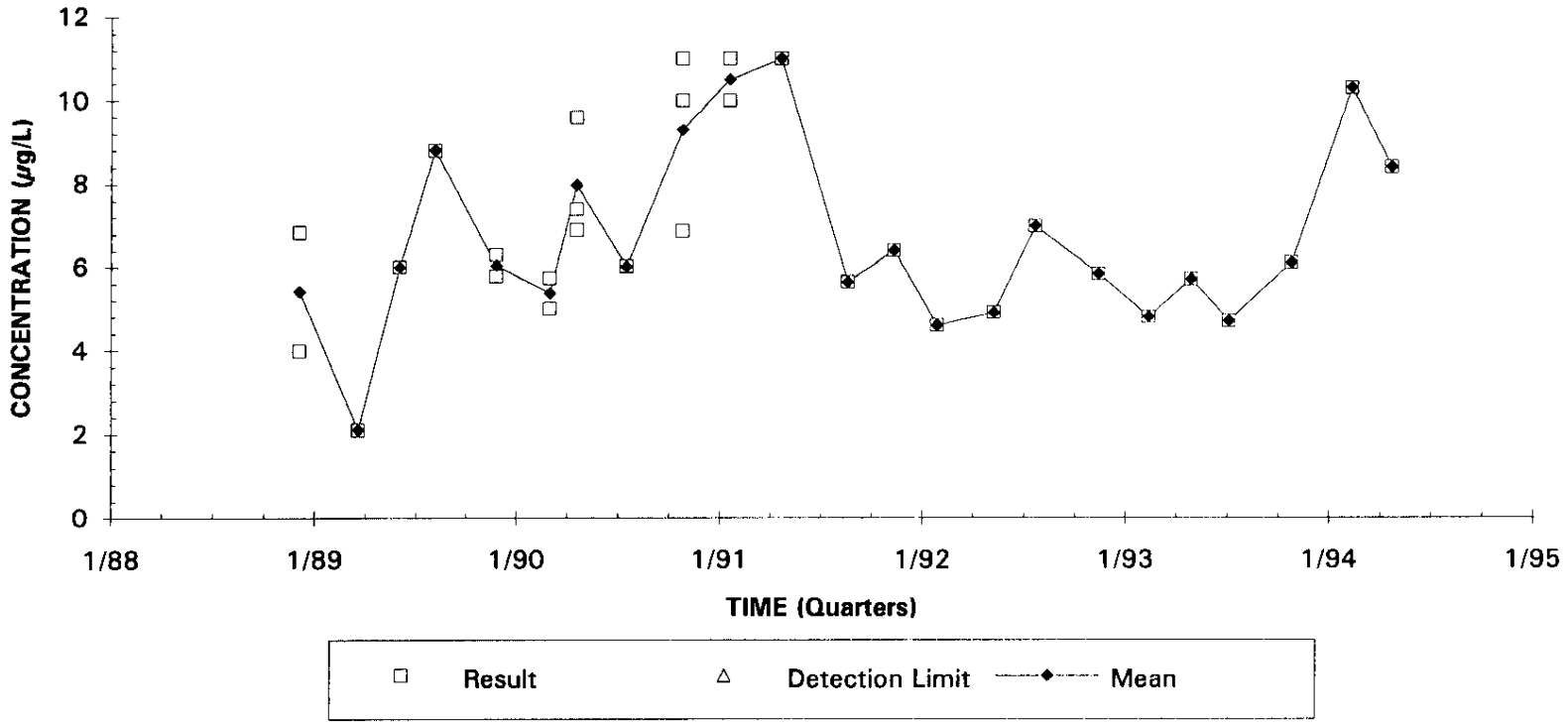
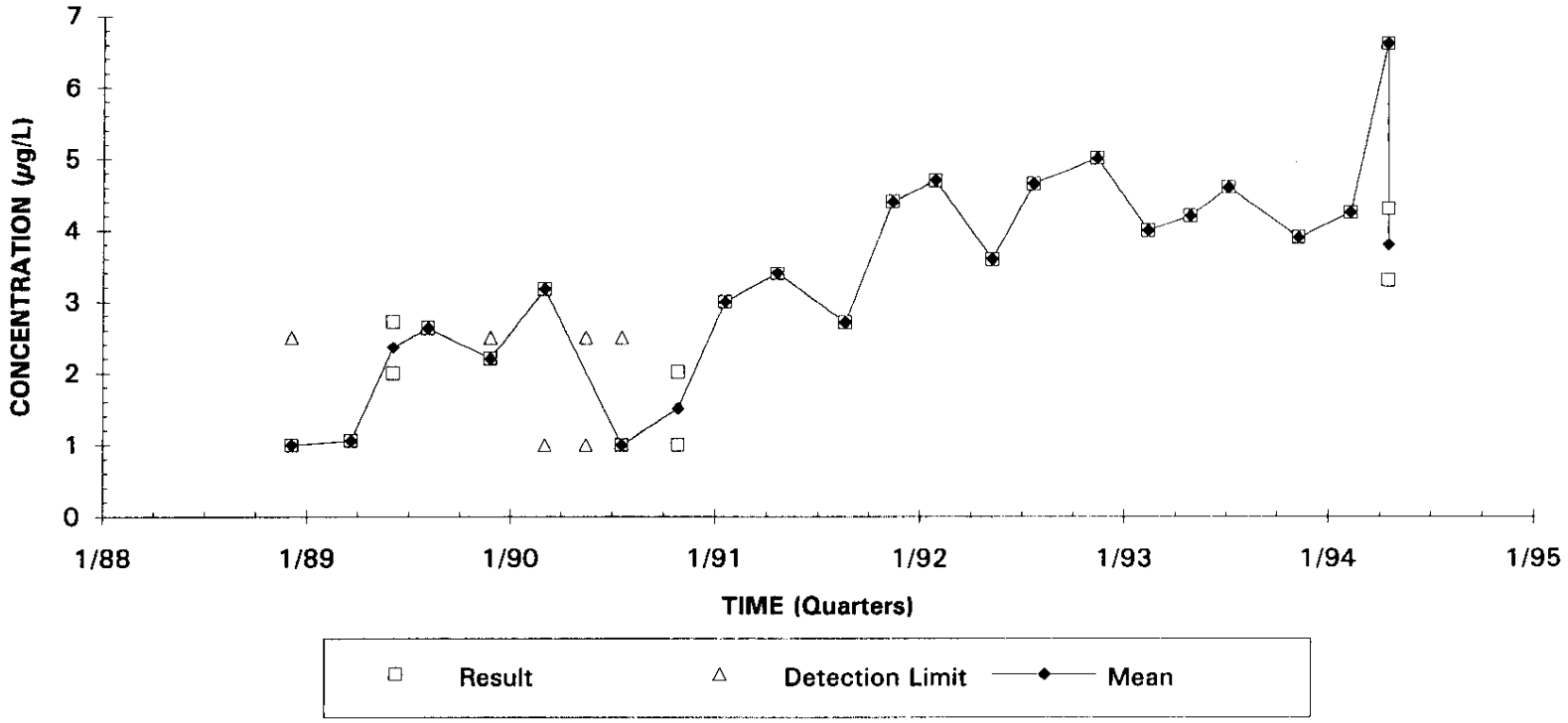
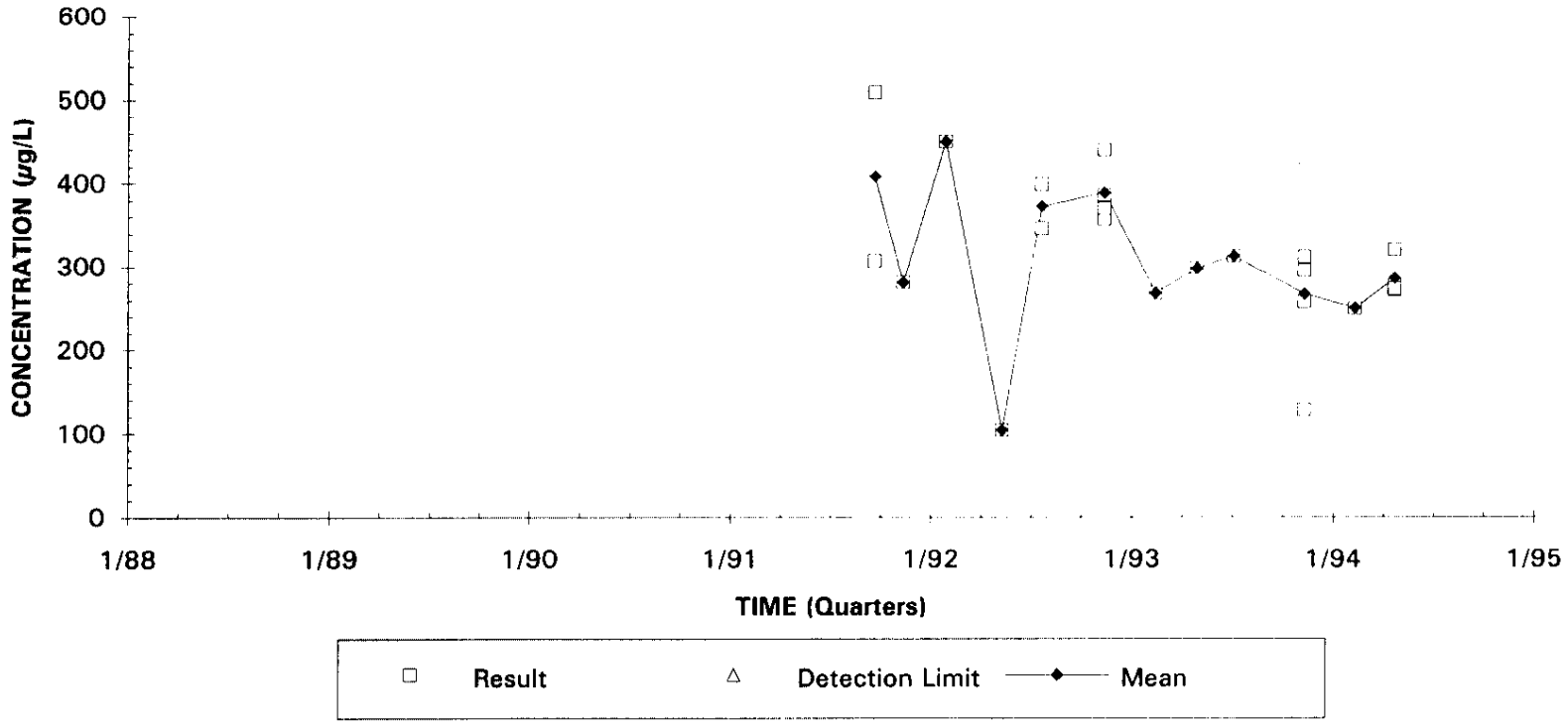


Trichloroethylene Concentrations
Well AMB 7



Trichloroethylene Concentrations
Well AMB 7A



Trichloroethylene Concentrations
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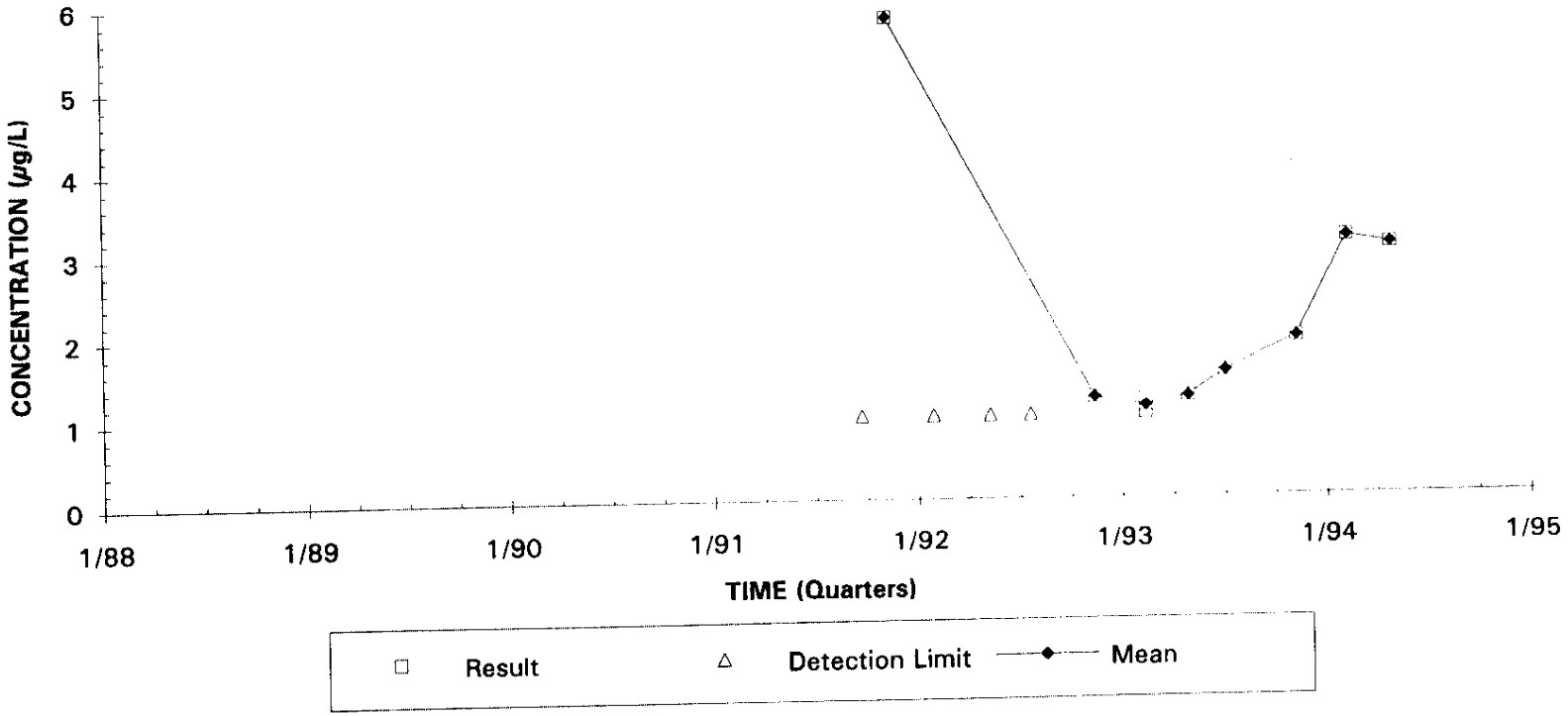
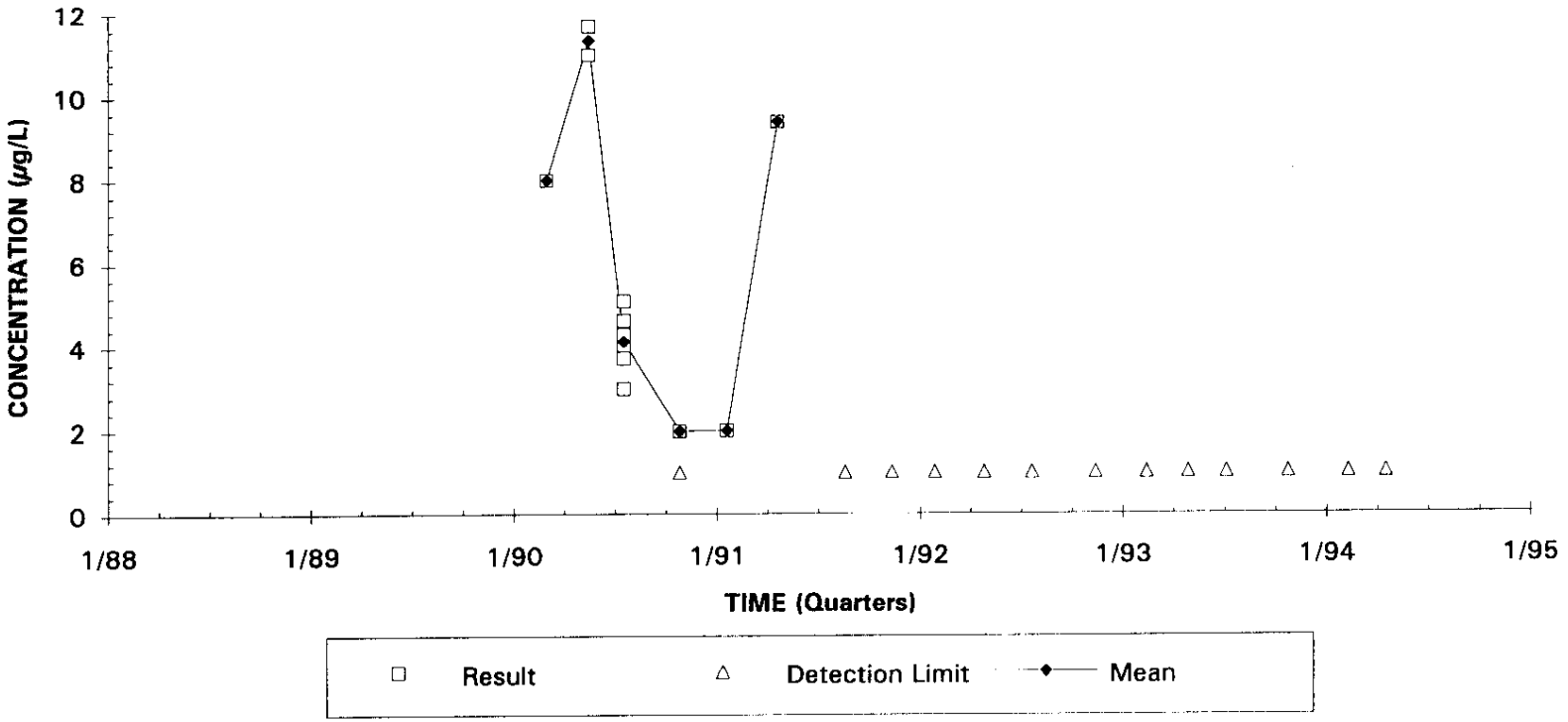
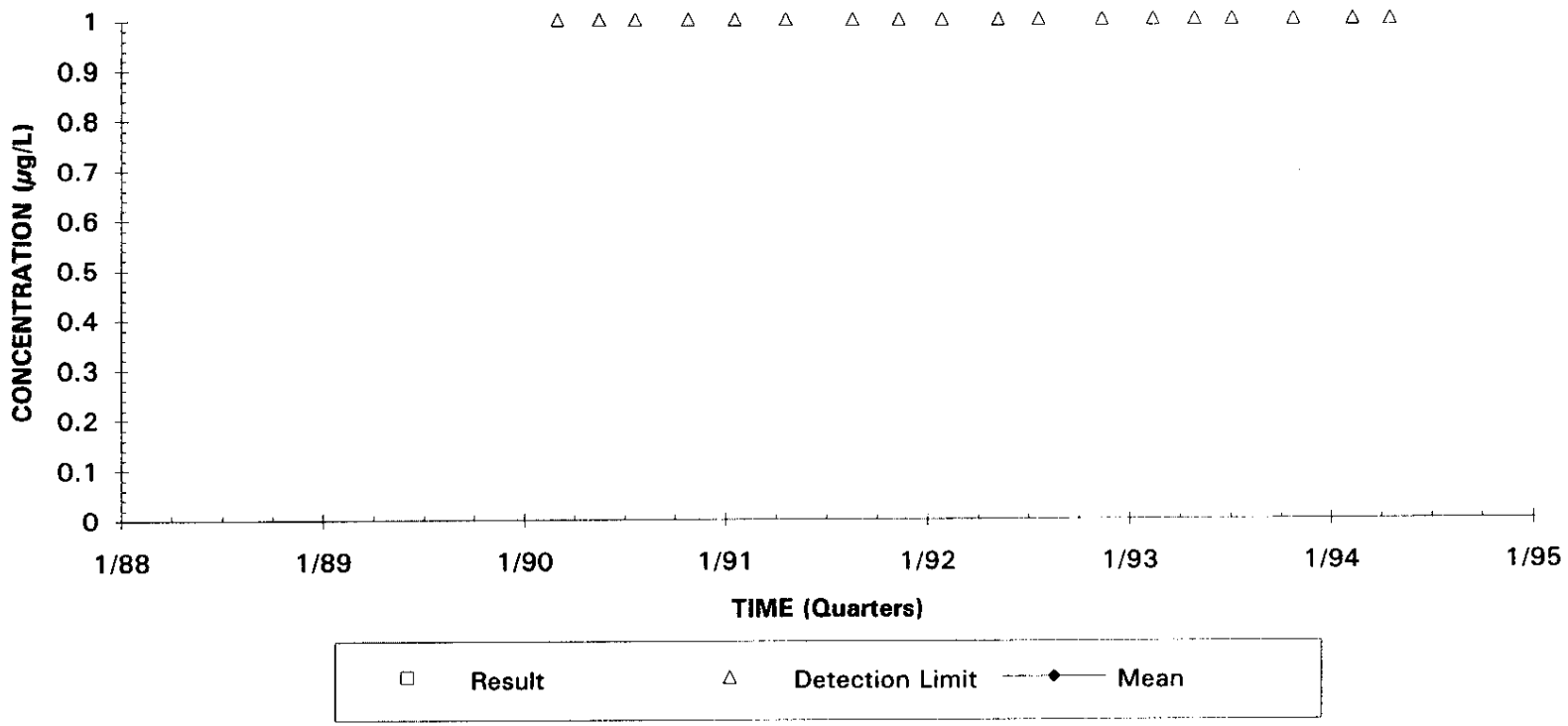


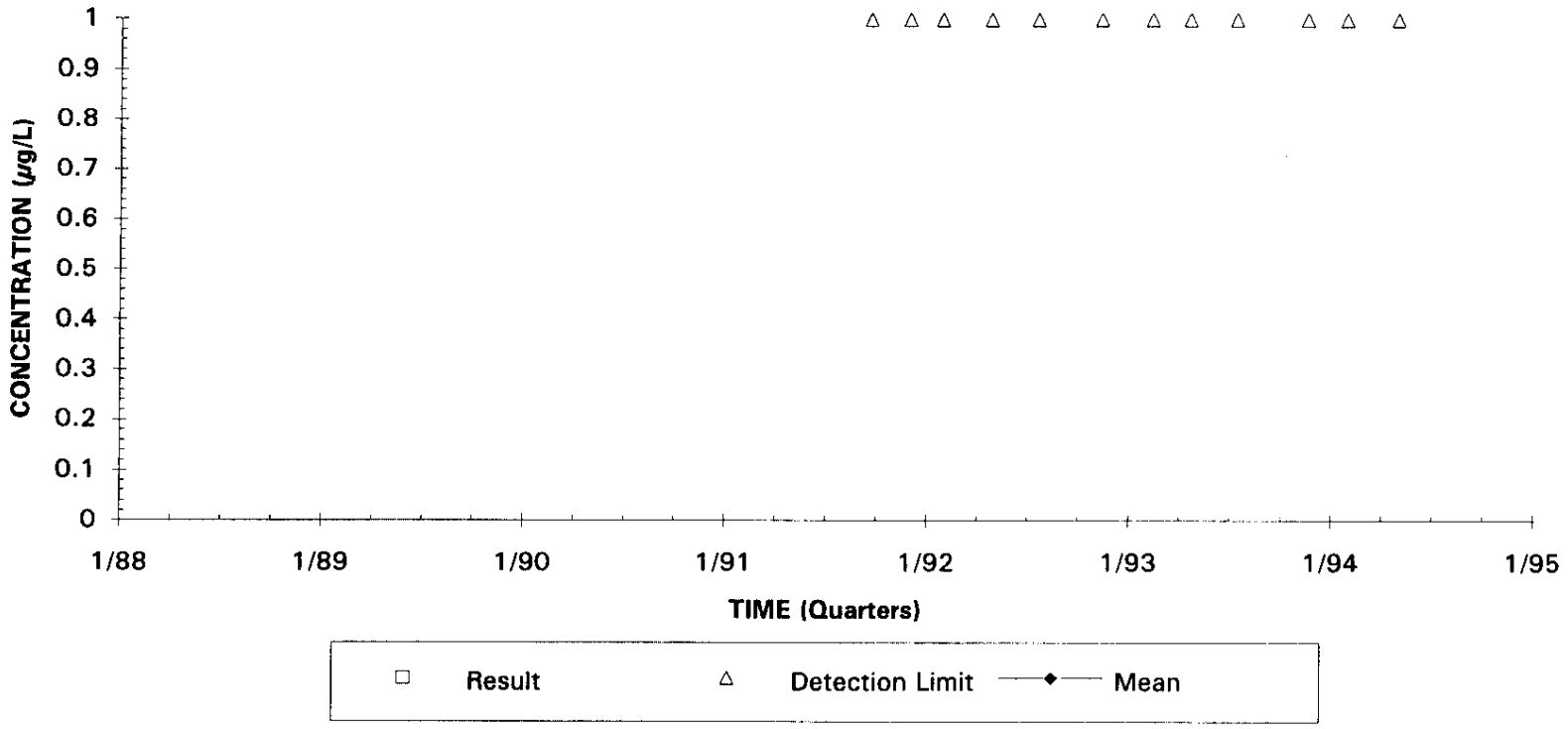
Trichloroethylene Concentrations
Well AMB 8D



Trichloroethylene Concentrations
Well AMB 9D



Trichloroethylene Concentrations
Well AMB 10A



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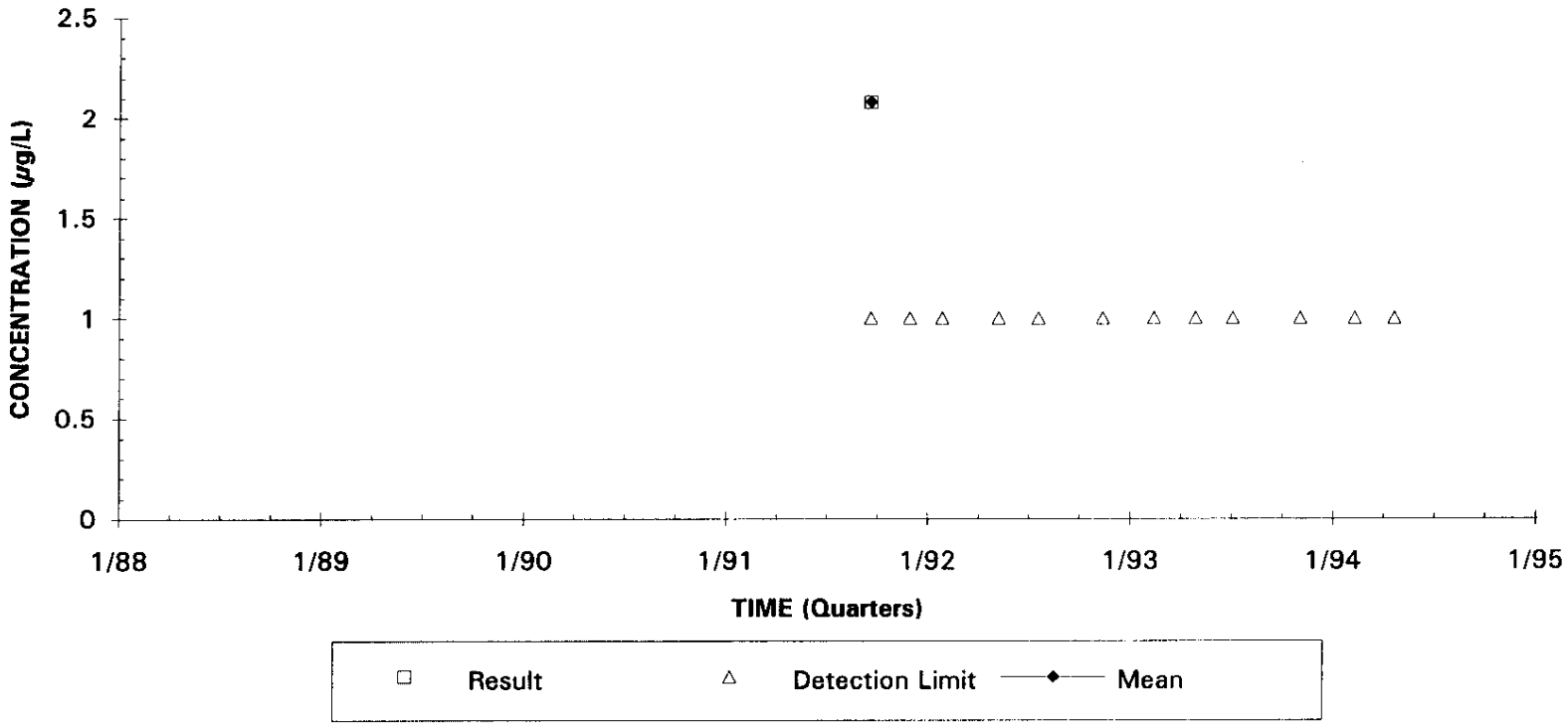

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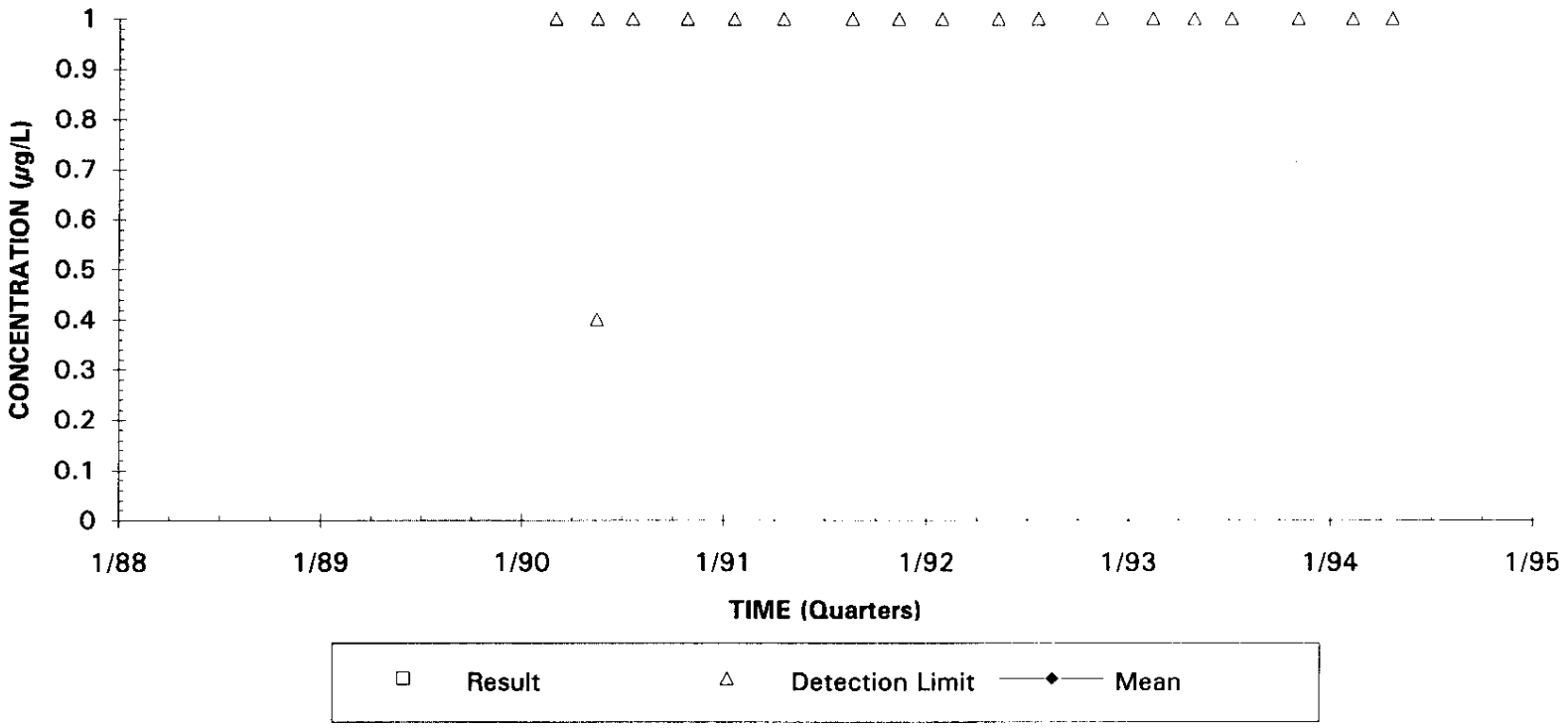

Trichloroethylene Concentrations
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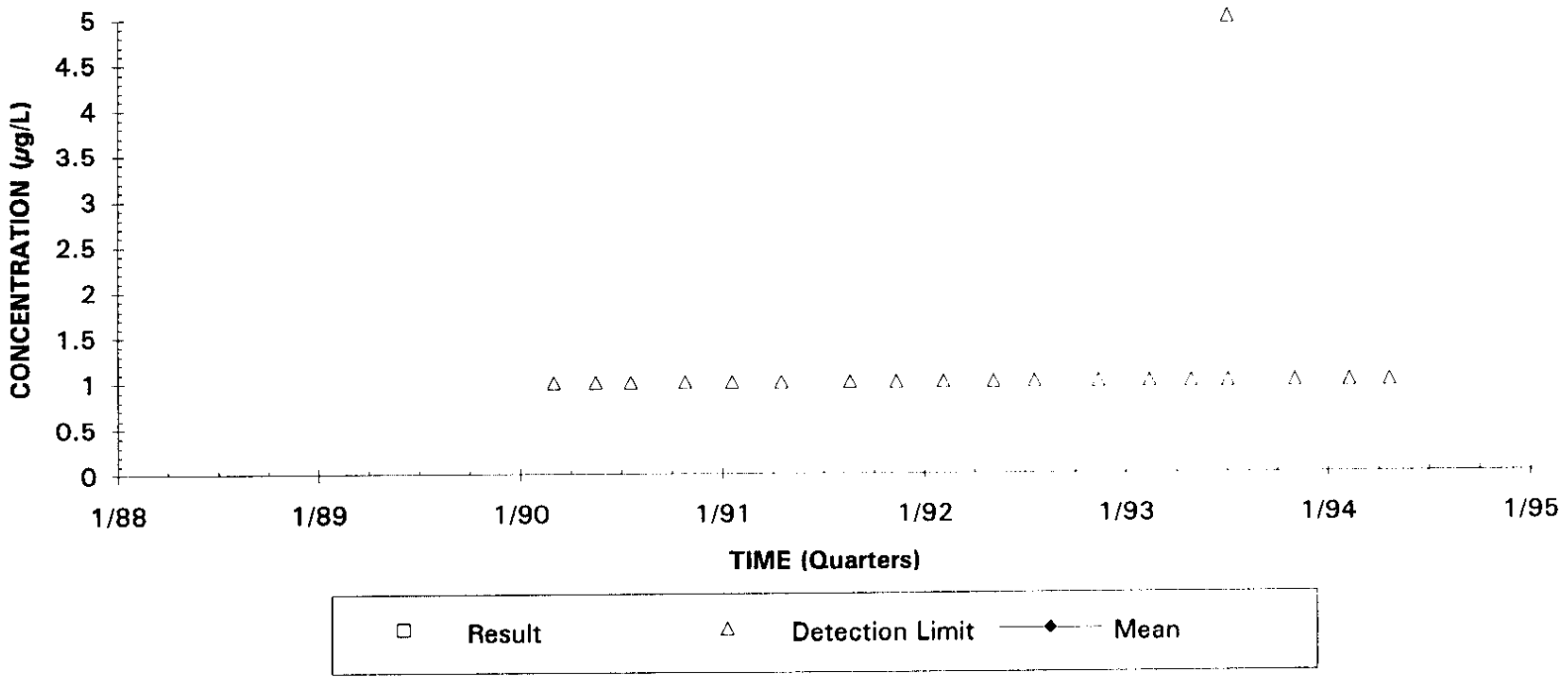

Trichloroethylene Concentrations
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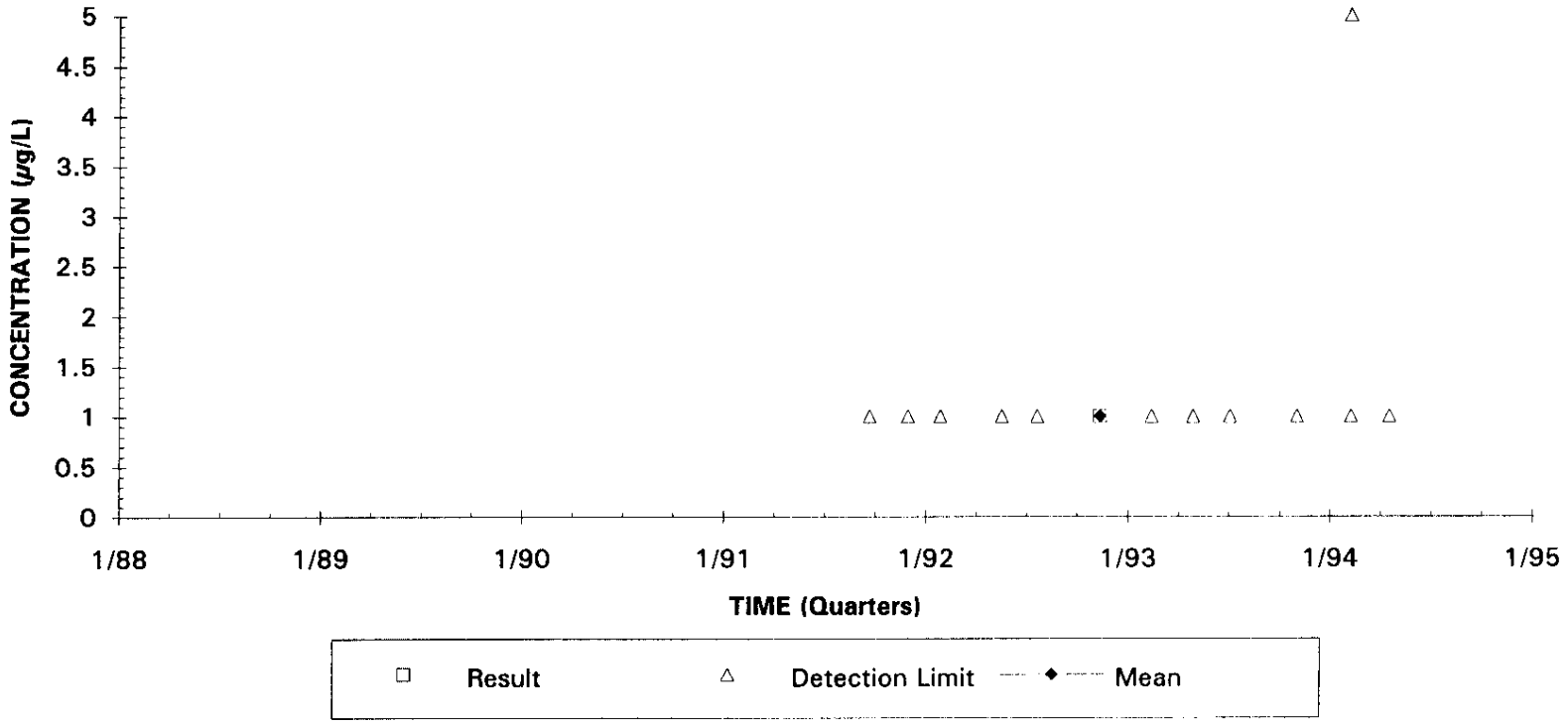

Trichloroethylene Concentrations
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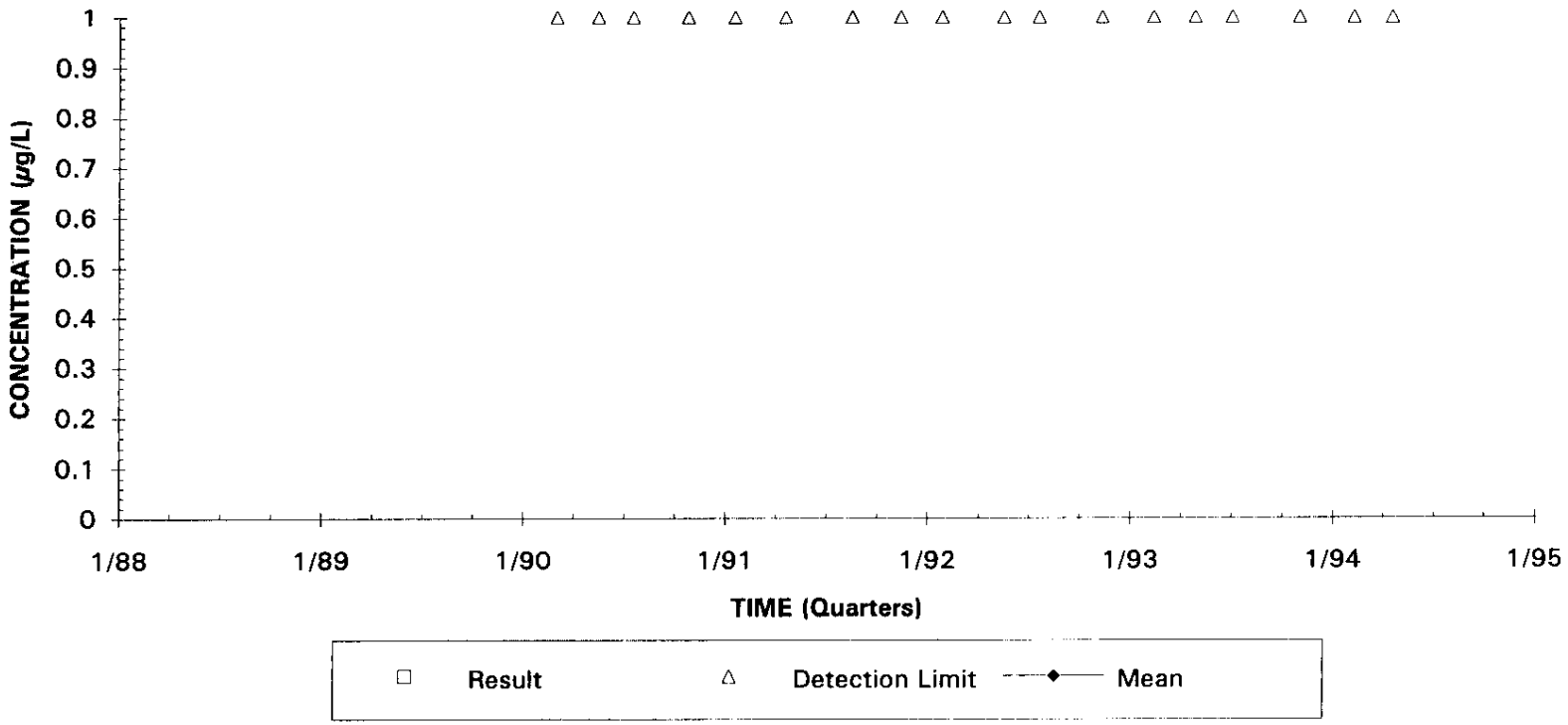

Trichloroethylene Concentrations
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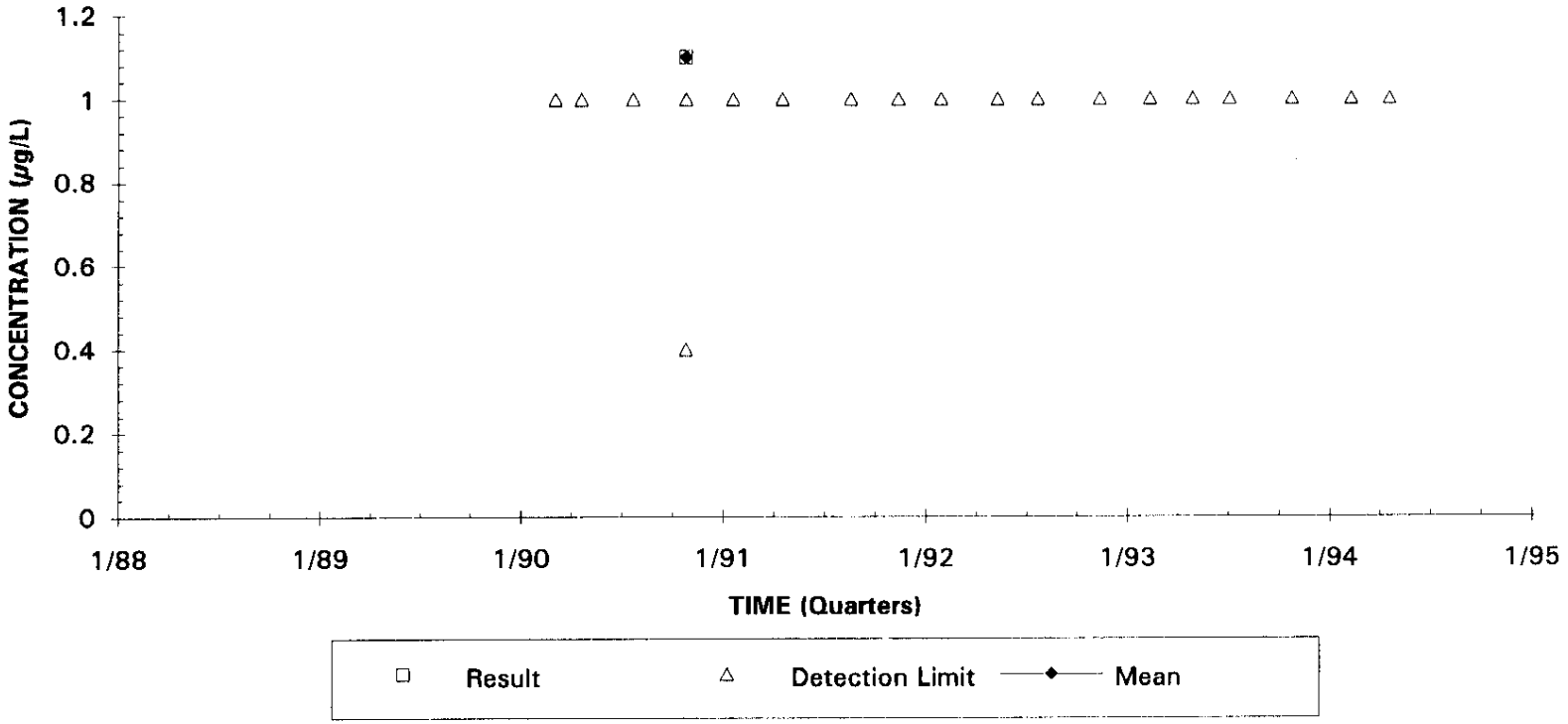
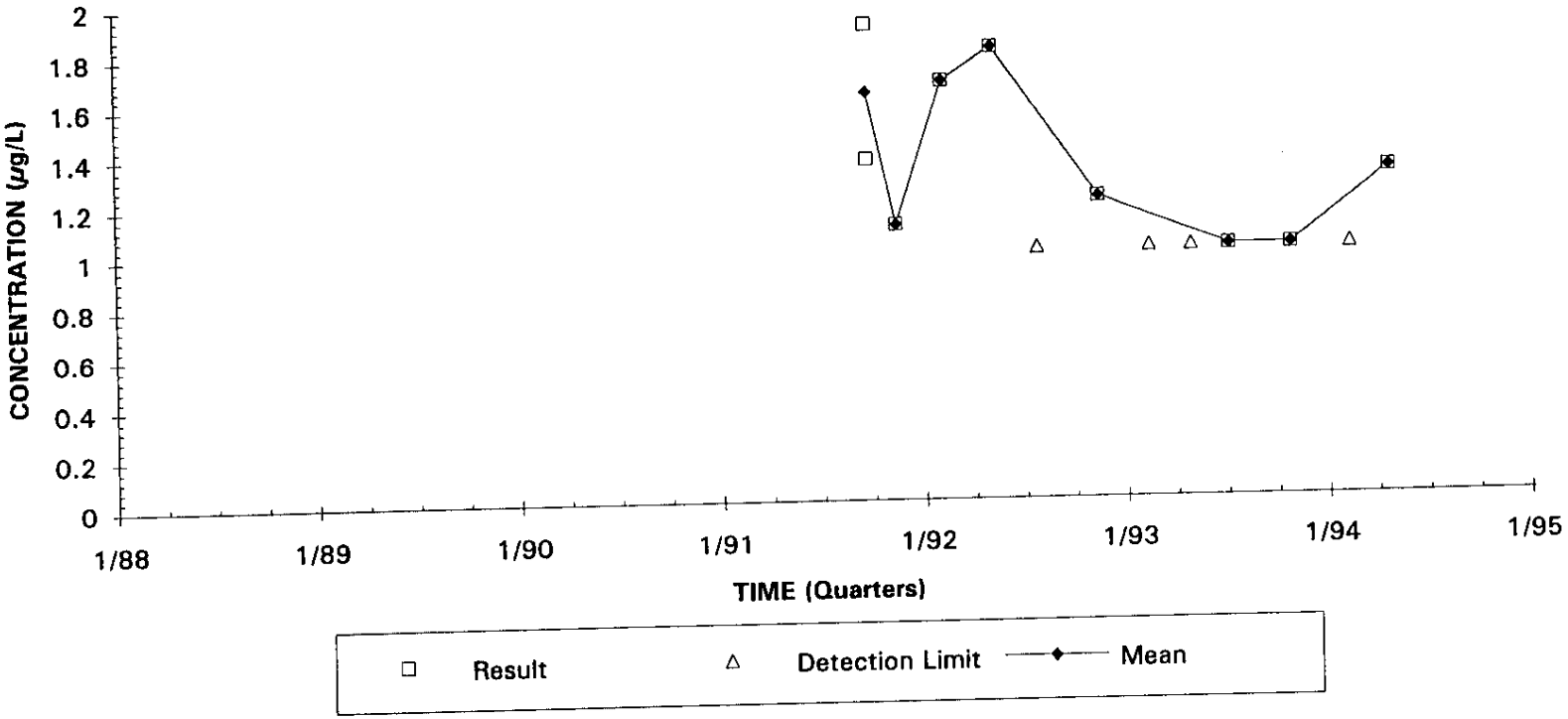


Trichloroethylene Concentrations
Well AMB 13AR



Appendix G

Hydrographs

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Hydrograph
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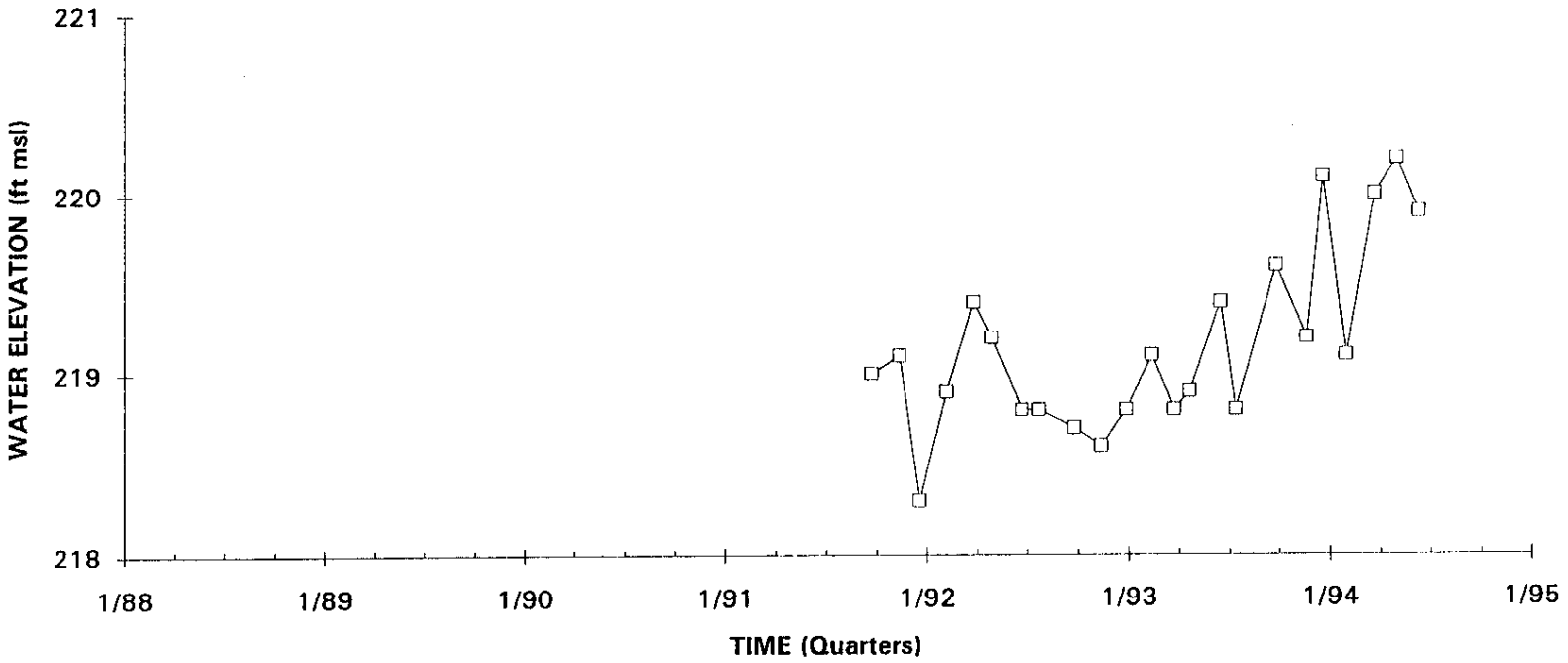
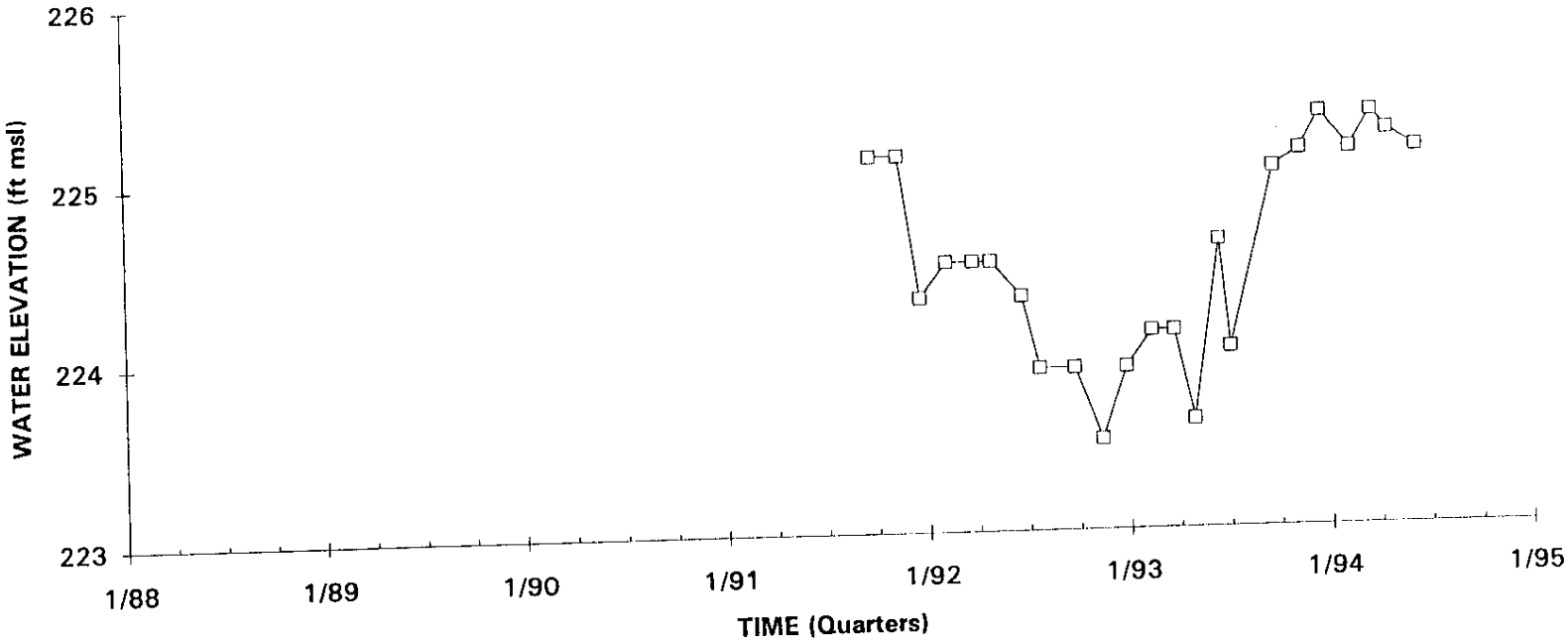
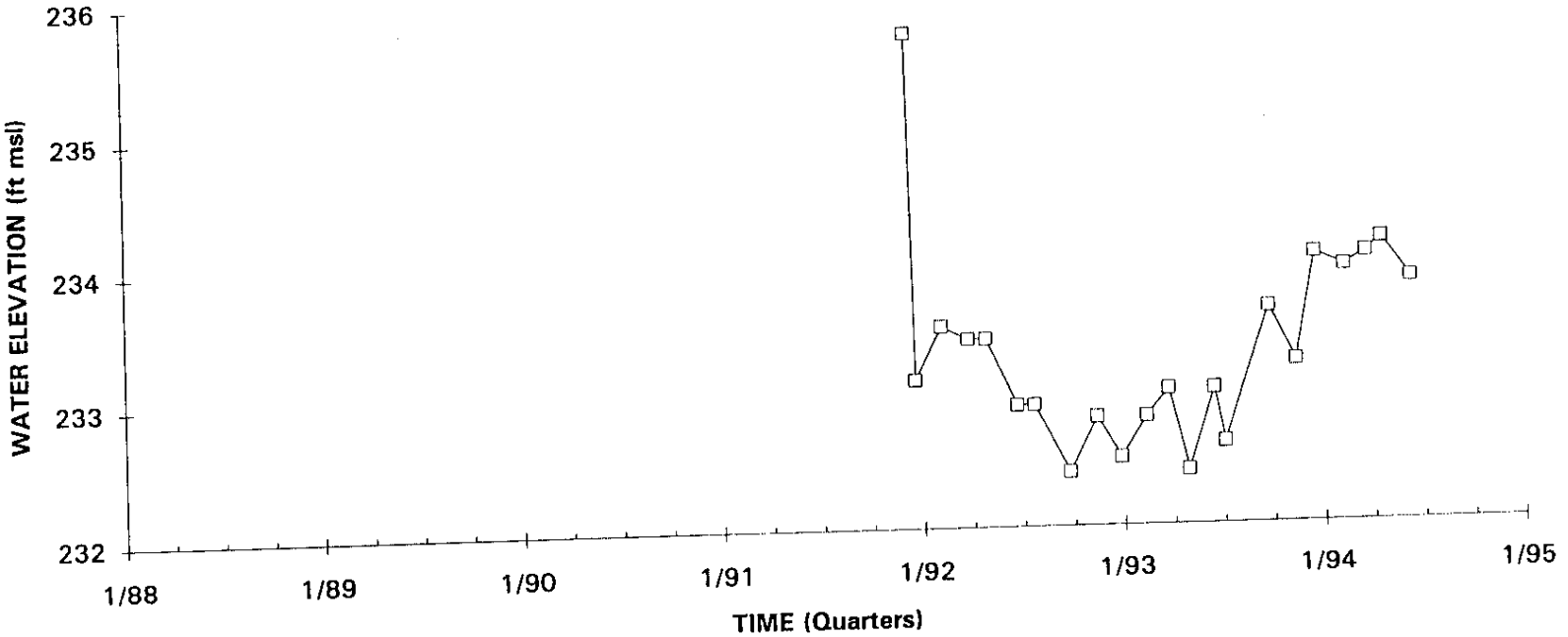


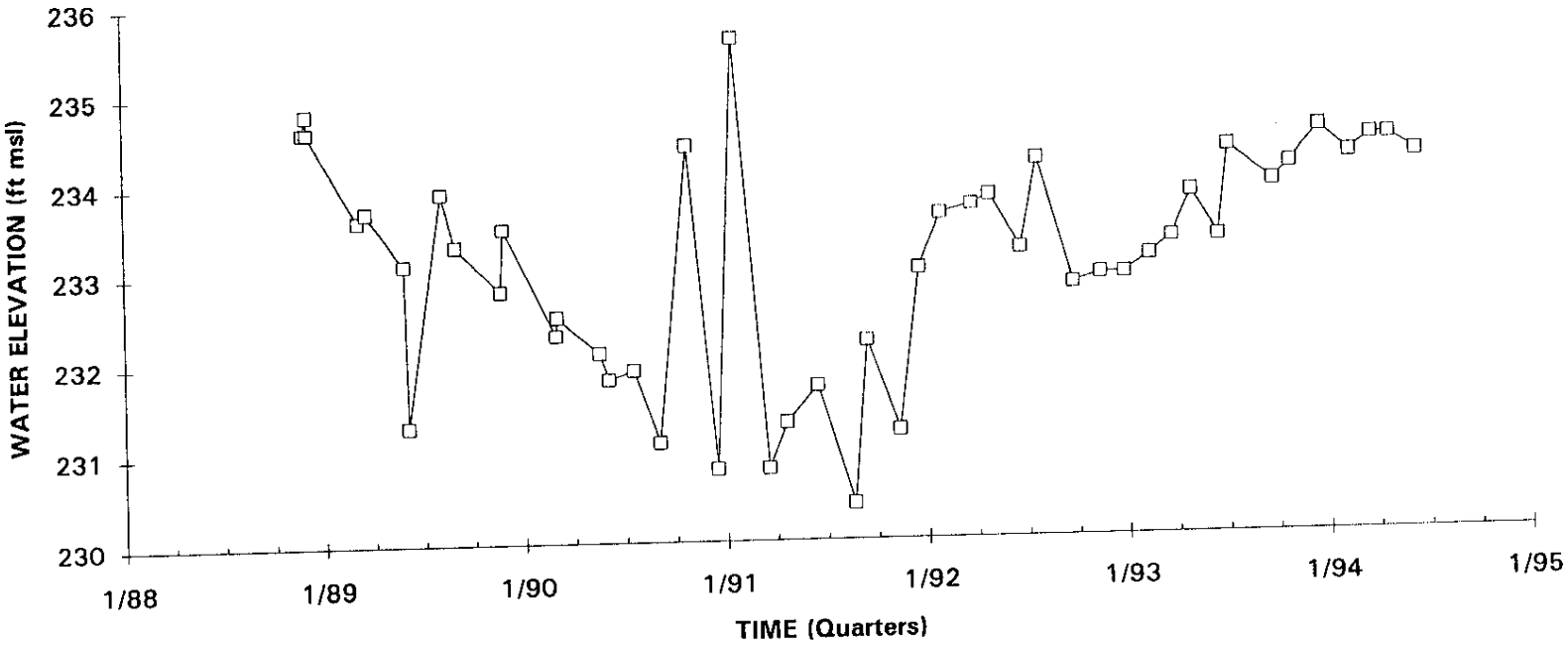
Hydrograph
Well AMB 4B



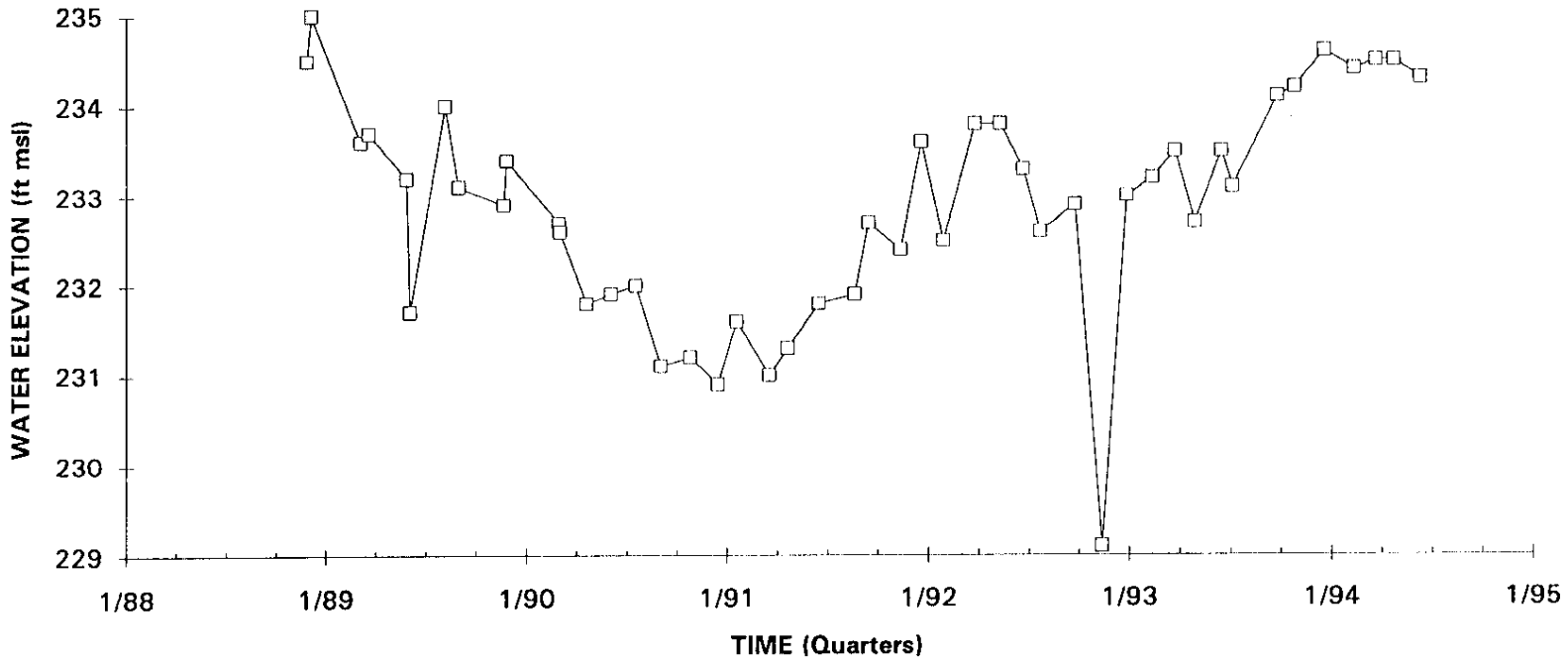
Hydrograph
Well AMB 4D



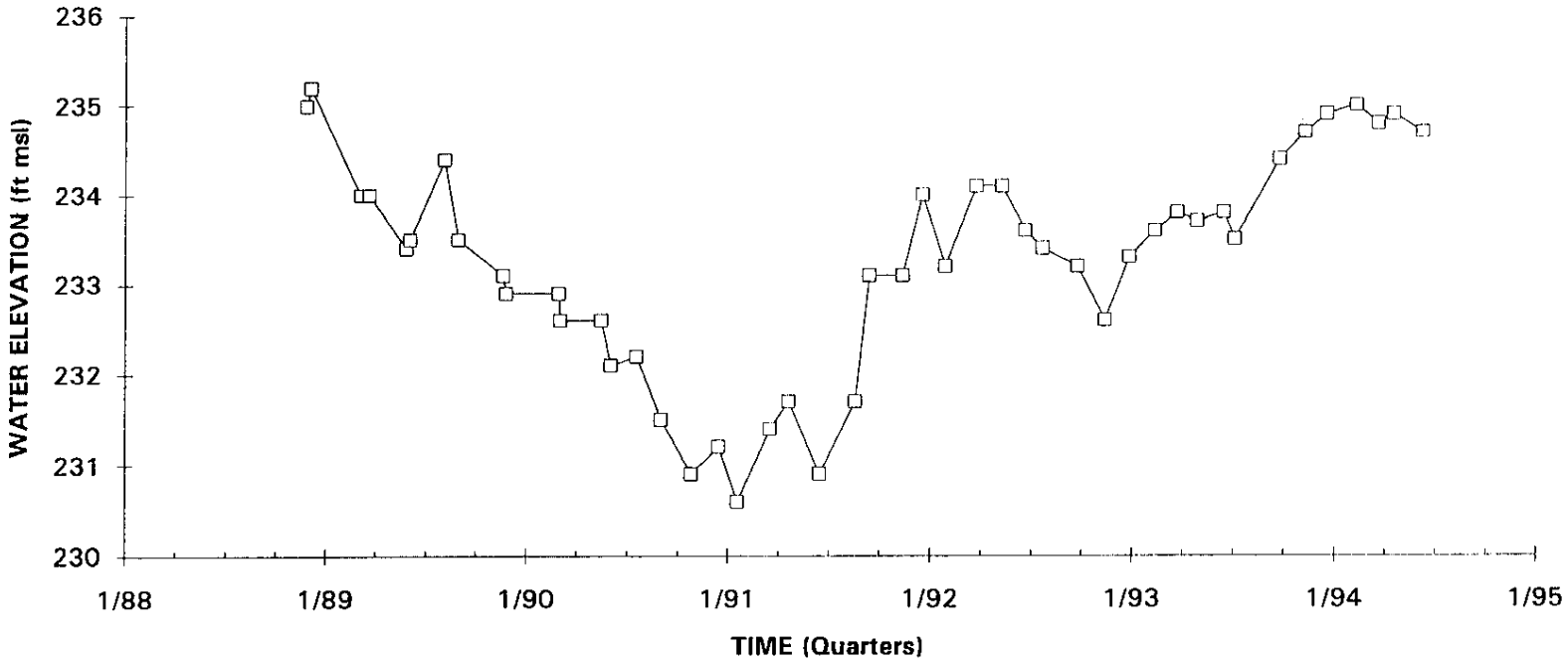
Hydrograph
Well AMB 5



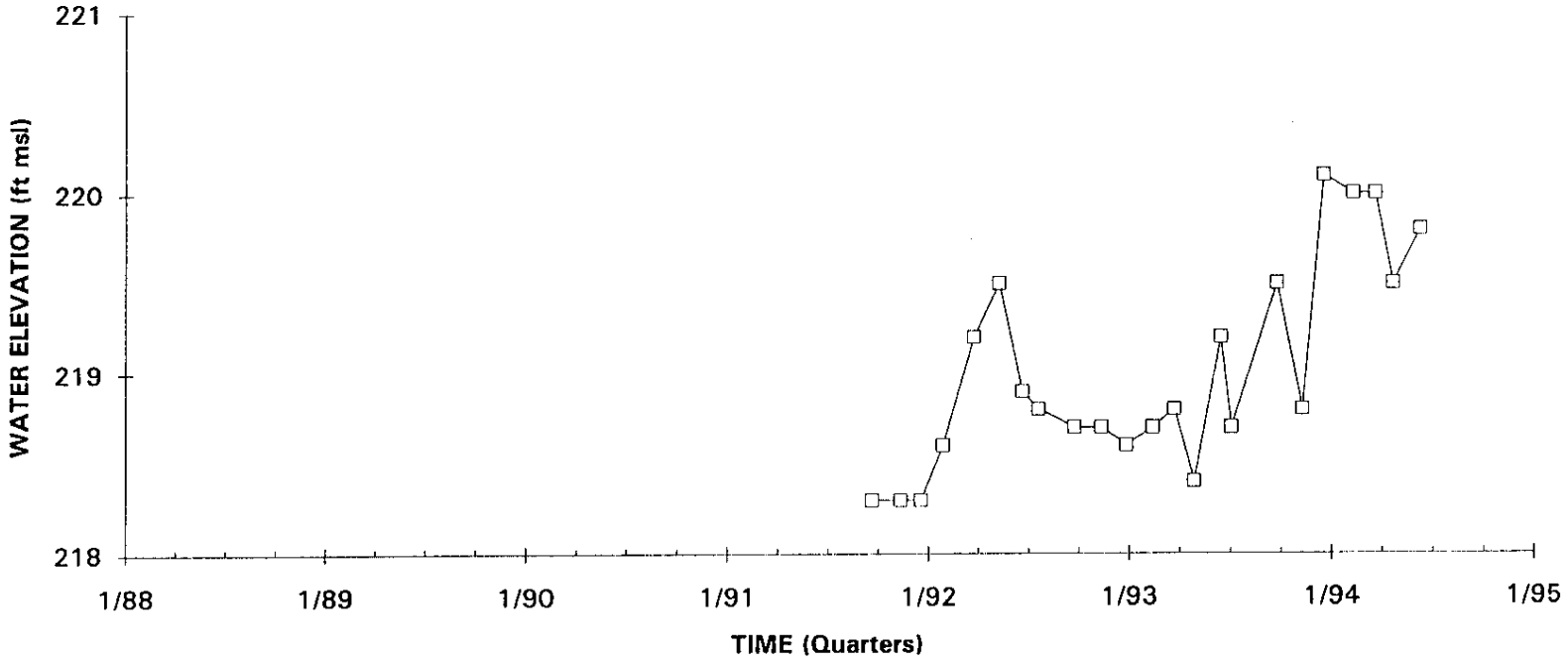
Hydrograph
Well AMB 6



Hydrograph
Well AMB 7



Hydrograph
Well AMB 7A



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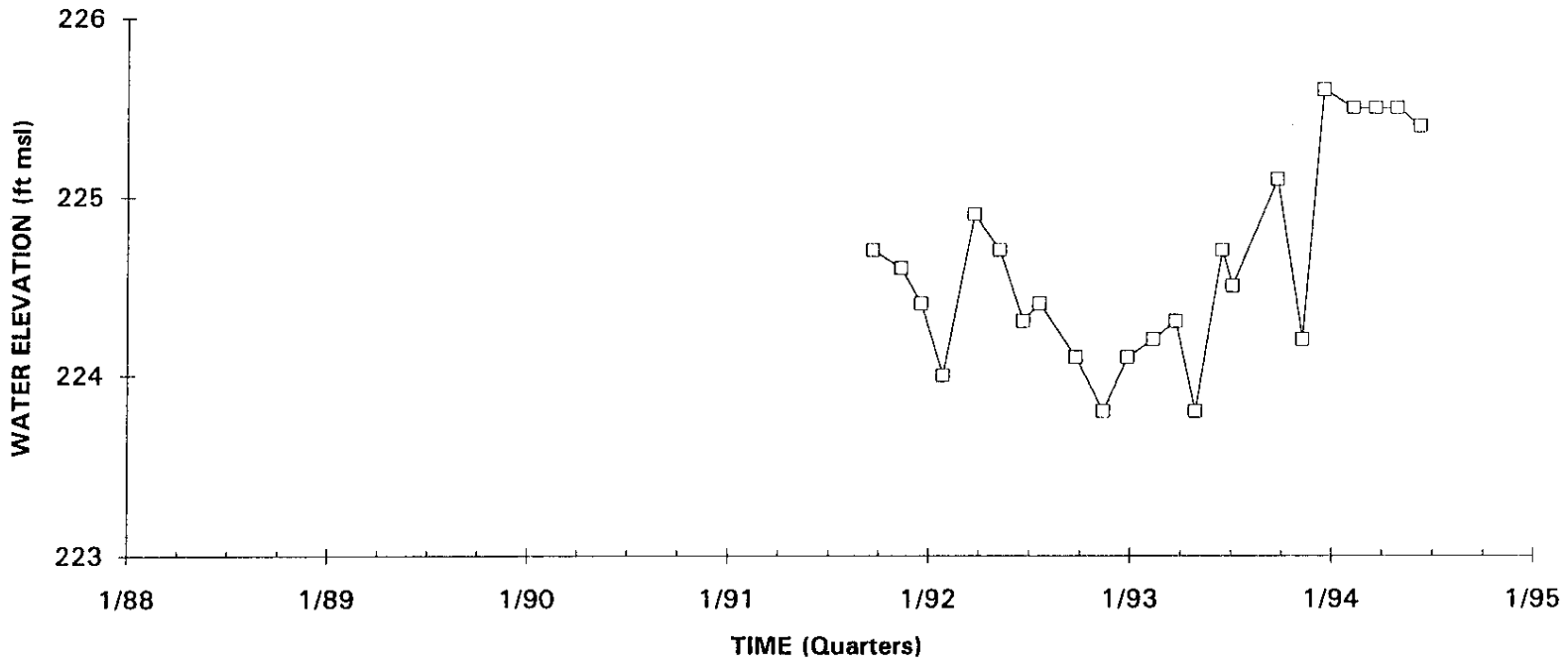
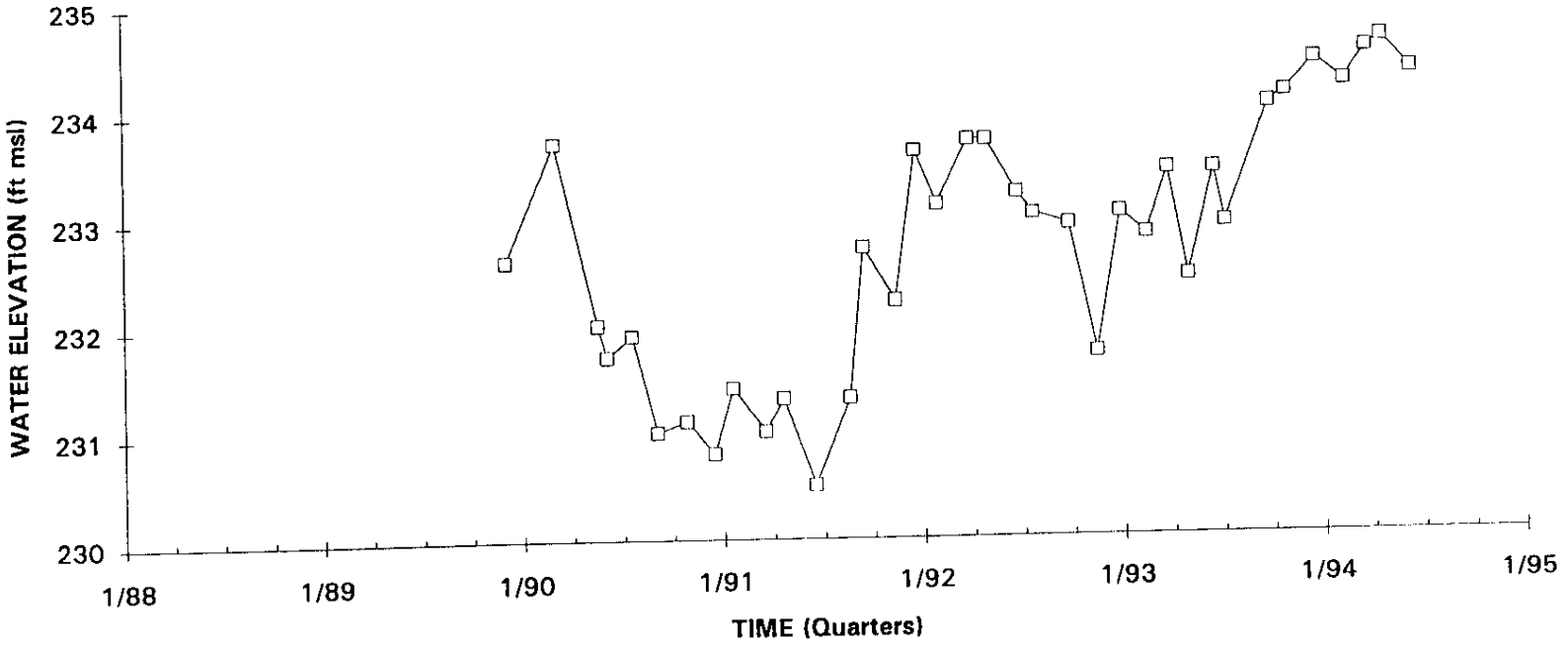
Well AMB 7B



Hydrograph
Well AMB 8D



Hydrograph
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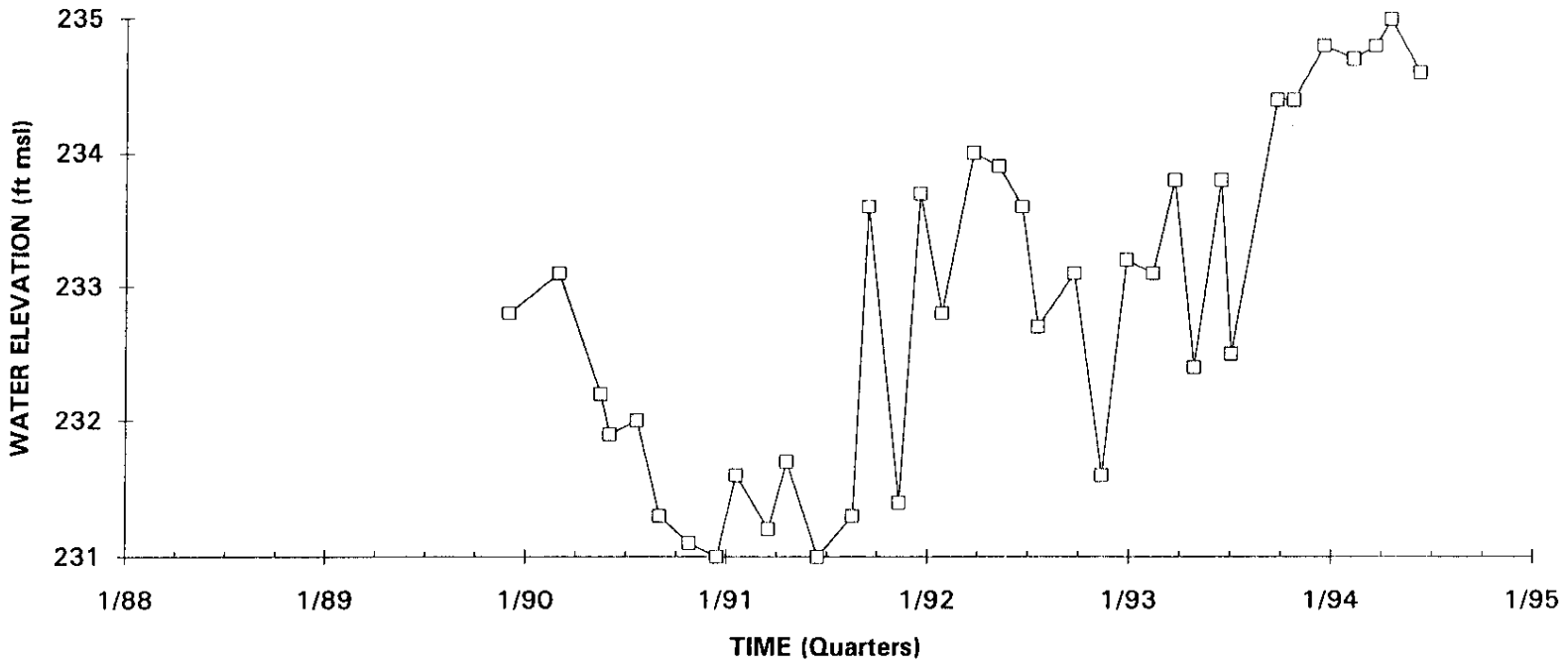
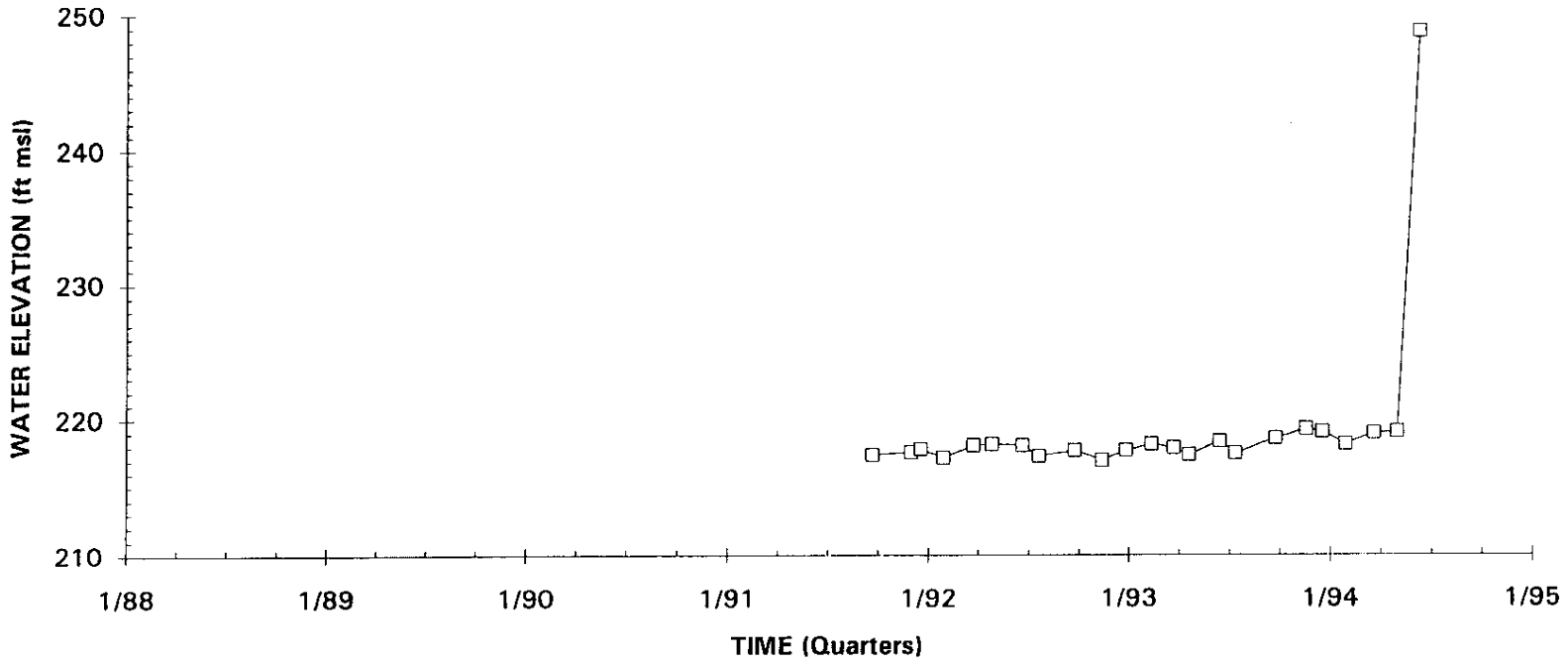


Hydrograph
Well AMB 10A



Hydrograph
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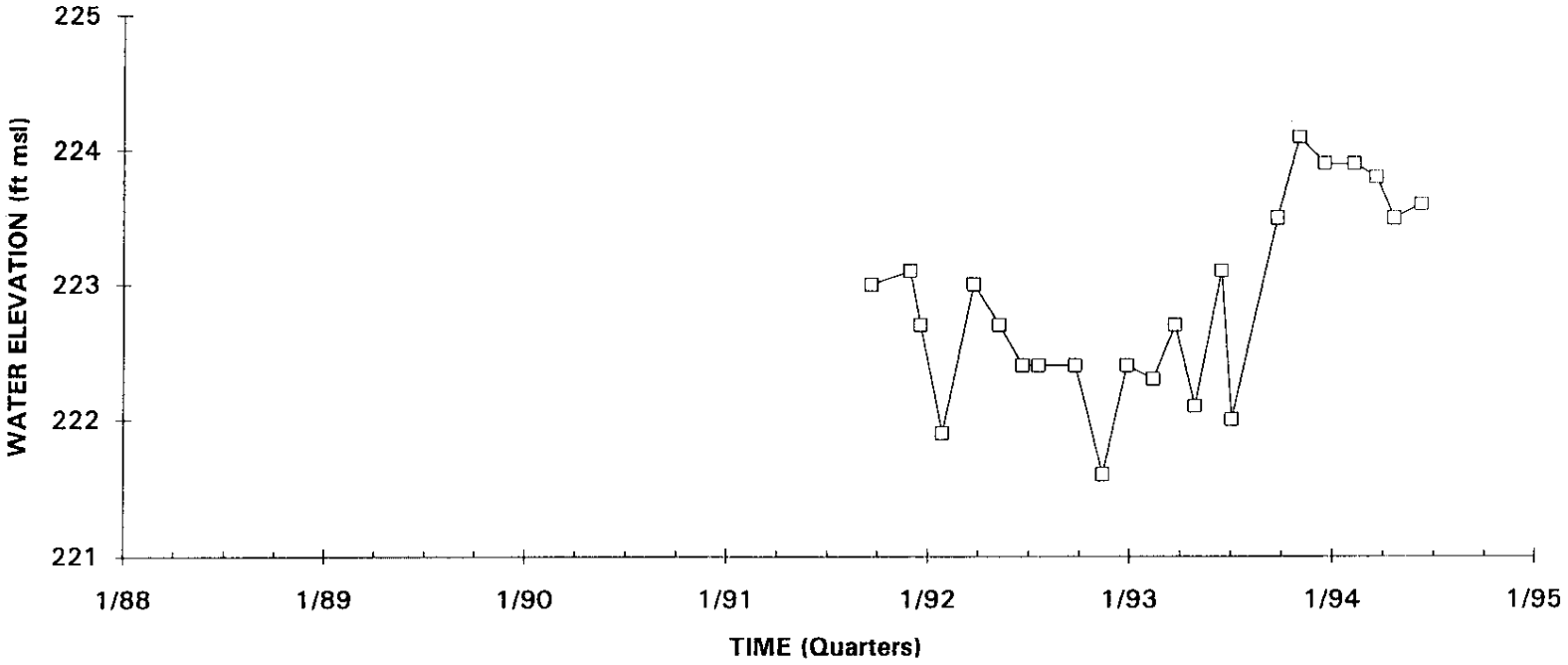

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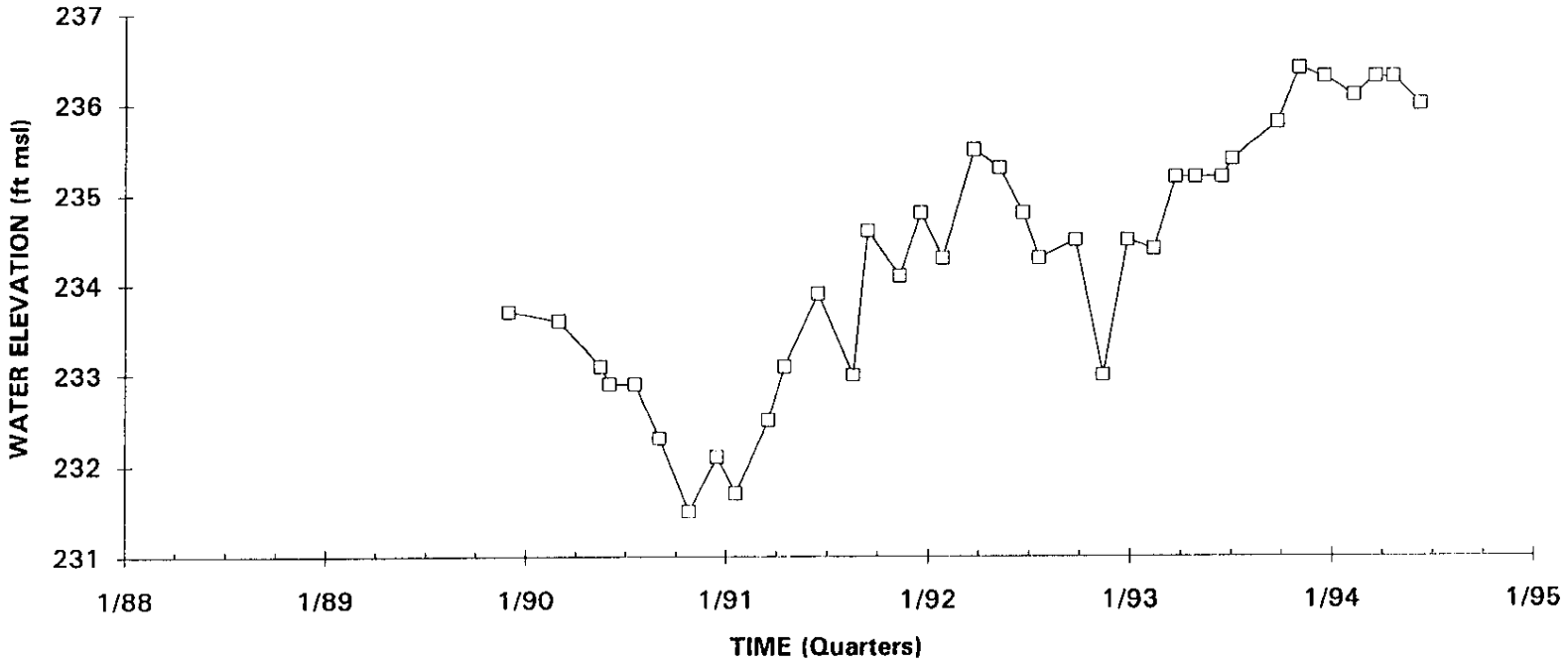

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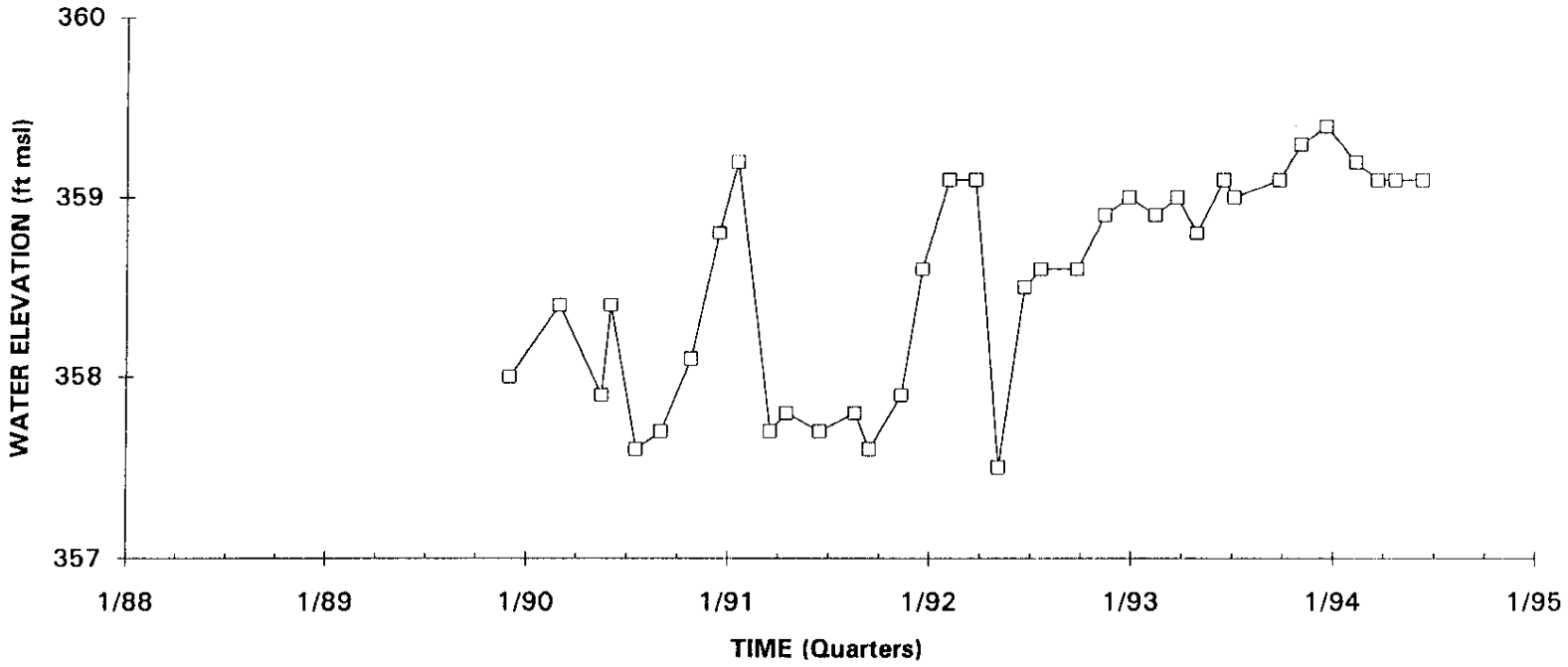
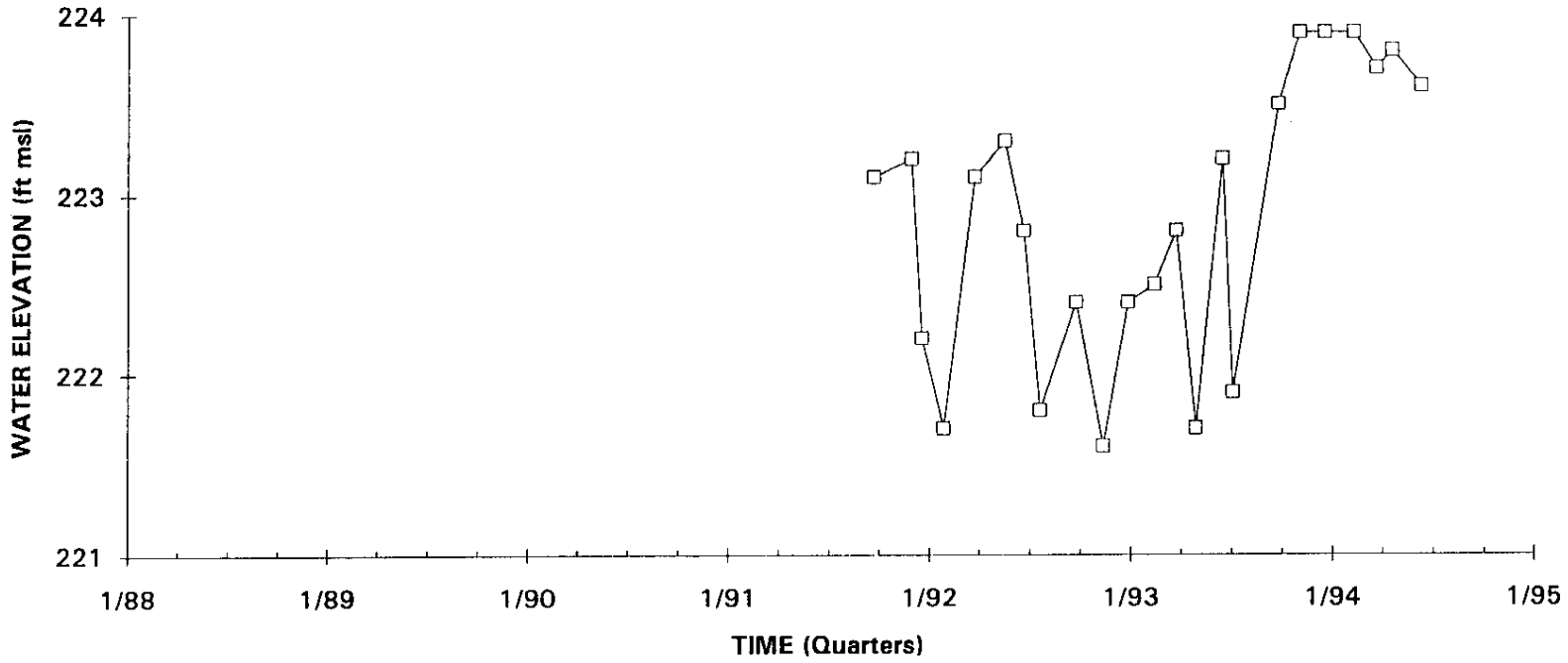


Hydrograph
Well AMB 11B



Hydrograph
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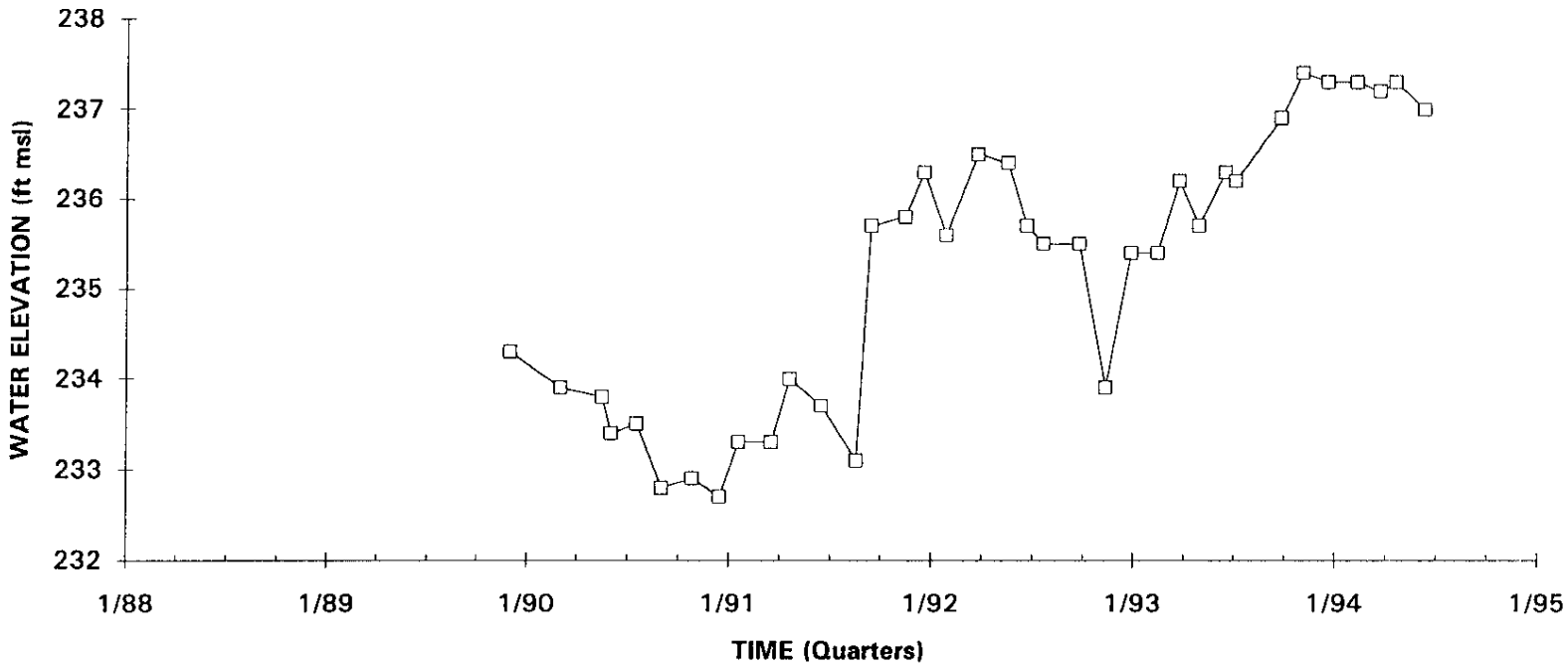
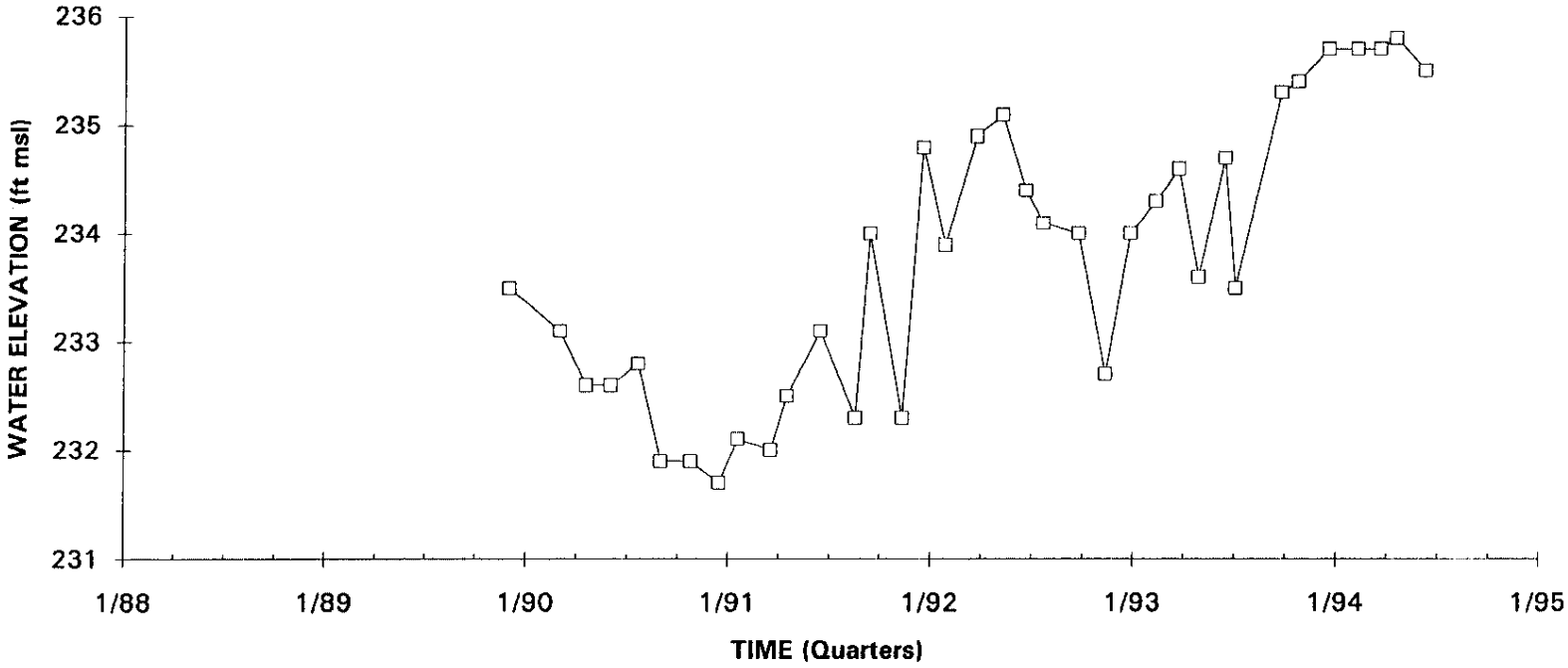


Hydrograph
Well AMB 12D



Hydrograph
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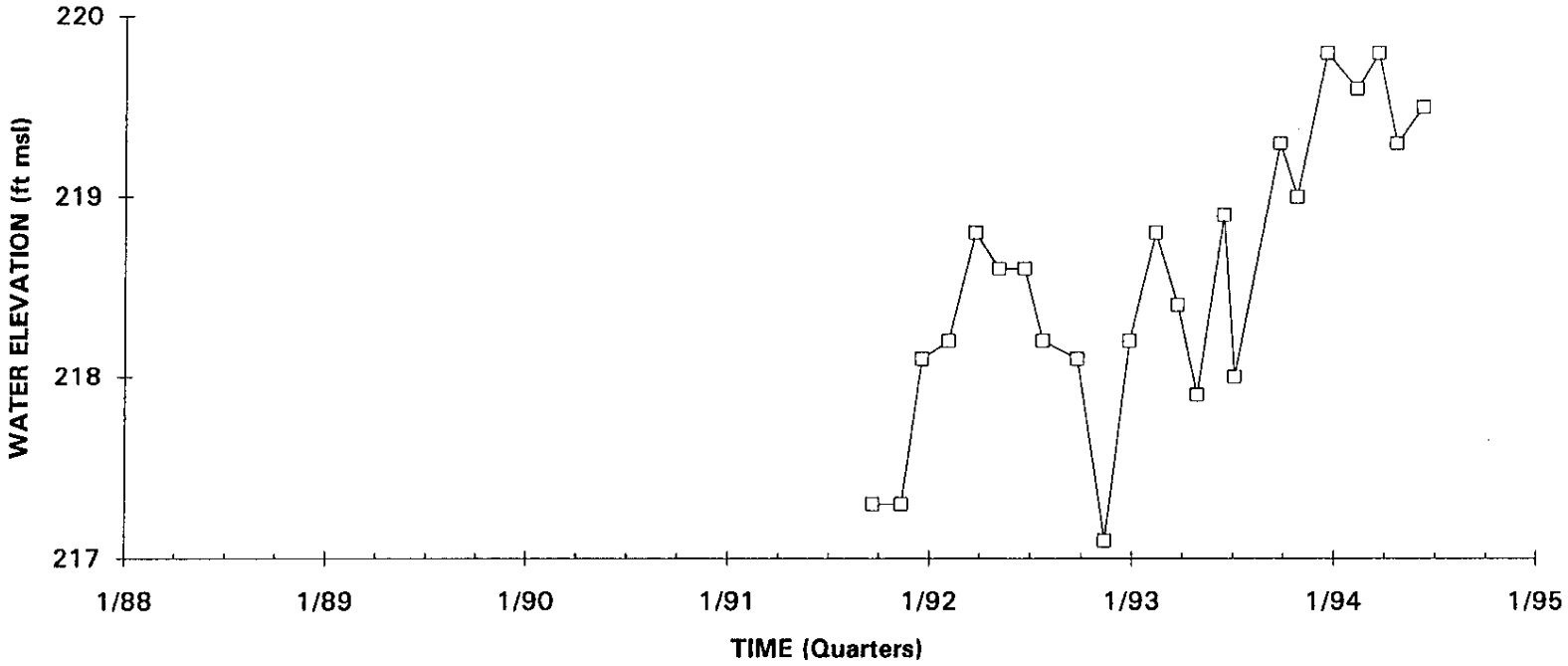

Appendix H

M-Area Large-Scale Maps

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