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Rev. 0

Groundwater and Leachate Monitoring and Sampling at the Environmental Restoration Disposal Facility, Calendar Year 2002

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TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 PURPOSE AND OBJECTIVES 1

2.0 BACKGROUND 2

2.1 GENERAL DESCRIPTION 2

2.2 ENVIRONMENTAL RESTORATION DISPOSAL FACILITY 2

2.2.1 Closed Cells 2
2.2.2 Open Cells 2

3.0 GROUNDWATER AND LEACHATE MONITORING 5

3.1 GROUNDWATER SAMPLING 5

3.1.1 General Approach to Evaluating Results 7
3.1.2 Statistical Approach to Evaluating Results 7
3.1.3 Determination of Tolerance Intervals 8

3.2 LEACHATE SAMPLING 9

3.3 WATER LEVELS 9

4.0 ANALYTICAL RESULTS AND FIELD DATA 11

4.1 SUMMARY OF GROUNDWATER ANALYSES 11

4.2 SUMMARY OF LEACHATE ANALYSIS 17

4.3 SUMMARY OF WATER-LEVEL MEASUREMENTS 18

5.0 CONCLUSIONS AND RECOMMENDATIONS 19

6.0 REFERENCES 20

APPENDICES

A GROUNDWATER SAMPLING RESULTS, 1996-2002 ..... A-i

B GROUNDWATER SAMPLING TRENDS, 1996-2002 ..... B-i

C LEACHATE SAMPLING RESULTS SUMMARY, 2000-2002 ..... C-i

FIGURES

1. Location of the Environmental Restoration Disposal Facility. 3
2. ERDF Monitoring Well Location Map. 4
3. Water-Level Contour Map. 10
4. Hydrograph from ERDF Groundwater Monitoring Wells. 12

TABLES

1. List of Analytes by Analytical Method 6
2. Summary of Tolerance Interval Comparisons and Trends 14

ACRONYMS

COC	contaminant of concern
CY	calendar year
DOW	description of work
ERDF	Environmental Restoration Disposal Facility
ETF	Effluent Treatment Facility
GPP	groundwater protection plan
HEIS	Hanford Environmental Information System
RCRA	*Resource Conservation and Recovery Act of 1976*

METRIC CONVERSION CHART

Into Metric Units			Out of Metric Units		
If You Know	*Multiply By*	*To Get*	*If You Know*	*Multiply By*	*To Get*
Length			**Length**		
inches	25.4	millimeters	millimeters	0.039	inches
inches	2.54	centimeters	centimeters	0.394	inches
feet	0.305	meters	meters	3.281	feet
yards	0.914	meters	meters	1.094	yards
miles	1.609	kilometers	kilometers	0.621	miles
Area			**Area**		
sq. inches	6.452	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.093	sq. meters	sq. meters	10.76	sq. feet
sq. yards	0.836	sq. meters	sq. meters	1.196	sq. yards
sq. miles	2.6	sq. kilometers	sq. kilometers	0.4	sq. miles
acres	0.405	hectares	hectares	2.47	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	grams	grams	0.035	ounces
pounds	0.454	kilograms	kilograms	2.205	pounds
ton	0.907	metric ton	metric ton	1.102	ton
Volume			**Volume**		
teaspoons	5	milliliters	milliliters	0.033	fluid ounces
tablespoons	15	milliliters	liters	2.1	pints
fluid ounces	30	milliliters	liters	1.057	quarts
cups	0.24	liters	liters	0.264	gallons
pints	0.47	liters	cubic meters	35.315	cubic feet
quarts	0.95	liters	cubic meters	1.308	cubic yards
gallons	3.8	liters			
cubic feet	0.028	cubic meters			
cubic yards	0.765	cubic meters			
Temperature			**Temperature**		
Fahrenheit	subtract 32, then multiply by 5/9	Celsius	Celsius	multiply by 9/5, then add 32	Fahrenheit
Radioactivity			**Radioactivity**		
picocuries	37	millibecquerel	millibecquerels	0.027	picocuries

1.0 INTRODUCTION

The Environmental Restoration Disposal Facility (ERDF) is a Hanford Site low-level mixed waste disposal facility that was brought into service on July 1, 1996. Baseline sampling and analytical data obtained from monitoring wells and the ERDF leachate collection system were used to determine contaminants of concern (COCs) and background conditions for long-term monitoring as described in the *Groundwater Protection Plan for the Environmental Restoration Disposal Facility* (ERDF GPP) (BHI 1996b) and to meet the requirements of the ERDF Record of Decision (ROD) (EPA 1995). Ongoing groundwater and leachate monitoring are performed to meet the requirements of the ERDF ROD, and details of the monitoring program are described in the *Description of Work for Routine Groundwater Sampling at the Environmental Restoration Disposal Facility* (ERDF DOW) (BHI 1996a).

1.1 PURPOSE AND OBJECTIVES

The purpose of this annual monitoring report is to evaluate groundwater conditions and trends beneath the ERDF and to report leachate results to fulfill the requirements specified in the ERDF ROD (EPA 1995).

The objectives of this report are as follows:

- Review routine groundwater sampling data to statistically evaluate if there have been changes in COC concentrations over time that may be attributed to ERDF operations and to assess conditions that may indicate the presence of encroaching groundwater contaminant plumes originating from upgradient sources in the 200 West Area

- Assess data from routine ERDF leachate sampling to determine if additional constituents should be added to the ERDF groundwater monitoring COC list

- Evaluate the groundwater levels in the ERDF monitoring wells to determine if the existing wells need to be modified or replaced.

Appendix A shows analytical results for groundwater samples that were collected from the ERDF monitoring well network from calendar year (CY) 1996 through CY 2002. Appendix B graphically shows trends in the monitoring data resulting from routine groundwater sampling in the ERDF well network. The most recent 3 years of leachate analytical results for samples collected from CY 2000 through CY 2002 are presented in Appendix C. Leachate data collected from CY 1996 through CY 1999 are contained in *Groundwater Monitoring and Sampling at the Environmental Restoration Disposal Facility, Calendar Year 1996 Through 1999* (Faurote 2000).

2.0 BACKGROUND

2.1 GENERAL DESCRIPTION

The ERDF site is located between the 200 East and 200 West Areas of the Hanford Site (Figure 1). This location was selected for the ERDF over other possible locations, in part because of the depth to groundwater in this area, its location above pre-existing groundwater plumes, the relatively flat topography in this area, and the compatibility of this location with stakeholder recommendations.

The ERDF landfill is authorized under the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*. The landfill was designed to meet the *Resource Conservation and Recovery Act of 1976* (RCRA) minimum technology requirements; however, it is not permitted as a RCRA facility. Wastes disposed at the ERDF contain elevated levels of radionuclides and hazardous constituents originating from 100, 200, and 300 Area waste sites.

2.2 ENVIRONMENTAL RESTORATION DISPOSAL FACILITY

Initial landfill construction at ERDF included two waste cells identified as cells 1 and 2. Initial placement of waste in these cells has been completed. Two additional cells (3 and 4) that are roughly equal in size to the original cells have also been constructed and are currently in use. Figure 2 shows the ERDF as it is currently constructed. Throughout CY 2002, approximately 3.5 million metric tons (3.9 million tons) of remediation wastes have been disposed at the facility. Two additional cells (5 and 6) are currently being designed and are planned to be in service during CY 2005. Expansion of the ERDF site has been authorized to cover as much as 4.1 km^2 (1.6 mi^2).

2.2.1 Closed Cells

The initial 10.3-ha (25.5-ac) area that comprised cells 1 and 2 received waste between July 1996 and September 2000. An interim cover has been placed over the parts of the cells that have been brought up to grade.

2.2.2 Open Cells

Cells 3 and 4, which are roughly 9.7 ha (24 acres) in size, were constructed at the ERDF beginning in August 1998. Waste was first placed in cell number 4 during June 2000 and in cell number 3 during September 2001. Both cells 3 and 4 are operational and received waste during CY 2002.

Figure 1. Location of the Environmental Restoration Disposal Facility.

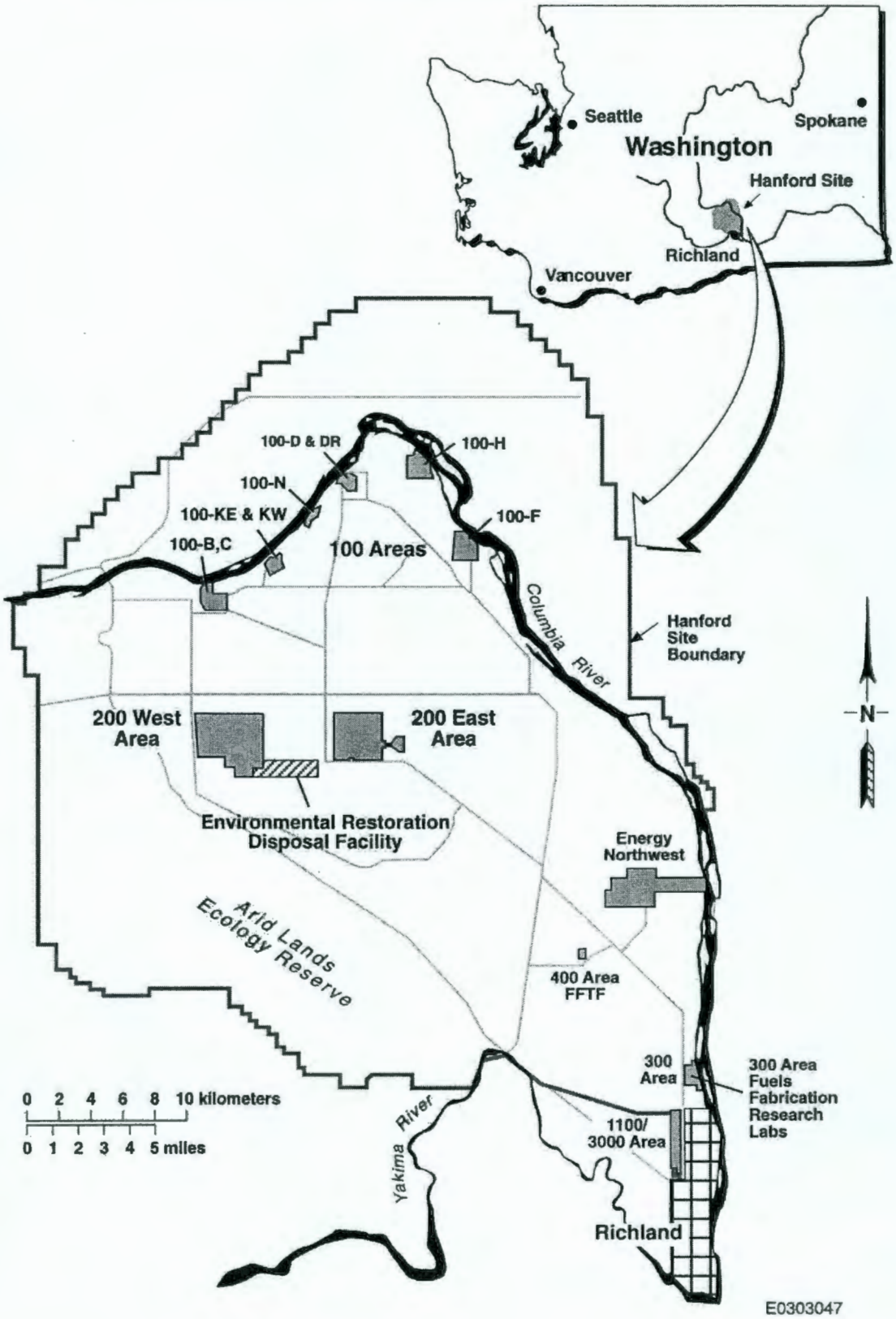
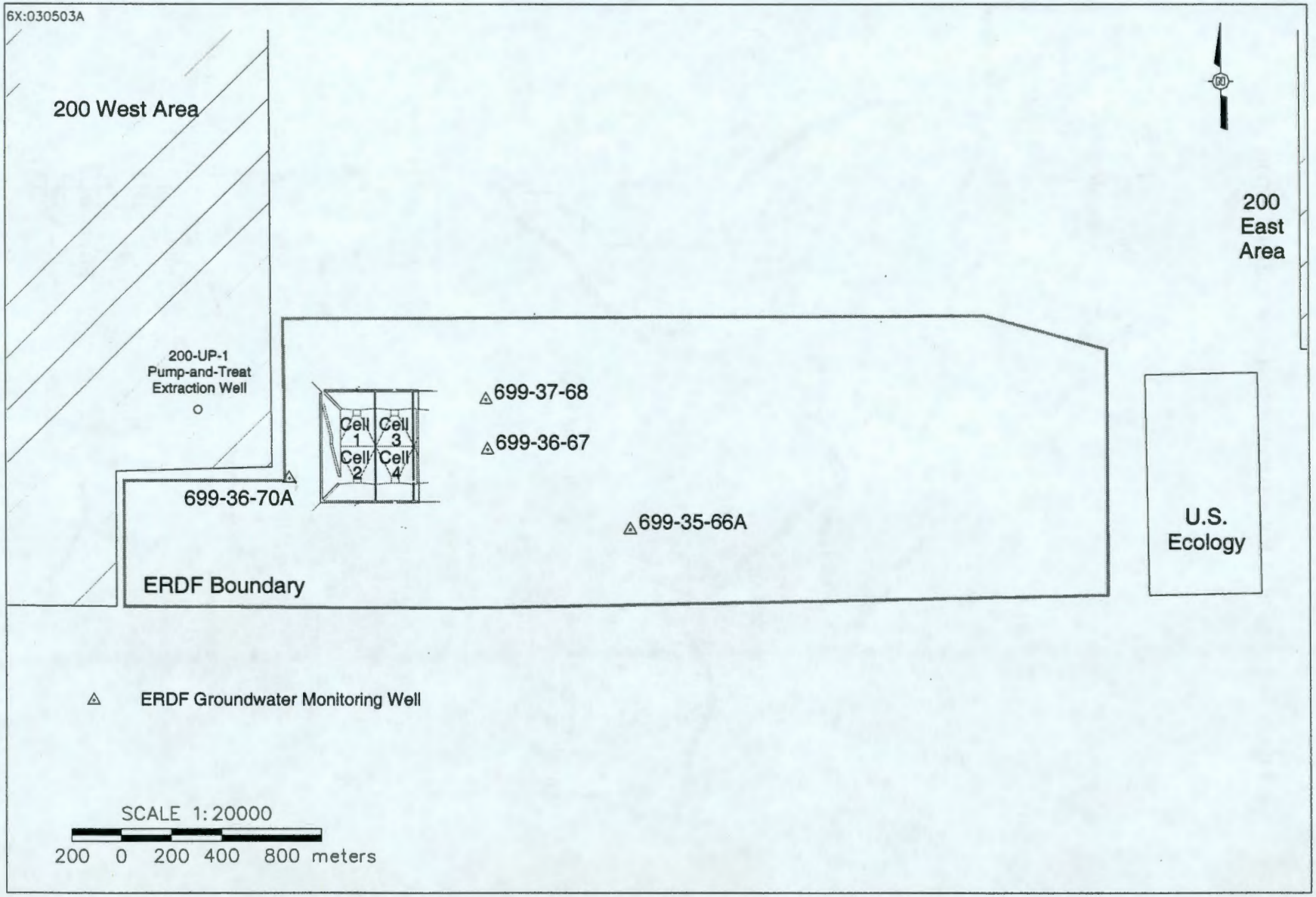


Figure 2. ERDF Monitoring Well Location Map.



2.2.3 New Cells

Cells 5 and 6 are currently being designed, and construction of these cells is planned to begin at the end of CY 2003. Design of these new cells is consistent with that of the existing cells. This expansion has been allowed under an amendment to the ERDF ROD (EPA 2003), which was approved in January 2003.

3.0 GROUNDWATER AND LEACHATE MONITORING

The groundwater and leachate monitoring program is described in the ERDF GPP (BHI 1996b). This section provides an overview of these monitoring requirements.

3.1 GROUNDWATER SAMPLING

Groundwater samples are collected semiannually from four monitoring wells in the vicinity of the ERDF. This monitoring well network is scheduled for routine sampling during the first and third quarters of each year. The monitoring well network consists of one upgradient well (699-36-70A) and three downgradient wells (699-35-66A, 699-36-67, and 699-37-68). Well locations are shown in Figure 2.

Guidelines for determining COCs for routine groundwater monitoring are described in the ERDF DOW (BHI 1996a). The COCs for routine monitoring were determined based on the results of pre-operational baseline sampling conducted in March 1996 and known contaminant plumes beneath the ERDF. Additional COCs may be added to the groundwater monitoring program if analytical results from leachate sampling indicate it is warranted. Table 1 lists the CY 2002 analytes for the groundwater monitoring program.

Routine groundwater sampling has been conducted since ERDF operations commenced, with the following exceptions:

- The March 2000 sampling event was not completed due to a Hanford Site moratorium on all groundwater sampling. This moratorium was instated by the U.S. Department of Energy because of issues regarding the management of secondary wastes associated with groundwater sampling. These waste issues were not resolved until early May 2000, and because of the time required to resolve these issues, the March 2000 event was not rescheduled.

- Downgradient well 699-37-68 was not sampled during the September 2000 sampling event because the pump in that well was not operational. Repairs to the pump were not completed in time for sampling to take place within the third quarter of 2000.

Table 1. List of Groundwater Analytes by Analytical Method (from BHI 1996a).

Analyte	Method[a]	Practical Quantitation Limit	Accuracy[b] (%)	Precision[b] (%)
Arsenic	7060	10 µg/L	±25	±25
Barium	6010A	20 µg/L	±25	±25
Chromium	6010A	70 µg/L	±25	±25
Lead	6010A	40 µg/L	±25	±25
Selenium	7740	750 µg/L	±25	±25
Tin	6010A	30 µg/L	±25	±25
Vanadium	6010A	80 µg/L	±25	±25
Zinc	6010A	20 µg/L	±25	±25
Carbon tetrachloride	8240A/8260	5 µg/L	±25	±25
Alkalinity	310.1[c]	10,000 µg/L	±20	±25
Chloride	300/modified	10,000 µg/L	±20	±25
Fluoride	300/modified	100 µg/L	±20	±25
Nitrogen (in nitrite/nitrate)	353.1	0.05 µg/L	±20	±25
Sulfate	300/modified	2,000 µg/L	±20	±25
Total dissolved solids	160.1[c]	10,000 µg/L	±20	NA
Total organic halides	9020	5 µg/L	±20	NA
Carbon-14	[d]	200 pCi/L	±20	±25
Iodine-129	[d]	5 pCi/L	±20	±25
Technetium-99	[d]	15 pCi/L	±20	±25
Radium	903.1	1 pCi/L	±20	±25
Total uranium	[d]	0.1 µg/L	±20	±25
Gross alpha	900.0	3 pCi/L	±20	±25
Gross beta	900.0	4 pCi/L	±20	±25
pH	[e]	NA	NA	NA
Specific conductance	[e]	25 µS/m	±20	NA
Turbidity	180.1[c]	0.05 NTU	±0.05 NTU	NA

[a] Method number indicated is from *Test Method for Evaluating Solid Wastes: Physical Chemical Methods* (SW-846) (EPA 1986), unless otherwise specified.
[b] Accuracy is expressed as percent recovery; precision is expressed as a percent relative difference.
[c] Method specified is from *Methods for Chemical Analysis of Water and Wastes* (Kopp and McKee 1983).
[d] Industry standard method, laboratory specific, based on acceptance from Bechtel Hanford, Inc.
[e] Parameter will be measured in the field in compliance with BHI-EE-01, *Environmental Investigations Procedures*, Procedure 4.1, "Groundwater Sampling."
NA = not available, or not applicable
NTU = nephelometric turbidity unit

During CY 2002, groundwater sampling was completed at all of the ERDF monitoring wells in March and September, as scheduled.

3.1.1 General Approach to Evaluating Results

Groundwater samples collected from the ERDF monitoring well network were analyzed in accordance with the requirements of EPA SW-846 (EPA 1986), industry standard, or laboratory-specific test methods as presented in Table 1. Laboratory results for these samples were entered into the Hanford Environmental Information System (HEIS), a Hanford Site database that contains environmental analytical data. Groundwater monitoring data contained in HEIS were evaluated to identify the analytical results needed for inclusion in this report. The following data selection and evaluation criteria were applied:

- Quality assurance/quality control data were evaluated for the purpose of identifying potential collection or analytical problems. However, unless a problem with the data was identified during this review, the results of, or a discussion regarding, the quality assurance/quality control data were not included in this report.

- All data qualifiers were recorded.

- If duplicate samples were taken for a given monitoring well and no indication regarding the status of the sample (e.g., main or duplicate) was available, the first value listed was used as the primary sample result.

- If the relative percent difference between values reported for main and duplicate samples was greater than 20%, the samples were flagged in the data spreadsheet and the data evaluated to determine their applicability.

- Data acceptance based on a less than 20% relative percent difference criterion was relaxed for analytical results reported at or near the method detection limit (e.g., typically within five times the detection limit). This allows for an expected increased analytical error when values are close to the detection limit.

- Only analytical results for metals from filtered groundwater samples were used for metals evaluation.

3.1.2 Statistical Approach to Evaluating Results

The statistical analysis of ERDF groundwater monitoring data is based on the ERDF GPP (BHI 1996b) and *Hanford Site Groundwater Monitoring: Setting, Source, and Methods* (PNNL 2000). The ERDF GPP requires that background water quality be established from four consecutive groundwater sampling events using one of two methods. The background conditions can be determined using either facility-wide groundwater quality data or historical data from each well in the monitoring network. The first approach (facility-wide) results in a

single background value for the site for each constituent to which subsequent groundwater quality data are compared. This is referred to as an interwell comparison (PNNL 2000).

The second approach (historical) results in background water quality data for each well to which the subsequent groundwater quality data are compared. This approach is referred to as an intrawell comparison (PNNL 2000). The interwell approach has been selected and used for the ERDF groundwater monitoring program because this method allows for the consideration of impacts from non-ERDF sources.

For each analyte of interest identified in the ERDF GPP, data from four pre-operational sampling events at each of the four ERDF monitoring wells were grouped together into data sets. The average concentration, activity, or other appropriate measure for each analyte was determined, and the tolerance interval for each analyte was calculated. Two-sided tolerance intervals were developed to allow for the potential concentration decreases that may be due to the offsite migration of contaminant plumes and improvements in groundwater quality over time. Data from the subsequent semiannual monitoring events are compared to background levels and the tolerance intervals. Those constituents observed to have levels outside of the tolerance interval are evaluated to determine whether the deviation may be related to an ERDF or non-ERDF source(s).

Where analytical results report a nondetect, the detection limit value is used in this assessment. If a current measurement exceeds a tolerance interval based on the reported detection limit, it is not considered to be a confirmed exceedance and is discussed qualitatively.

3.1.3 Determination of Tolerance Intervals

The tolerance interval represents a concentration range that contains a specified proportion of the population with a specified probability (PNNL 2000). Both the upper and lower bounds of the interval (two-sided) were calculated. The parametric tolerance interval was determined using the following equation:

$$TI = \overline{x_b} + k*S_b \text{ (two-sided)}$$

where:

k	=	normal tolerance factor, which depends on the number of background samples (n), coverage (P%), and the confidence level (Y)
x_b	=	mean of background concentrations
S_b	=	sample standard deviation
TI	=	tolerance interval.

Coverage of 95% and a confidence level of 95% were used. Application of this equation assumes that a normal (or lognormal) distribution is a reasonable approximation of the background concentrations.

3.2 LEACHATE SAMPLING

Each of the ERDF cells was constructed with a double liner system for the purpose of collecting liquids, or leachate, which may travel through the waste materials stored at the disposal site. These liquids are typically generated from natural precipitation and the application of dust control water that percolates downward through the disposed waste materials and collects on the surface of the lining material. The primary or upper liners and the secondary or lower liners each are designed to deliver leachate to sump areas. Sumps for the upper liners are independent from the sumps associated with the lower liners. The upper and lower sumps at each of the cells are routinely evacuated and the leachate is stored in holding tanks prior to transfer to the Effluent Treatment Facility (ETF).

The leachate is sampled to provide data for leachate delisting analyses and to assess whether additional COCs should be added to the routine ERDF groundwater monitoring program. Separate leachate sampling is also performed to verify that waste acceptance criteria for the ETF are met prior to the transfer of leachate to that facility. The evaluation and reporting of the ETF sampling data is outside the scope of this report.

A composite sample of leachate media is collected in duplicate from the sumps (cells 1 through 4) associated with the upper landfill liners. The composite samples consist of equal quantities of material taken from each of the four sumps associated with the upper liners.

Initial leachate sampling (through the end of CY 2000) was performed quarterly for an extensive list of analytes as defined by the ERDF ROD (EPA 1995). This "long list" of analytes is shown in Table C-2 in Appendix C. At the end of the initial baseline sampling, the analyte list was revised (short list), and leachate sampling was reduced to a biannual basis. The short list of analytes is identified in Table C-1 of Appendix C. On a semiannual basis (every 2 years), sampling of the long list of analytes is performed on the leachate defined by the ERDF ROD (EPA 1995).

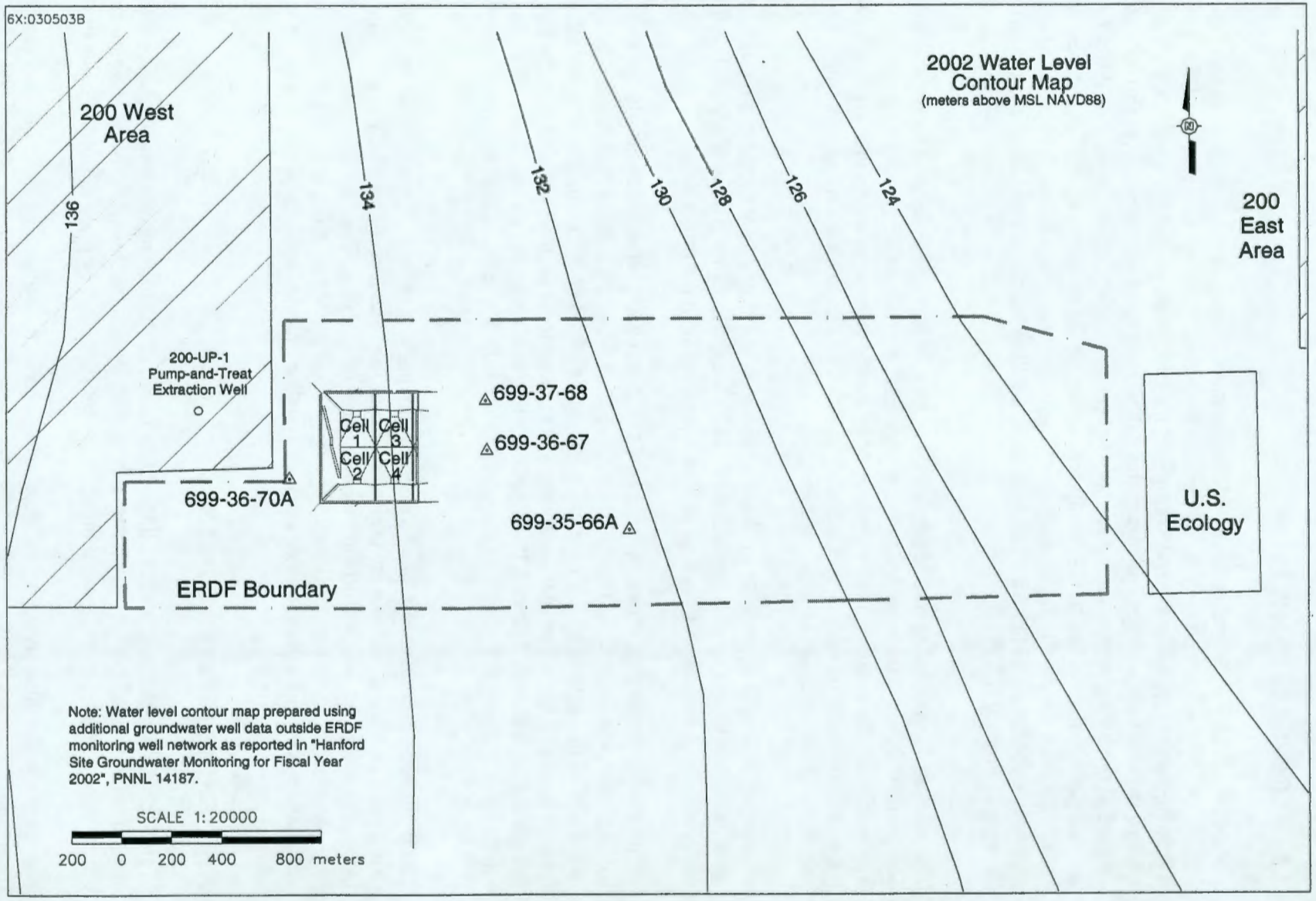
ERDF operations continued routine sampling and analysis of landfill leachate during CY 2002. Composite leachate samples were collected during June and December of CY 2002. The December sampling was performed to the long list of analytes. Data for the current year and from the two prior years of leachate sampling (i.e., CYs 2000 to 2002) are used to identify trends that may indicate if additional laboratory analysis for groundwater samples is warranted.

3.3 GROUNDWATER LEVELS

Water-level measurements were collected from each of the four monitoring wells to determine groundwater accessibility during future monitoring events. Water-level measurements are taken during each routine groundwater monitoring event immediately prior to sample collection.

Based on a water table map (Figure 3), groundwater in the vicinity of the ERDF generally moves from the west across the site to the northeast. The hydraulic gradient is about 0.001 m/m

Figure 3. Water-Level Contour Map.



(0.011 ft/ft) (BHI 1995). The groundwater table in and near the 200 West Area has been steadily declining since discharges to the 200 West Area pond and trench systems were discontinued during the mid-1980s.

It should be noted that in previous ERDF groundwater monitoring reports, incorrect water-level elevations were presented for well 699-37-68 for the monitoring events from March 1999 through September 2001. Based on a review of historical well survey reports, it was confirmed that the casing height for this well was increased sometime between September 1998 and March 1999 and that the new surveyed height was not used for reporting. The data presented in the monitoring well hydrograph for this report reflect the actual water-level elevations based on the modified top-of-casing elevation.

The current hydrograph for the ERDF monitoring wells presented in Figure 4 indicates an annual decline of less than 0.4 m/yr (1.31 ft/yr), which is consistent with the regional hydrologic changes reported for the area (Swanson et al. 1999, Hartman et al. 2003).

4.0 ANALYTICAL RESULTS AND FIELD DATA

Analytical results for leachate and groundwater samples collected during CY 2002 are discussed in the following subsections. Also discussed are the data resulting from groundwater-level measurements.

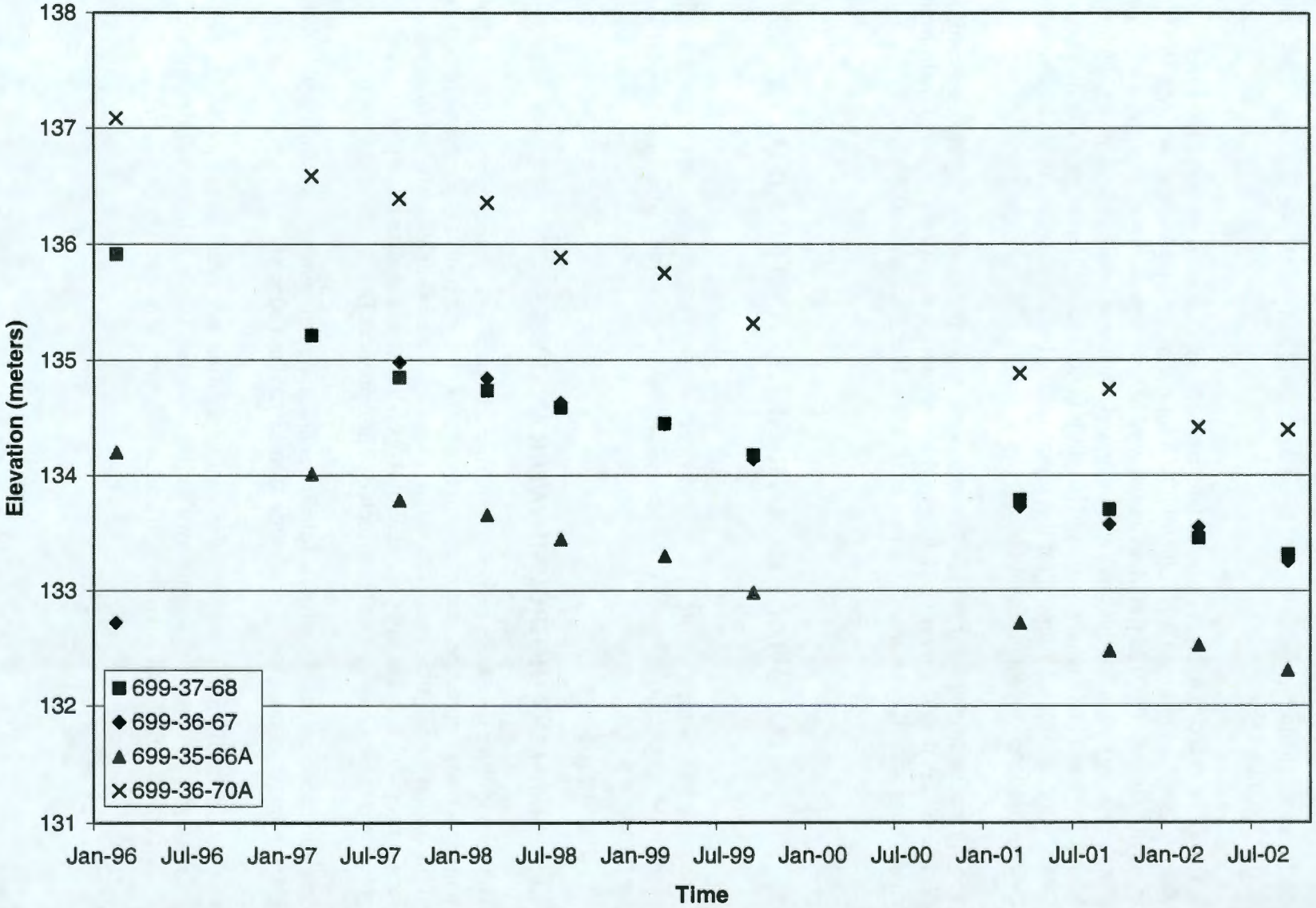
4.1 SUMMARY OF GROUNDWATER ANALYSES

The groundwater results were used to measure analytical and statistical variability. The statistical basis for comparison of the groundwater analysis results is presented in Section 3.1.2 of this report. Analytical results reported for groundwater samples collected from the ERDF monitoring well network are presented in Appendix A, and analyte trend plots summarizing groundwater monitoring results are included in Appendix B.

Specific exceedances of statistical tolerances and apparent trends are summarized in Table 2. The groundwater monitoring results are summarized as follows:

- A statistically significant exceedance of upper tolerance intervals at monitoring wells occurred for dissolved arsenic (two wells), selenium (three wells), chloride (one well), gross beta (two wells), radium (one well), and total organic halides (three wells).

Figure 4. Hydrograph from ERDF Groundwater Monitoring Wells.



- Arsenic. Arsenic concentrations were equal to the upper tolerance level in downgradient well 699-35-66A and exceeded the upper tolerance interval in downgradient well 699-36-67. Arsenic concentrations in the upgradient well were just below the tolerance interval. Given that historically arsenic concentrations have exceeded the tolerance interval in both upgradient and downgradient wells, it is likely that the presence of arsenic is attributed to non-ERDF sources.

  It should be noted that the upper tolerance interval for arsenic was exceeded in monitoring well 699-36-67 during the September 2002 monitoring event because the laboratory analytical detection/reporting limit was above the upper tolerance interval. This is not a conclusive indication of a tolerance interval exceedance. However, the tolerance interval for arsenic was exceeded during the previous monitoring event at this well.

- Selenium. The upper tolerance interval for selenium was exceeded in the upgradient well (699-36-70A) and in two downgradient wells (699-35-66A and 699-37-68). Selenium was detected at concentrations below the upper tolerance interval in downgradient well 699-36-67. The presence of selenium is likely due to non-ERDF sources.

- Chloride. The reported chloride concentration at downgradient well 699-37-68 for the March 2002 sampling event was below the upper tolerance interval; however, during the September 2002 sampling event chloride was reported at a concentration above the tolerance interval. Chloride concentrations at upgradient well 699-36-70A and downgradient wells 699-35-66a and 699-36-67 were reported below the upper tolerance interval. The chloride concentration in downgradient well 699-37-68 has steadily increased since approximately September 1998. The reason for this exceedance was not apparent; however, it may be due to the migration of chloride along the cross-gradient component of a plume originating at a non-ERDF source.

  A statistically significant exceedance of the lower tolerance interval for chloride occurred at monitoring well 699-35-66A. The reason for this exceedance of the lower tolerance interval was not apparent.

- Gross Beta. Gross beta concentrations exceeded the upper tolerance interval at upgradient well 699-36-70A and at downgradient well 699-36-67 during the March 2002 monitoring event. The gross beta concentrations reported for downgradient wells 699-35-66A and 699-37-68 were below the upper tolerance interval during the March 2002 event. During the September monitoring event gross beta concentrations for all four ERDF wells were below the upper tolerance interval. Given that historically gross beta concentrations have exceeded the tolerance interval in both upgradient and downgradient wells, it is likely that the presence of gross beta is attributed to non-ERDF sources.

- Radium. The upper tolerance interval for radium was exceeded in downgradient well 699-35-66A in March 2002, and radium was not detected in this well during the September 2002 event. Radium was not detected in upgradient well 699-36-70A and

downgradient wells 699-36-67 and 699-37-68 during both the March and September 2002 monitoring events. The radium concentration reported by the laboratory for well 699-35-66A during the March 2002 event was flagged, and it appears that an unusually high error factor may be associated with this data. This reported value may not represent an actual exceedance of the tolerance interval.

- Total Organic Halides. Total organic halide concentrations exceeded the upper tolerance interval in upgradient well 699-36-70A and in downgradient wells 699-35-66A and 699-37-68. Total organic halide concentrations did not exceed the upper tolerance interval in downgradient well 699-36-67. Given that historically total organic halide concentrations have exceeded the tolerance interval in both upgradient and downgradient wells, it is likely that the presence of total organic halides is attributed to non-ERDF sources.

Table 2. Summary of Tolerance Interval Comparisons and Trends. (3 Pages)

Analyte	Upper Tolerance Interval	Well(s) Exceeding Tolerance Interval in CY 2002[a]				Comments
		70A	66A	67	68	
Arsenic	4.4 µg/L	No	Yes	Yes	*	Wells 66A, 67 and 70A exhibited generally decreasing trends during 2002. High detection limits produced inconclusive trend indications for well 67 in September 2002.
Barium	123.3 µg/L	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Chromium	16.5 µg/L	No	No	No	No	Concentrations in well 66A have decreased to below the tolerance interval. Concentrations in well 68 have increased but are below the tolerance interval. All other wells appear stable.
Lead	70.4 µg/L	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Selenium	5.6 µg/L	Yes	Yes	No	Yes	Wells 70A, 66A, and 68 exhibited concentrations in excess of the tolerance interval.
Tin	55.6 µg/L	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Uranium	3.4 µg/L	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Vanadium	41.0 µg/L	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Zinc	757 µg/L	No	No	No	No	Well 67 continued to exhibit stable but elevated concentrations relative to the other three wells, apparently as a continuing impact of galvanic corrosion to well components in previous years.

Table 2. Summary of Tolerance Interval Comparisons and Trends. (3 Pages)

Analyte	Upper Tolerance Interval	Well(s) Exceeding Tolerance Interval in CY 2002[a]				Comments
		70A	66A	67	68	
Alkalinity	151.8 mg/L	No	No	No	No	All wells exhibited concentrations below the tolerance interval; however, the concentration in well 68 increased moderately during 2002.
Chloride	25.9 mg/L	No	No	No	Yes	Well 68 exhibited a concentration slightly above the tolerance interval during the September 2002 event.
Fluoride	0.5 mg/L	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Sulfate	37.8 mg/L	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Gross alpha	3.3 pCi/L	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Gross beta	31.7 pCi/L	Yes	No	Yes	No	All wells exhibited generally decreasing concentrations with wells 70A and 67 exceeding the upper tolerance interval during the March 2002 monitoring event.
Carbon-14	26.8 pCi/L	No	No	No	No	Carbon-14 concentrations were generally variable with all wells below the tolerance interval during 2002. All reported values were nondetects.
Iodine-129	21.5 pCi/L	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Radium	0.5 pCi/L	Yes	No	No	No	The upper tolerance interval for radium was exceeded in well 66A in March 2002; however, the data appear to be suspect and are inconclusive.
Technetium-99	94.9 pCi/L	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Carbon tetrachloride	10.6 µg/L	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Total organic halides (TOX)	9.5 µg/L	Yes	Yes	No	Yes	Wells 70A, 66A, and 68 exhibited concentrations above the tolerance interval. Well 68 exhibited a significant increased concentration during September 2002.
Nitrogen in nitrite and nitrate	51.5 mg/L	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Total dissolved solids	573.6 mg/L	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Specific conductance	743.3 µS/m	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.

Table 2. Summary of Tolerance Interval Comparisons and Trends. (3 Pages)

Analyte	Upper Tolerance Interval	Well(s) Exceeding Tolerance Interval in CY 2002[a]				Comments
		70A	66A	67	68	
pH	8.0 units	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.
Turbidity	50 NTU	No	No	No	No	All wells exhibited stable concentrations below the tolerance interval.

[a] Well identification:
70A = upgradient monitoring well 699-36-70A
66A = downgradient monitoring well 699-35-66A
67 = downgradient monitoring well 699-36-67
68 = downgradient monitoring well 699-37-68
* = Results inconclusive due to high detection limit for samples reported as nondetect.

- Numerous contaminant plumes that originated from past activities in the 200 West Area are near, or beneath, the ERDF site. Plumes originating at other sources and detected in ERDF monitoring wells include nitrate, carbon tetrachloride, gross beta, gross alpha, technetium-99, iodine-129, and uranium. The apparent trends in groundwater concentrations of these constituents are as follows:

  - Nitrogen. Reported concentrations for nitrogen (nitrate plus nitrite) have remained fairly consistent, with similar concentrations in the upgradient monitoring well and two of the downgradient wells. Downgradient monitoring well 699-35-66A exhibited a substantially lower, but stable, concentration during the monitoring period.

  - Carbon Tetrachloride. Carbon tetrachloride concentrations have remained consistent and similar within the ERDF monitoring wells.

  - Gross Beta Activity. Activity concentrations for gross beta appear to have generally declined during CY 2002. Upgradient well 699-36-70A and downgradient well 699-36-67 have exceeded the background tolerance interval since 1999 through March 2002, but were below the tolerance interval during the September 2002 monitoring event.

  - Gross Alpha Activity. Gross alpha activity concentrations were below detection limits in all samples collected during CY 2002, and the laboratory detection limits were within the calculated tolerance intervals.

  - Technetium-99. Technetium-99 activity concentrations did not exceed the background tolerance interval in any of the ERDF monitoring wells during CY 2002.

- Iodine-129. Iodine-129 activity concentrations have remained fairly stable in all monitoring wells over the course of ERDF monitoring activities, and no wells have exceeded the background tolerance interval.

- Uranium. Uranium concentrations in groundwater were generally stable during CY 2002, and no wells exceeded the upper tolerance interval.

- Downgradient well 699-36-67 continues to exhibit elevated zinc concentrations (greater than 250 μg/L) that are below the upper tolerance interval. The zinc concentrations in this well, and previously in well 699-37-68, were attributed to galvanic corrosion of galvanized riser pipe used with sampling pump equipment. The zinc concentration in well 699-37-68 decreased substantially during 2001 and continues at a level similar to that in wells 699-36-70A and 699-35-66A. The continued elevated zinc concentration in well 699-36-67 suggests that galvanic corrosion of the pumping equipment may be continuing.

- Some of the reported metal values for field duplicate samples collected during the September 2002 monitoring event at well 699-36-67 appear to be suspect based on resulting relative percent differences. Metal analytes where the main sample set was reported at a value above the method detection limit exhibited large relative percent difference values. Higher relative percent difference values appear to be associated with metal analytes that had higher reported constituent concentrations. A review of the data suggests that the main sample set values are accurate but that the duplicate sample values are suspect (and therefore the calculated relative percent difference values are suspect). It appears that the likely cause of this error could either be that the field duplicate and field blank sample containers were exchanged in the field and mislabeled, or that the field duplicate and field blank sample containers were exchanged at the laboratory and incorrectly reported.

4.2 SUMMARY OF LEACHATE ANALYSIS

Data associated with leachate sampling conducted from CY 2000 through CY 2002 are presented in Appendix C. Only analytical results that were reported as significant detects (>1 ppb) or that were reported as nondetected values but which are on the routine short list or groundwater monitoring COC lists are included in this report. A summary of leachate monitoring results follows.

Leachate samples contained detectable concentrations of common metals, anions, and mobile radionuclides. Constituents that were generally increasing in concentration include selenium, nitrate, gross alpha, gross beta, carbon-14, technetium-99, and total uranium.

- Selenium. Over the past 3 years the reported concentrations for selenium were nondetectable until June 2001. Since June 2001 the concentration of selenium has gradually increased.

- Nitrate. Nitrate concentrations remained fairly stable during CY 2000 and in CY 2002.

- Gross Alpha. Gross alpha activity concentrations appear to have remained fairly stable during the past 3 years of leachate monitoring until the December 2002 monitoring event. Reported gross alpha activity concentration during the December 2002 sampling event exhibited an approximately three- to seven-fold increase over previous monitoring. This increase does not conclusively indicate an increasing trend in gross alpha activity concentrations because it occurred only during the most recent monitoring event.

- Gross Beta. Gross beta activity concentrations remained fairly stable until June 2001. However, the gross beta activity concentrations appear to have increased from December 2001 through December 2002.

- Carbon-14. Carbon-14 activity concentrations were not reported between February 2000 and August 2000. From December 2000 through June 2002, the carbon-14 concentrations were reported as nondetectable. During the December 2002 sampling event, detectable carbon-14 activity concentrations were reported. The most recent reported values do not conclusively indicate an increasing trend in carbon-14 concentrations.

- Technetium-99. Technetium-99 activity concentrations were not reported between February 2000 and August 2000. From December 2000 through December 2002, technetium-99 concentrations have been generally increasing.

- Uranium. Uranium activity concentrations were not reported between February 2000 and August 2000. From December 2000 through December 2001, uranium concentrations appear to have remained stable. CY 2002 monitoring indicates an increase in uranium activity concentrations.

4.3 SUMMARY OF WATER-LEVEL MEASUREMENTS

Based on the measured water levels in the four ERDF monitoring wells, it was determined that each well contains approximately 8.0 m (26.25 ft) of water. At the current rate of decline, these wells would be available for use, as they are currently constructed, for approximately 20 years. However, it appears that the rate of water table decline is lessening and that an additional 8.0 m (26.25 ft) decline in the groundwater level may not occur. Therefore, these wells may likely provide sampling access for a period of time longer than 20 years.

It should be noted that as the ERDF expands to the east of the existing cells, the expansion of this facility would be moving in a direction toward downgradient wells 699-36-67 and 699-37-68. Such continued expansion will encroach upon these wells, and it would be necessary to properly decommission and replace them.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the CY 2002 analytical results, the statistical analysis of monitoring data, an evaluation of leachate monitoring data, and a review of the groundwater-level measurement data, the following conclusions and recommendations are presented:

- Elevated levels of arsenic, selenium, gross beta, and total organic halides reported for samples collected from the ERDF monitoring wells are likely due to the migration of contaminants from non-ERDF sources in the 200 West Area.

- The tolerance interval for chloride in downgradient well 699-37-68 was exceeded during the September 2002 monitoring event. The chloride concentration in this well has steadily increased since approximately September 1998. The reason for this exceedance is likely due to a non-ERDF source; however, future monitoring data should be evaluated to see if its source can be determined. It may also be necessary to collect or evaluate data from other non-ERDF wells to make this determination.

- The elevated zinc concentrations in the downgradient monitoring well 699-36-67 may be an indication of continued galvanic corrosion associated with the riser pipe components of the sampling pump. The riser pipe in this well should be inspected for potential sources of continuing galvanic corrosion.

- Leachate samples analyzed for selenium, nitrate, gross alpha, gross beta, carbon-14, technetium-99, and uranium exhibited possible trends indicating increased concentrations over the past 3 years. Groundwater monitoring data for these constituents were examined to determine if ERDF operations may have potentially impacted groundwater. In all cases, groundwater concentrations for these constituents have remained stable or have decreased. Based on this, it appears that ERDF leachate has not negatively impacted groundwater at this location.

- No additional analysis is necessary for the routine leachate sampling given that the groundwater and leachate sampling conducted to date does not indicate potential impacts to the groundwater from ERDF operations.

- The constituents detected in ERDF leachate samples were compared to the groundwater monitoring analyte list to determine if additional analytes should be added to the groundwater monitoring program. At this time, no additional analytes are recommended for the groundwater monitoring program based on this evaluation.

- The ERDF monitoring wells could likely provide sampling access for a period of time longer than 20 years, and it is not anticipated that well modifications will be necessary. However, it may be necessary to decommission and replace downgradient wells 699-36-67 and 699-37-68 as additional cells are added to the ERDF.

- The current groundwater sampling frequency appears to be appropriate for future monitoring needs.

6.0 REFERENCES

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APPENDIX A

GROUNDWATER SAMPLING RESULTS, 1996-2002

Table A-1. Arsenic Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Arsenic (μg/L)	3.0	2.6	2.8	3.5	2.1	2.8	3.3	3.3		2.6	3.0	5.6	4.4	4.4
RPD	0.0%	17.0%	3.6%	33.0%										
Qualifier	B	B	B	B	B	B	U	U						
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	Above TI	Above TI	Above TI
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Arsenic (μg/L)	1.1	1.0	2.0	1.9	1.6	1.0	3.3	3.3		2.4	2.3	10.0	4.6	4.5
RPD					37.0%		0.0%							
Qualifier	B	B	B	B	B	U	U	U		U	U	U		U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	Above TI	Above TI	Above TI
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Arsenic (μg/L)	1.7	0.7	1.4	1.6	0.6	1.0	3.3	3.3			3.2	52.1	3.0	3.3
RPD	0.0%										33.8%			
Qualifier	B	B	B	U	U	U	U	U				U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	No Data	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Arsenic (μg/L)	3.0	2.1	2.5	3.3	2.6	1.2	3.3	3.3		3.8	5.2	52.1	4.3	3.8
RPD										17.1%				
Qualifier	B	B	B	B	B	B	U	U				U		
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	Above TI	No Data	OK	OK
Upper Tolerance Interval	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Background Average	2.1													
Background Standard Deviation	0.9													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	4.4													
Tolerance Interval Minimum Value	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1

Note: Blank cells denote not applicable.
B = Value is greater than detection limit but less than laboratory required reporting limit.
OK = acceptable
RPD = relative percent difference
TI = tolerance interval
U = non-detect

Table A-2. Barium Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Barium (μg/L)	46.0	42.9	46.3	40.9	43.7	39.8	40.5	40.3		38.9	38.0	40.5	38.3	39.8
RPD		0.0%	1.5%	3.1%				0.2%					0.5%	
Qualifier	B	B	B	B		B		B						
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Barium (μg/L)	81.9	66.7	87.6	64.6	66.8	58.2	58.4	54.1		51.5	50.0	200.0	56.2	58.1
RPD					0.3%		1.0%					0.0%		197.9%
Qualifier	B	B	B	B		B		B				U		
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	Above TI	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Barium (μg/L)	90.6	77.9	102.0	69.6	79.0	71.1	73.2	69.8			68.1	64.9	68.7	67.9
RPD	1.5%					3.0%					2.6%			
Qualifier	B	B	B	B		B		B						
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Barium (μg/L)	92.1	80.8	93.4	76.6	78.4	74.1	72.8	75.6		73.8	71.4	71.2	66.9	69.4
RPD				4.3%	5.0%		4.4%							
Qualifier	B	B	B			B		B						
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	123.3	123.3	123.3	123.3	123.3	123.3	123.3	123.3	123.3	123.3	123.3	123.3	123.3	123.3
Background Average	72.5													
Background Standard Deviation	19.7													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	123.3													
Tolerance Interval Minimum Value	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7

Table A-3. Chromium Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Chromium (μg/L)	13.4	11.9	12.2	13.3	16.6	13.5	13.9	14.8		16.3	14.8	21.1	16.2	16.2
RPD		1.7%	1.7%	1.0%				0.0%					0.6%	
Qualifier														
Outside Tolerance Interval					Above TI	OK	OK	OK	No Data	OK	OK	Above TI	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Chromium (μg/L)	4.4	4.4	2.7	3.3	3.6	4.2	2.2	2.5		1.6	2.4	10.0	5.2	5.6
RPD					8.7%		4.4%					0.0%		129.4%
Qualifier	U	U	U	B	B	U		B				U		
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Chromium (μg/L)	7.7	4.4	4.5	3.5	4.1	4.2	3.1	3.1			3.8	5.4	11.3	8.7
RPD	40.6%										16.9%			
Qualifier	B	U	B	U	B	U		B						
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Chromium (μg/L)	5.9	4.4	3.9	3.5	6.8	4.2	5.1	4.4		4.6	4.1	7.4	6.0	5.5
RPD				2.8%	23.0%		17.9%			6.3%				
Qualifier	B	U	B	U	B	U		B						
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
Background Average	6.5													
Background Standard Deviation	3.9													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	16.5													
Tolerance Interval Minimum Value	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6	-3.6

Table A-4. Lead Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Lead (μg/L)	1.0	42.1	26.0	1.1	1.1	30.2	1.8	2.1		2.1	2.6	3.7	2.8	2.4
RPD														
Qualifier	UJ	U	U	U	U	U	U	U		U	U			U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Lead (μg/L)	1.0	42.1	26.0	1.1	1.1	30.2	1.8	49.2		2.1	2.6	6.8	2.2	2.4
RPD														
Qualifier	UJ	U	U	U	U	U	U			U	U		U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Lead (μg/L)	1.0	42.1	26.0	47.1	2.4	30.2	2.5	2.4			2.6	22.7	4.2	2.4
RPD														
Qualifier	UJ	U	U	U	B	U		B			U	U		U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Lead (μg/L)	1.0	42.1	34.8	1.1	1.1	30.2	1.8	6.7		2.1	2.6	22.7	2.2	2.4
RPD														
Qualifier	UJ	U	B	U	U	U	U			U	U	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4
Background Average	21.0													
Background Standard Deviation	19.2													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	70.4													
Tolerance Interval Minimum Value	-28.5	-28.5	-28.5	-28.5	-28.5	-28.5	-28.5	-28.5	-28.5	-28.5	-28.5	-28.5	-28.5	-28.5

J = Value is an estimate.

Table A-5. Selenium Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Selenium (μg/L)	2.1	3.1	2.6	3.2	3.2	3.2	5.2	3.7		3.4	2.6	5.9	7.9	4.1
RPD		3.3%	0.0%	10.0%									2.6%	
Qualifier	B	B	BN	B	B	B		U			U			U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	Above TI	Above TI	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Selenium (μg/L)	2.6	3.8	3.5	3.6	3.6	4.5	4.5	3.7		3.5	3.1	5.0	3.6	4.1
RPD					0.0%									
Qualifier	B	B	BN	B	B	B		U				U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Selenium (μg/L)	3.4	4.8	3.9	4.6	4.2	5.5	4.2	4.6			2.6	62.1	7.7	4.1
RPD	5.7%					5.3%								
Qualifier	B	B	BN	B	B			B			U	U		U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	Above TI	Above TI	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Selenium (μg/L)	3.5	4.1	3.1	4.8	4.4	5.8	7.6	7.3		4.0	3.4	62.1	7.8	7.4
RPD										31.6%				
Qualifier	B	B	BN	B	B							U		
Outside Tolerance Interval					OK	Above TI	Above TI	Above TI	No Data	OK	OK	Above TI	Above TI	Above TI
Upper Tolerance Interval	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Background Average	3.5													
Background Standard Deviation	0.8													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	5.6													
Tolerance Interval Minimum Value	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

N = Spiked sample recovery not within control limits.

Table A-6. Tin Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Tin (μg/L)	35.3	33.5	24.7	5.6	4.9	28.0	2.7	2.1			3.5	2.4	3.3	4.7
RPD														
Qualifier	U	U	U	U	U	U	U	U			U	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Tin (μg/L)	35.3	33.5	24.7	5.6	4.9	28.0	2.7	2.1			3.5	100.0	3.3	4.7
RPD														
Qualifier	U	U	U	U	U	U	U	U			U	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	Above TI	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Tin (μg/L)	35.3	33.5	24.7	33.2	4.9	28.0	2.7	2.1			3.5	13.9	3.3	4.7
RPD														
Qualifier	U	U	U	U	U	U	U	U			U	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Tin (μg/L)	35.3	33.5	29.0	5.6	4.9	28.0	2.7	2.1			3.5	13.9	3.3	4.7
RPD														
Qualifier	U	U	B	U	U	U	U	U			U	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Upper Tolerance Interval	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6
Background Average	26.8													
Background Standard Deviation	11.2													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	55.6													
Tolerance Interval Minimum Value	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1

Table A-7. Uranium Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Uranium (μg/L)	2.6	2.4	2.7	2.6	2.3	2.6	2.6	2.5		3.3	2.3	2.4	2.4	2.3
RPD			1.1%	7.9%				4.6%					3.2%	
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Uranium (μg/L)	2.2	2.3	2.7	2.4	2.4	2.5	3.0	2.6		3.2	2.4	2.3	2.5	2.1
RPD					2.0%		6.9%					1.3%		5.9%
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Uranium (μg/L)	2.7	2.2	2.9	2.4	2.3	2.3	2.7	2.6			2.8	2.7	2.8	2.6
RPD	1.1%					0.9%					1.4%			
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Uranium (μg/L)	2.9	2.4	3.2	3.0	3.0	3.3	3.4	3.4		3.2	3.1	3.1	3.2	3.0
RPD										13.3%				
Qualifier														
Outside Tolerance Interval					OK	OK	Above TI	Above TI	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Background Average	2.6													
Background Standard Deviation	0.3													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	3.4													
Tolerance Interval Minimum Value	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9

Table A-8. Vanadium Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Vanadium (μg/L)	26.8	33.4	33.2	27.8	29.0	39.5	28.3	28.7		27.5	27.1	28.5	27.4	28.6
RPD		2.0%	1.0%	2.0%				0.0%					3.0%	
Qualifier	J	B	B	B		B		B						
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Vanadium (μg/L)	12.6	25.1	26.0	18.8	18.6	30.1	15.0	17.5		15.5	16.5	50.0	23.4	26.7
RPD					1.6%		7.6%					0.0%		184.2%
Qualifier	J	B	B	B		B		B				U		
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	Above TI	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Vanadium (μg/L)	14.4	24.3	25.3	24.9	23.0	36.0	23.6	23.5			25.0	22.8	23.4	24.3
RPD	4.7%					6.0%					1.2%			
Qualifier	J	B	B	B		B		B						
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Sep-01	Sep-01	Mar-02	Sep-02
Vanadium (μg/L)	23.6	32.9	28.9	28.8	28.4	39.5	25.2	26.4		27.3	25.8	26.2	25.6	28.8
RPD				11.4%	5.8%		17.4%			0.4%				
Qualifier	J	B	B			B		B						
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0
Background Average	25.4													
Background Standard Deviation	6.0													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	41.0													
Tolerance Interval Minimum Value	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9

Table A-9. Zinc Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Zinc (µg/L)	13.7	15.4	26.7	8.1	5.8	10.3	2.6	2.9		7.4	4.4	5.8	3.1	7.1
RPD		39.7%	0.8%	34.8%				18.8%					17.5%	
Qualifier	U	B		B	B	B		B						
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Zinc (µg/L)	146.0	260.0	382.0	339.0	321.0	241.0	164.0	215.0		357.0	262.0	310.0	280.0	329.0
RPD					0.9%		13.0%					4.7%		199.3%
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Zinc (µg/L)	368.0	665.0	507.0	394.0	386.0	663.0	347.0	350.0			17.4	24.6	33.4	33.6
RPD	81.5%					5.3%					0.6%			
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Zinc (µg/L)	8.5	23.1	55.4	10.3	6.1	4.7	10.6	0.8		2.8	0.9	17.1	0.4	2.3
RPD										40.0%				
Qualifier	U				B	B		U					U	
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	757.0	757.0	757.0	757.0	757.0	757.0	757.0	757.0	757.0	757.0	757.0	757.0	757.0	757.0
Background Average	201.4													
Background Standard Deviation	215.4													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	757.0													
Tolerance Interval Minimum Value	-354.3	-354.3	-354.3	-354.3	-354.3	-354.3	-354.3	-354.3	-354.3	-354.3	-354.3	-354.3	-354.3	-354.3

Table A-10. Alkalinity Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Alkalinity (mg/L)	138.0	143.0	144.0	138.0	140.0	143.0	143.0	139.0		160.0	137.0	132.0	138.0	135.0
RPD			2.1%	2.9%				0.7%					2.2%	
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	Above TI	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Alkalinity (mg/L)	121.0	125.0	129.0	125.0	123.0	124.0	124.0	123.0		137.0	145.0	128.0	124.0	128.0
RPD					0.8%		0.0%					1.6%		1.6%
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Alkalinity (mg/L)	124.0	129.0	121.0	125.0	127.0	131.0	129.0	130.0			152.0	130.0	132.0	146.0
RPD	0.8%					0.0%					2.7%			
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	Above TI	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Alkalinity (mg/L)	113.0	117.0	113.0	119.0	120.0	124.0	123.0	122.0		119.0	120.0	124.0	126.0	131.0
RPD							0.8%			3.3%				
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	151.8	151.8	151.8	151.8	151.8	151.8	151.8	151.8	151.8	151.8	151.8	151.8	151.8	151.8
Background Average	126.5													
Background Standard Deviation	9.8													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	151.8													
Tolerance Interval Minimum Value	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2

Table A-11. Chloride Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Chloride (mg/L)	21.1	19.0	19.7	19.9	16.1	18.3	19.5	19.9		18.4	18.6	19.0	16.6	18.0
RPD	5.4%		2.6%	3.0%				5.2%					1.2%	
Qualifier					CD									
Outside Tolerance Interval					Below TI	OK	OK	OK	No Data	OK	OK	OK	Below TI	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Chloride (mg/L)	24.2	22.9	23.7	22.9	21.4	23.7	24.9	26.3		25.7	25.7	23.4	22.6	24.5
RPD					0.0%		2.0%					4.2%		4.4%
Qualifier					D									
Outside Tolerance Interval					OK	OK	OK	Above TI	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Chloride (mg/L)	20.2	20.1	20.1	21.0	19.6	21.0	21.7	28.1			22.3	23.3	25.2	26.6
RPD	2.0%					1.4%					21.2%			
Qualifier					CD									
Outside Tolerance Interval					OK	OK	OK	Above TI	No Data	No Data	OK	OK	OK	Above TI
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Chloride (mg/L)	24.2	21.7	20.4	22.4	20.9	21.4	23.3	23.2		21.4	17.2	20.5	19.3	20.7
RPD							14.3%			4.6%				
Qualifier			D		CD									
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9
Background Average	21.5													
Background Standard Deviation	1.7													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	25.9													
Tolerance Interval Minimum Value	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1

C = Analyte detected in associated laboratory batch blank.
D = Analysis was run at a secondary dilution.

Table A-12. Fluoride Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Fluoride (mg/L)	0.3	0.3	0.3	0.4	0.3	0.3	0.5	0.5		0.5	0.5	1.0	0.3	0.3
RPD			0.0%											
Qualifier							U	U		U	U	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	Above TI	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Fluoride (mg/L)	0.4	0.4	0.4	0.1	0.4	0.4	0.5	0.5		0.5	2.5	1.0	0.3	0.3
RPD					0.3%							0.0%		
Qualifier				U			U	U		U	U	U		U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	Above TI	Above TI	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Fluoride (mg/L)	0.4	0.3	0.3	0.3	0.3	0.3	0.5	0.5			2.5	0.5	0.3	0.4
RPD	0.0%					0.9%					0.0%			
Qualifier							U	U			U	U	U	
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	Above TI	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Fluoride (mg/L)	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5		0.5	0.5	0.5	0.3	0.3
RPD														
Qualifier							U	U		U	U	U		U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Background Average	0.4													
Background Standard Deviation	0.1													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	0.5													
Tolerance Interval Minimum Value	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Table A-13. Sulfate Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Sulfate (mg/L)	24.2	25.2	27.0	26.6	22.7	26.0	26.8	25.9		30.5	26.9	27.8	25.6	26.2
RPD			0.0%	1.9%				0.4%					0.0%	
Qualifier					D									
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Sulfate (mg/L)	29.9	32.2	31.5	32.6	31.4	30.7	32.4	32.5		31.7	36.0	30.3	29.2	29.2
RPD					0.6%		1.2%					1.6%		3.4%
Qualifier					D									
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Sulfate (mg/L)	28.7	30.3	30.5	31.4	31.2	31.5	30.8	31.3			37.8	31.0	30.5	31.1
RPD	0.7%					0.9%					4.4%			
Qualifier					D									
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	Above TI	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Sulfate (mg/L)	30.7	33.2	32.2	34.9	34.8	35.4	37.3	34.6		35.9	31.6	34.5	33.8	32.7
RPD							5.8%			4.6%				
Qualifier			D		D									
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.8
Background Average	30.1													
Background Standard Deviation	3.0													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	37.8													
Tolerance Interval Minimum Value	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3

Table A-14. Gross Alpha Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Gross Alpha (pCi/L)	1.5	1.7	0.2	0.4	1.3	0.4	2.7	2.6		0.3	0.3	-0.4	0.2	0.3
RPD														
Qualifier	J	J	U	U	J	U	J	J		U	U	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Gross Alpha (pCi/L)	2.1	0.1	1.3	0.8	0.7	2.3	0.1	0.5		0.5	1.0	0.8	0.5	0.9
RPD														
Qualifier	J	U	U	U	U	J	U	U		U	U	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Gross Alpha (pCi/L)	2.4	1.2	0.8	2.5	0.7	2.5	1.5	1.6			1.4	0.4	0.0	-0.4
RPD	33.7%					31.6%								
Qualifier	J	U	U	J	U	J	U	U			U	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Gross Alpha (pCi/L)	2.3	1.6	1.3	1.2	2.2	2.9	1.3	0.9		0.3	2.3	1.1	0.4	0.3
RPD														
Qualifier	J	J	J	J	J	J	U	U		U	U	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Background Average	1.3													
Background Standard Deviation	0.8													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	3.3													
Tolerance Interval Minimum Value	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6

Table A-15. Gross Beta Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Gross Beta (pCi/L)	10.9	13.2	10.5	12.7	10.5	17.1	25.0	25.8		27.6	26.2	29.8	28.5	23.3
RPD			6.5%	21.8%				2.8%					1.8%	
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Gross Beta (pCi/L)	22.4	26.9	21.6	20.7	25.4	27.4	17.0	57.2		49.2	59.4	41.2	39.1	26.3
RPD					3.9%		119.0%					4.0%		7.3%
Qualifier														
Outside Tolerance Interval					OK	OK	OK	Above TI	No Data	Above TI	Above TI	Above TI	Above TI	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Gross Beta (pCi/L)	15.5	17.6	13.5	15.9	14.5	19.1	27.0	27.1			35.5	29.8	30.8	21.4
RPD	3.2%					35.1%					10.7%			
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	Above TI	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Gross Beta (pCi/L)	20.4	25.7	23.2	21.0	20.2	25.1	56.0	38.0		49.9	47.8	41.2	42.7	28.7
RPD							76.2%	27.7%		5.1%				
Qualifier														
Outside Tolerance Interval					OK	OK	Above TI	Above TI	No Data	Above TI	Above TI	Above TI	Above TI	OK
Upper Tolerance Interval	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7
Background Average	18.2													
Background Standard Deviation	5.2													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	31.7													
Tolerance Interval Minimum Value	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8

Table A-16. Carbon-14 Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Carbon-14 (pCi/L)	22.3		22.2	10.7	19.4	18.5	25.0	7.4		35.2	9.6	32.5	21.4	5.0
RPD			2.7%	43.8%										
Qualifier	J		J	J	J	J	U	U		U	U	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	Above TI	OK	Above TI	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Carbon-14 (pCi/L)	6.8		11.1	3.3	7.2	8.6	9.9	-2.7		13.7	43.4	22.5	11.6	17.0
RPD												107.9%		
Qualifier	J		J	U	U	J	U	U		U	U	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	Above TI	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Carbon-14 (pCi/L)	2.5		3.8	5.4	-1.5	6.5	-6.5	-5.9			57.0	-1.2	13.2	8.5
RPD											18.8%			
Qualifier	U		U	U	U	U	U	U			J	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	Above TI	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Carbon-14 (pCi/L)	4.3	3.9		1.6	3.7	2.1	-6.1	-9.5		3.8	-28.1	-15.1	21.7	-1.6
RPD														
Qualifier	J	U		U	U	U	U	U		U	U	U	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	Below TI	Below TI	OK	OK
Upper Tolerance Interval	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8
Background Average	8.2													
Background Standard Deviation	7.2													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	26.8													
Tolerance Interval Minimum Value	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5	-10.5

Table A-17. Iodine-129 Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Iodine-129 (pCi/L)	9.4	7.5	11.0	11.3	8.1	9.6	6.1	5.7		0.3	4.6	3.1	6.0	4.7
RPD	3.3%		8.5%	0.0%				20.3%					16.4%	
Qualifier										U	U	U		J
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Iodine-129 (pCi/L)	9.4	11.9	7.8	9.7	13.2	12.2	7.9	9.2		11.0	13.8	12.3	10.7	12.0
RPD														36.0%
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Iodine-129 (pCi/L)	6.0	2.2	2.8	3.0	1.6	2.8	2.9	1.9			2.7	4.6	2.2	2.3
RPD						7.9%								
Qualifier		U	J	J	U		U	U			U	J	U	U
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Iodine-129 (pCi/L)	18.7	13.7	11.8	16.2	15.2	15.2	14.4	6.5		13.1	16.7	13.8	13.9	14.3
RPD					0.0%					5.9%				
Qualifier								U						
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
Background Average	9.5													
Background Standard Deviation	4.6													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	21.5													
Tolerance Interval Minimum Value	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4

Table A-18. Technetium-99 Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Technetium-99 (pCi/L)	25.5	20.3	21.6	17.3	23.2	29.4	0.0	40.4		35.6	45.5	47.6	51.4	52.8
RPD			7.7%	8.8%				16.3%					17.6%	
Qualifier							U							
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Technetium-99 (pCi/L)	65.0	53.5	77.5	66.8	68.6	74.9	86.0	85.2		80.1	75.9	56.5	71.8	59.7
RPD					9.4%		3.6%					12.0%		14.6%
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Technetium-99 (pCi/L)	31.0	32.1	30.0	34.8	23.5	16.5	36.0	44.6			40.2	46.9	46.3	58.8
RPD	3.2%					75.5%					5.1%			
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Technetium-99 (pCi/L)	64.2	52.3	59.9	57.0	78.2	77.4	70.5	90.1		85.6	92.0	72.3	76.1	67.1
RPD										11.2%				
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	94.9	94.9	94.9	94.9	94.9	94.9	94.9	94.9	94.9	94.9	94.9	94.9	94.9	94.9
Background Average	44.3													
Background Standard Deviation	19.6													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	94.9													
Tolerance Interval Minimum Value	-6.3	-6.3	-6.3	-6.3	-6.3	-6.3	-6.3	-6.3	-6.3	-6.3	-6.3	-6.3	-6.3	-6.3

Table A-19. Radium Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Radium (pCi/L)	0.1		0.0	0.1	0.1						0.1	-0.4	0.9	-0.1
RPD														
Qualifier	U		U	U	U						U	U	J	U
Outside Tolerance Interval					OK	No Data	No Data	No Data	No Data	No Data	OK	Below TI	Above TI	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Radium (pCi/L)	0.2		0.1	0.0	0.1						0.4	0.5	0.1	-0.1
RPD														
Qualifier	U		J	U	U						U	U	U	U
Outside Tolerance Interval					OK	No Data	No Data	No Data	No Data	No Data	OK	Above TI	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Radium (pCi/L)	0.2		0.1	0.1	0.1						0.0	0.2	0.3	-0.3
RPD														
Qualifier	J		J	U	U						U	U	U	U
Outside Tolerance Interval					OK	No Data	No Data	No Data	No Data	No Data	OK	OK	OK	Below TI
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Radium (pCi/L)	0.5		0.1	0.1	0.1						0.0	0.7	0.4	0.1
RPD														
Qualifier	J		U	U	U						U	U	U	U
Outside Tolerance Interval					OK	No Data	No Data	No Data	No Data	No Data	OK	Above TI	OK	OK
Upper Tolerance Interval	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Background Average	0.1													
Background Standard Deviation	0.1													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	0.5													
Tolerance Interval Minimum Value	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2

Table A-20. Carbon Tetrachloride Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Carbon Tetrachloride (μg/L)	5.0	4.0	3.0	5.0		2.0	1.0	1.0		1.0	1.0	5.0	1.0	1.0
RPD			28.6%										0.0%	
Qualifier	U	J	J	U		J	J	J		J	J	U	J	J
Outside Tolerance Interval					No Data	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Carbon Tetrachloride (μg/L)	2.0	7.0	6.0	4.0		6.0	4.0	4.0		5.0	6.0	4.0	5.0	5.2
RPD												0.0%		4.4%
Qualifier	J			J			J	J				J		
Outside Tolerance Interval					No Data	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Carbon Tetrachloride (μg/L)	5.0	5.0	5.0	5.0		3.0	3.0	3.0			5.0	5.0	5.0	5.9
RPD						0.0%					5.1%			
Qualifier	U	J	U	U		J	J	J				J		
Outside Tolerance Interval					No Data	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Carbon Tetrachloride (μg/L)	4.0	7.0	7.0	11.0		5.0	7.0	5.0		9.0	7.0	7.0	9.0	8.0
RPD										0.0%				
Qualifier	J					U								
Outside Tolerance Interval					No Data	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
Background Average	5.3													
Background Standard Deviation	2.1													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	10.6													
Tolerance Interval Minimum Value	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table A-21. Nitrogen in Nitrite and Nitrate Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Nitrogen in Nitrite and Nitrate (mg/L)	4.6	4.2	4.0	4.2	4.6	4.2	4.5	4.6		4.7	5.5	4.6	4.5	4.5
RPD			4.1%	1.4%				2.2%					2.2%	
Qualifier					D									
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Nitrogen in Nitrite and Nitrate (mg/L)	20.2	20.6	22.6	18.9	20.1	24.0	20.6	20.0		19.1	19.9	17.6	16.3	15.8
RPD							1.0%					1.7%		0.0%
Qualifier					D									
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Nitrogen in Nitrite and Nitrate (mg/L)	35.6	33.7	34.1	35.4	34.3	34.5	31.8	33.0			32.2	29.3	27.9	26.6
RPD	2.5%					2.0%					2.8%			
Qualifier					D									
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Nitrogen in Nitrite and Nitrate (mg/L)	31.9	26.1	21.3	24.6	25.3	26.3	24.6	23.7		24.6	24.7	23.0	18.9	19.0
RPD										5.9%				
Qualifier					D									
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	51.5	51.5	51.5	51.5	51.5	51.5	51.5	51.5	51.5	51.5	51.5	51.5	51.5	51.5
Background Average	21.4													
Background Standard Deviation	11.7													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	51.5													
Tolerance Interval Minimum Value	-8.7	-8.7	-8.7	-8.7	-8.7	-8.7	-8.7	-8.7	-8.7	-8.7	-8.7	-8.7	-8.7	-8.7

Table A-22. Total Organic Halides Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Total Organic Halides (μg/L)	6.6	5.0	5.0	6.1	4.6	5.9	24.0	12.0		206.0	17.1	6.5	6.1	10.5
RPD														
Qualifier	J	U	U		U		U	U		J	U	U		
Outside Tolerance Interval					OK	OK	Above TI	Above TI	No Data	Above TI	Above TI	OK	OK	Above TI
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Total Organic Halides (μg/L)	10.5	5.0	5.0	4.6	4.6	5.9	12.0	206.0			20.0	7.4	9.3	5.6
RPD														
Qualifier	J	U	U	U	U		U				U	U		
Outside Tolerance Interval					OK	OK	Above TI	Above TI	No Data	No Data	Above TI	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Total Organic Halides (μg/L)	5.0	5.0	5.0	5.0	4.6	5.0	14.3	12.0			20.0	6.5	5.2	60.6
RPD	27.6%													
Qualifier		U	U	U	U	U		U			U	U	U	
Outside Tolerance Interval					OK	OK	Above TI	Above TI	No Data	No Data	Above TI	OK	OK	Above TI
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Total Organic Halides (μg/L)	5.6	5.0	2.7	4.6	4.6	6.7	34.5	12.0		181.0	20.0	6.5	9.5	8.5
RPD										0.6%				
Qualifier	J	U	U	U	U			U			U	U		
Outside Tolerance Interval					OK	OK	Above TI	Above TI	No Data	Above TI	Above TI	OK	Above TI	OK
Upper Tolerance Interval	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Background Average	5.4													
Background Standard Deviation	1.6													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	9.5													
Tolerance Interval Minimum Value	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Table A-23. Total Dissolved Solids Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Total Dissolved Solids (mg/L)	254.0	236.0	279.0	278.0	322.0	296.0	280.0	270.0		270.0	278.0	305.0	258.0	276.0
RPD			1.4%	0.4%				3.6%					2.7%	
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Total Dissolved Solids (mg/L)	340.0	367.0	404.0	377.0	320.0	406.0	380.0	370.0		340.0	407.0	384.0	333.0	328.0
RPD					3.5%		5.1%					1.8%		0.6%
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Total Dissolved Solids (mg/L)	401.0	457.0	514.0	463.0	456.0	491.0	440.0	470.0			349.0	535.0	430.0	446.0
RPD	5%										22.2%			
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Total Dissolved Solids (mg/L)	384.0	411.0	390.0	401.0	327.0	422.0	390.0	410.0		520.0	400.0	420.0	358.0	344.0
RPD							4.0%			5.6%				
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	573.6	573.6	573.6	573.6	573.6	573.6	573.6	573.6	573.6	573.6	573.6	573.6	573.6	573.6
Background Average	372.3													
Background Standard Deviation	78.0													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	573.6													
Tolerance Interval Minimum Value	170.9	170.9	170.9	170.9	170.9	170.9	170.9	170.9	170.9	170.9	170.9	170.9	170.9	170.9

Table A-24. Turbidity Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Turbidity (NTU)	0.3		0.7	1.9	1.7	1.3		2.3		2.3	1.7	1.5	1.9	2.2
RPD														
Qualifier	J													
Outside Tolerance Interval					OK	OK	No Data	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Turbidity (NTU)	0.3		8.9	14.4	23.4	90.5	52.6	87.2		142.0	38.2	3.4	11.1	5.6
RPD														
Qualifier	J													
Outside Tolerance Interval					OK	Above TI	Above TI	Above TI	No Data	Above TI	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Turbidity (NTU)	3.2		60.6	4.6	4.9	3.0					16.7	6.6	7.4	6.7
RPD	73.8%													
Qualifier	J													
Outside Tolerance Interval					OK	OK	No Data	No Data	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Turbidity (NTU)	0.3	1.3	0.8	1.3	3.5		4.5	2.7		2.6	1.1	1.2	5.0	4.7
RPD														
Qualifier	J													
Outside Tolerance Interval					OK	No Data	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
Background Average	7.6													
Background Standard Deviation	16.5													
Normal Tolerance Factor	2.6	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58		
Tolerance Interval Maximum Value	50.0													
Tolerance Interval Minimum Value	-34.9	-34.9	-34.9	-34.9	-34.9	-34.9	-34.9	-34.9	-34.9	-34.9	-34.9	-34.9	-34.9	-34.9

NTU = nephelometric turbidity unit

Table A-25. pH Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
pH			7.8	7.9	7.9	8.0		8.0		7.9	8.6	7.8	7.9	7.9
RPD														
Qualifier														0
Outside Tolerance Interval					OK	OK	No Data	OK	No Data	OK	Above TI	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
pH			7.7	7.9	7.8	8.3	7.7	7.7		7.7	7.7	7.7	7.8	7.8
RPD														
Qualifier														0
Outside Tolerance Interval					OK	Above TI	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
pH			7.6	7.7	7.7	7.8					7.7	7.8	7.8	7.8
RPD														
Qualifier														0
Outside Tolerance Interval					OK	OK	No Data	No Data	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
pH	7.8	7.7	7.7	7.8	7.6	8.0	7.7	7.8		7.8	7.8	7.7	7.7	7.7
RPD														
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Background Average	7.7													
Background Standard Deviation	0.1													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	8.0													
Tolerance Interval Minimum Value	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5

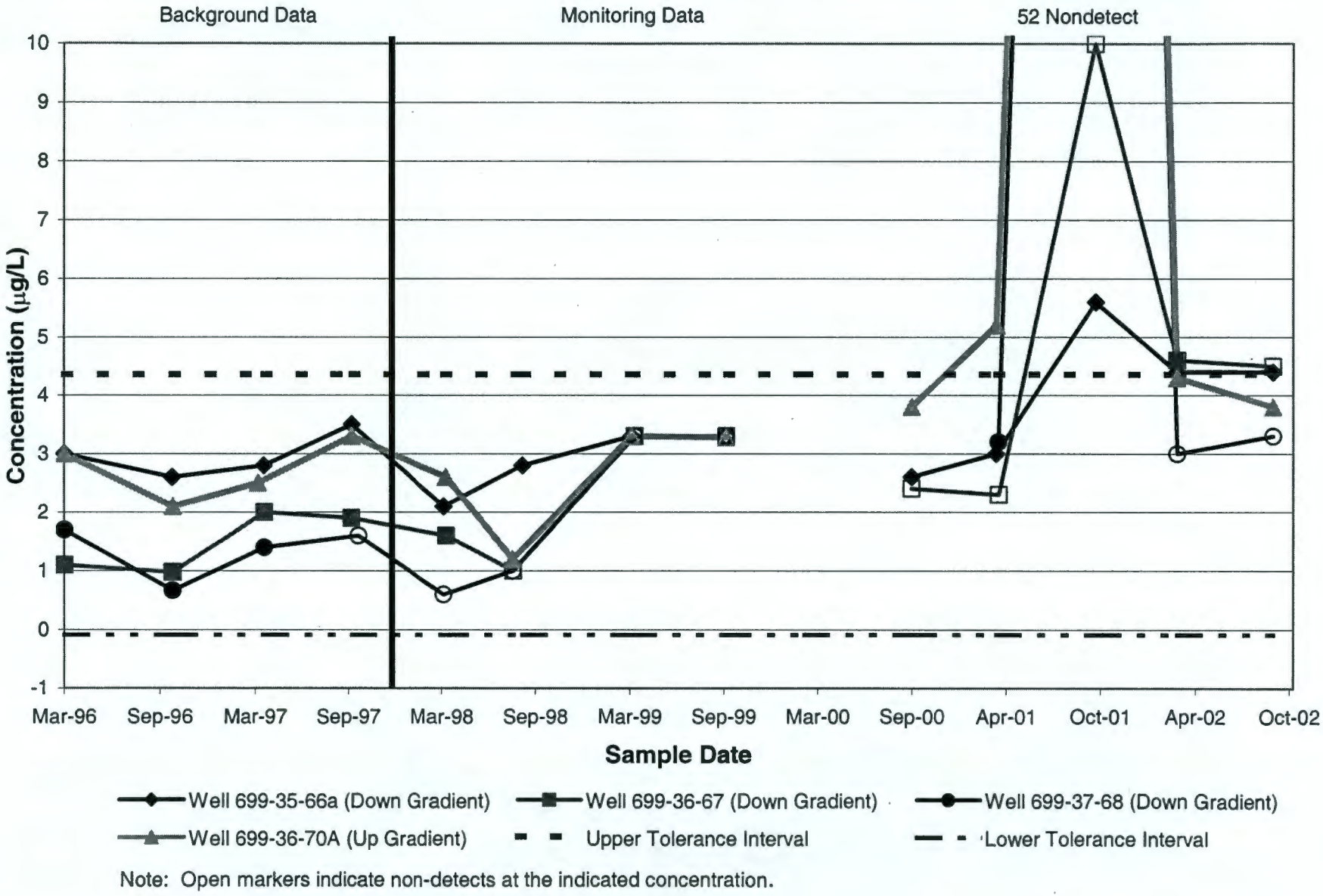
Table A-26. Specific Conductance Data.

Well	Background Data				Monitoring Events									
Well 699-35-66a (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Specific Conductance (μS/m)			428.0	423.0	441.0	405.0		413.0		412.0	416.0	423.0	413.0	412.0
RPD														
Qualifier														0
Outside Tolerance Interval					OK	OK	No Data	OK	No Data	OK	OK	OK	OK	OK
Well 699-36-67 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Specific Conductance (μS/m)			545.0	540.0	534.0	510.0	577.0	541.0		537.0	533.0	522.0	518.0	517.0
RPD														
Qualifier														0
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Well 699-37-68 (Down Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Specific Conductance (μS/m)			630.0	614.0	671.0	270.0					618.0	601.0	605.0	605.0
RPD														
Qualifier														0
Outside Tolerance Interval					OK	Below TI	No Data	No Data	No Data	No Data	OK	OK	OK	OK
Well 699-36-70A (Up Gradient)	Mar-96	Sep-96	Mar-97	Sep-97	Mar-98	Aug-98	Mar-99	Sep-99	Mar-00	Sep-00	Mar-01	Sep-01	Mar-02	Sep-02
Specific Conductance (μS/m)	618.0	595.0	562.0	575.0	565.0	546.0	585.0	578.0		565.0	555.0	540.0	522.0	537.0
RPD							5.8%							
Qualifier														
Outside Tolerance Interval					OK	OK	OK	OK	No Data	OK	OK	OK	OK	OK
Upper Tolerance Interval	743.3	743.3	743.3	743.3	743.3	743.3	743.3	743.3	743.3	743.3	743.3	743.3	743.3	743.3
Background Average	553.0													
Background Standard Deviation	73.8													
Normal Tolerance Factor	2.6													
Tolerance Interval Maximum Value	743.3													
Tolerance Interval Minimum Value	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7

APPENDIX B

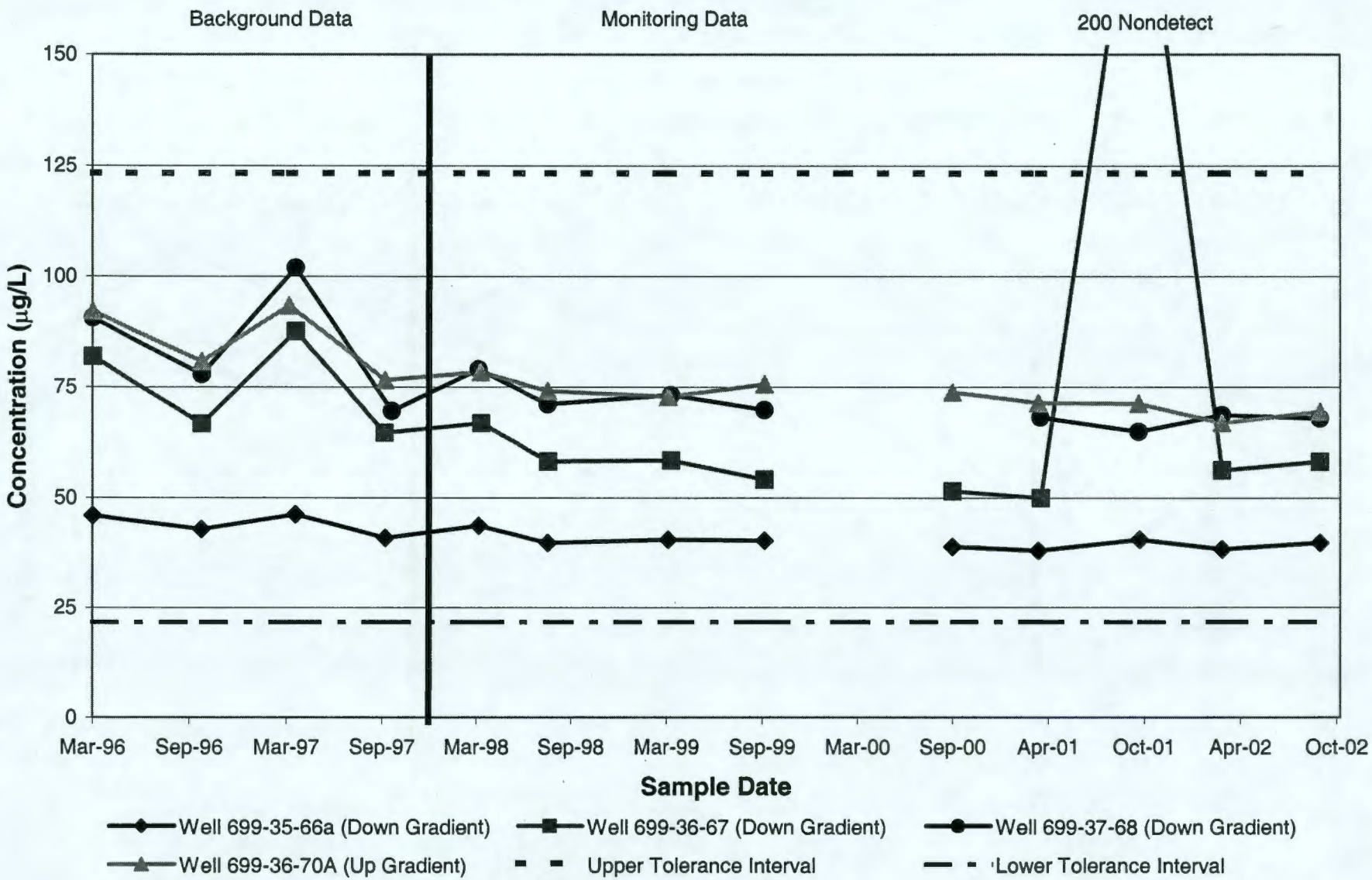
GROUNDWATER SAMPLING TRENDS, 1996-2002

Figure B-1. Arsenic Trends.



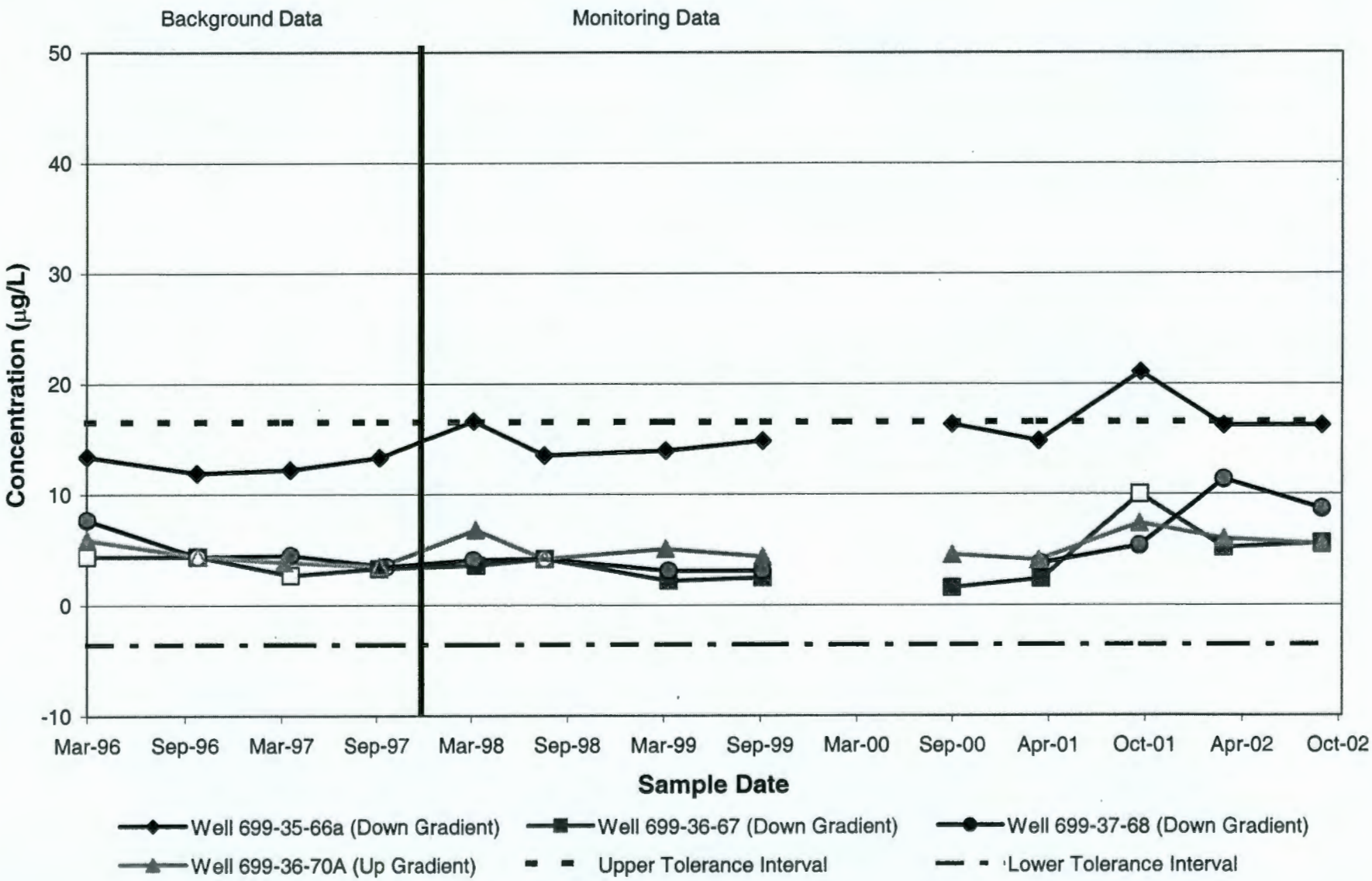
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-2. Barium Trends.



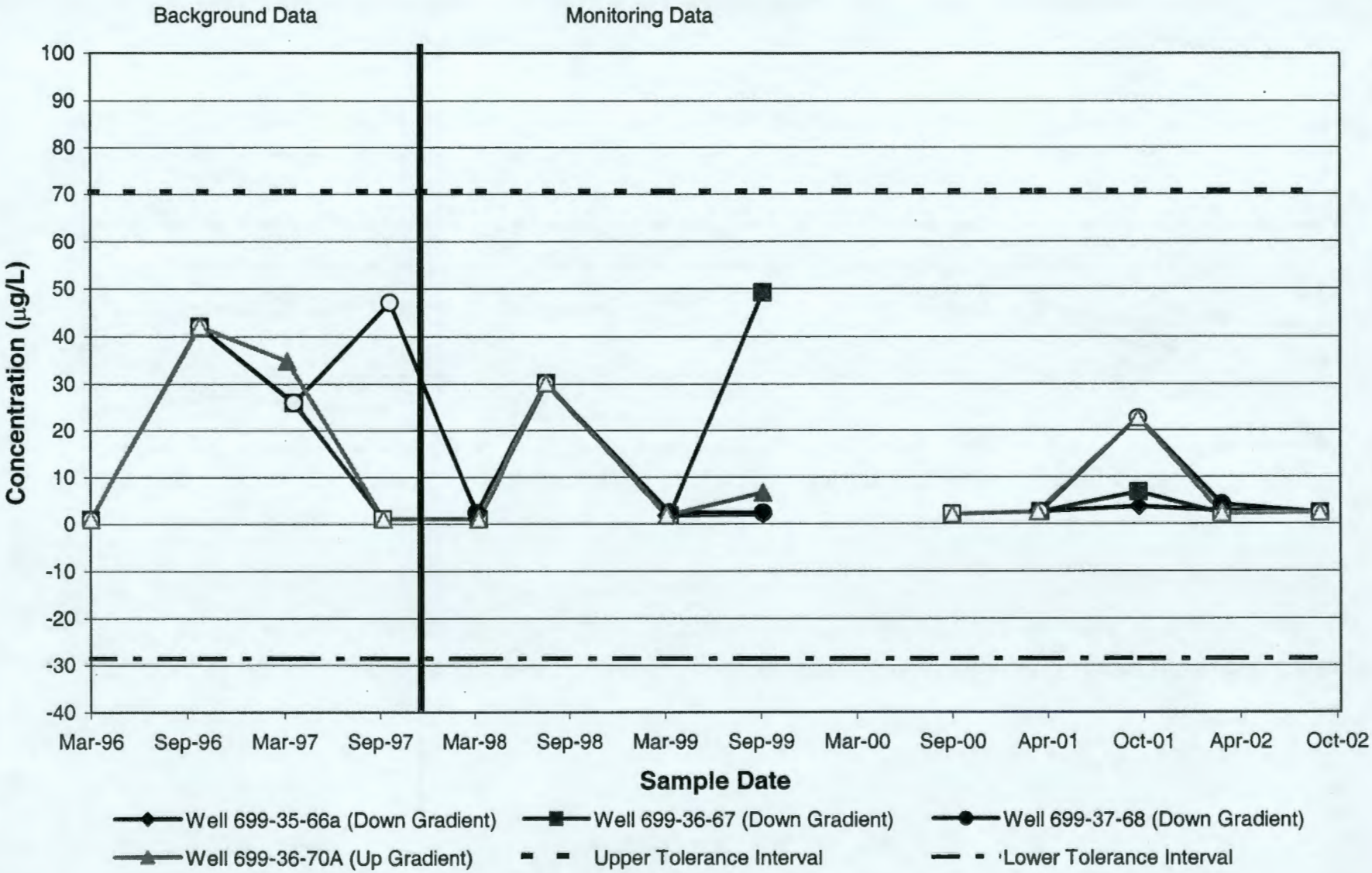
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-3. Chromium Trends.



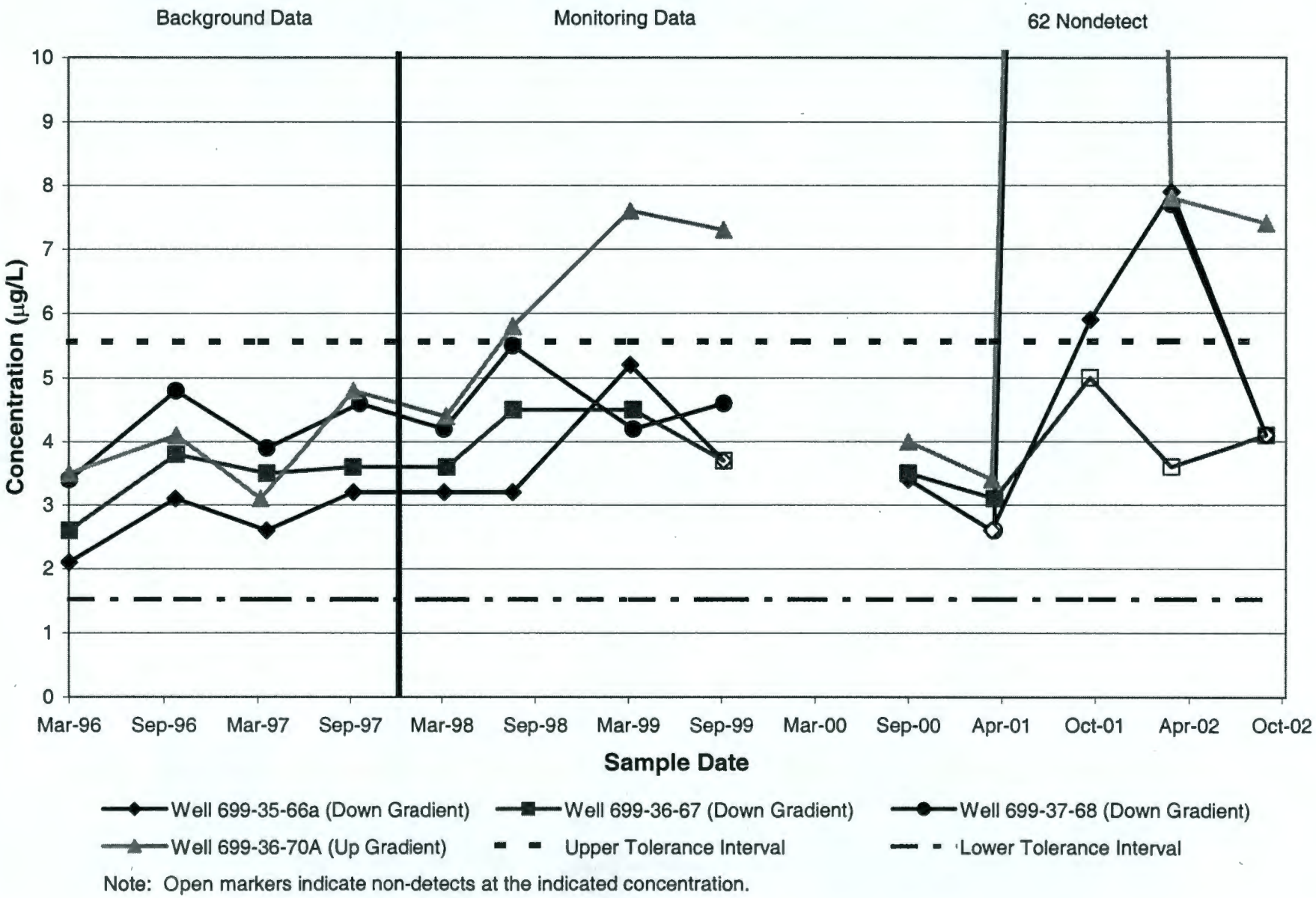
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-4. Lead Trends.



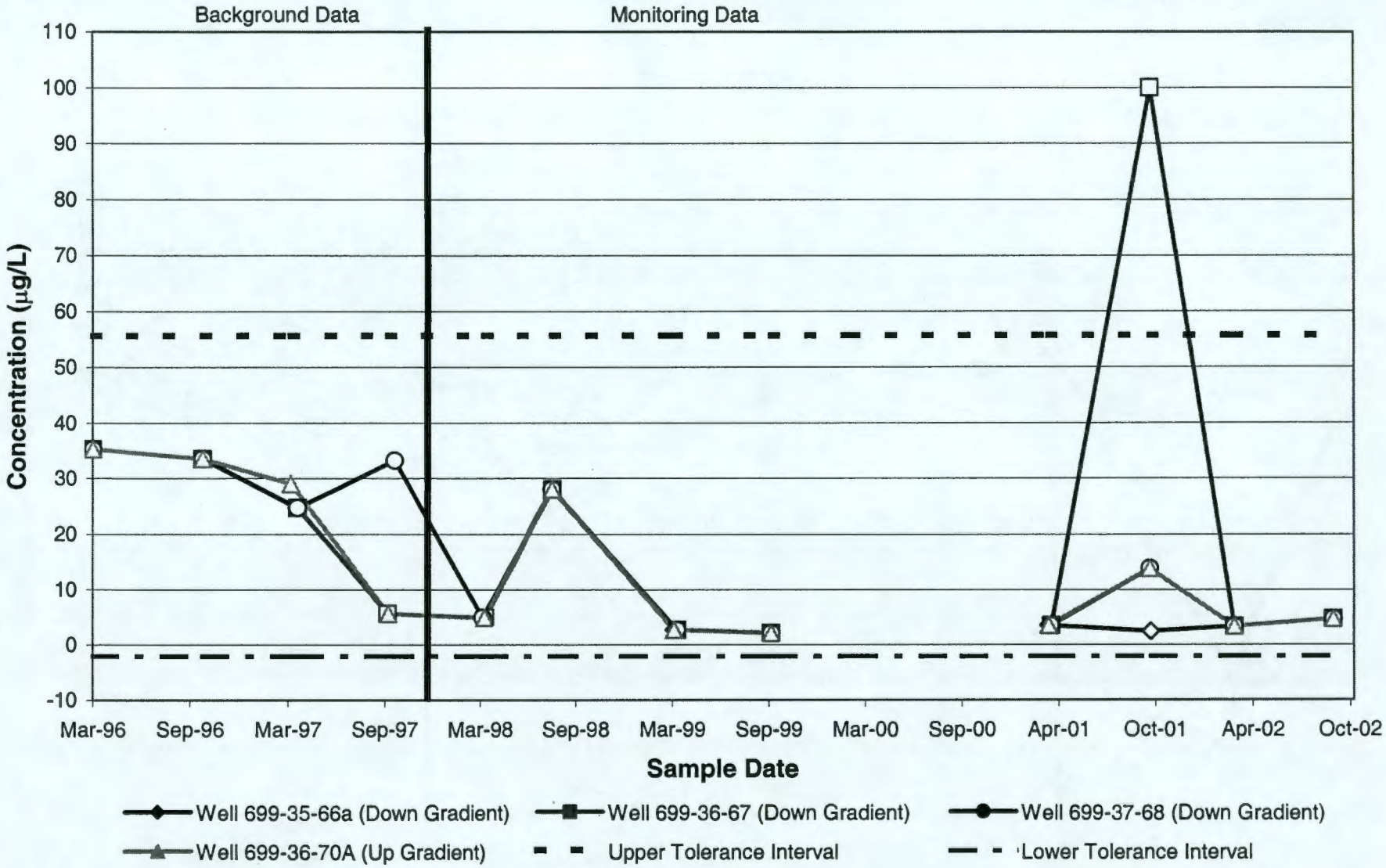
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-5. Selenium Trends.



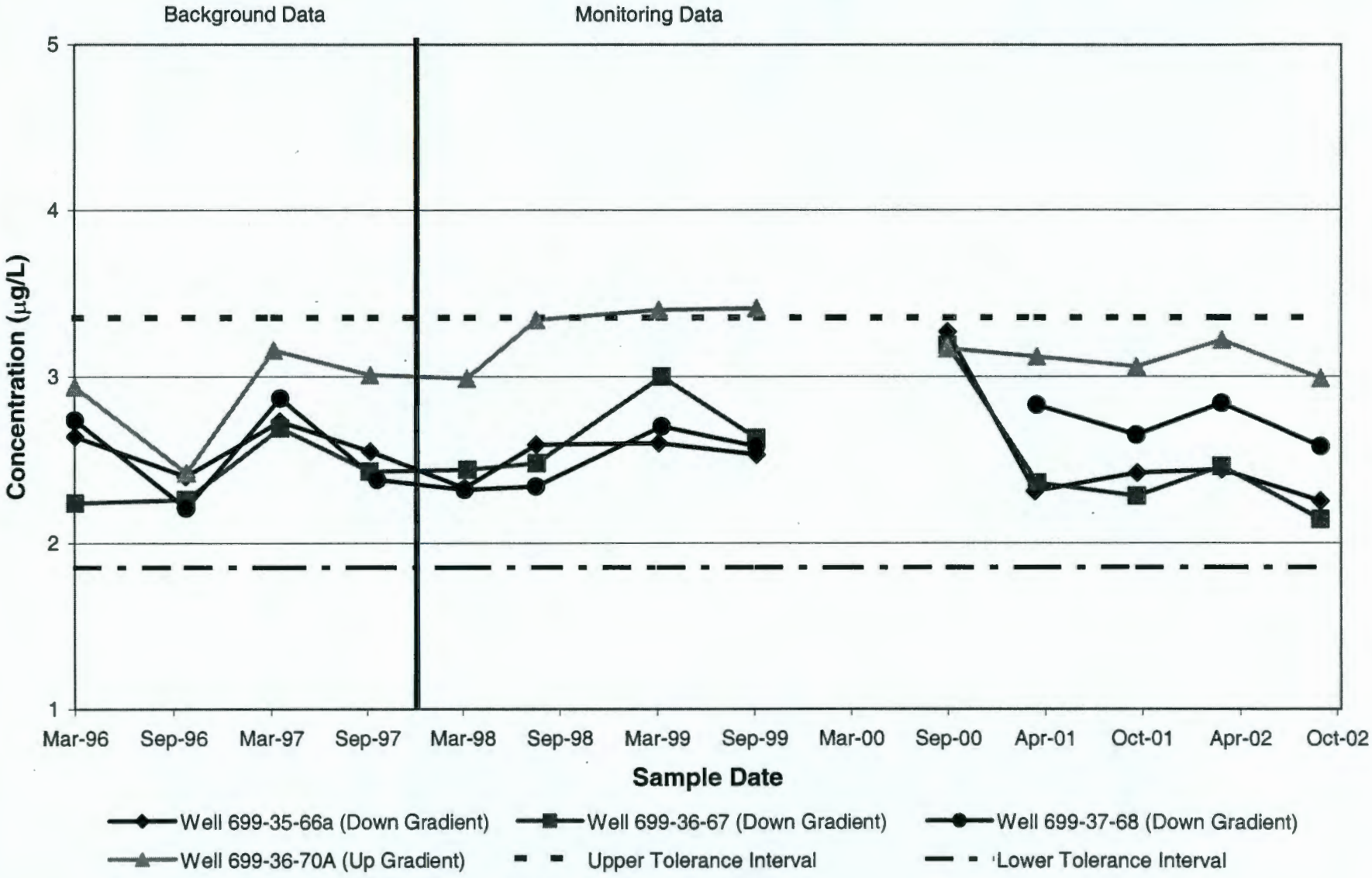
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-6. Tin Trends.



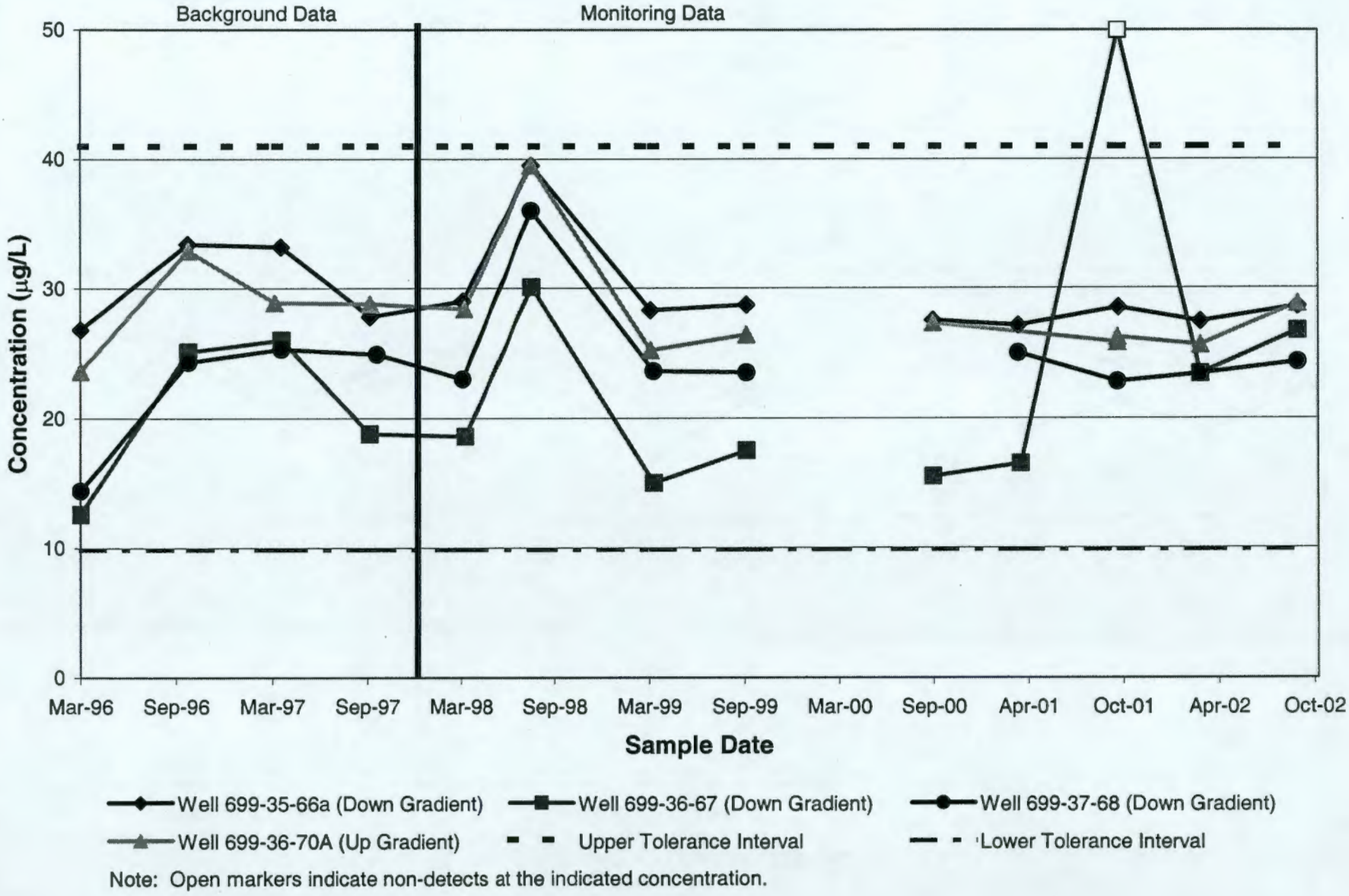
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-7. Uranium Trends.



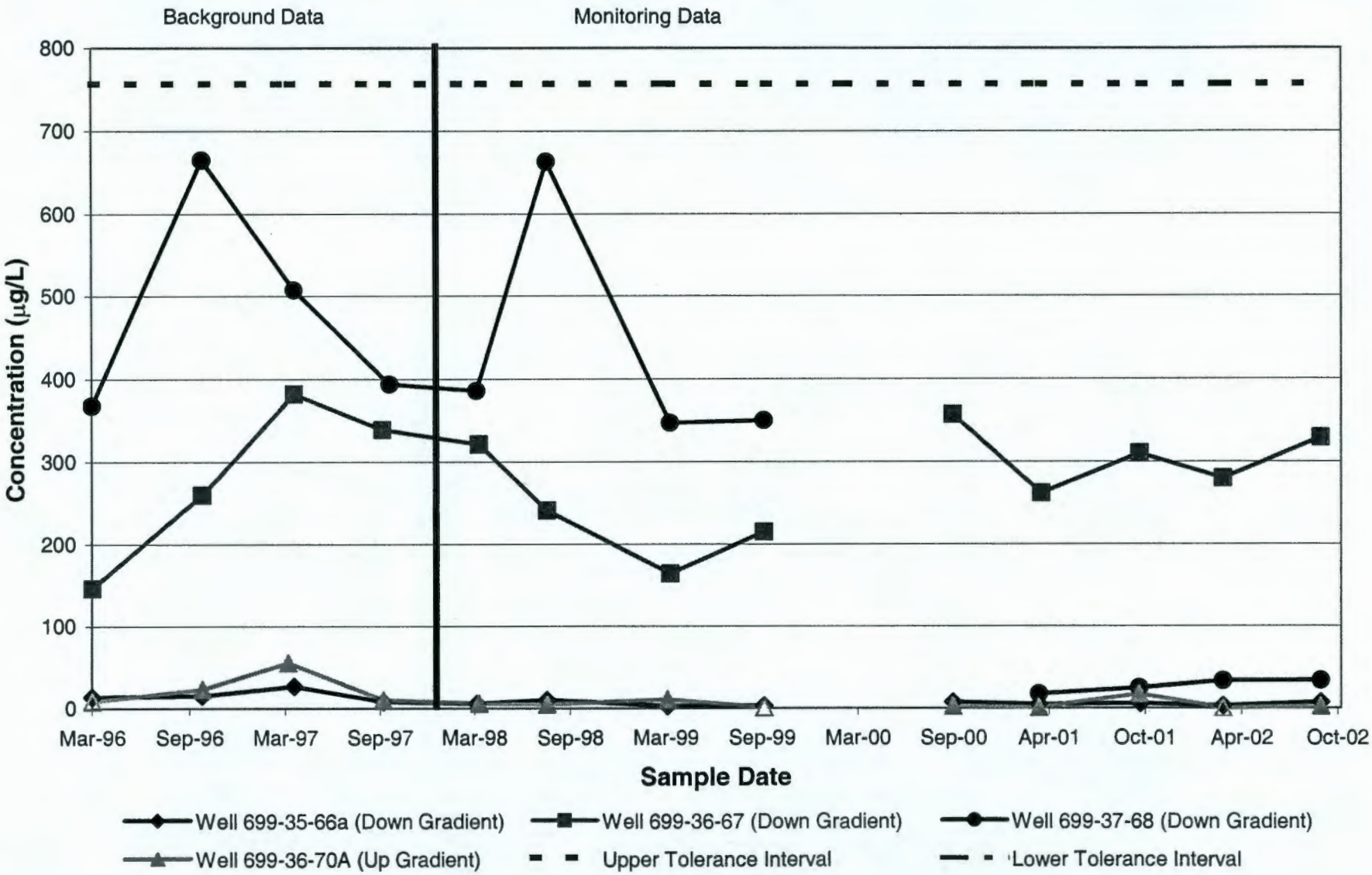
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-8. Vanadium Trends.



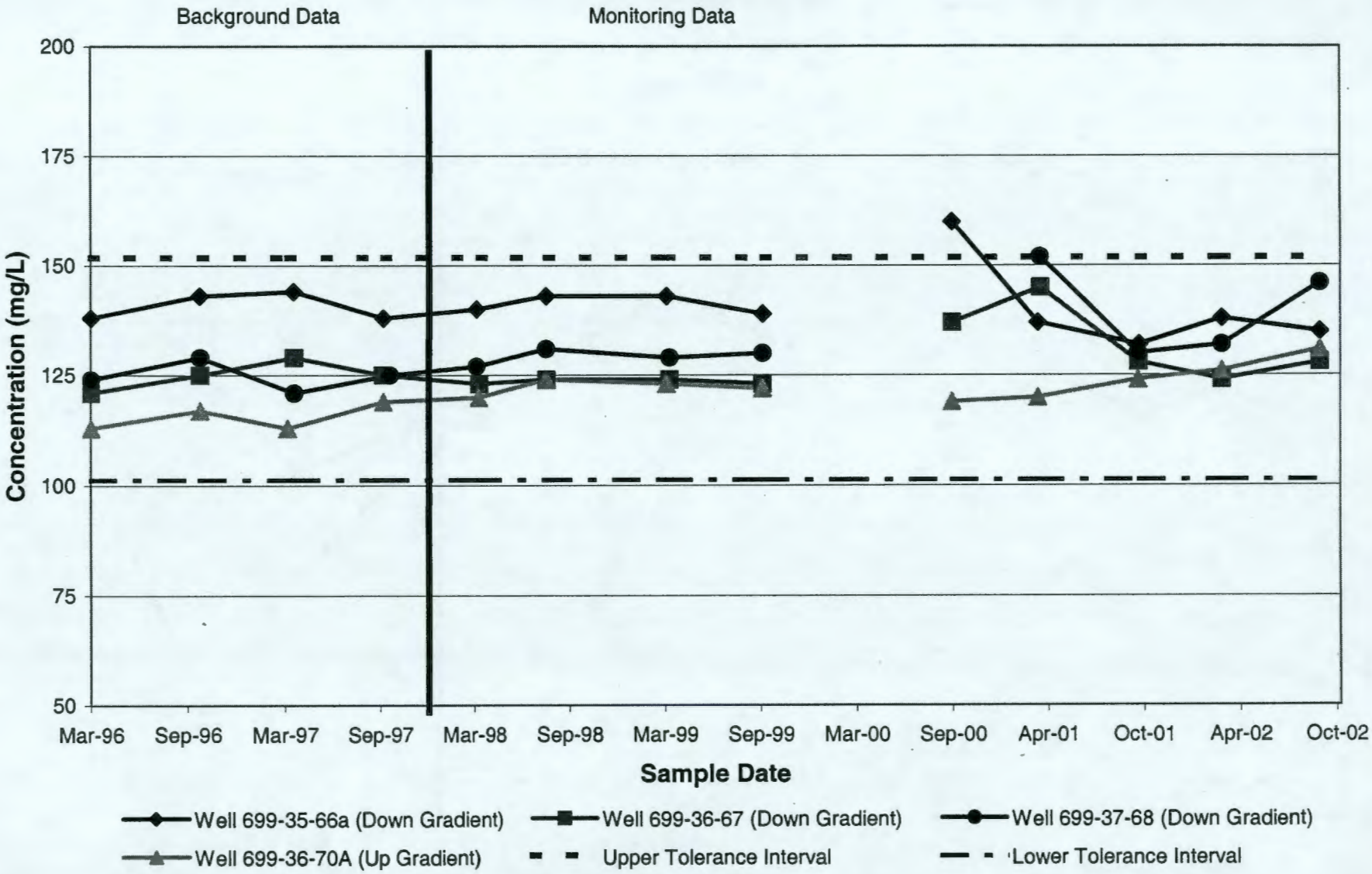
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-9. Zinc Trends.



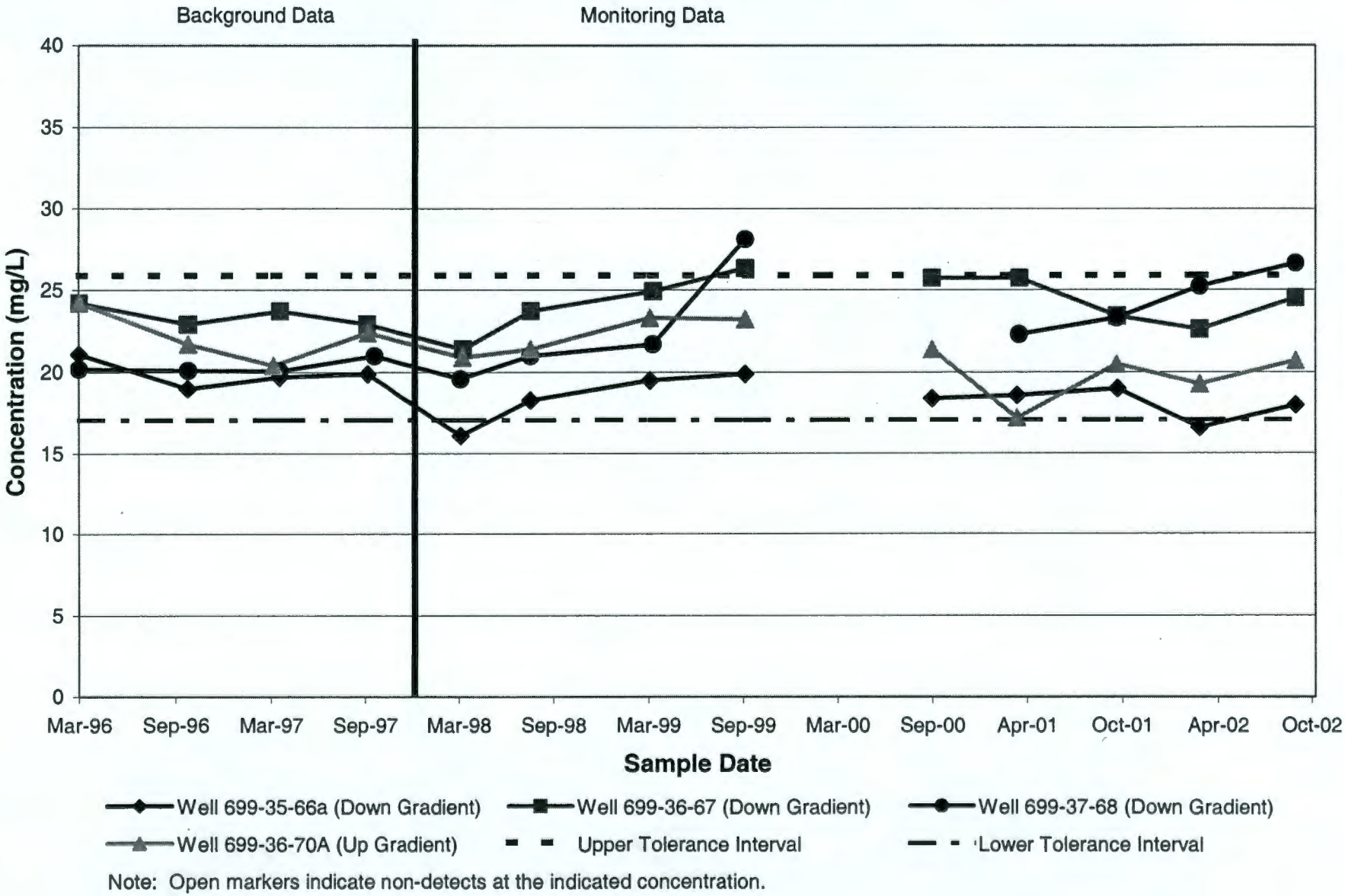
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-10. Alkalinity Trends.



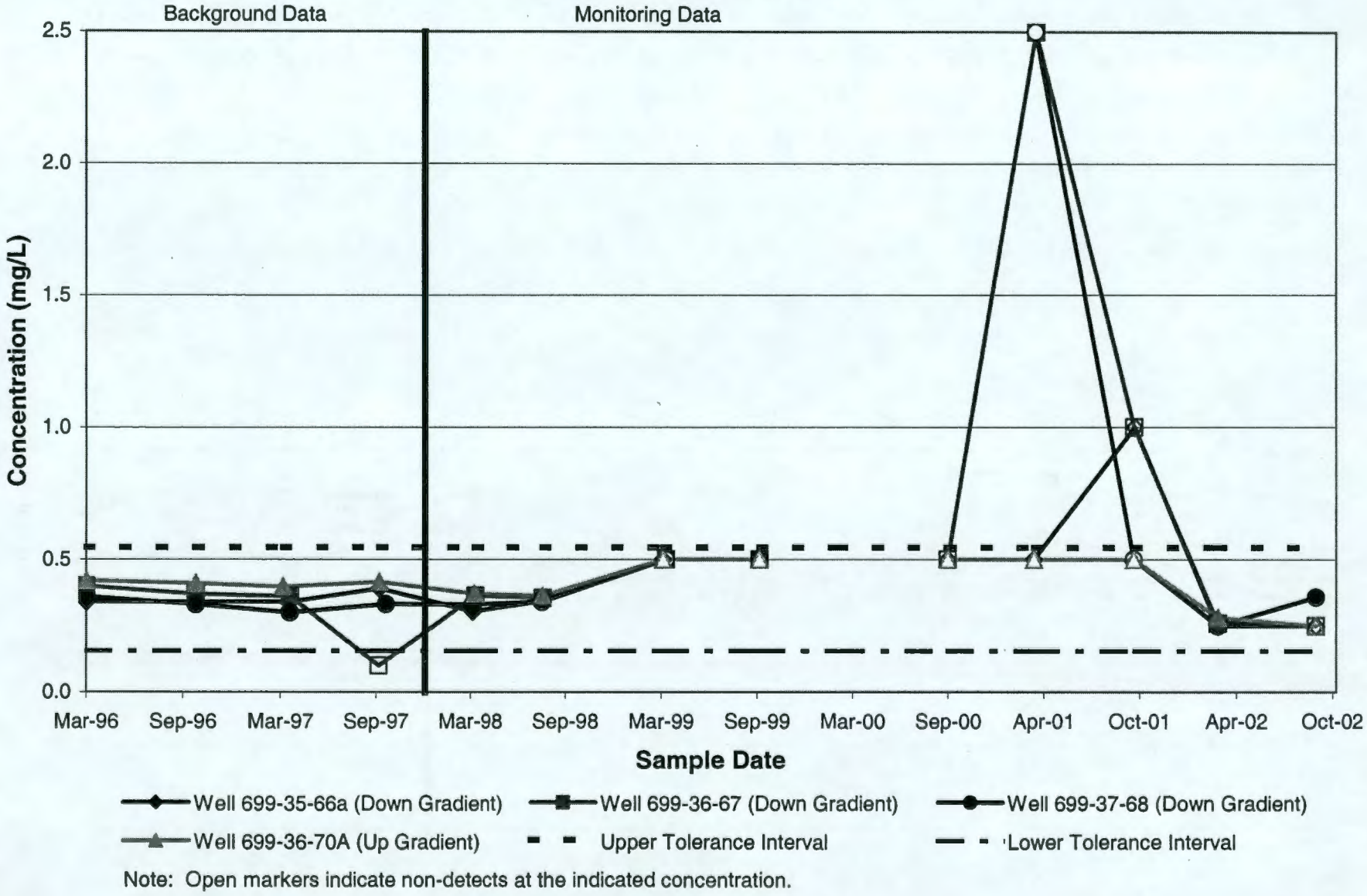
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-11. Chloride Trends.



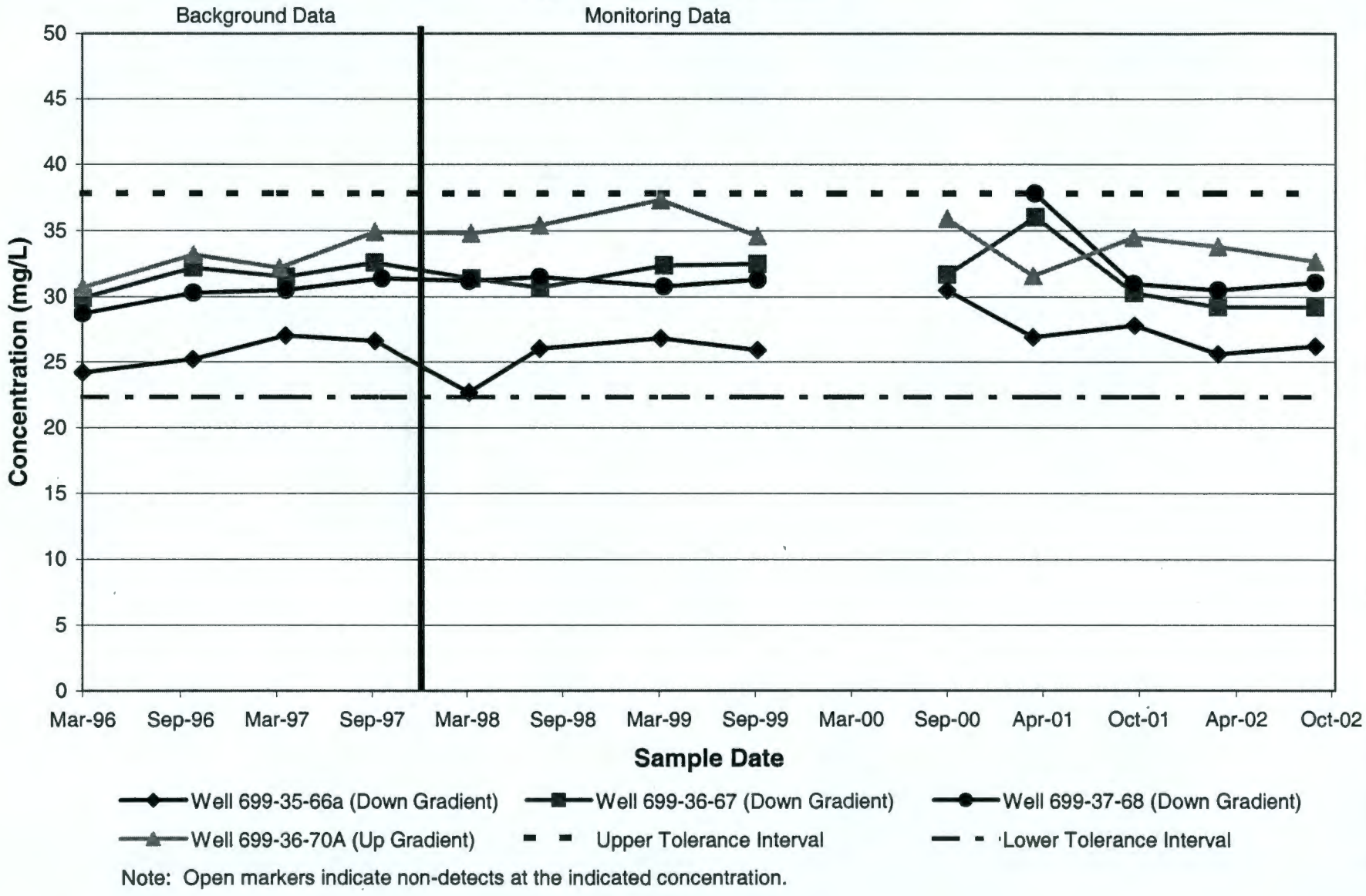
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-12. Fluoride Trends.



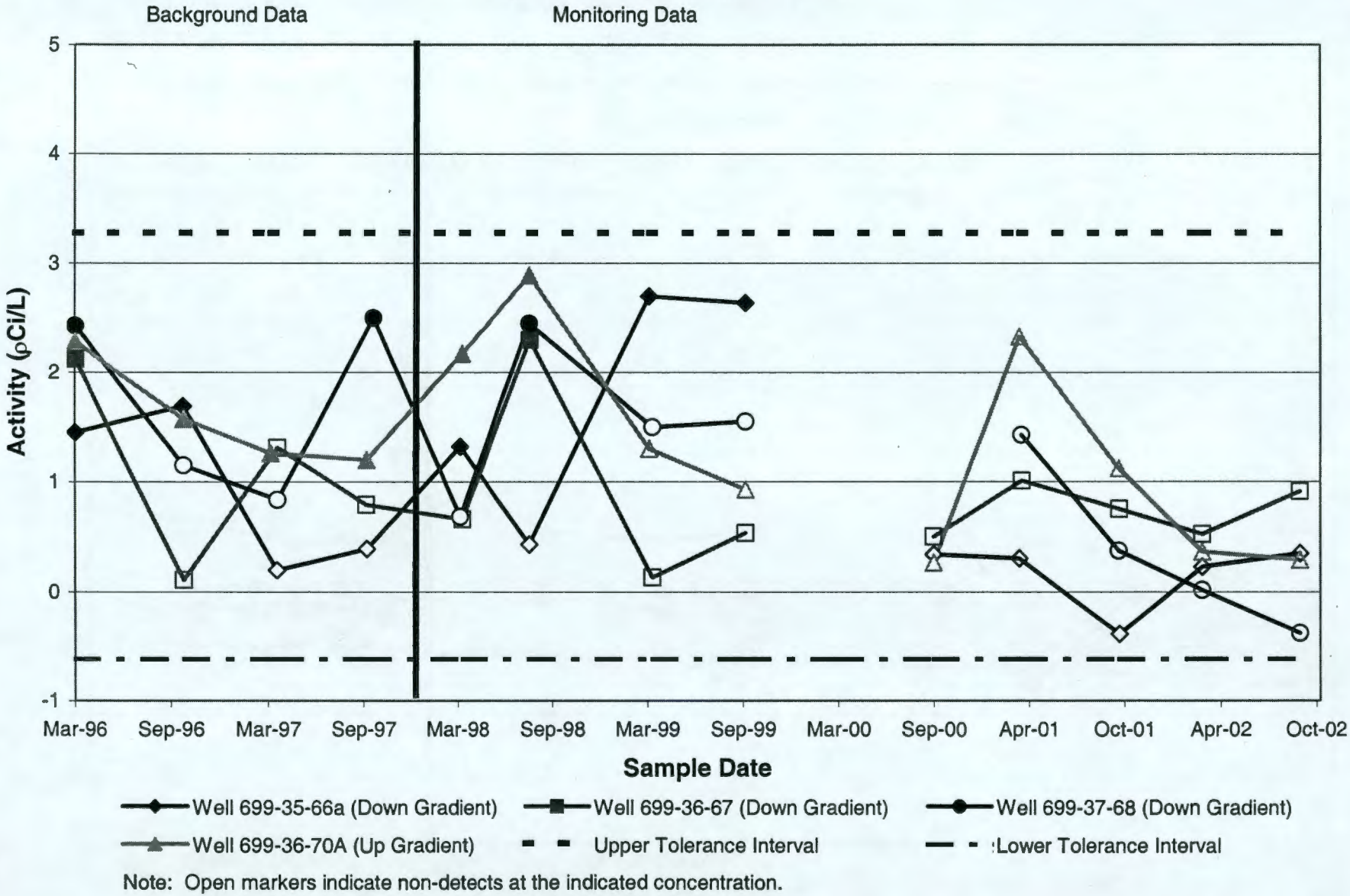
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-13. Sulfate Trends.



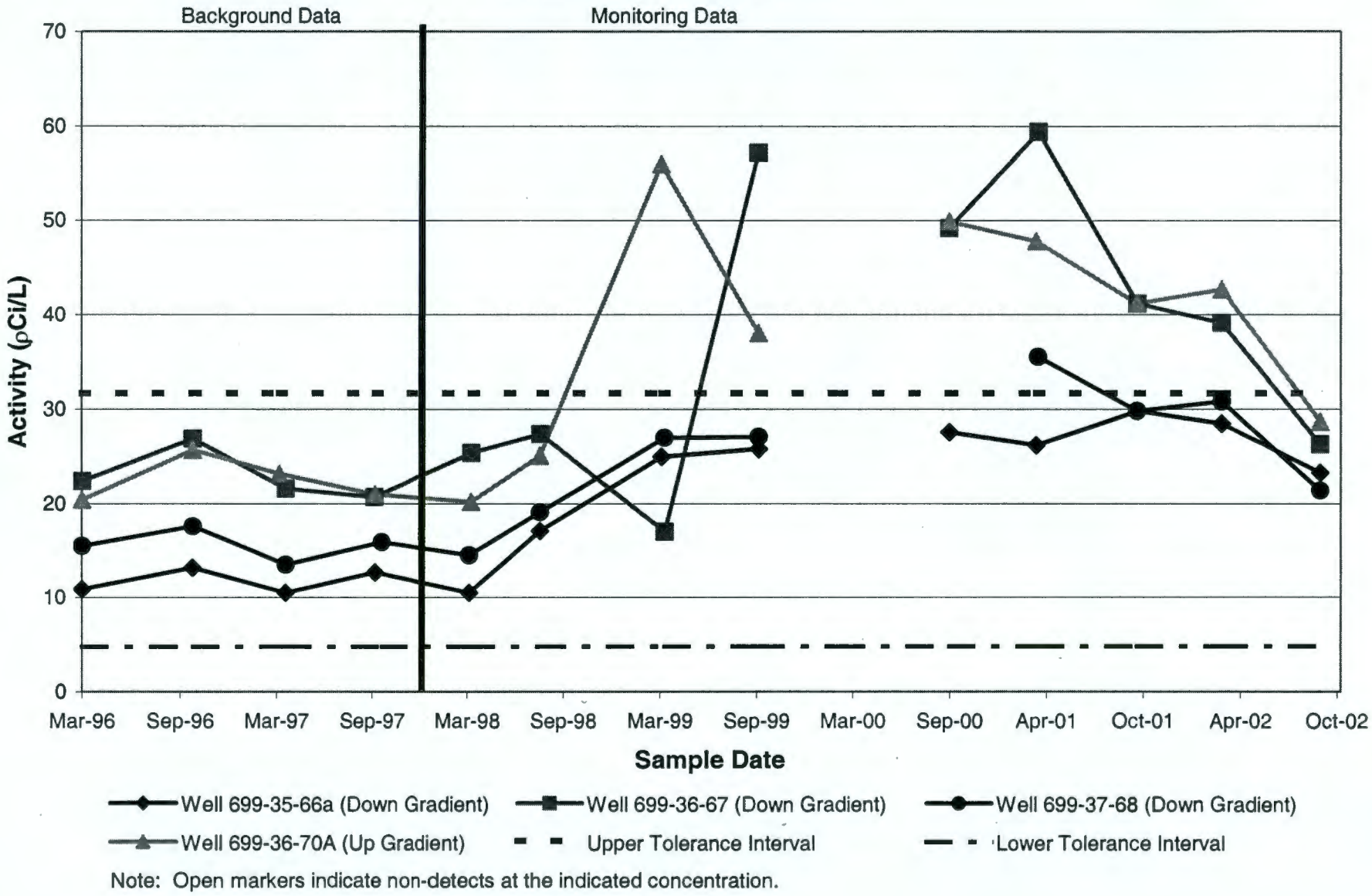
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-14. Gross Alpha Trends.



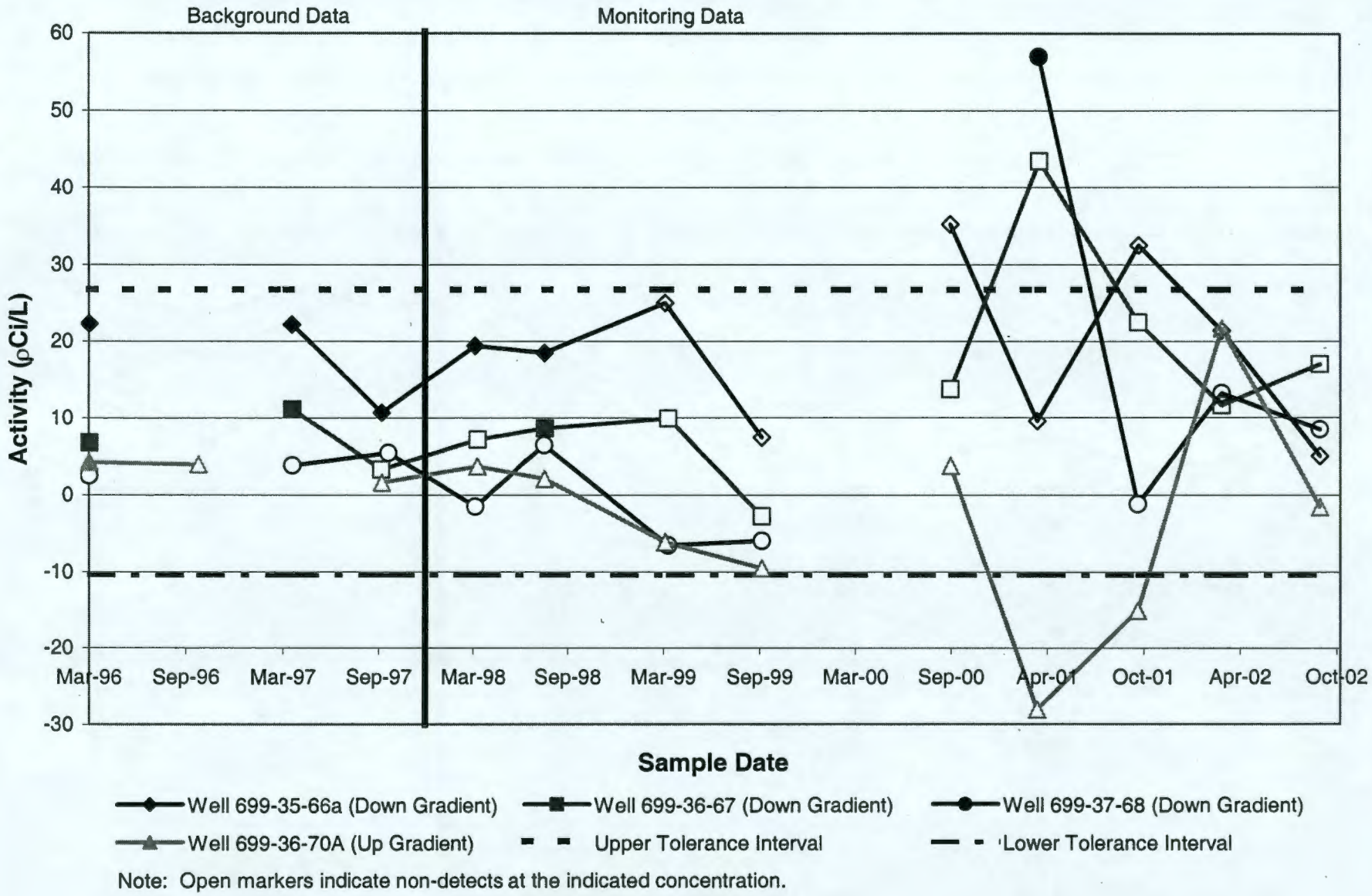
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-15. Gross Beta Trends.



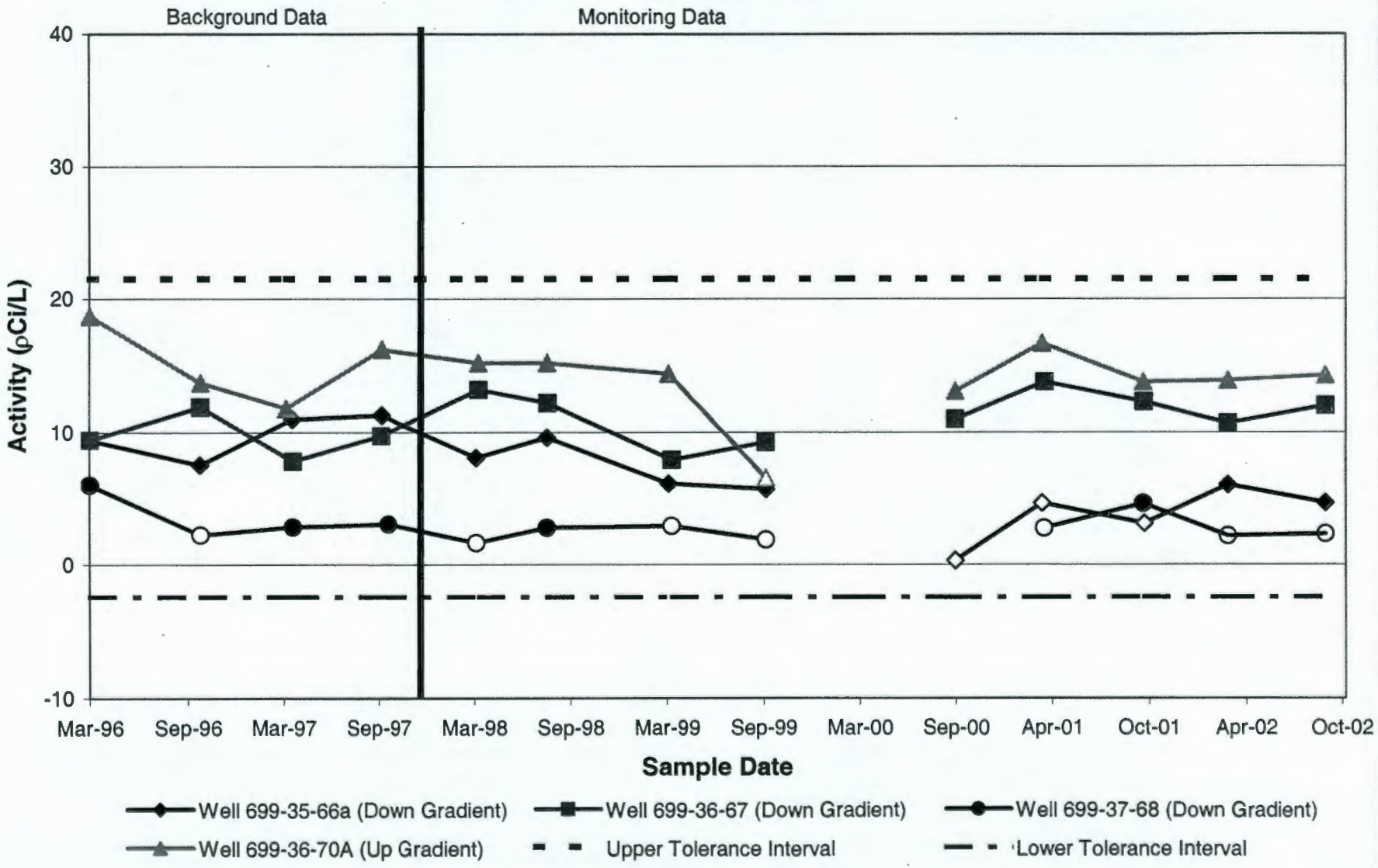
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-16. Carbon-14 Trends.



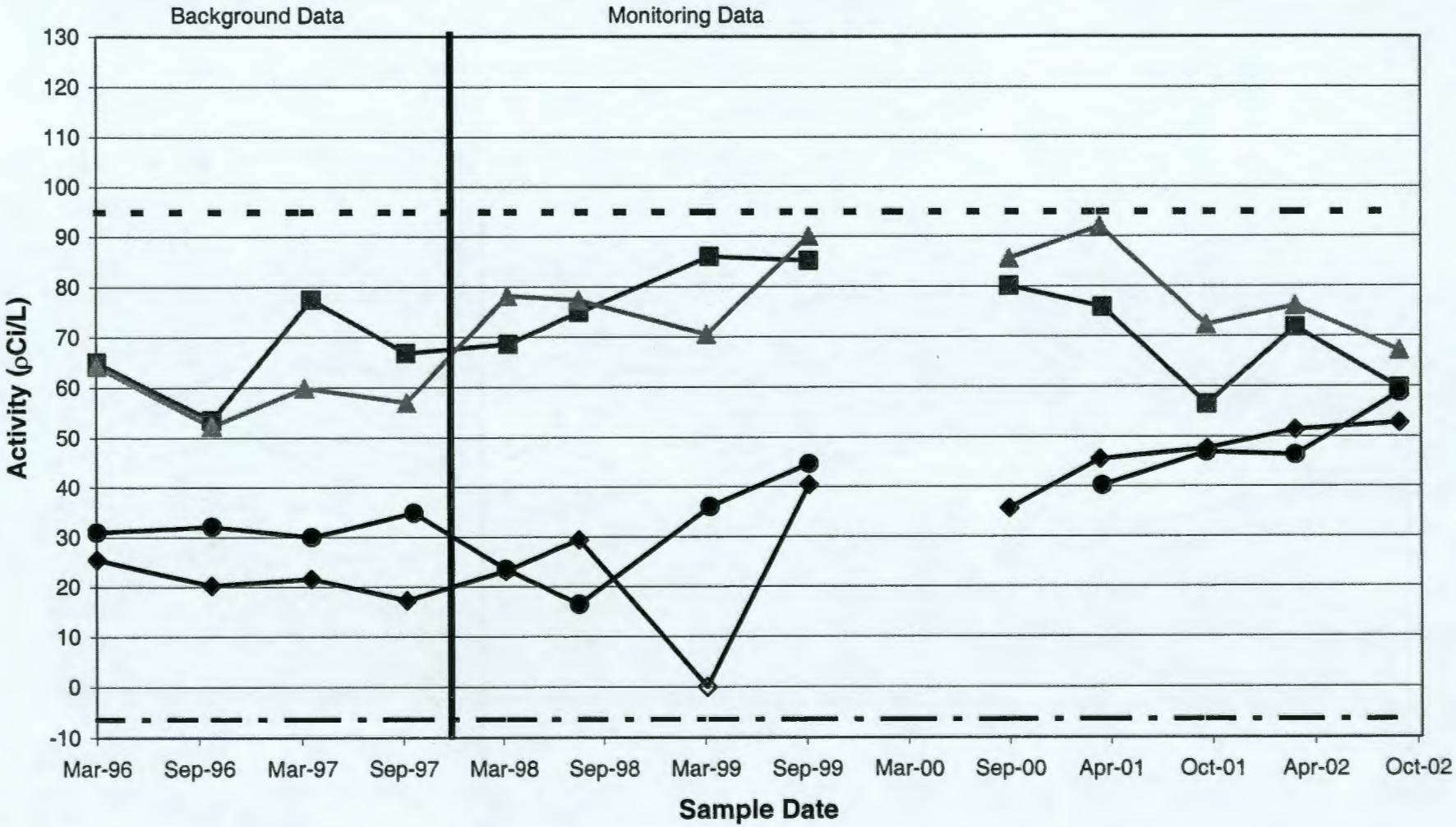
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-17. Iodine-129 Trends.



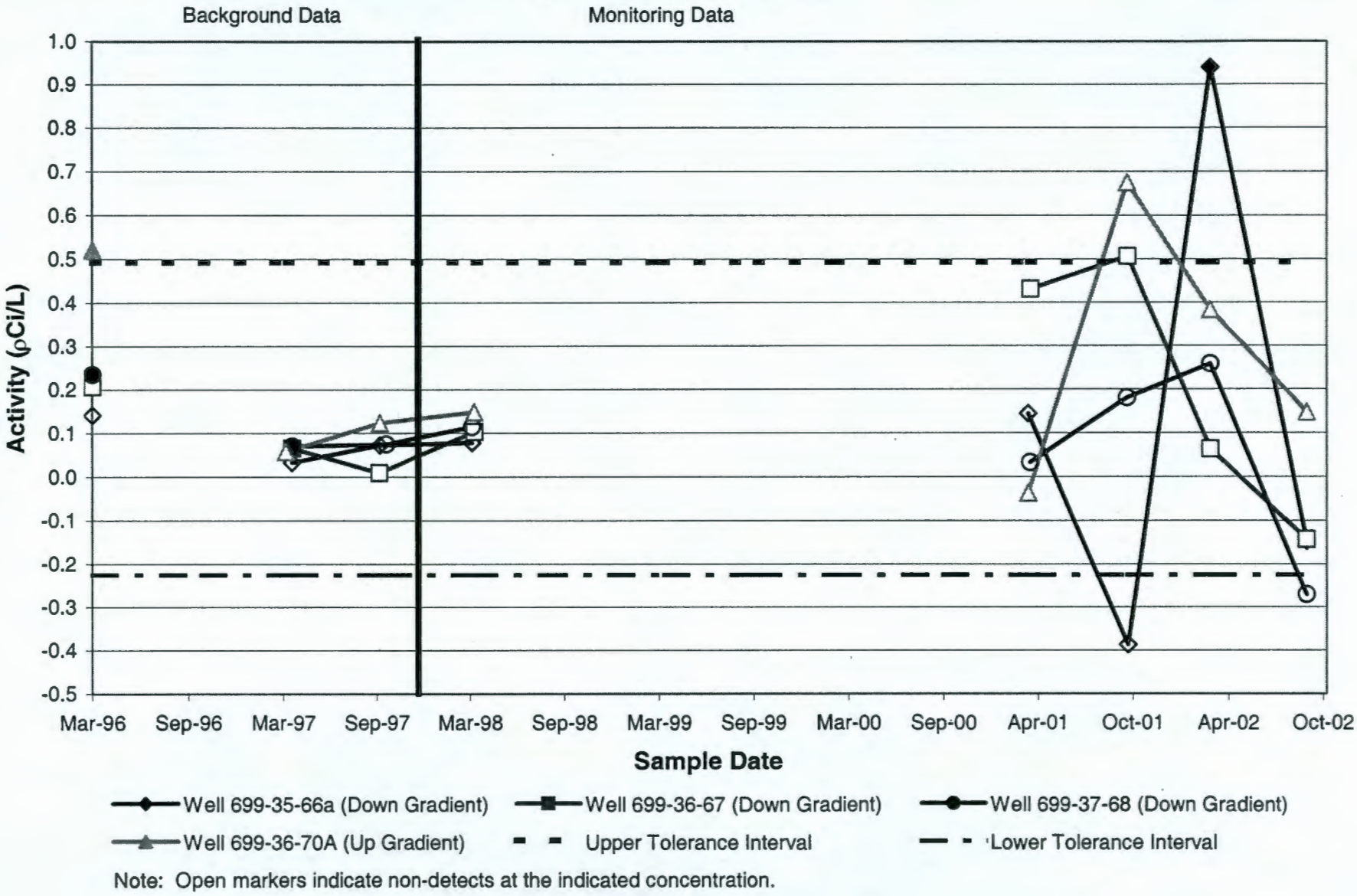
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-18. Technetium-99 Trends.



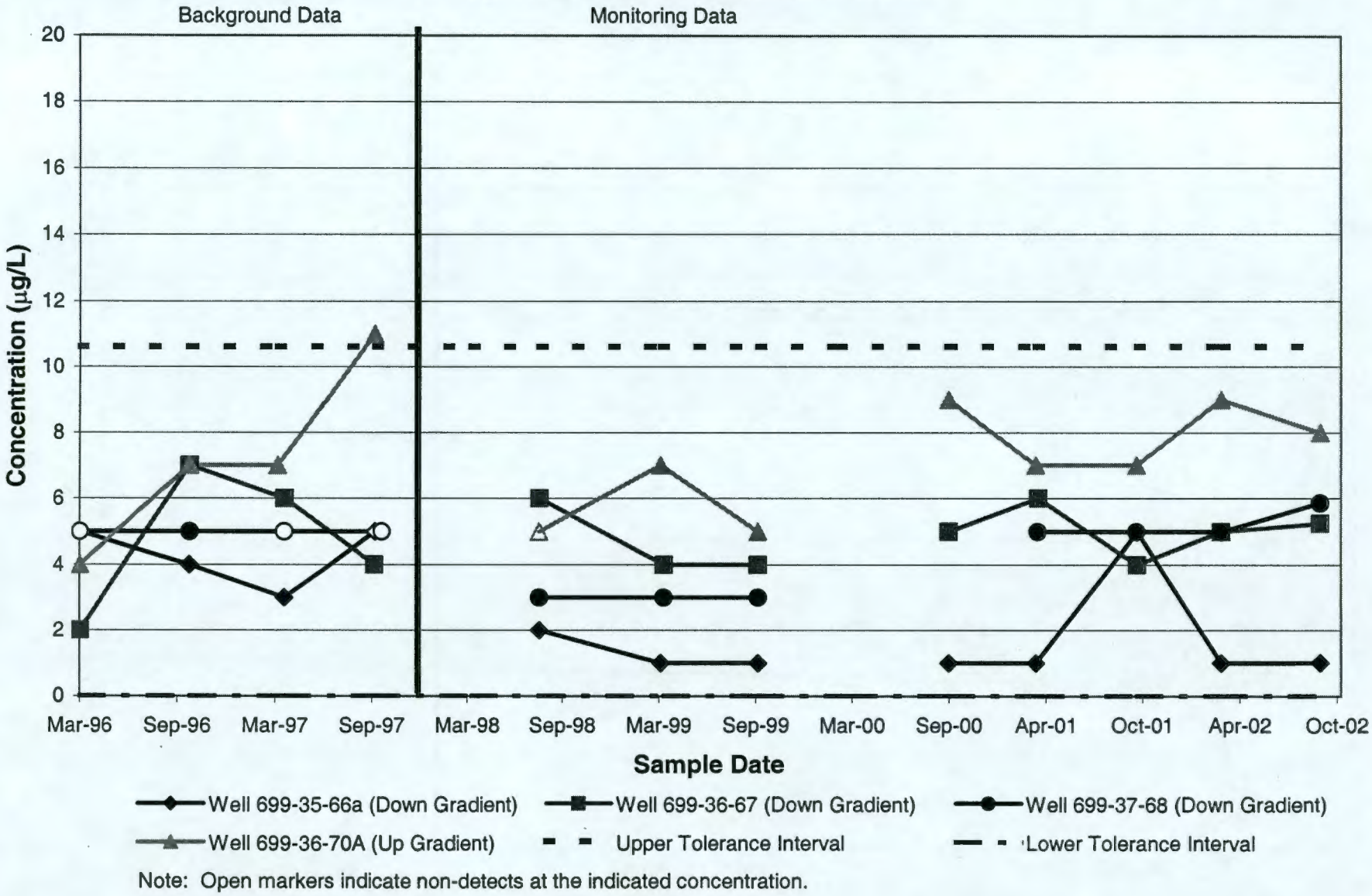
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-19. Radium Trends.



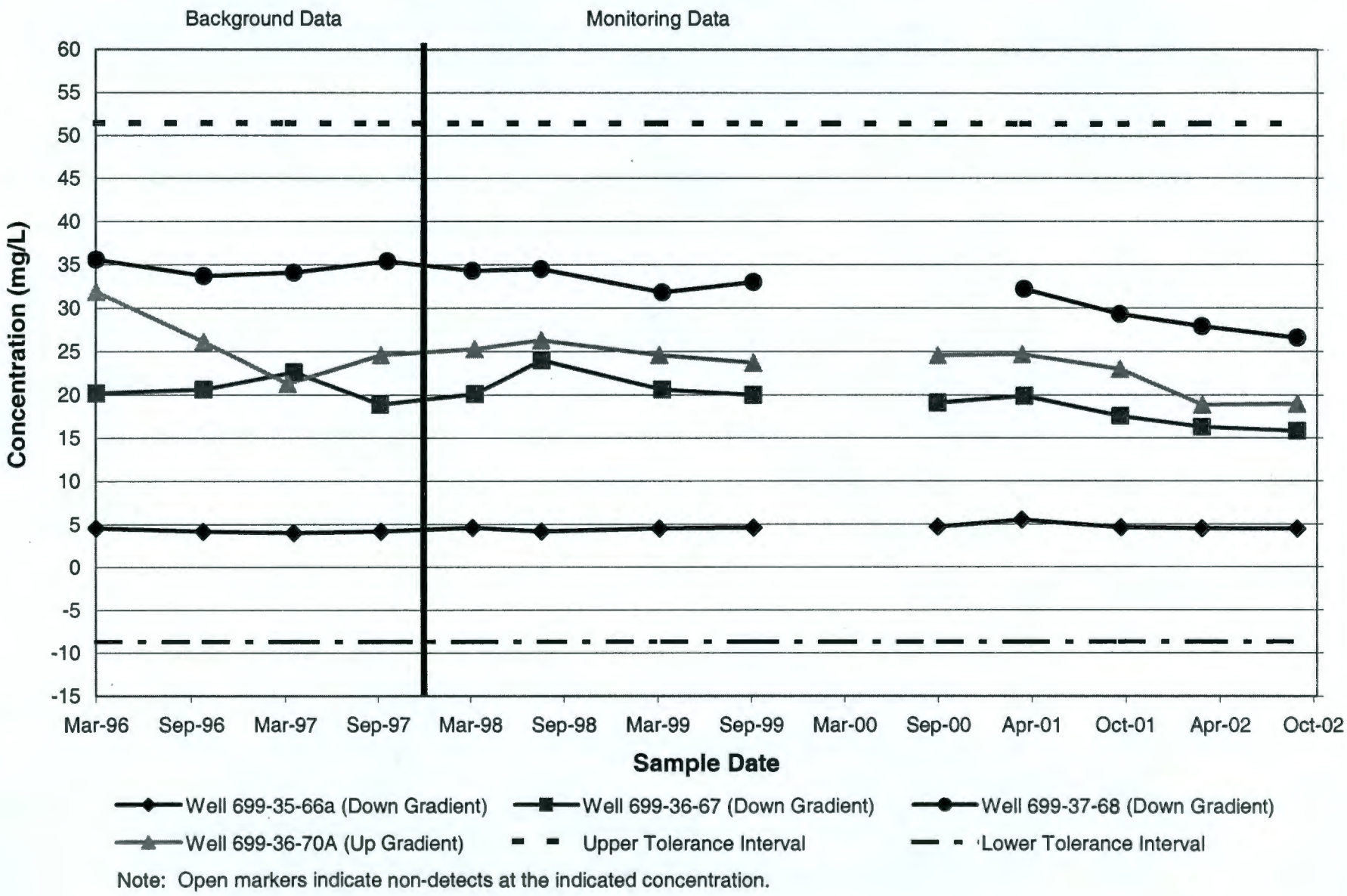
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-20. Carbon Tetrachloride Trends.



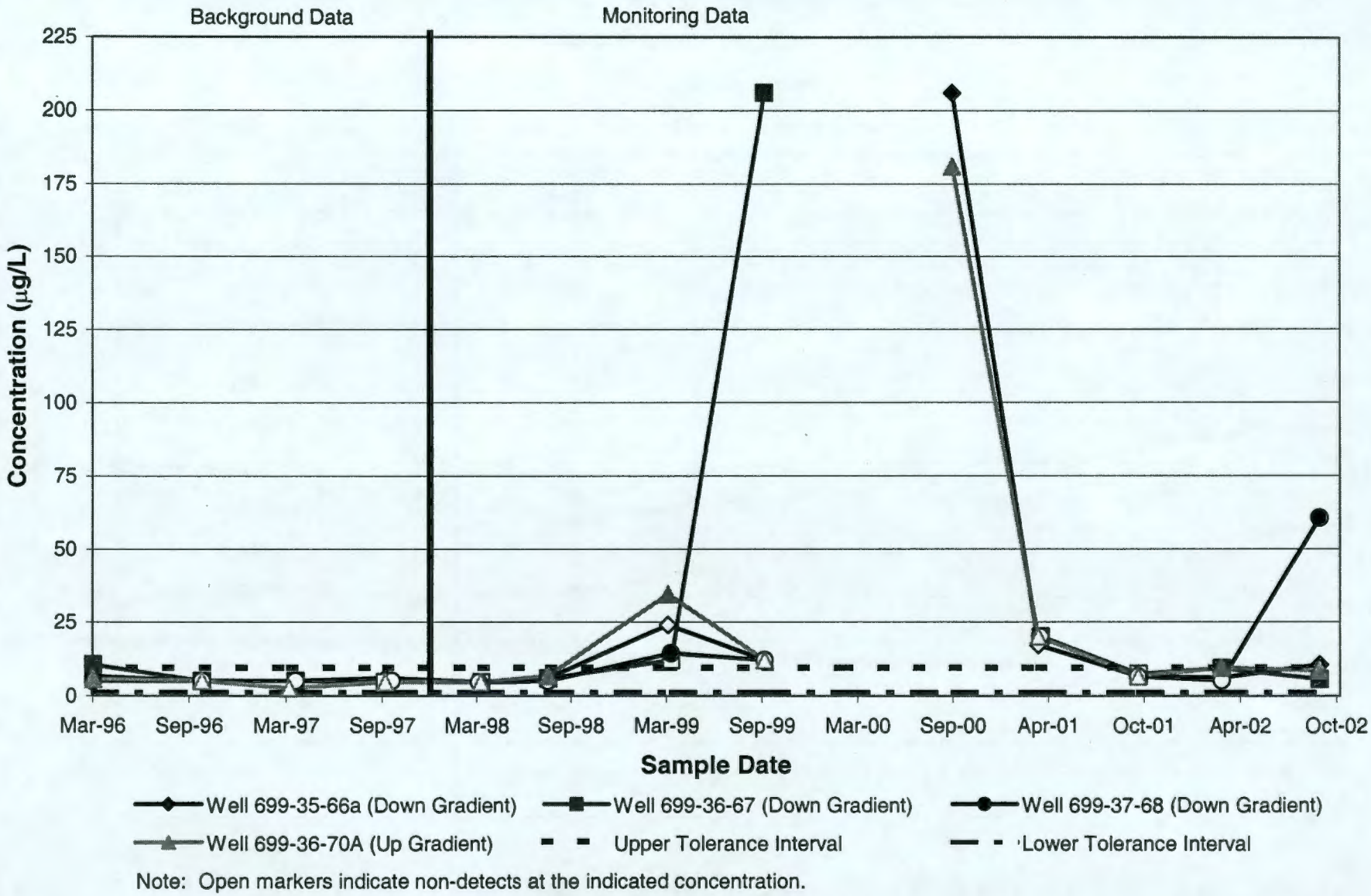
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-21. Nitrogen in Nitrite and Nitrate Trends.



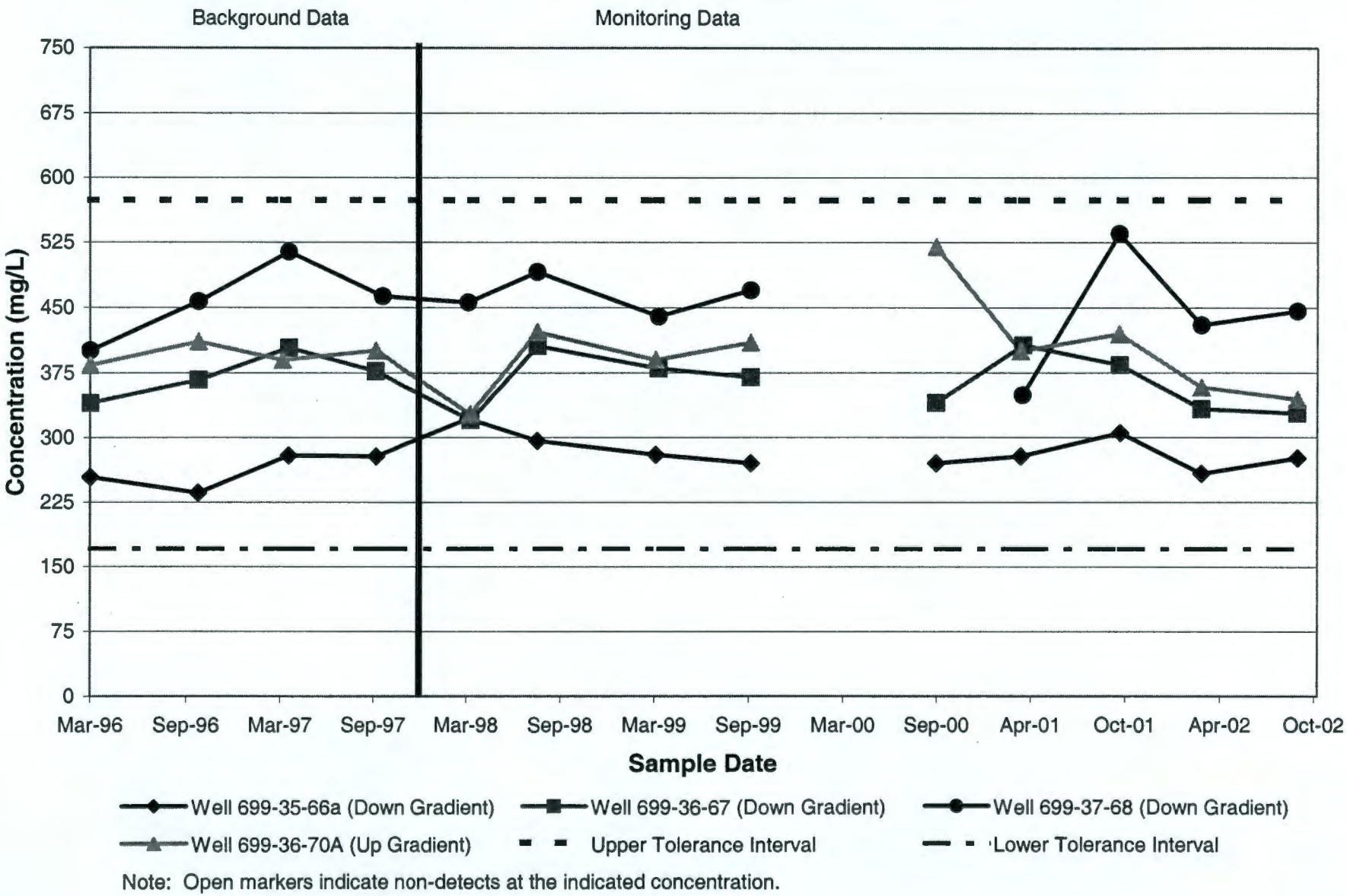
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-22. Total Organic Halides Trends.



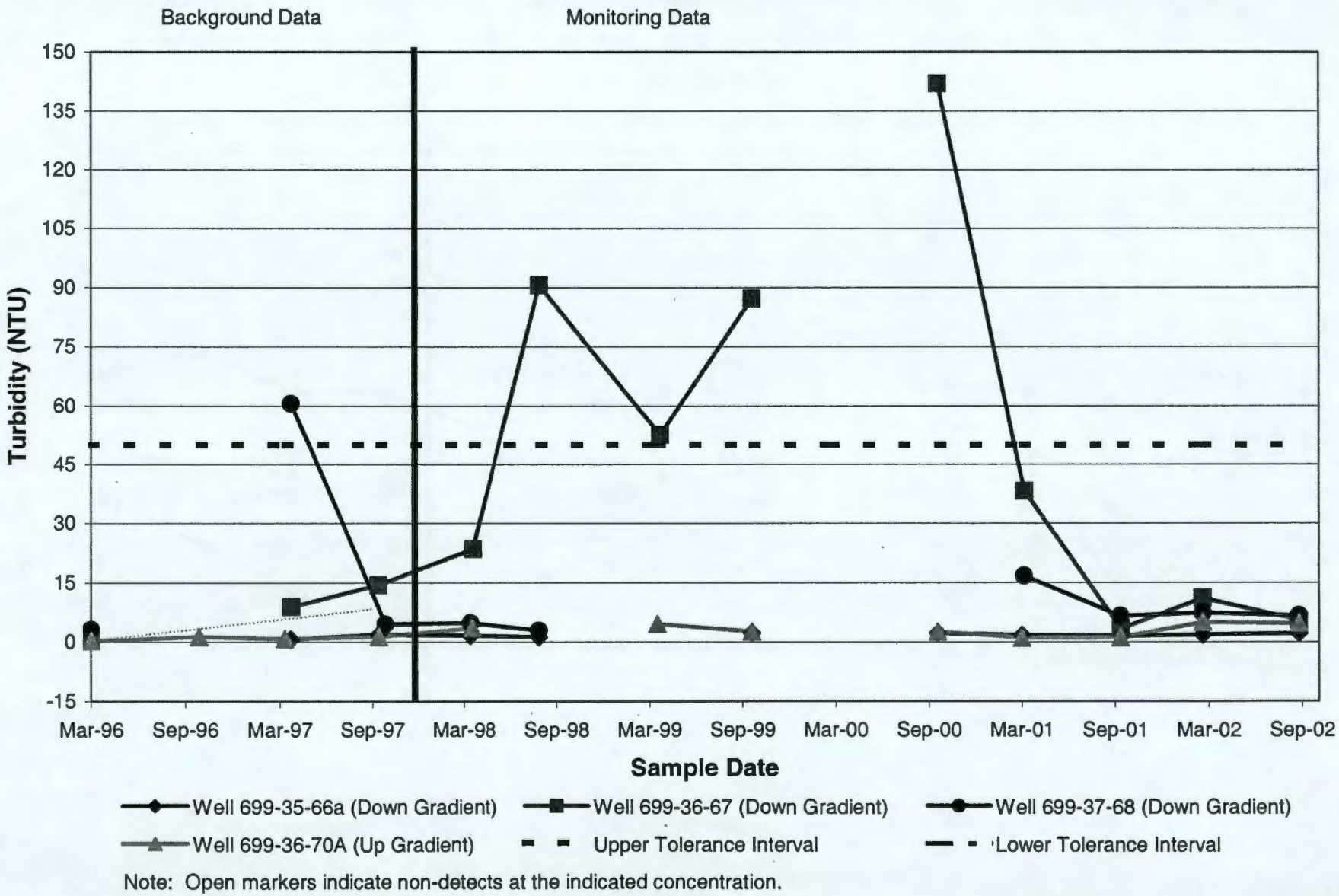
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-23. Total Dissolved Solids Trends.



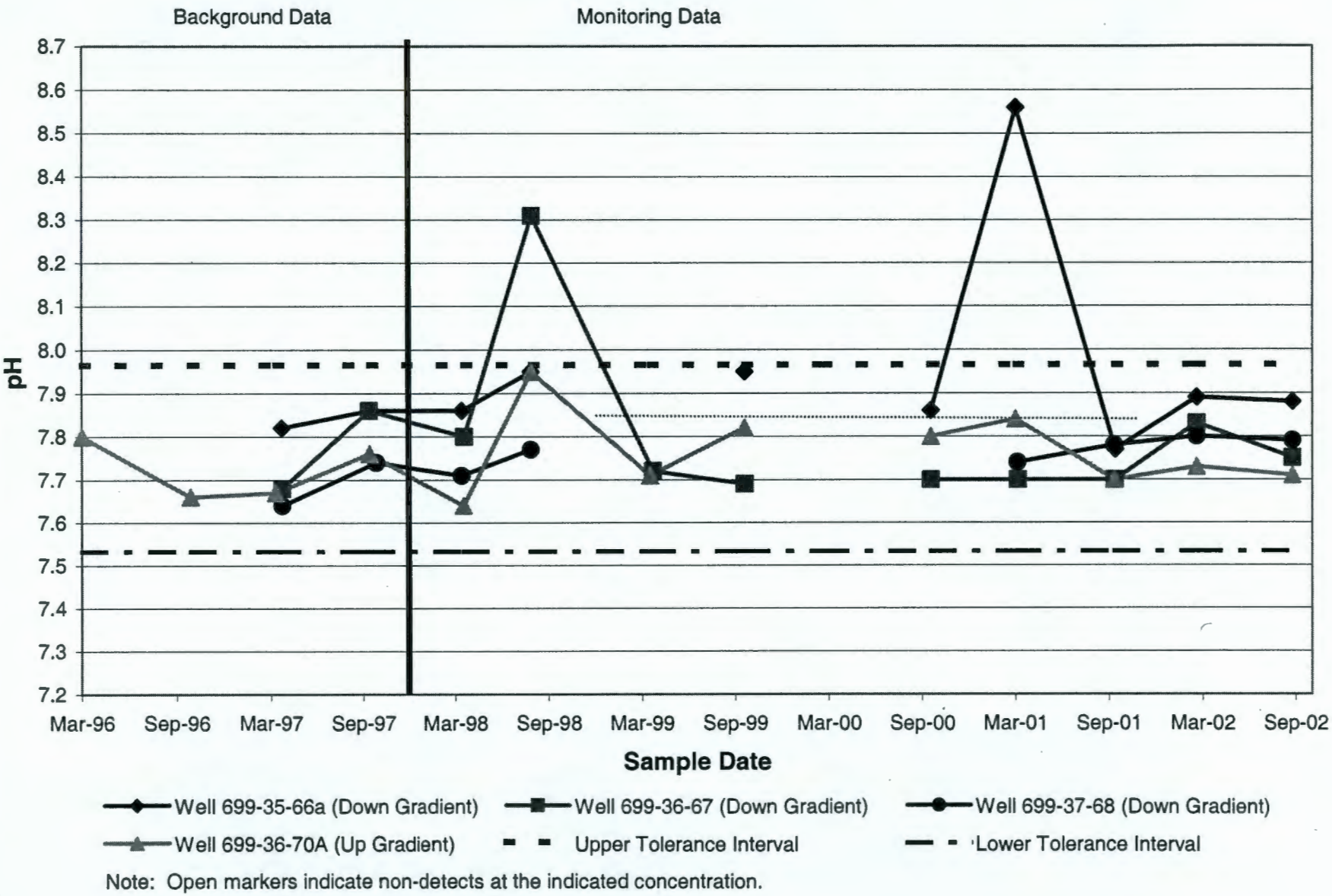
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-24. Turbidity Trends.



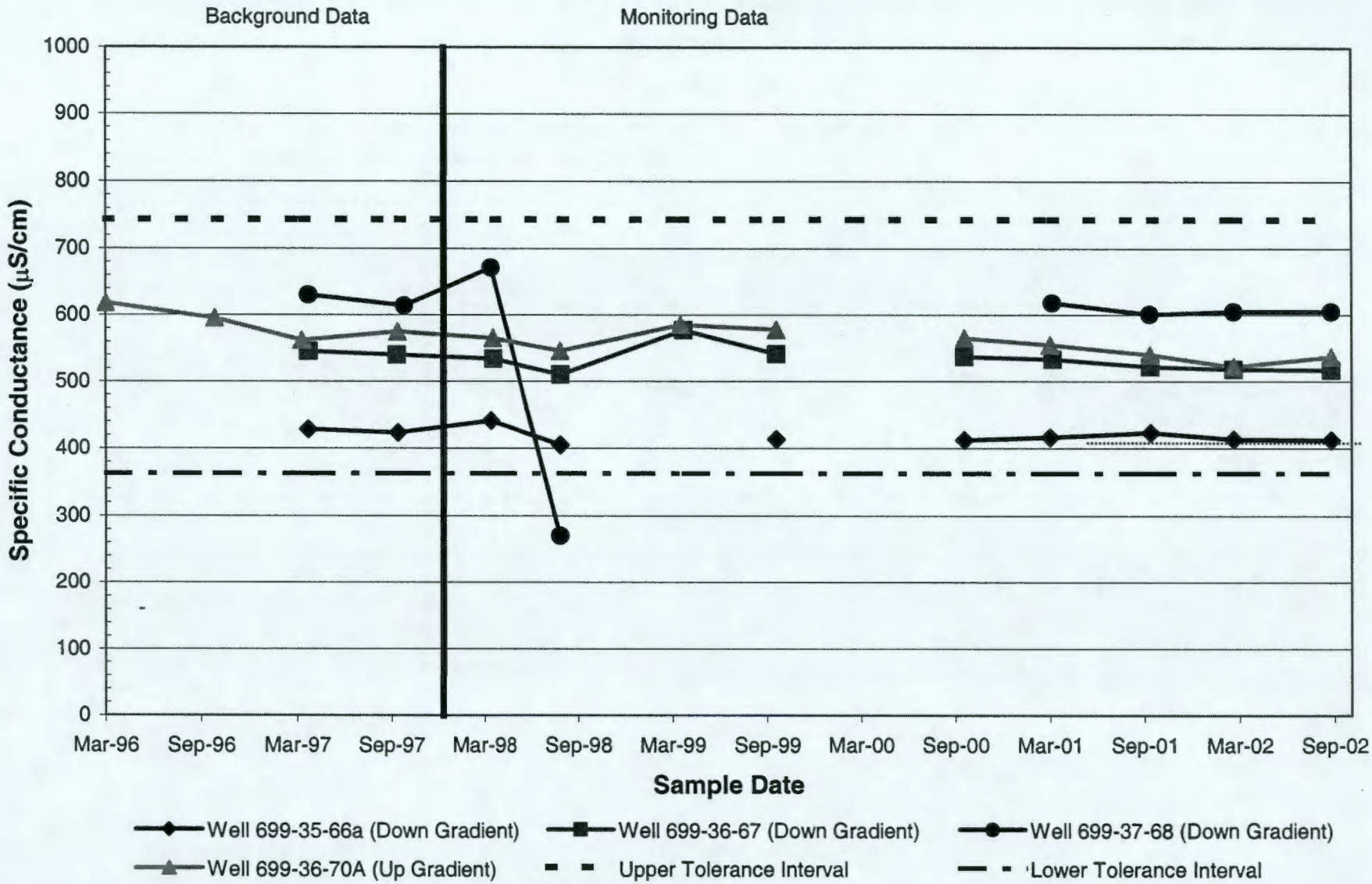
Note: Open markers indicate non-detects at the indicated concentration.

Figure B-25. pH Trends.



Note: Open markers indicate non-detects at the indicated concentration.

Figure B-26. Specific Conductance Trends.



Note: Open markers indicate non-detects at the indicated concentration.

APPENDIX C

LEACHATE SAMPLING RESULTS SUMMARY, 2000-2002

Table C-1. Summary of Leachate Sampling Results, 2000-2002. (2 Pages)

Constituent	Feb-00	Feb-00	May-00	May-00	Aug-00	Aug-00	Dec-00	Dec-00	Jun-01	Jun-01	Dec-01	Dec-01	Jun-02	Jun-02	Dec-02	Dec-02	Units
Aluminum[c]	24.8	63.4	21.3	30.3	41.3	48.5	22.7U	26	NR	NR	NR	NR	NR	NR	35.4	41.4	µg/L
Antimony[c]	2.7	2.8	2.2U	2.2U	2.1U	2.1U	2.3U	2.3U	NR	NR	NR	NR	NR	NR	2.6	2.5	µg/L
Arsenic[a,b]	11.7	13	13.9	12	11.3	9.9	11.3	11	10.7	11.3	46.5U	46.5U	6.9	7.4	9.6	10.2	µg/L
Barium[a,b]	86.5	96.6	95.1	92.2	105	123	97.7	99.4	82.7	86.3	103	95.1	97.1	96.9	94.8	110	µg/L
Calcium[c]	174000	192000	191000	188000	213000	232000	194000	197000	NR	NR	NR	NR	NR	NR	231000	234000	µg/L
Chromium[a,b]	14	13.7	15.2	15.1	15.9	11.5	40.9	25.2	183	19.9	18.9	18.3	20.7	20.5	23.4	21.4	µg/L
Copper[c]	5.9	7	7.6	8	6.6	8.7	9	9.5	NR	NR	NR	NR	NR	NR	10.8	14.5	µg/L
Iron[c]	14.6U	22	10.8U	13	87.5	42	128	44.9	NR	NR	NR	NR	NR	NR	62.8	29.5	µg/L
Lead[a,b]	2.3U	2.3U	2.3U	2.3U	2.1U	2.1U	2.1U	2.1U	2.6U	2.6U	27.8U	27.8U	1.7U	1.7U	2.4U	2.4U	µg/L
Magnesium[c]	56400	62600	60700	60300	57000	63300	57700	58800	NR	NR	NR	NR	NR	NR	63800	72200	µg/L
Nickel[c]	10.1	11	9.9	11.1	7.6	9.4	13.6	12.1	NR	NR	NR	NR	NR	NR	11.9	18.5	µg/L
Potassium[c]	24000	26200	26000J	25600J	17300	17400	23400	23500	NR	NR	NR	NR	NR	NR	17000	19500	µg/L
Selenium[a,b]	4.4U	4.4U	4.5U	4.5U	4.3U	4.3U	3.3U	3.3U	3.6	10.2	50.4U	50.4U	8.3	3.8	14	12.3	µg/L
Silicon[c]	17300J	18700J	18700	18500	18700J	19000J	18500	18400	NR	NR	NR	NR	NR	NR	18700	19100	µg/L
Sodium[c]	308000J	308000J	292000	291000	226000J	248000J	264000J	253000J	NR	NR	NR	NR	NR	NR	260000	302000	µg/L
Tin[a,b]	1.9U	1.9U	3.4U	3.4U	2.1U	2.1U	2.6U	2.6U	3.5U	3.5U	18.8U	18.8U	3.1U	3.1U	3.3U	3.3U	µg/L
Vanadium[a,b]	23.2	24.6	24.5	25.4	21.6	20.4	21.7	21.5	23.7	21.9	14.6	16.1	18.7	18.8	20.4	21.2	µg/L
Zinc[a,b]	10	5.1U	2.2U	12.4	4.5	3.9	2.4	2.9	17.3	8	24.3	10.2	16.9	26.4	2.3	2.2	µg/L
Carbon tetrachloride[a,b]	5U	5U	5U	5UJ	5U	5U	5U	5U	5U	5U	5U	5U	1U	1U	5U	5U	µg/L
Methyl alcohol[c]	6500UJ	6500UJ	6500UR	6500UR	4000J	11000J	5000U	5000U	NR	NR	NR	NR	NR	NR	5000U	5000U	µg/L
Trichlorofluoro-methane[c]	1J	5U	5U	5UJ	6	6	2J	1J	NR	NR	NR	NR	NR	NR	3J	5U	µg/L
pH[a,b]	8.2J	7.3J	7.81J	7.94J	7.7J	7.8J	7.8J	7.8J	7.9	7.88	8	8	8.05	7.97	7.65	7.63	pH
Specific Conductance[a,b]	2620	2590	2570	2560	2400	2490	2360	2430	2170	2180	2780	2750	2360	2460	2590	2600	µS/m
Bromide[a]	12500U	12500U	25000U	25000U	2740J	2500UJ	12500UJ	12500UJ	2500U	2500U	2500U	2500U	10100U	10100U	5050U	5050U	µg/L
Chloride[a,b]	347000	334000	287000	274000	280000J	298000J	303000J	296000J	239000	245000	305000	302000	252000	218000	236000	247000	µg/L
Fluoride[a,b]	2000	1900	2500U	2500U	5000UR	5000UR	5000UJ	5000UJ	5000U	5000U	5000U	5000U	707U	707U	10100U	10100U	µg/L
Nitrate[a]	260000	280000	260000	277000	161000J	190000J	260000J	290000J	238000	240000	271000	252000	347000	329000	347000	367000	µg/L
Nitrite[a]	12000U	12000U	25000U	25000U	2500UR	2500UR	12000UJ	12000UJ	12500U	12500U	25000U	25000U	6640U	6640U	2660U	2660U	µg/L
Sulfate[a,b]	373000	373000	329000	339000	531000J	528000J	369000J	384000J	343000	354000	602000	593000	423000	402000	375000	363000	µg/L
Total Organic Carbon[c]	12600	12700	46000	48100	11800	12000	10800	8000	NR	NR	NR	NR	NR	NR	7240	7330	µg/L
Oil & Grease[c]	2000	2000	2200	2100	1000U	1000U	4800	4700	NR	NR	NR	NR	NR	NR	1080U	1080U	µg/L
Total Dissolved Solids[a,b]	1800000	1800000	1720000	1820000	1640000J	1700000J	1500000J	2000000J	1670000	1650000	2130000	2190000	1960000	1950000	1920000	1920000	µg/L
Total Suspended Solids[c]	12000	23000	5600	5000U	10000J	5000UJ	5000U	5000U	NR	NR	NR	NR	NR	NR	5000U	5000U	µg/L
Gross alpha[a,b]	156	153	156	161	4.87	8.96	47.9J	62.2J	88.6	129	180	178	-4.12U	-1.44U	488	624	pCi/L

Table C-1. Summary of Leachate Sampling Results, 2000-2002. (2 Pages)

Constituent	Feb-00	Feb-00	May-00	May-00	Aug-00	Aug-00	Dec-00	Dec-00	Jun-01	Jun-01	Dec-01	Dec-01	Jun-02	Jun-02	Dec-02	Dec-02	Units
Gross beta[a,b]	367	414	361	368	21.5	30	229	281	330	377	580	505	750	568	1030	1070	pCi/L
Carbon-14[a,b]							-6.76UJ	19.5UJ	0U	23.1U	8.79U	-2.96U	14.4U	11.1U	33.4	27.4	pCi/L
Technetium-99[a,b]							675J	770J	504	488	956	848	1400	1140	1260	1270	pCi/L
Uranium (Total)[a,b]							224	288	212	220	272	260	518	530	1130	517	µg/L
Iodine-129[a,b]									-2.24U	-0.925U	0.273U	0.054U	0.776U	0.338U	-0.904U	0.693U	pCi/L
Total Radium Alpha Emissions[a,b]									-0.077U	-0.105U	0.054U	0.138U	-0.084U	-0.027U	0.017U	0.055U	pCi/L

[a]Analytes determined on twice yearly short list leachate samples.
[b]Routine groundwater sample analytes.
[c]Analytes showed significant detection (>1ppb) on long list analytical suite.
J = Value is an estimate.
NR = not requested
R= Rejected by data validation.
U = non-detect

Table C-2. Leachate Long List Analytes. (2 Pages)

(1-Methylethyl)benzene	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2,2-Tetrachloroethene	1,1,2-Trichloroethane
1,1,2-Trichloroethylene	1,1-Dichloroethane	1,1-Dichloroethene	1,2,2-Trichlorotrifluoroethane (Freon 113)	1,2,4-Trichlorobenzene
1,2-cis-Dichloroethene	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,2-Diphenylhydrazine
1,2-trans-Dichloroethene	1,3-Butadiene	1,3-Dichlorobenzene	1,3-Dichloropropene	1,3-Dinitrobenzene
1,4-Dichlorobenzene	1,4-Dinitrobenzene	1,4-Dioxane	1-Acetyl-2-thiourea	1-Chloroethene (Vinyl Chloride)
2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dichlorphenoxyacetic acid	2,4-Dimethylphenol
2,4-Dinitrophenol	2,5-Diamintoluene	2-Butanone (MEK)	2-Butenaldehyde (Crotonaldehyde)	2-Chloroethyl vinyl ether
2-Chloronaphthalene	2-Chlorophenol	2-Cyclohexyl-4,6-dinitrophenol	2-Methyl-2-propenenitrile (Methacrylonitrile)	2-Methylpropyl alcohol (Isobutyl alcohol)
2-Naphthylamine	2-Propanone (Acetone)	2-Propen-1-ol (Allyl alcohol)	3-Chloropropene (Allyl chloride)	4,4-DDD
4,4-DDE	4,4-DDT	4-Bromophenylphenyl ether	4-Chloro-3-methylphenol	4-Methyl-2-pentanone (MIBK)
4-Nitrophenol	7,12-Dimethylbenz[a] anthracene	Acenaphthene	Acetic acid ethyl ester (Ethyl acetate)	Acetic acid vinyl ester (Vinyl acetate)
Acetonitrile	Acetophenone	Acrolein	Acrylonitrile	Aldrin
alpha-BHC	alpha-Naphthylamine	Aluminum	Americium-241	Ammonia
Aniline	Anthracene	Antimony	Arsenic	Barium
Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
Benzyl alcohol	Beryllium	beta-BHC	Bis(2-Chloroethoxy)methane	Bis(2-chloroethyl) ether
Bis(2-Chloroisopropyl) ether	Bis(2-ethylhexyl) phthalate	Bromide	Bromodichloromethane	Bromomethane
Butylbenzylphthalate	Cadmium	Calcium	Carbon disulfide	Carbon tetrachloride
Carbon-14	Cesium-137	Chloride	Chlorobenzene	Chloroethane
Chloroform	Chloromethane	Chromium	Chrysene	cis-1,3-Dichloropropene
Cobalt	Cobalt-60	Copper	Cresols, total	Dibenz[a,h]anthracene
Dibromochloromethane	Dichlorobenzene	Dichlorodifluoromethane	Dichloromethane (Methylene Chloride)	Dichloroproponol
Dieldrin	Diethyl phthalate	Dimethyl phthalate	Di-n-butylphthalate	Dinitrobenzene
Di-n-octylphthalate	Endrin	Ethyl benzene	Ethyl ether	Ethyl methanesulfonate
Ethylene dibromide	Europium-152	Europium-154	Europium-155	Fluoranthene

Table C-2. Leachate Long List Analytes. (2 Pages)

Fluorene	Fluoride	Gamma-BHC (lindane)	Gross alpha	Gross beta
Heptachlor	Heptachlor Epoxide	Hexachlorobutadiene	Hexachloroethane	Hexachlorophene
Indeno(1,2,3-cd)pyrene	Iodine-129	Isophorone	Lead	Magnesium
Manganese	m-Cresol	Mercury	Methyl alcohol	N,N-Diphenylamine
Naphthalene	n-Butyl alcohol	Nickel	Nitrate	Nitrite
Nitrobenzene	N-Nitroso-di-n-propylamine	N-Nitrosodiphenylamine	N-Nitrosomorpholine	N-Nitroso-N,N-dimethylamine
O,O,O-Triethyl phosphorothioate	o-Cresol	Oil & Grease	PCB-1016	PCB-1221
PCB-1232	PCB-1242	PCB-1248	PCB-1254	PCB-1260
p-Cresol	Pentachlorophenol	Phenol	Phosphate	Polychlorinated biphenyls (PCBs)
Potassium	Potassium-40	p-Phenylenediamine	Pyrene	Pyridine
Radium-226	Radium-228	Selenium	Silicon	Silver
Sodium	Styrene	Sulfate	Technetium-99	Thallium
Thorium-228	Thorium-232	Tin	Toluene	Total Dissolved Solids
Total Organic Carbon	Total Radium Alpha Emissions	Total Suspended Solids	Toxaphene	trans-1,3-Dichloropropene
Tribromomethane (Bromoform)	Trichlorofluoromethane	Trichloromethanetiol	Uranium (Total)	Uranium-235
Uranium-238	Vanadium	Xylene	Zinc	

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