



Environmental Protection Department
Operations and Regulatory Affairs Division

LLNL Experimental Test Site 300

**Compliance Monitoring Report for
Waste Discharge Requirements 96-248**

*Annual/Fourth Quarter Report
2004*

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List of Abbreviations and Acronyms

BOD	biochemical oxygen demand
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
COC	constituent of concern
CVRWQCB	Central Valley Regional Water Quality Control Board
DMSO	dimethyl sulfoxide
DO	dissolved oxygen
DSWP	sewage percolation pond influent sampling location
EC	electrical conductivity or specific conductance
est	estimated (concentration)
ESWP	sampling location within sewage evaporation pond
HDPE	high-density polyethylene
HMX	octahydro-1, 3, 5, 7-tetranitro-1, 3, 5, 7-tetrazocine (also cyclo-tetramethylene-tetranitramine)
HPLC	high-performance liquid chromatography
ISWP	sewage pond influent sampling location
LCRS	leachate collection and removal system
LCS	laboratory control sample
LLNL	Lawrence Livermore National Laboratory
m	meters
MDL	method detection limit
MPN	most probable number (of bacteria)
MRP	Monitoring and Reporting Program
MS	matrix spike
MSD	matrix spike duplicate
NA	not applicable
NAFL	not available from laboratory
ND	not detected
NL	no limit

List of Abbreviations and Acronyms (concluded)

NR	analysis not required by permit
NS	not sampled
PCE	tetrachloroethene (tetrachloroethylene, perchloroethylene)
PETN	pentaerythritol tetranitrate
QA	quality assurance
Qal	Quaternary Age alluvium
QC	quality control
RDX	hexahydro-1, 3, 5-trinitro-1, 3, 5-triazine (also cyclo-1, 3, 5-trimethylene 2, 4, 6-trinitramine)
RL	reporting limit
SL	statistical test limit
STLC	soluble threshold limit concentration
SVOC	semivolatile organic compound
TATB	2, 4, 6-trinitro-1, 3, 5-benzenetriamine
TCE	trichloroethene (trichloroethylene)
TIC	tentatively identified compound
Tnbs ₁	Tertiary Age, Neroly Formation Lower Blue Sandstone (the regional aquifer)
Tnbs ₂	Tertiary Age, Neroly Formation Upper Blue Sandstone
Tnsc ₁	Tertiary Age, Neroly Formation Lower Siltstone/Claystone
TNT	2, 4, 6-trinitrotoluene (also 2-methyl-1, 3, 5-trinitrobenzene)
VOC	volatile organic compound
WDR	Waste Discharge Requirements (Permit)

Executive Summary

This report contains the elements required by Waste Discharge Requirements (WDR) 96-248 (Permit) for Site 300 for the combined 2004 fourth quarter and annual report. This is the ninth annual report prepared under this Permit. Compliance monitoring networks discussed in the report include:

- Process wastewater discharged into the Class II surface water impoundments (surface impoundment) (**Section 2.2**)
- Leak detection monitoring (including leachate collection and removal system monitoring, and ground water monitoring) for the surface impoundments (**Section 2.3**)
- Wastewater monitoring for the sewage evaporation and percolation ponds (**Section 3.2**)
- Ground water monitoring for the sewage evaporation and percolation ponds (**Section 3.3**)
- Observations at the percolation pits (**Section 4.0**).

The annual report elements are incorporated into this annual/fourth quarter report. Brief narrative summaries of each compliance network lead each section. These narrative summaries discuss compliance and significant incidents that occurred during 2004. Annual summaries of monitoring data are presented in graphical and tabular form in **Appendices A, B, C, and D**. Methods used to determine statistical test limits (SLs) for ground water constituents of concern (COCs) are summarized in **Appendix E**. Fourth quarter quality assurance and quality control (QA/QC) data are summarized in **Appendix F**.

All discharges into the surface impoundments were in compliance with the Permit during 2004.

The following damage to the surface impoundment's high-density polyethylene (HDPE) liner was reported during 2004. The event was reported to Susan Timm of the Central Valley Regional Water Quality Control Board (CVRWQCB) in a phone call on October 14, 2004:

- On October 13, a split in the HDPE liner of the upper surface impoundment was discovered. The split was approximately 6 to 8 inches long and more than three feet above the water line. Several other weak places, or striations, in the liner were noted at the same time. During an inspection on October 25, the damaged areas were observed by Susan Timm of the CVRWQCB. Repairs to all of those locations were completed on November 30, 2004.

LLNL does not expect this occurrence to adversely impact either surface or ground water at Site 300 since the cracks are located above the freeboard line and are unlikely to have contacted wastewater contained in the surface impoundment.

No liquids were discovered in the leachate collection and removal systems (LCRS) during weekly monitoring.

Required ground water monitoring parameters for the surface impoundments were below the specified SLs throughout 2004, except as identified in **Table 1**.

Table 1. COC concentrations exceeding their SLs in 2004.

COC exceeding SL (confirmed by retest)	Down gradient Wells		
	W-817-02	W-817-03	W-817-04
Ammonia	Did not exceed SL	4 th quarter ^a (1/27/2005) ^b	Did not exceed SL
Bicarbonate alkalinity	Did not exceed SL	Did not exceed SL	1 st , 2 nd , 3 rd quarter (7/2/2001) ^b
Bis(2-ethylhexyl) phthalate	3 rd quarter (10/20/2004) ^b	Did not exceed SL	Did not exceed SL

^a Ammonia was also detected in the method blank sample. See **Appendix F**.

^b Date of original letter report to the CVRWQCB.

Because sporadic detections of ammonia had occurred in ground water samples collected from up gradient well W-817-01 and from the three down gradient wells since 2001, LLNL had proposed a new SL of 0.080 mg/L for the down gradient monitor wells in 2002 (Brown 2002). The Regional Board has not yet acted to incorporate the SLs LLNL proposed in 2002. Concentrations of ammonia have remained below that proposed SL, except for occasional spikes.

Concentrations of bicarbonate alkalinity have been observed sporadically above the SL of 277 mg/L in down gradient monitor well W-817-04 since the second quarter of 2001. The concentrations of bicarbonate alkalinity are consistent with the SL that LLNL proposed in 2002 (Brown 2002) and remain below that SL.

Sporadic detections of the plasticizer compound bis(2-ethylhexyl)phthalate have occurred since 2000. Since the compound is a common laboratory contaminant, most of the detections have been accompanied by detections in method blank samples, and sometimes, in the ground water samples from the up gradient monitor well W-817-01. In the third quarter, bis(2-ethylhexyl)phthalate was detected in the ground water sample from the up gradient monitor well W-817-01, and is unlikely to have originated from the surface impoundments.

Monitoring data indicated compliance with the limits for the ground water and wastewater at the sewage evaporation and percolation ponds. None of the permitted mechanical equipment percolation pits overflowed during 2004.

1.0 Introduction

This report satisfies the Site 300 Experimental Test Site (Site 300) 2004 fourth quarter and annual monitoring and reporting requirements of the Central Valley Regional Water Quality Control Board's (CVRWQCB's) Waste Discharge Requirements 96-248 (the Permit). It details the results of compliance monitoring networks in the Explosives Process Area and the General Services Area and visual observations at a third percolation pit system at Site 300.

The High Explosive Process Area compliance network analyzes samples of ground water beneath, and process wastewater influent discharged into, two connected Class II surface impoundments where the process wastewater is evaporated. The General Services Area network analyzes samples of ground water beneath, and wastewater discharged into, the sewage evaporation and percolation ponds (sewage ponds) where sanitary waste is treated. The percolation pit network entails visual monitoring of five percolation pits that receive mechanical equipment wastewater.

Site 300, operated by LLNL, is located in the Altamont Hills approximately 13 kilometers (8 miles) southwest of the city of Tracy, California. **Figure 1** shows the locations of the surface impoundments within the Explosives Process Area and of the sewage ponds in the General Services Area of Site 300.

2.0 Class II Surface Water Impoundments

2.1 Compliance Monitoring Program

The Monitoring and Reporting Program in the Permit as modified in 1998 (MRP 96-248, Revision 1) specifies the required environmental monitoring for operation of the surface impoundments (Cohen 1998). These specifications include monitoring of process wastewater discharges to the surface impoundments and leak detection systems.

Process wastewater discharged to the surface impoundments is monitored for constituents found (or likely to be found) in materials used in operations conducted at buildings discharging to the surface impoundments. The monitoring program includes collecting and analyzing samples from: photographic process rinsewater from Buildings 801, 823, and 851 (**Tables A-1.1, A-1.2, and A-1.3**); Chemistry wastewater from Buildings 825, 826, and the Building 827 Complex (827A, 827C/D, and 827E) (**Tables A-2.1 through A-2.4**); and Explosives Process wastewater from Buildings 806/807, 809, and 817 (**Tables A-3.1, and A-3.2**). Discharges to the surface impoundments from Buildings 801 and 851 were discontinued after the first quarter of 2004; photographic rinsewater from those processes is now evaporated.

Leak detection system monitoring includes monitoring of the leachate collection and removal systems (LCRSs) and ground water. LCRSs installed between the clay liners of the surface impoundments are inspected weekly for the presence of moisture that might indicate a leak in the HDPE liner. Ground water samples are collected quarterly from monitor wells located up gradient and down gradient of the surface impoundments (**Figure 2**).

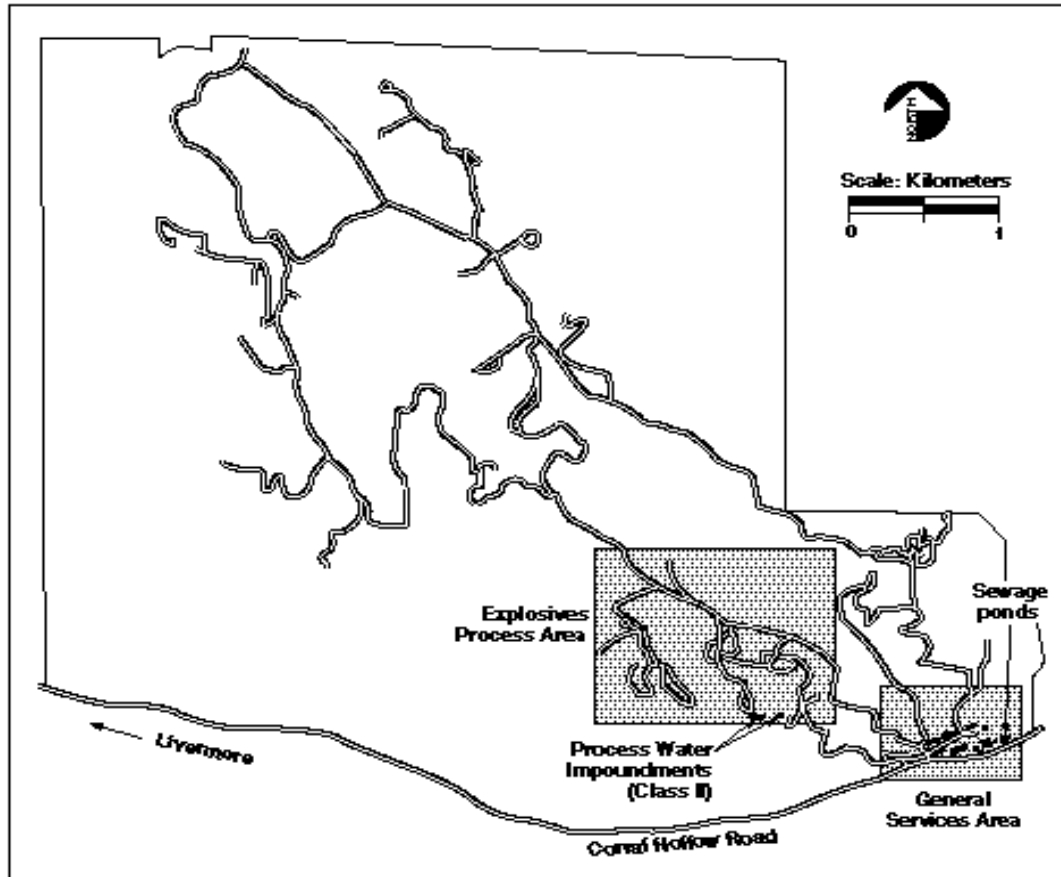


Figure 1. Location of Class II surface water impoundments and sewage evaporation and percolation ponds.

Ground water analytical results are compared with statistical test limits (SLs) to identify statistical evidence of a release of chemicals into the ground water from the surface impoundments.

The four ground water monitor wells are screened in the Tertiary Age, Neroly Formation Upper Blue Sandstone (Tnbs₂). The direction of ground water flow is approximately southeasterly. Monitor well W-817-01 is hydrologically up gradient of the surface impoundments, and monitor wells W-817-02, W-817-03, and W-817-04 are down gradient. LLNL collects ground water samples quarterly from these monitor wells and analyzes them for the COCs specified in MRP 96-248, Revision 1 (Cohen 1998).

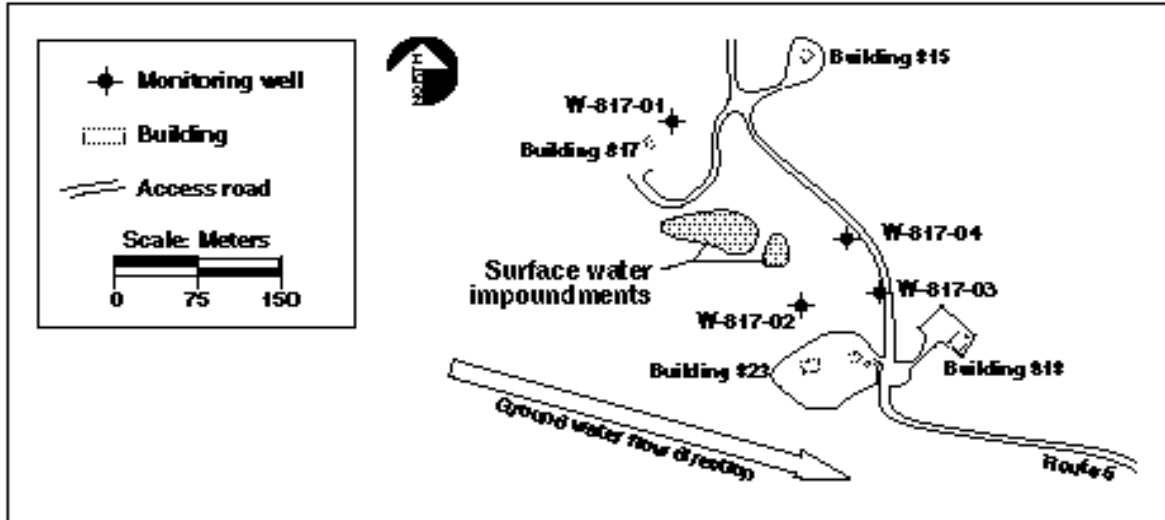


Figure 2. Site 300 Explosives Process Area ground water compliance monitoring locations.

2.2 Process Wastewater Monitoring Network

Data discussed in this section are provided in tabular form in **Appendix A (Tables A-1.1 through A-3.2)** for all 2004 data. A discussion of the process wastewater quality assurance/quality control (QA/QC) data is provided in **Appendix F** along with the associated field/method blank QA/QC data tables for the fourth quarter data (**Tables F-1.1 and F-1.2**).

2.2.1 Photographic Process Rinsewater Discharges

LLNL samples all discharges from photographic process rinsewater retention tanks at Buildings 801 and 851. Once samples are collected, the tank contents are immediately discharged to the surface impoundments. Analytical results are used to confirm that the discharges are consistent with the effluent limits specified in the Permit. Photographic process rinsewater from the Building 823 retention tank discharges automatically to the surface impoundments. Because of pump problems in the past, LLNL has switched to manual operation of the pump. This waste stream is sampled once each quarter to verify that discharges are consistent with the effluent limits specified in the Permit.

All discharges into the Class II surface impoundments were in compliance with the effluent limits during 2004. Metals concentrations in all process rinsewater discharges sampled from retention tanks were in compliance with the Permit's effluent limits during 2004. Historical data for the COCs are plotted in **Appendix A**, and the 2004 analytical results are tabulated in **Tables A-1.1, A-1.2, and A-1.3**.

During 2004, one discharge from Building 801 was sampled in the first quarter (**Table A-1.1**); each of four discharges from Building 823 were sampled in the first, second, third, and fourth quarters (**Table A-1.2**); and one discharge from Building 851 was sampled in the first quarter (**Table A-1.3**).

2.2.2 Chemistry Area Wastewater Discharges

Process wastewater generated from the Chemistry Area (Buildings 825, 826, and the Building 827 Complex) is held in retention tanks until evaluation of the analytical results from the samples collected indicates compliance with the Permit's effluent limits. Data are reported for the quarter when the discharge to the surface impoundments occurs, although wastewater samples may actually be collected in an earlier quarter.

Constituent concentrations in all process wastewater discharges that occurred during 2004 from the Building 827 Complex were in compliance with the effluent limits. No discharges occurred from the retention tanks at Buildings 825, 826, or 827A during the year. Analytical results for the Chemistry Area wastewater samples including COCs and additional analytes are presented in **Tables A-2.1** through **A-2.4**. Historical data plots are included in **Appendix A**.

2.2.3 Explosives Process Area Wastewater Discharges

Wastewater generated from the Explosives Process Area (Buildings 806/807, 809, and 817) is sampled annually in accordance with MRP 96-248, Revision 1 (Cohen 1998).

The concentrations of COCs in process wastewater discharges sampled during 2004 from the Explosives Process Area were in compliance with the effluent limits. Process discharges associated with Buildings 806/807 were sampled once during the third quarter, and discharges associated with Building 817 were also sampled once during the third quarter. There were no discharges associated with Building 809; there have been no processes operating at Building 809 since construction activities began there in May 2001. Although construction has been completed, Building 809 will be offline until the final certification for the new isostatic press and ovens is complete. Annual analytical results of Explosives Process Area wastewater discharge samples are presented in **Tables A-3.1** and **A-3.2**. Historical data plots are included in **Appendix A**.

2.3 Leak Detection Monitoring Network

On October 13, a split in the HDPE liner of the upper surface impoundment was discovered. The split was approximately 6 to 8 inches long and more than three feet above the present water line. Several other weak places, or striations, in the liner were noted at the same time. Repairs to all of those locations were completed November 30, 2004.

2.3.1 Leachate Collection and Removal Systems Monitoring

The two LCRSs were monitored weekly for the presence of liquids that would indicate a leak in a surface impoundment liner. No liquid was discovered in this system during 2004.

2.3.2 Ground Water Monitoring

In 2004, three COCs (ammonia in samples from well W-817-03 during the fourth quarter; bicarbonate alkalinity in samples from well W-817-04 during the first, second, and third quarters; and bis(2-ethylhexyl)phthalate in samples from well W-817-02 during the third quarter) exceeded the respective SLs. Although concentrations exceeding the SLs were

confirmed by at least one retest sample from each well, LLNL does not believe these elevated concentrations of any COC (**Table B-1.1**) originated from the surface impoundments.

Table B-1.2 lists all ground water analytical results, including retest sample results, for the fourth quarter of 2004 for COCs under MRP 96-248, Revision 1 (Cohen 1998). Analytical results from other parameters analyzed in water samples from these wells, which are not required by MRP 96-248, Revision 1, but are part of the analytical laboratory suites, are listed in **Table B-2.1**. **Appendix E** provides a brief description of all statistical methods used to evaluate compliance with the limits established in MRP 96-248, Revision 1 (Cohen 1998). A discussion of the fourth quarter ground water QA/QC data is provided in **Appendix F**, along with the field QA/QC data tables (**Tables F-2.1** and **F-2.2**).

The concentrations of ammonia analyzed in ground water samples collected on October 29 and November 1, 2004, were 0.05 mg/L from down gradient well W-817-02, 0.06 mg/L from down gradient well W-817-03, and 0.07 mg/L from down gradient well W-817-04. All of these concentrations exceeded the SL of 0.02 mg/L (**Tables B-1.1** and **B-1.2**). This exceedance was confirmed by results of the retest samples collected from well W-817-03 only on December 2, 2004, and the statistically significant evidence was reported to the CVRWQCB (Raber 2005). No concentration of ammonia analyzed in any of those wells exceeded the SL of 0.080 mg/L proposed by LLNL in 2002 (Brown 2002). See also **Table F-2.1** and **Appendix F** for a discussion of ammonia detected in the field blank sample and how that might bias these results.

Concentrations of bicarbonate alkalinity were confirmed as exceeding the current SL of 277 mg/L in samples collected from down gradient well W-817-04 during first, second, and third quarter monitoring (**Table B-1.1**) and were previously reported to the CVRWQCB at the end of the second quarter of 2001 (Raber 2001). Although the concentrations of bicarbonates from well W-817-04 exceed the current SL, they remain lower than the SL of 305 mg/L that LLNL proposed for that well in 2002 (Brown 2002).

Concentrations of the plasticizer compound bis(2-ethylhexyl)phthalate in ground water samples collected from down gradient well W-817-02 in the third quarter were confirmed as exceeding the SL of 5 $\mu\text{g/L}$. Although this statistical exceedance was reported to the CVRWQCB (Raber 2004) according to the Permit, LLNL does not believe this compound originated from the surface impoundments. This common laboratory contaminant was also detected, at an estimated concentration $<5 \mu\text{g/L}$, in the up gradient well W-817-01 in the third quarter (**Table B-1.1** and **Brown 2004**).

The energetic compound pentaerythritol tetranitrate (PETN) was detected the first time ever in ground water samples collected from down gradient monitor well W-817-02 in the second and third quarters (2.69 $\mu\text{g/L}$ and 15.4 $\mu\text{g/L}$, respectively). Although this statistical exceedance was reported to the CVRWQCB (Raber 2004) according to the Permit, these statistical exceedances were not confirmed by retest samples. Likewise, concentrations of the energetic compounds hexahydro-1, 3, 5-trinitro-1, 3, 5-triazine (RDX) and 4-amino-2,6-dinitrotoluene exceeded the SLs in samples from one or more

down gradient monitor wells during the third quarter and were reported to the CVRWQCB (Raber 2004), but the concentrations of these compounds were not confirmed as exceeding their SLs.

Plots of all COC data over time and tabular annual summaries of the ground water analytical data are included in **Appendix B**.

3.0 Sewage Evaporation and Percolation Ponds

3.1 Compliance Monitoring Program

Monitoring at the sewage evaporation pond (evaporation pond) and the sewage percolation pond (percolation pond) (**Figure 3**) is also specified in the MRP 96-248, Revision 1 (Cohen 1998). Applicable reporting requirements are detailed in the Permit (CVRWQCB 1996).

Quarterly samples of wastewater flowing into the evaporation pond are collected for analysis from a location west of the pond (sampling location ISWP in **Figure 3**). ISWP is a manhole that captures all waste streams before they flow into the pond. The samples are analyzed for electrical conductivity (EC), pH, and biochemical oxygen demand (BOD).

Quarterly wastewater samples are collected from the evaporation pond (sampling location ESWP) and analyzed for pH, EC, and dissolved oxygen (DO). Observations of the pond are made at least monthly for freeboard, color, odor, and levee condition. Any discharge from the evaporation pond to the percolation pond (sampling location DSWP) is sampled and analyzed for BOD, EC, total and fecal coliform, and pH.

Leak detection monitoring at the sewage ponds is accomplished by monitoring the shallow ground water, including the regional aquifer (Tnbs₁) beneath and adjacent to the ponds. Ground water monitoring includes semiannual sampling and analysis of the collected samples. **Table 2** lists each monitor well; and whether it is up gradient, down gradient, or cross gradient of the sewage ponds; and the geological interval(s) over which it is screened. **Figure 3** shows the location of each of the wells.

Table 2. Monitor well location relative to sewage ponds and aquifer monitored.

Monitor well	Location	Screening interval
W-7E	Up gradient	Tnsc ₁ /Tnbs ₁
W-7ES	Up gradient	Qal/Tnsc ₁
W-7PS	Up gradient	Qal
W-35A-04	Cross gradient	Qal
W-26R-01	Down gradient	Tnbs ₁
W-26R-11	Down gradient	Qal
W-26R-05	Down gradient	Qal/Tnbs ₁
W-25N-20	Down gradient	Qal/Tnbs ₁
W-7DS	Down gradient	Qal/Tnbs ₁

Note: Tnbs₁ is the regional aquifer.

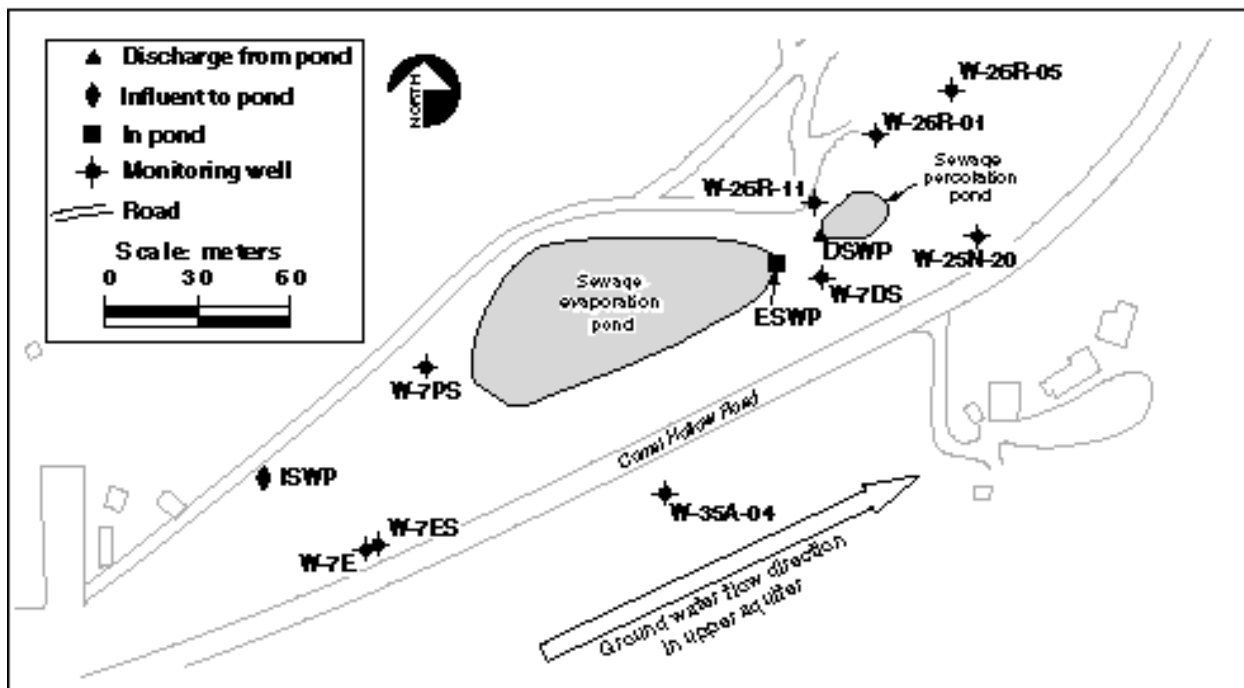


Figure 3. Site 300 sewage pond ground water and surface water compliance monitoring locations

3.2 Wastewater Monitoring

All required wastewater monitoring parameters for the sewage ponds were in compliance with the Permit’s provisions and specifications throughout 2004. Continuous discharge occurred during the first quarter (**Table C-4**) from the evaporation pond to the percolation pond (Brown 2004a). Historical plots and tabular summaries of the 2004 data are included in **Appendix C**.

3.3 Ground Water Monitoring

All required monitoring parameters for the sewage pond ground water network were in compliance with specified ground water receiving limits throughout 2004. Semiannual ground water samples were collected and analyzed during the first and third quarters of

2004. Historical data plots and tabular annual summaries of the analytical data are included in **Appendix D**.

4.0 Percolation Pits

MRP 96-248, Revision 1, requires monthly inspections of the percolation pits at Buildings 806A, 827A, 827C, 827D, and 827E. Sampling and analysis for metals is required whenever an overflow occurs.

During 2004, the percolation pits at Buildings 806A, 827A, 827C, 827D, and 827E operated normally, and no overflows occurred. The percolation pits at both Buildings 827C and 827D contained standing water throughout the fourth quarter.

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Appendix A

Annual Summary Plots and Tables of Surface Impoundments Process Water Monitoring Data

Appendix A

This appendix contains graphical and tabular summaries of the 2004 surface water impoundments influent monitoring. The monitoring requirements of WDR 96-248 began in the fourth quarter of 1996.

Wastewater influent monitoring includes photographic process water from Buildings 801, 823, and 851; the Chemistry Area (Buildings 825, 826, and 827 Complex); and discharges from the Explosives Process Area (Buildings 806, 807, 809, and 817).

Retention tank designations for the photographic process and Chemistry Areas are as follows: 801-R3O1 (old), 801-R3O2 (new), 823-R1U1, 851-R1A1 (photographic process area); and 825-R1A1, 826-R1A1, 827A-R1A1, 827C-R1A1, and 827A-R2A1 (Chemistry Area). Process discharges from the Explosives Process Area are generated from Buildings 806/807 and 817 and are designated as B806/807 and B817, respectively. The plots contain all monitoring data available since LLNL began storing sample results from these retention tanks in 1992. There are no 2004 data for B809 because there have been no operations there since May 2001.

The plots display the pH parameter and concentrations of trace metals, volatile organic compounds, and semi-volatile organic compounds in wastewater influent to the surface water impoundments. The plots begin with the retention tank associated with the lowest building number for each detected analyte always plotted first. Only analytes detected in each retention tank are plotted.

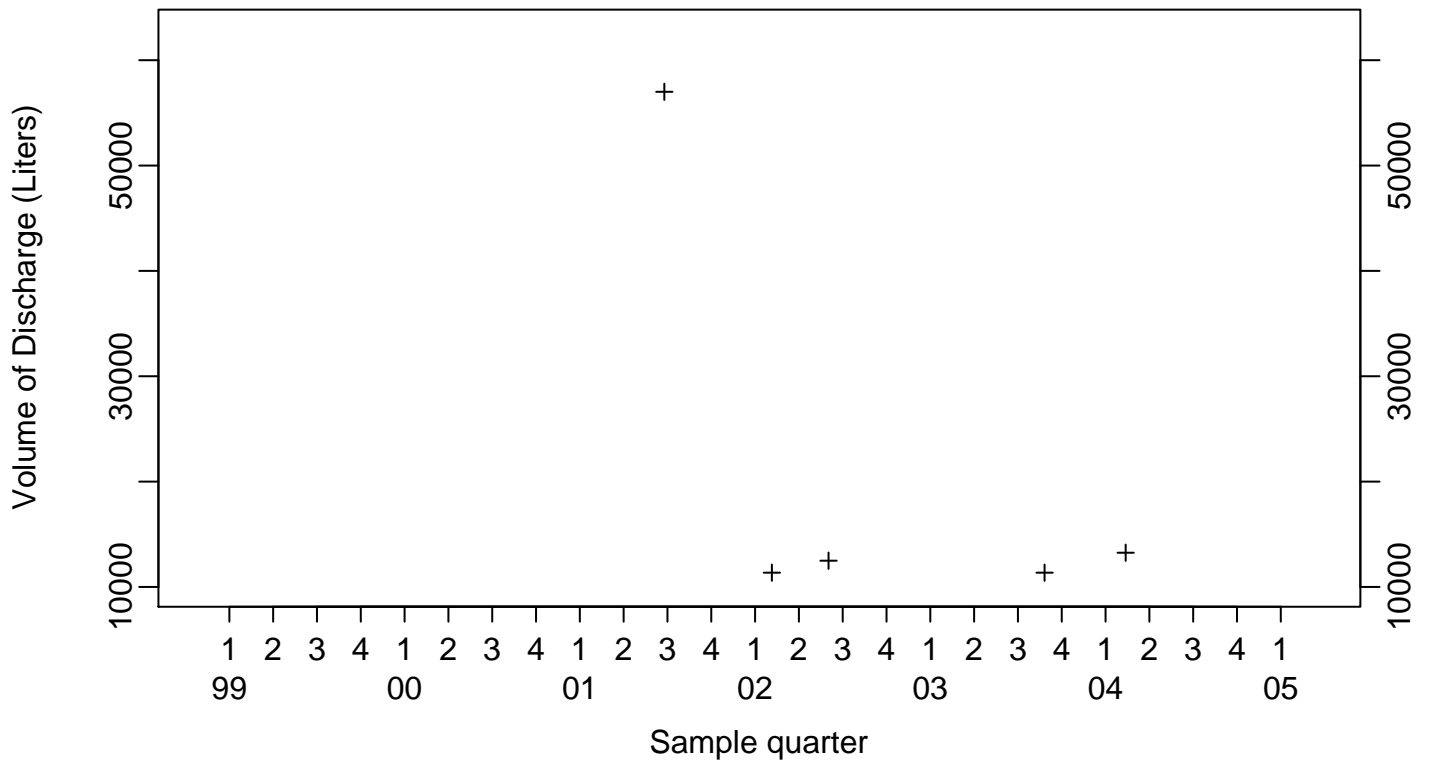
Each two-dimensional graph plots concentration on the vertical axis versus time (years divided into four quarterly sampling periods) on the horizontal axis. Units of measure are given on the vertical axis label and in the header at the top of each page. Values above the analytical reporting limit for each analyte are plotted as solid diamonds, values below the reporting limit are plotted as open inverted triangles, and the estimated values between the reporting limit and method detection limit are plotted as crosses.

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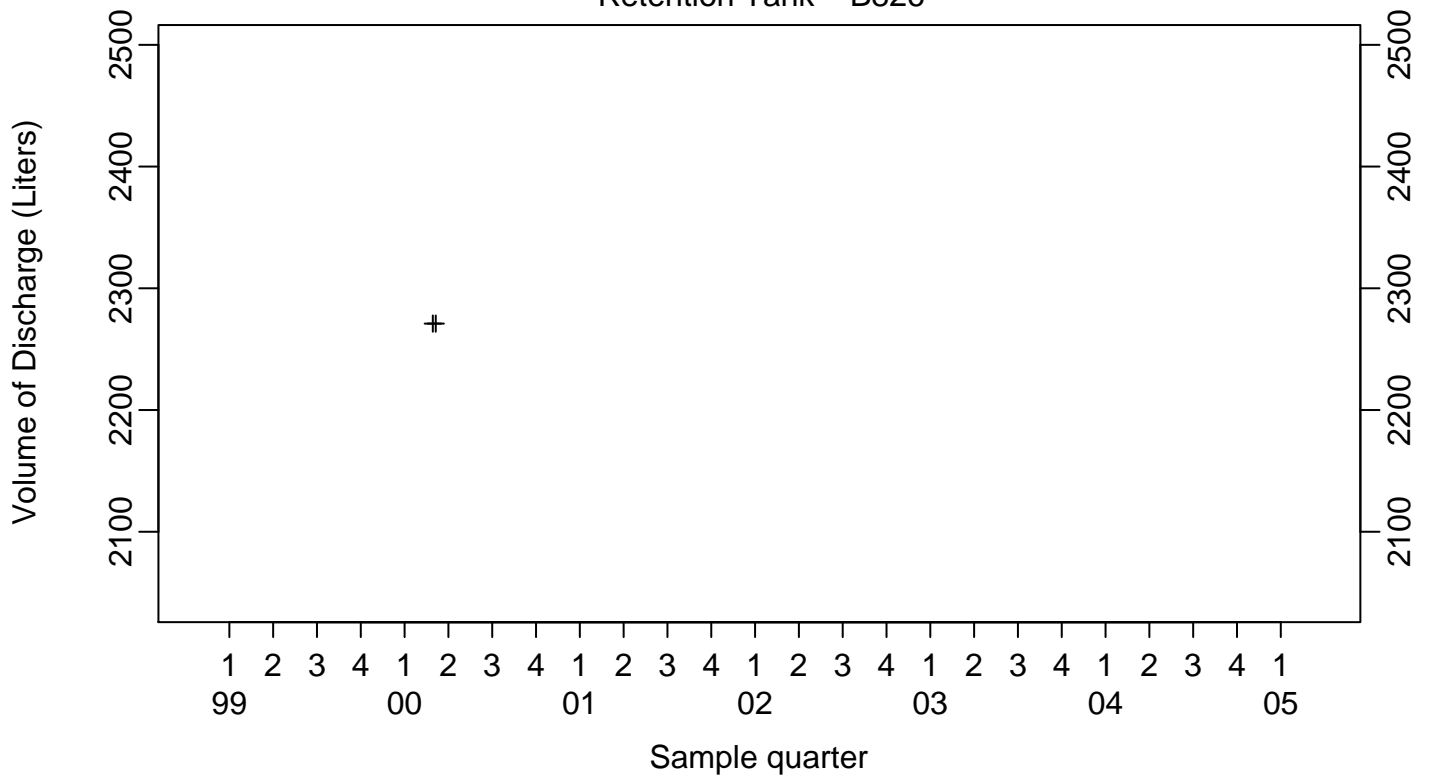
Annual Plots of Surface Impoundments Process Water Monitoring Data

Surface Impoundments Process Water Volume of Discharge (Liters)

Retention Tank B801

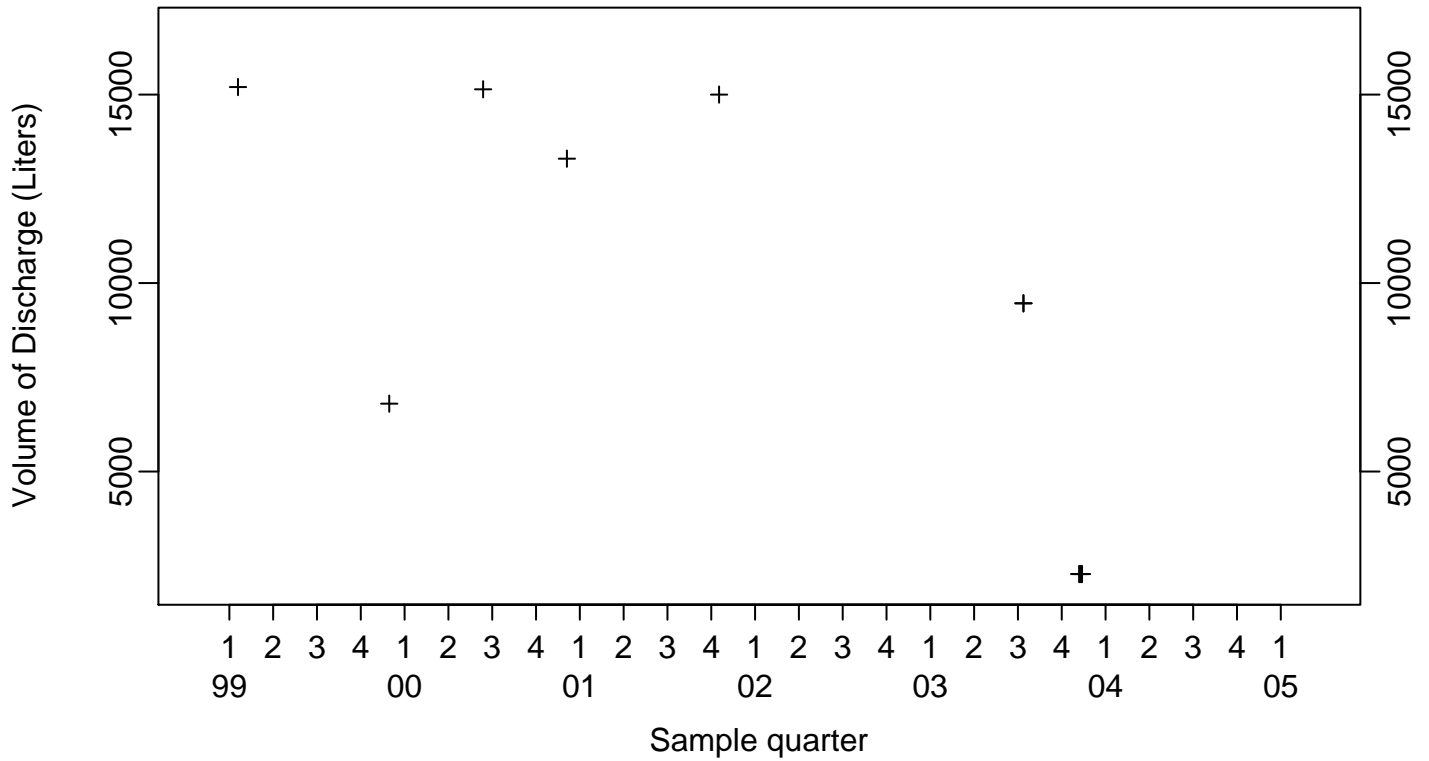


Retention Tank B826

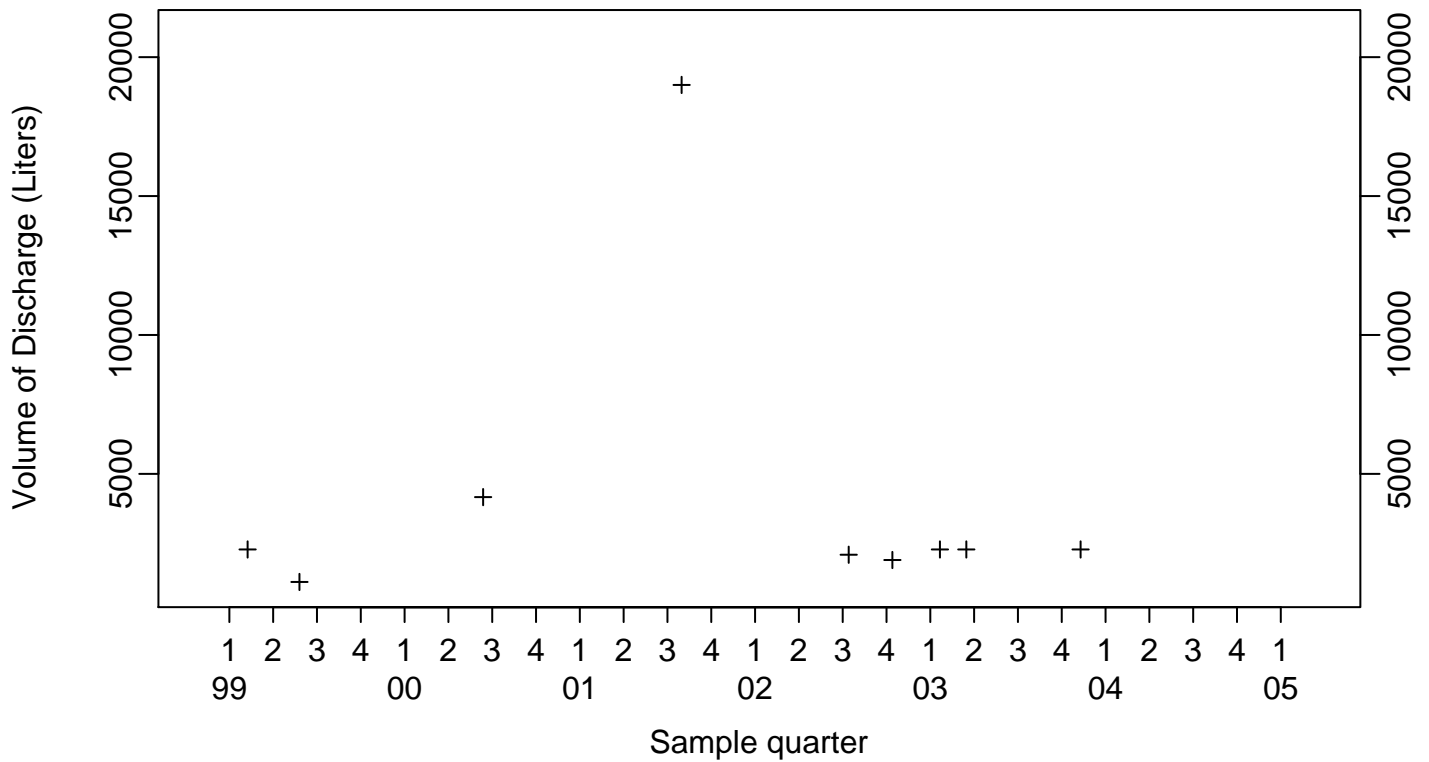


Surface Impoundments Process Water Volume of Discharge (Liters)

Retention Tank B827C/D



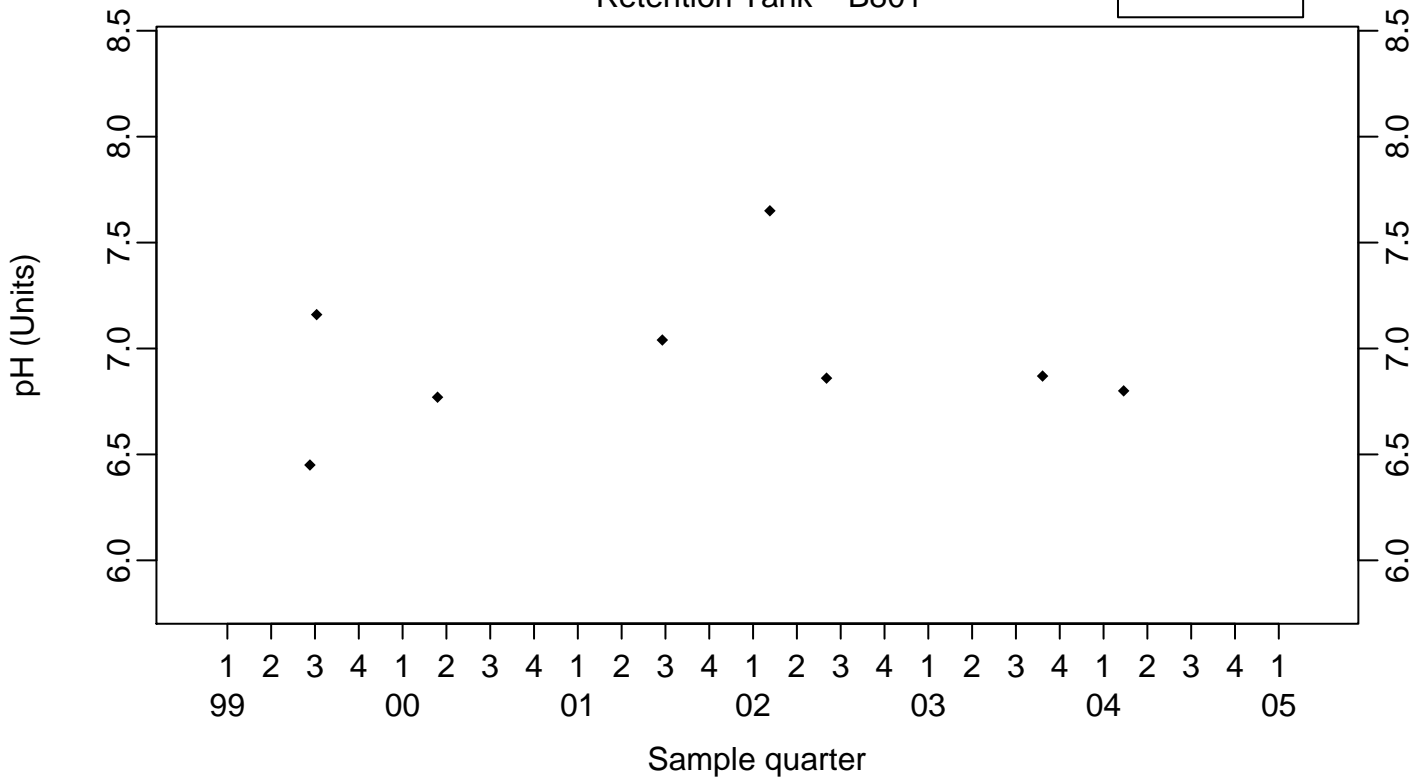
Retention Tank B827E



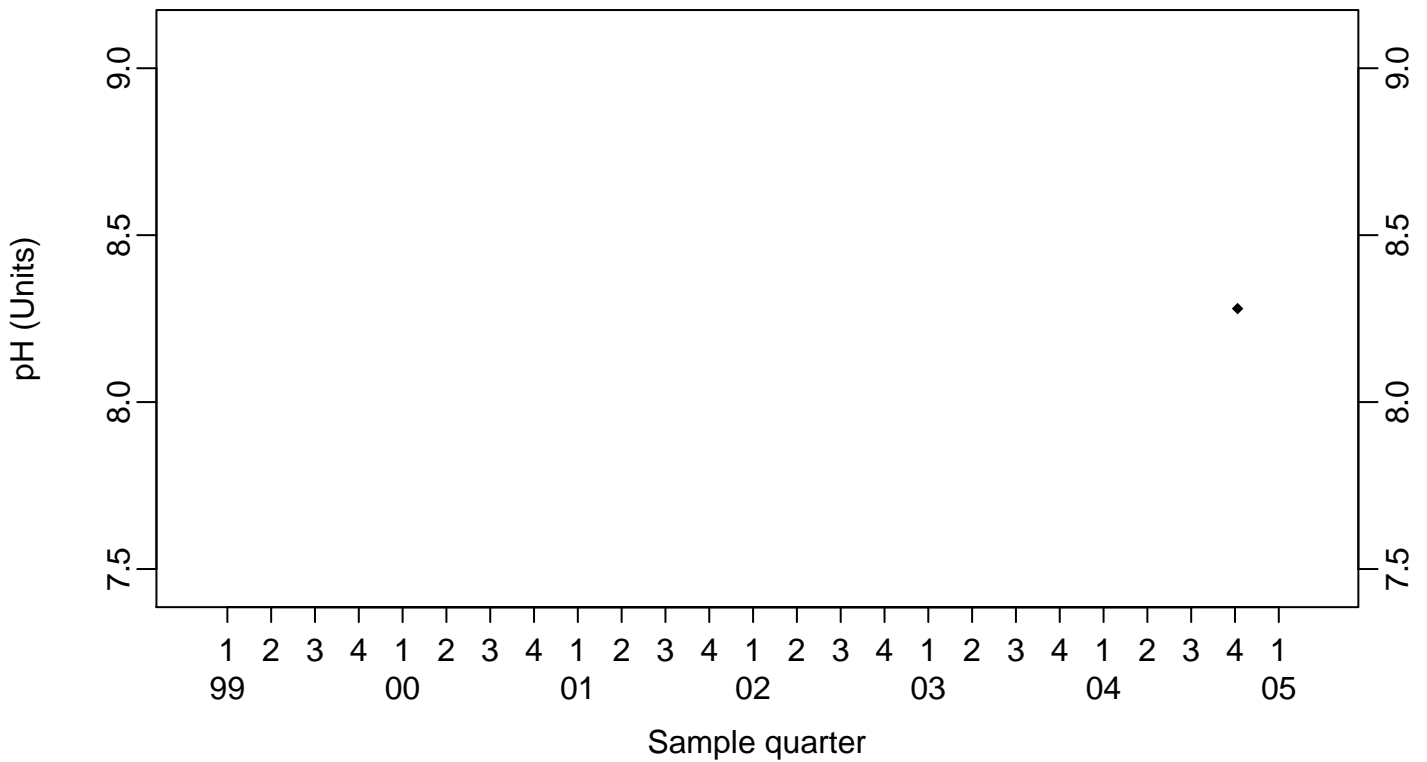
Surface Impoundments Process Water pH (Units)

Retention Tank B801

◆ Above RL
▽ Below RL



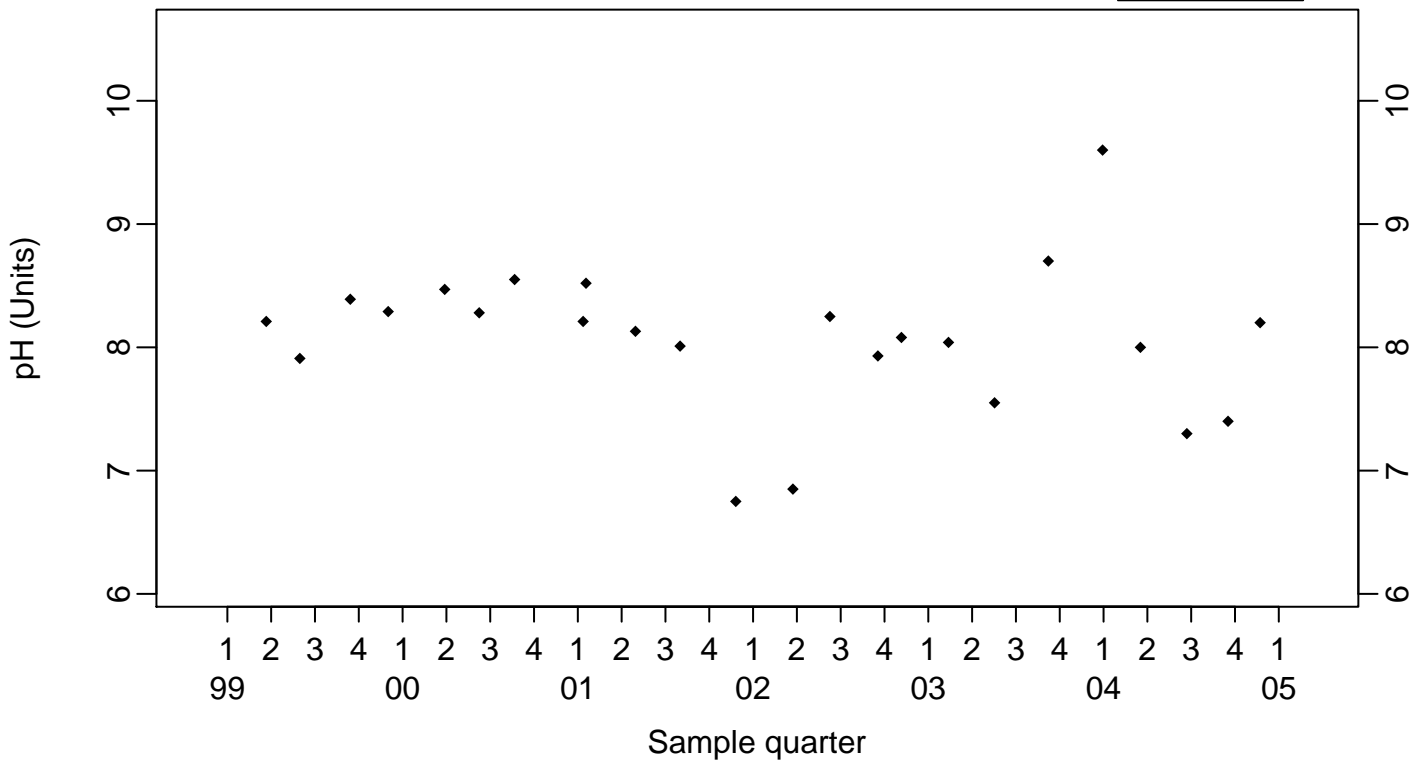
Retention Tank B806/807



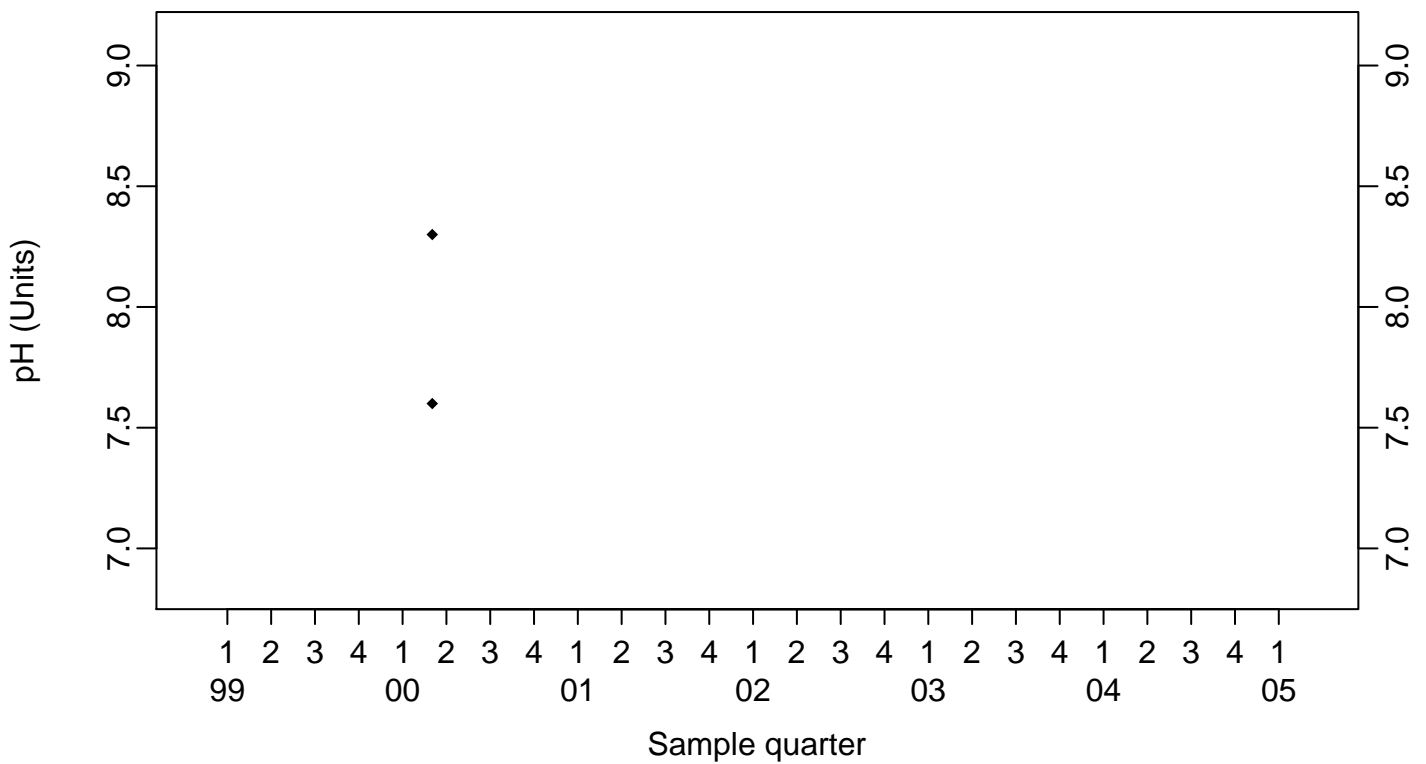
Surface Impoundments Process Water pH (Units)

Retention Tank B823A

- ◆ Above RL
- ▽ Below RL



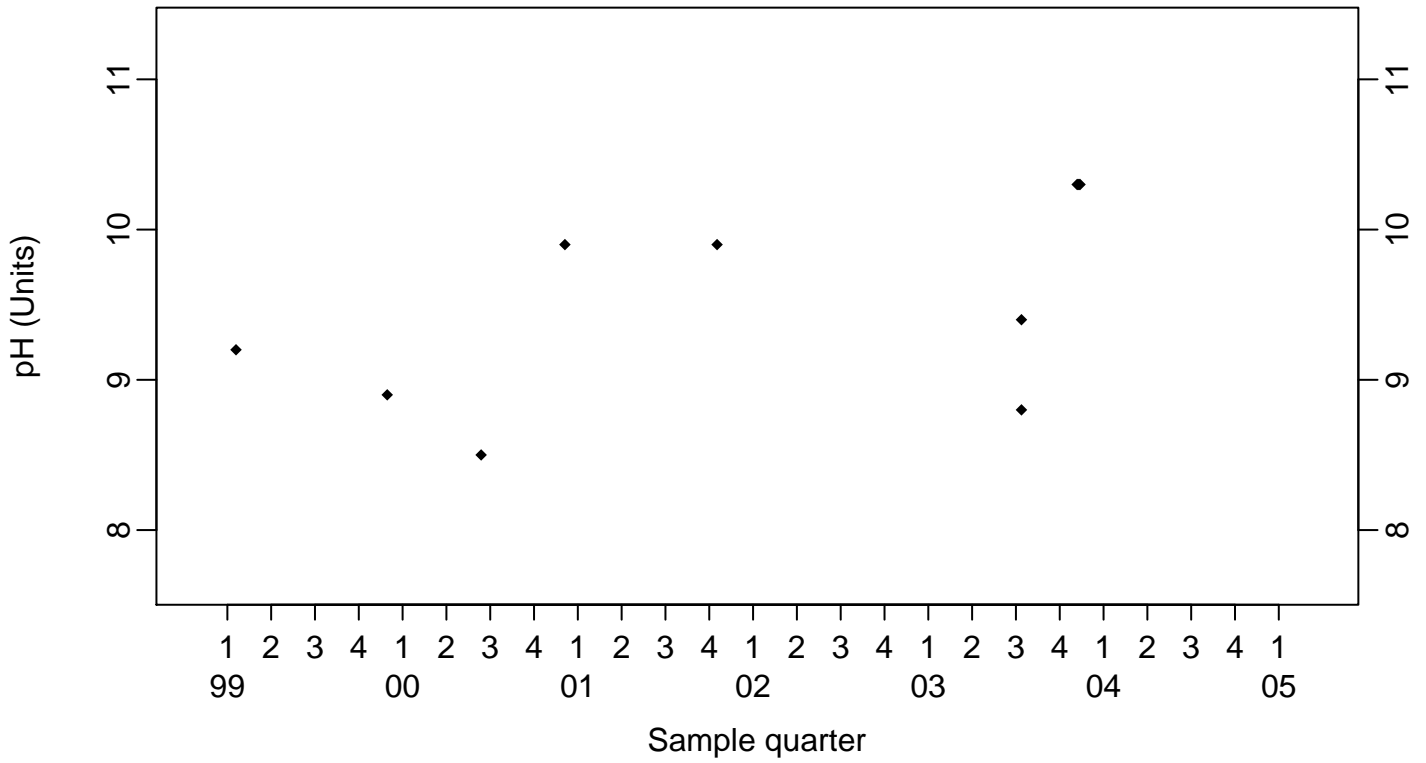
Retention Tank B826



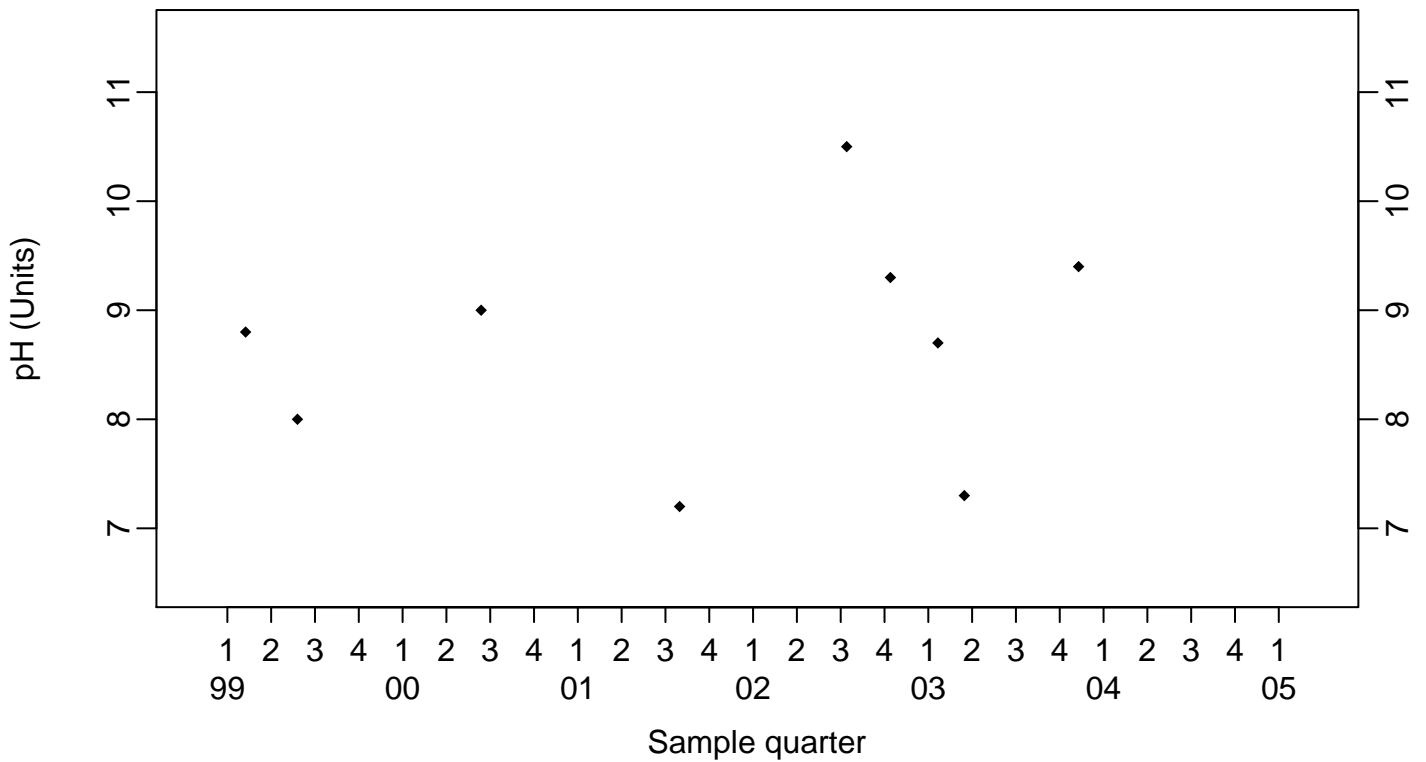
Surface Impoundments Process Water pH (Units)

Retention Tank B827C/D

◆ Above RL
▽ Below RL



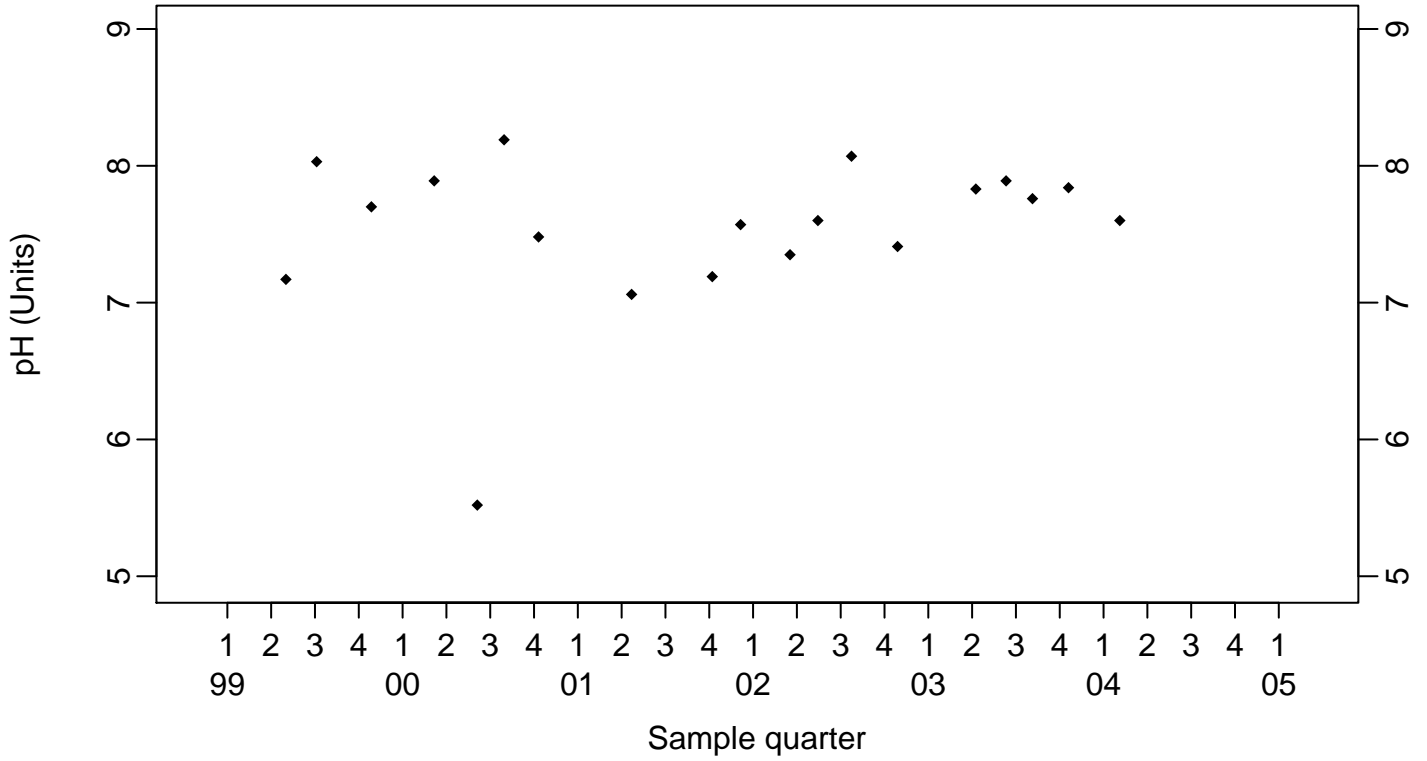
Retention Tank B827E



Surface Impoundments Process Water pH (Units)

Retention Tank B851

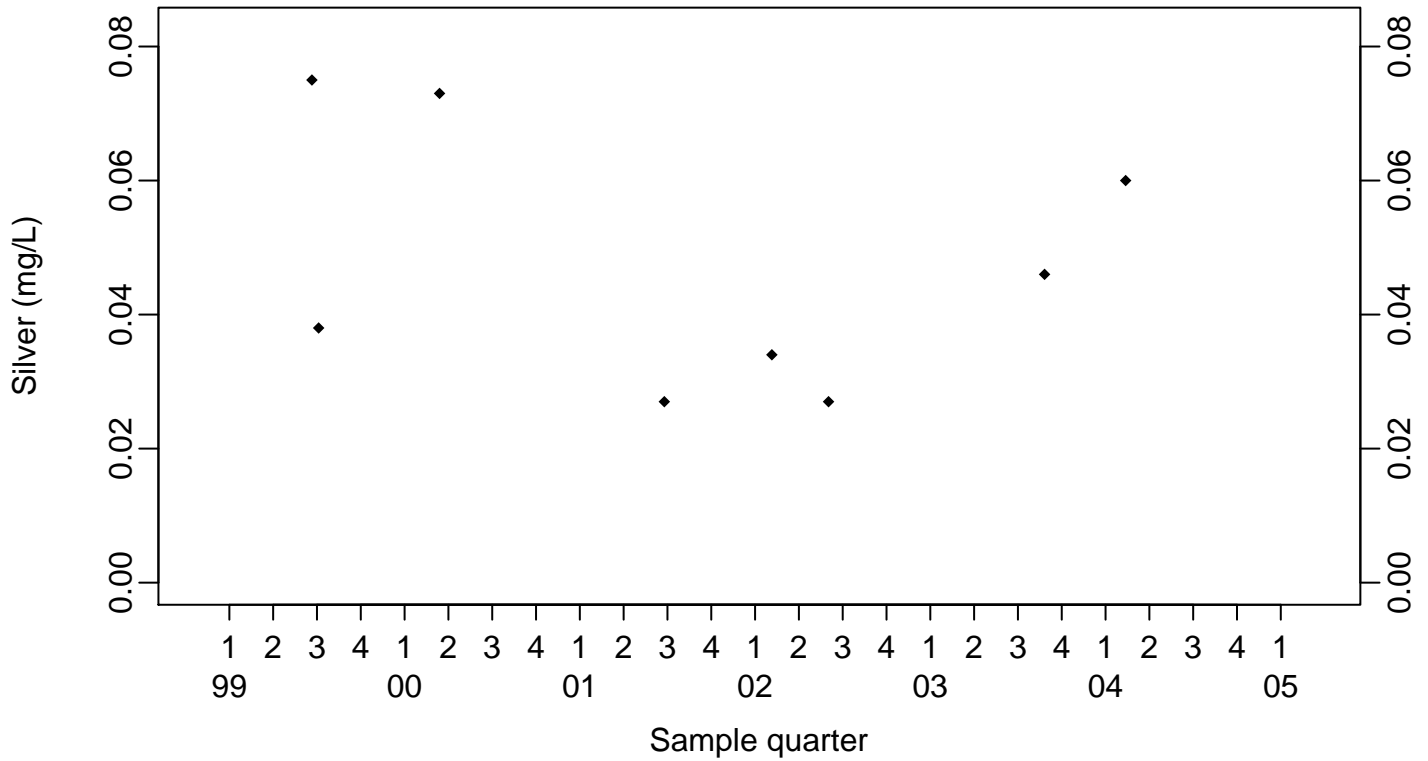
- ◆ Above RL
- ▽ Below RL



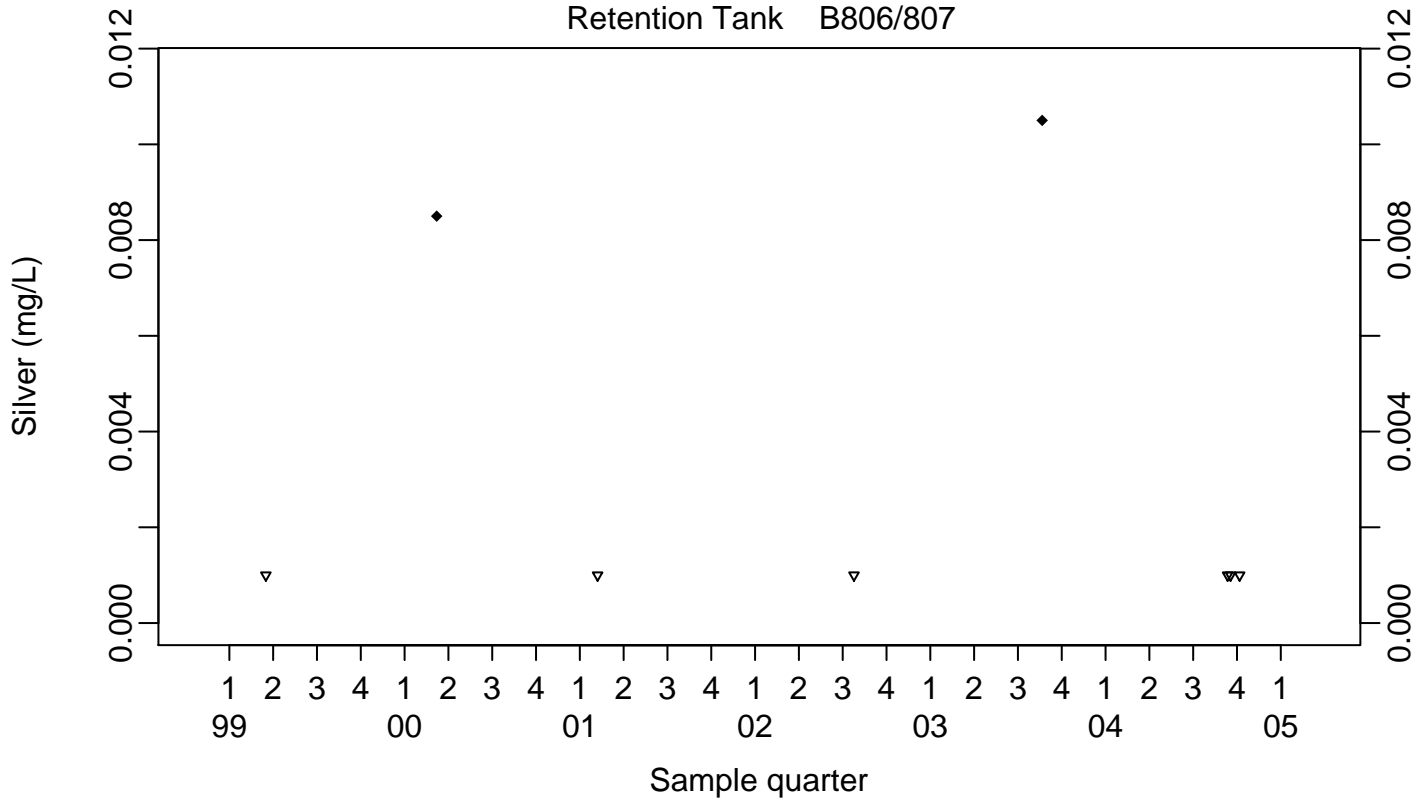
Surface Impoundments Process Water Silver (mg/L)

Retention Tank B801

◆ Above RL
▽ Below RL



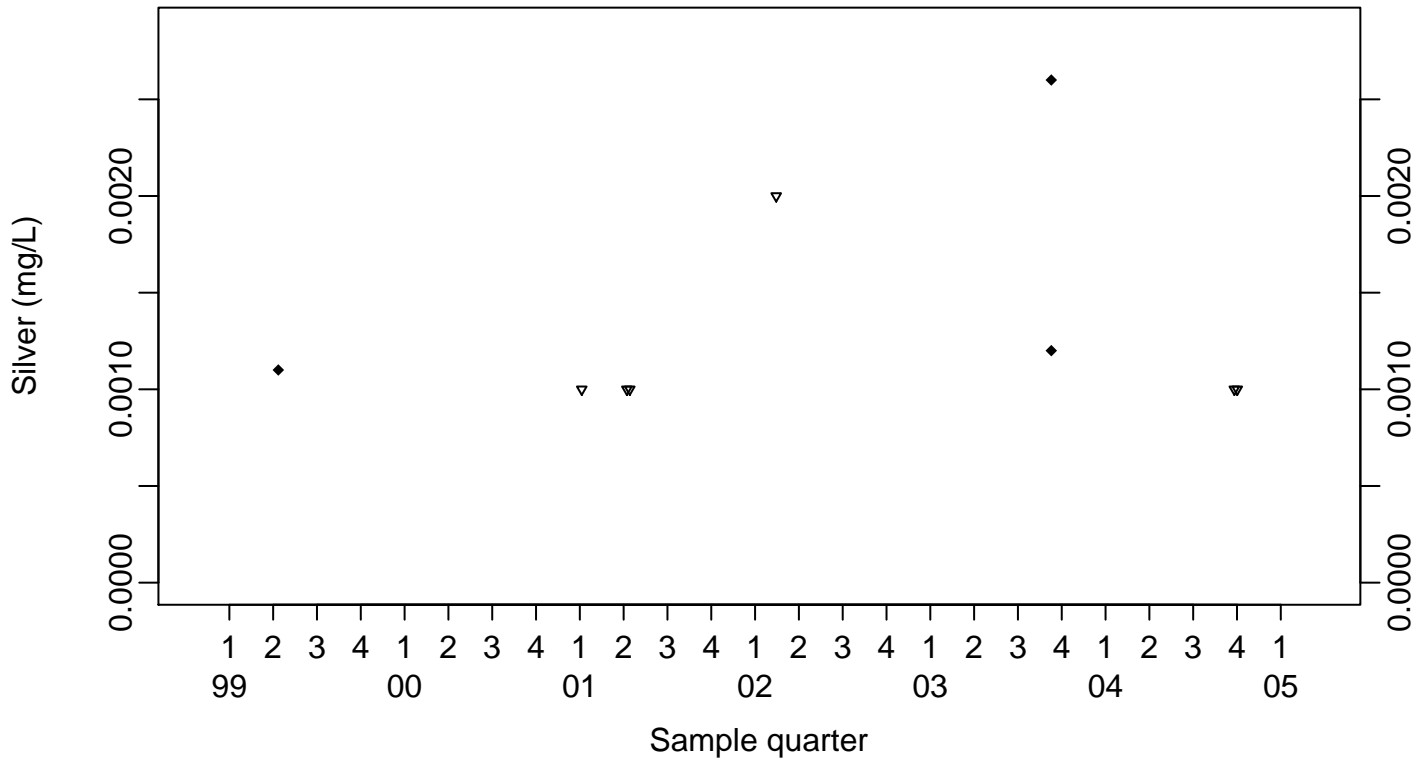
Retention Tank B806/807



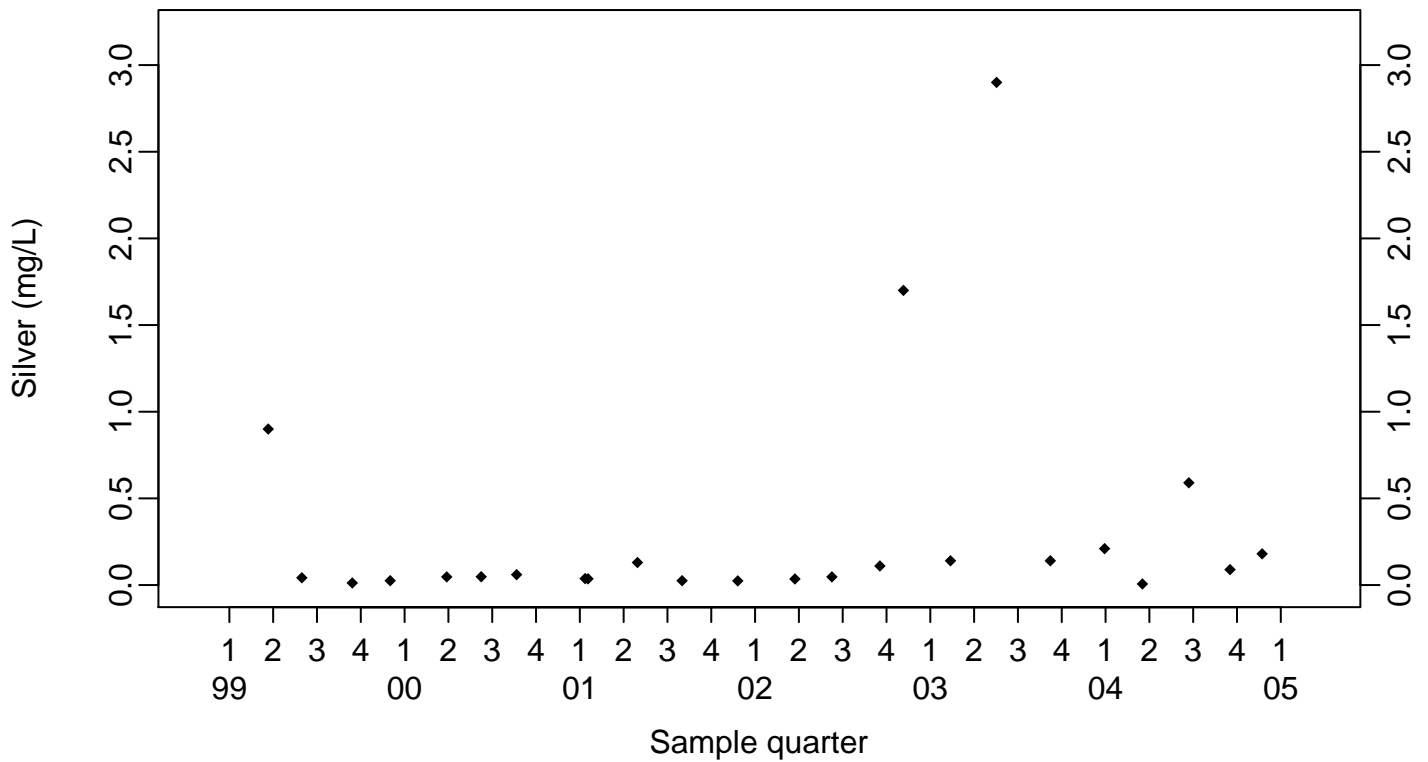
Surface Impoundments Process Water Silver (mg/L)

Retention Tank B817

◆ Above RL
▽ Below RL



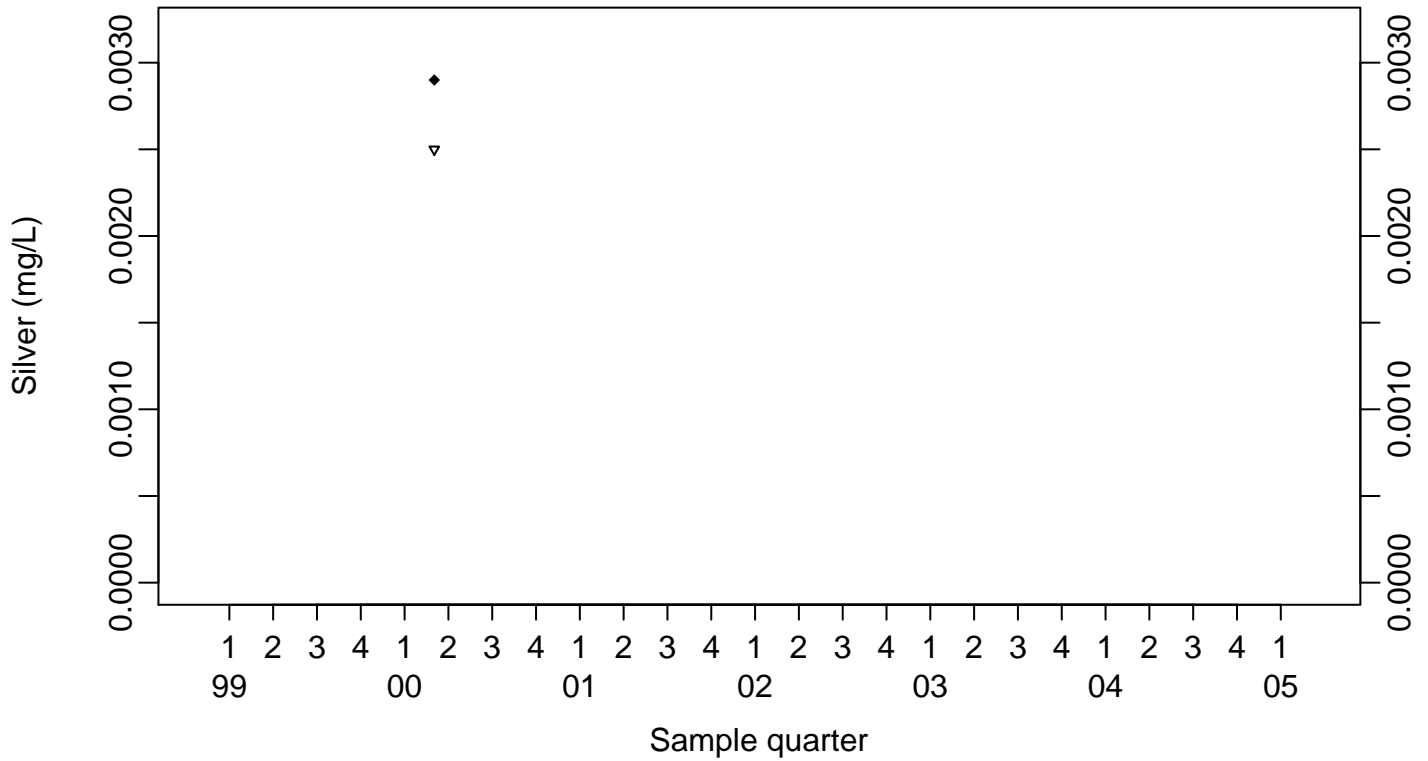
Retention Tank B823A



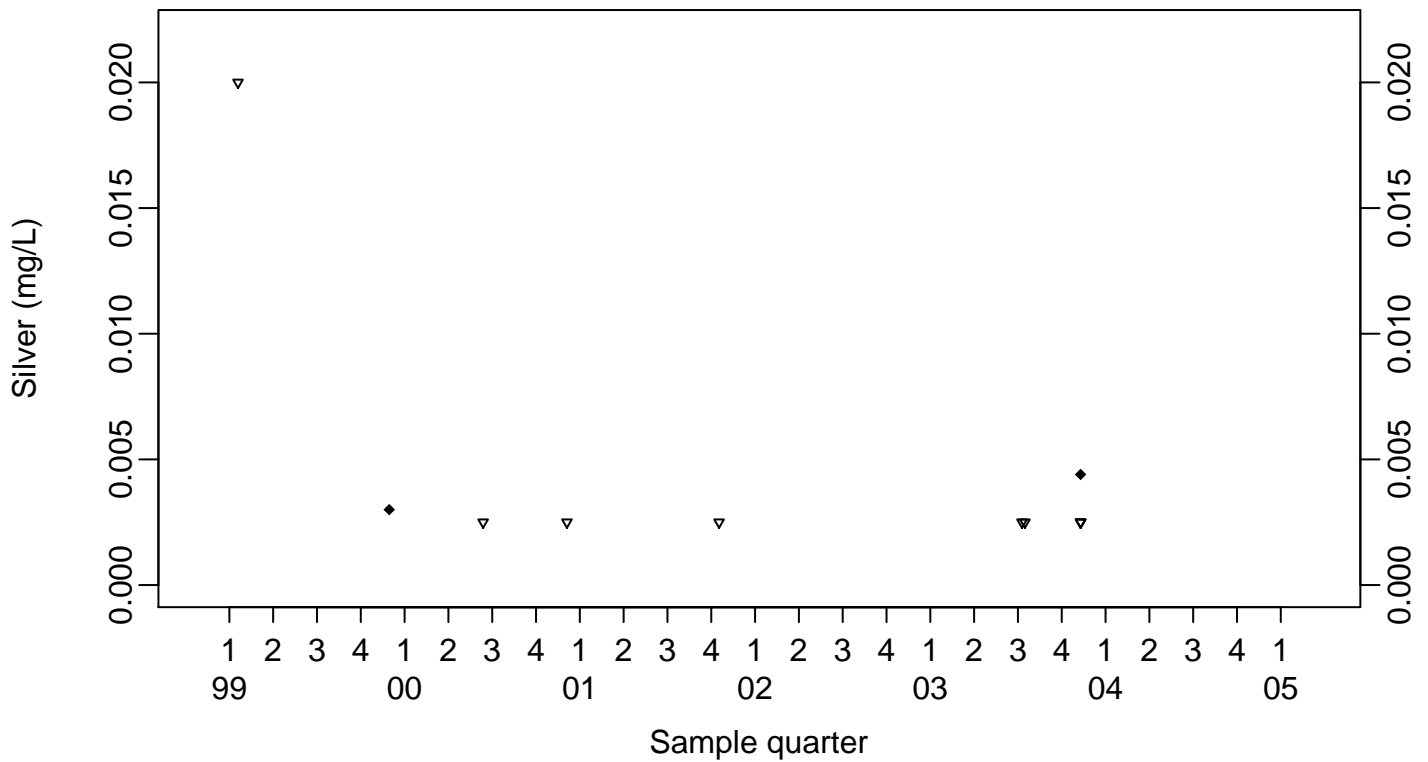
Surface Impoundments Process Water Silver (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



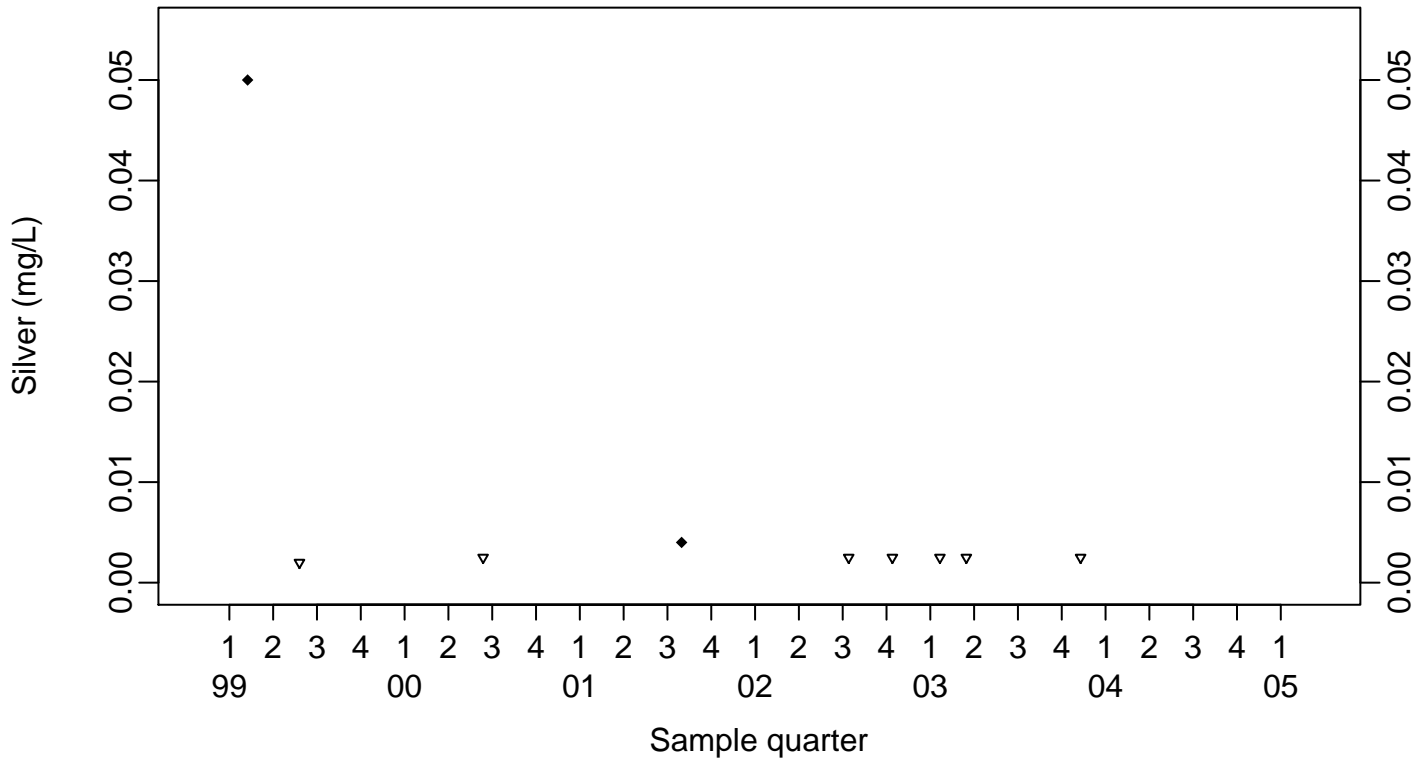
Retention Tank B827C/D



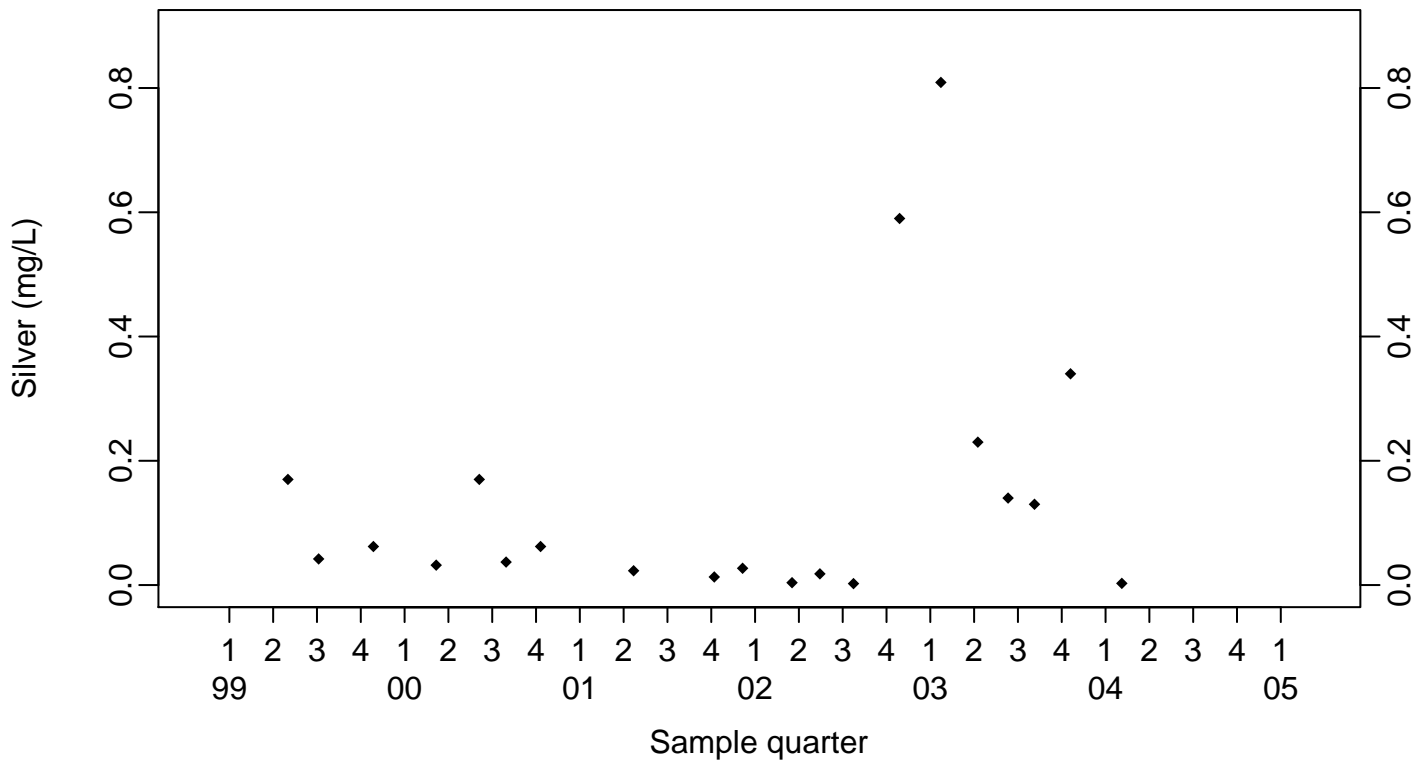
Surface Impoundments Process Water Silver (mg/L)

Retention Tank B827E

◆ Above RL
▽ Below RL



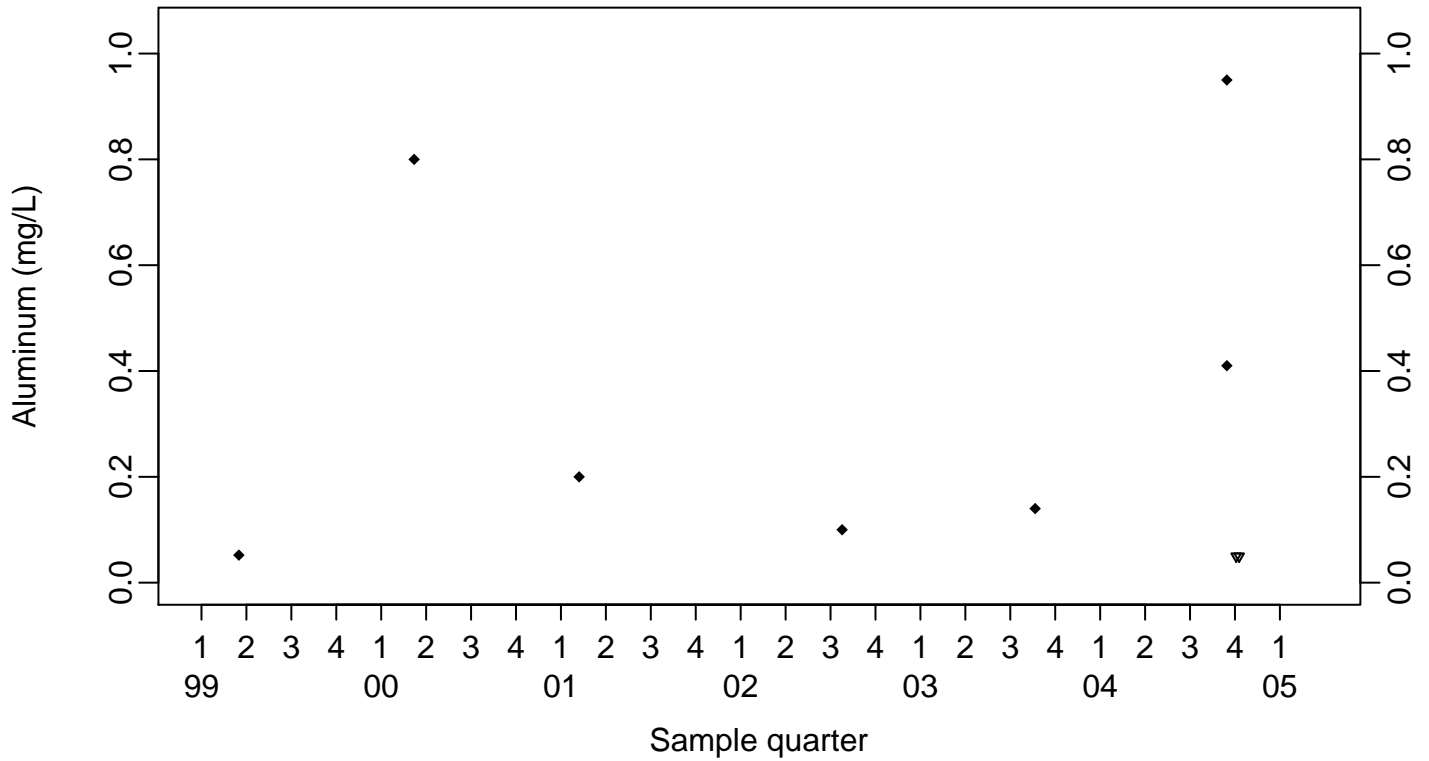
Retention Tank B851



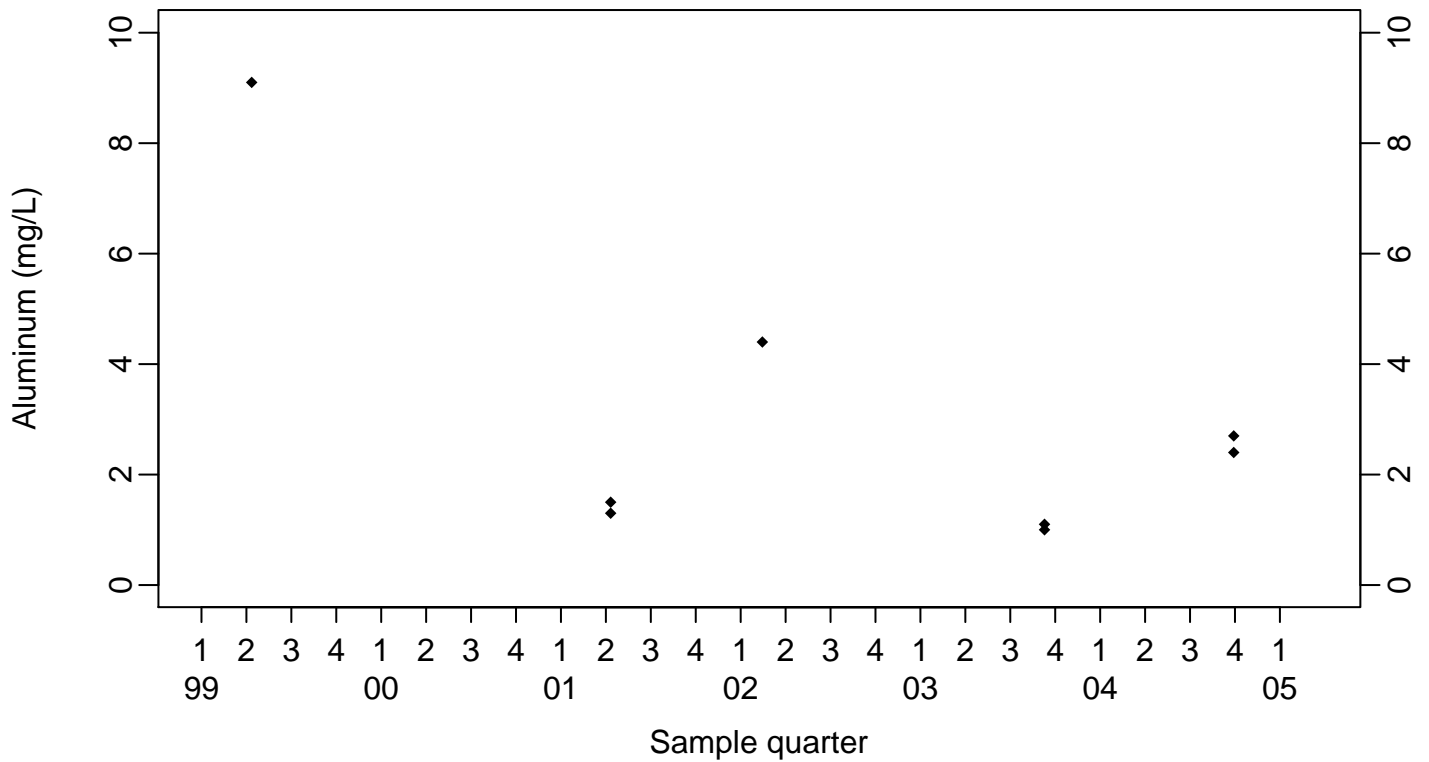
Surface Impoundments Process Water Aluminum (mg/L)

Retention Tank B806/807

◆ Above RL
▽ Below RL



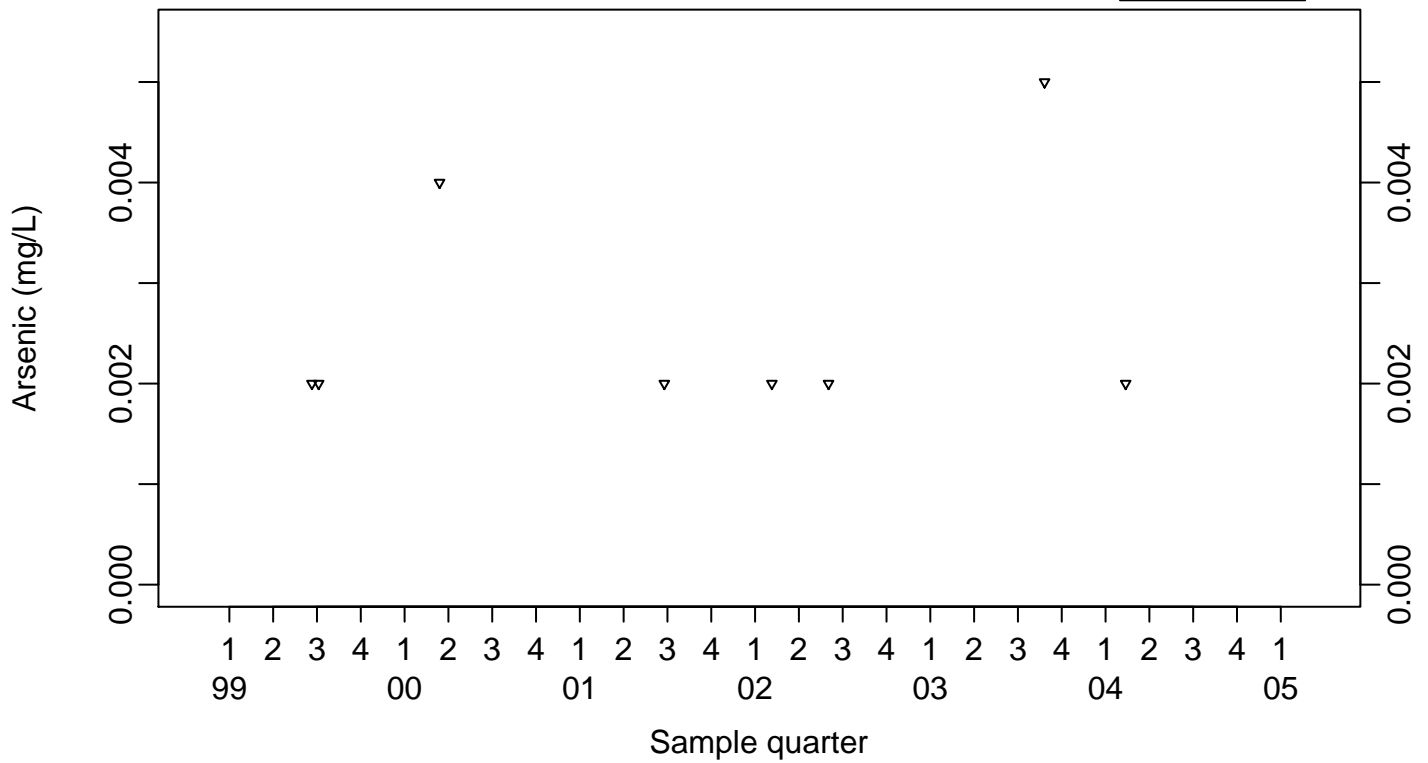
Retention Tank B817



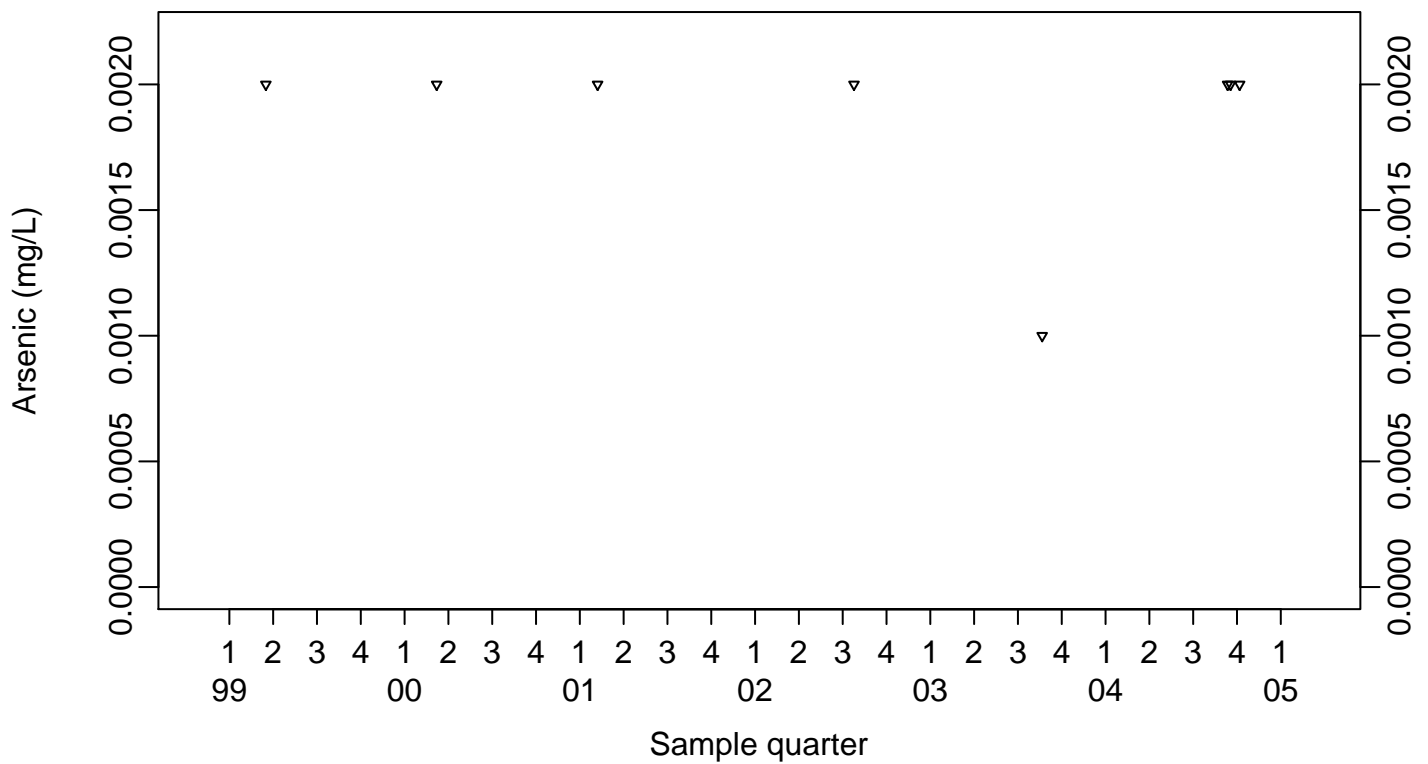
Surface Impoundments Process Water Arsenic (mg/L)

Retention Tank B801

◆ Above RL
▽ Below RL



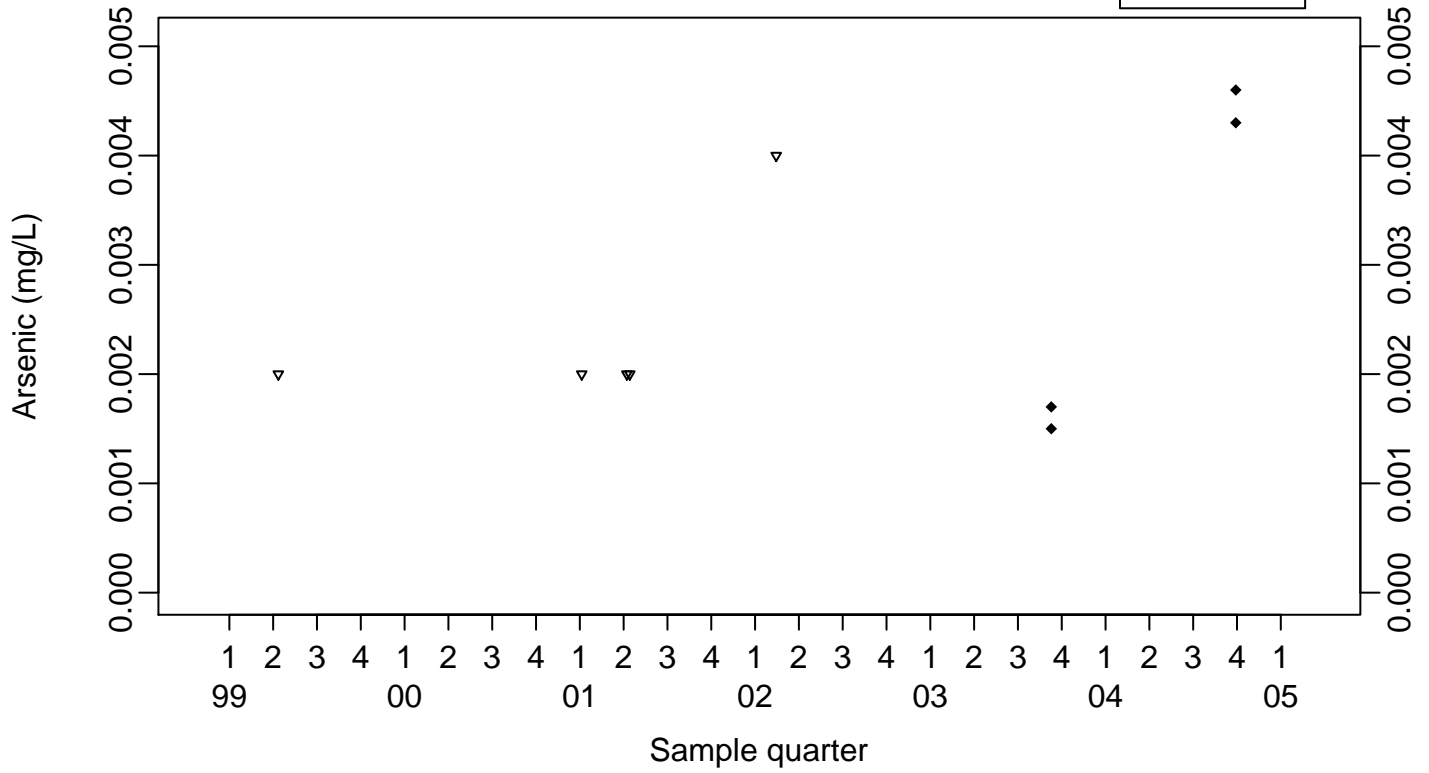
Retention Tank B806/807



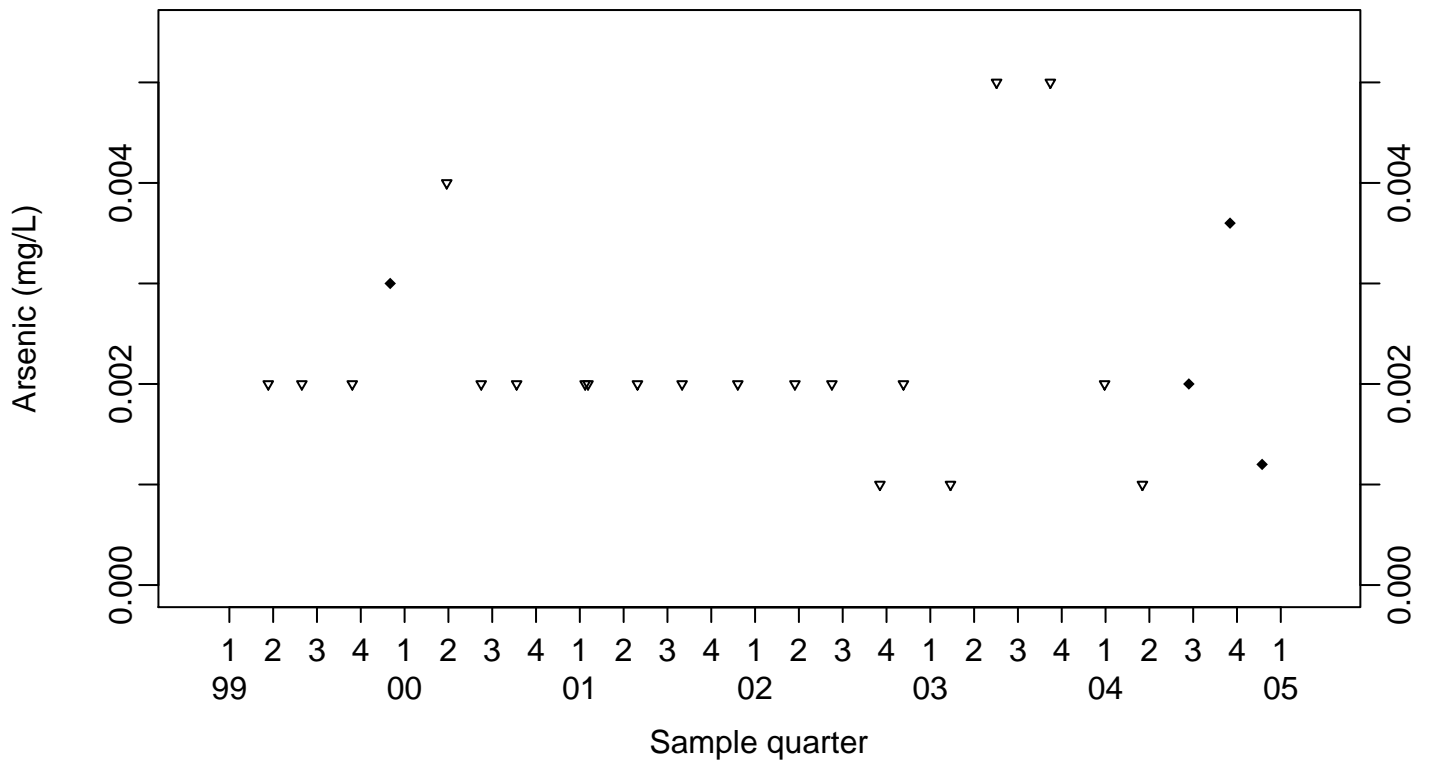
Surface Impoundments Process Water Arsenic (mg/L)

Retention Tank B817

◆ Above RL
▽ Below RL



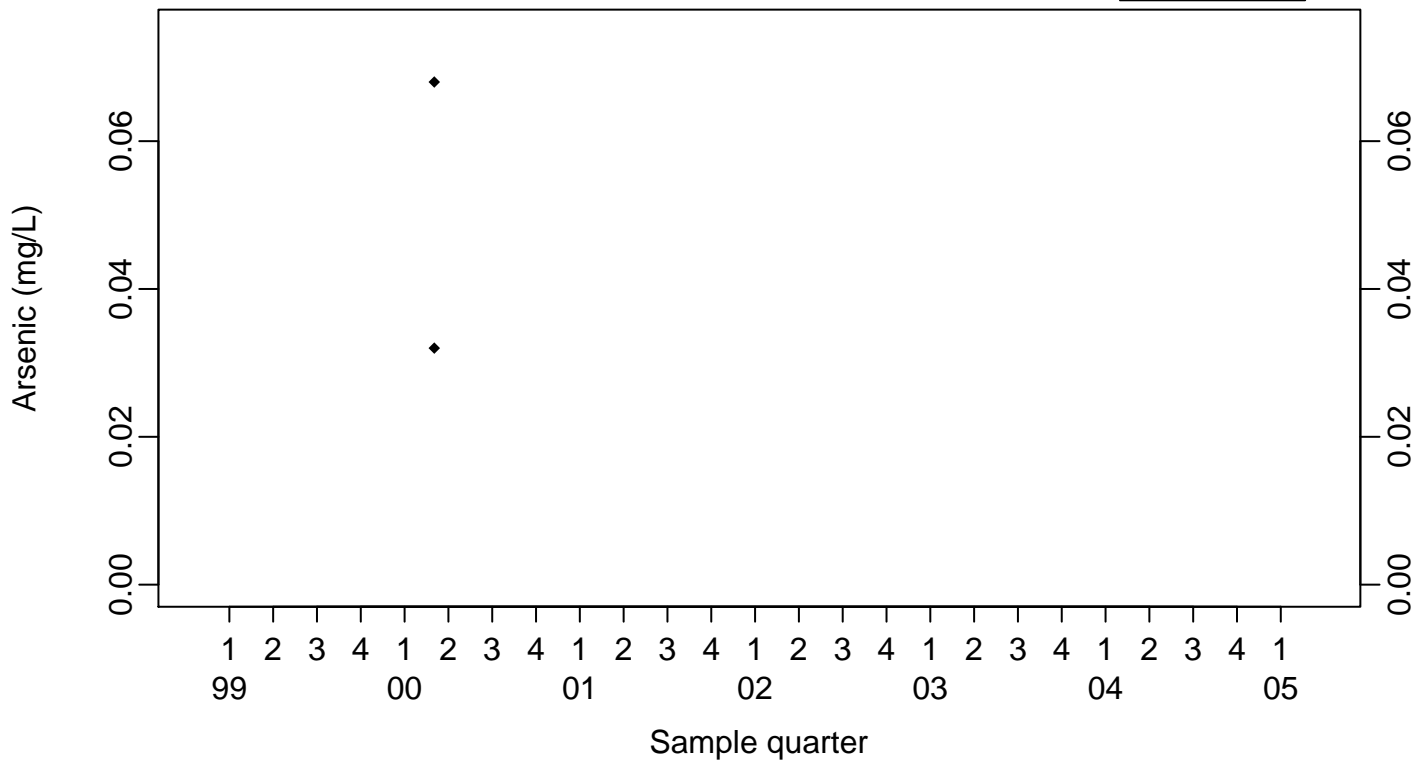
Retention Tank B823A



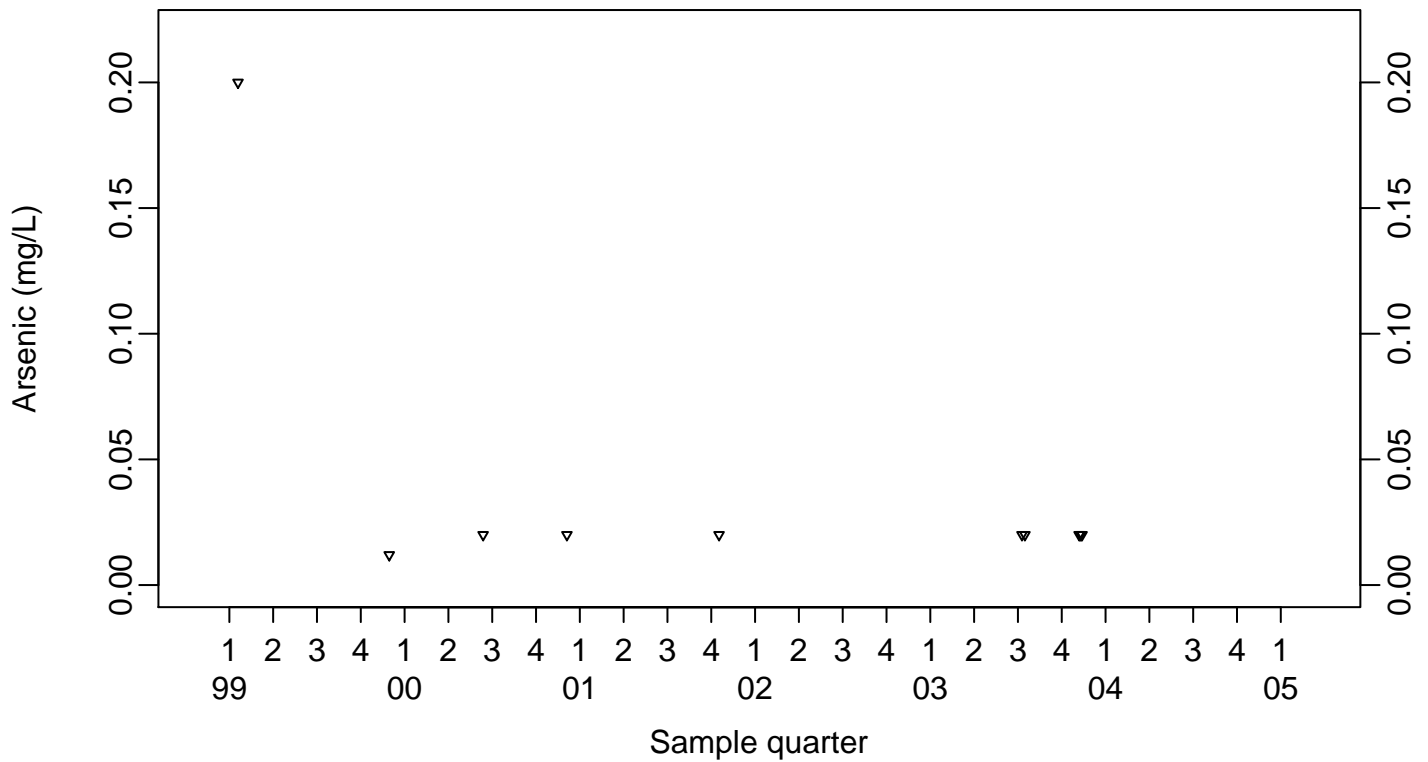
Surface Impoundments Process Water Arsenic (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



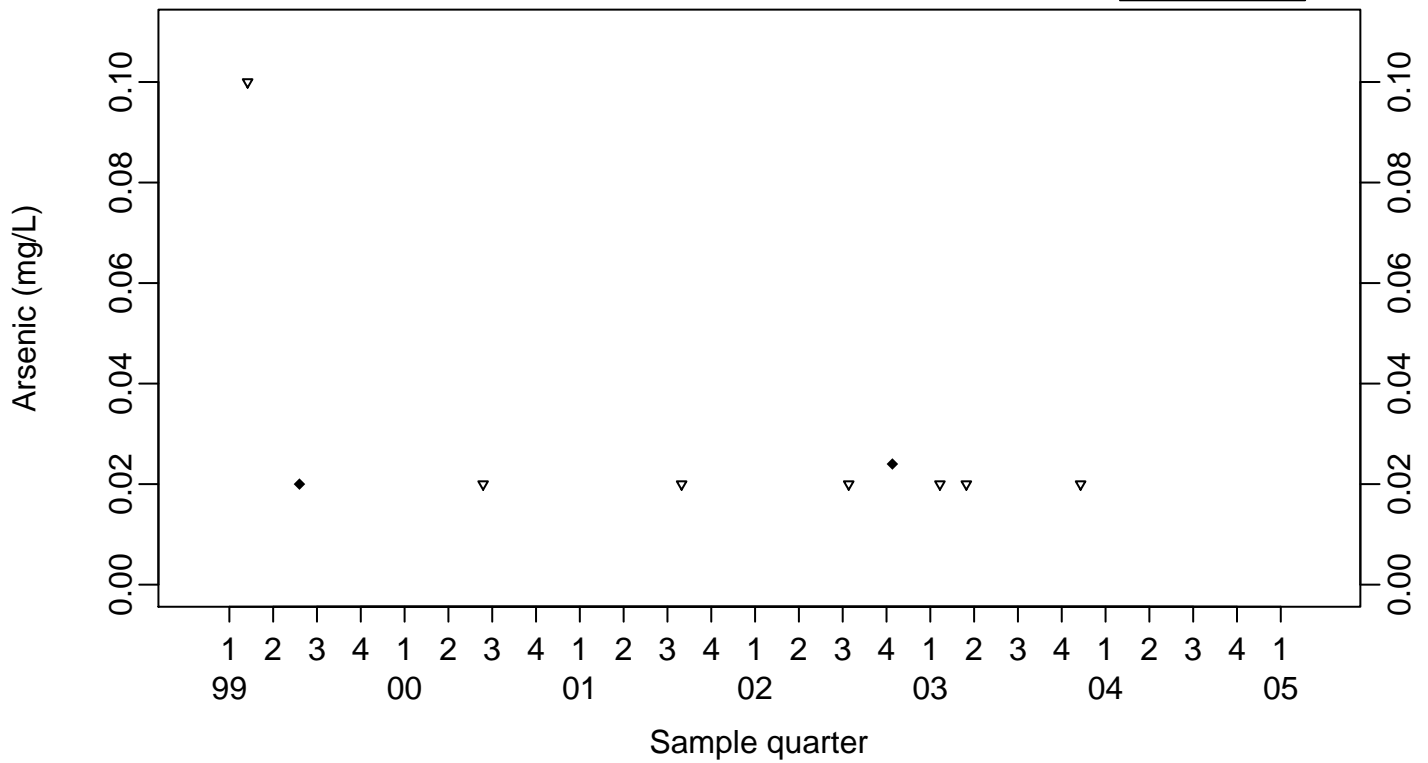
Retention Tank B827C/D



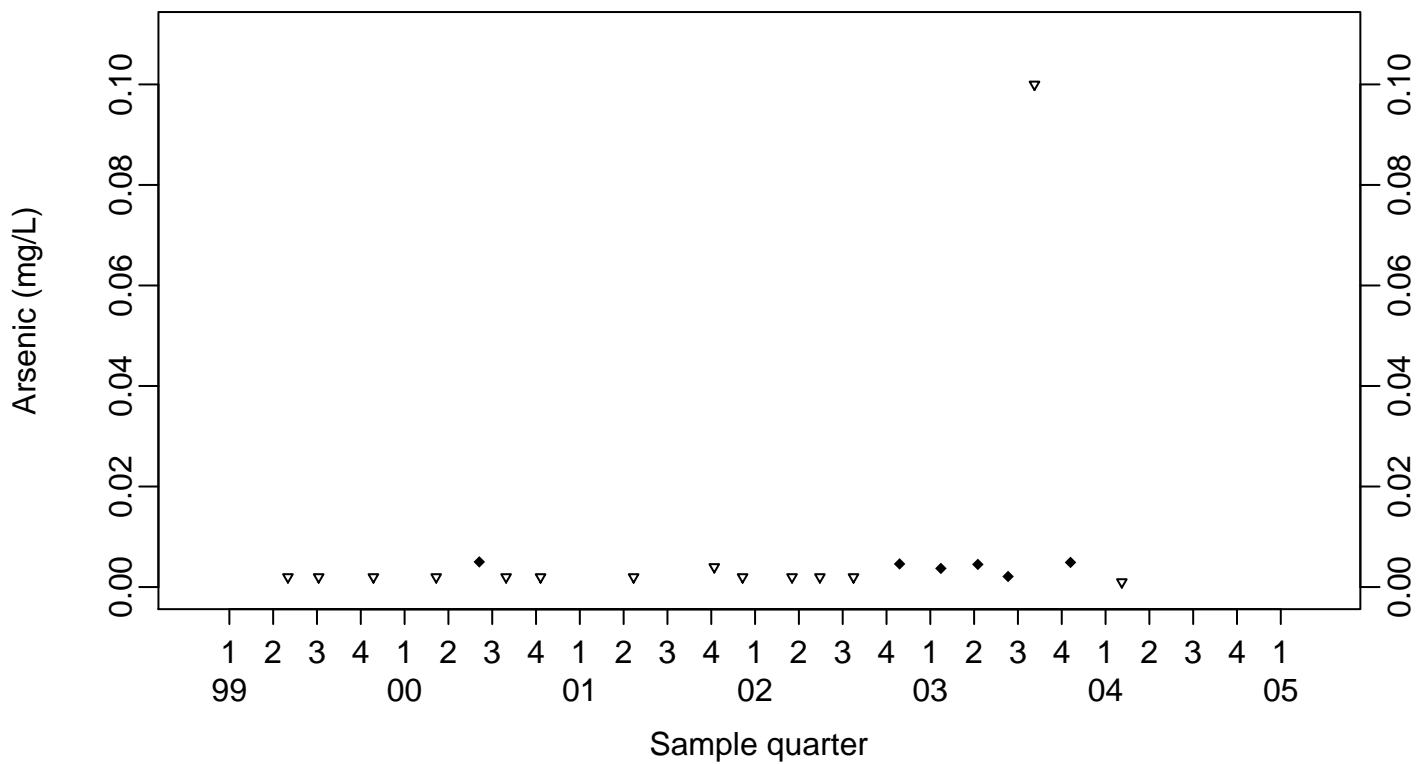
Surface Impoundments Process Water Arsenic (mg/L)

Retention Tank B827E

◆ Above RL
▽ Below RL



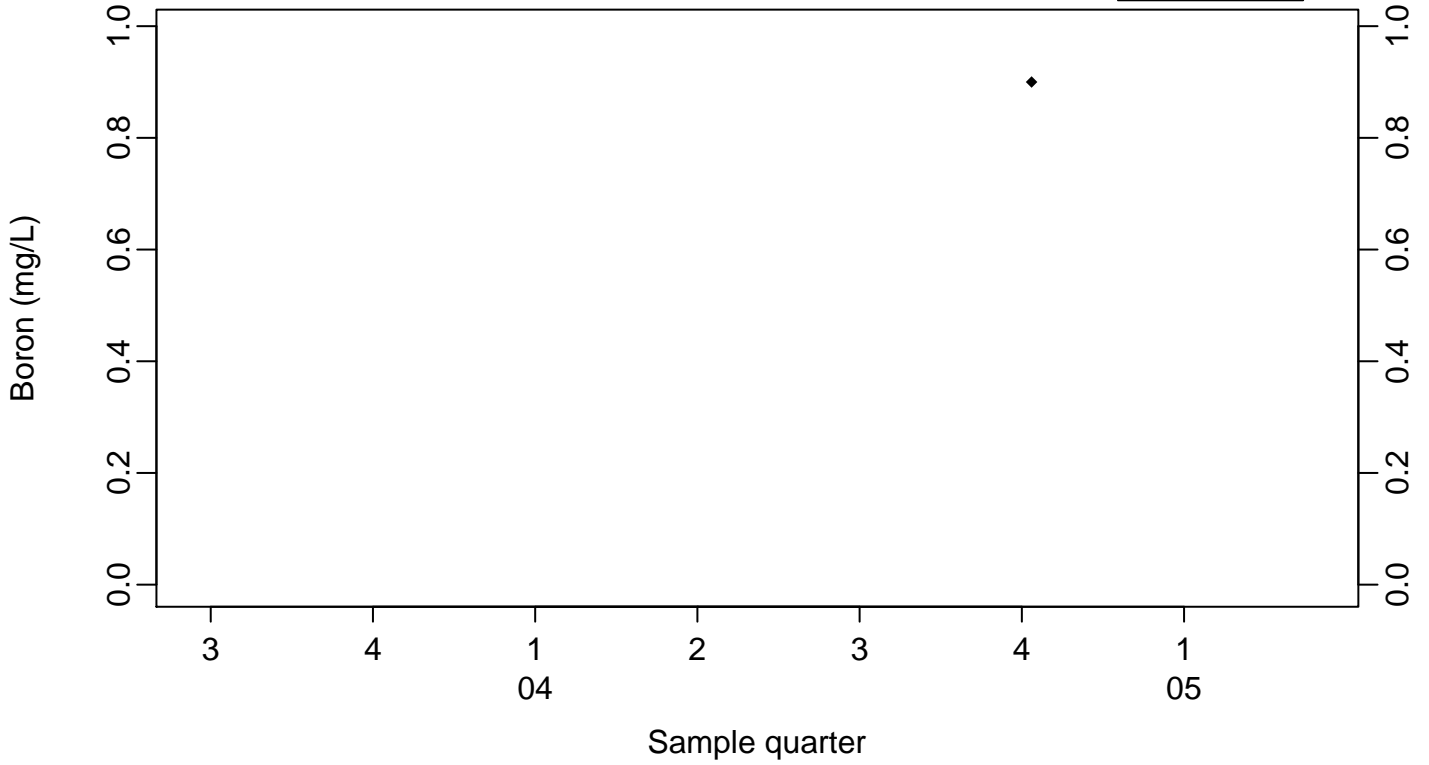
Retention Tank B851



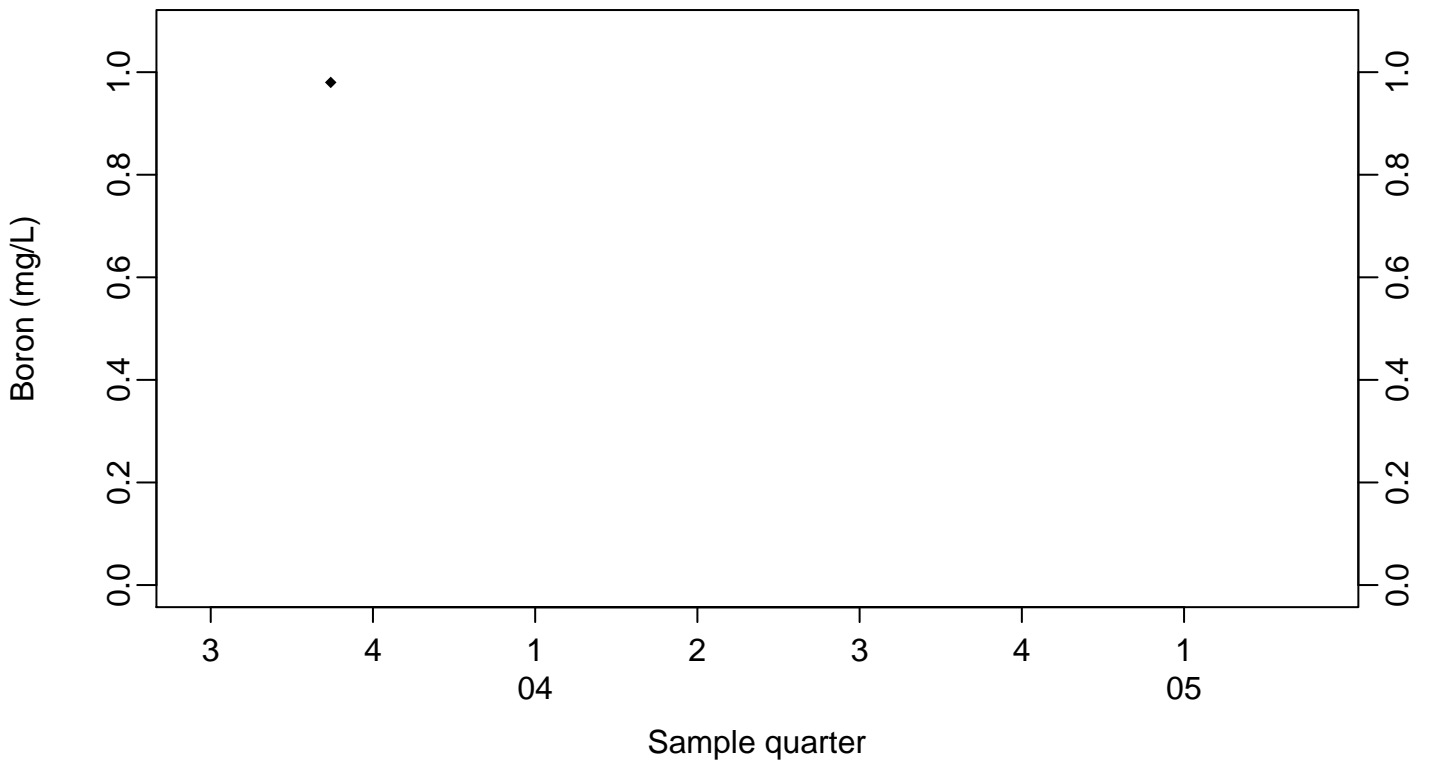
Surface Impoundments Process Water Boron (mg/L)

Retention Tank B806/807

◆ Above RL
▽ Below RL



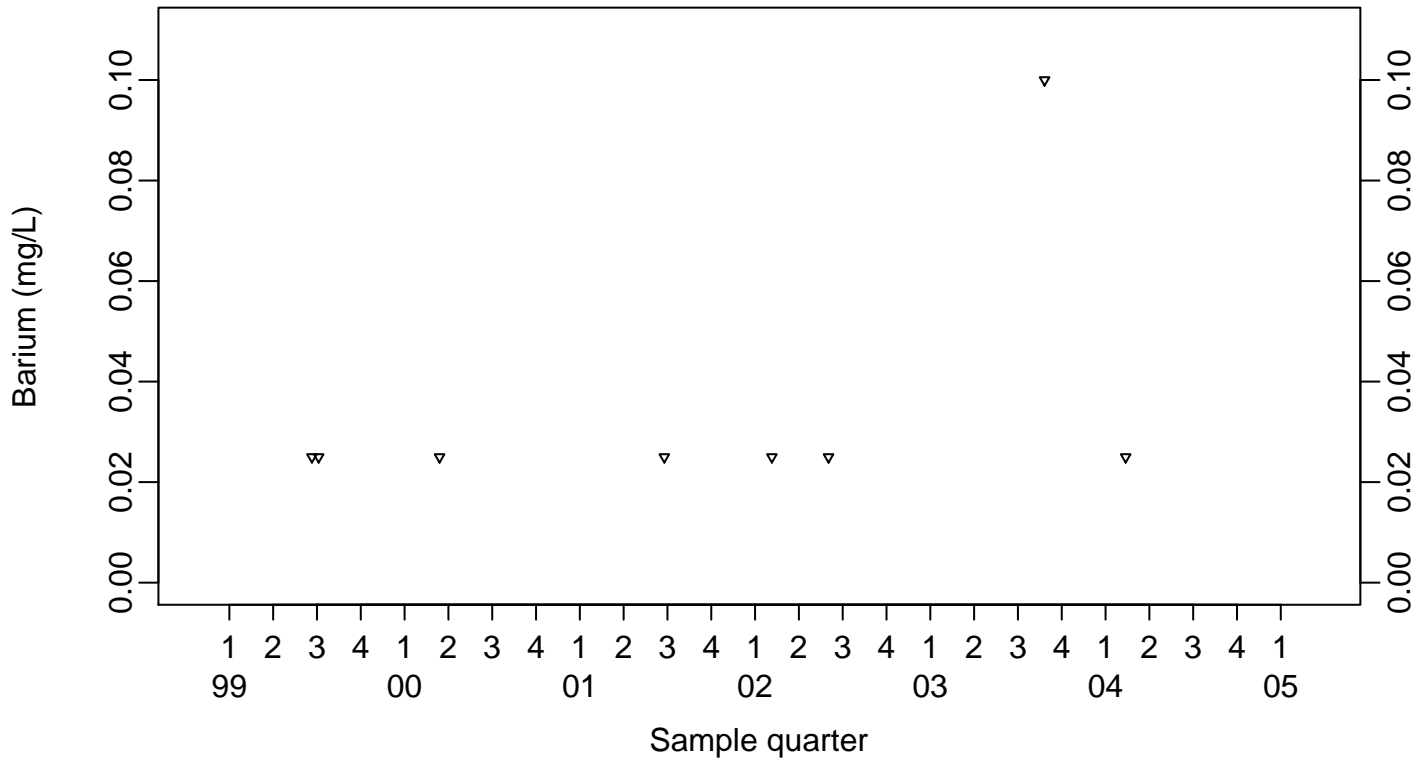
Retention Tank B823A



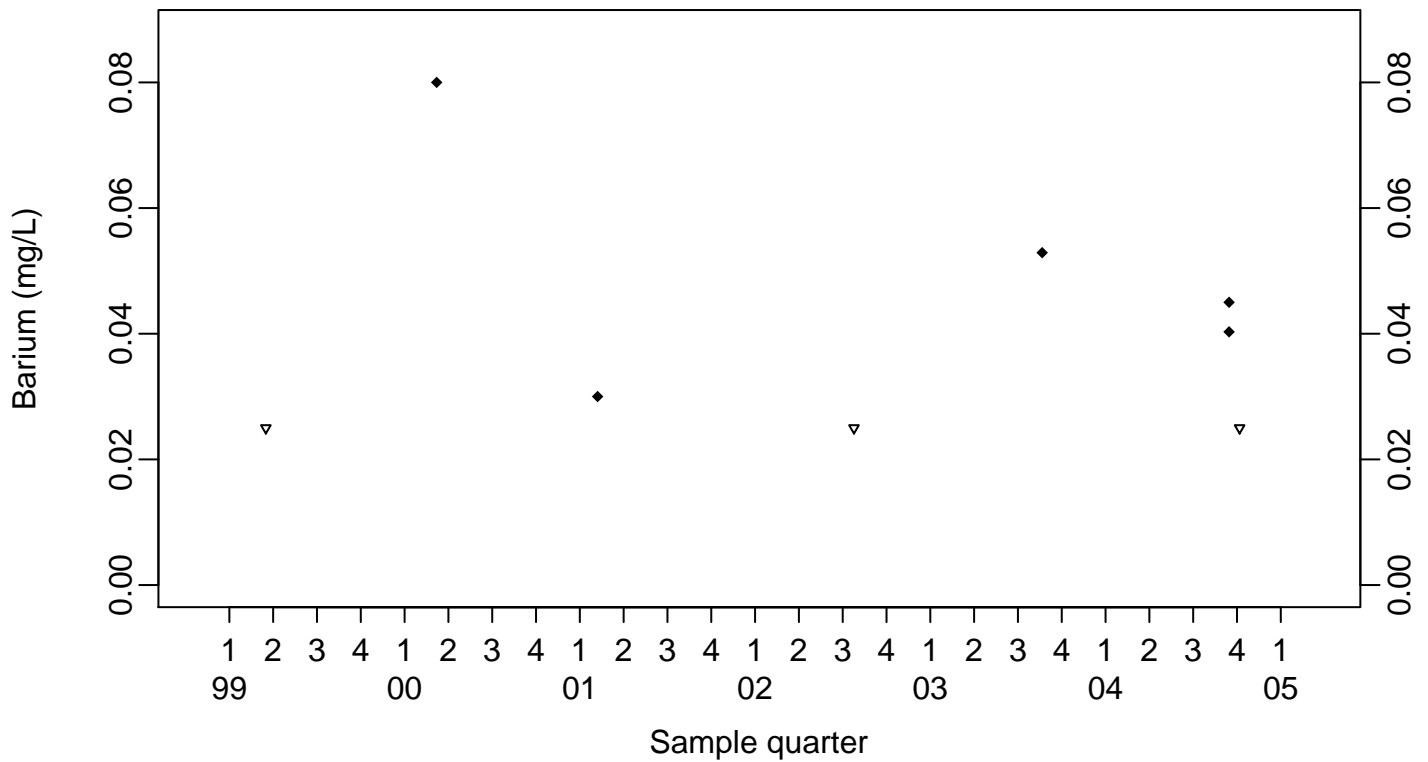
Surface Impoundments Process Water Barium (mg/L)

Retention Tank B801

◆ Above RL
▽ Below RL



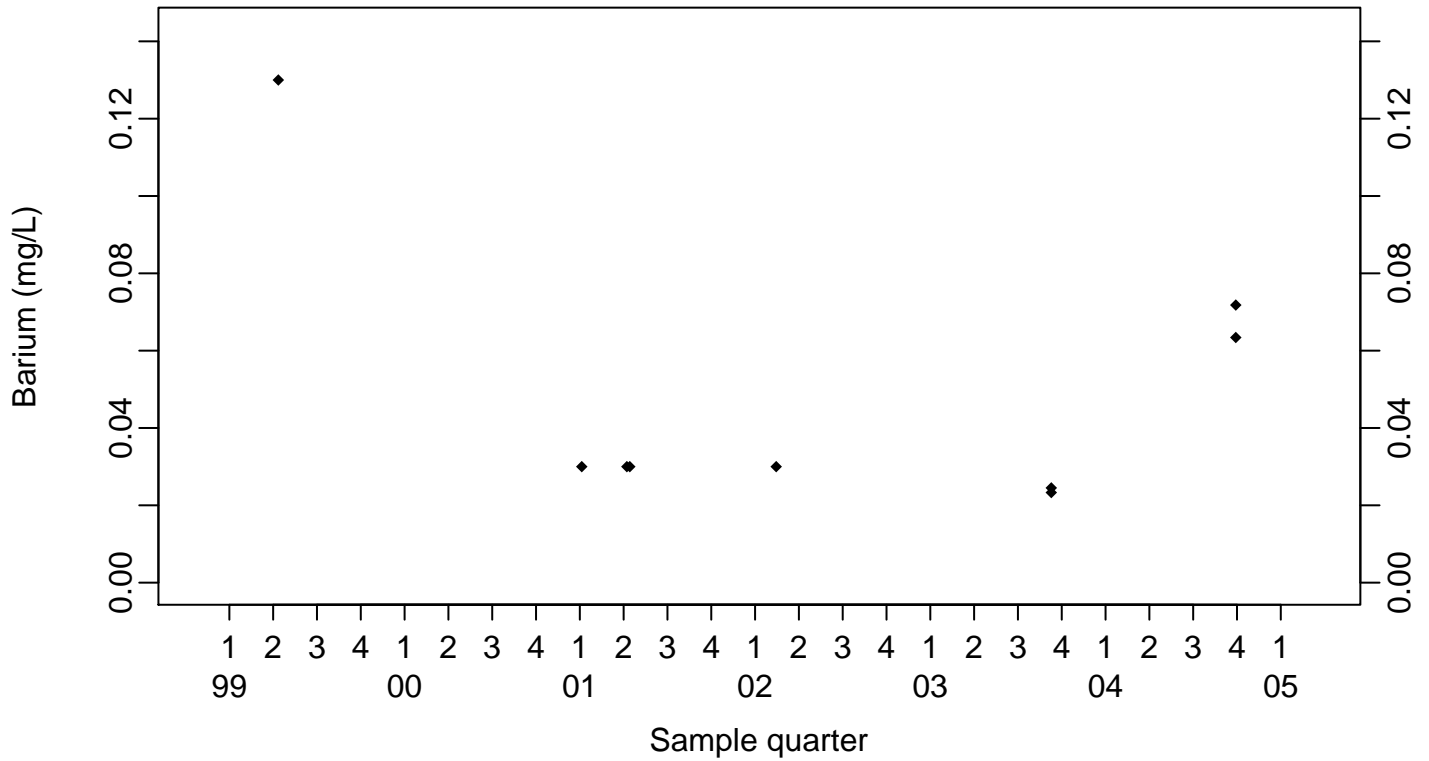
Retention Tank B806/807



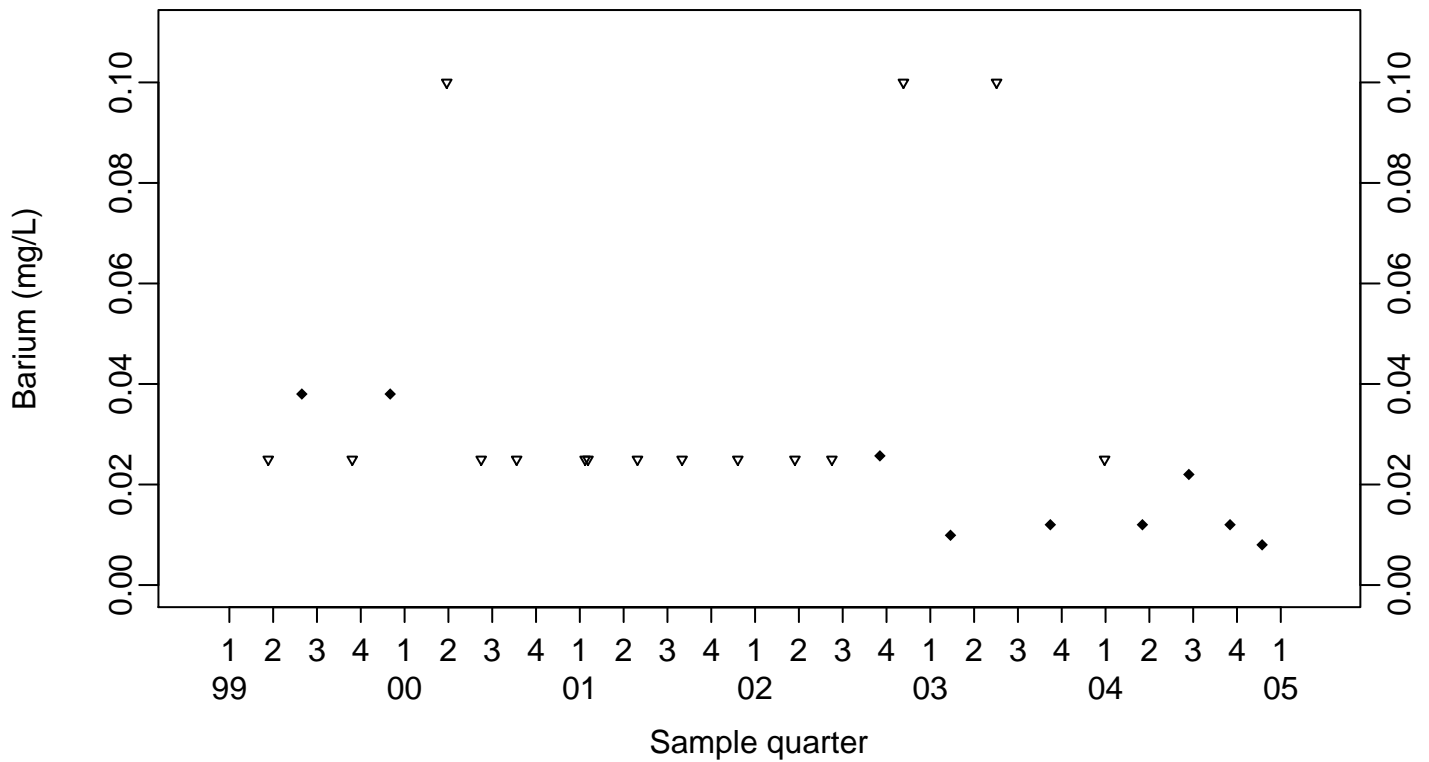
Surface Impoundments Process Water Barium (mg/L)

Retention Tank B817

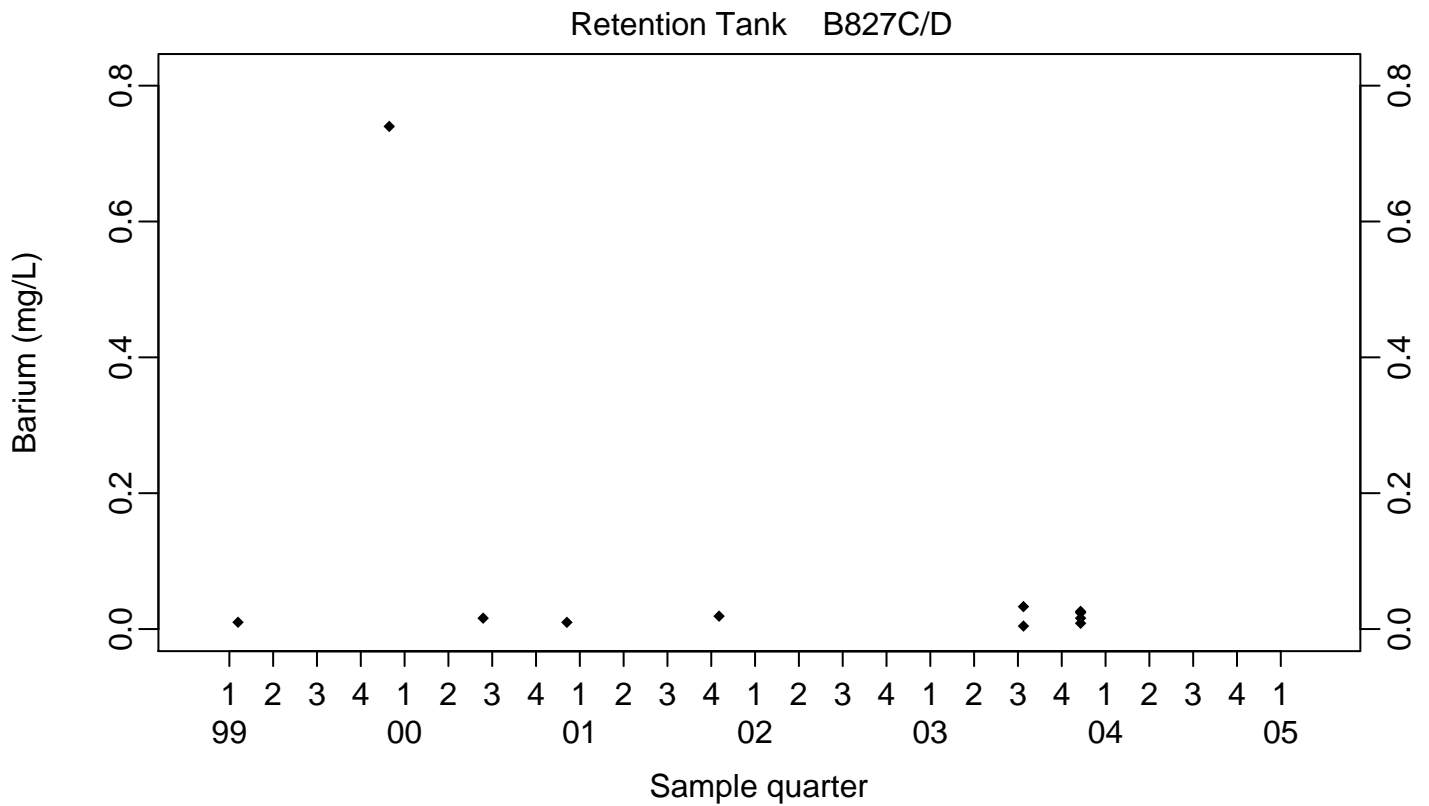
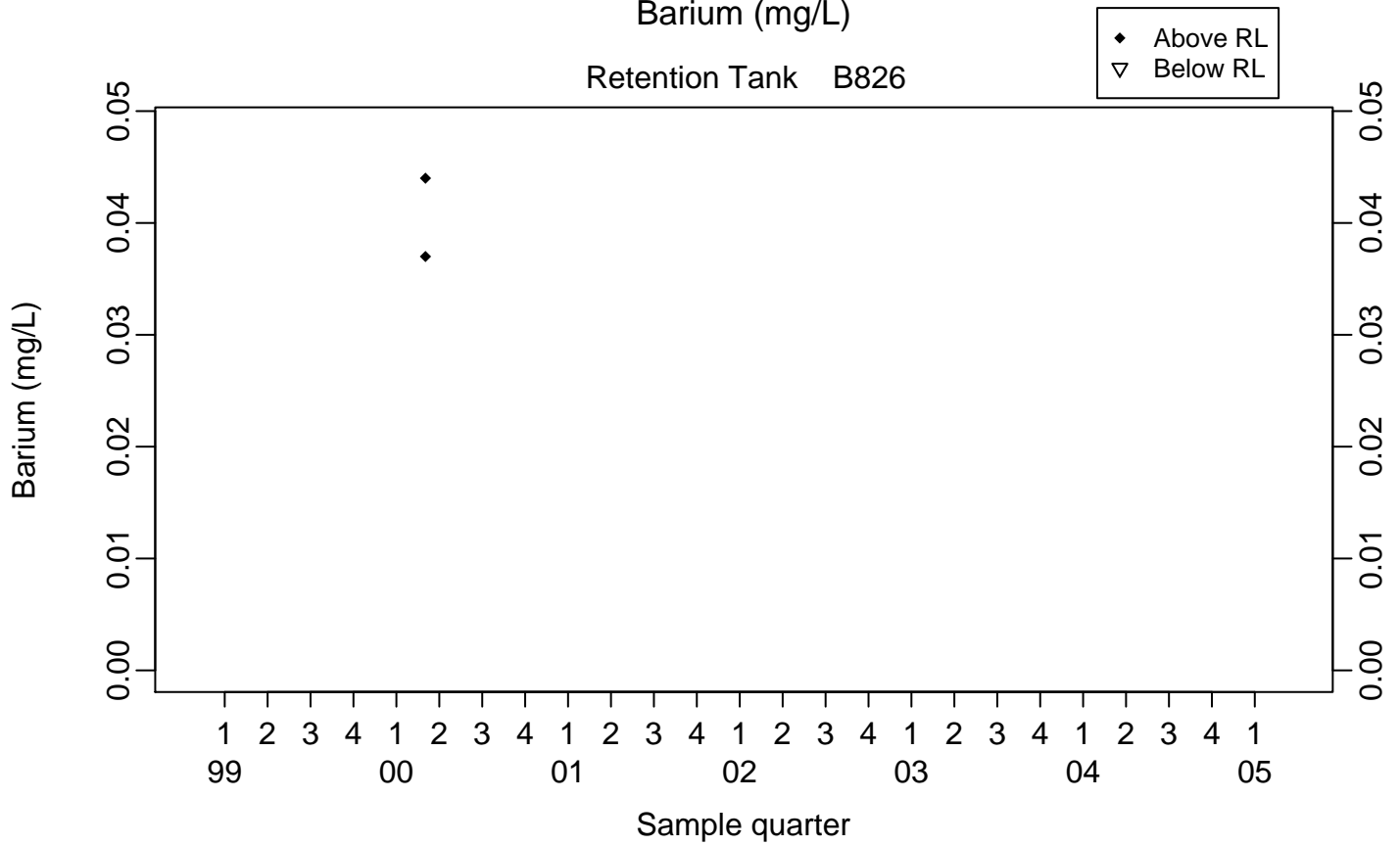
◆ Above RL
▽ Below RL



Retention Tank B823A



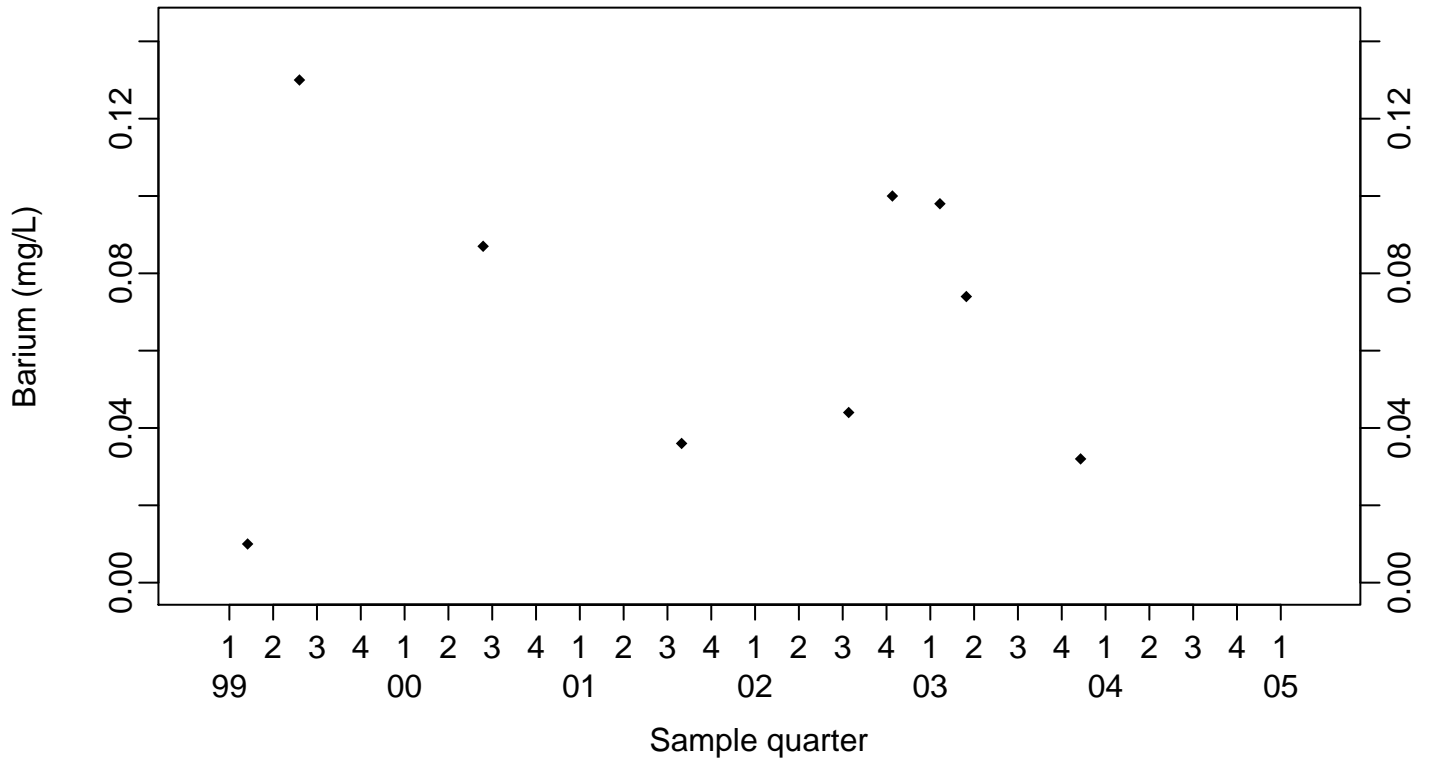
Surface Impoundments Process Water Barium (mg/L)



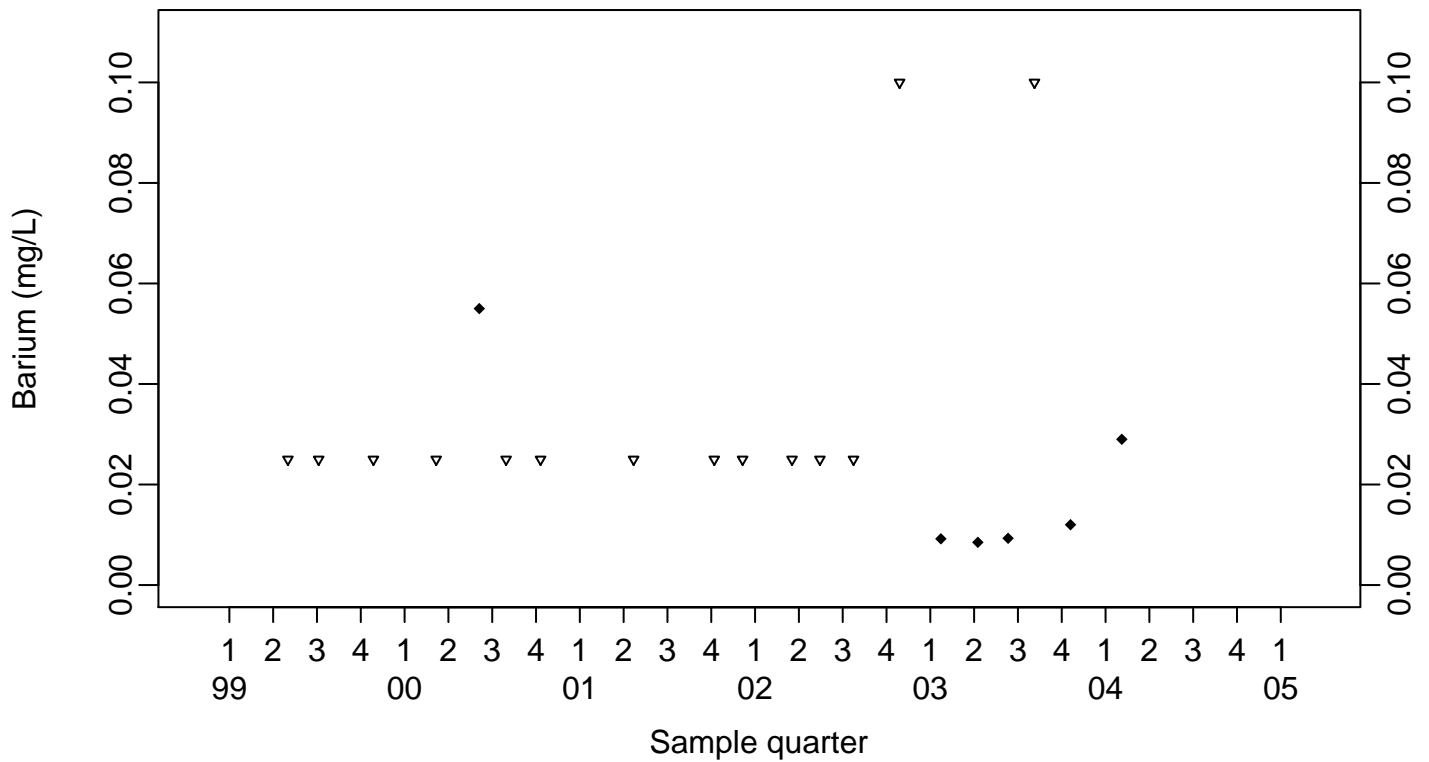
Surface Impoundments Process Water Barium (mg/L)

Retention Tank B827E

◆ Above RL
▽ Below RL



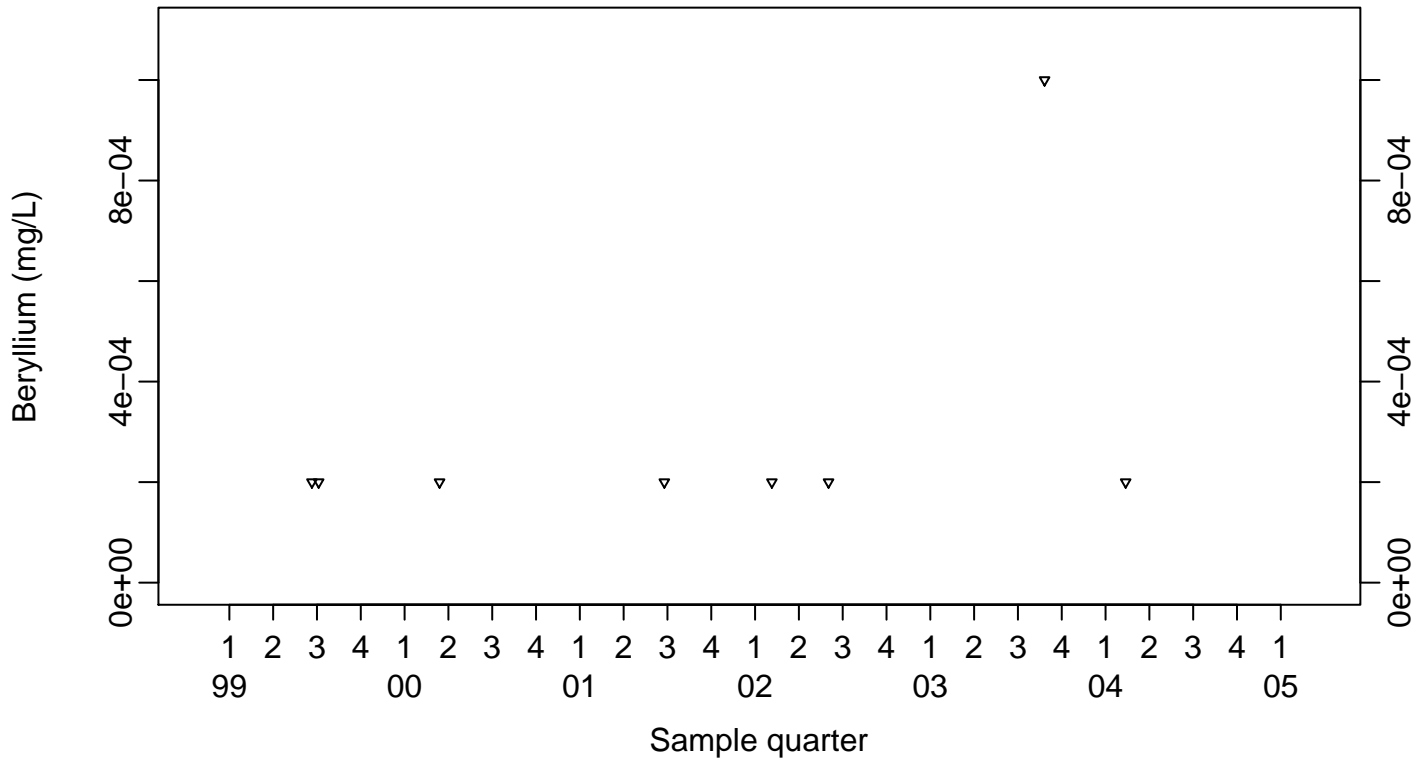
Retention Tank B851



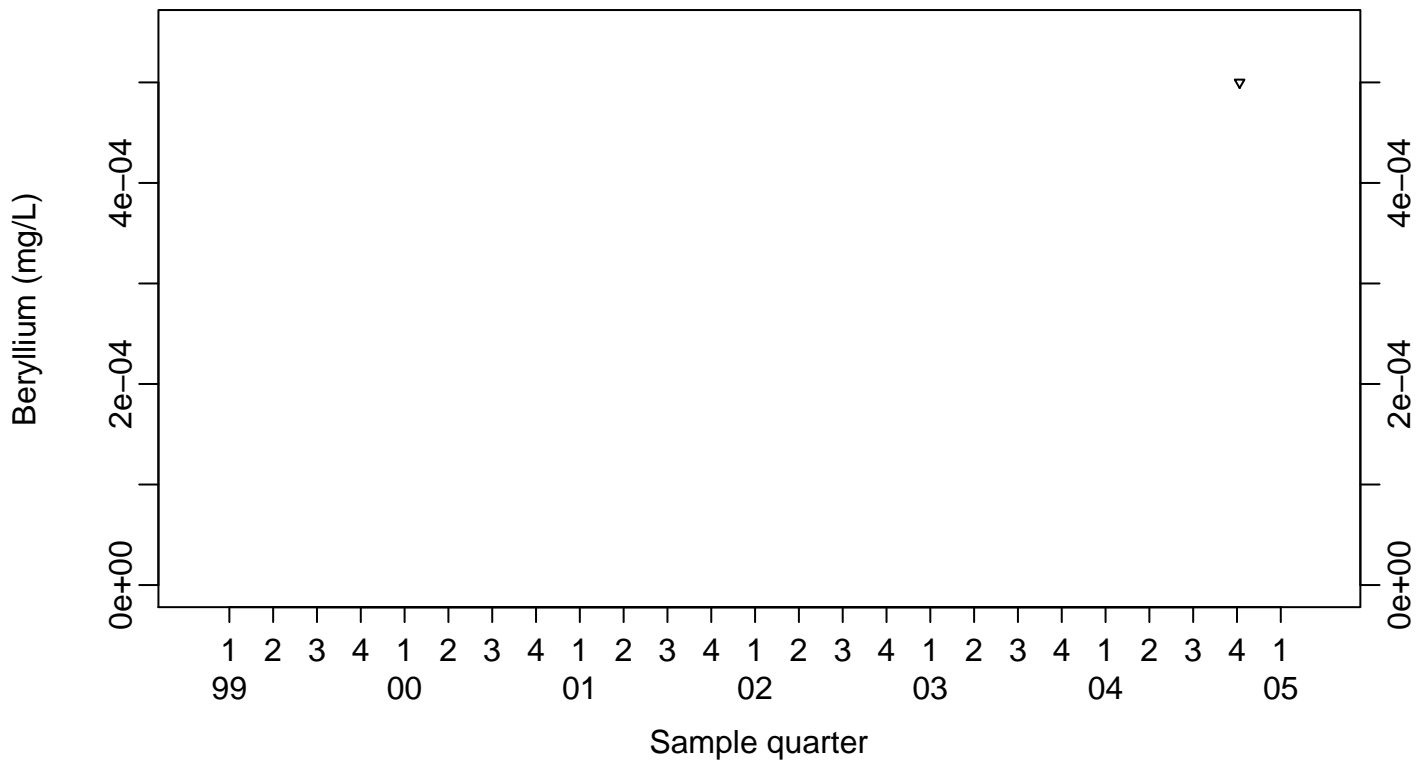
Surface Impoundments Process Water Beryllium (mg/L)

Retention Tank B801

◆ Above RL
▽ Below RL



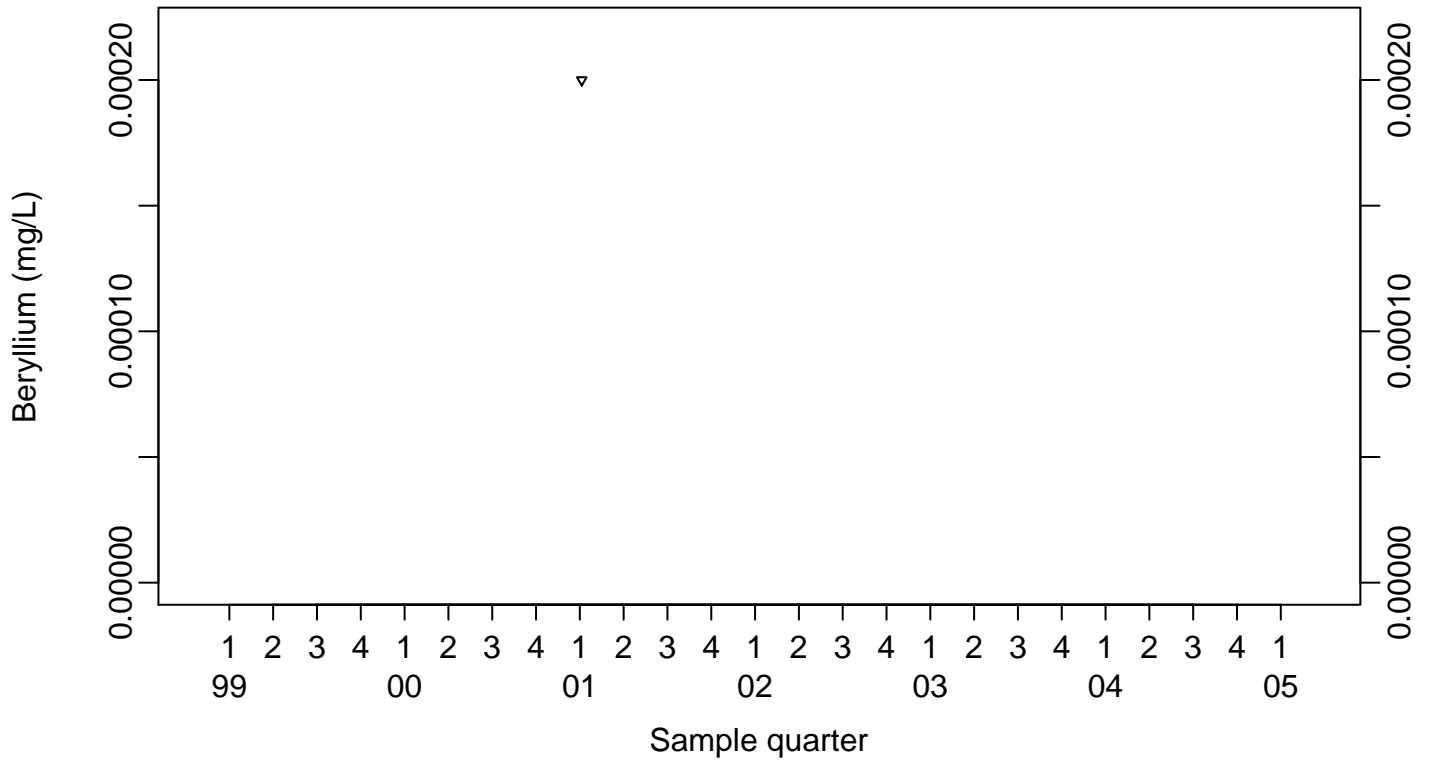
Retention Tank B806/807



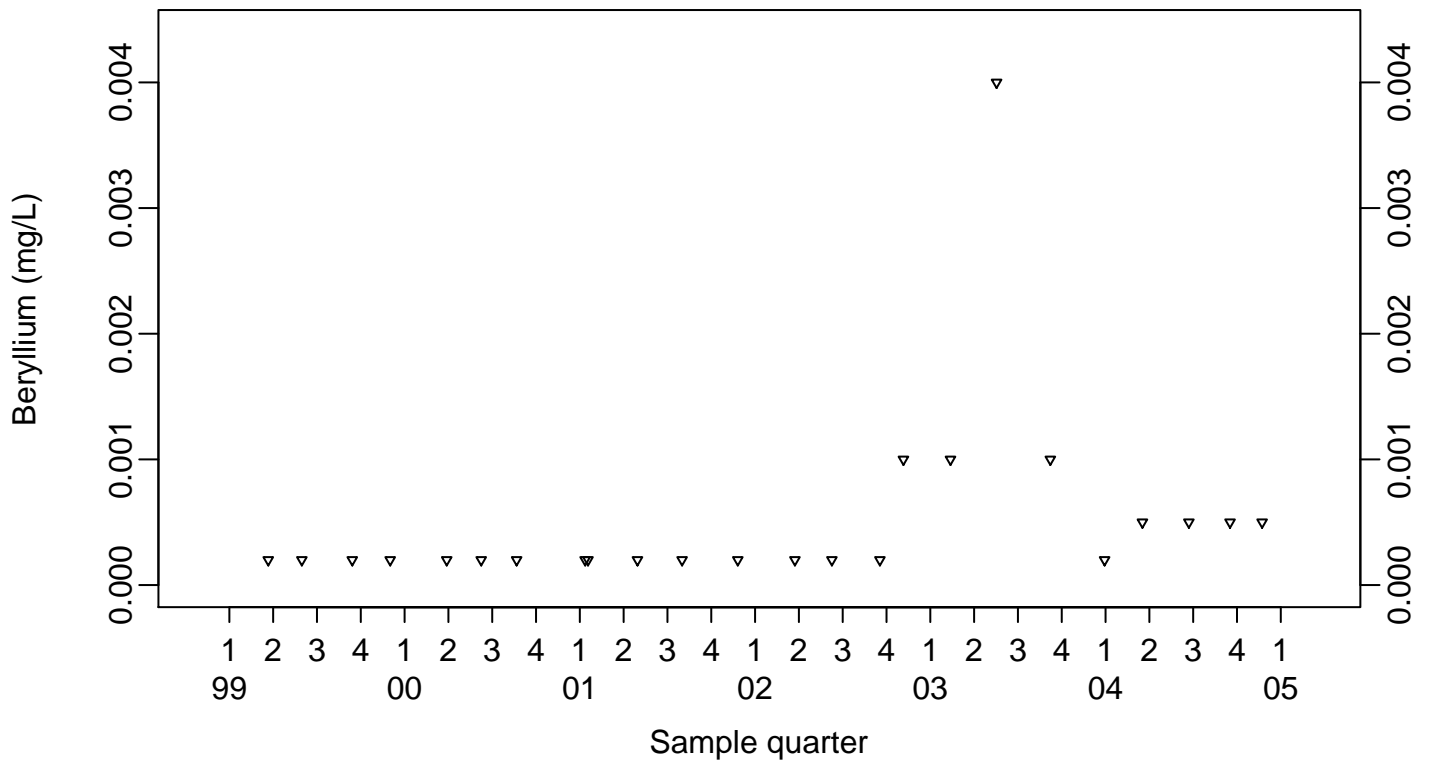
Surface Impoundments Process Water Beryllium (mg/L)

Retention Tank B817

◆ Above RL
▽ Below RL



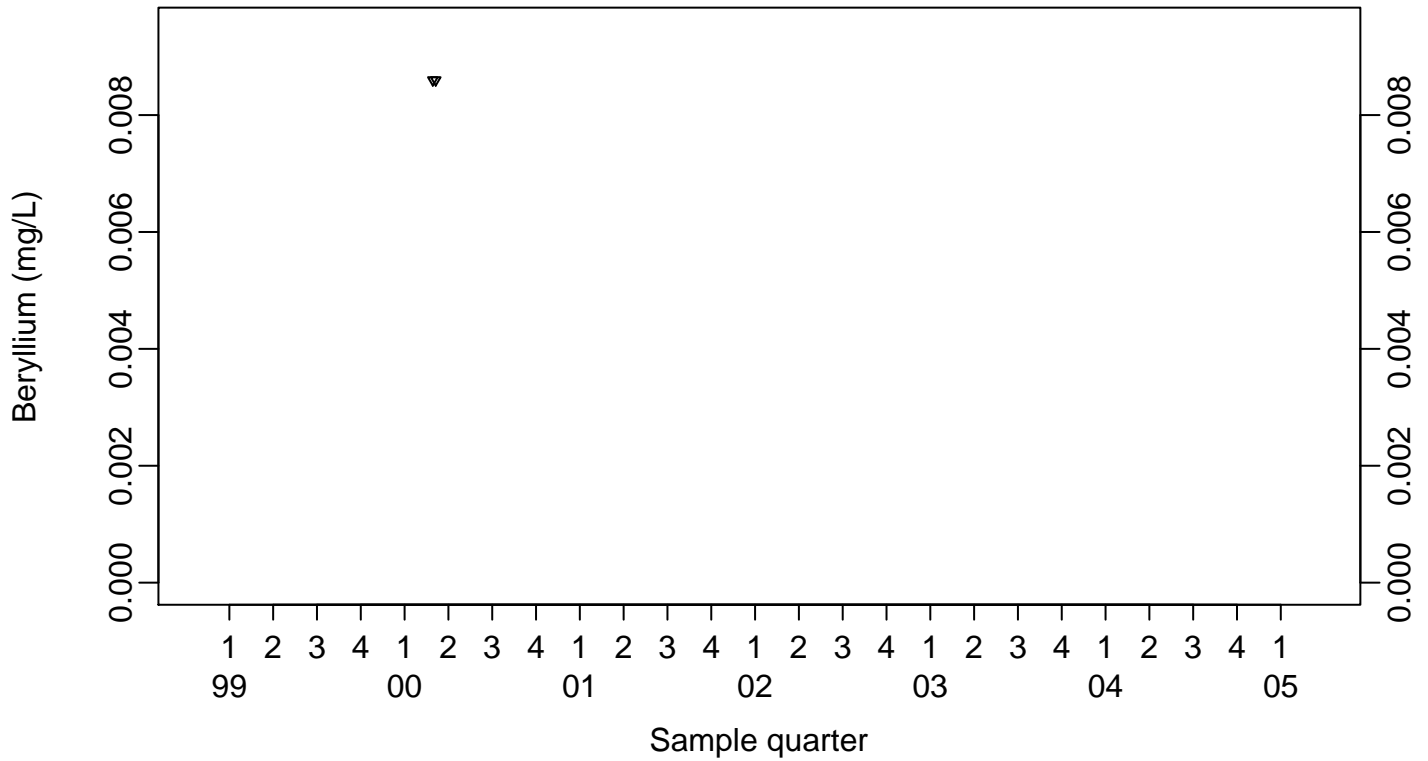
Retention Tank B823A



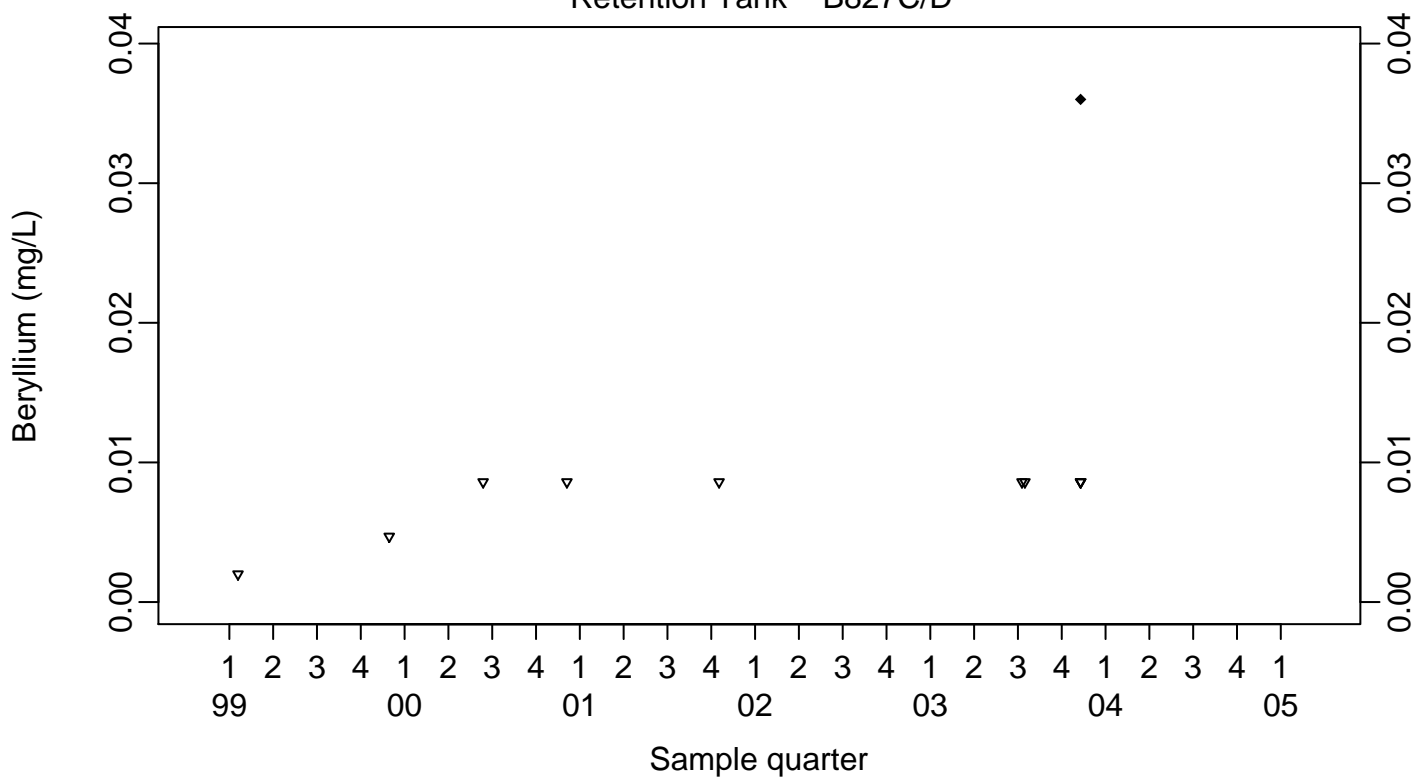
Surface Impoundments Process Water Beryllium (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



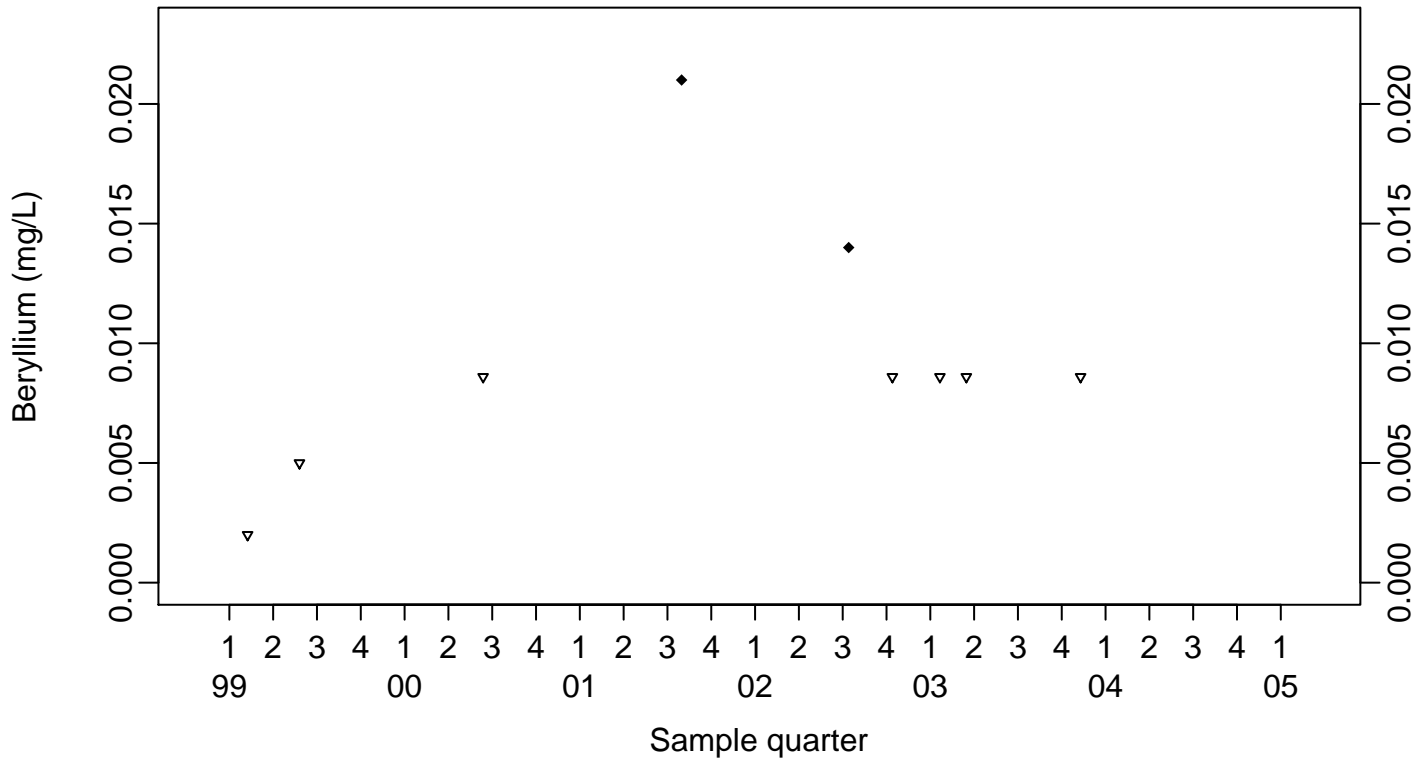
Retention Tank B827C/D



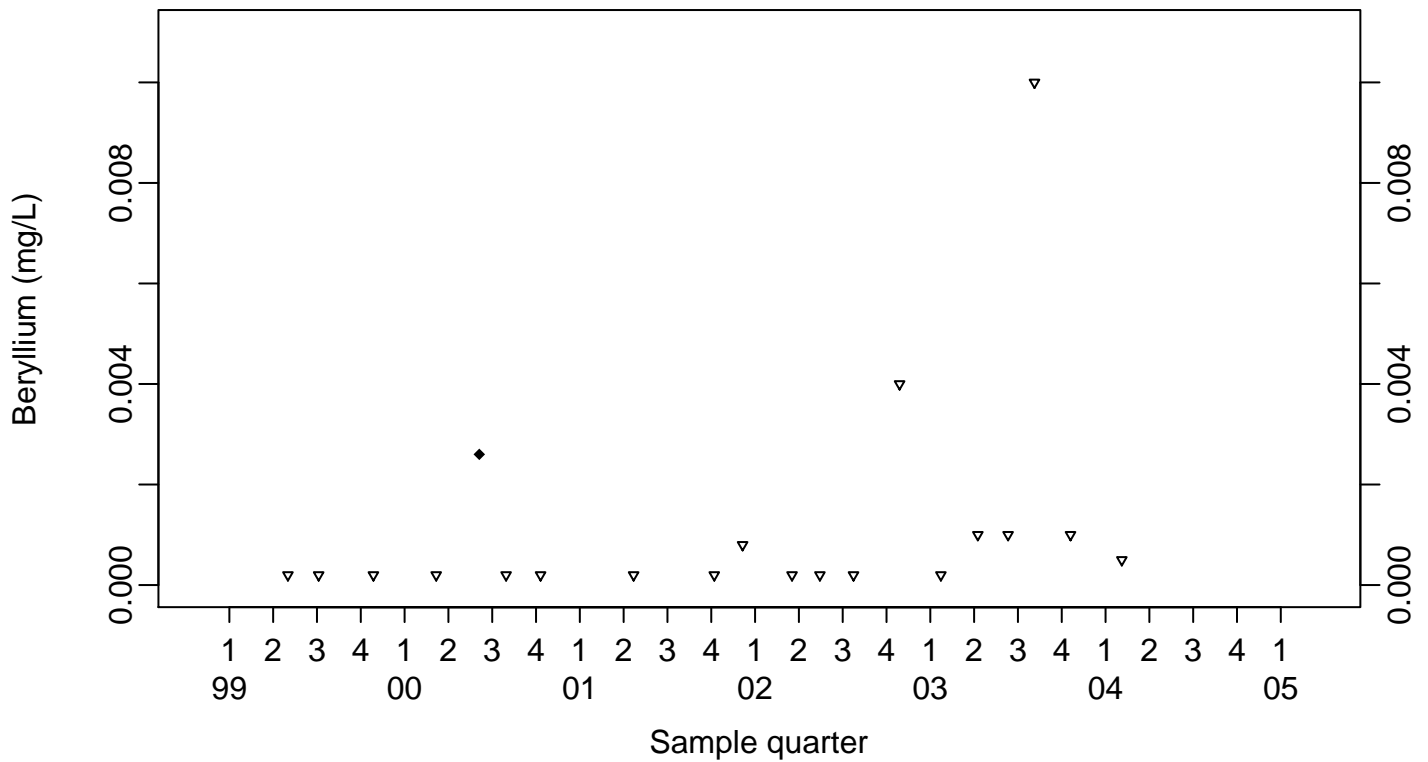
Surface Impoundments Process Water Beryllium (mg/L)

Retention Tank B827E

- ◆ Above RL
- ▽ Below RL



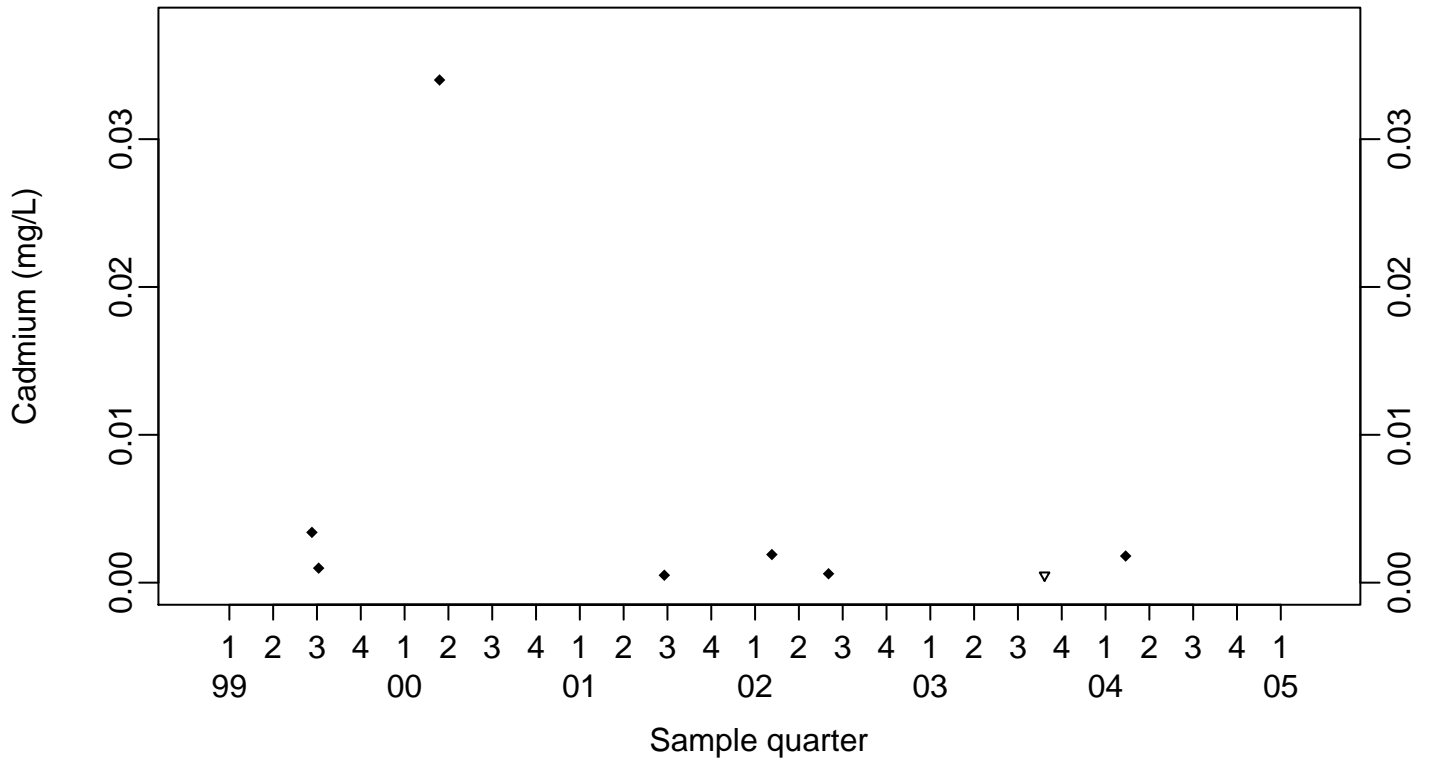
Retention Tank B851



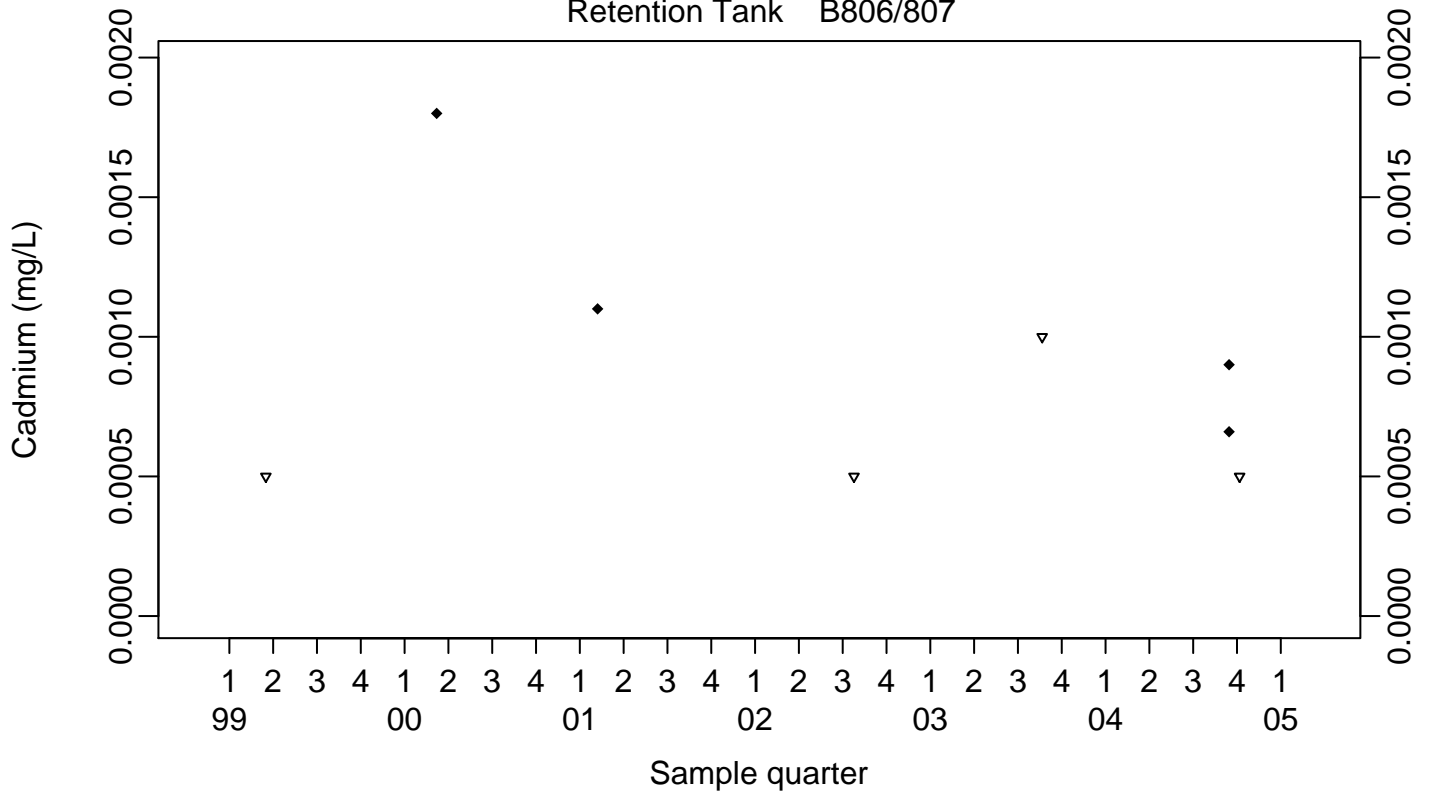
Surface Impoundments Process Water Cadmium (mg/L)

Retention Tank B801

◆ Above RL
▽ Below RL



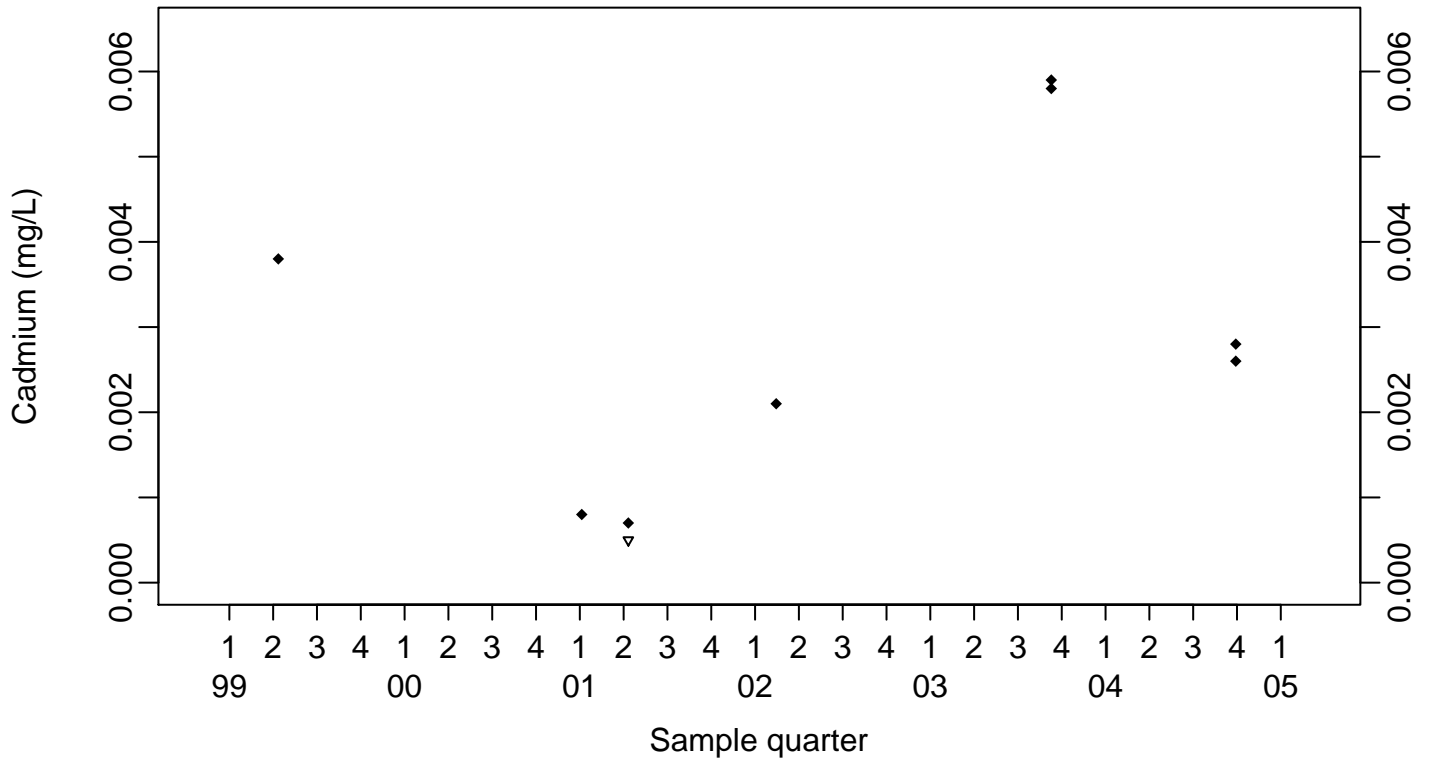
Retention Tank B806/807



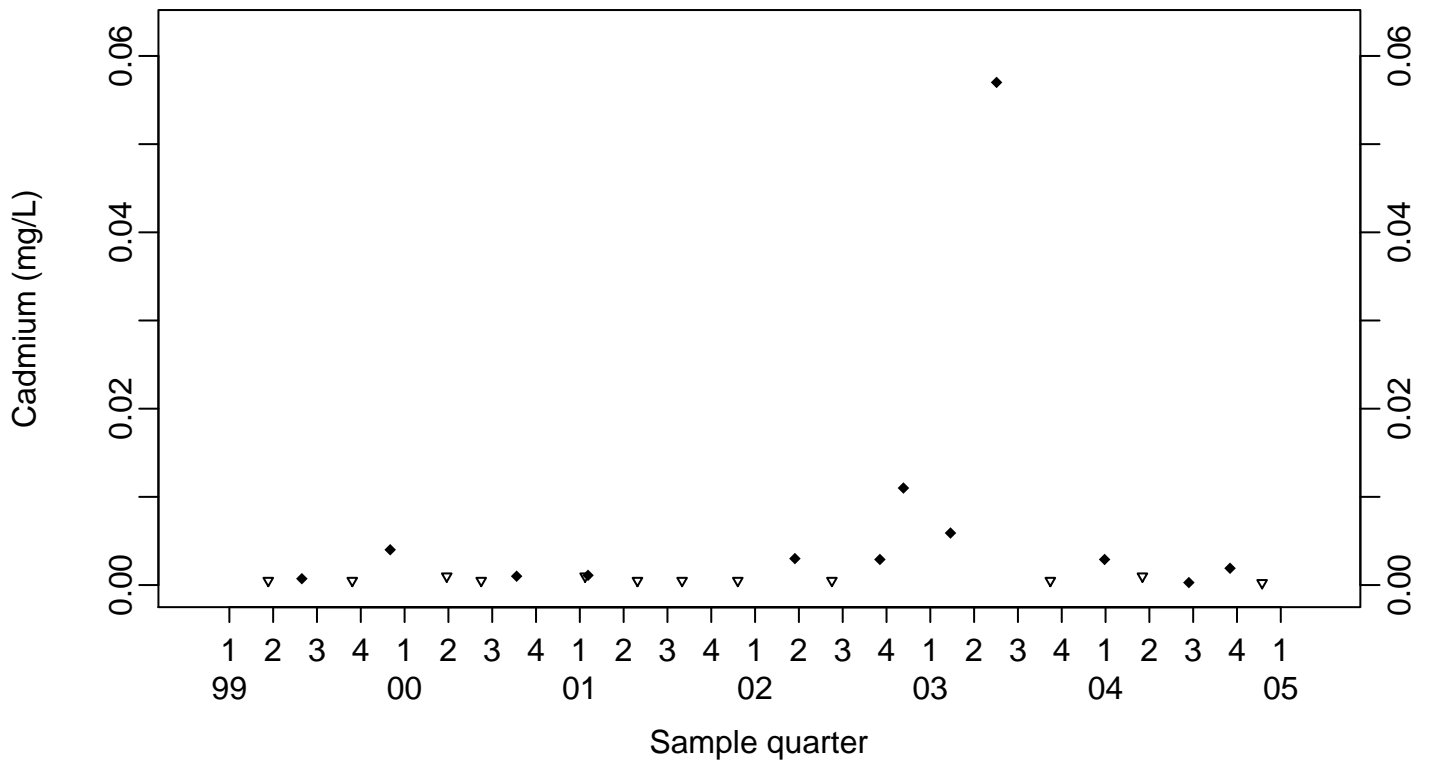
Surface Impoundments Process Water Cadmium (mg/L)

Retention Tank B817

◆ Above RL
▽ Below RL



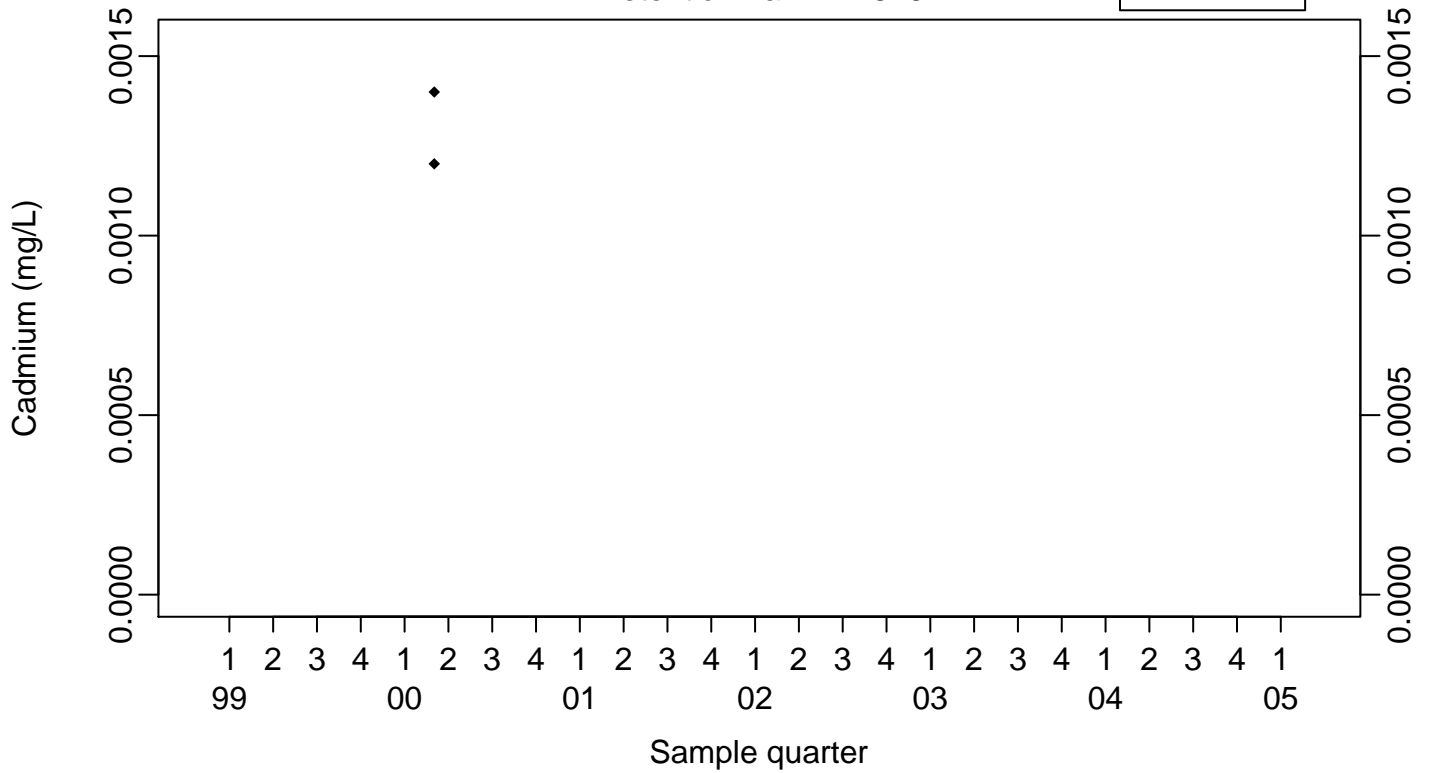
Retention Tank B823A



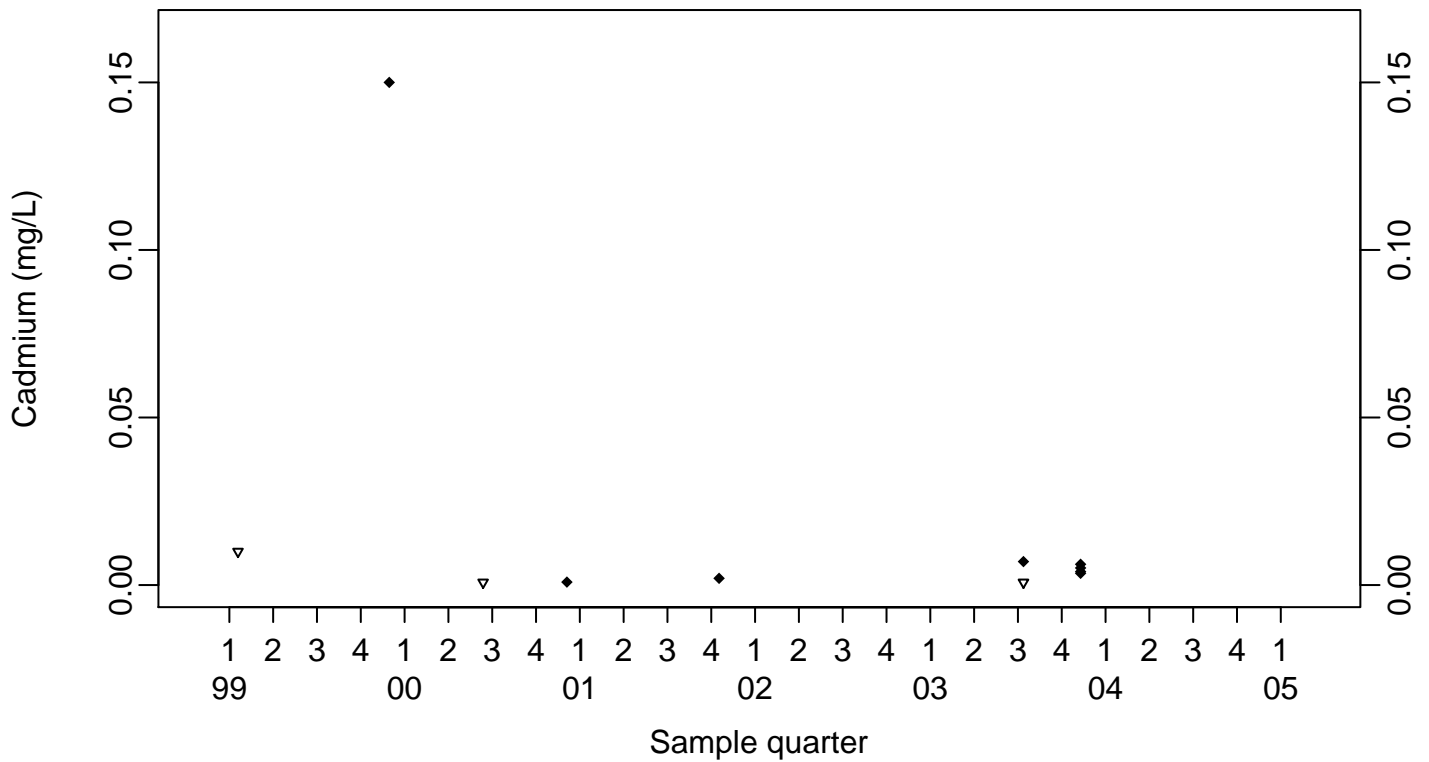
Surface Impoundments Process Water Cadmium (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



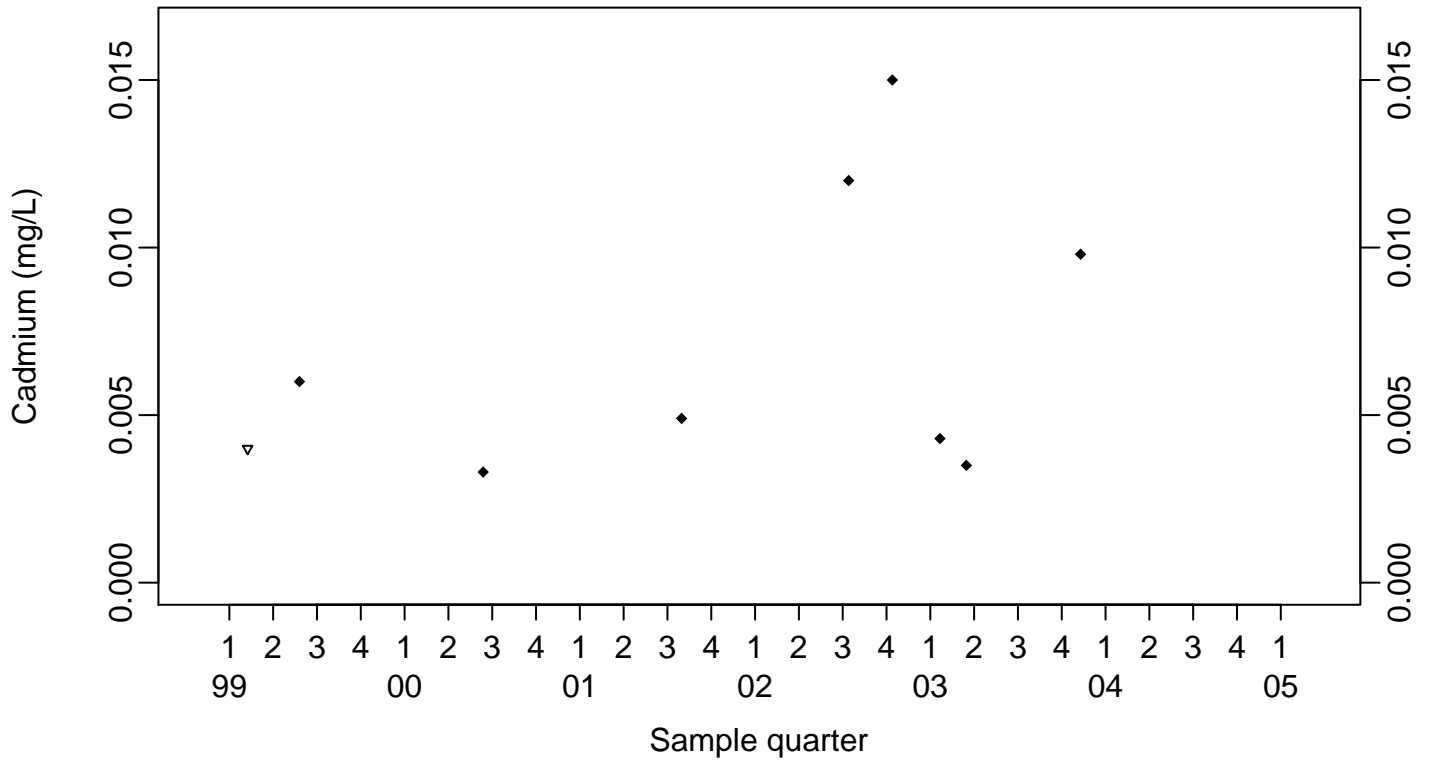
Retention Tank B827C/D



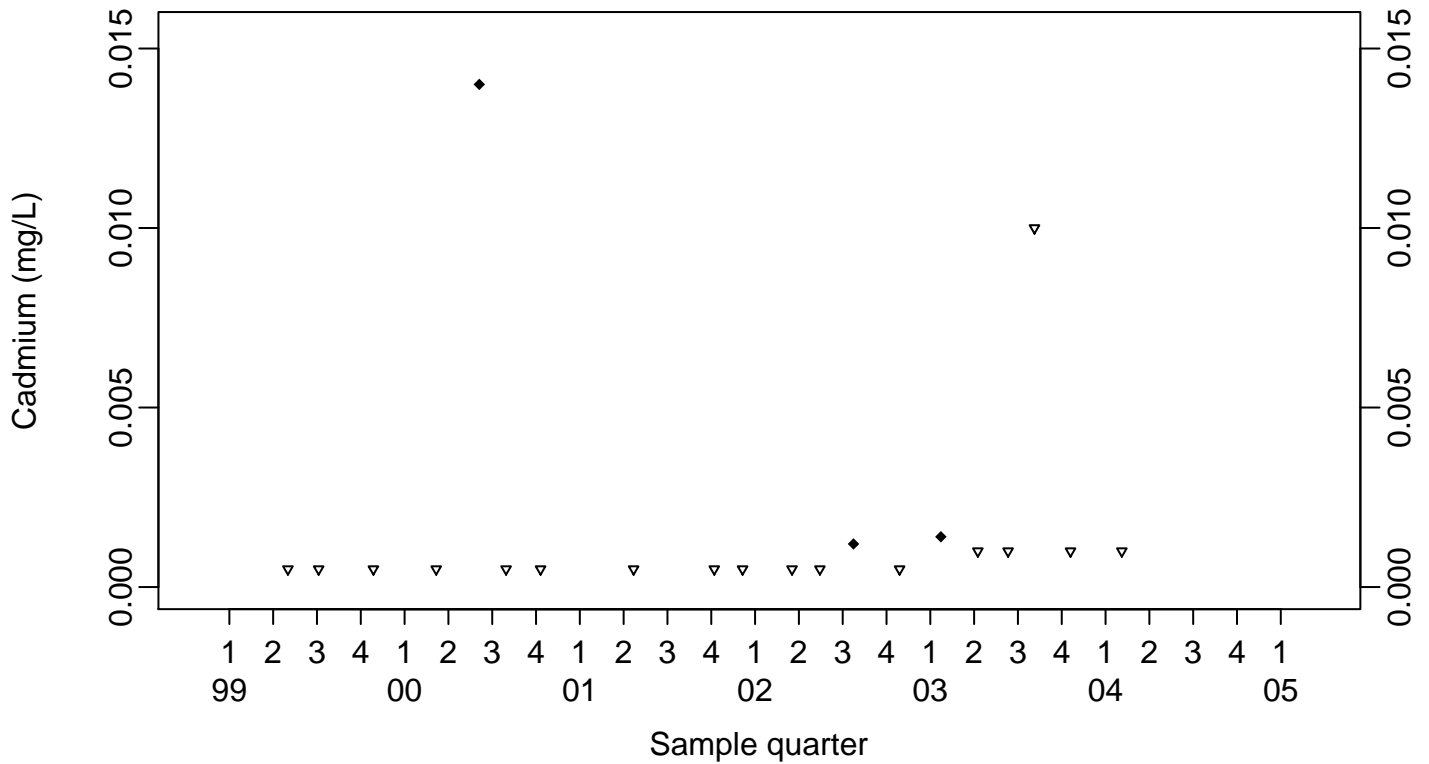
Surface Impoundments Process Water Cadmium (mg/L)

Retention Tank B827E

- ◆ Above RL
- ▽ Below RL



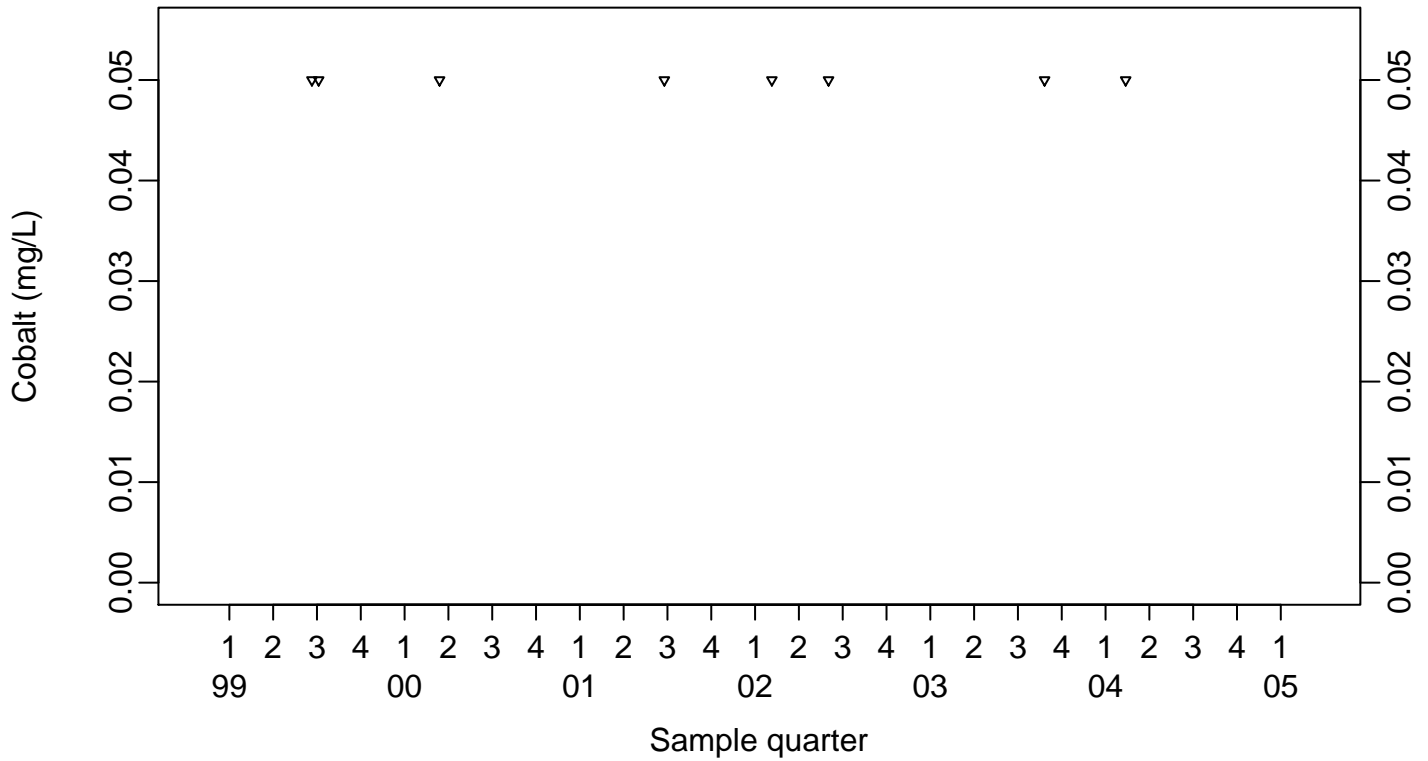
Retention Tank B851



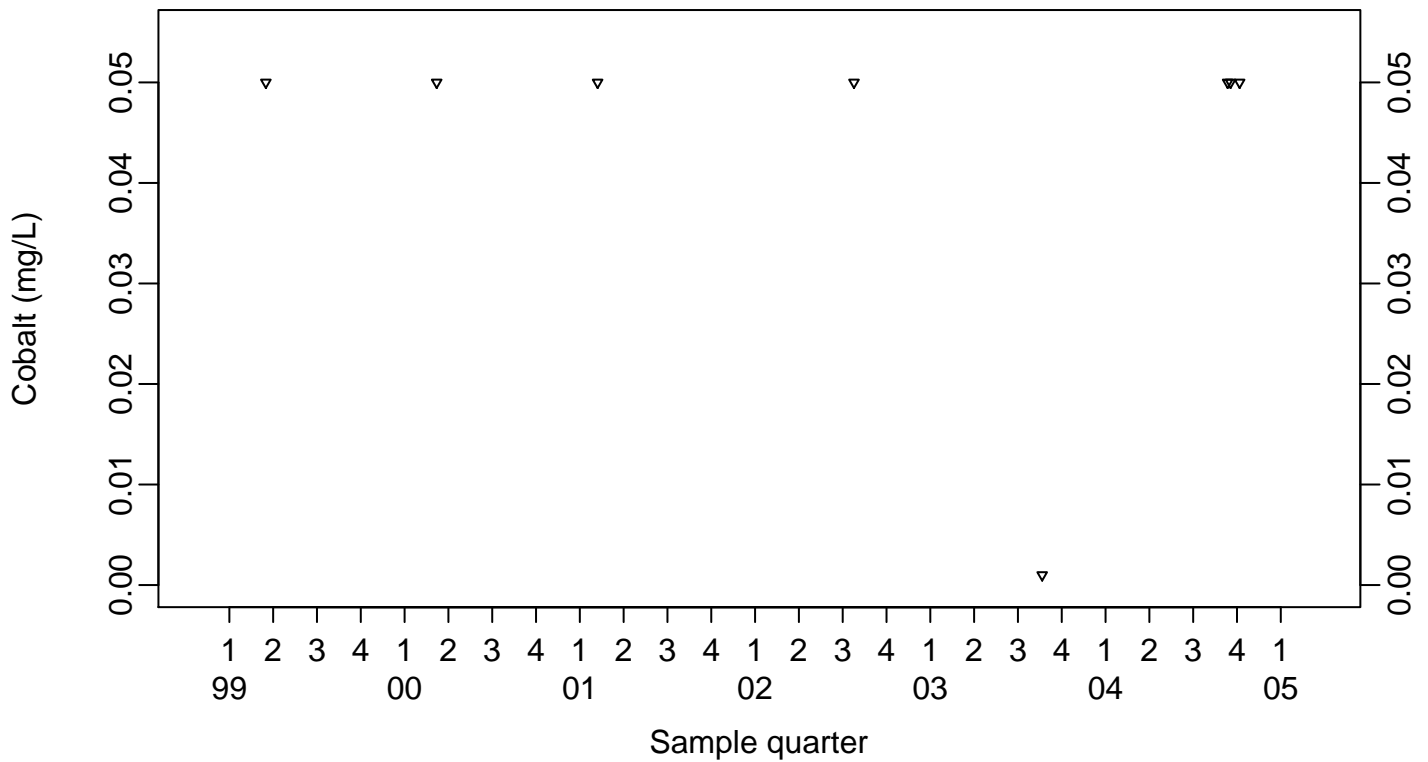
Surface Impoundments Process Water Cobalt (mg/L)

Retention Tank B801

◆ Above RL
▽ Below RL



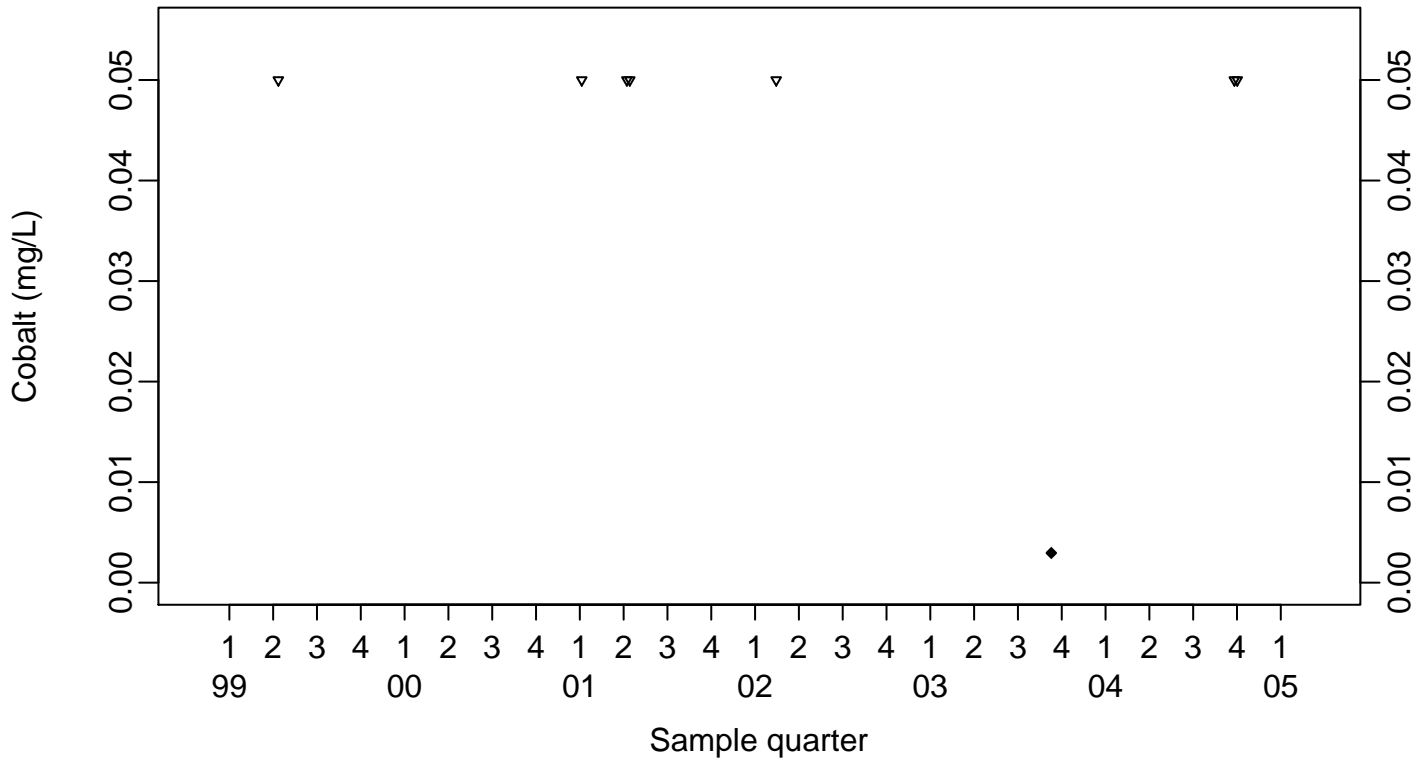
Retention Tank B806/807



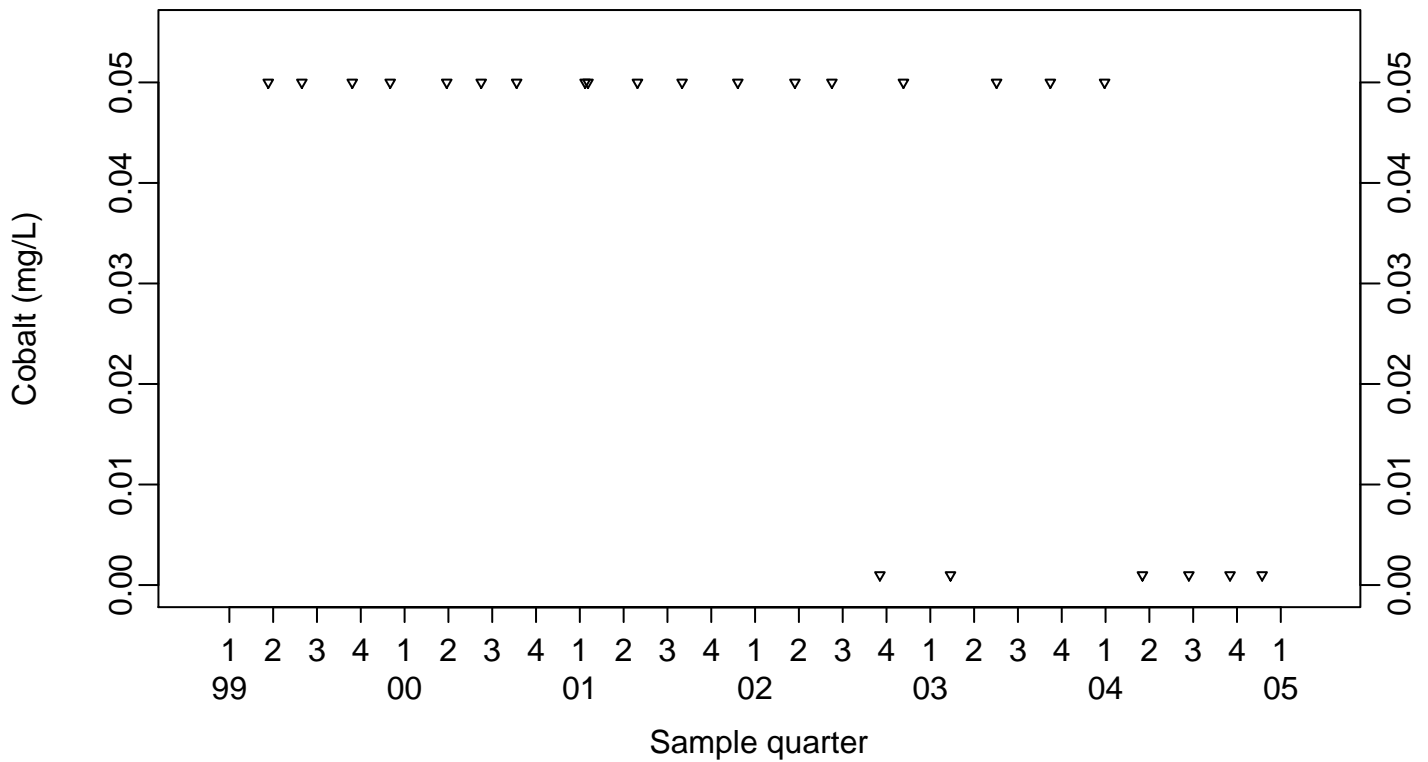
Surface Impoundments Process Water Cobalt (mg/L)

Retention Tank B817

◆ Above RL
▽ Below RL



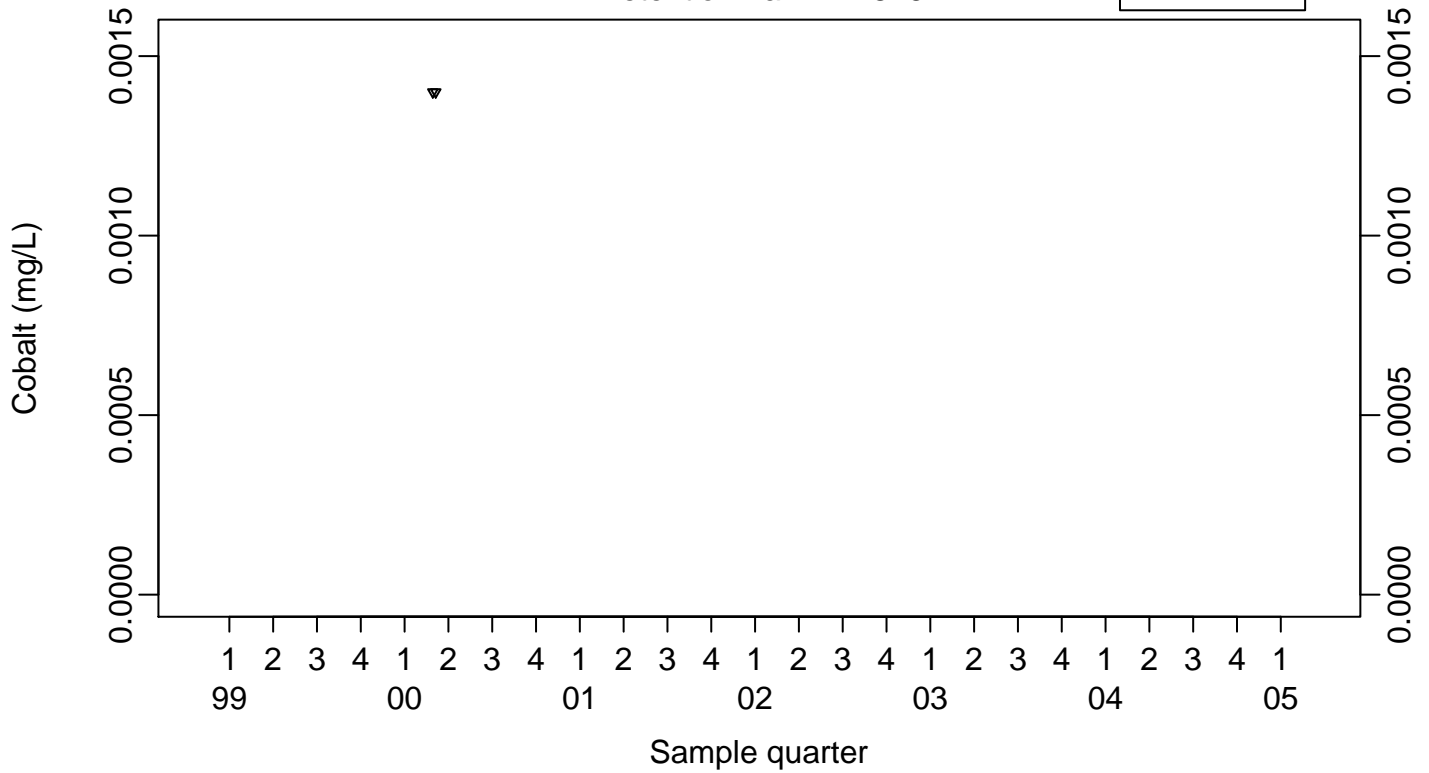
Retention Tank B823A



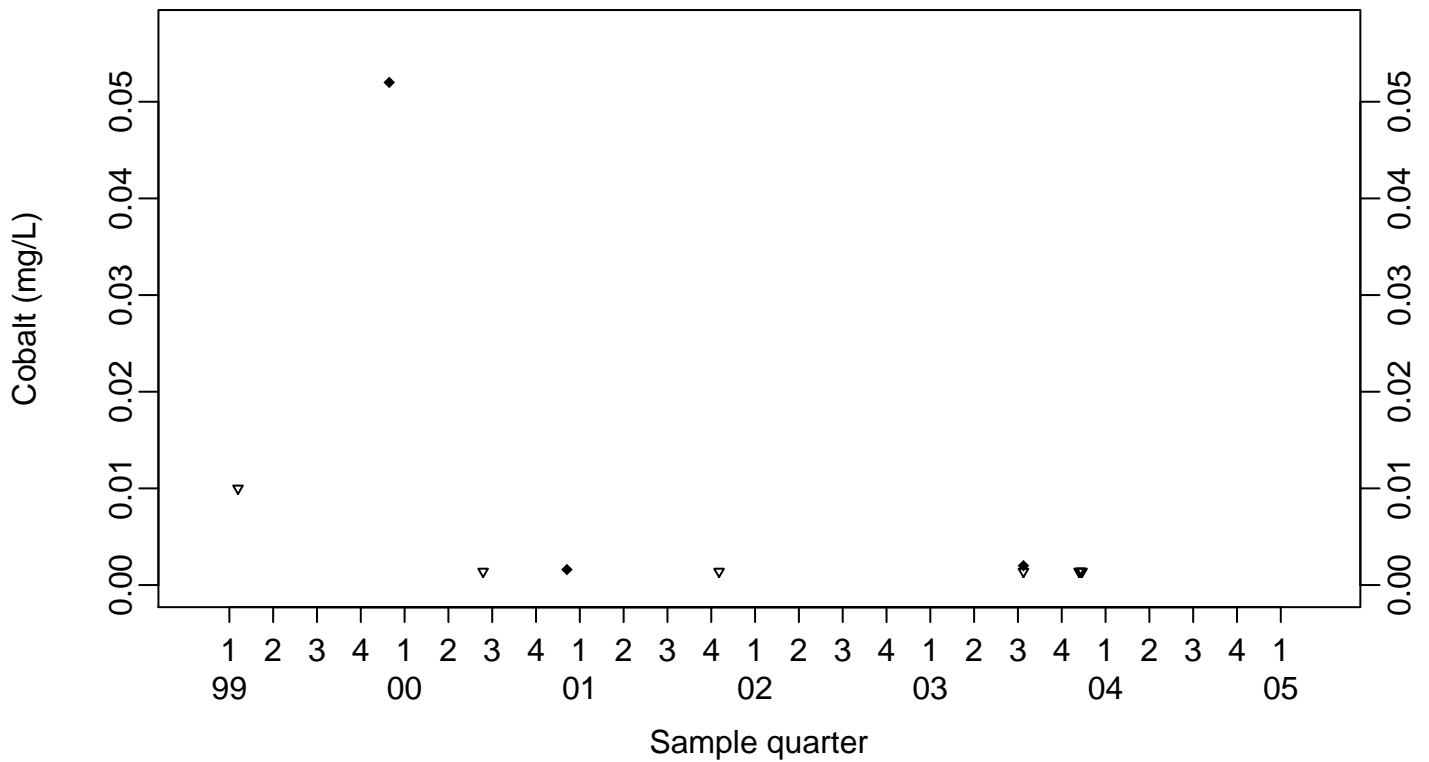
Surface Impoundments Process Water Cobalt (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



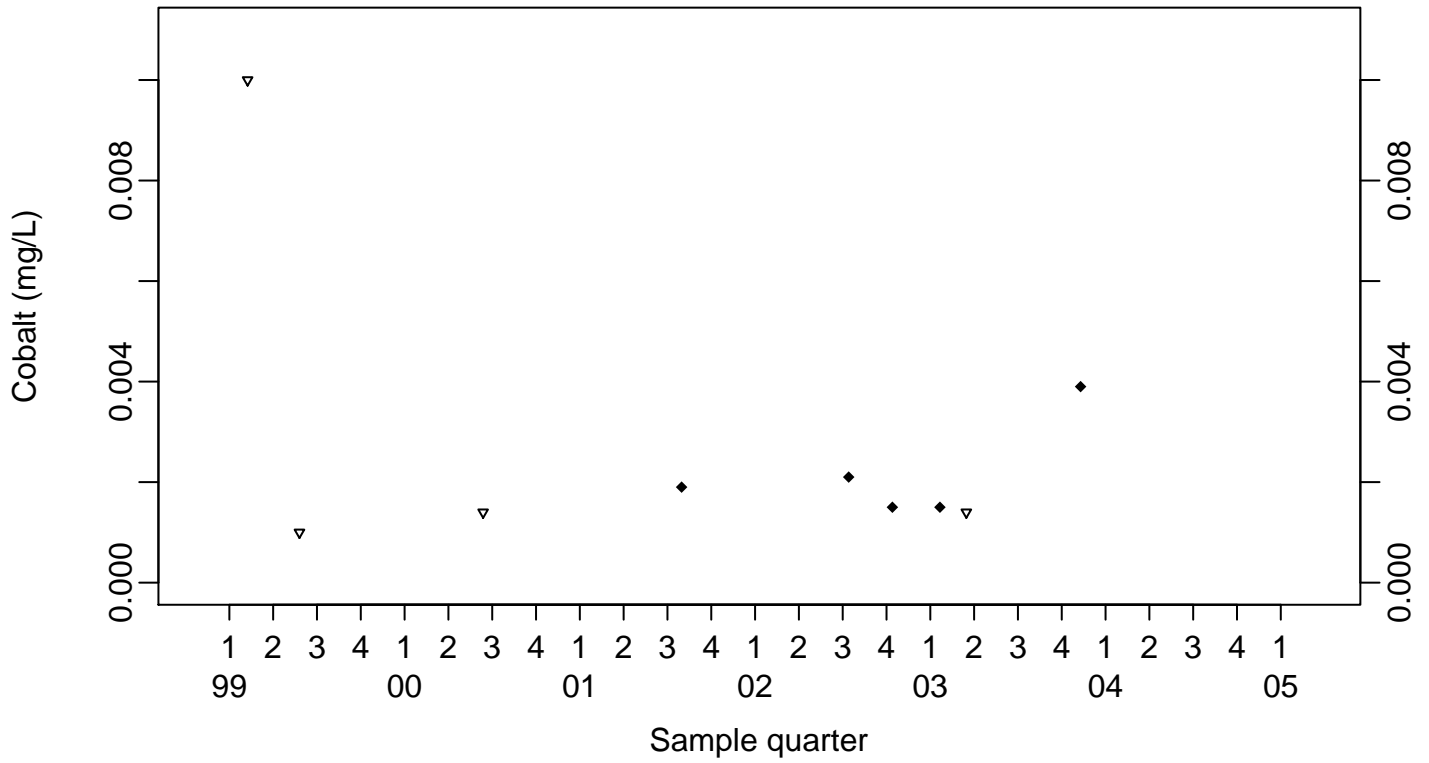
Retention Tank B827C/D



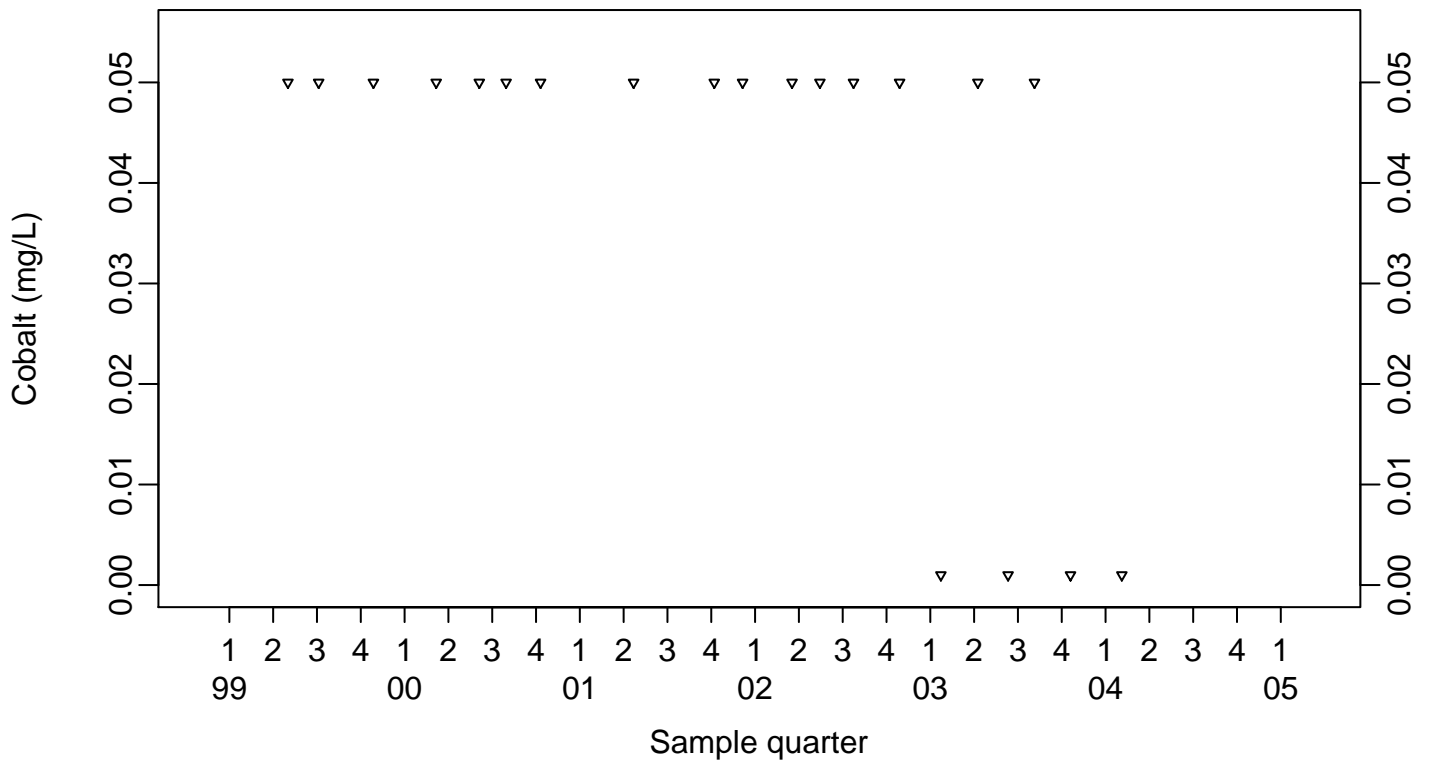
Surface Impoundments Process Water Cobalt (mg/L)

Retention Tank B827E

- ◆ Above RL
- ▽ Below RL



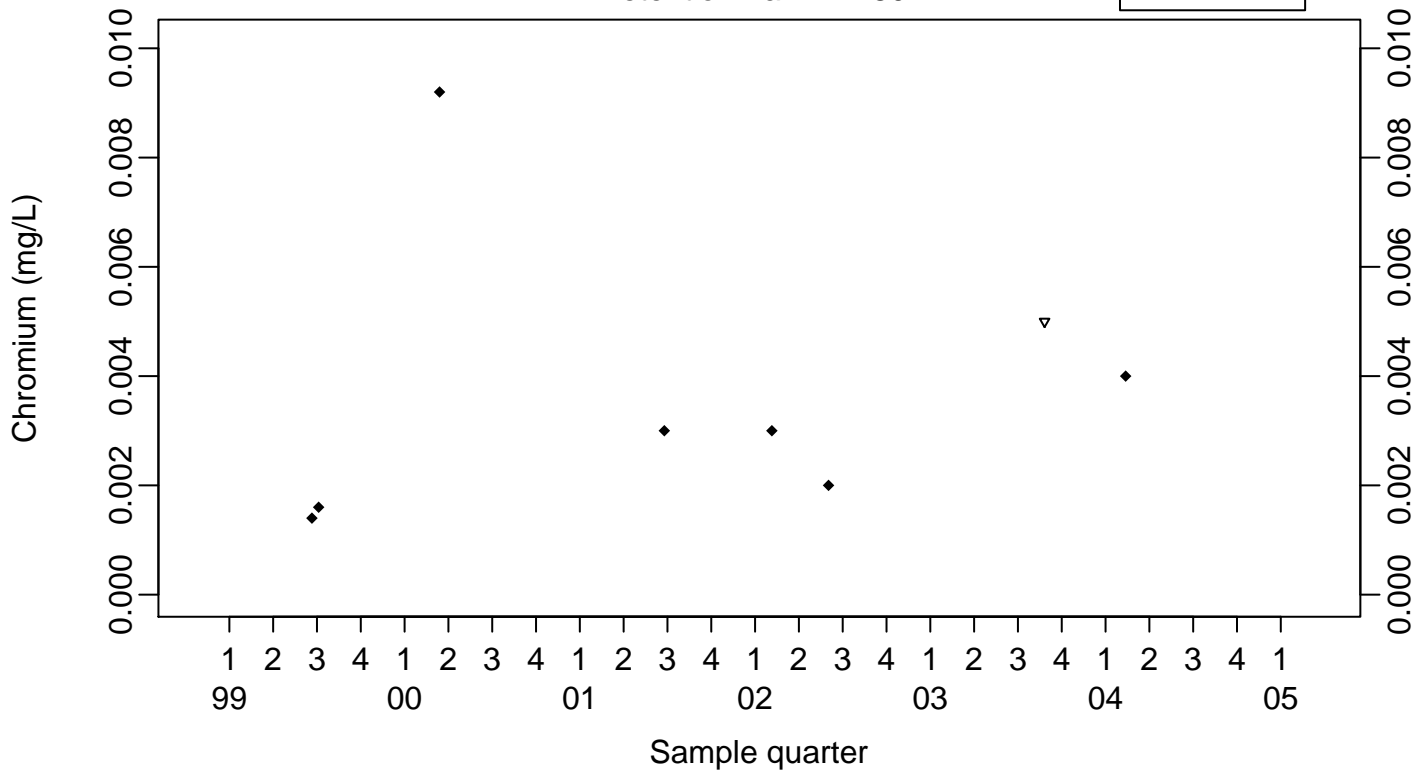
Retention Tank B851



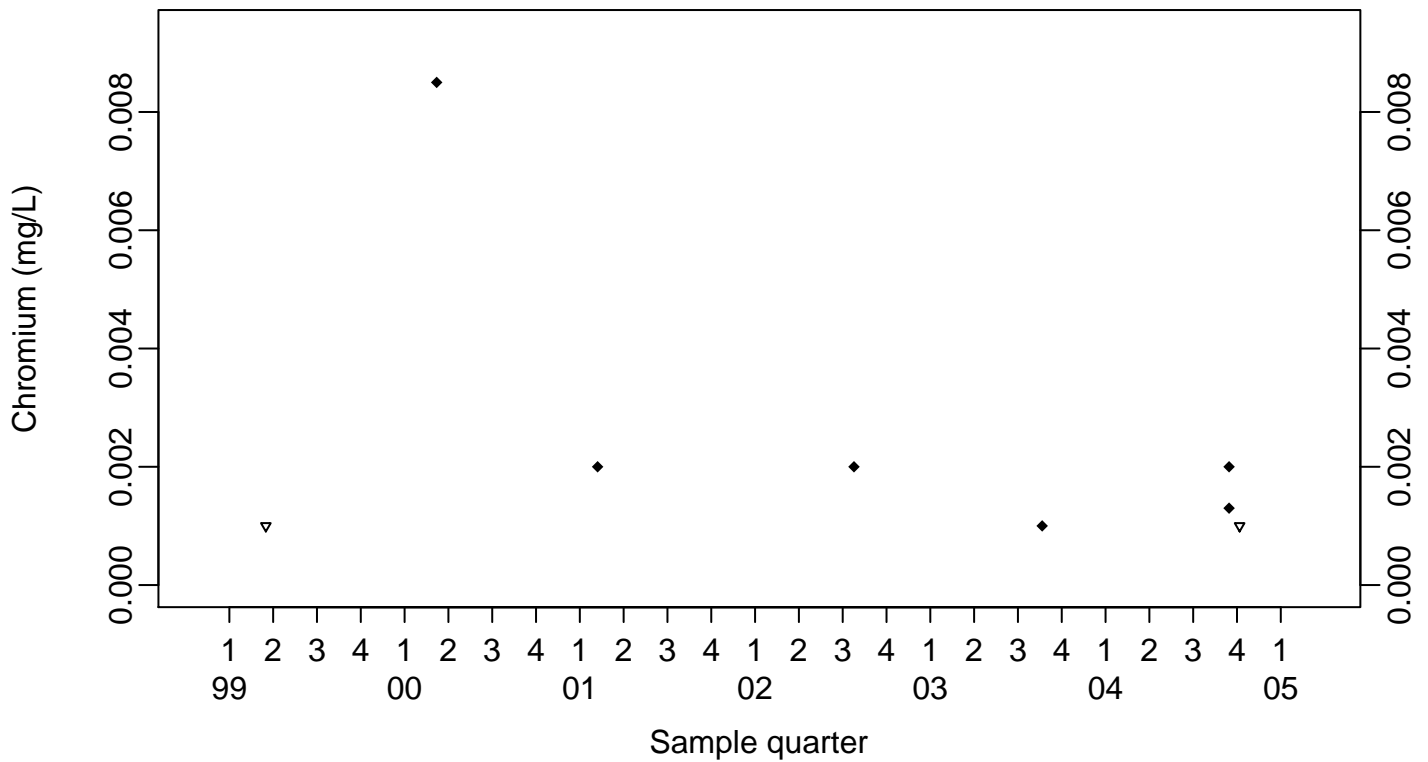
Surface Impoundments Process Water Chromium (mg/L)

Retention Tank B801

◆ Above RL
▽ Below RL



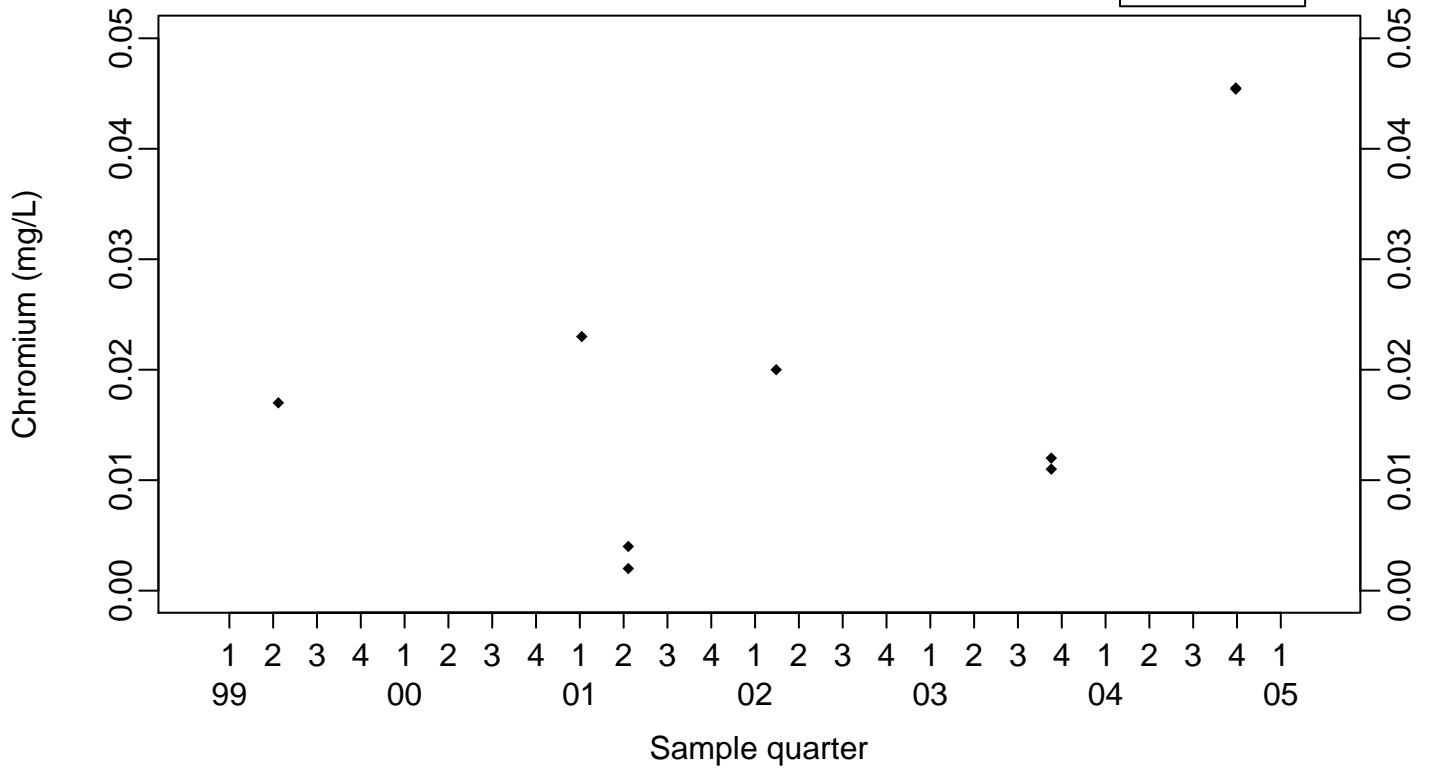
Retention Tank B806/807



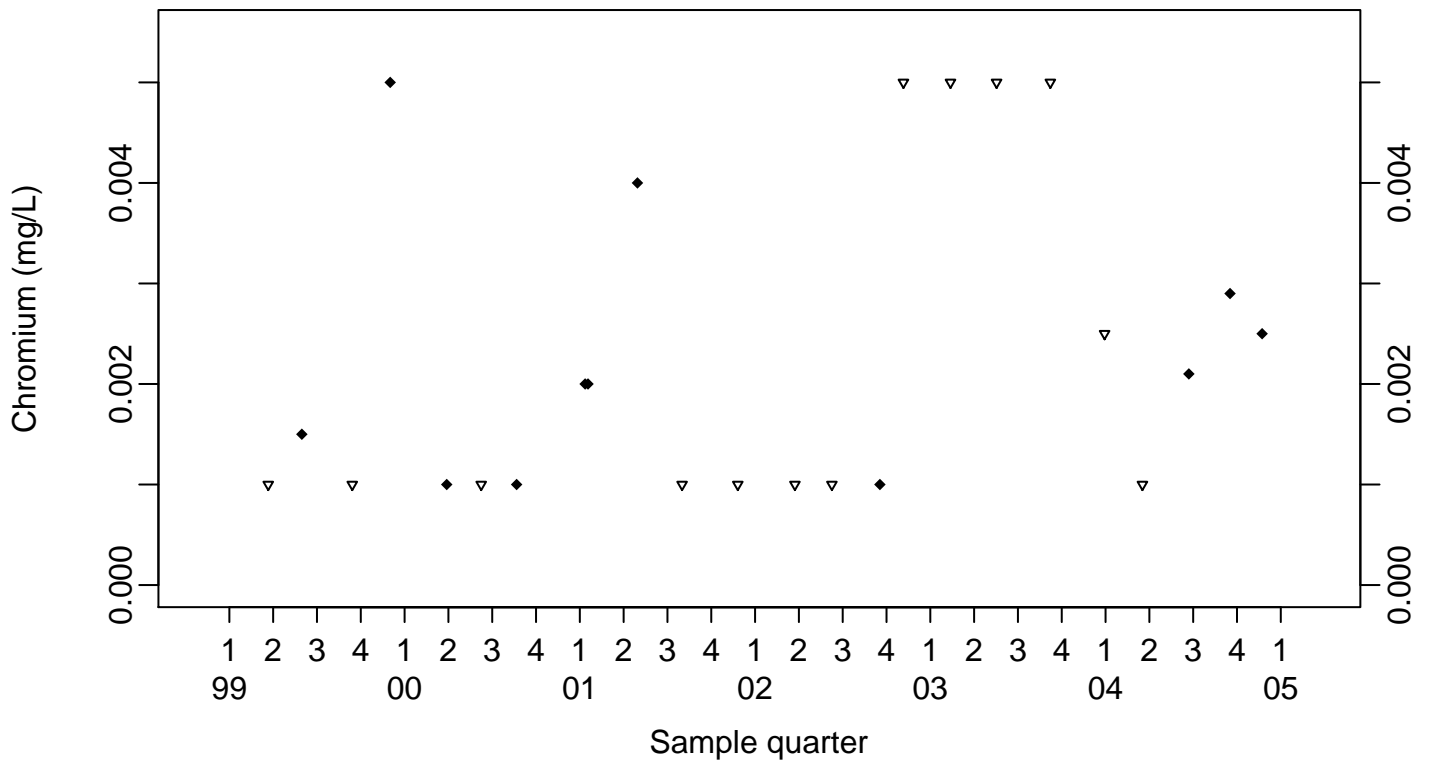
Surface Impoundments Process Water Chromium (mg/L)

Retention Tank B817

◆ Above RL
▽ Below RL



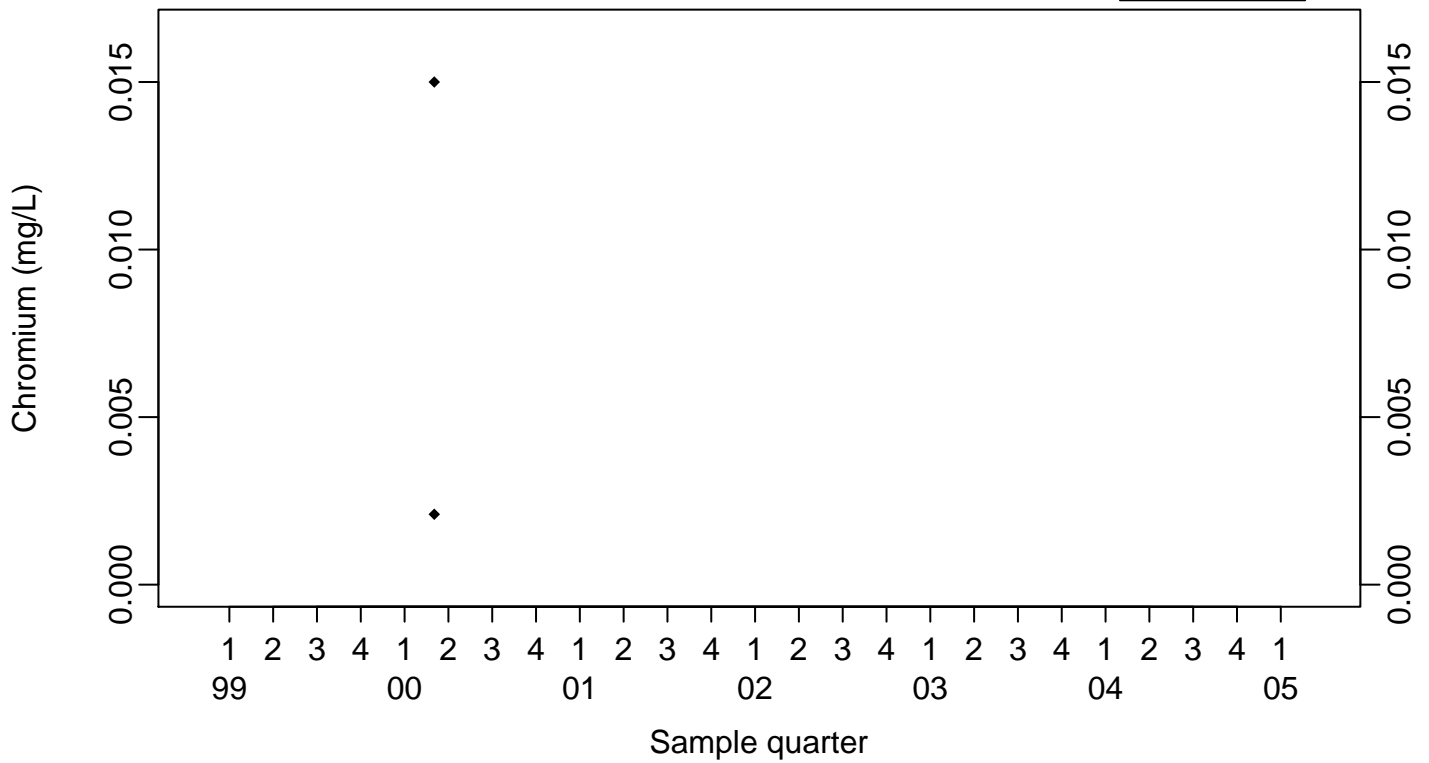
Retention Tank B823A



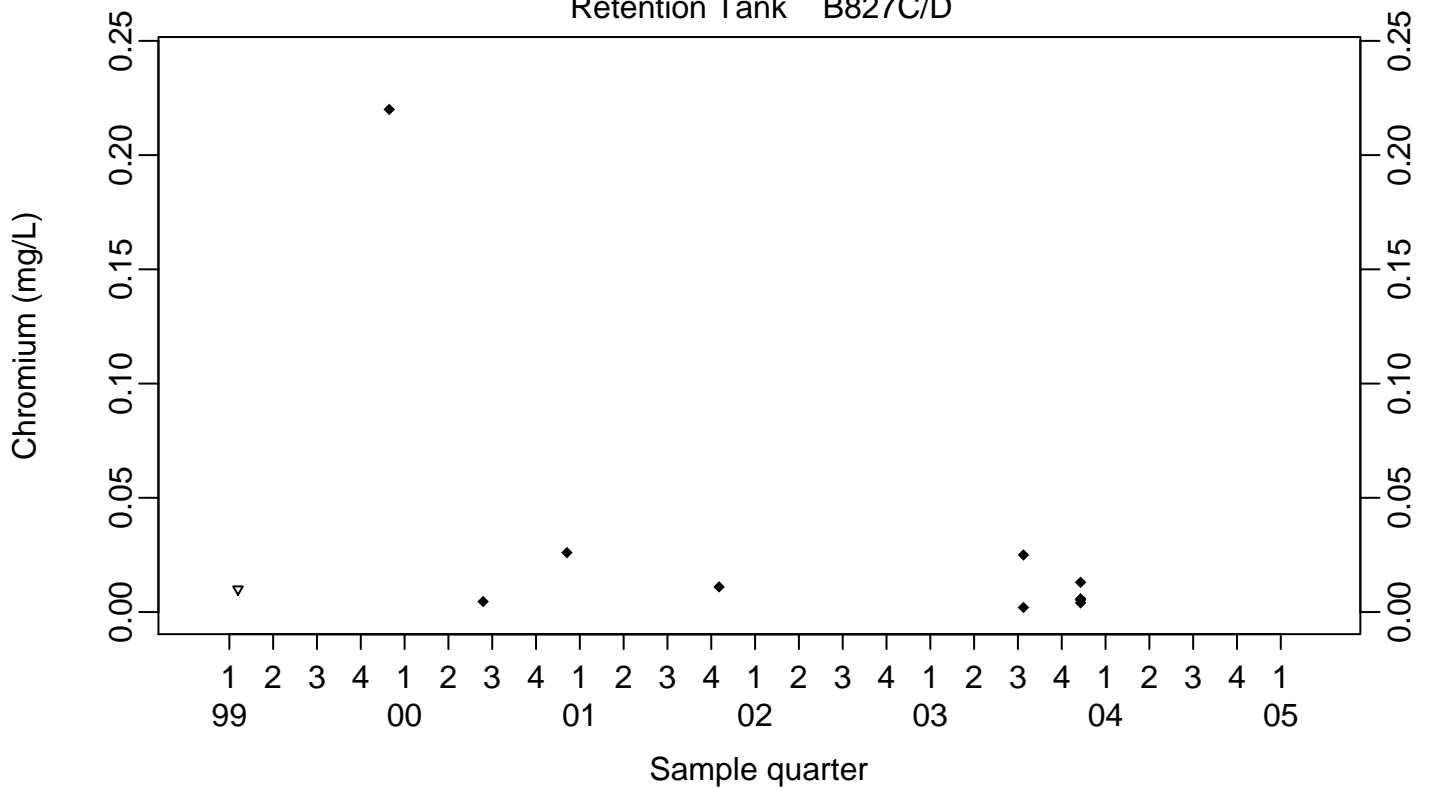
Surface Impoundments Process Water Chromium (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



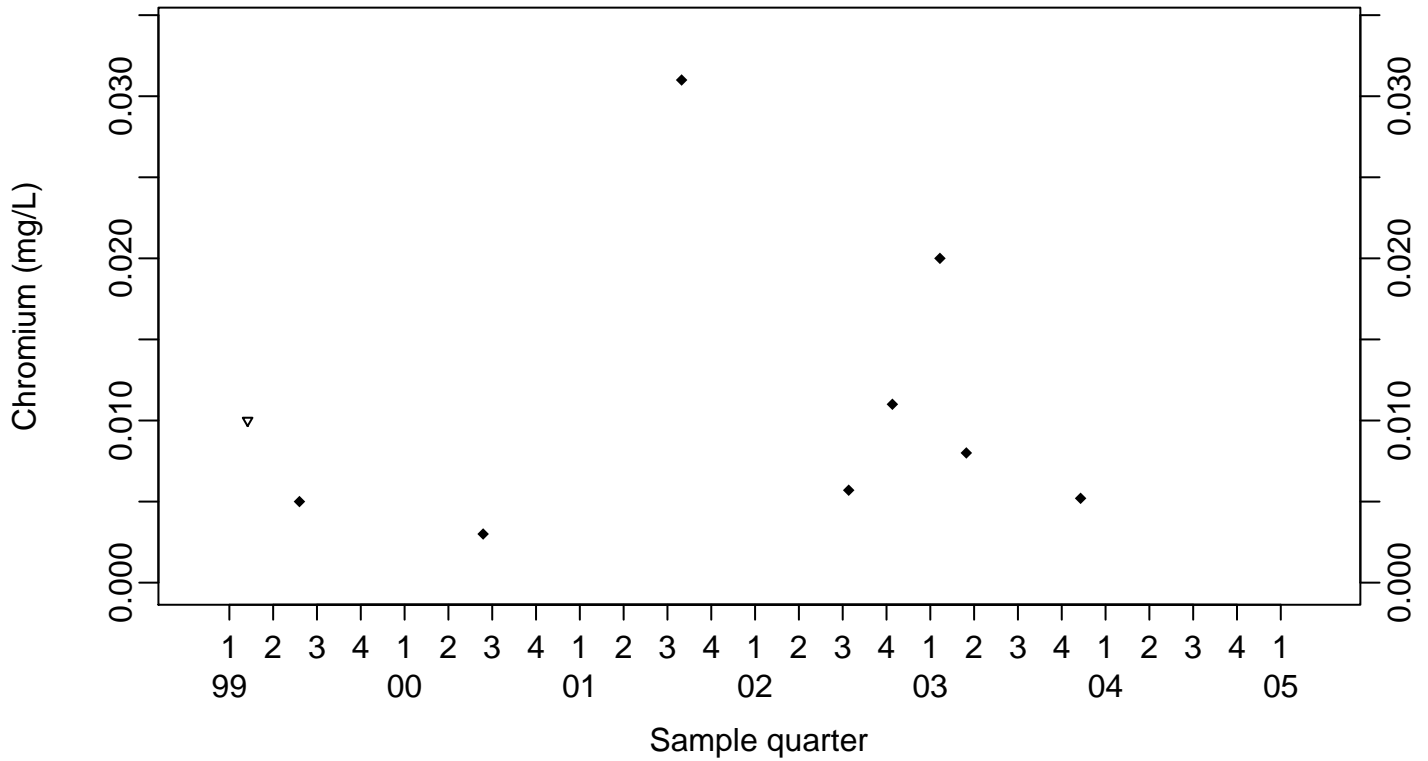
Retention Tank B827C/D



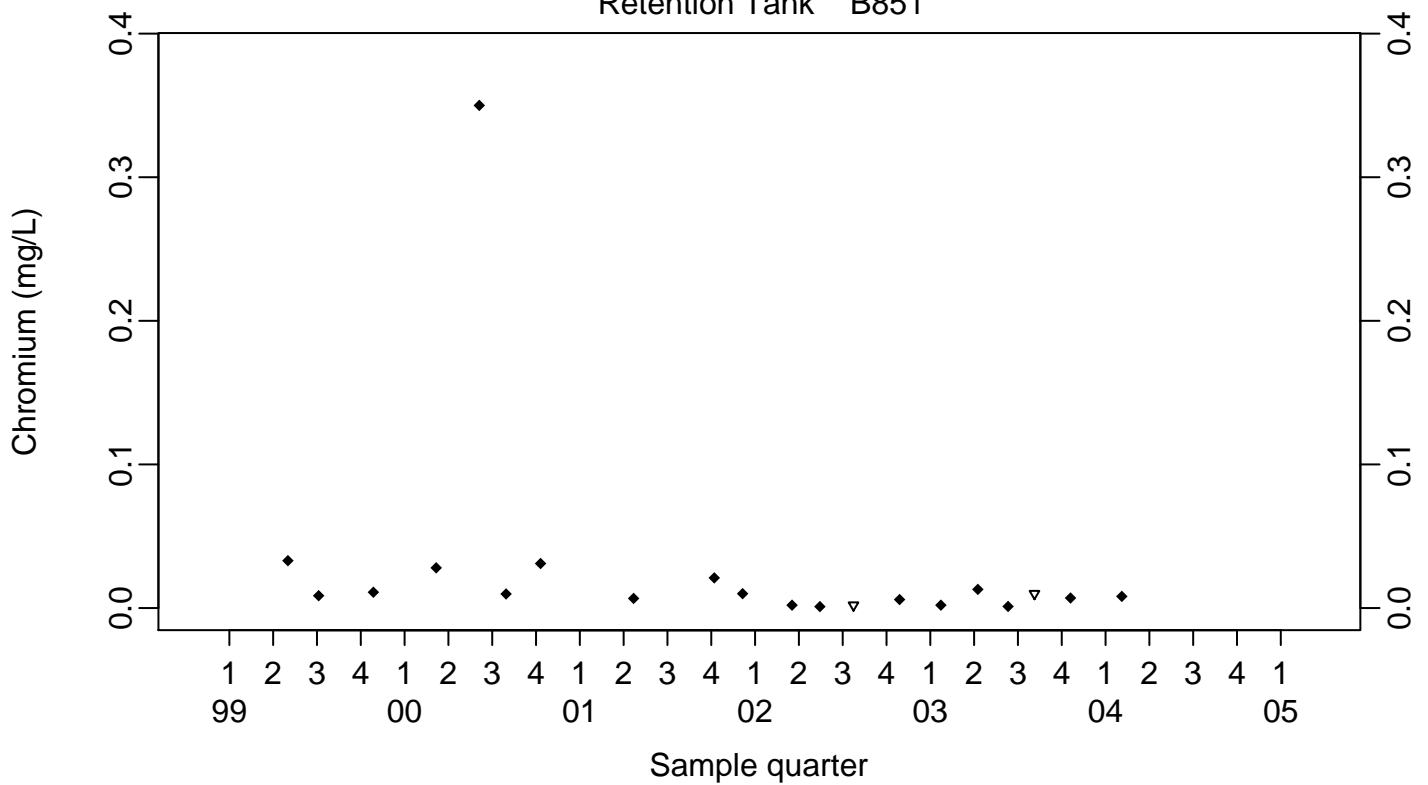
Surface Impoundments Process Water Chromium (mg/L)

Retention Tank B827E

◆ Above RL
▽ Below RL

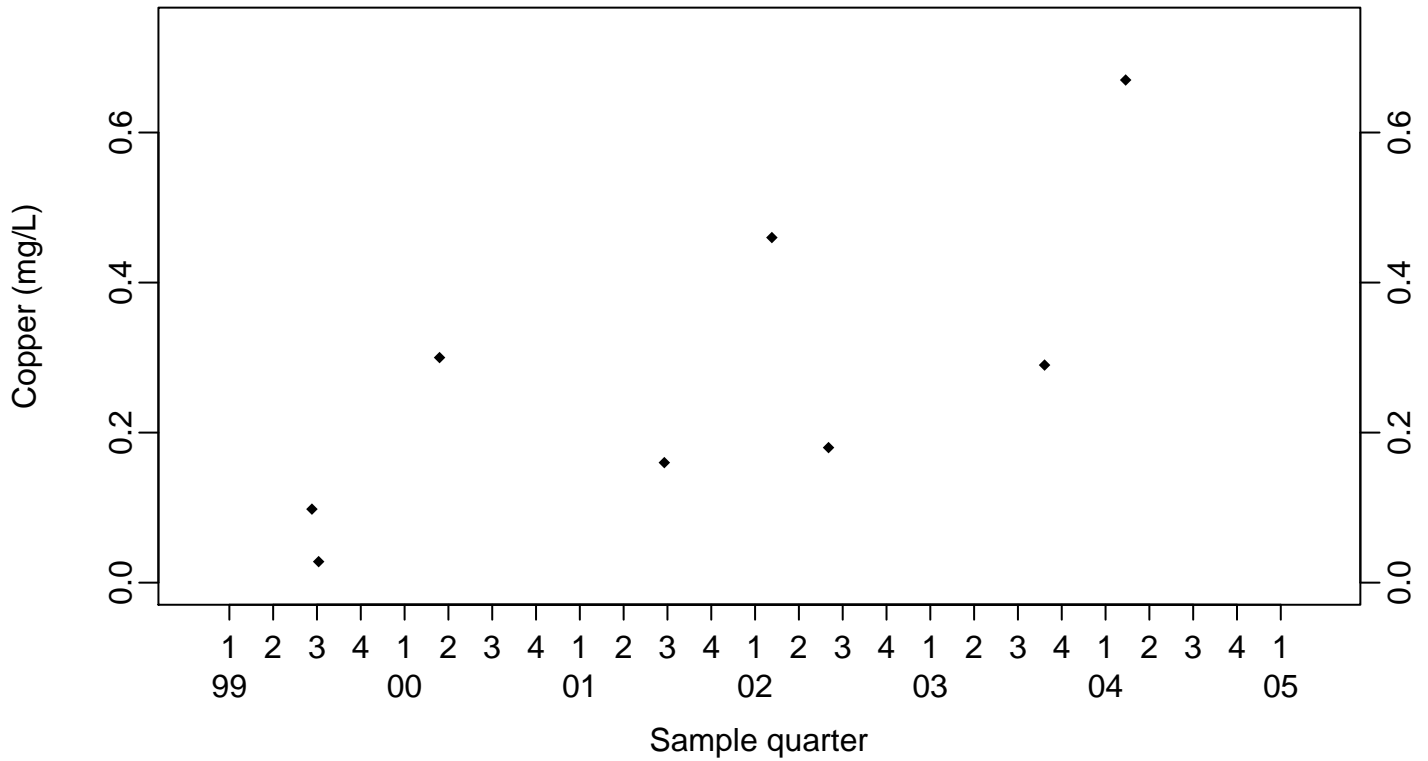
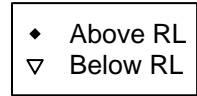


Retention Tank B851

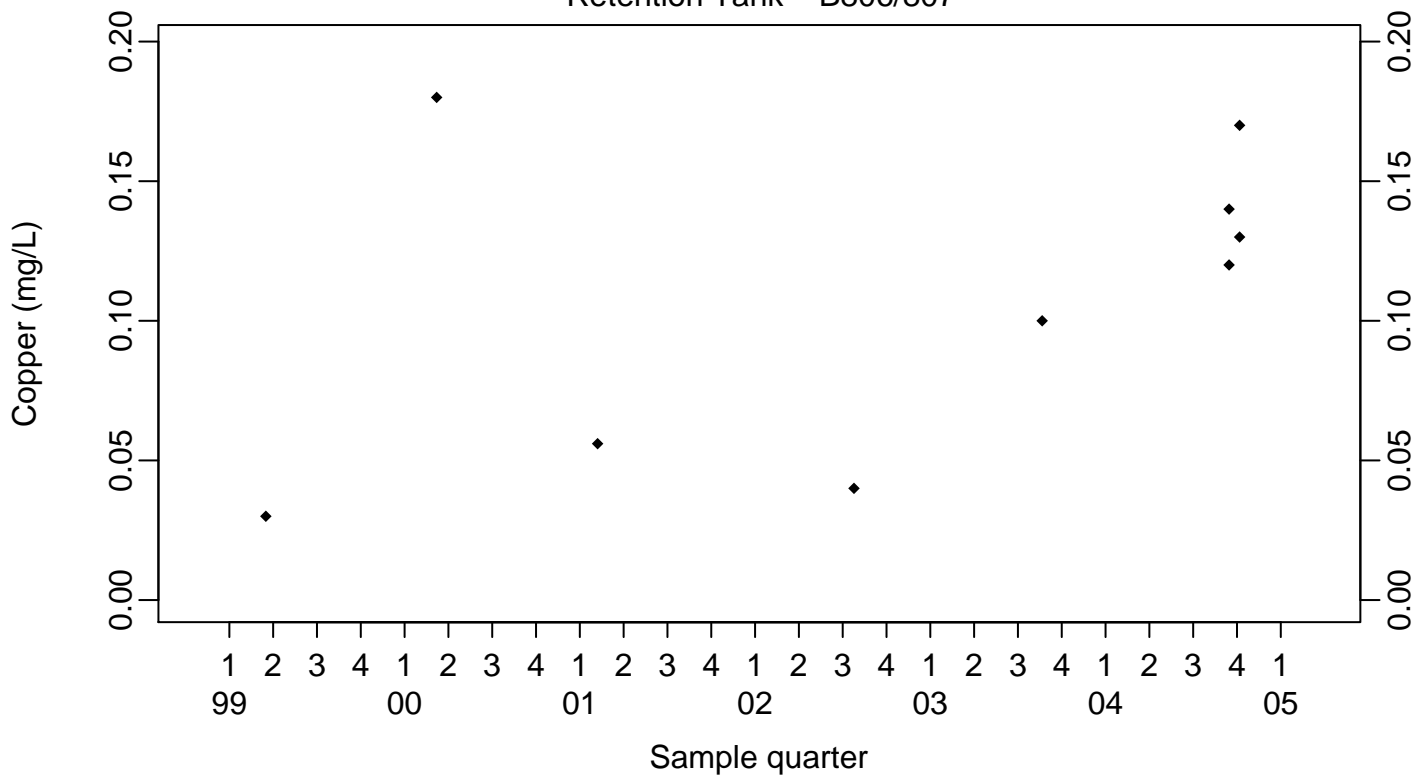


Surface Impoundments Process Water Copper (mg/L)

Retention Tank B801



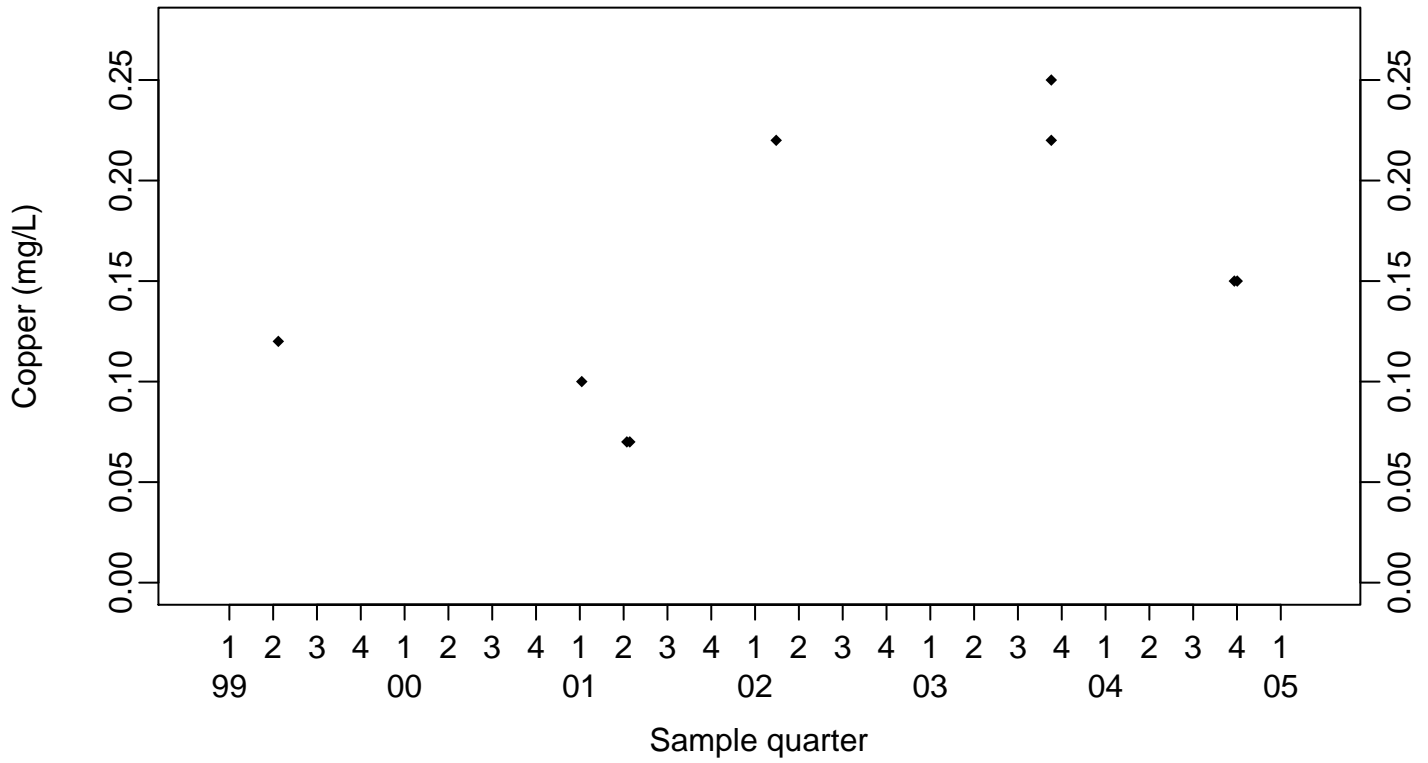
Retention Tank B806/807



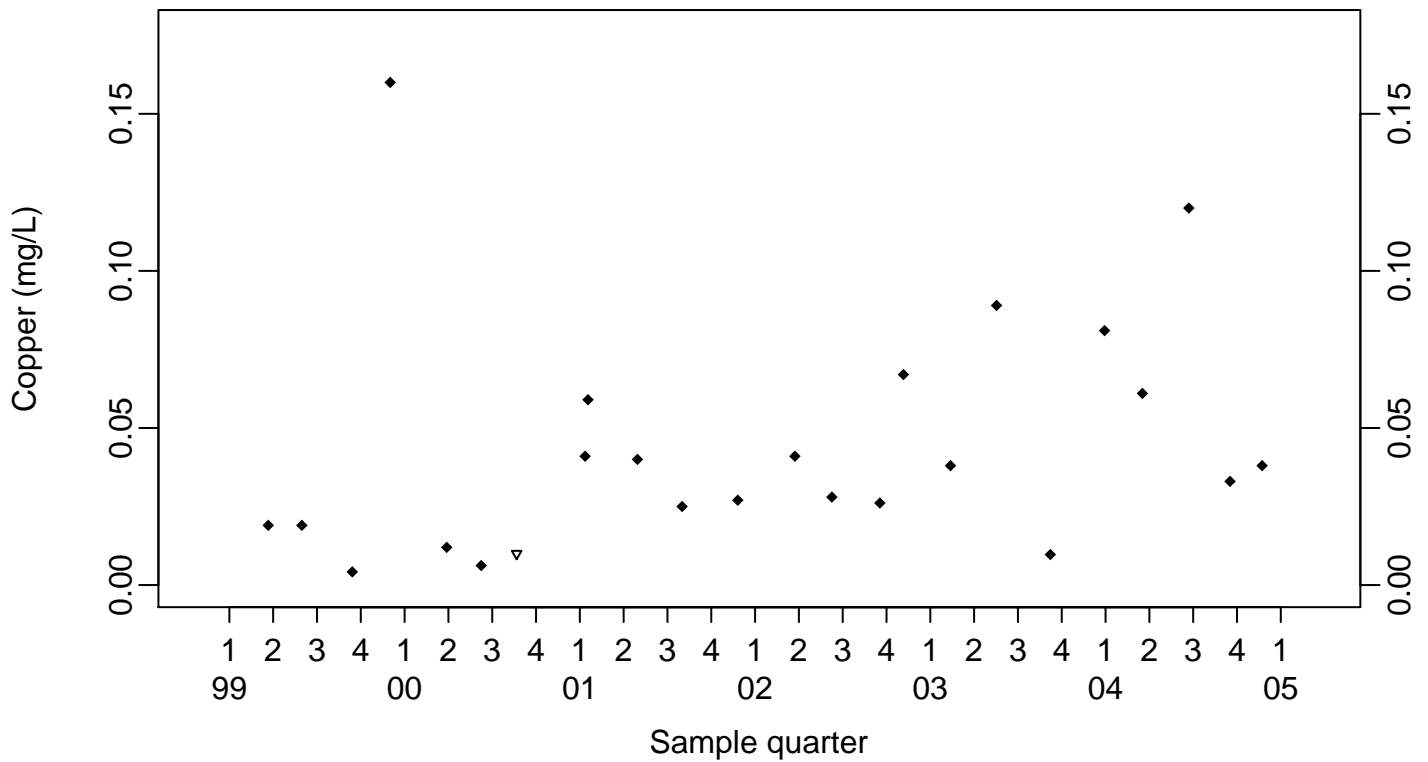
Surface Impoundments Process Water Copper (mg/L)

Retention Tank B817

◆ Above RL
▽ Below RL



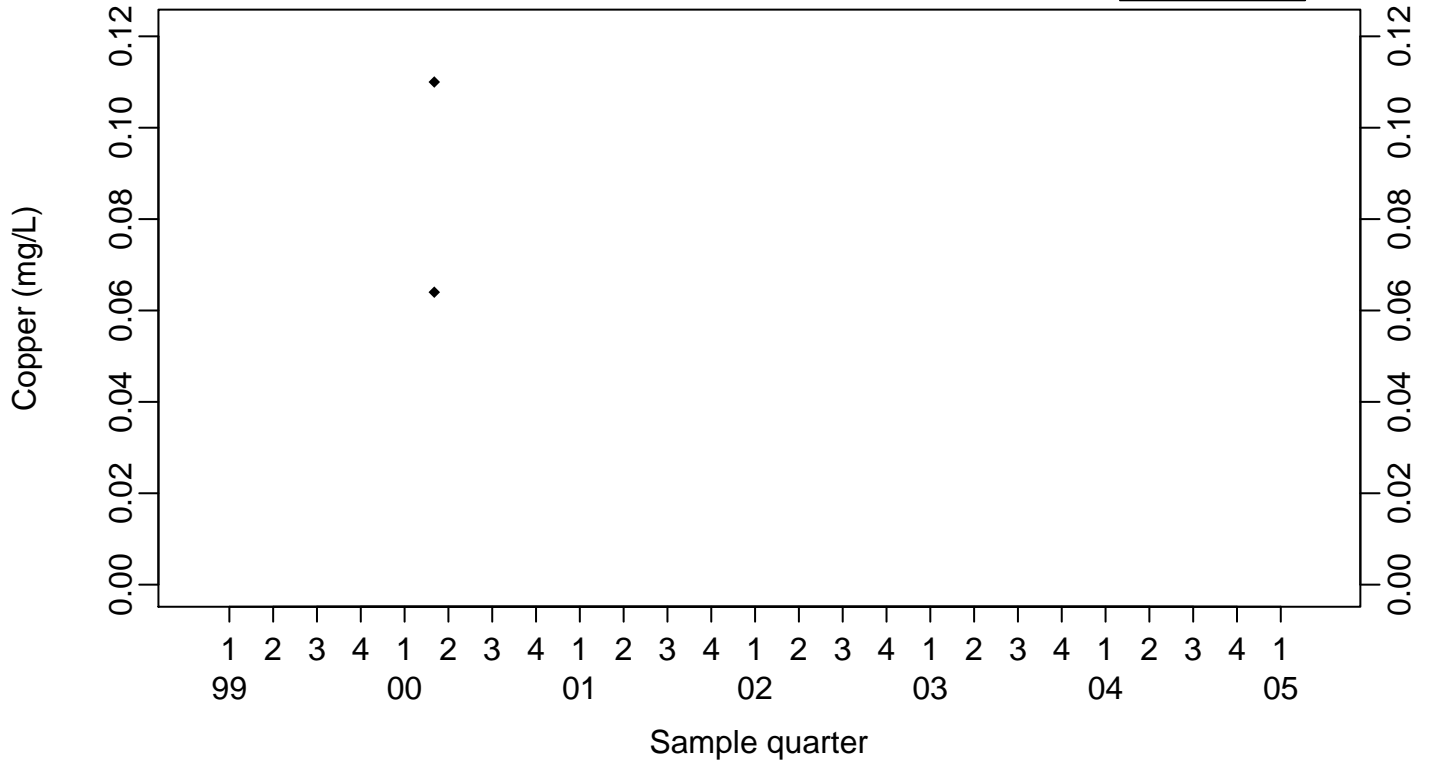
Retention Tank B823A



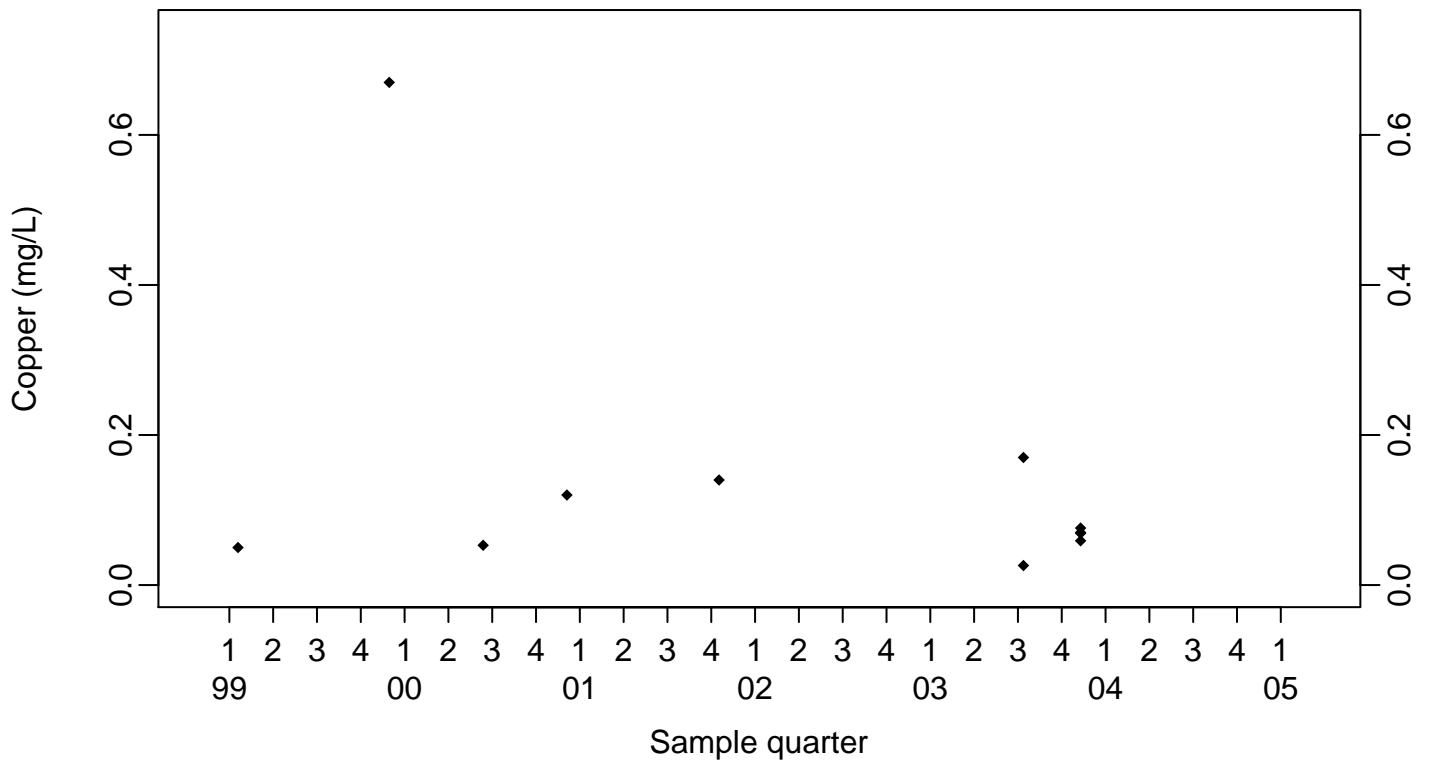
Surface Impoundments Process Water Copper (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



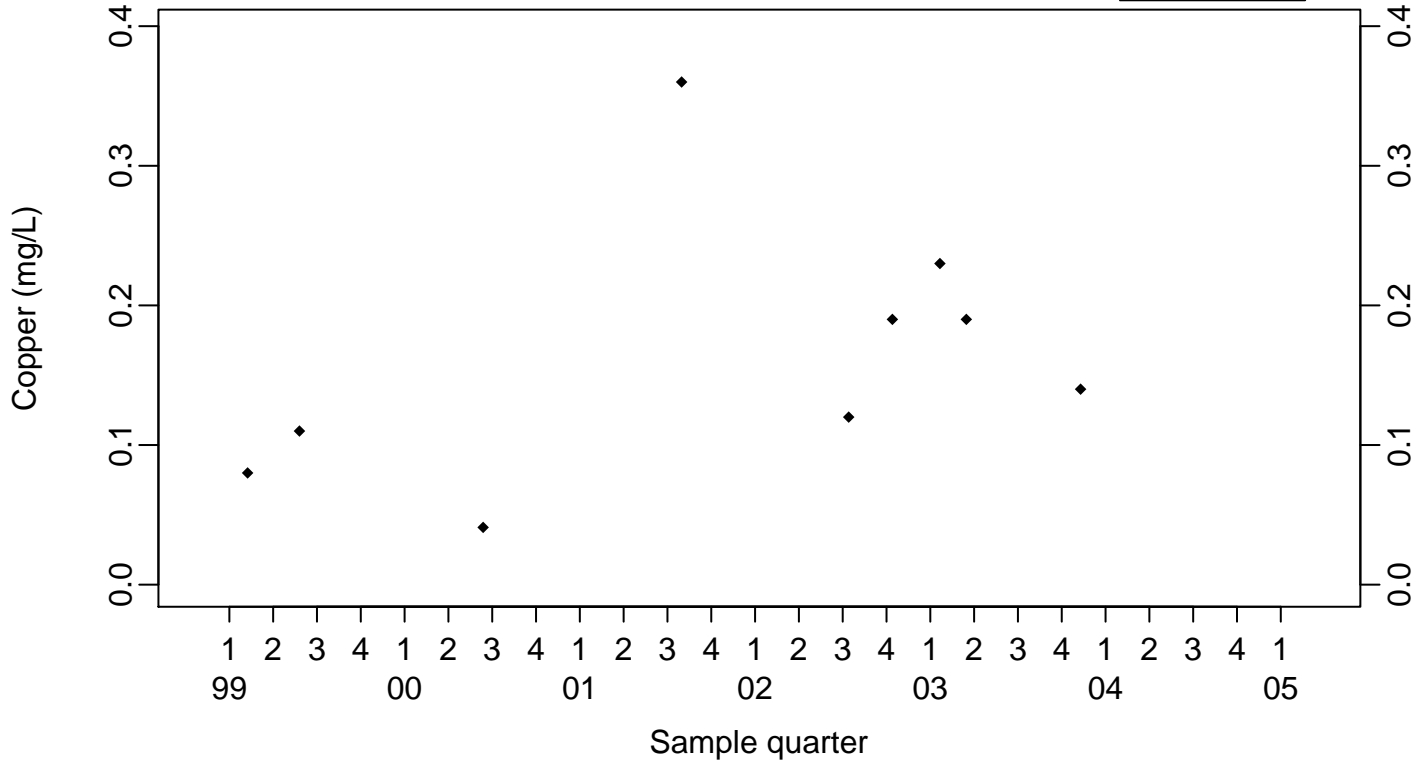
Retention Tank B827C/D



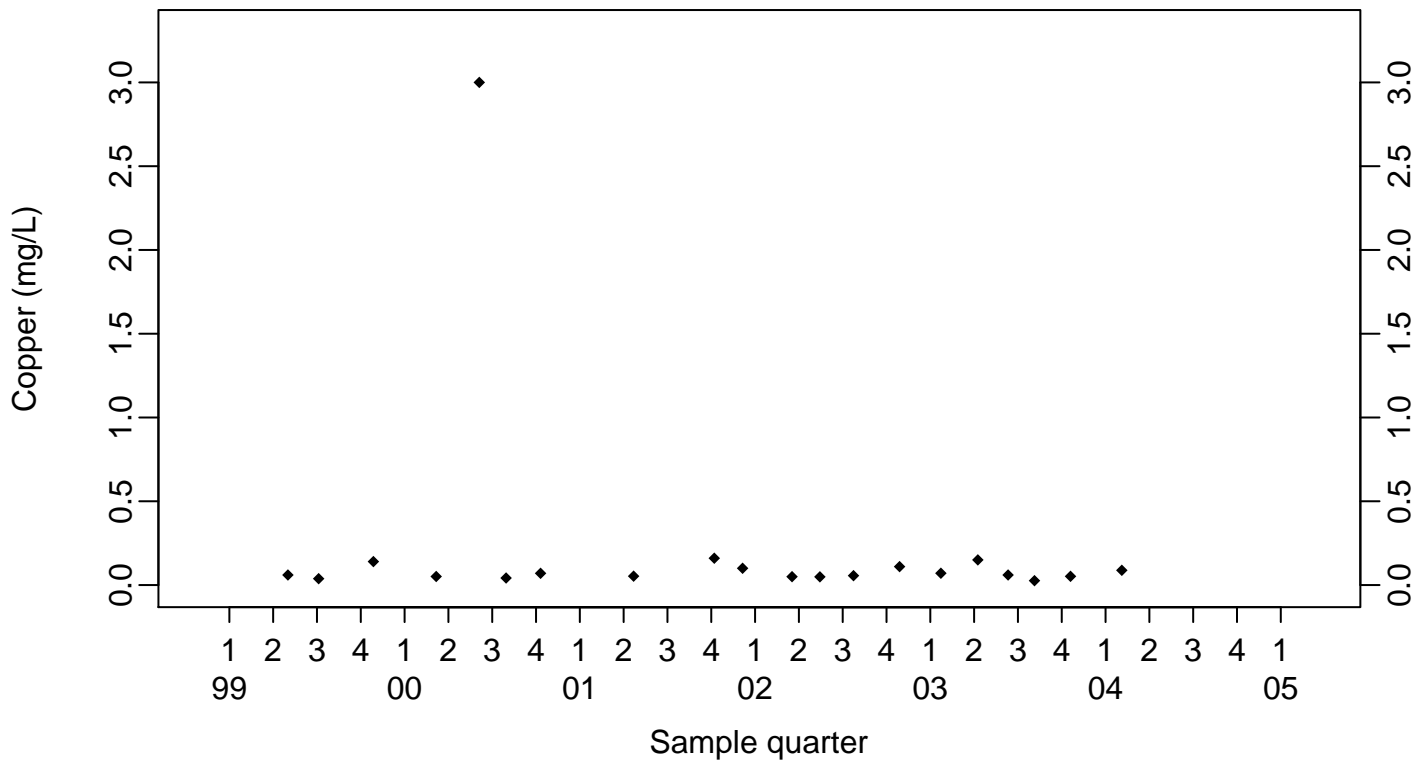
Surface Impoundments Process Water Copper (mg/L)

Retention Tank B827E

◆ Above RL
▽ Below RL



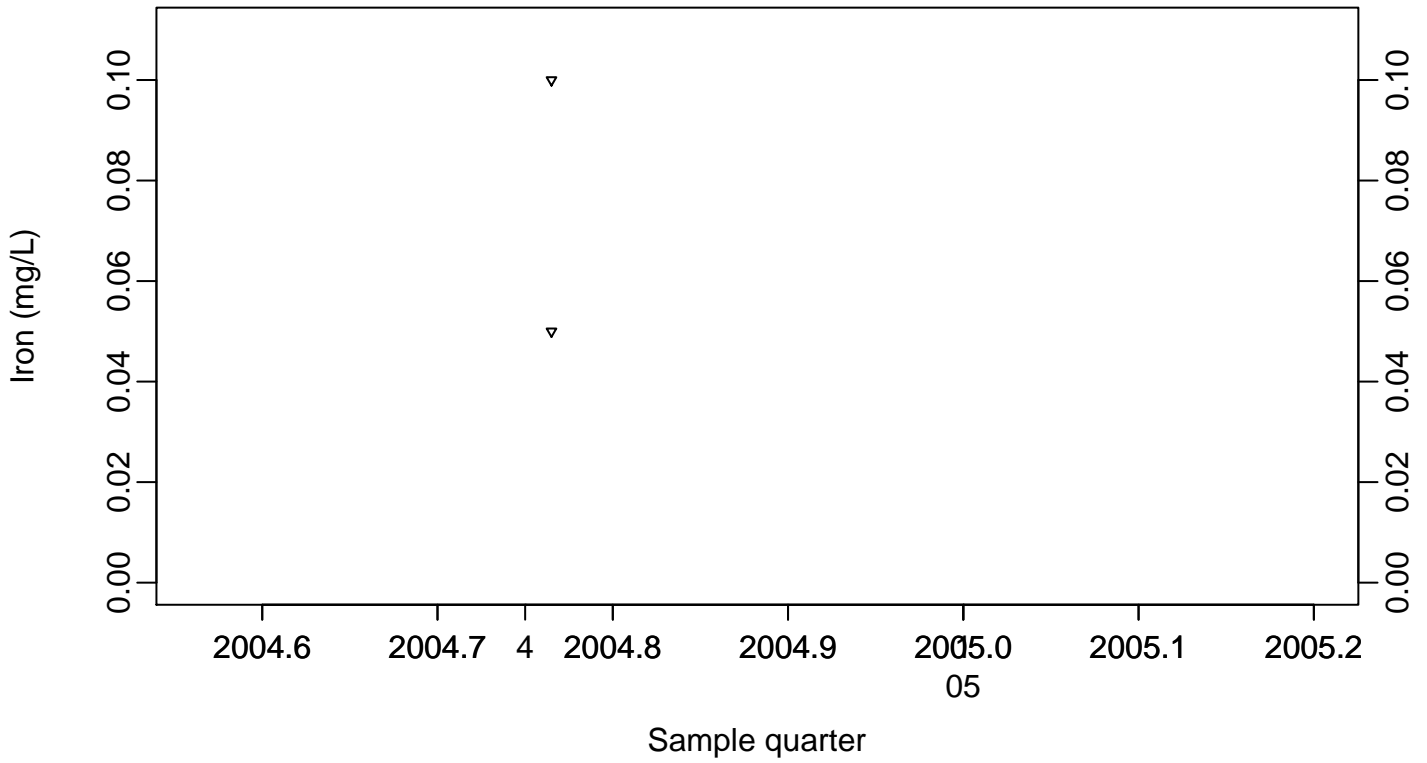
Retention Tank B851



Surface Impoundments Process Water Iron (mg/L)

Retention Tank B806/807

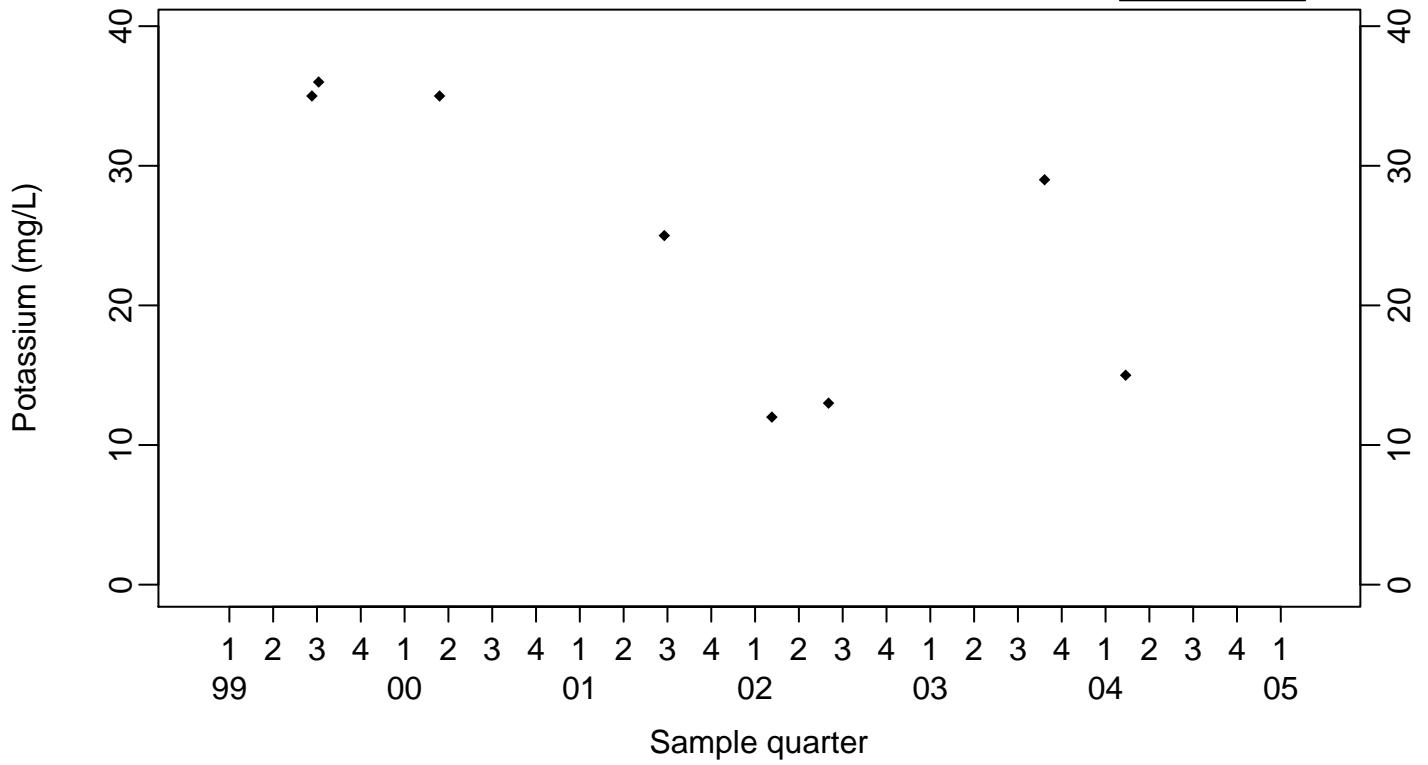
◆	Above RL
▽	Below RL



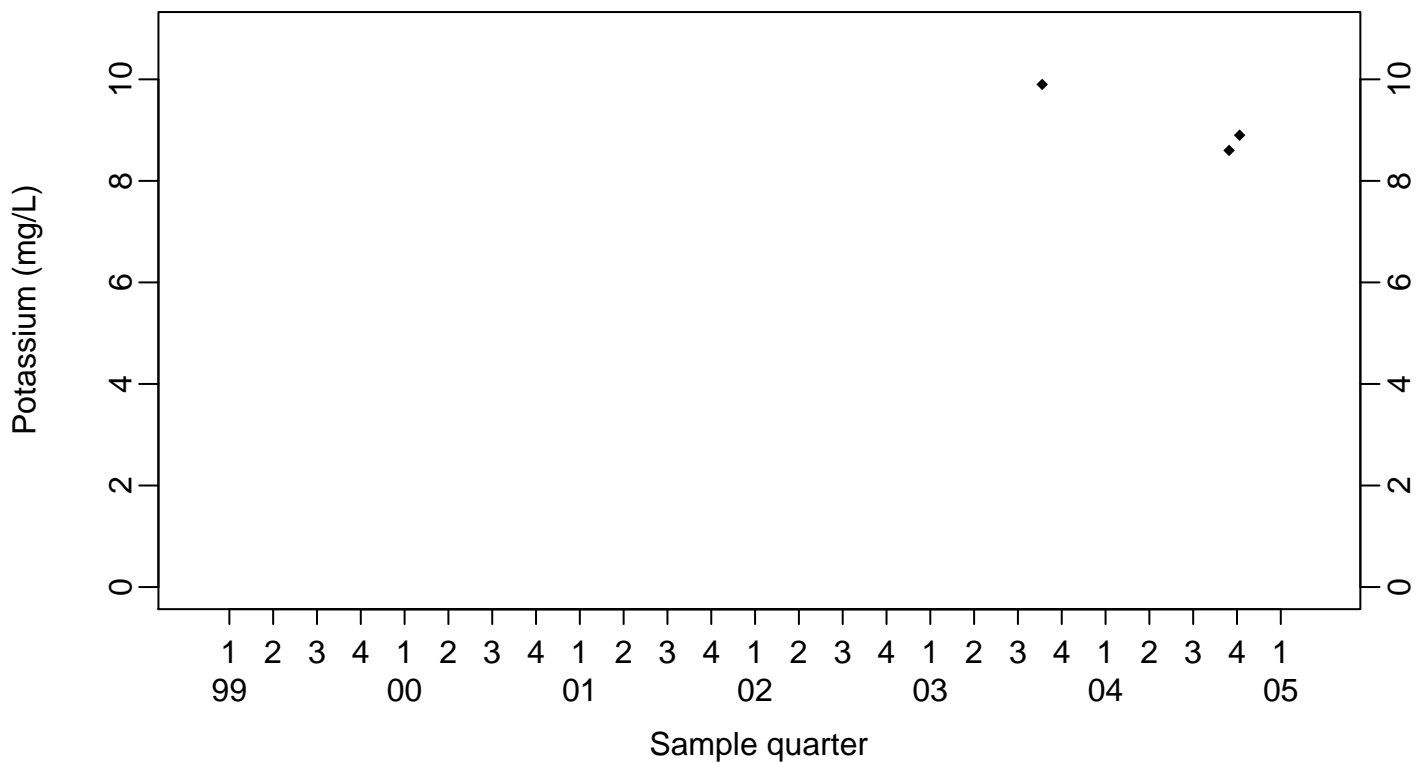
Surface Impoundments Process Water Potassium (mg/L)

Retention Tank B801

◆ Above RL
▽ Below RL



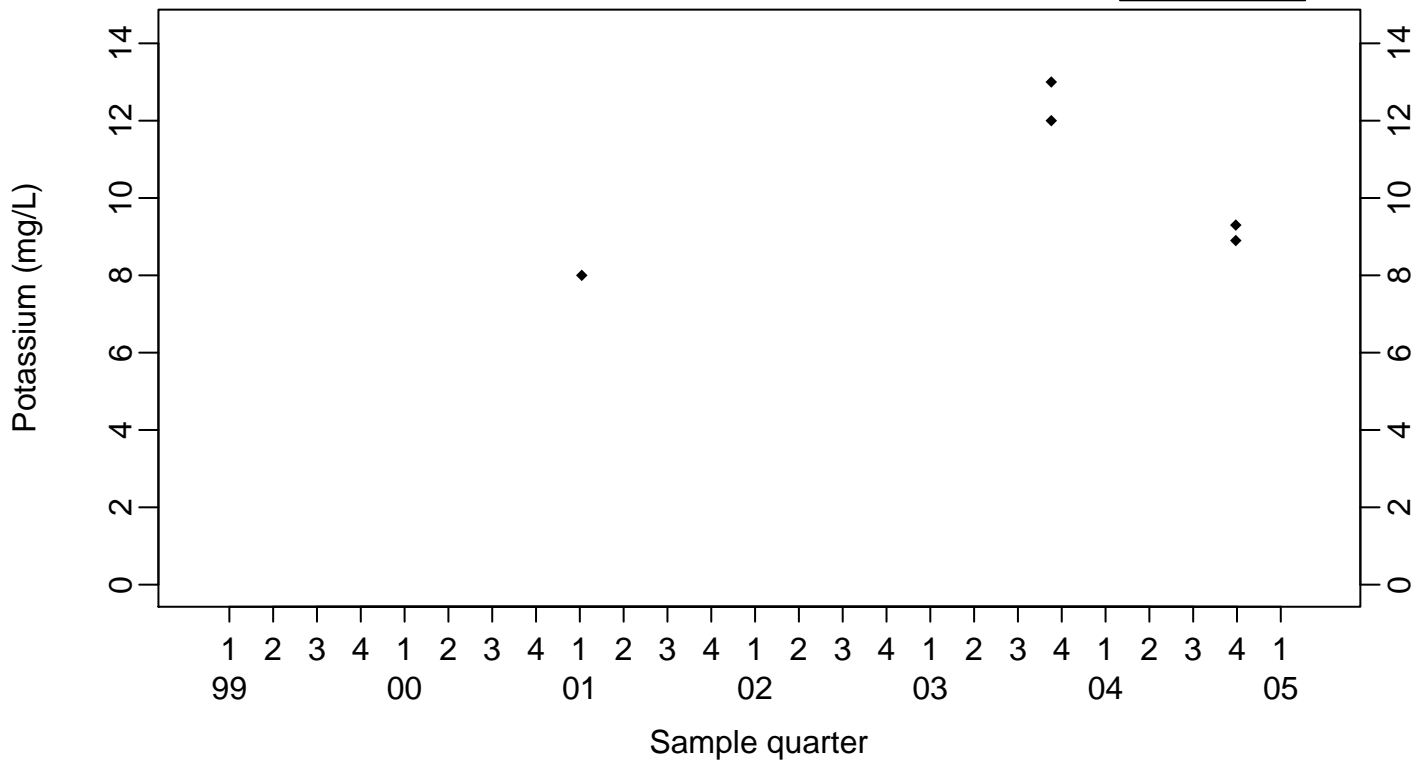
Retention Tank B806/807



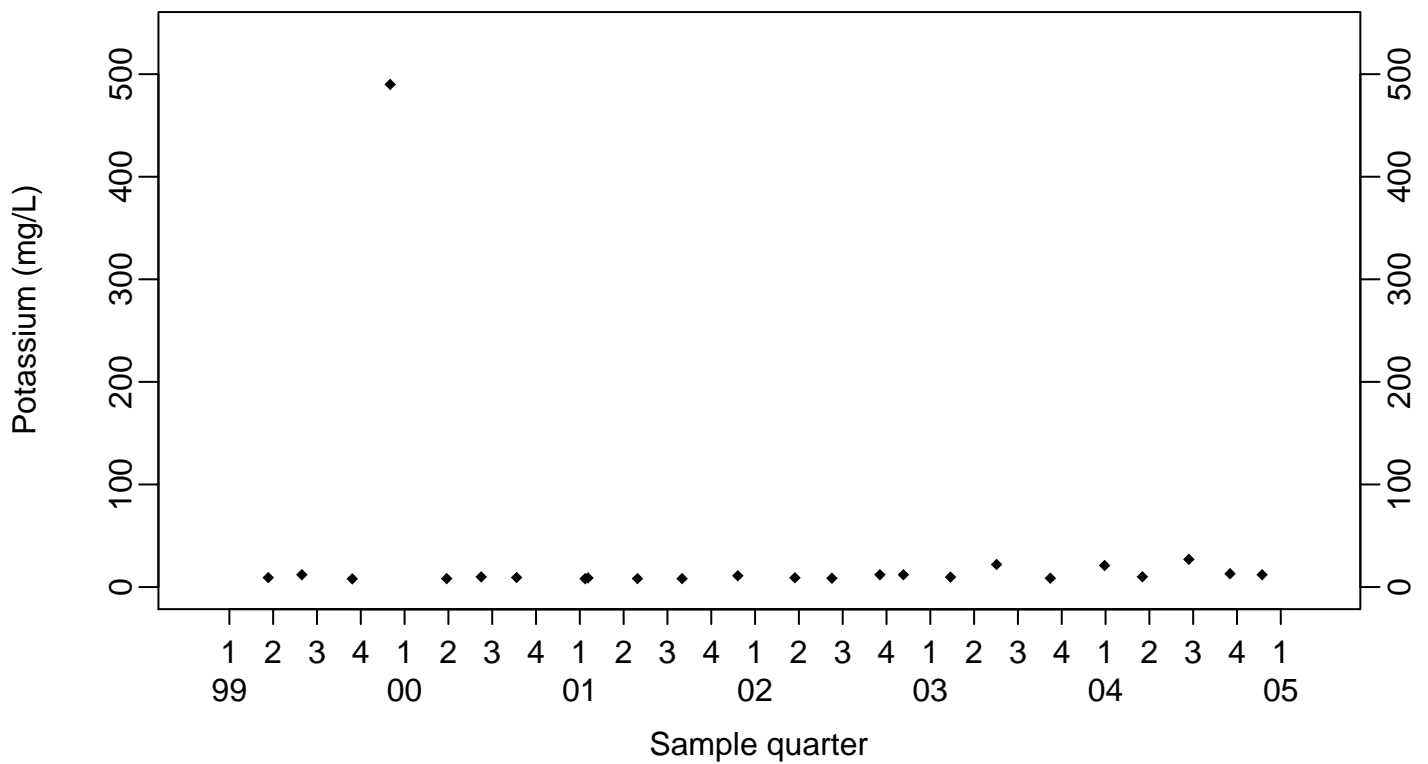
Surface Impoundments Process Water Potassium (mg/L)

Retention Tank B817

◆ Above RL
▽ Below RL



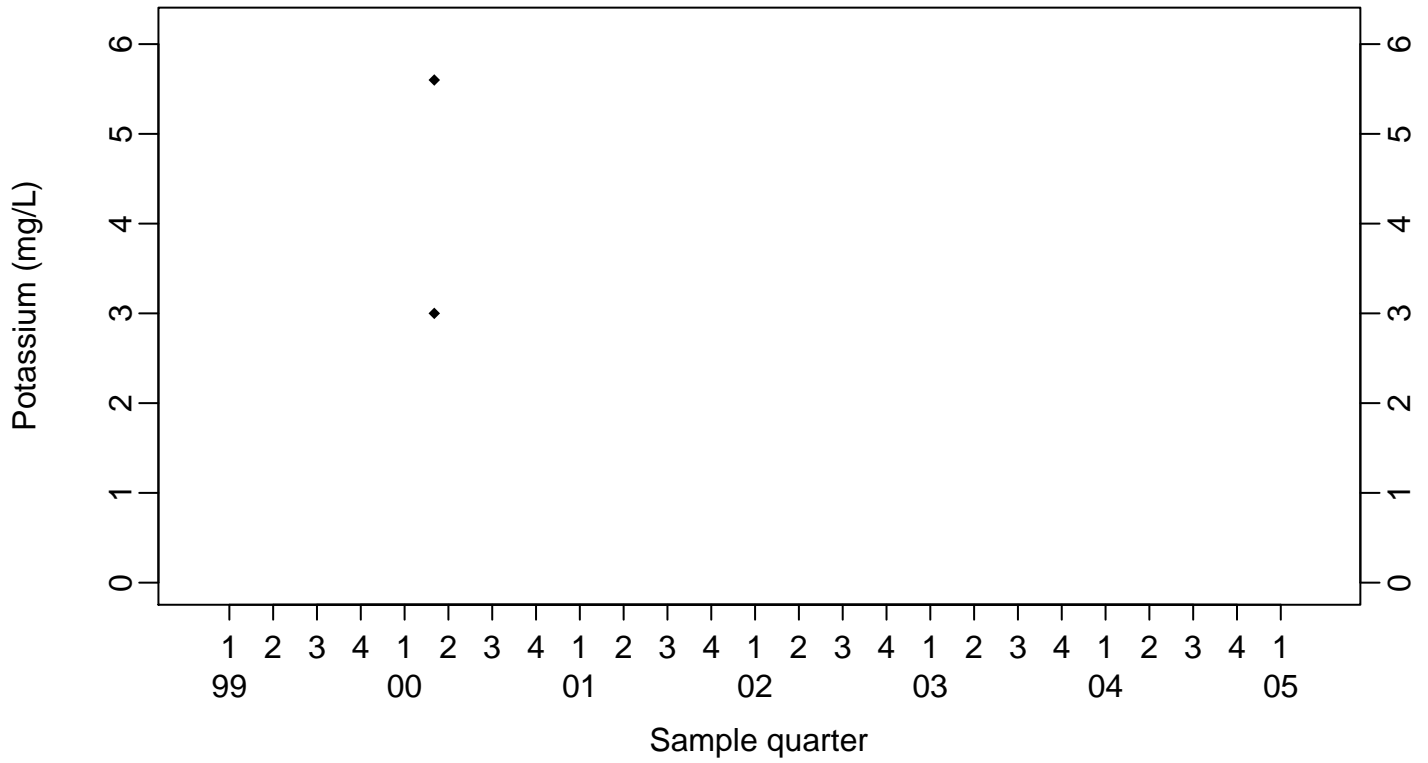
Retention Tank B823A



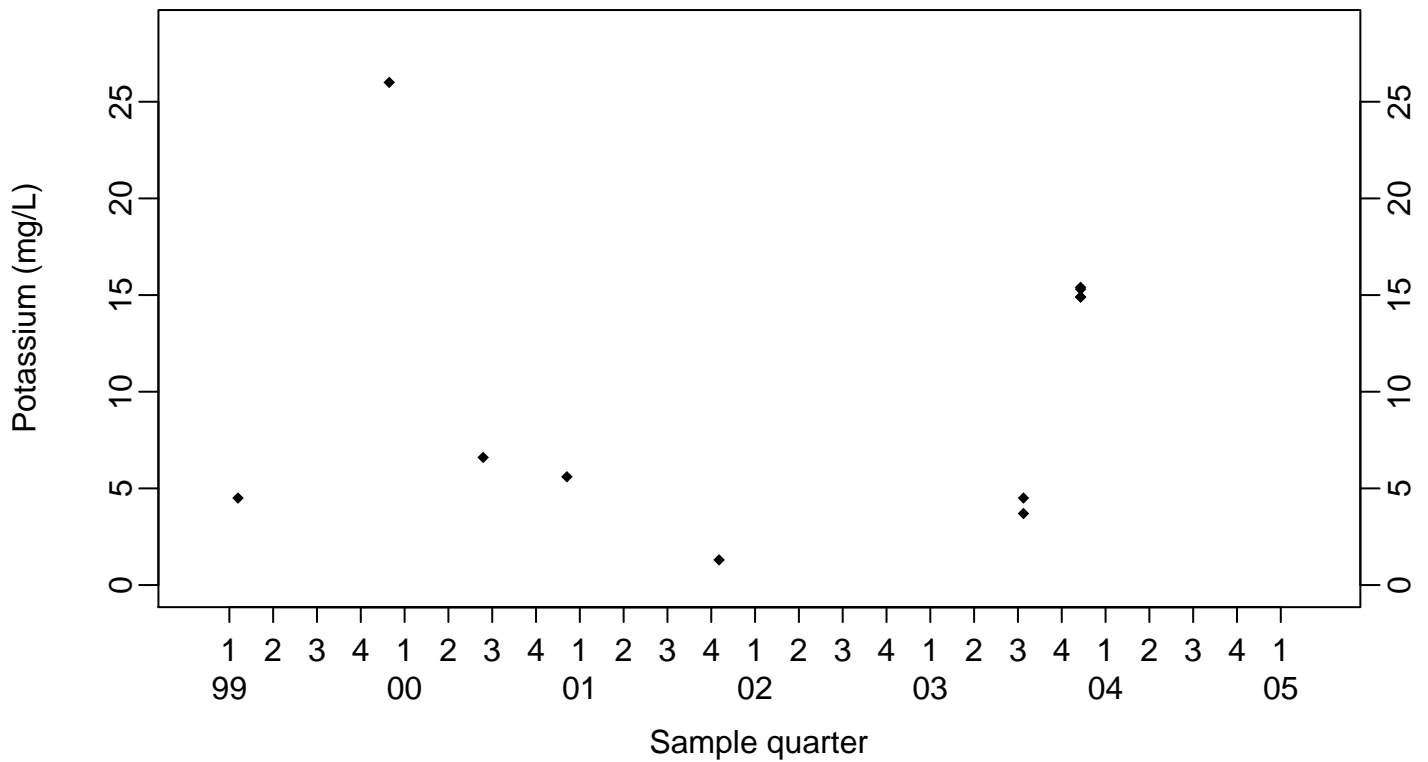
Surface Impoundments Process Water Potassium (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



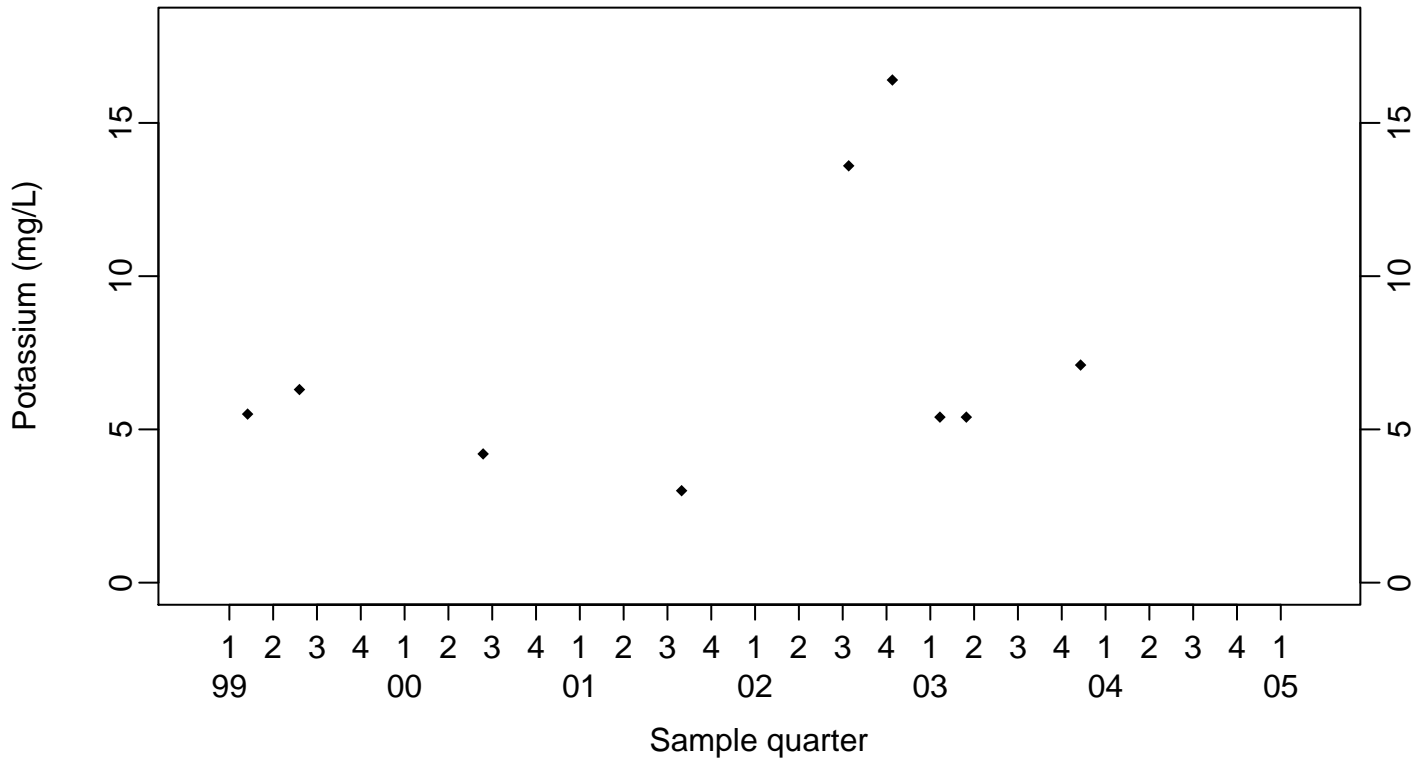
Retention Tank B827C/D



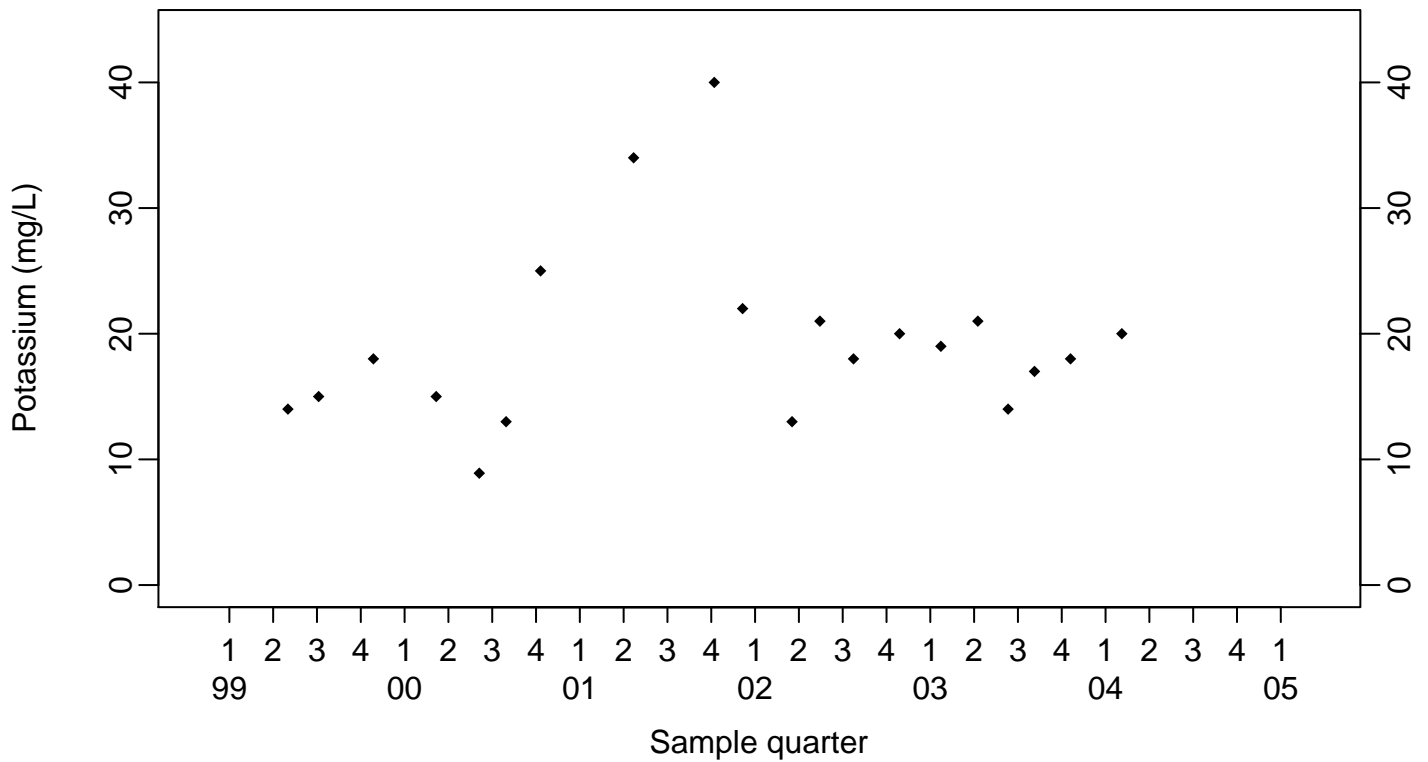
Surface Impoundments Process Water Potassium (mg/L)

Retention Tank B827E

- ◆ Above RL
- ▽ Below RL



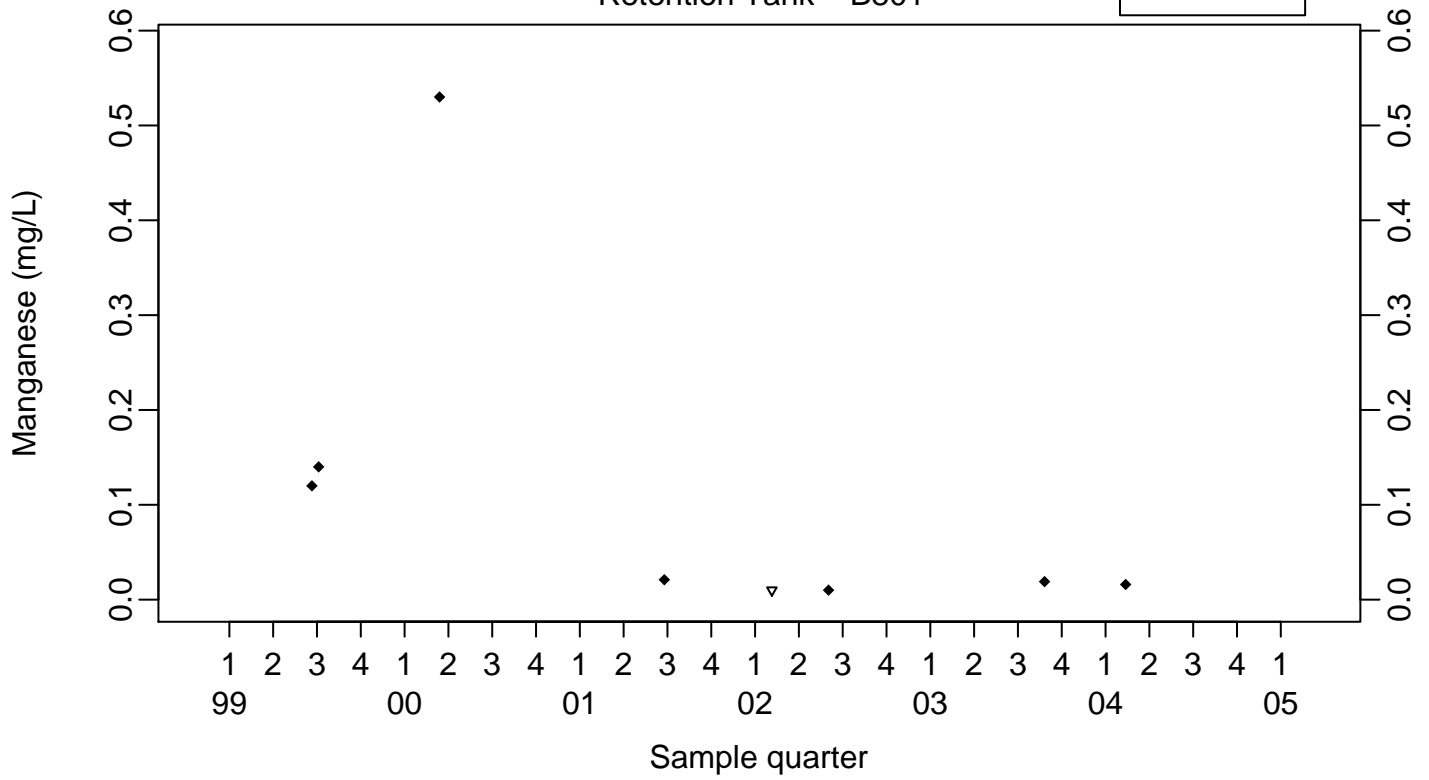
Retention Tank B851



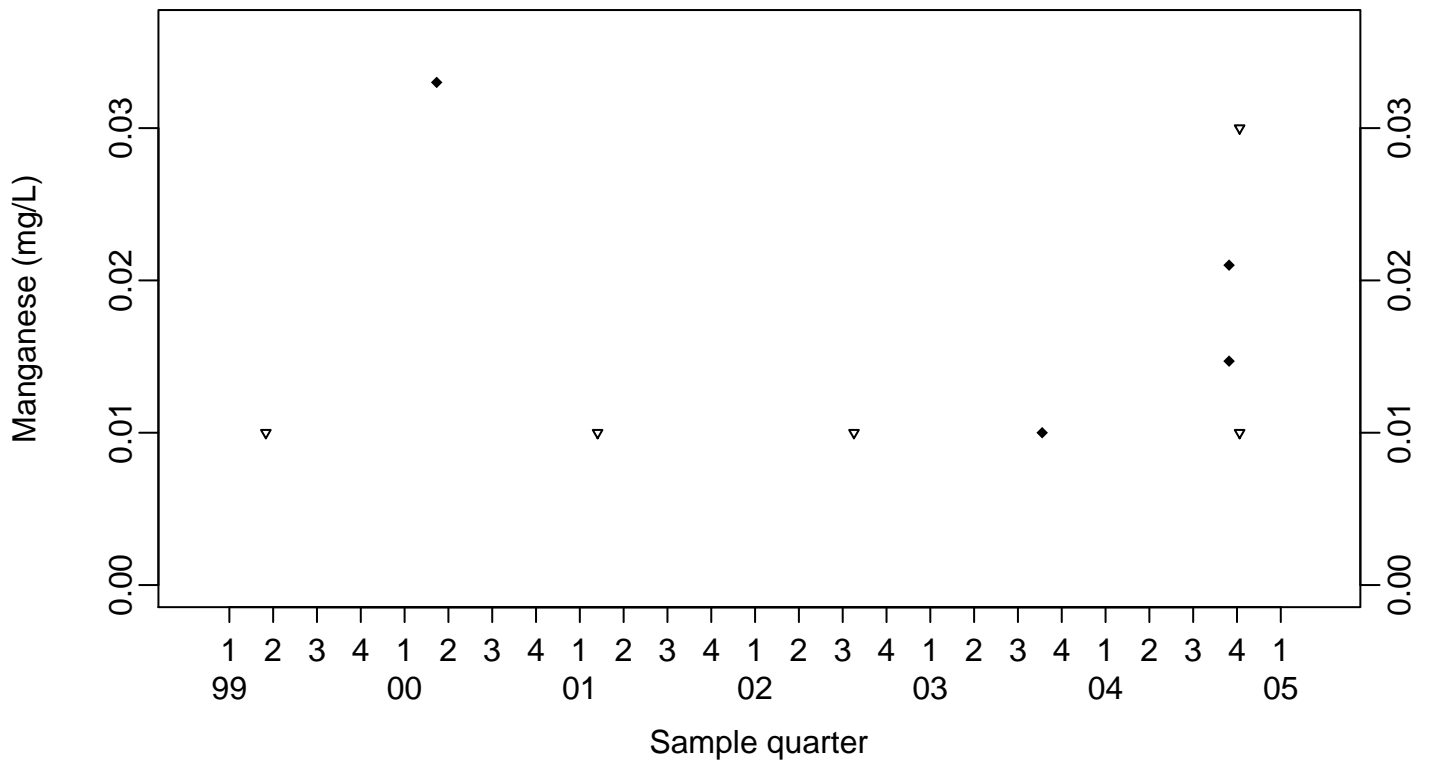
Surface Impoundments Process Water Manganese (mg/L)

Retention Tank B801

◆ Above RL
▽ Below RL



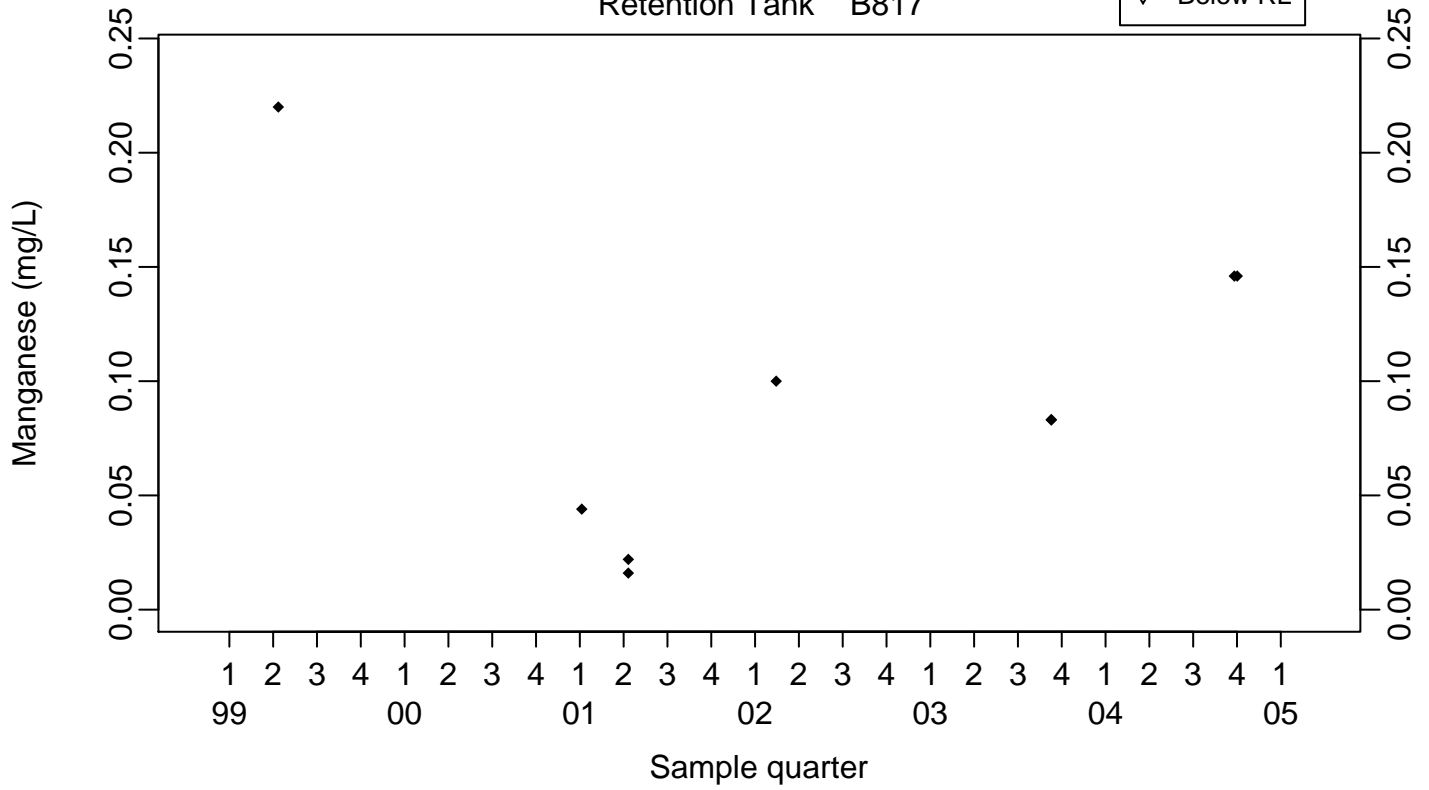
Retention Tank B806/807



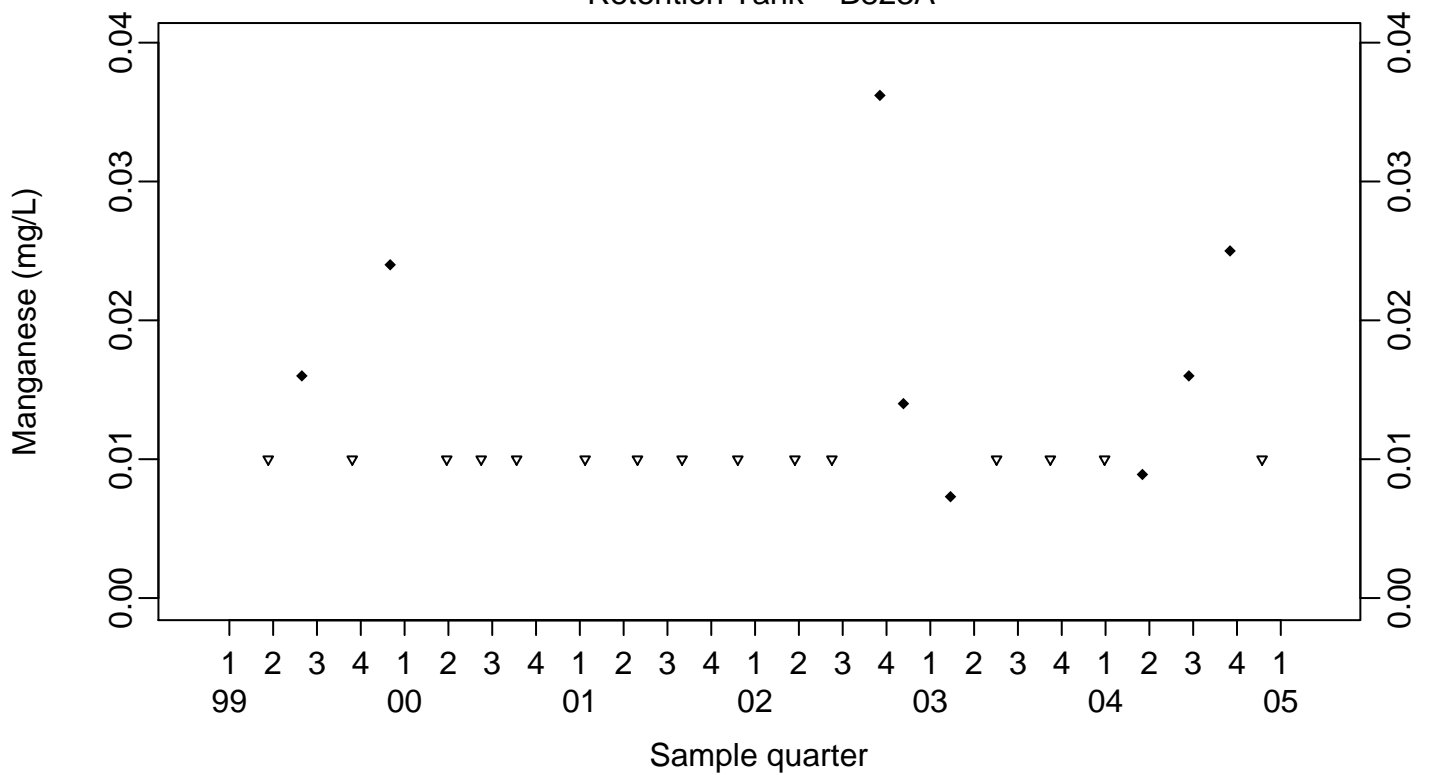
Surface Impoundments Process Water Manganese (mg/L)

Retention Tank B817

◆ Above RL
▽ Below RL

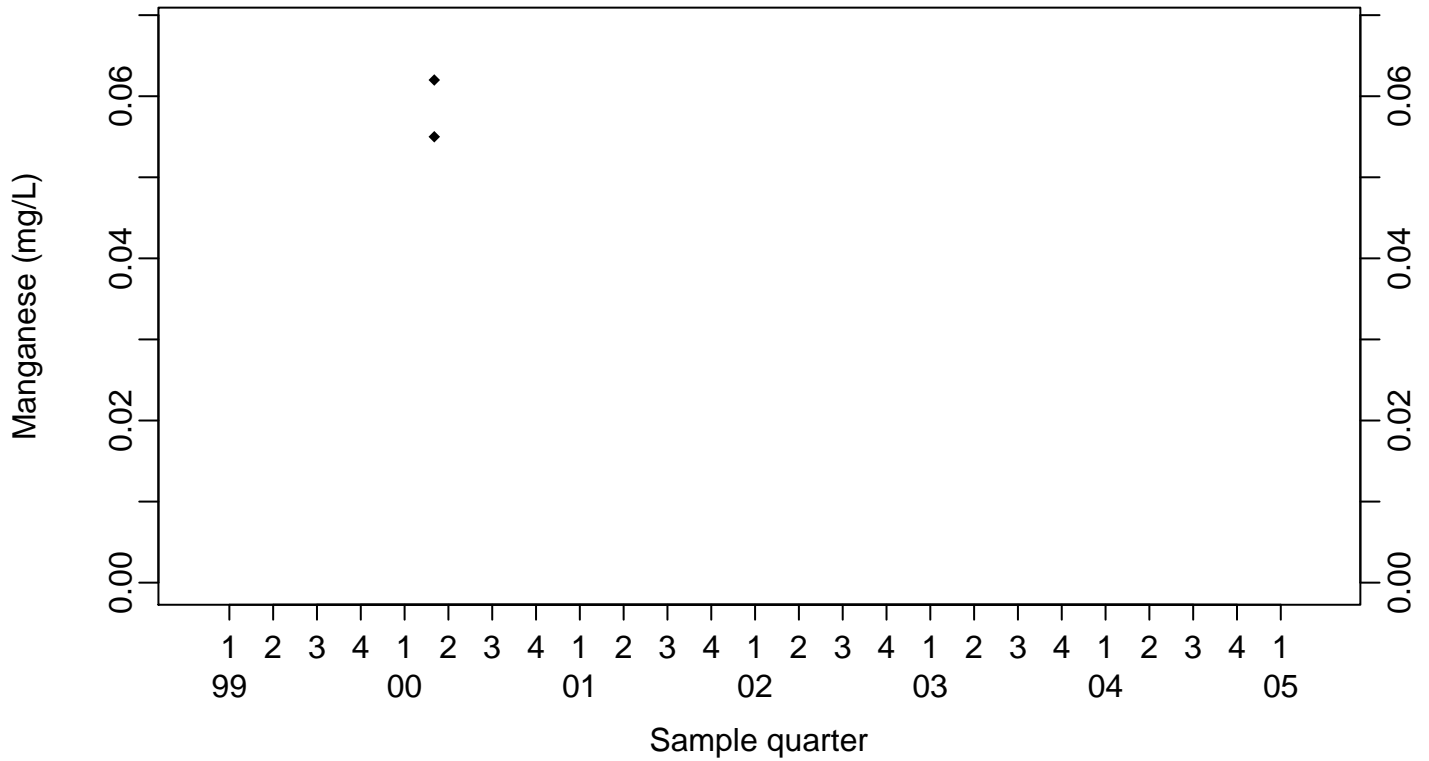
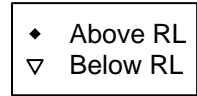


Retention Tank B823A

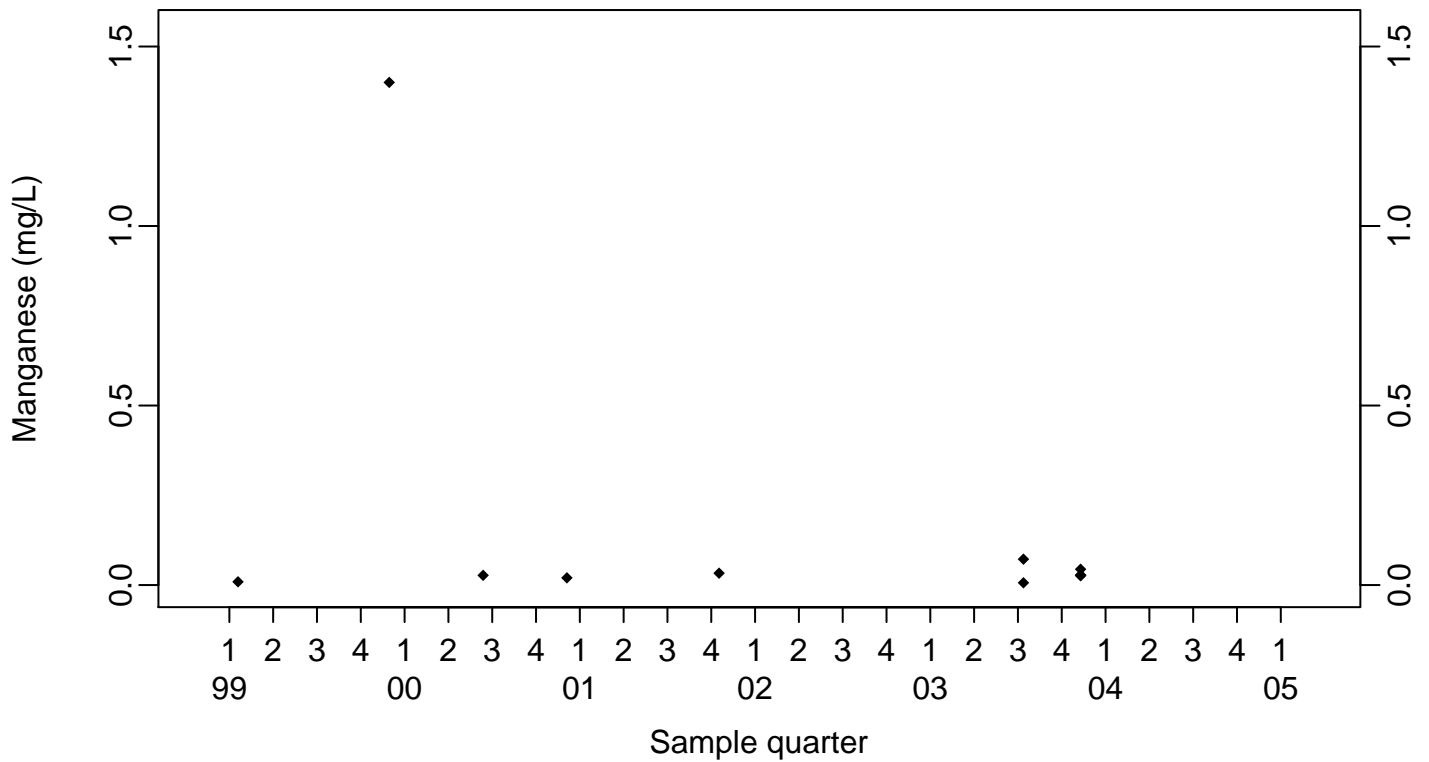


Surface Impoundments Process Water Manganese (mg/L)

Retention Tank B826



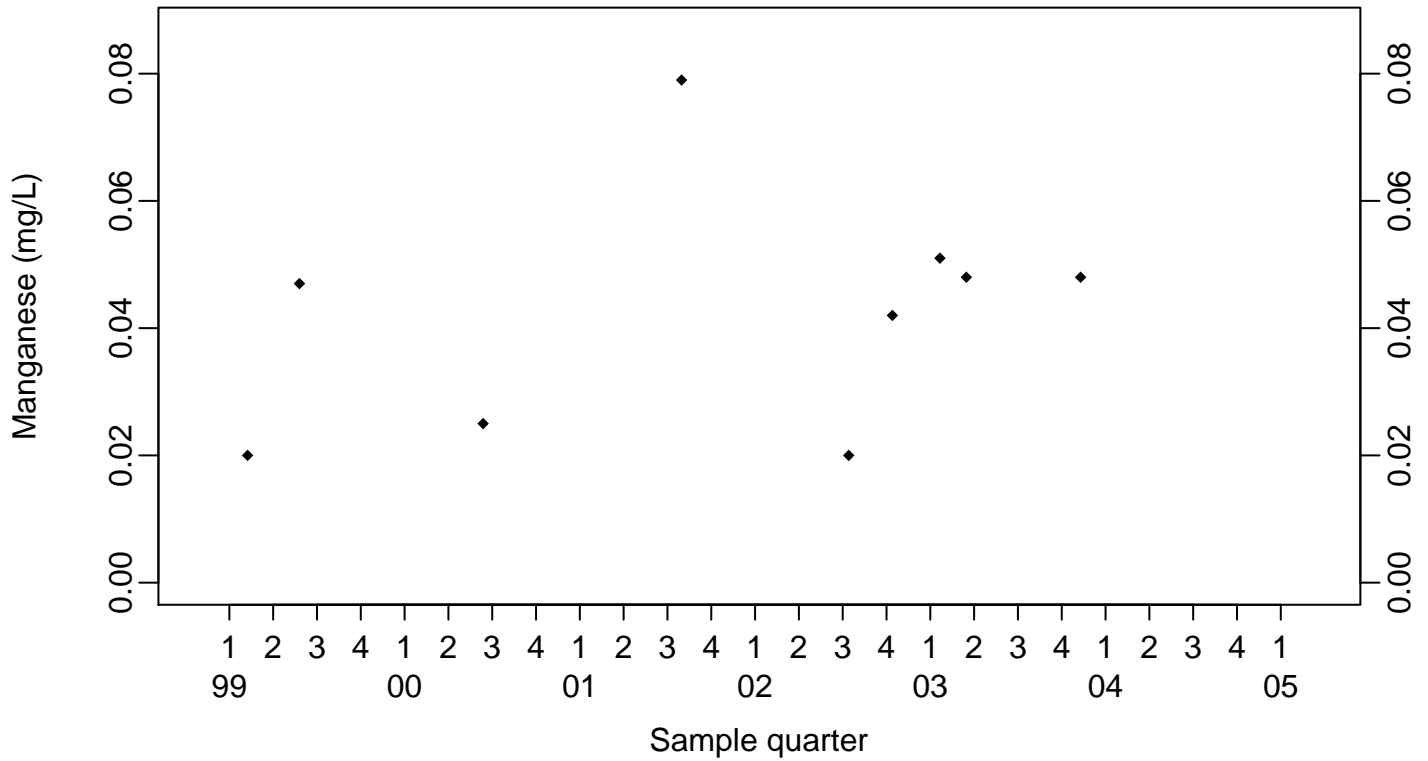
Retention Tank B827C/D



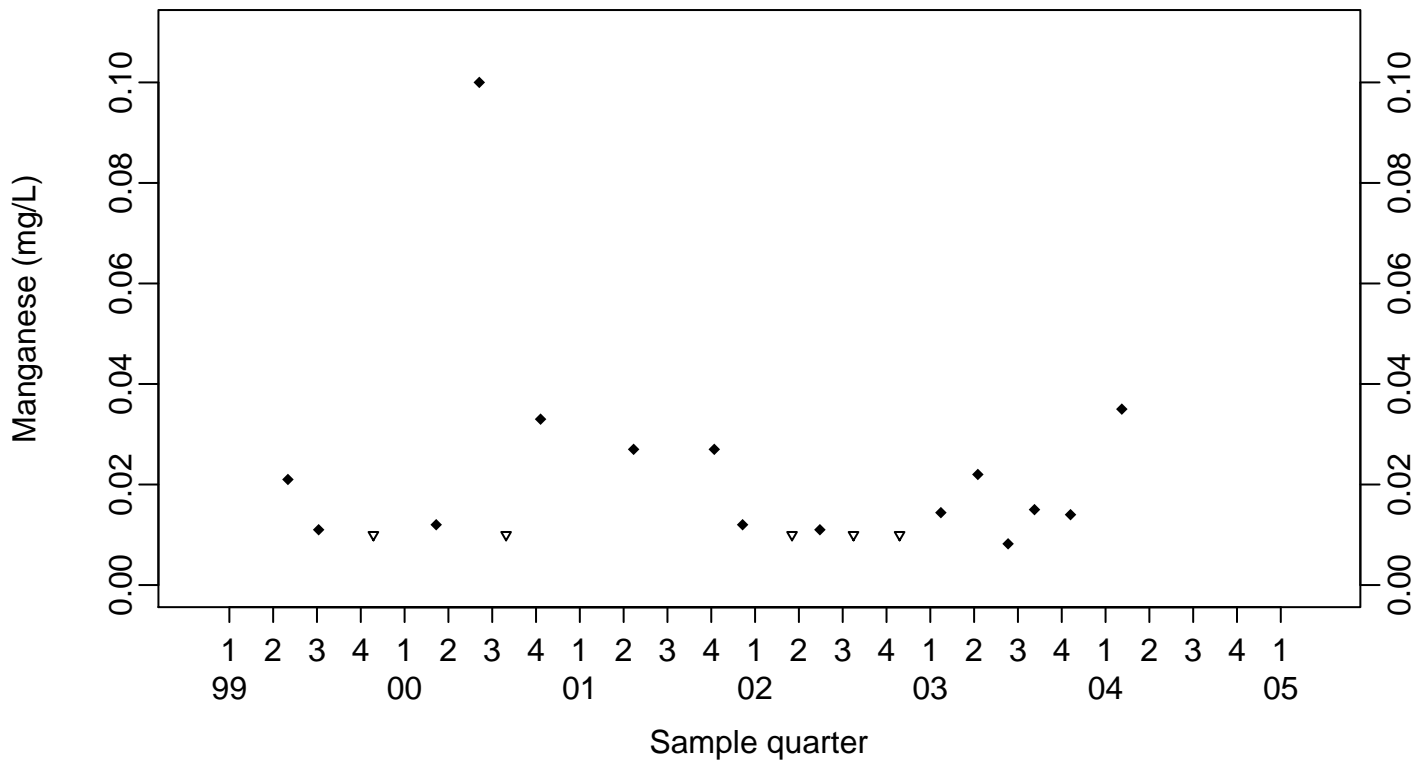
Surface Impoundments Process Water Manganese (mg/L)

Retention Tank B827E

◆ Above RL
▽ Below RL



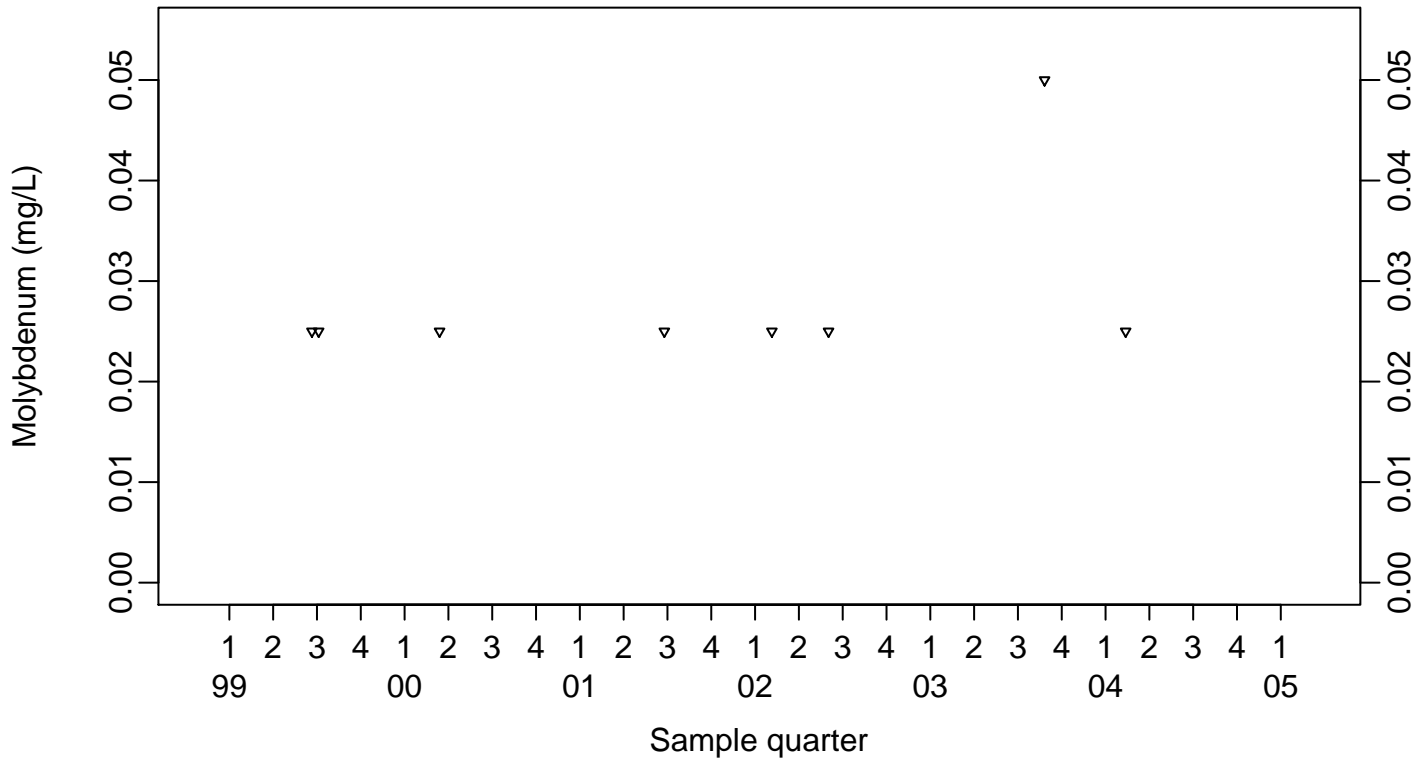
Retention Tank B851



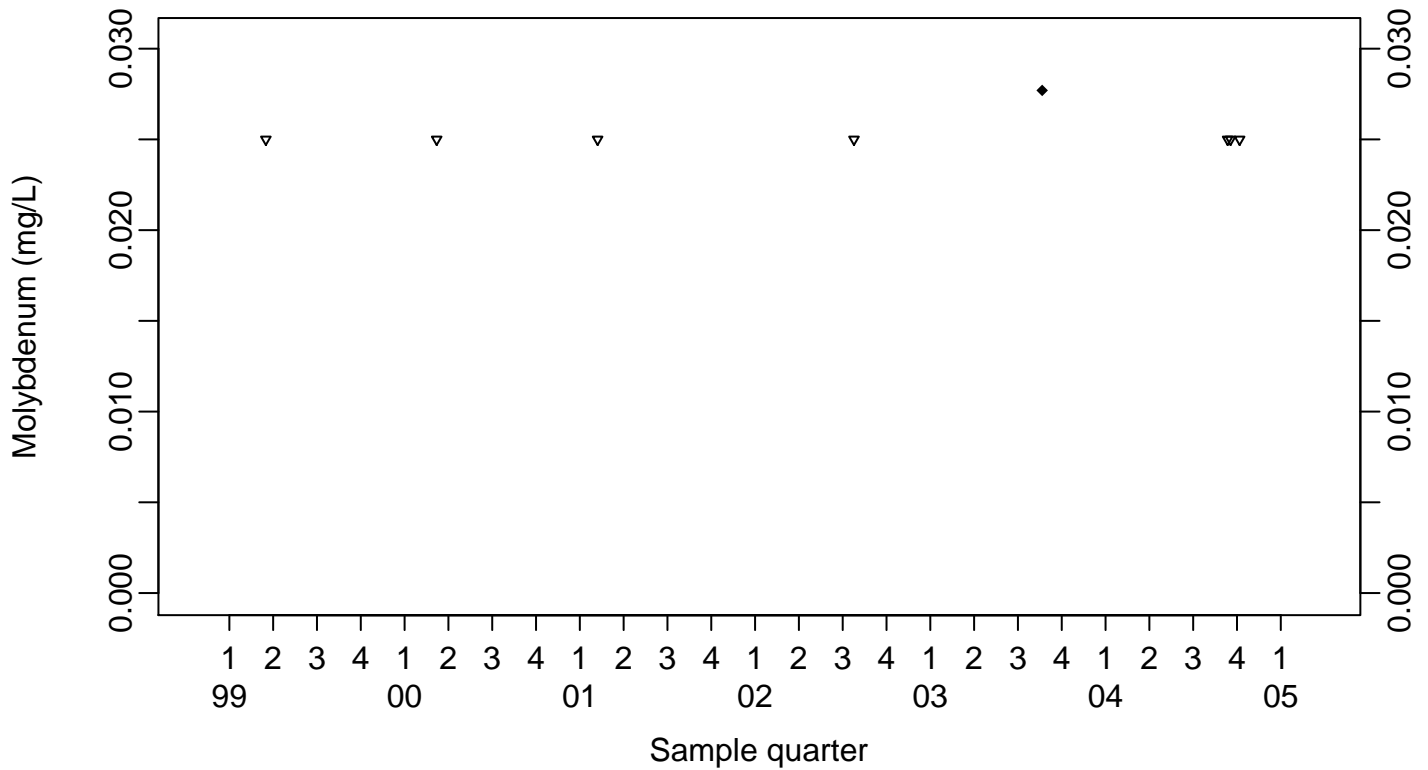
Surface Impoundments Process Water Molybdenum (mg/L)

Retention Tank B801

◆ Above RL
▽ Below RL

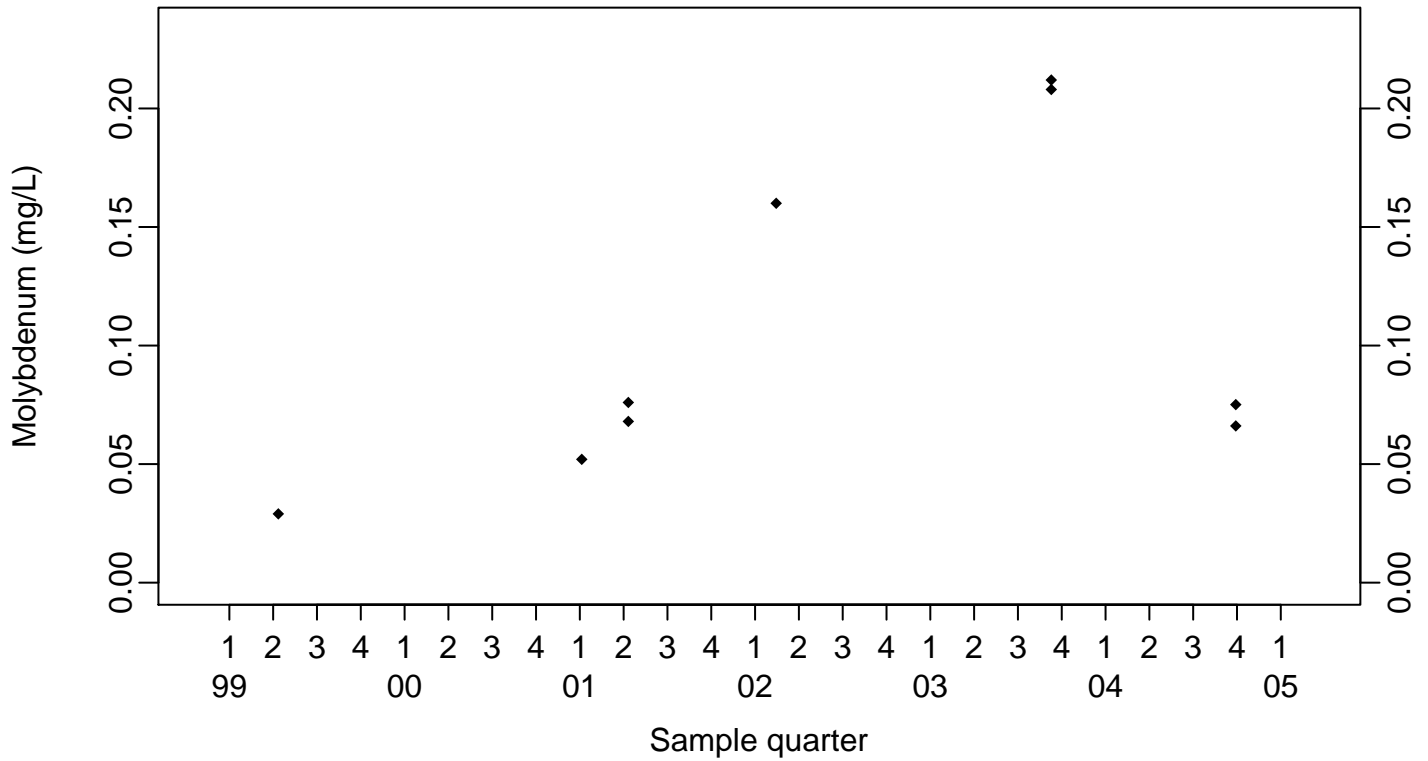
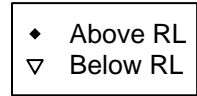


Retention Tank B806/807

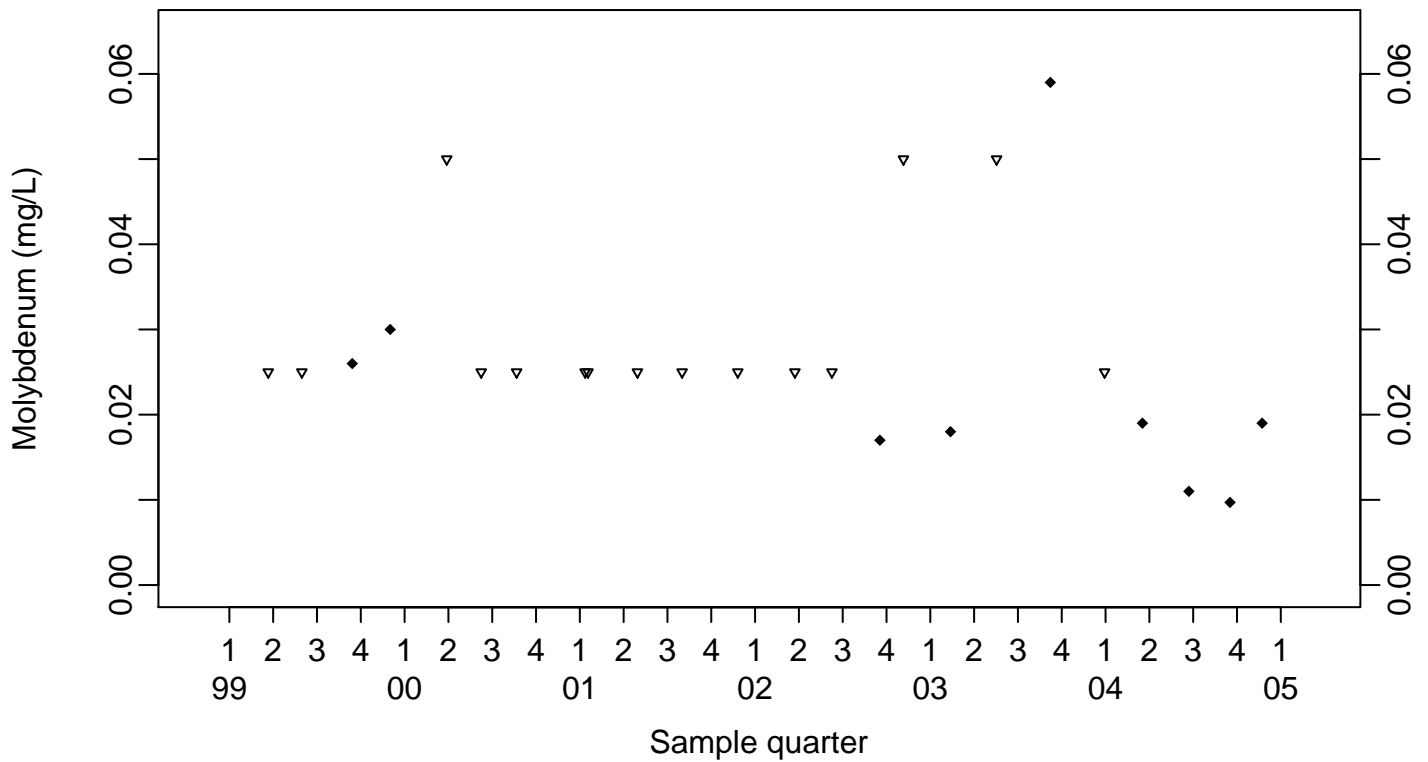


Surface Impoundments Process Water Molybdenum (mg/L)

Retention Tank B817



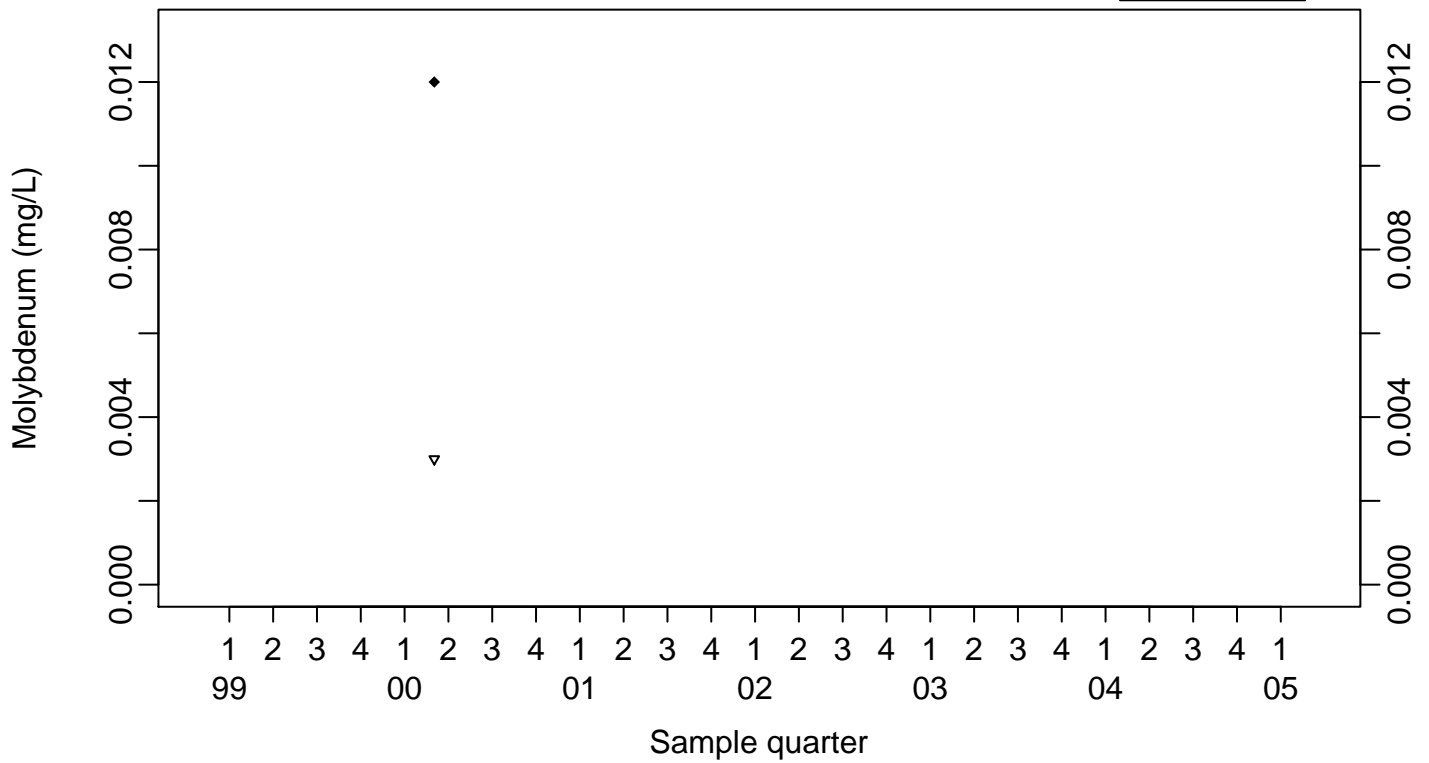
Retention Tank B823A



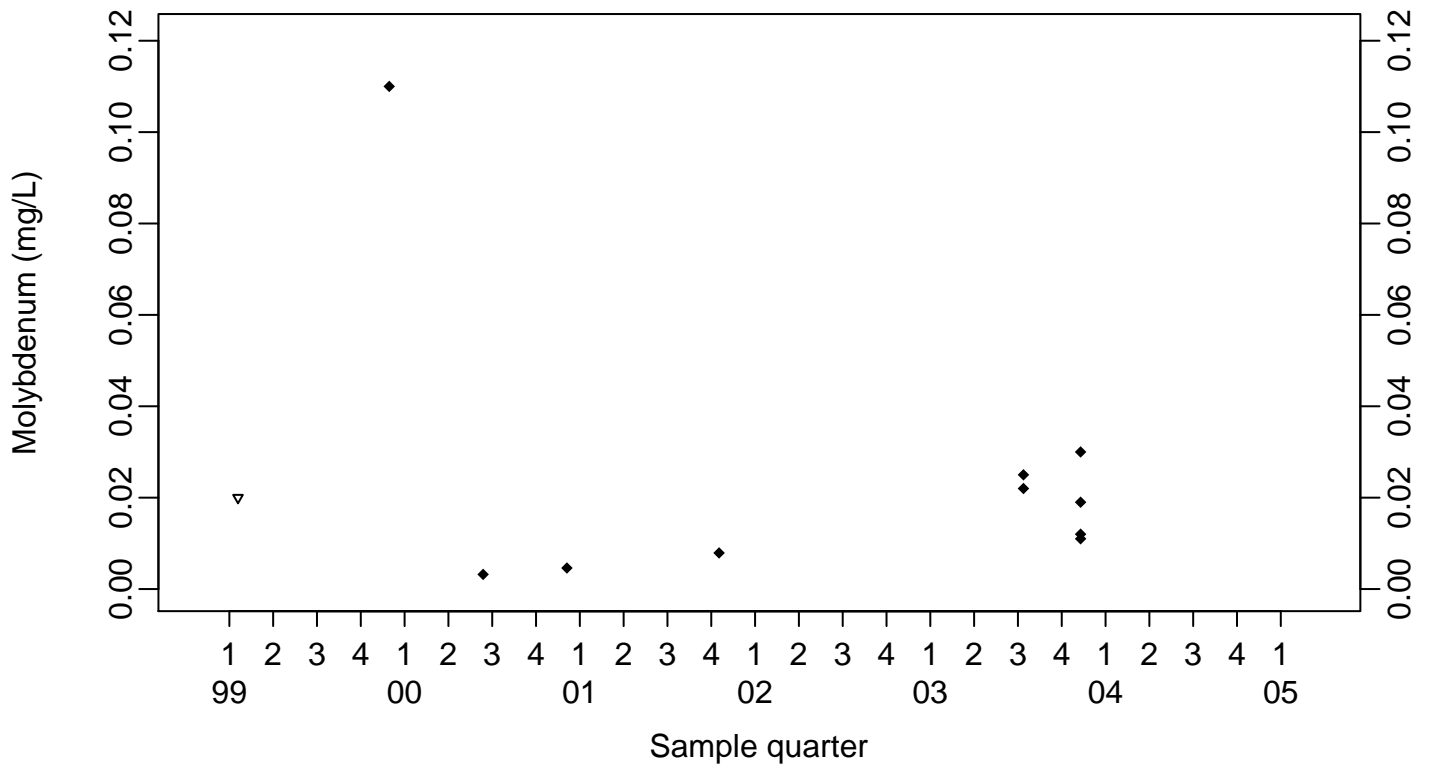
Surface Impoundments Process Water Molybdenum (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



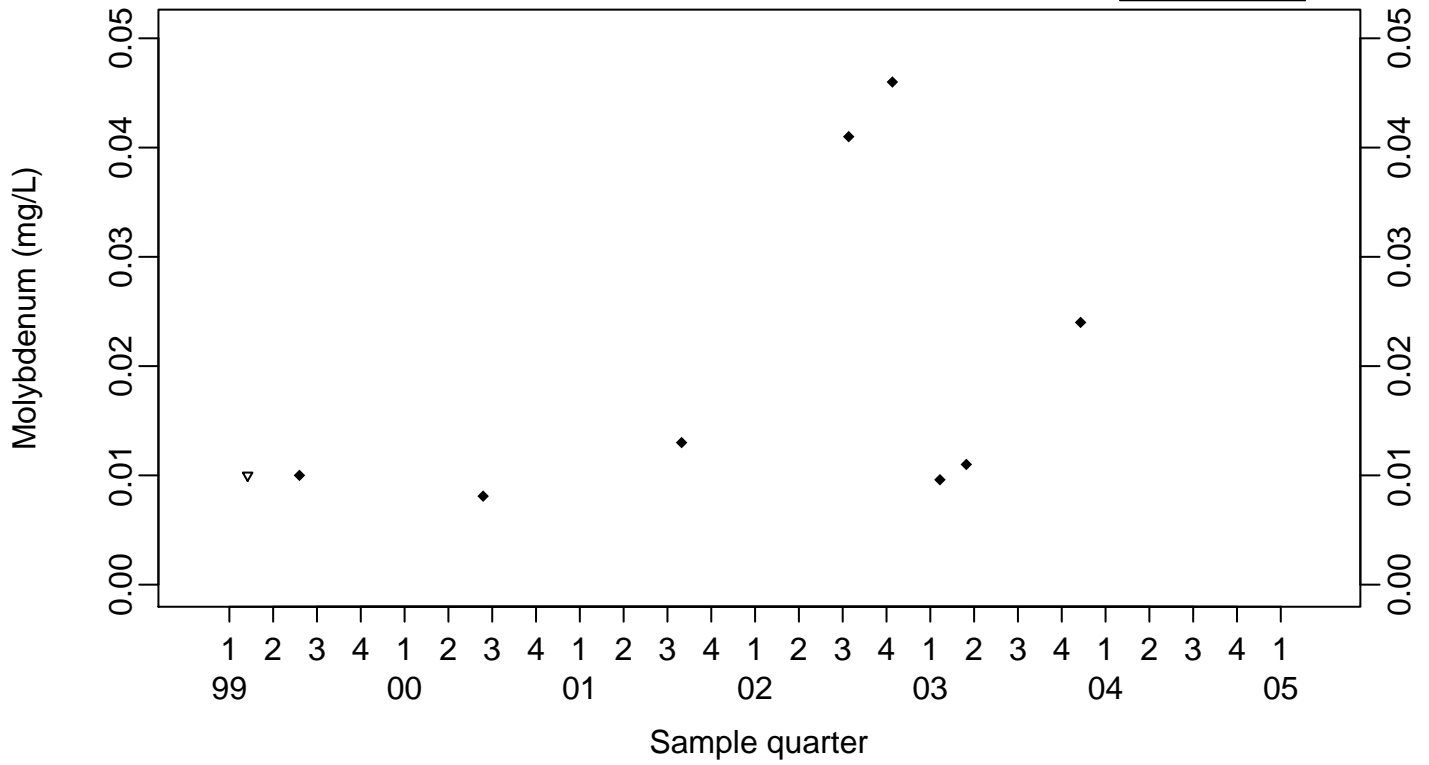
Retention Tank B827C/D



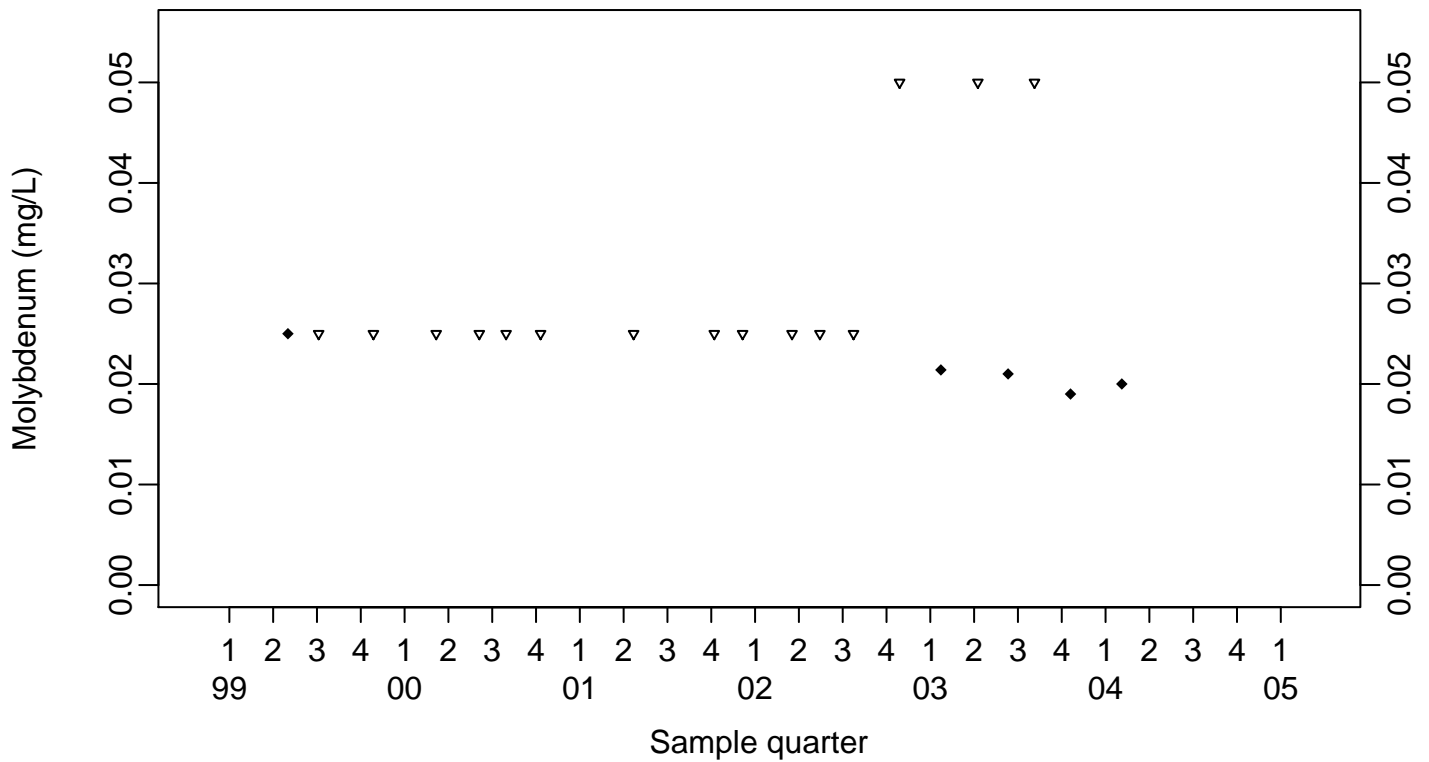
Surface Impoundments Process Water Molybdenum (mg/L)

Retention Tank B827E

◆ Above RL
▽ Below RL



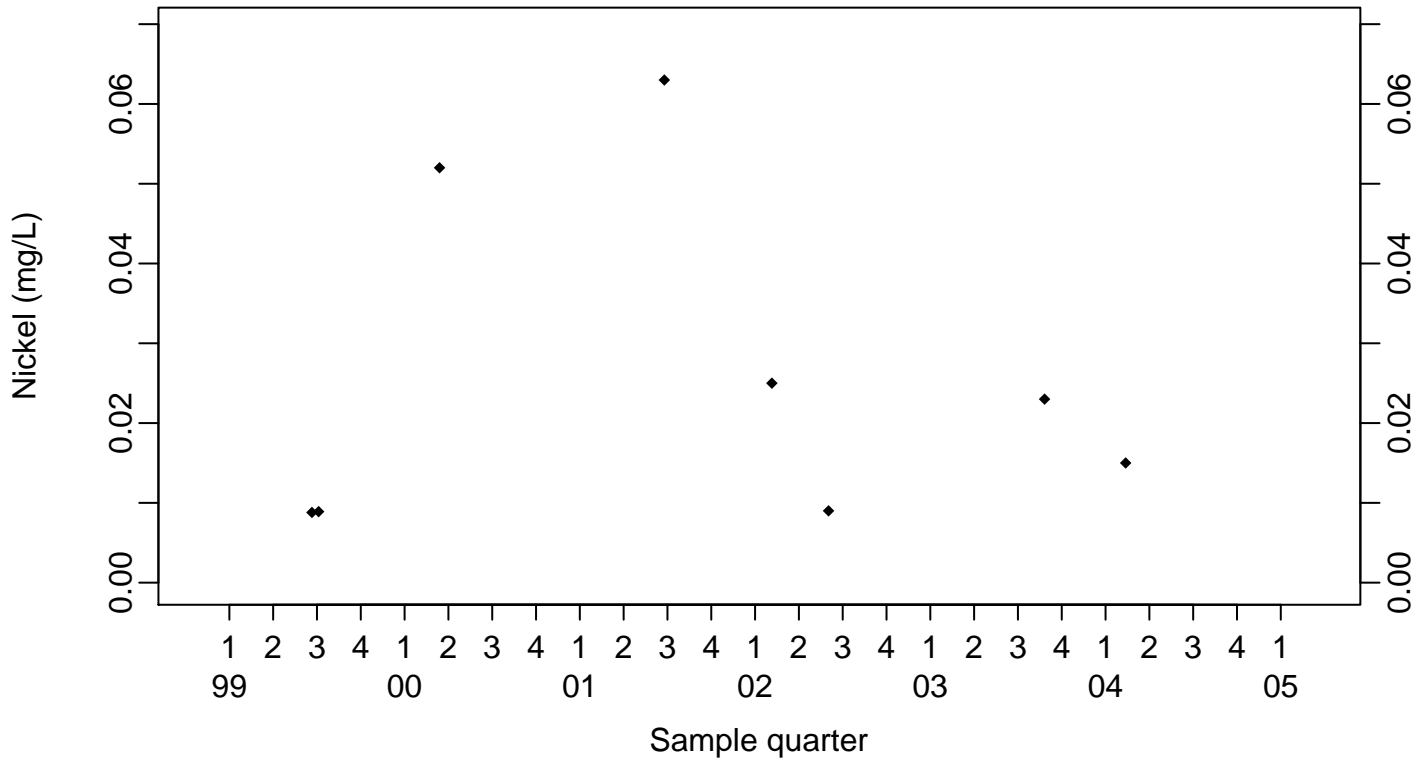
Retention Tank B851



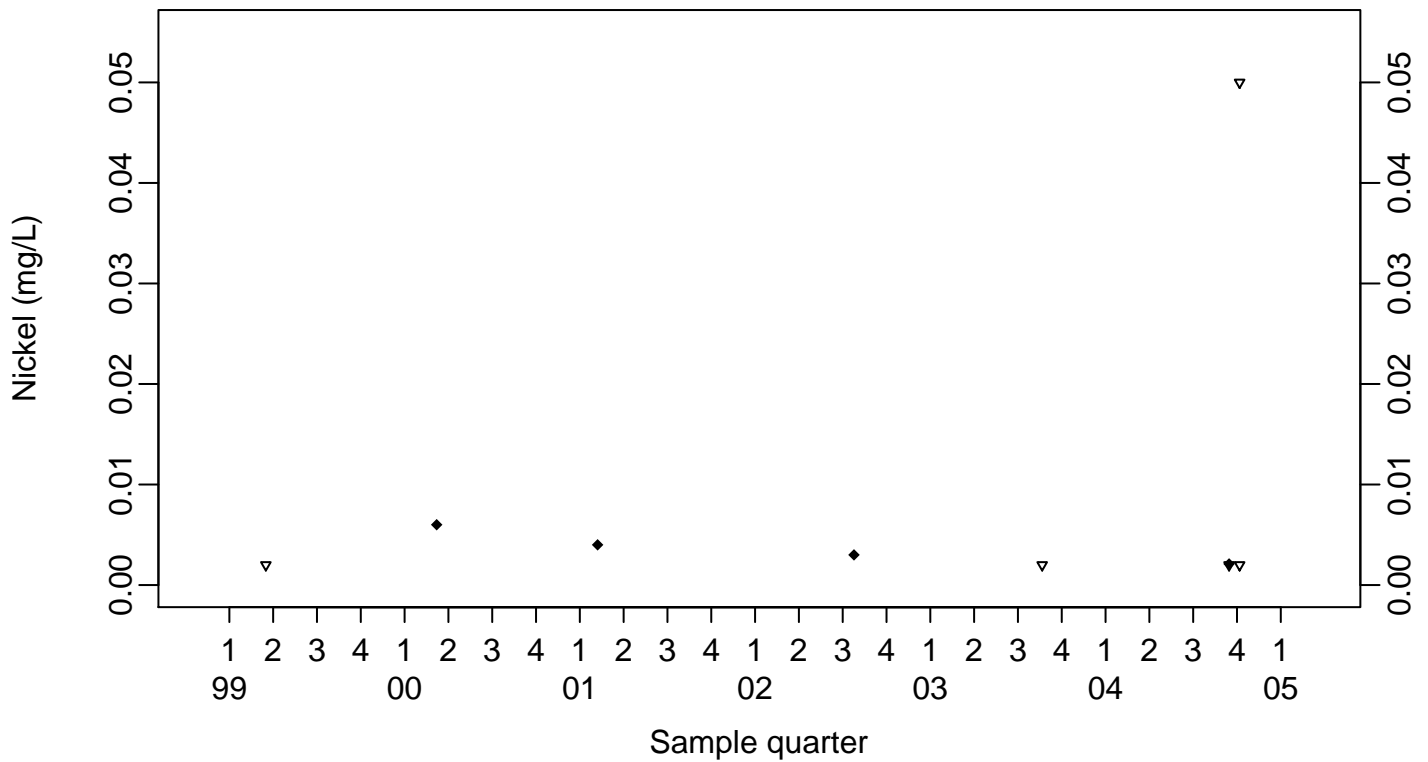
Surface Impoundments Process Water Nickel (mg/L)

Retention Tank B801

◆ Above RL
▽ Below RL



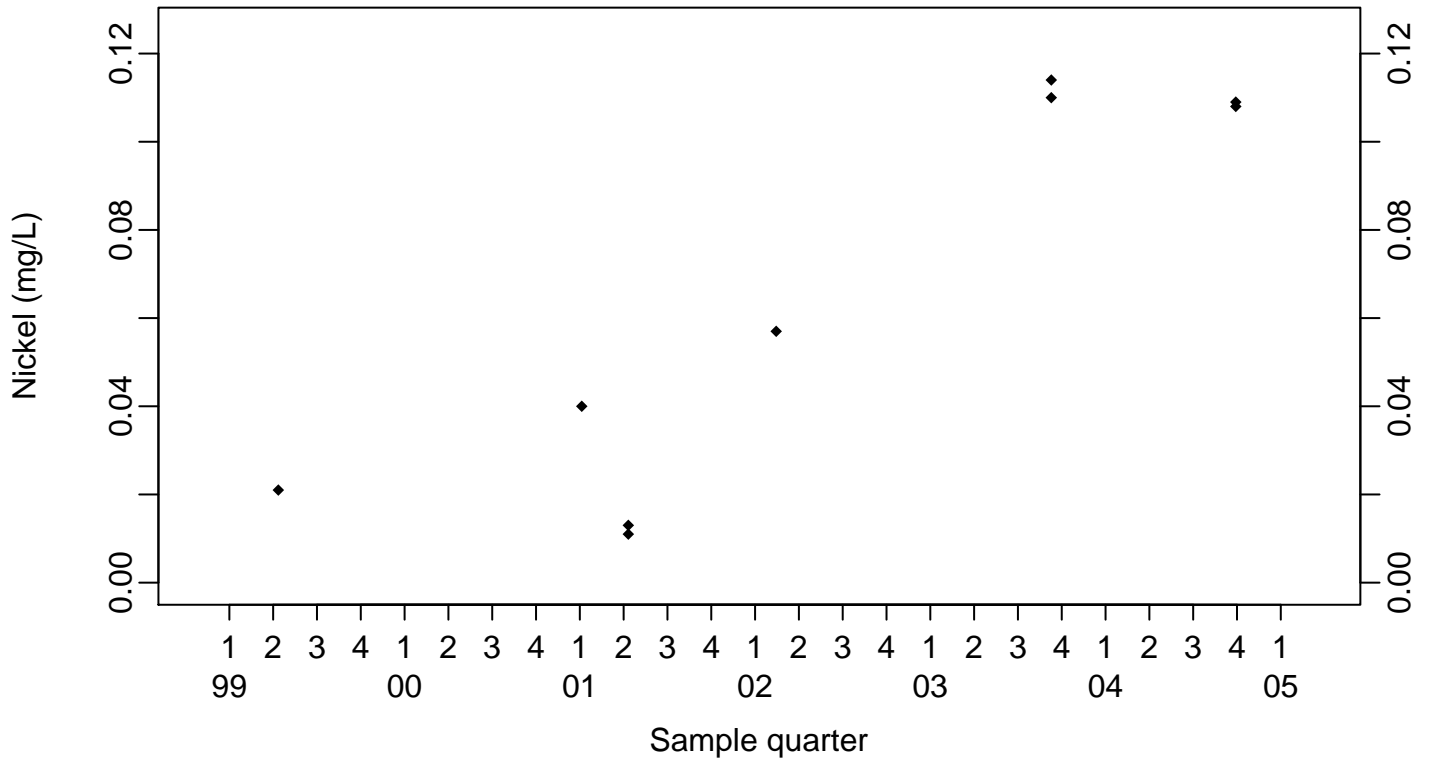
Retention Tank B806/807



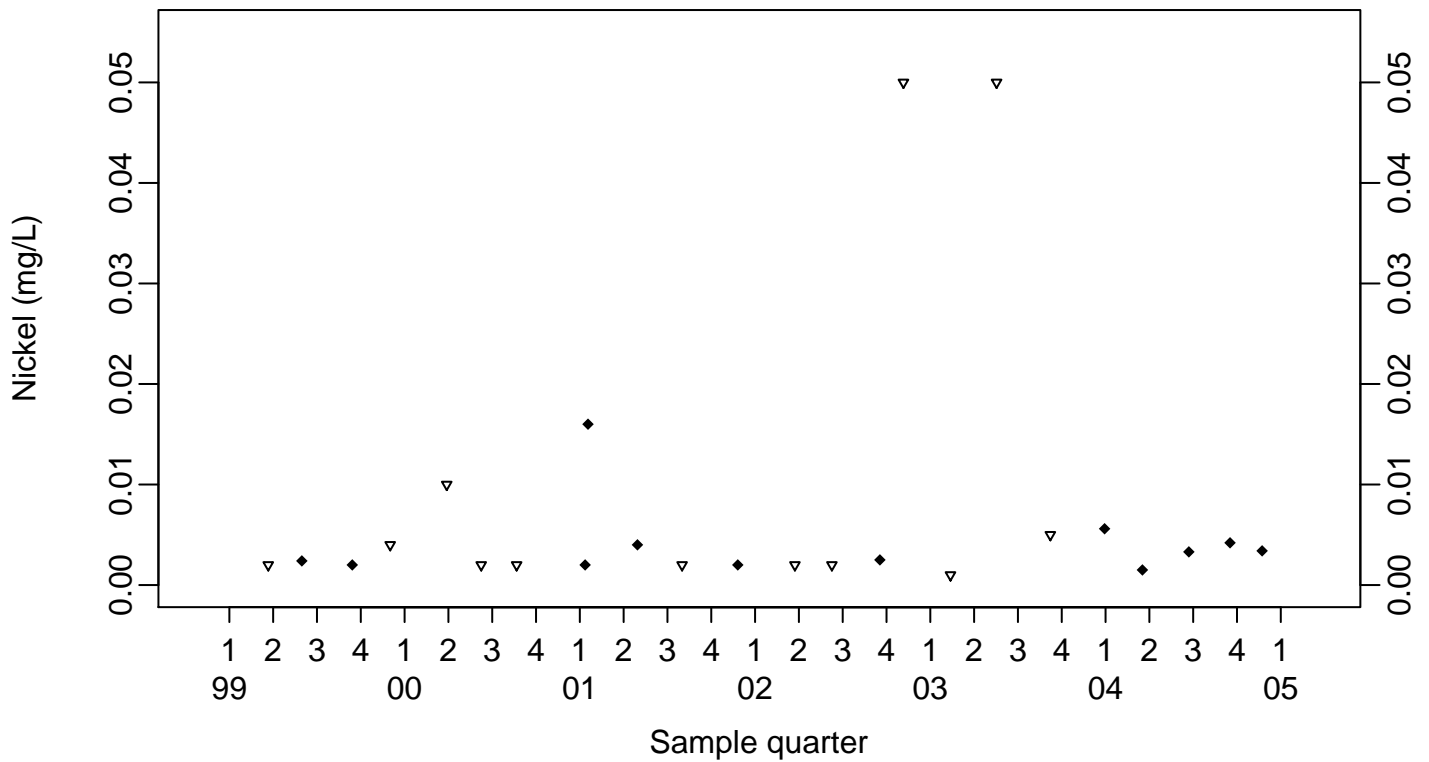
Surface Impoundments Process Water Nickel (mg/L)

Retention Tank B817

◆ Above RL
▽ Below RL



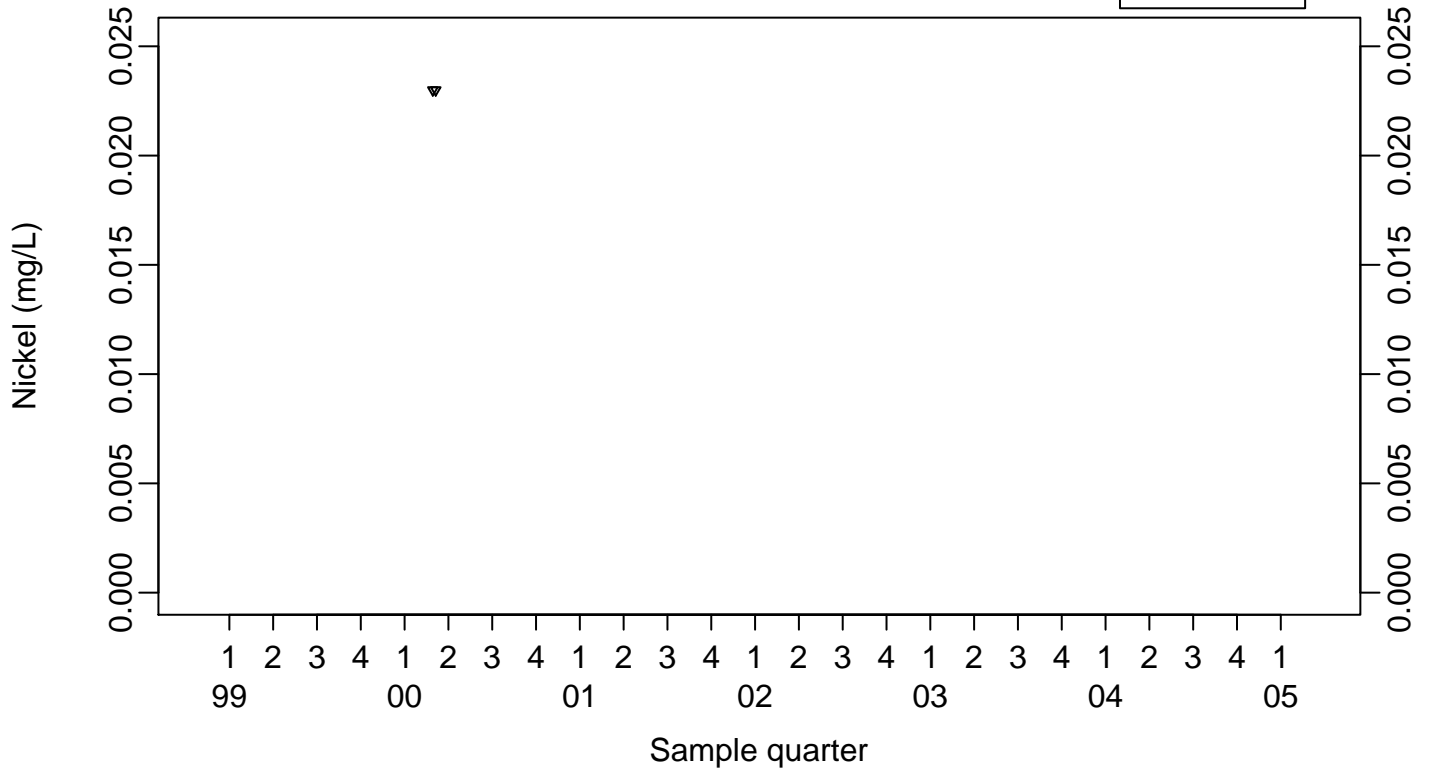
Retention Tank B823A



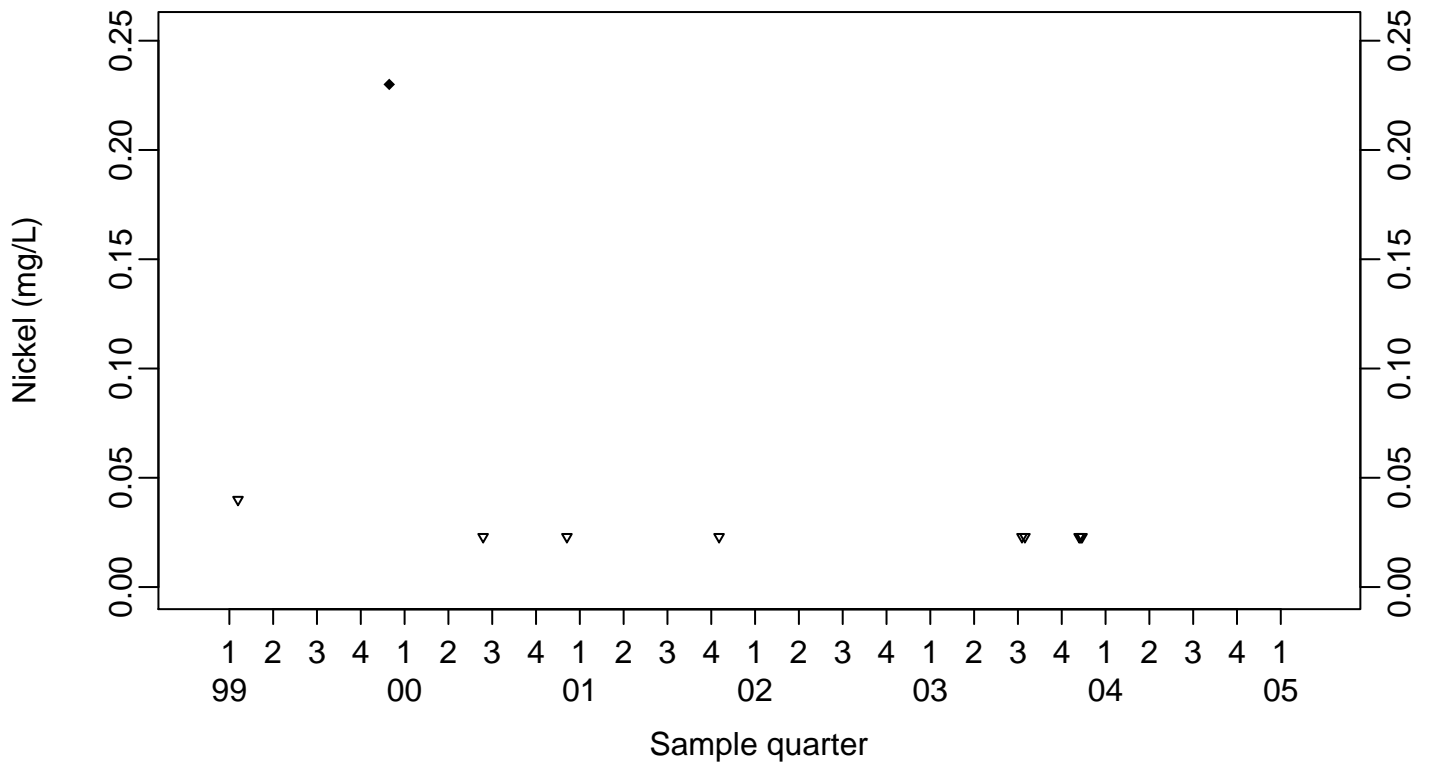
Surface Impoundments Process Water Nickel (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL

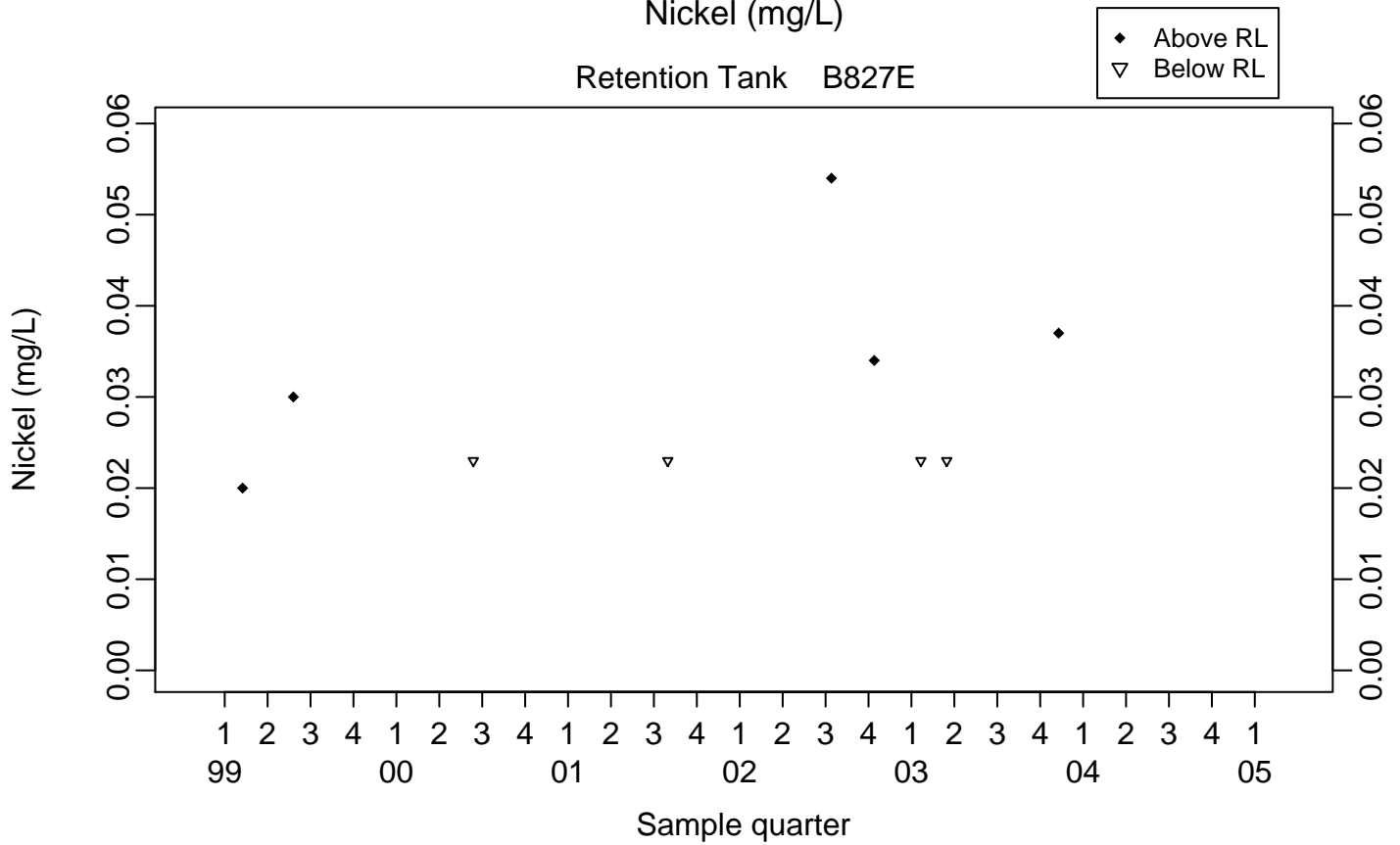


Retention Tank B827C/D

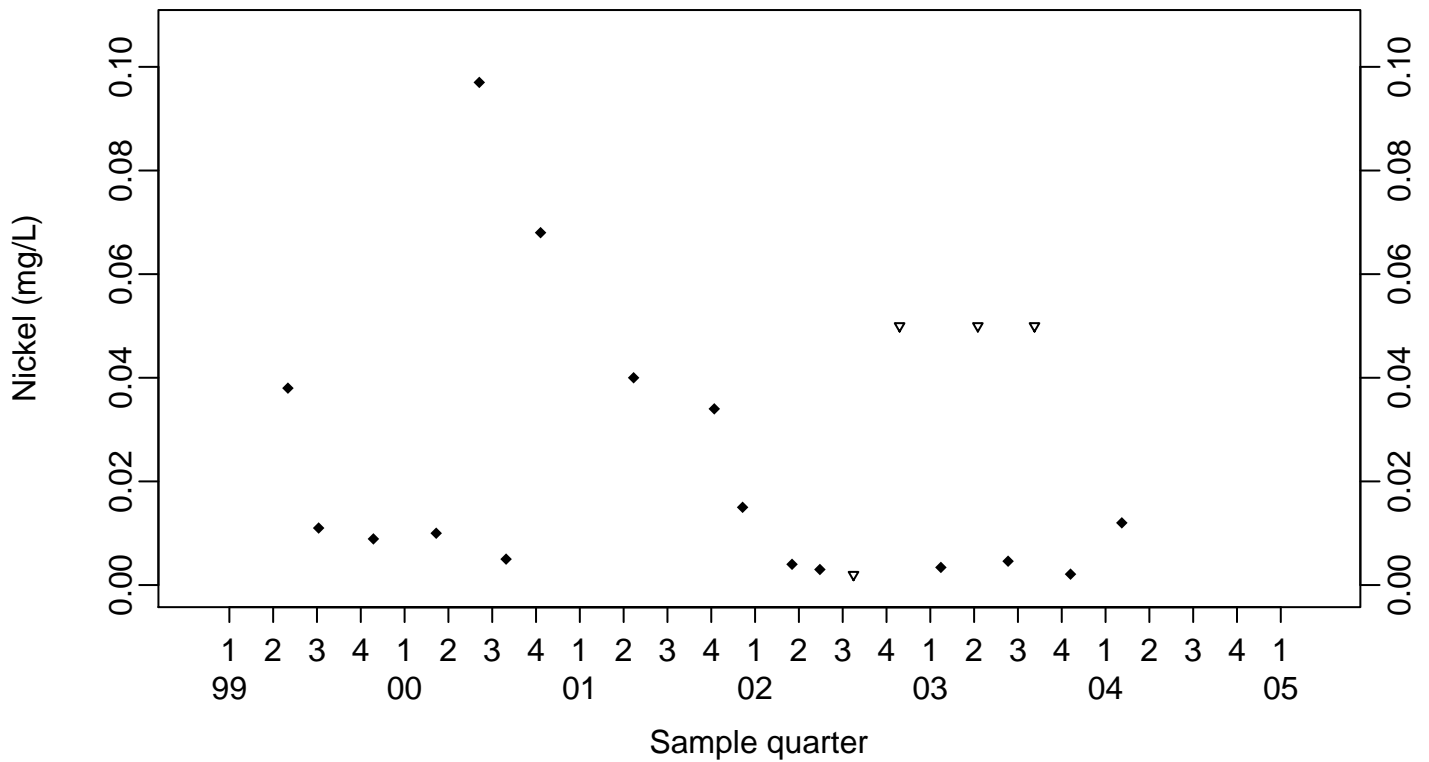


Surface Impoundments Process Water Nickel (mg/L)

Retention Tank B827E



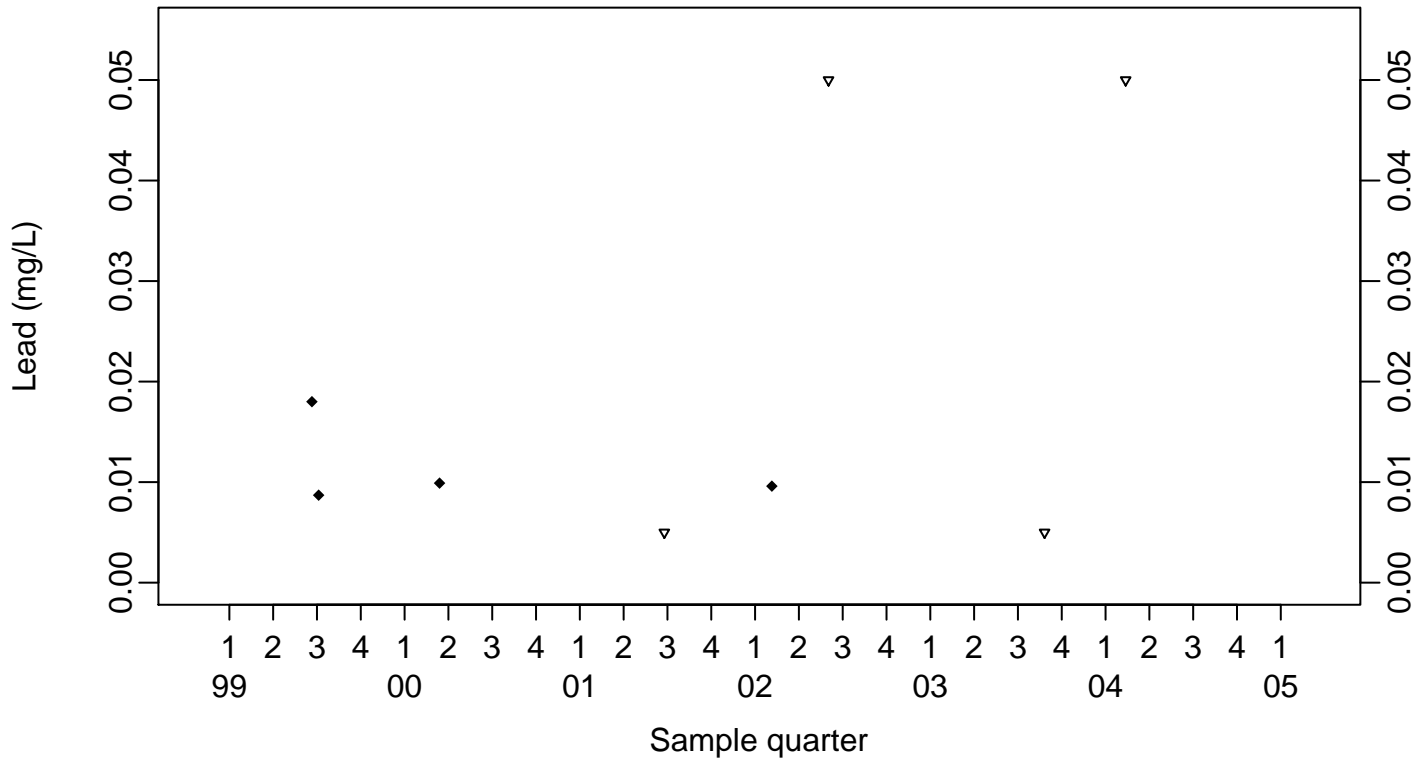
Retention Tank B851



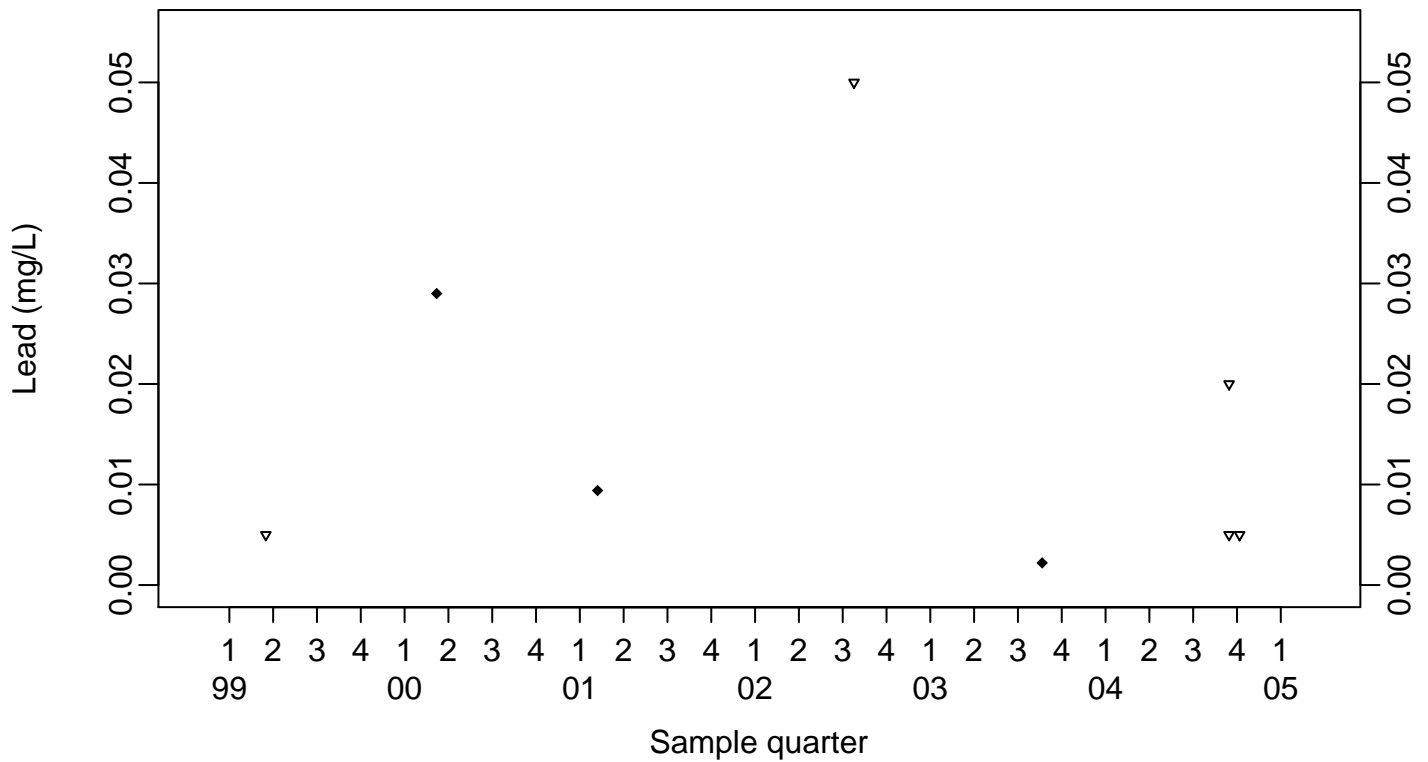
Surface Impoundments Process Water Lead (mg/L)

Retention Tank B801

◆ Above RL
▽ Below RL

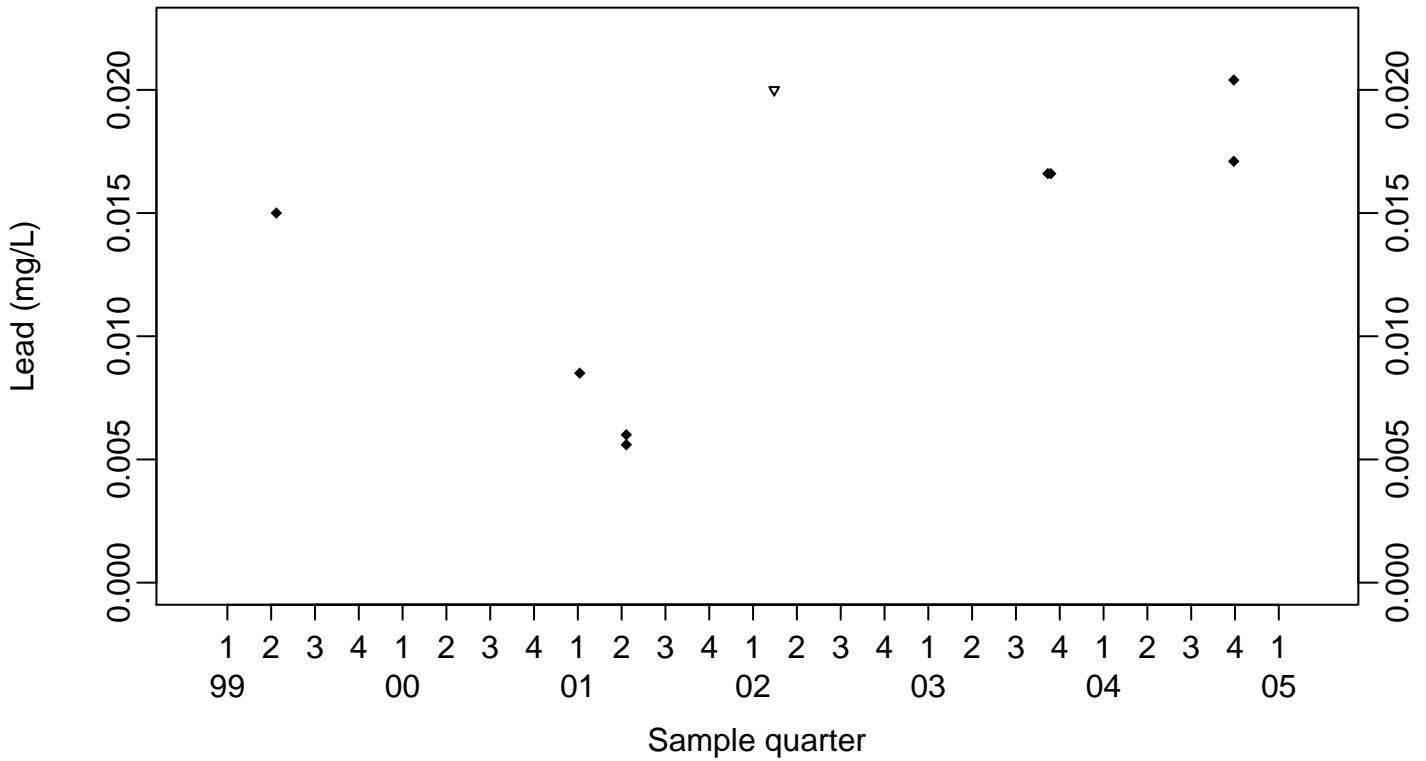
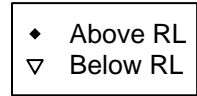


Retention Tank B806/807

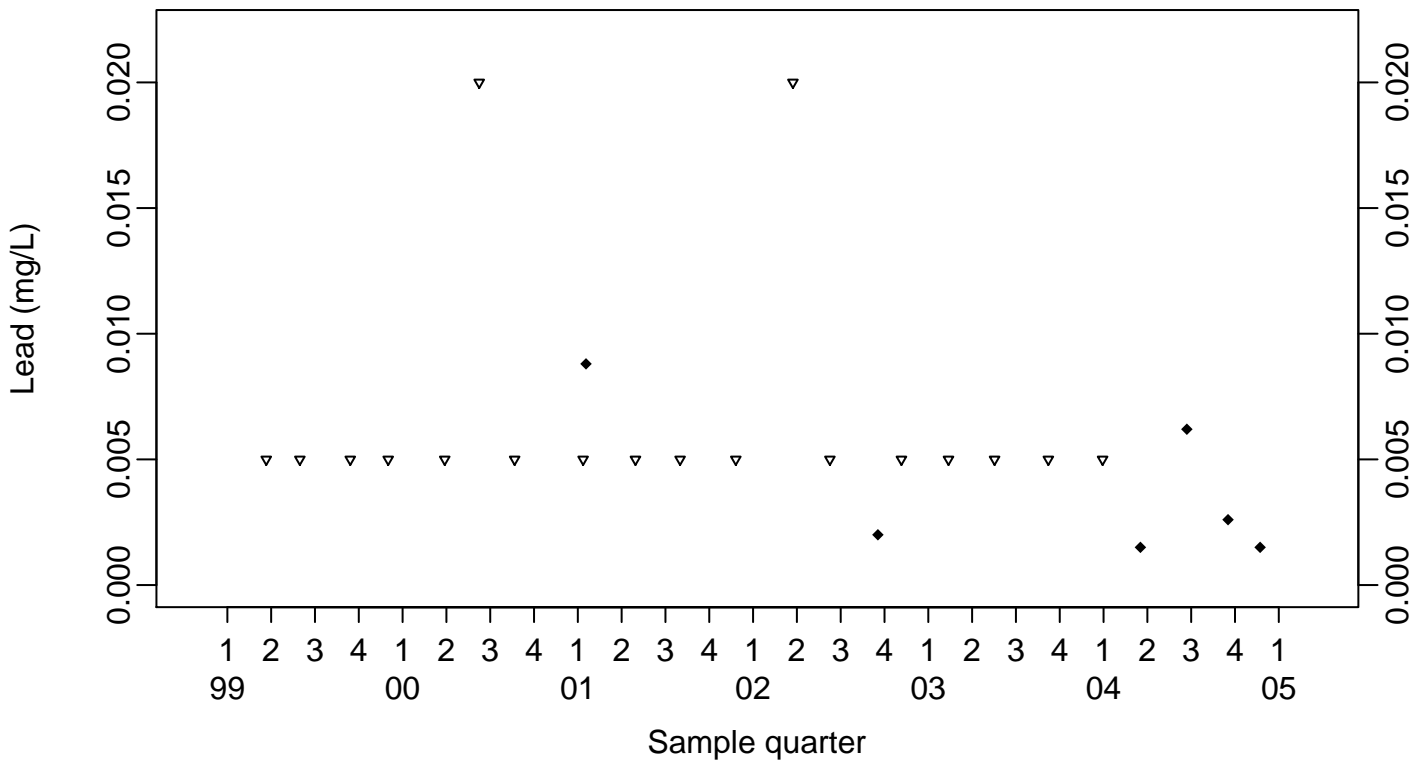


Surface Impoundments Process Water Lead (mg/L)

Retention Tank B817



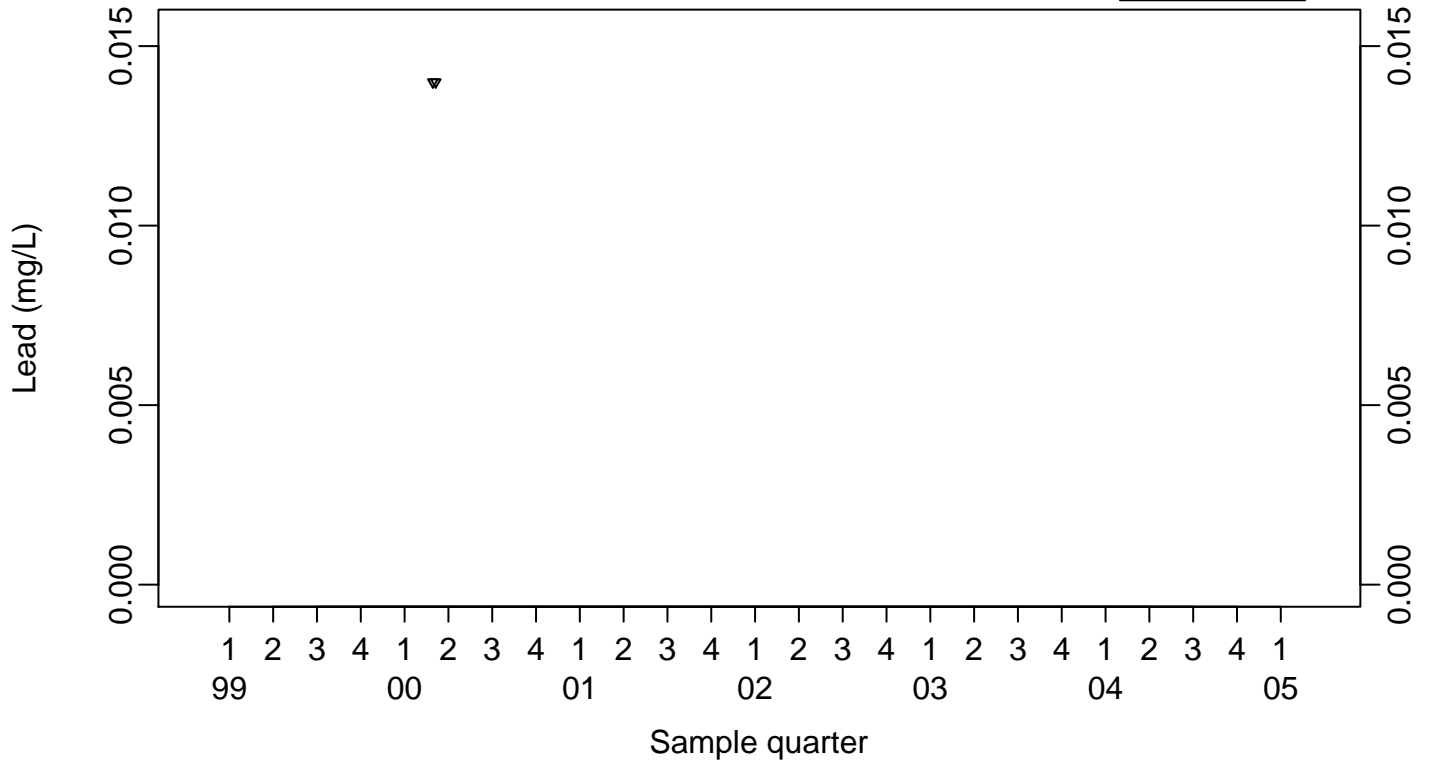
Retention Tank B823A



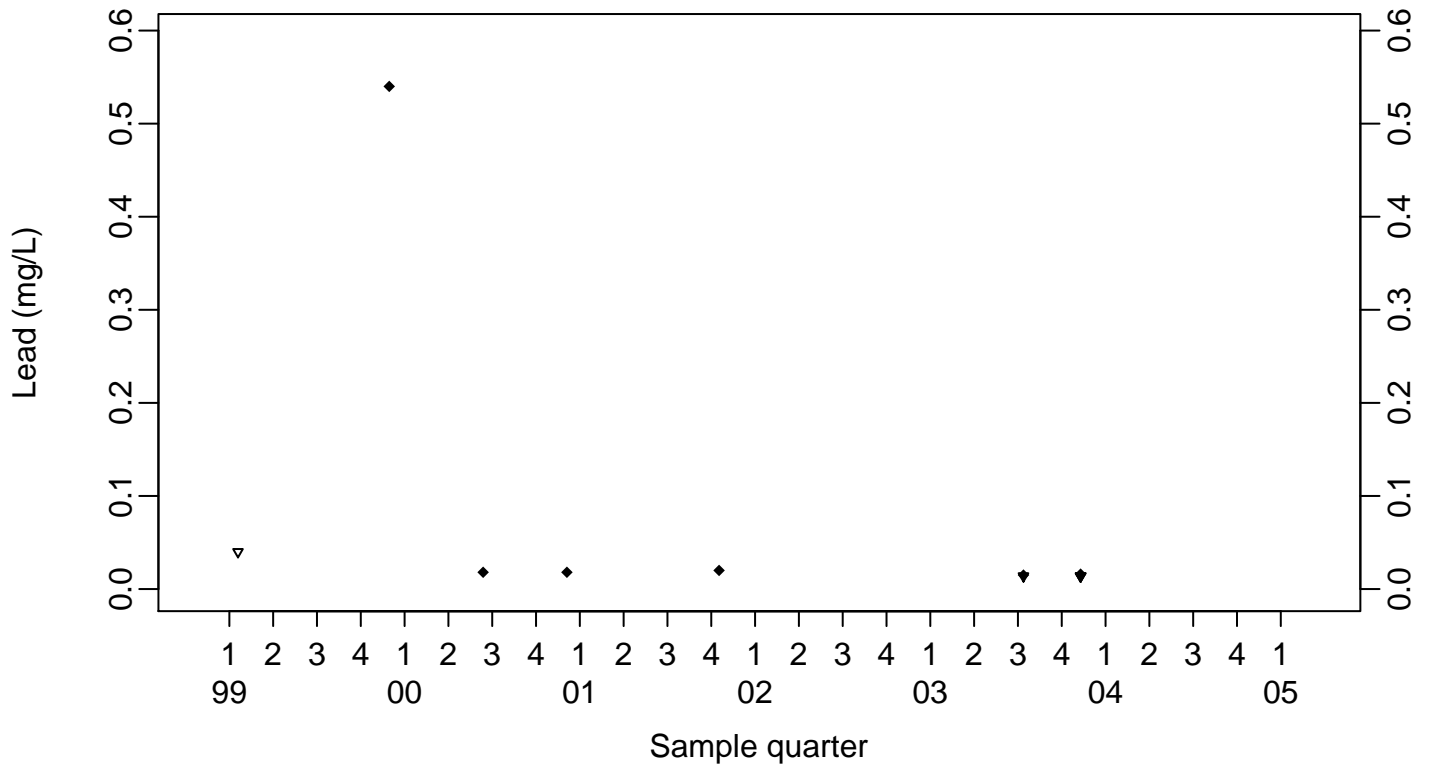
Surface Impoundments Process Water Lead (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



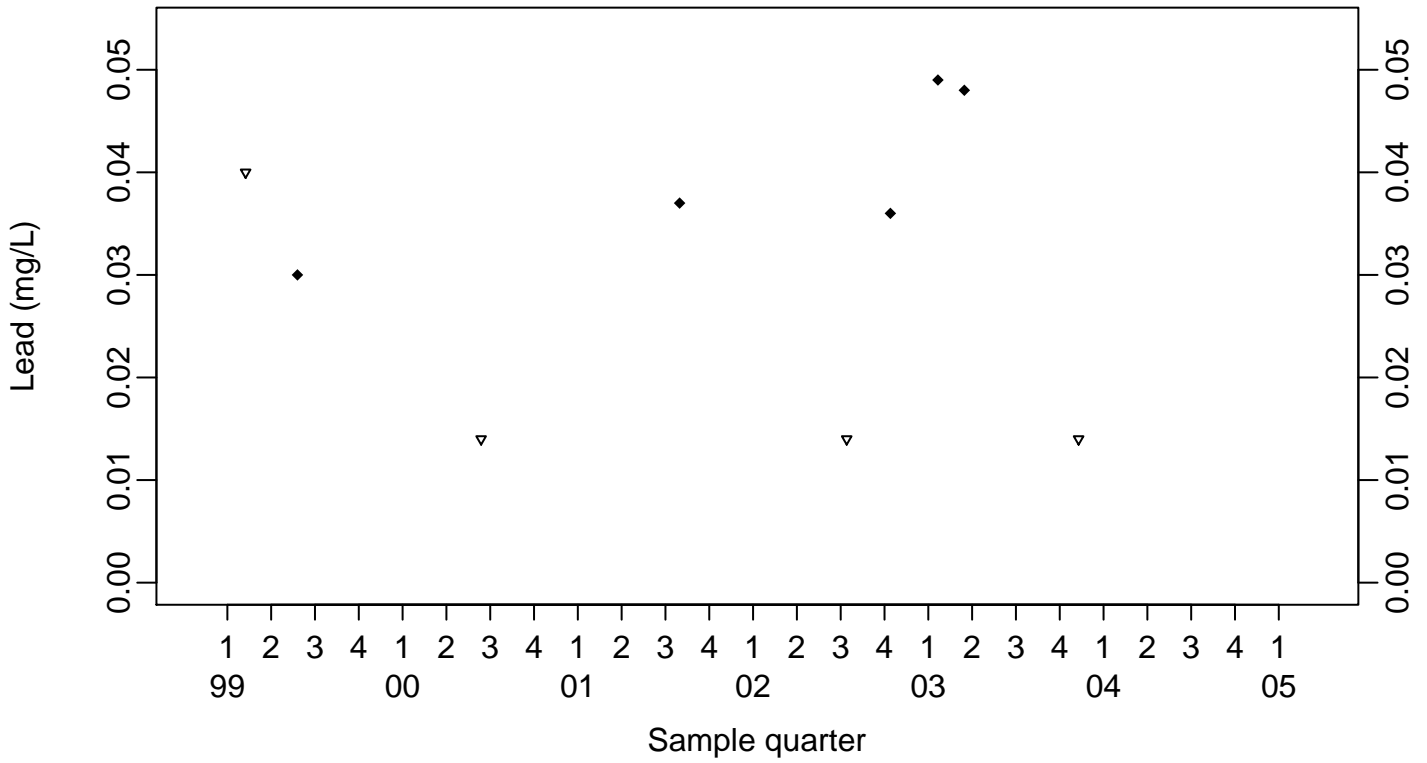
Retention Tank B827C/D



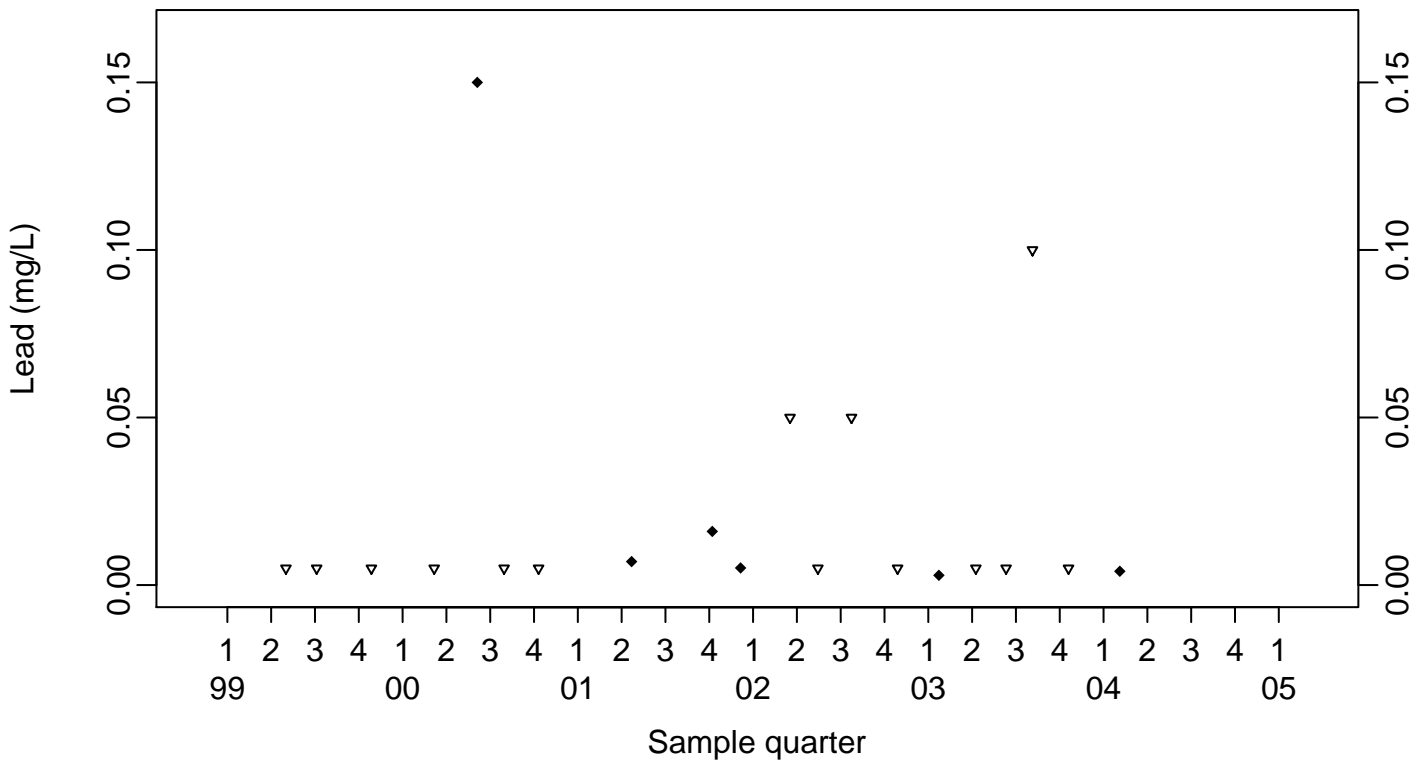
Surface Impoundments Process Water Lead (mg/L)

Retention Tank B827E

- ◆ Above RL
- ▽ Below RL



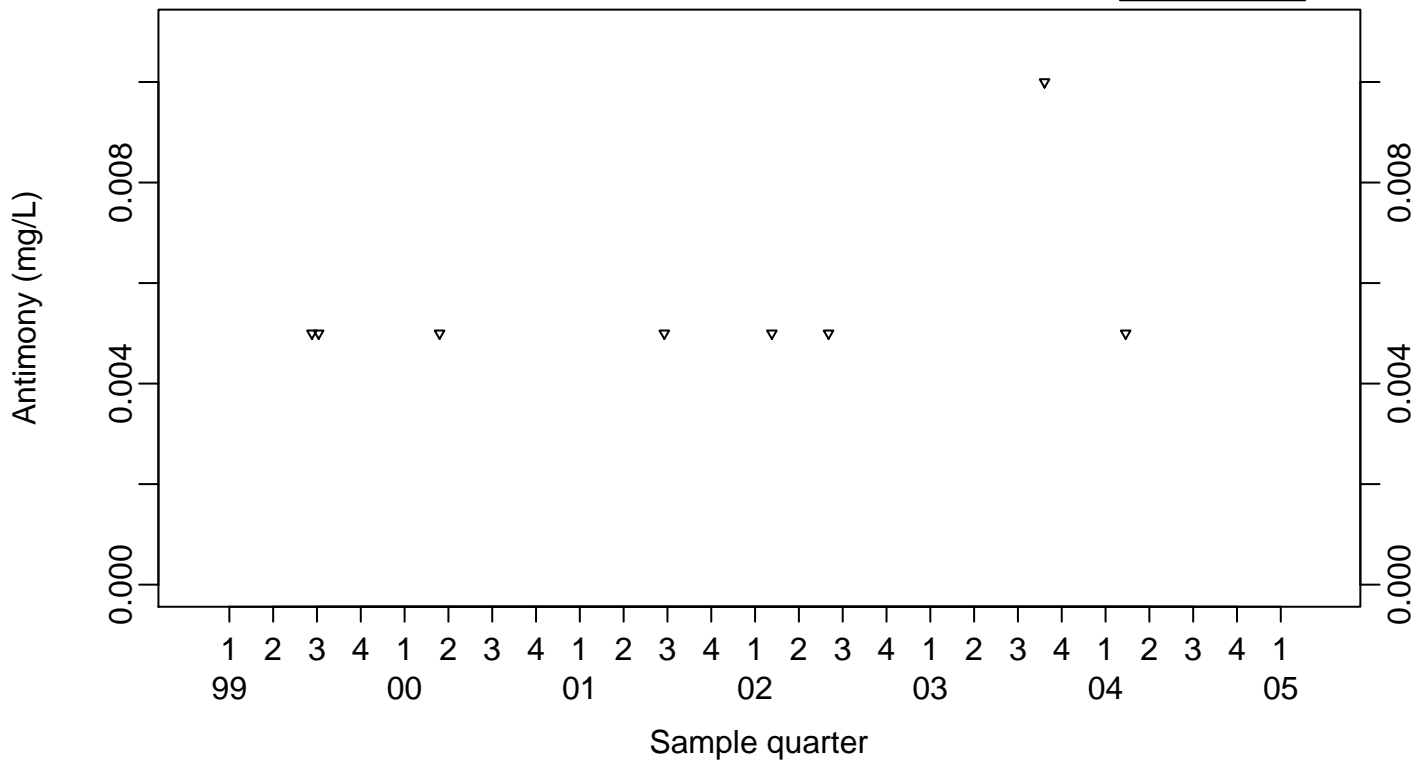
Retention Tank B851



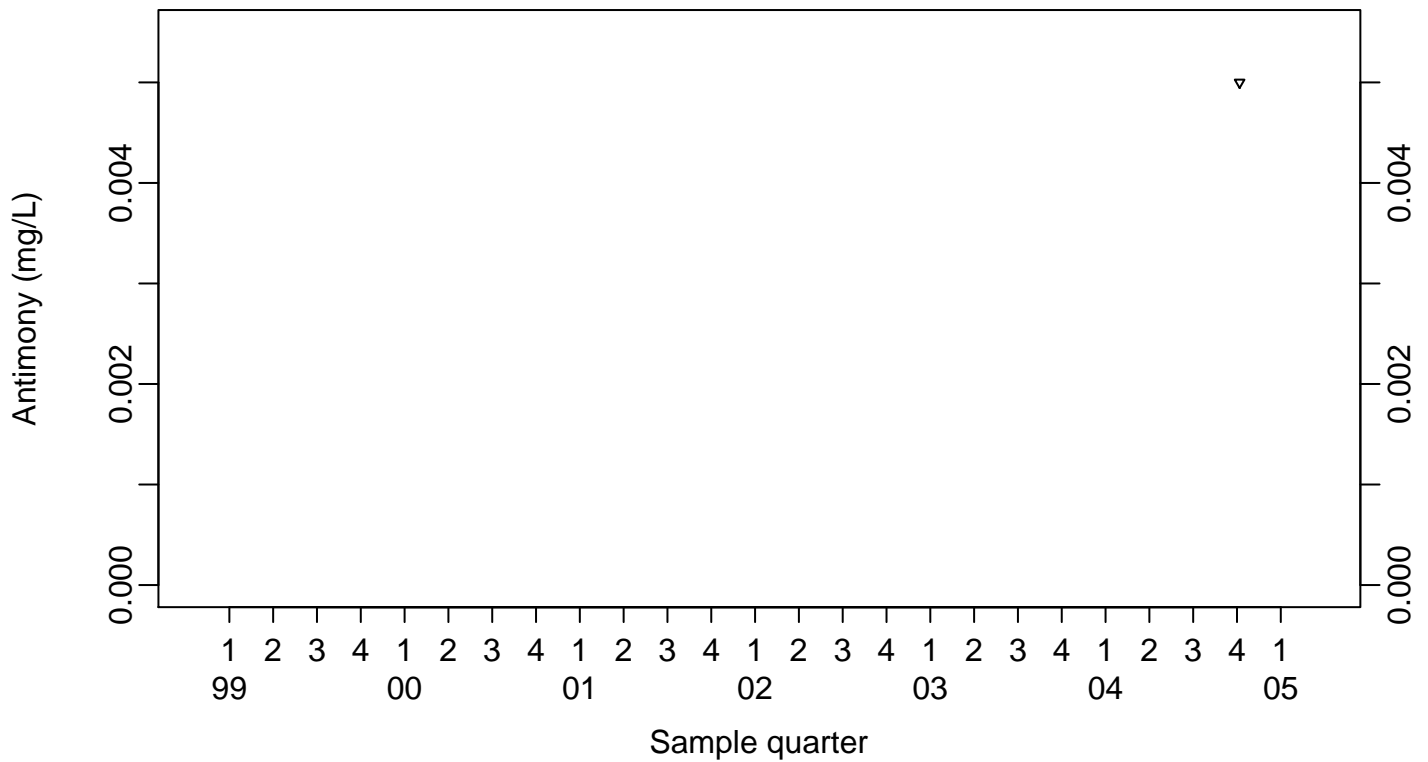
Surface Impoundments Process Water Antimony (mg/L)

Retention Tank B801

◆ Above RL
▽ Below RL



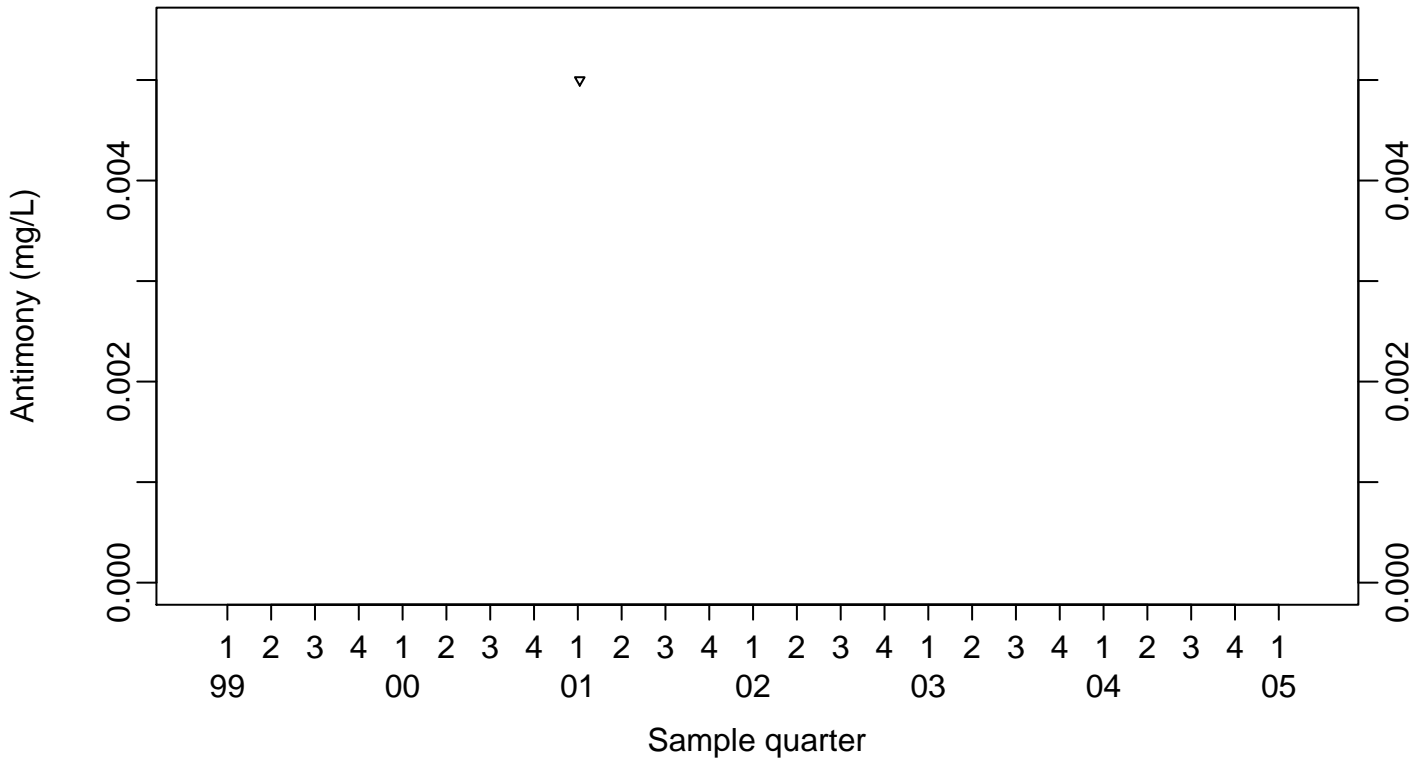
Retention Tank B806/807



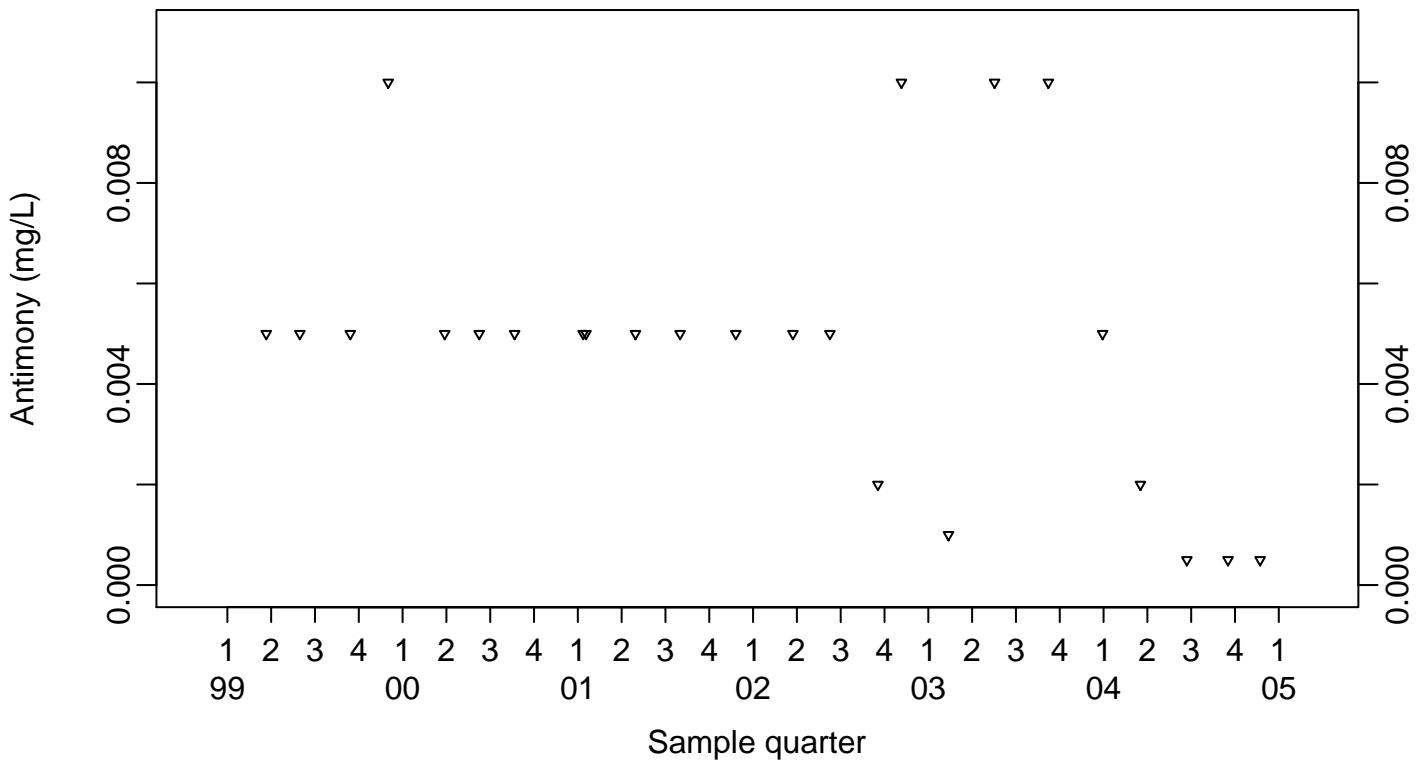
Surface Impoundments Process Water Antimony (mg/L)

Retention Tank B817

◆ Above RL
▽ Below RL



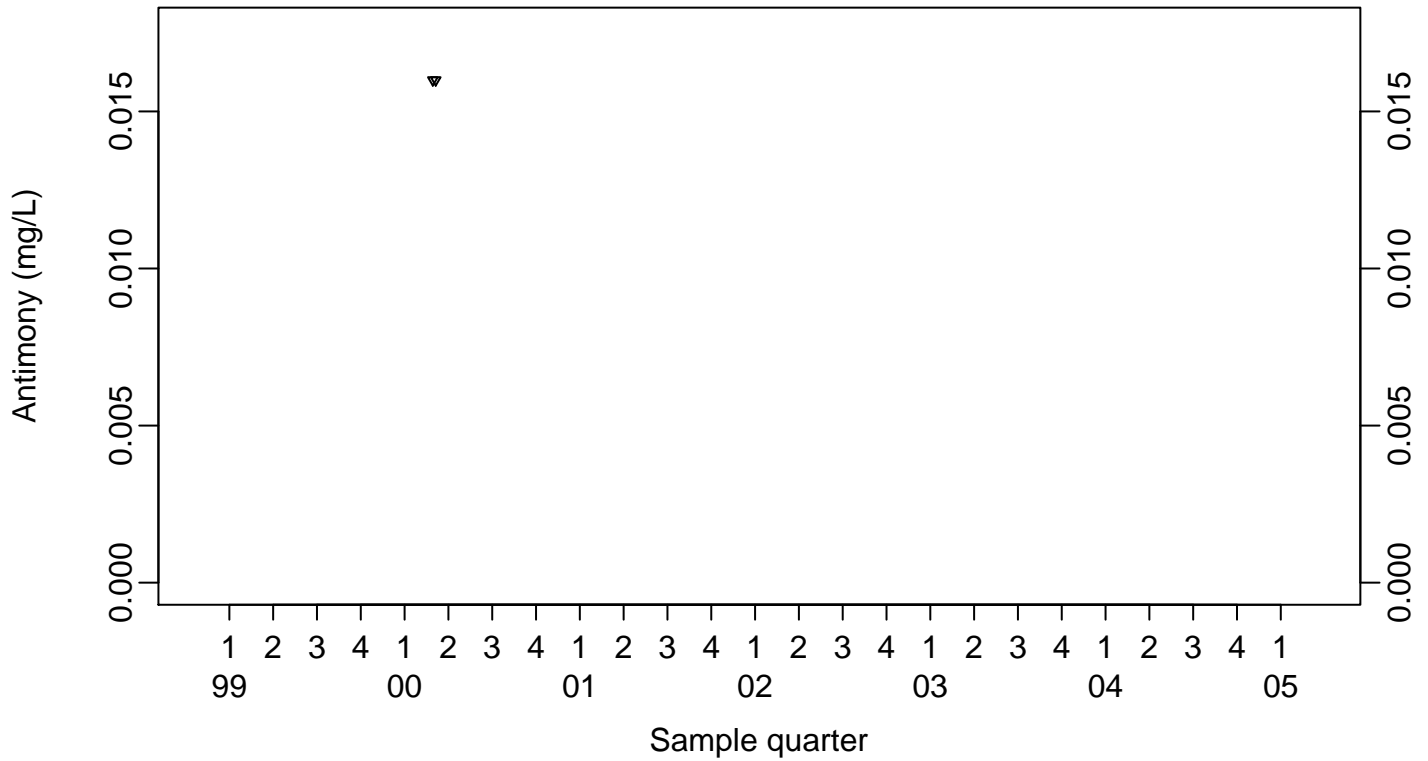
Retention Tank B823A



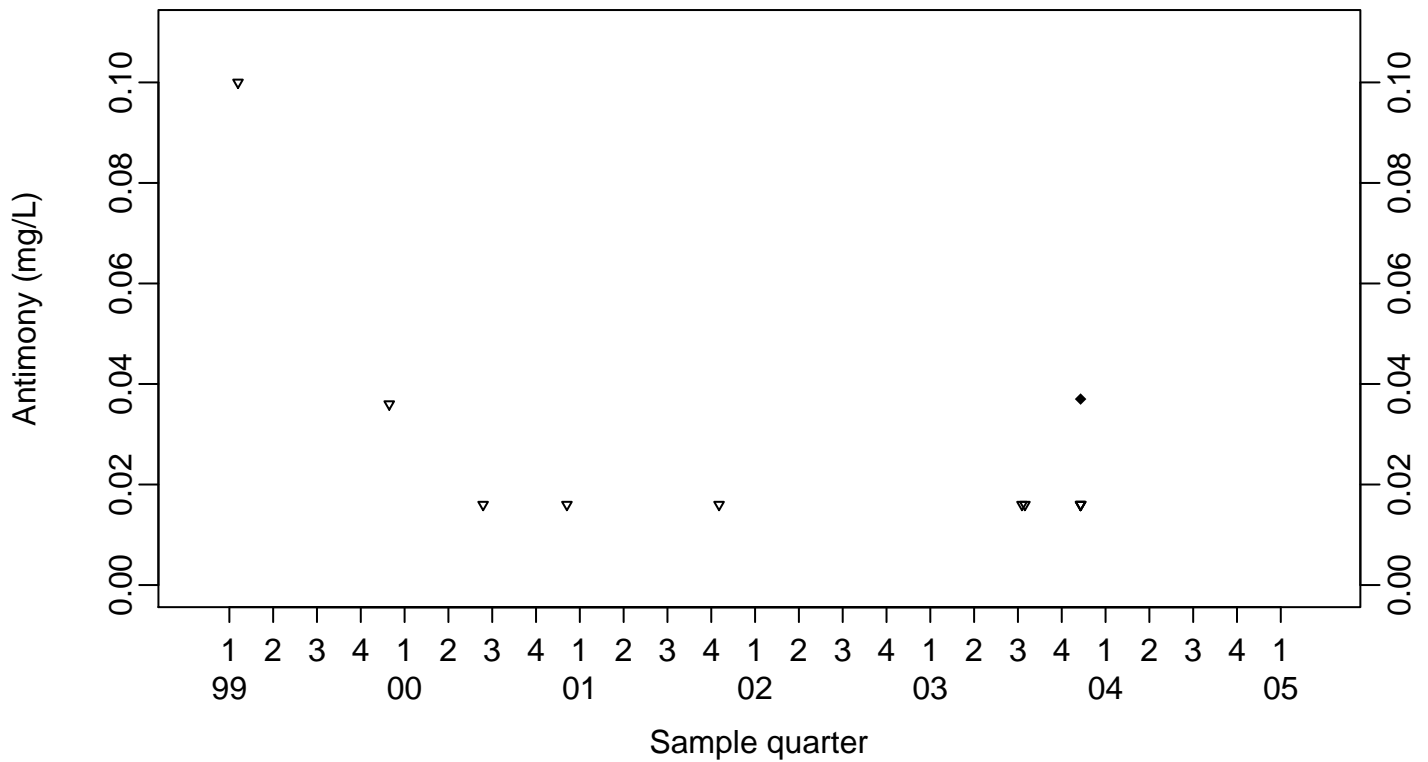
Surface Impoundments Process Water Antimony (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



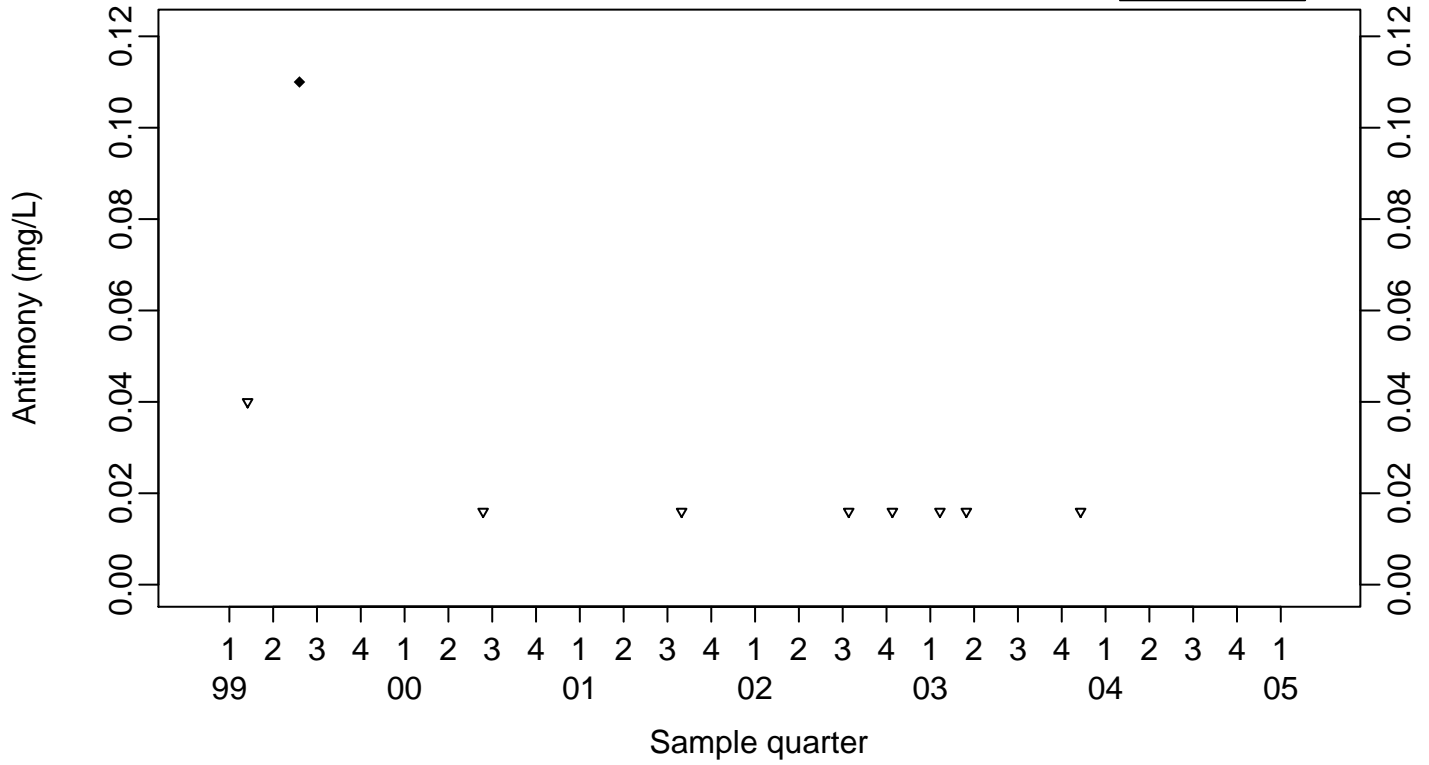
Retention Tank B827C/D



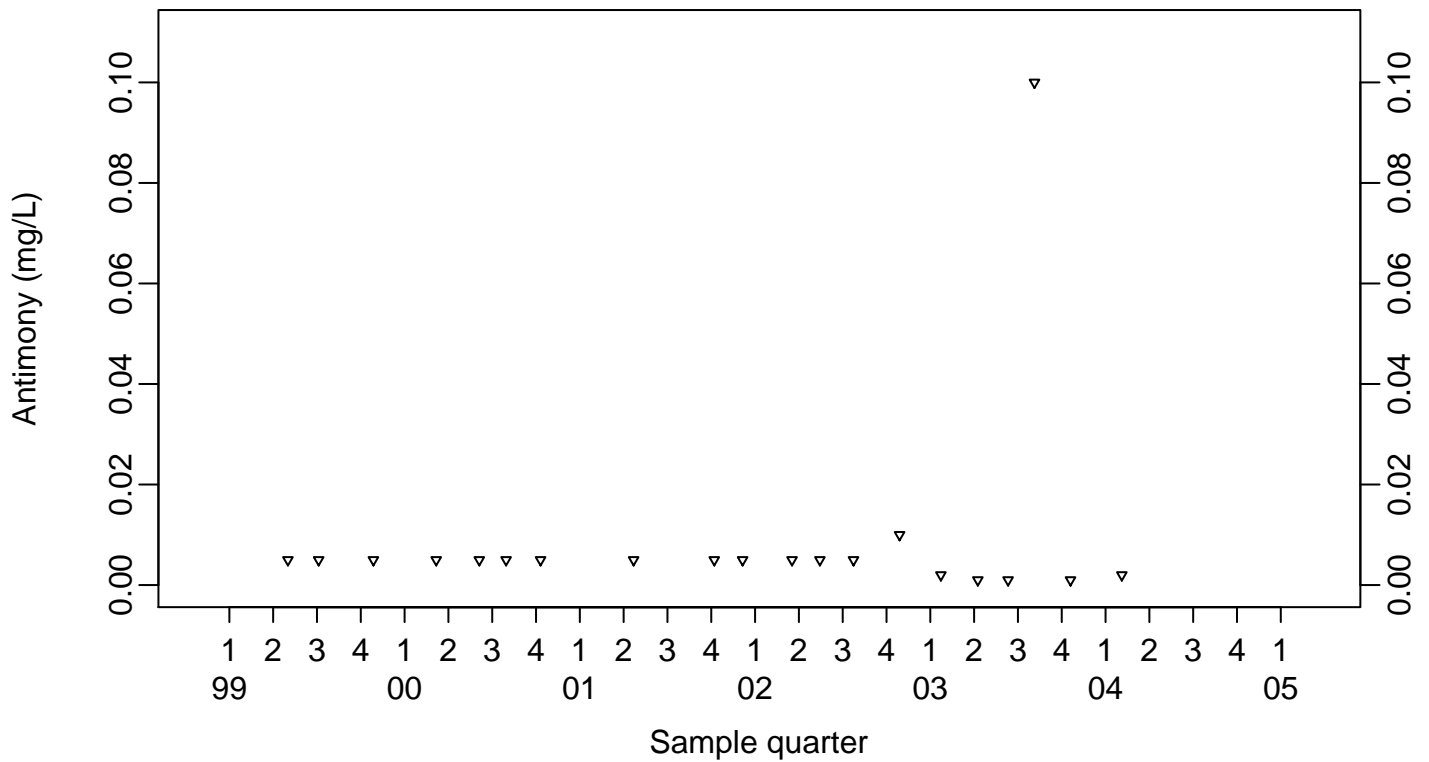
Surface Impoundments Process Water Antimony (mg/L)

Retention Tank B827E

◆ Above RL
▽ Below RL



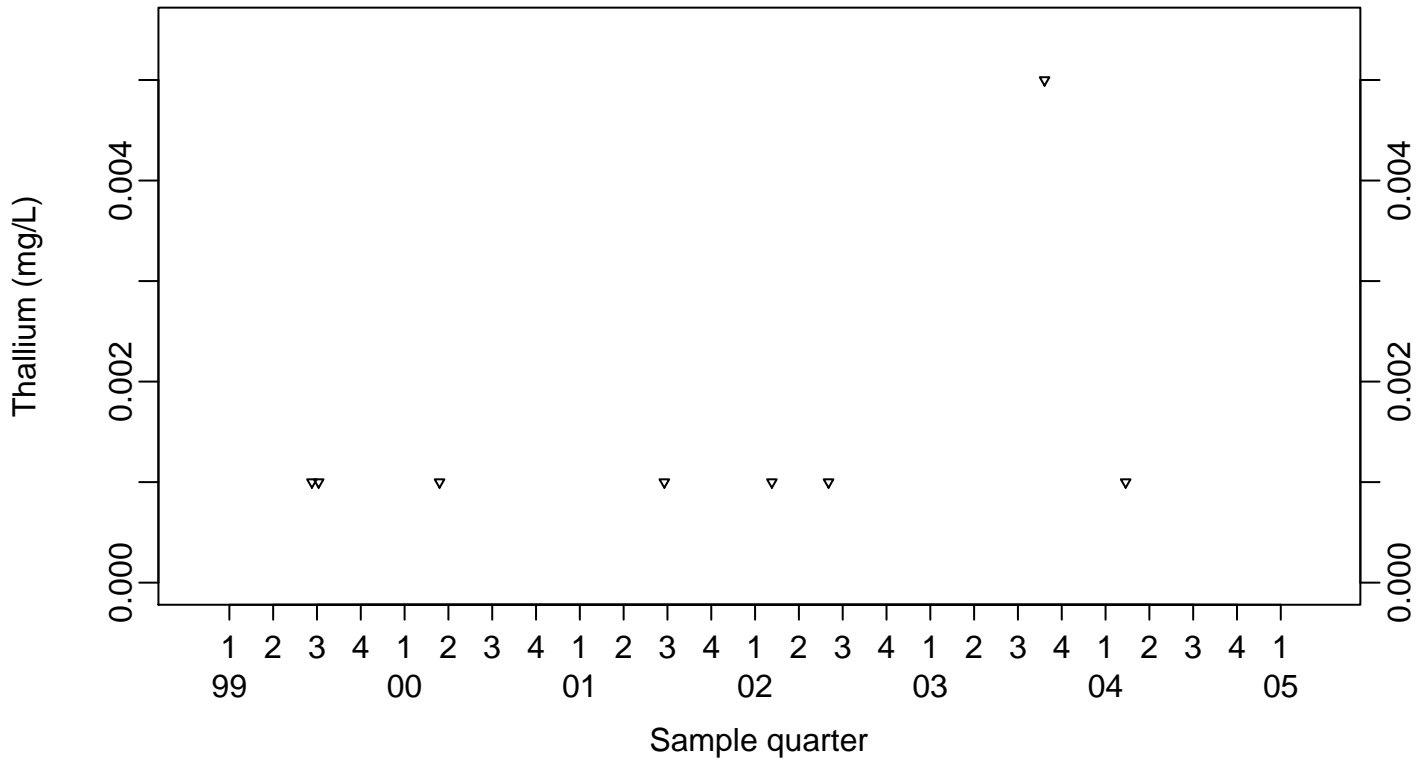
Retention Tank B851



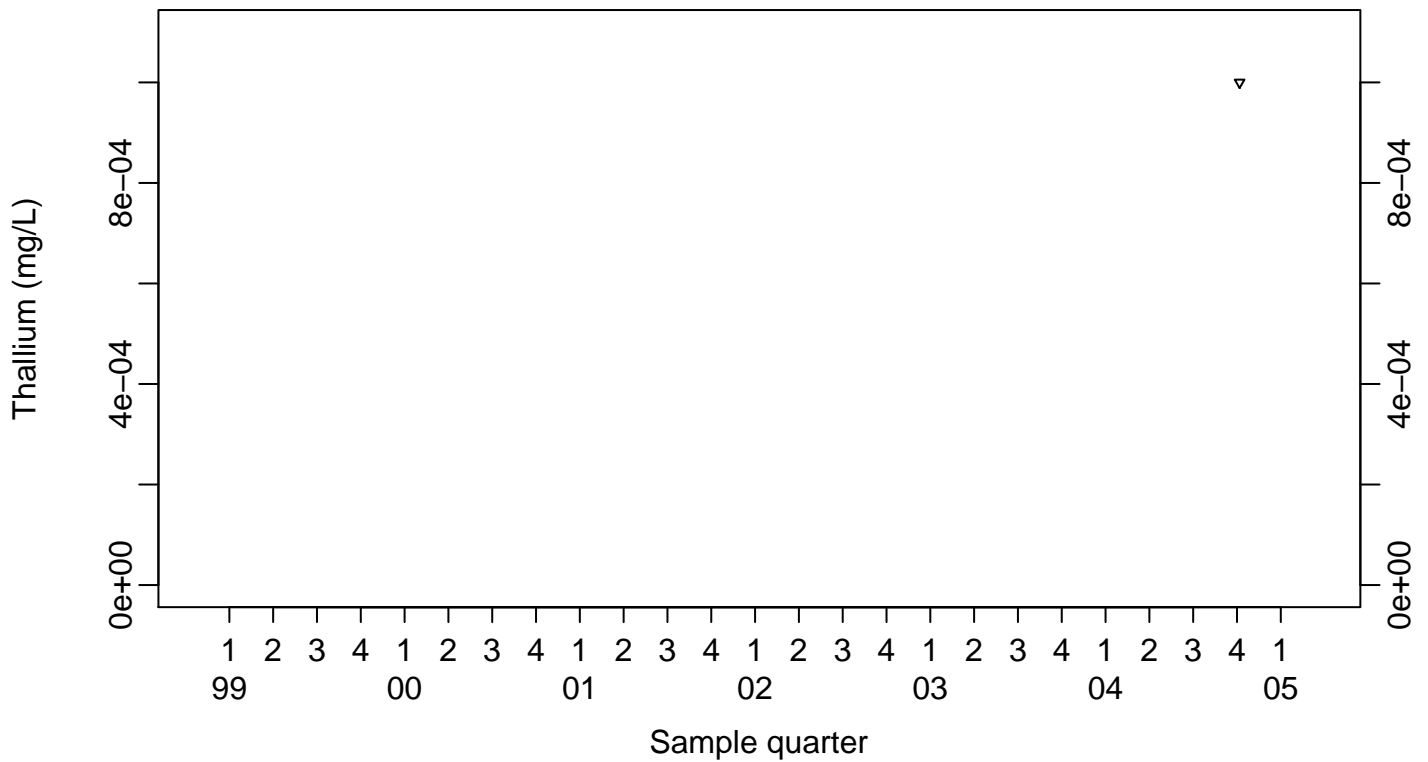
Surface Impoundments Process Water Thallium (mg/L)

Retention Tank B801

- ◆ Above RL
- ▽ Below RL



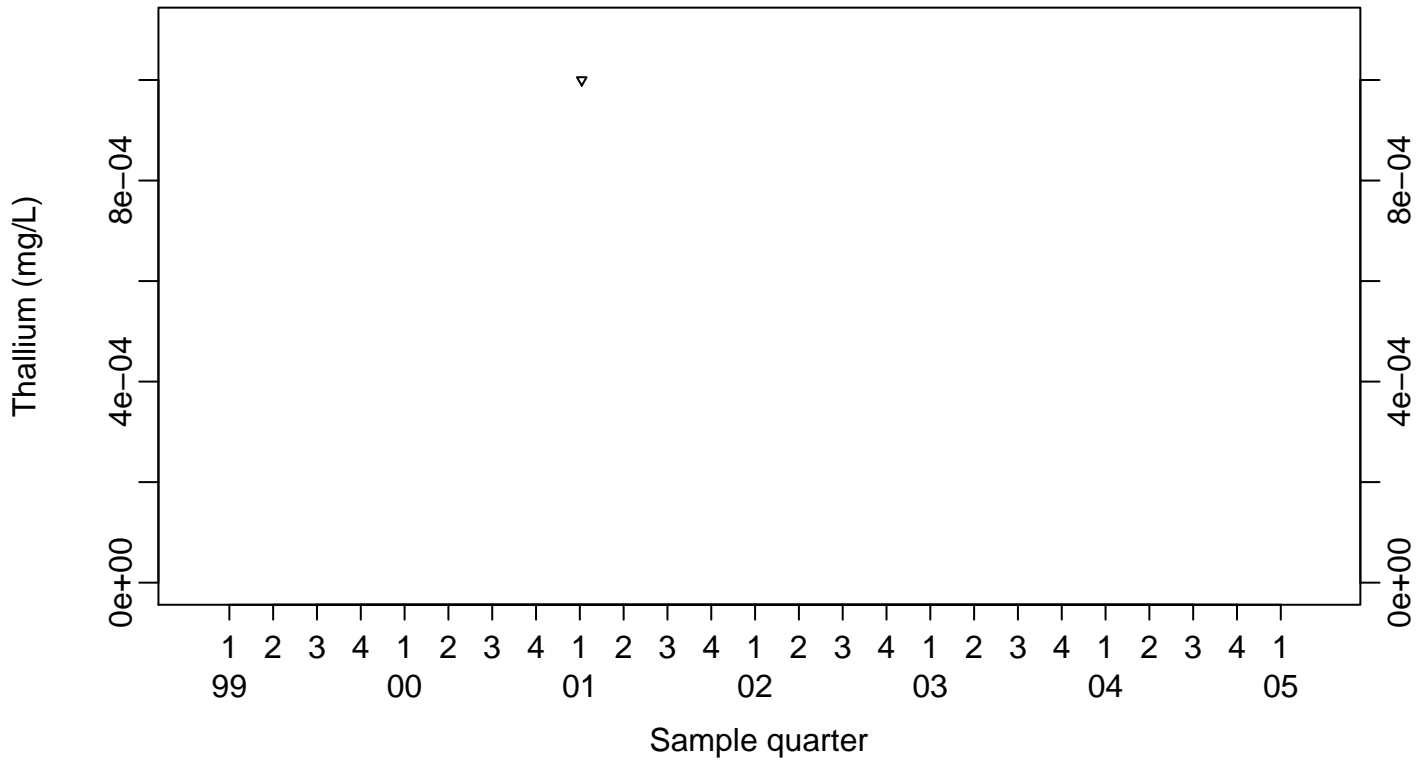
Retention Tank B806/807



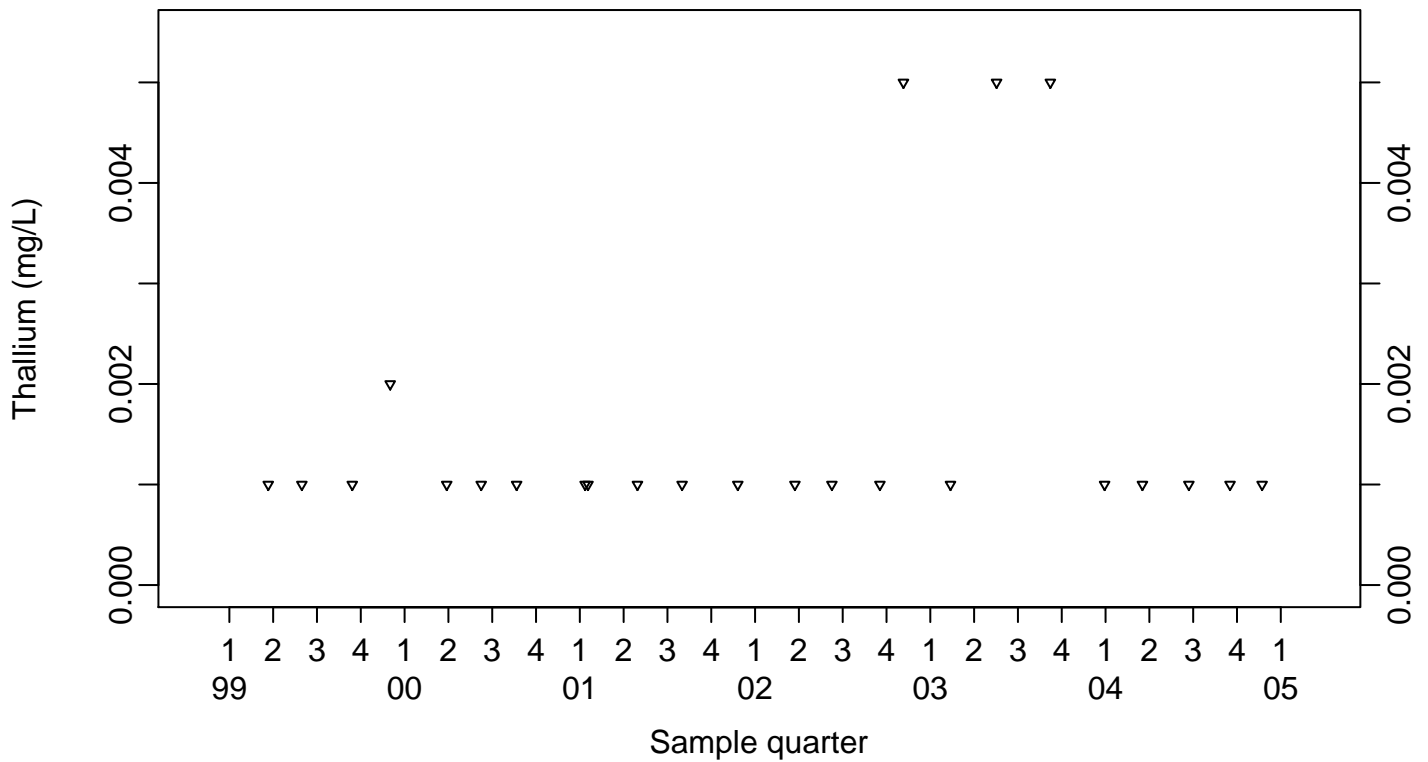
Surface Impoundments Process Water Thallium (mg/L)

Retention Tank B817

◆ Above RL
▽ Below RL



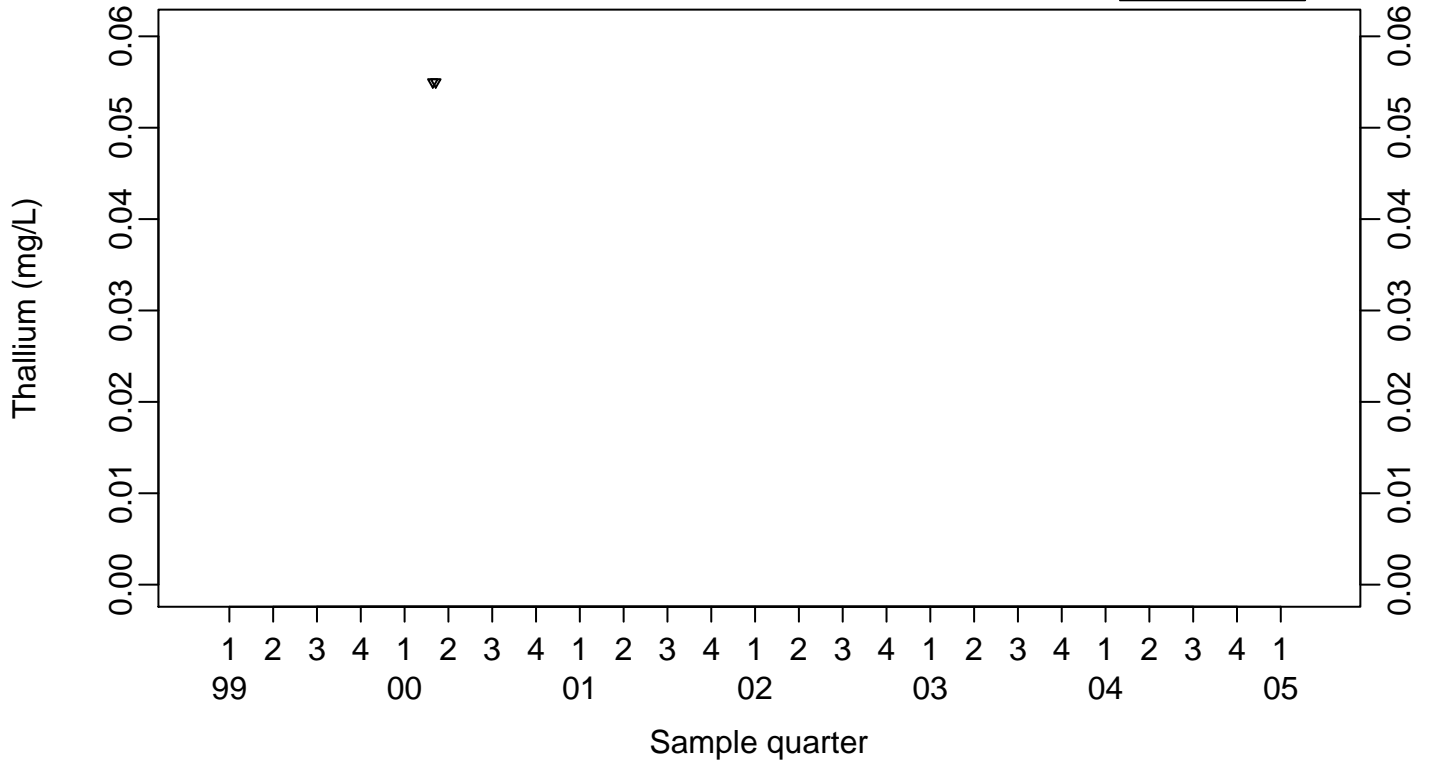
Retention Tank B823A



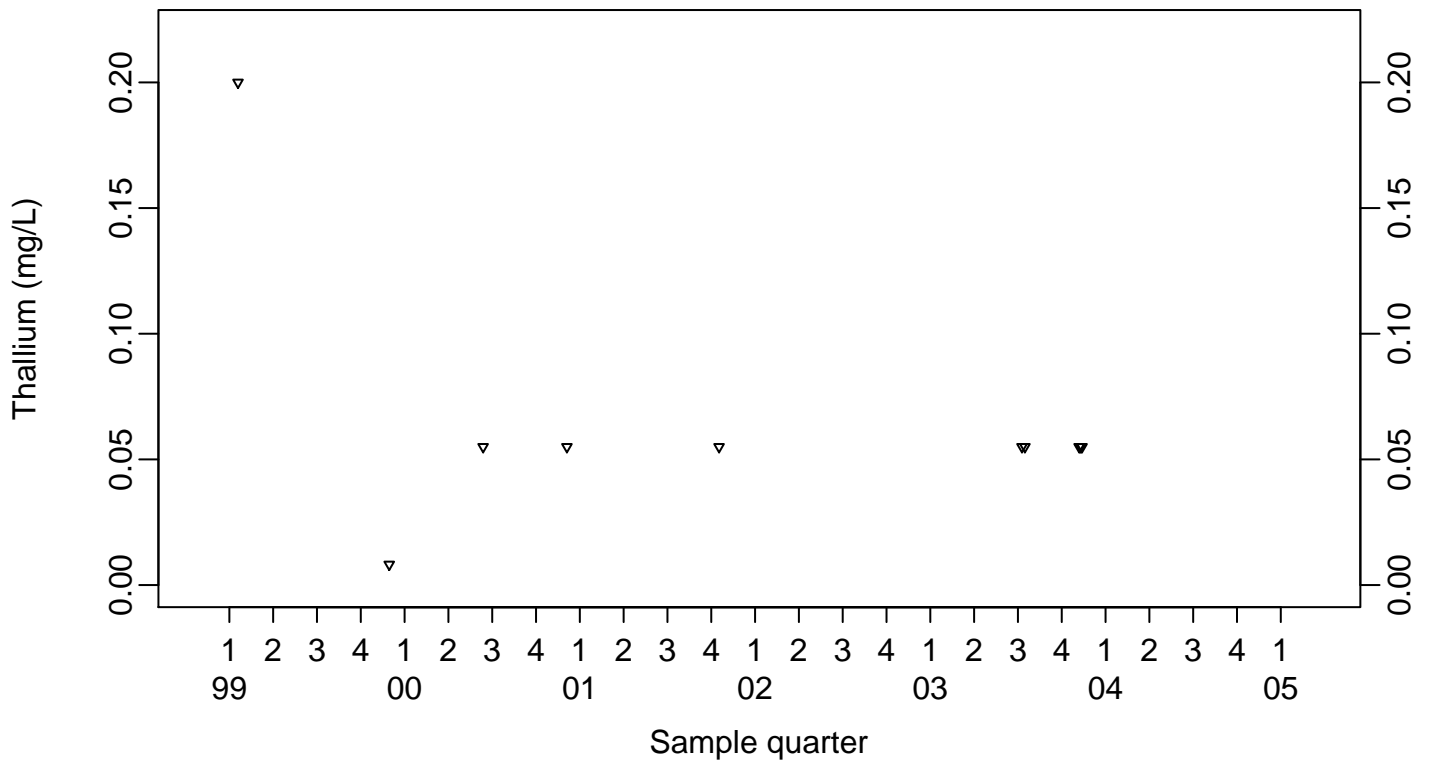
Surface Impoundments Process Water Thallium (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



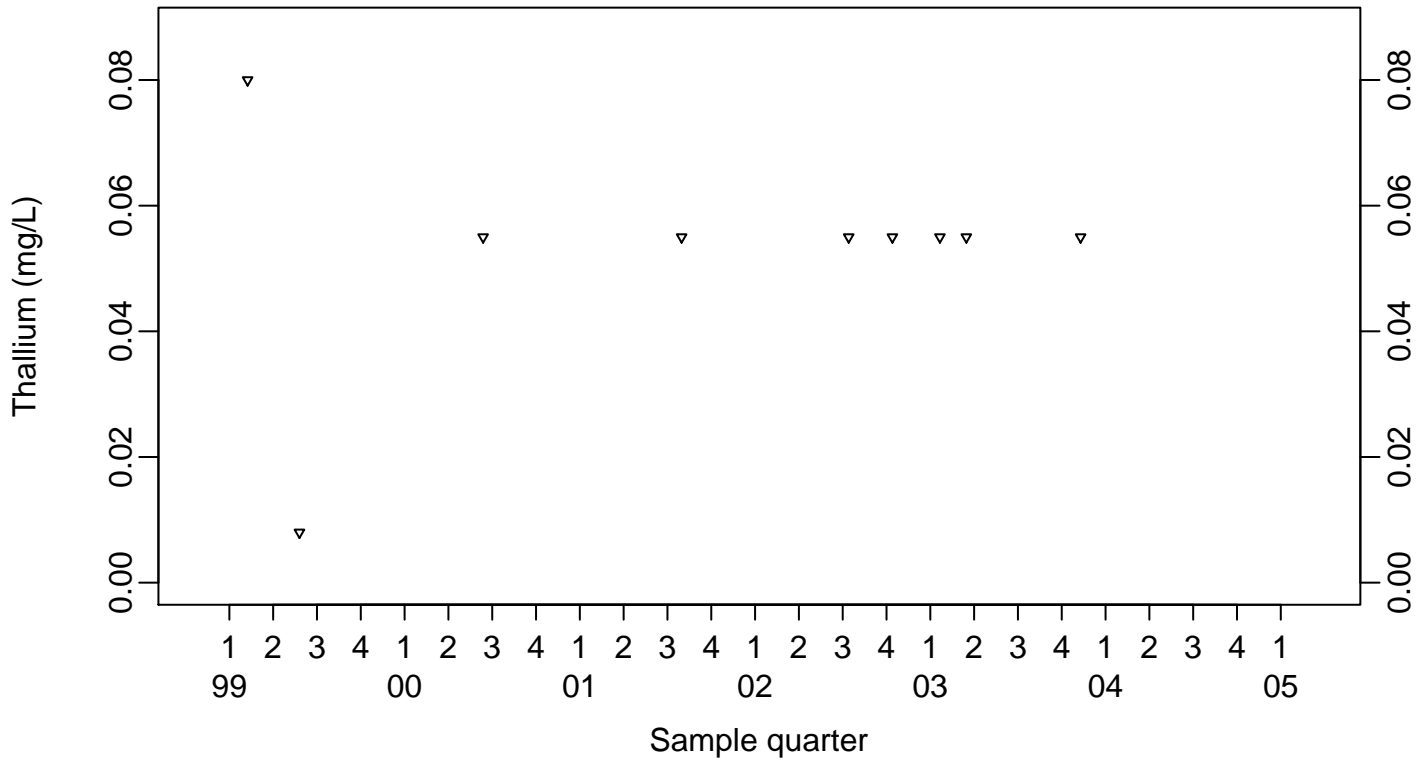
Retention Tank B827C/D



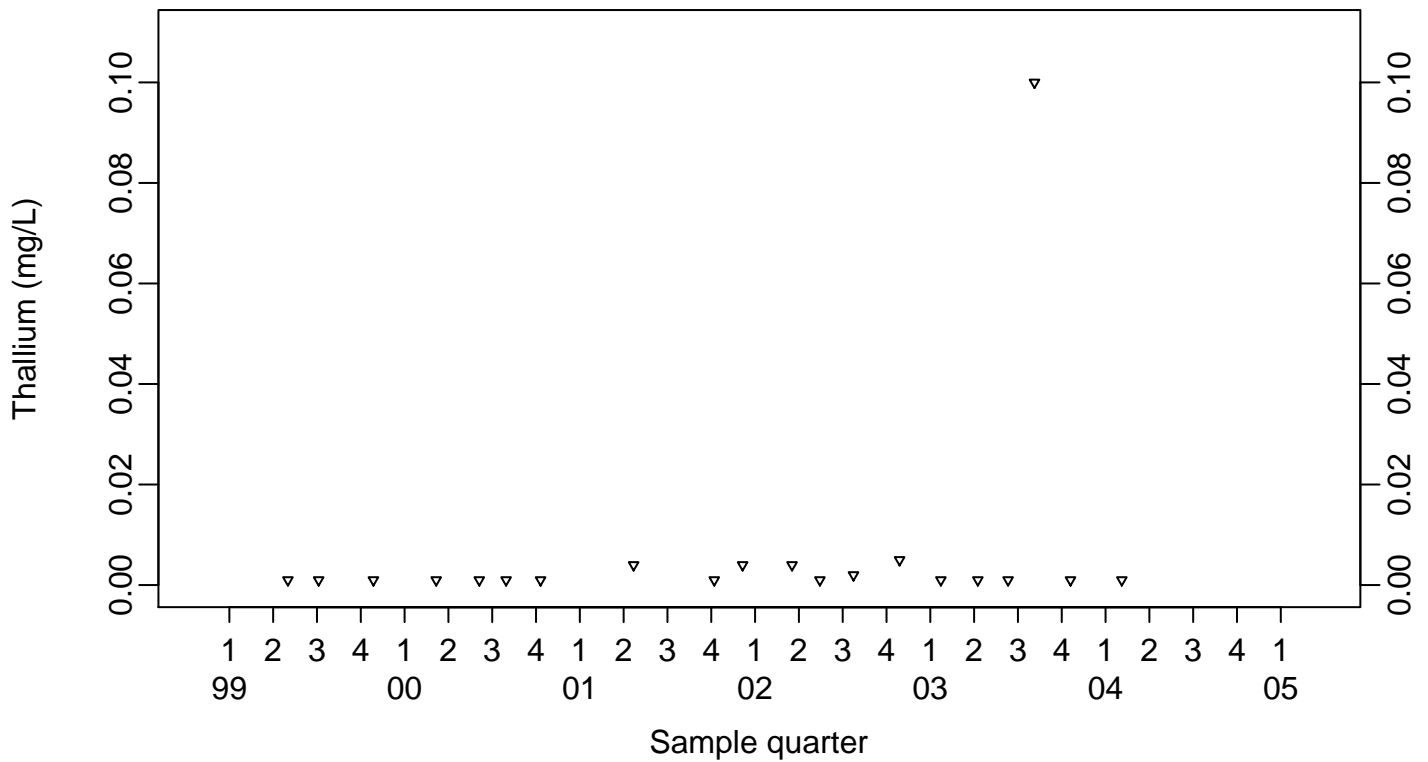
Surface Impoundments Process Water Thallium (mg/L)

Retention Tank B827E

◆ Above RL
▽ Below RL



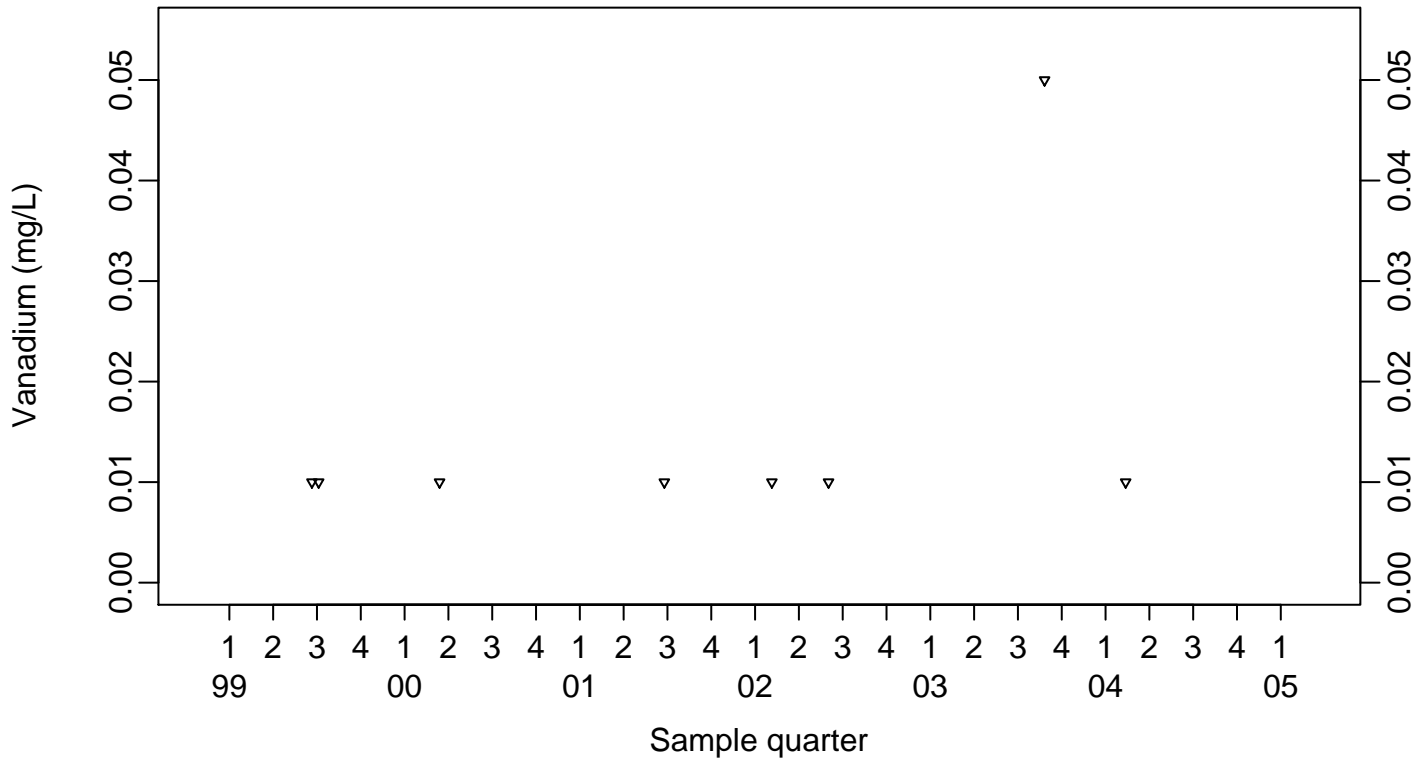
Retention Tank B851



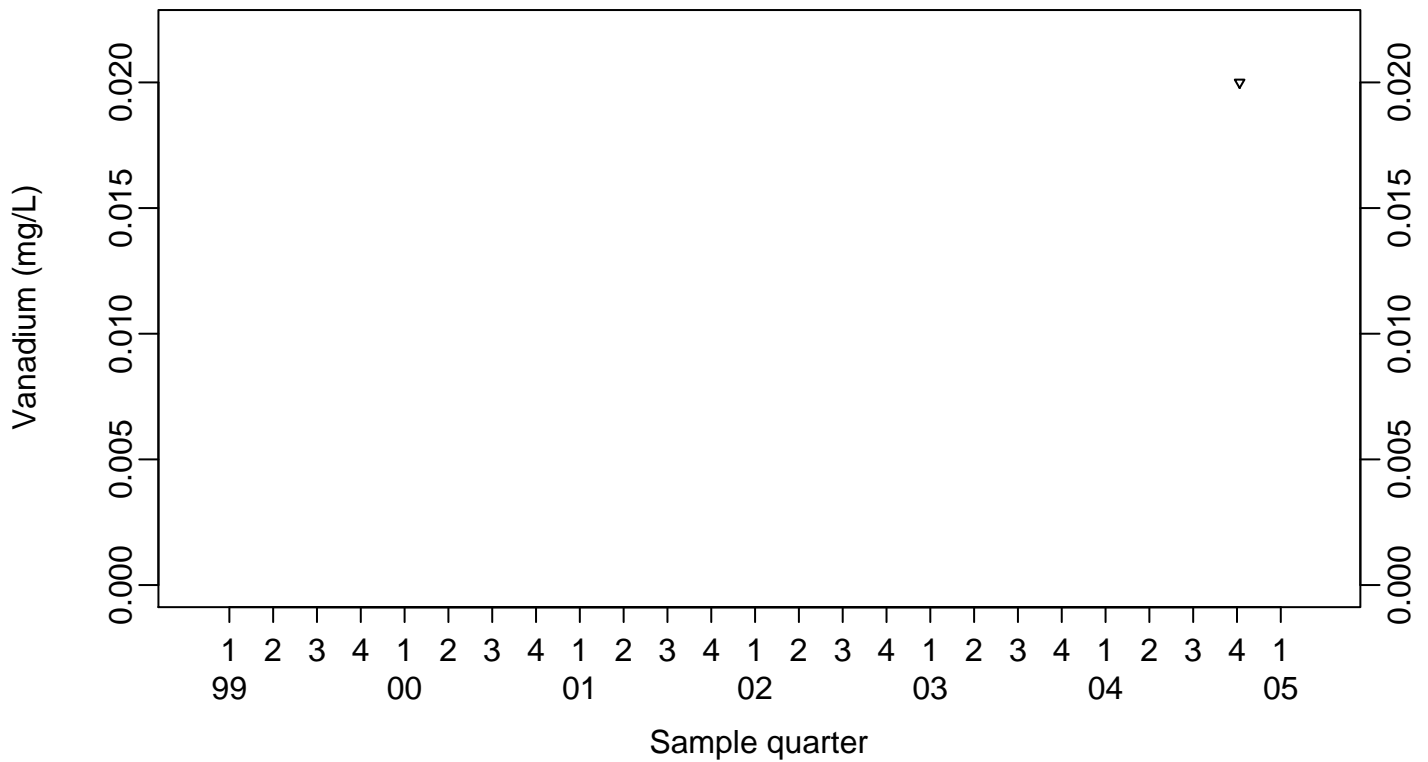
Surface Impoundments Process Water Vanadium (mg/L)

Retention Tank B801

- ◆ Above RL
- ▽ Below RL



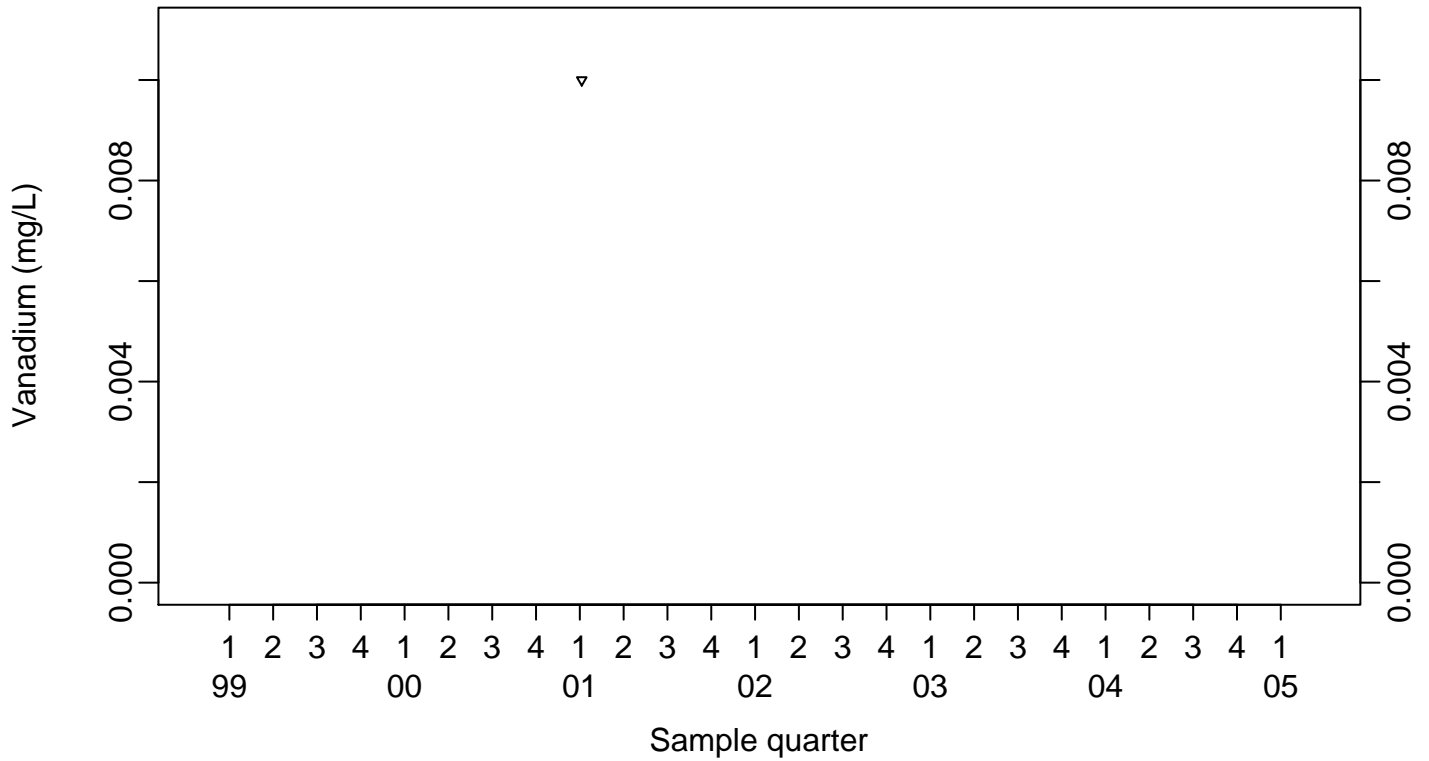
Retention Tank B806/807



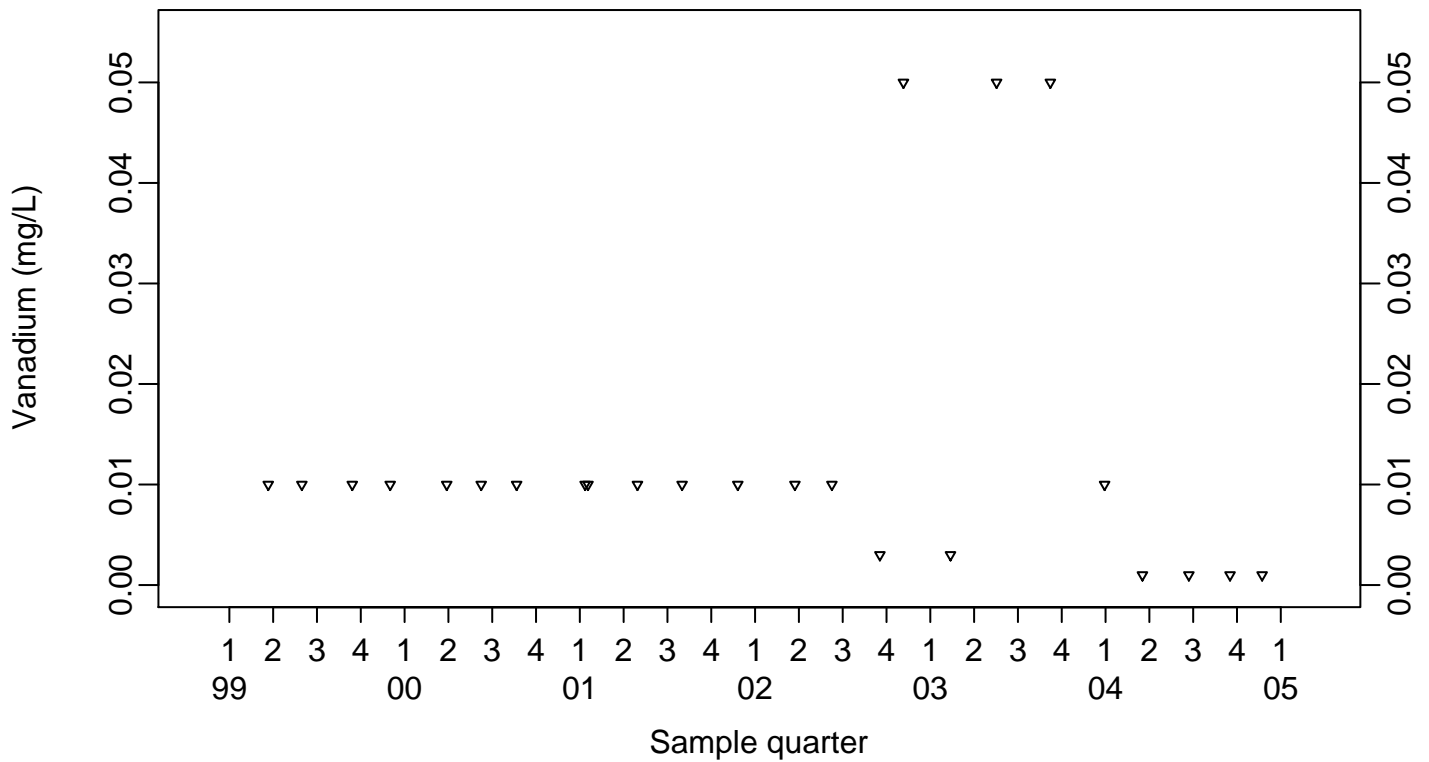
Surface Impoundments Process Water Vanadium (mg/L)

Retention Tank B817

◆ Above RL
▽ Below RL



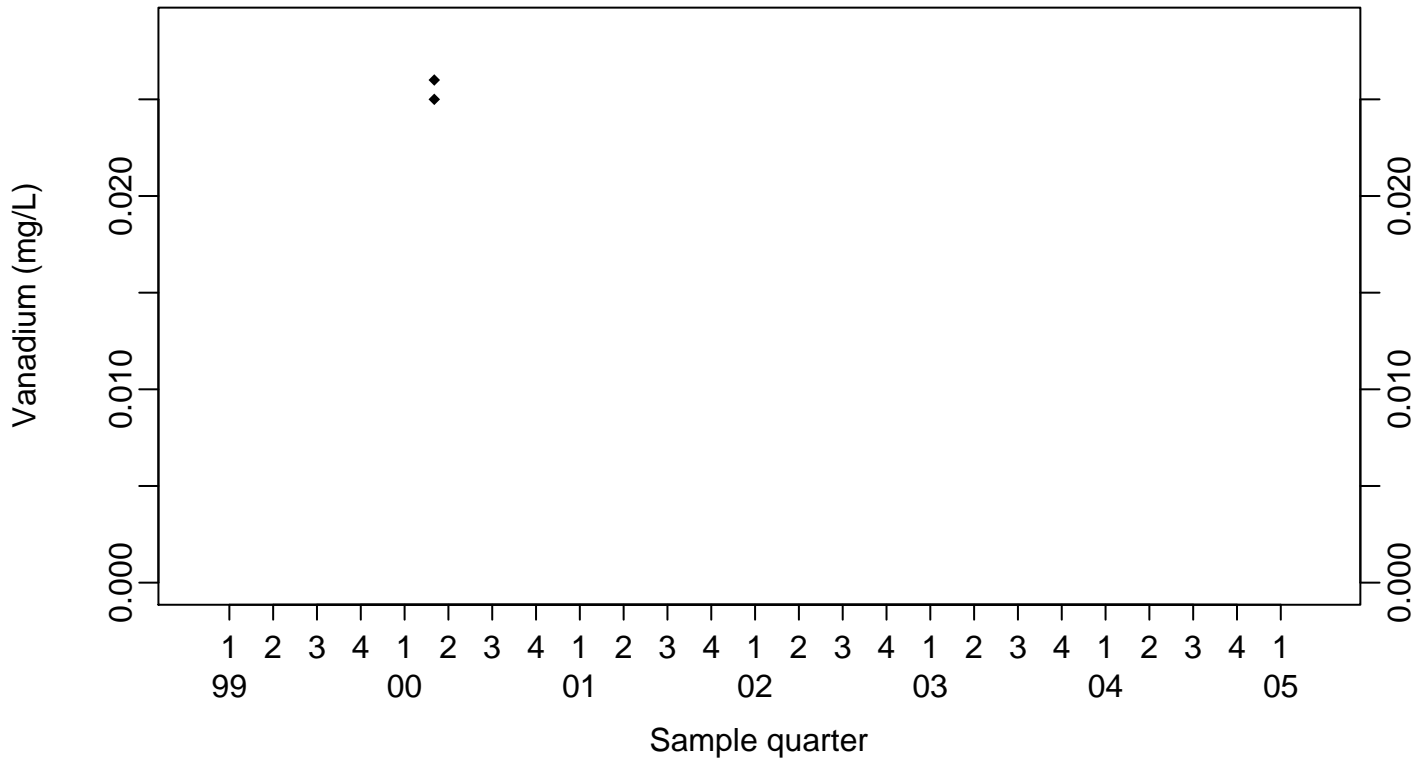
Retention Tank B823A



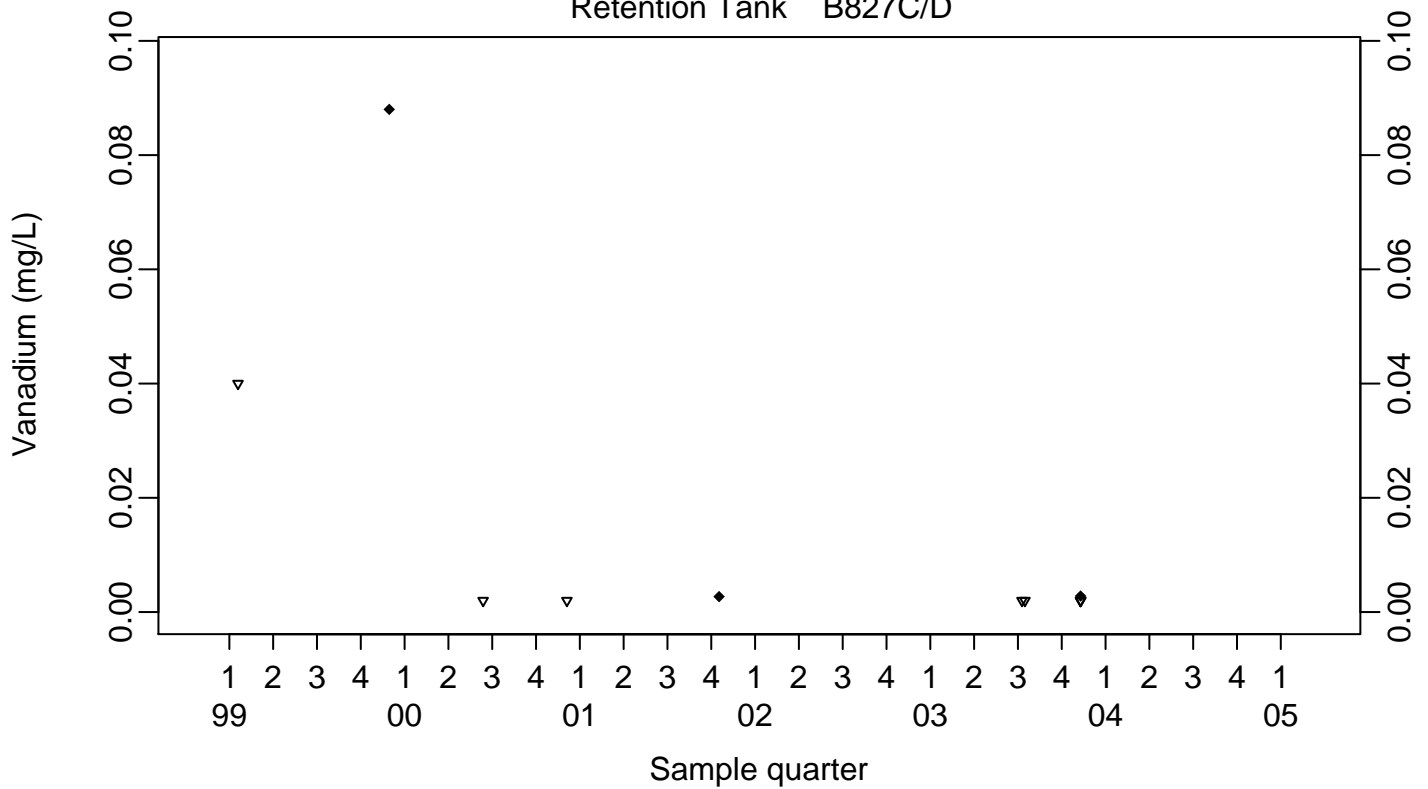
Surface Impoundments Process Water Vanadium (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



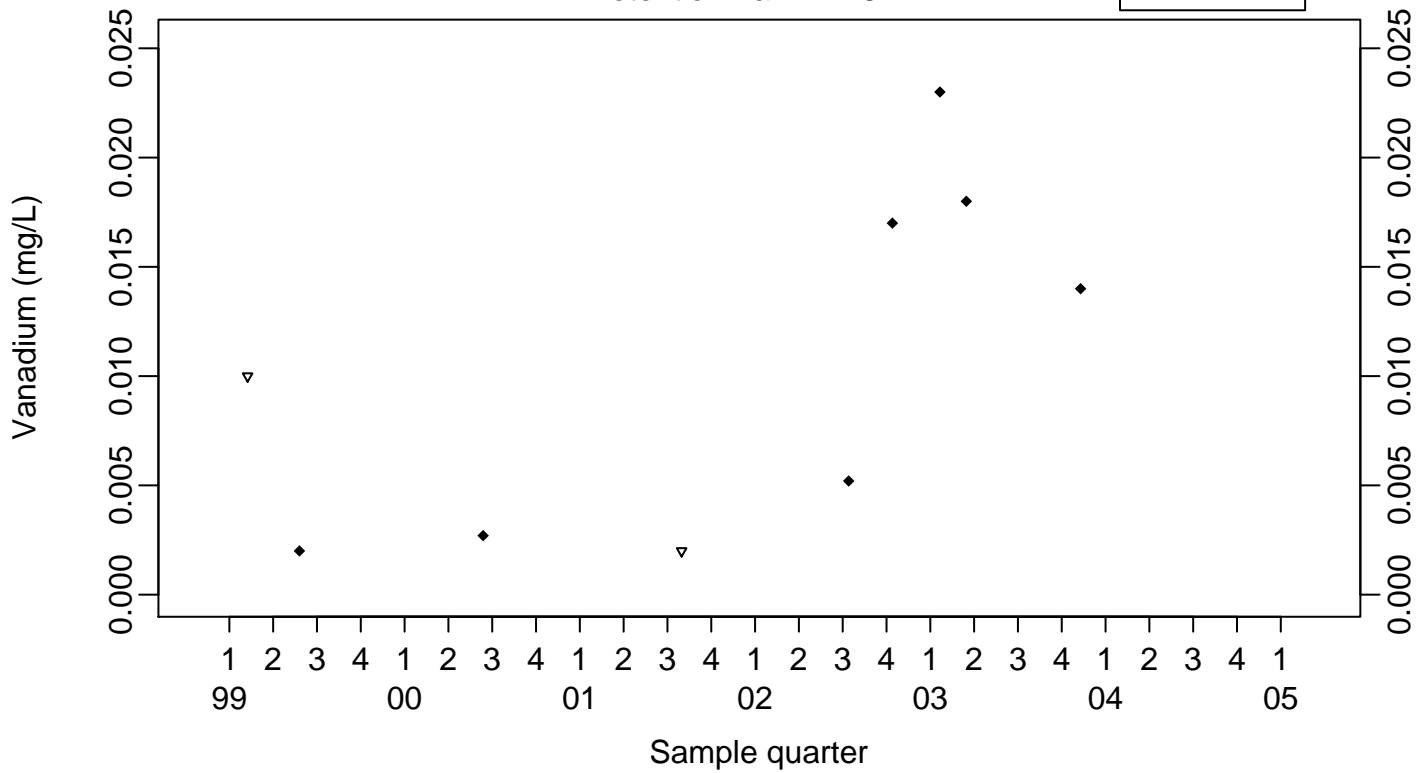
Retention Tank B827C/D



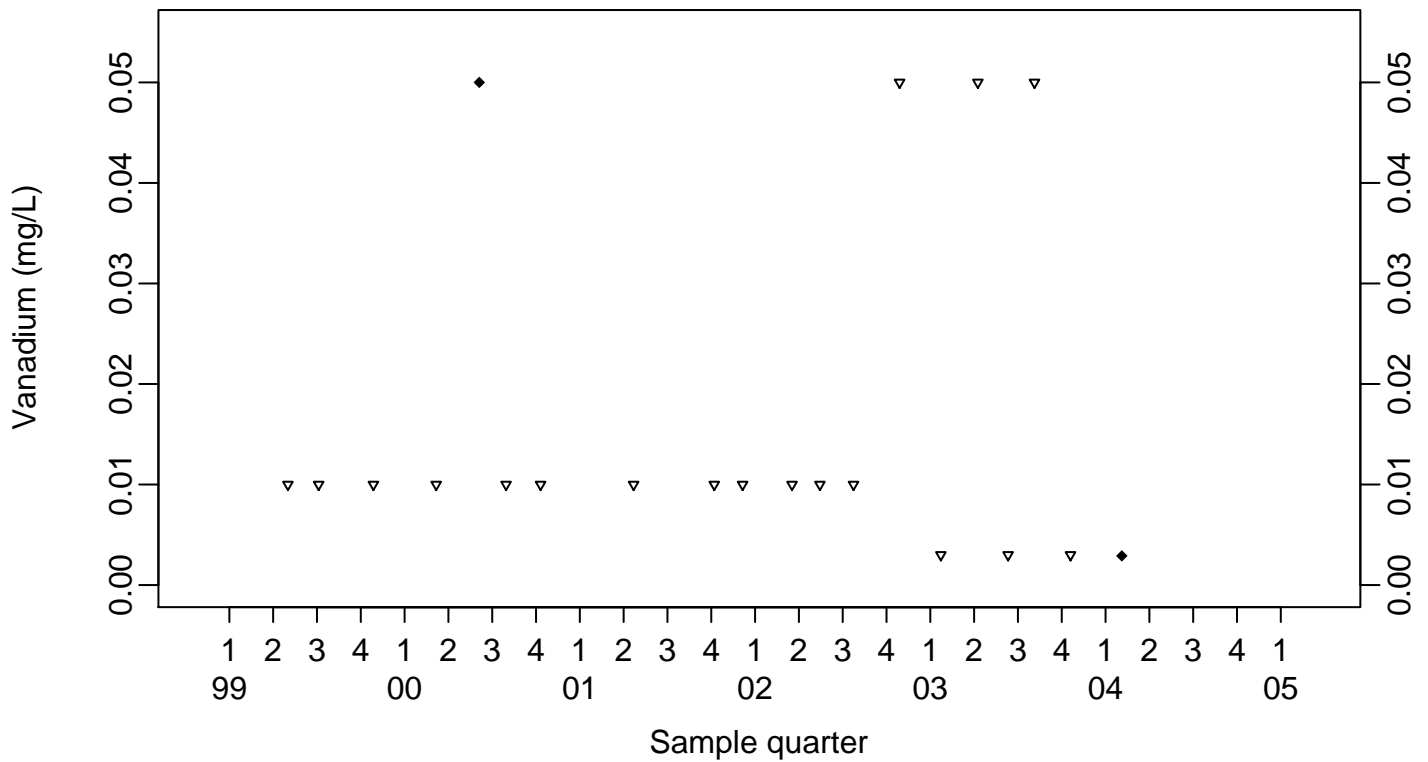
Surface Impoundments Process Water Vanadium (mg/L)

Retention Tank B827E

◆ Above RL
▽ Below RL



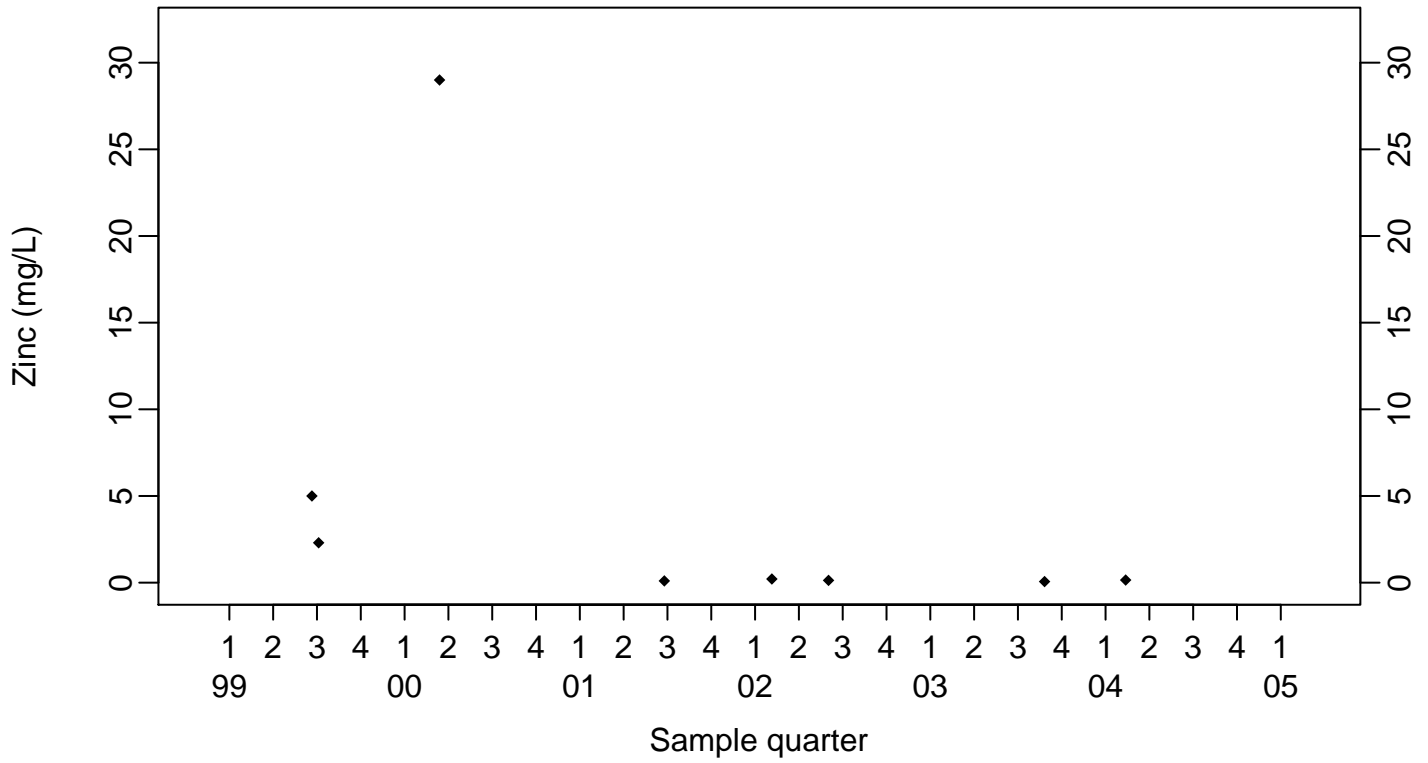
Retention Tank B851



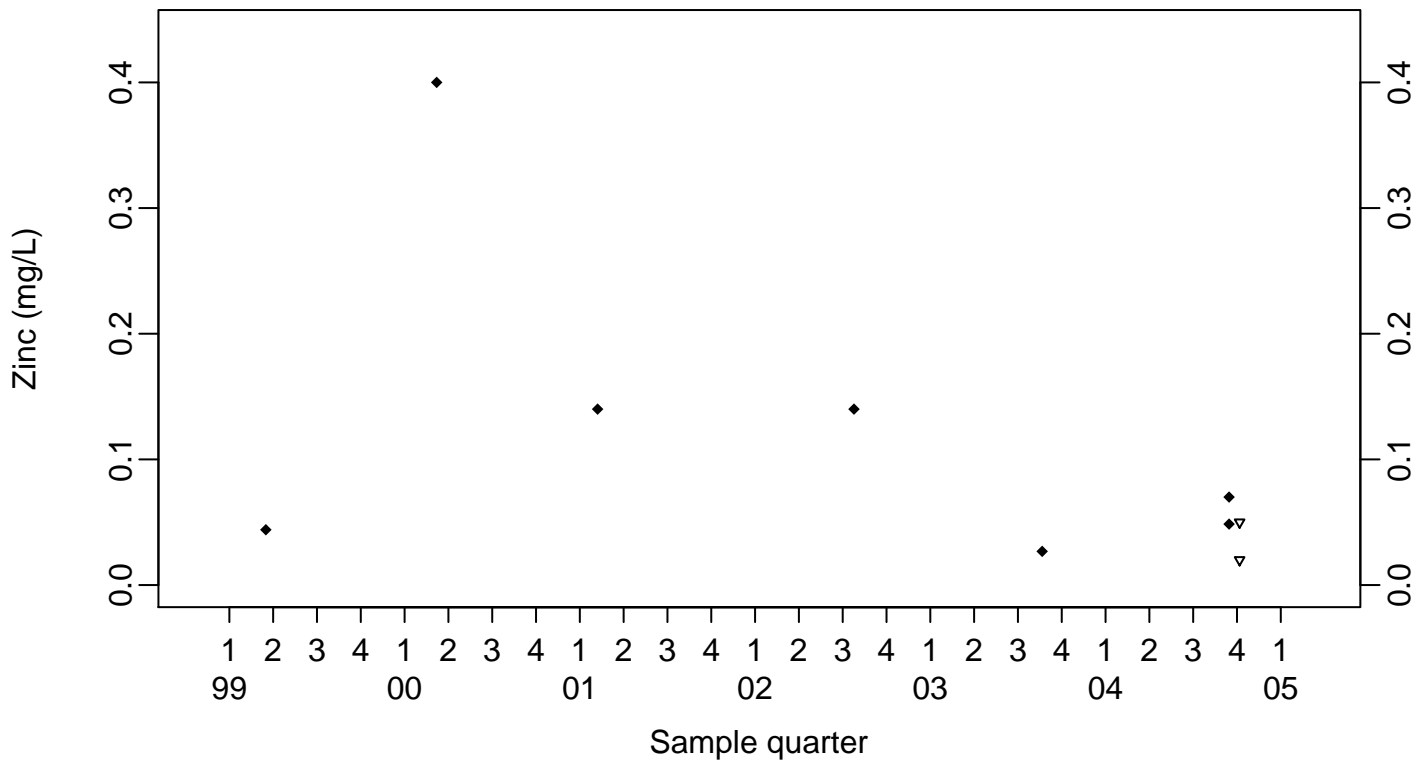
Surface Impoundments Process Water Zinc (mg/L)

Retention Tank B801

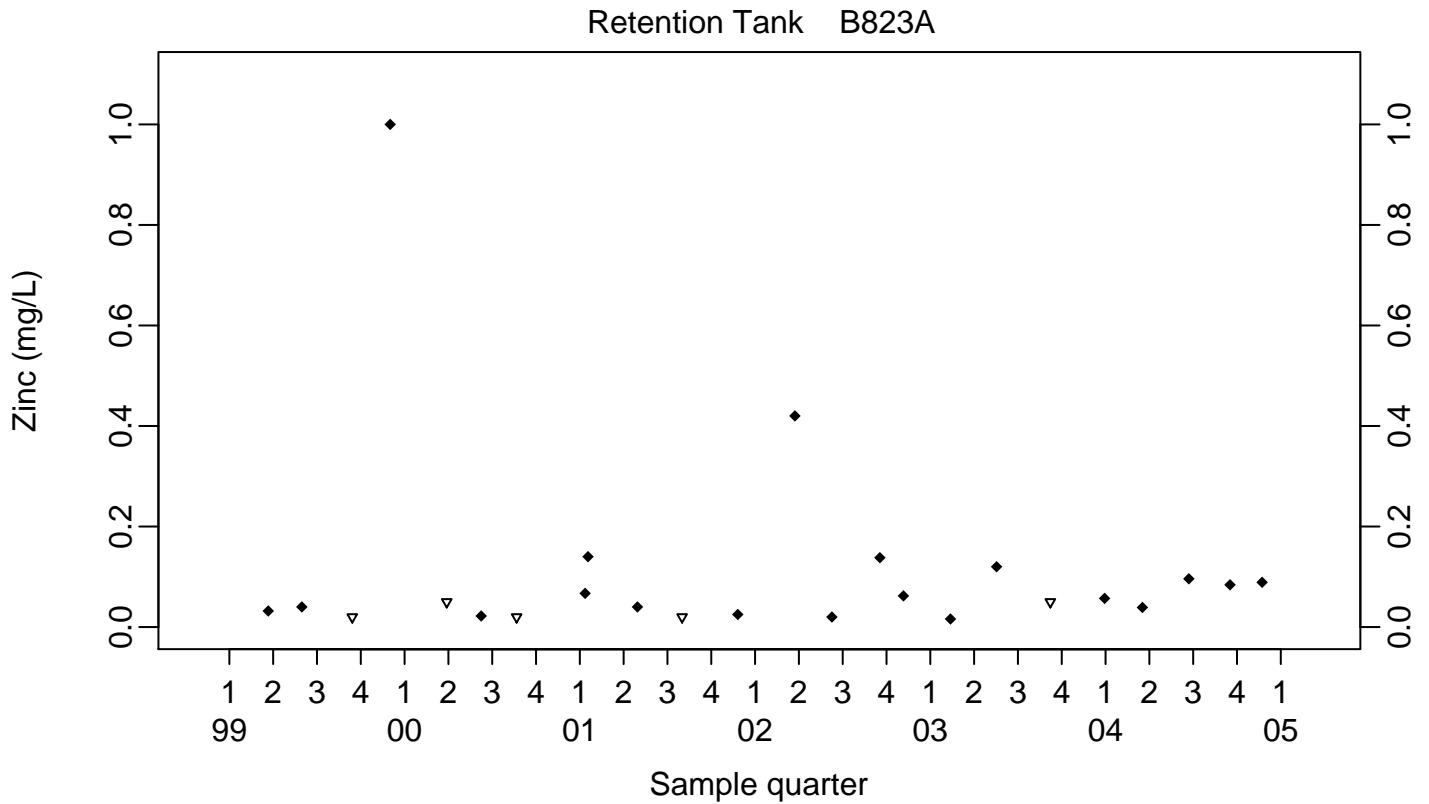
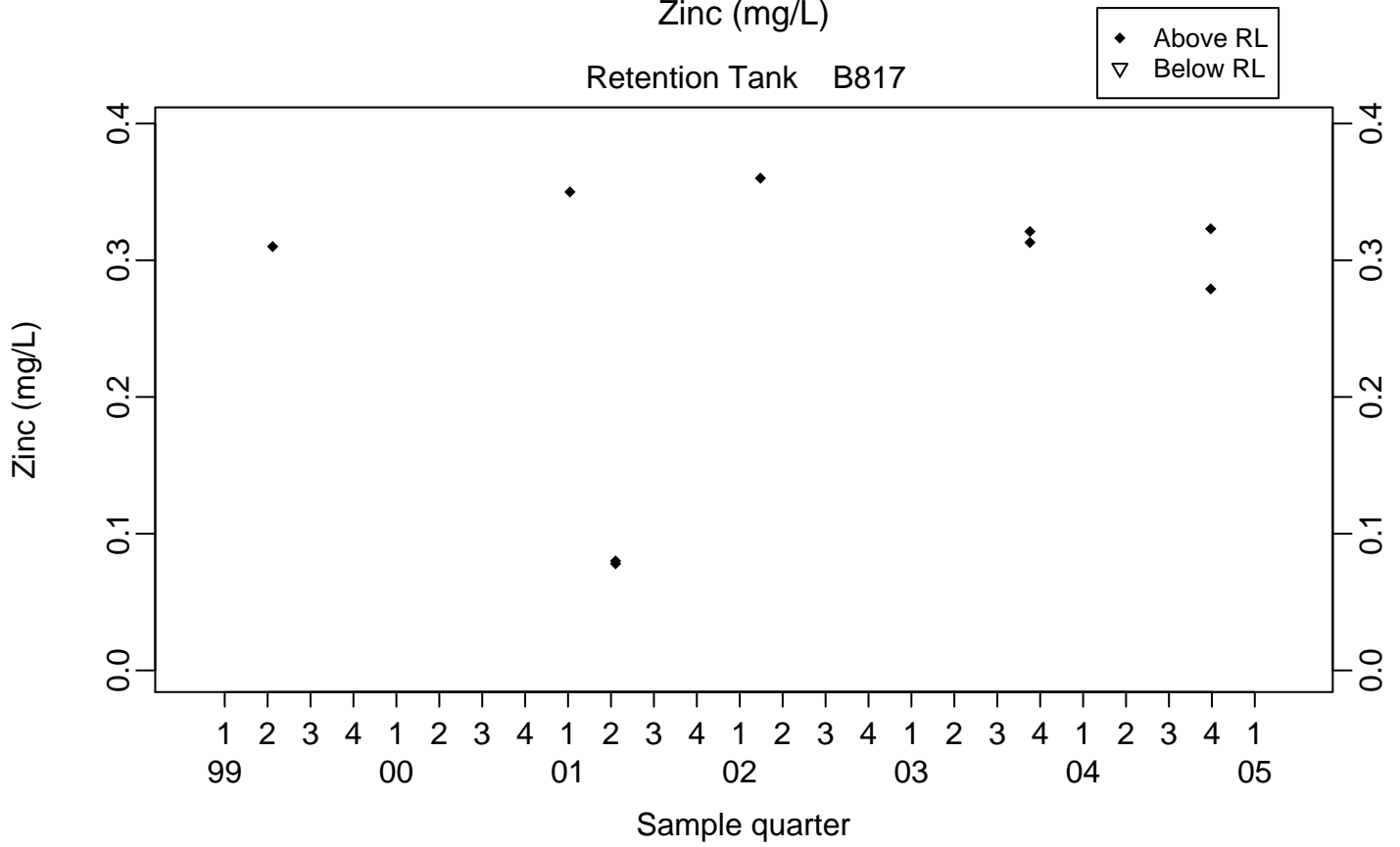
◆ Above RL
▽ Below RL



Retention Tank B806/807



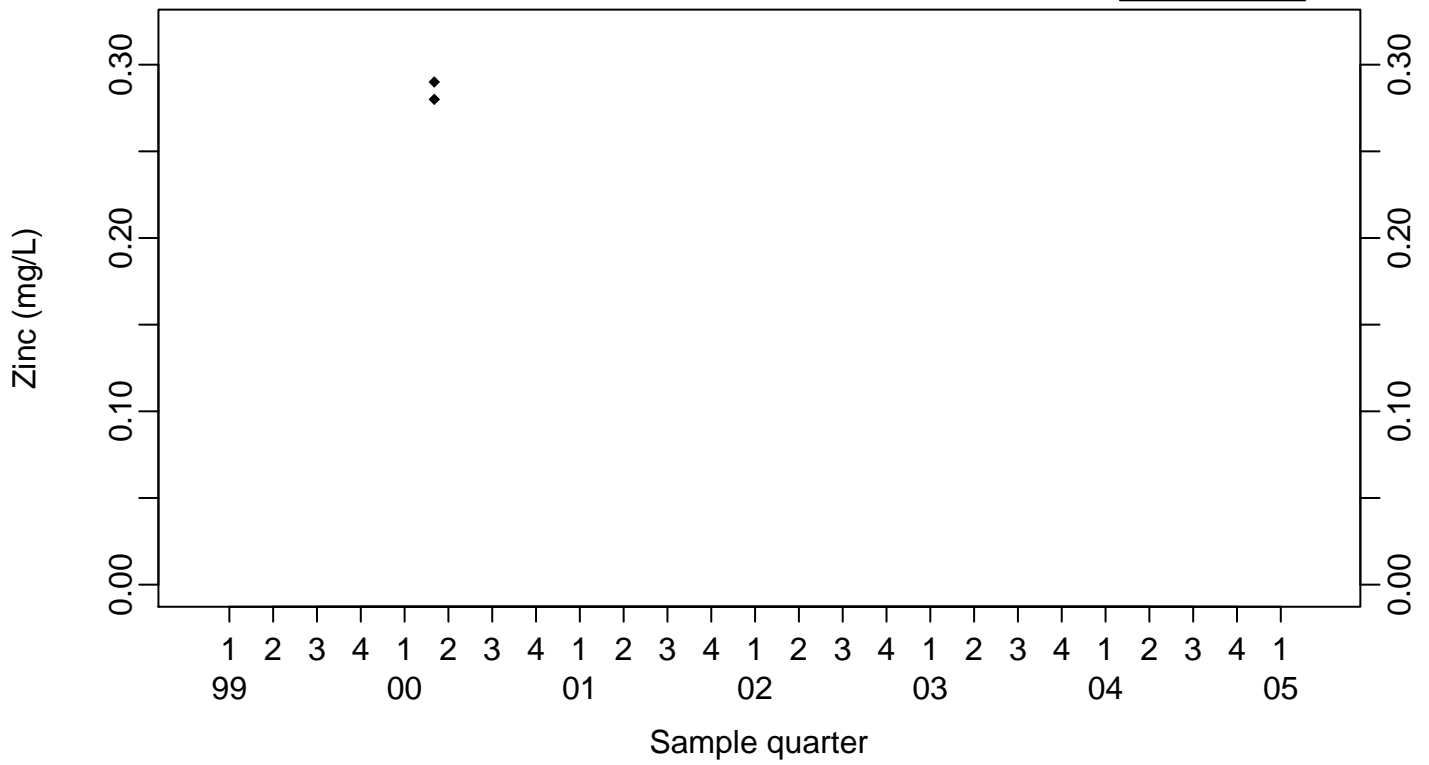
Surface Impoundments Process Water Zinc (mg/L)



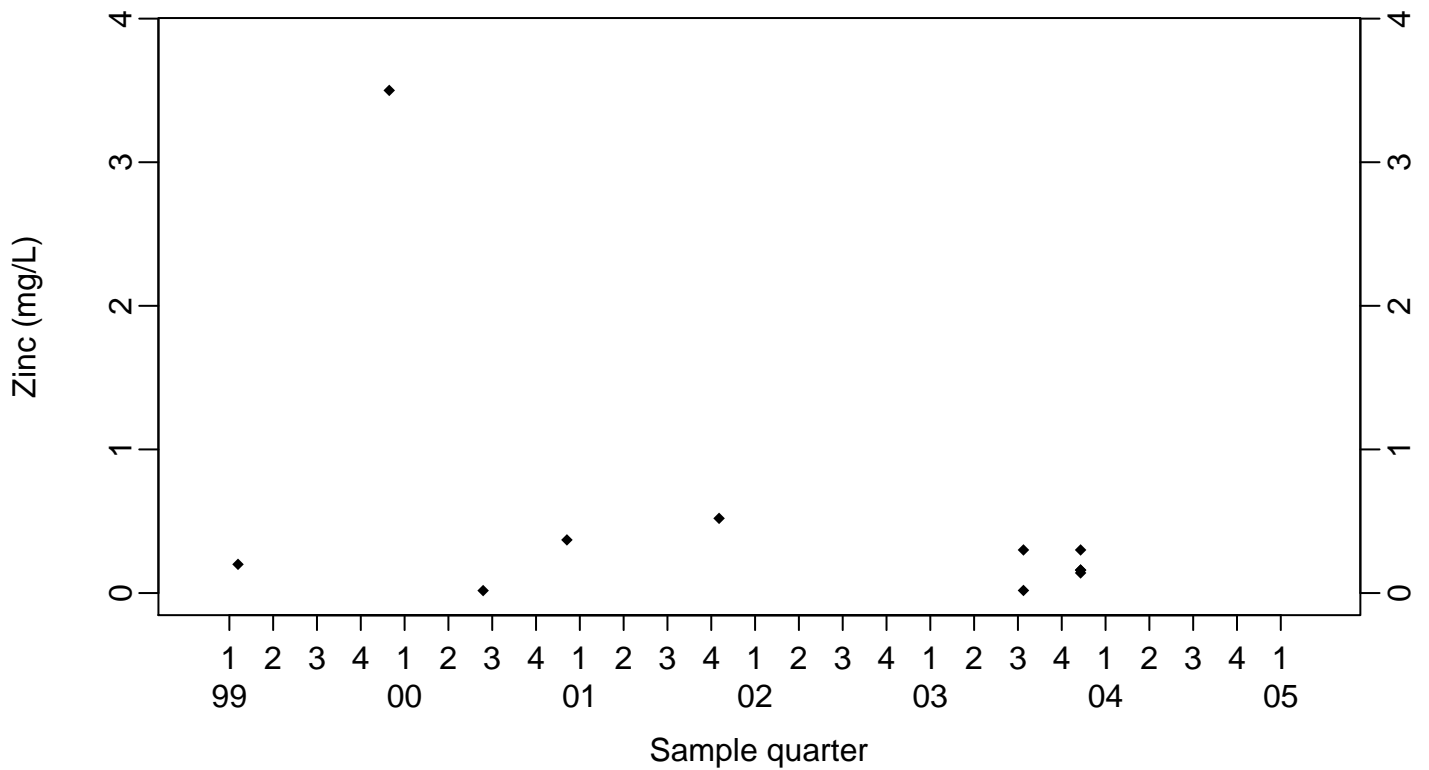
Surface Impoundments Process Water Zinc (mg/L)

Retention Tank B826

◆ Above RL
▽ Below RL



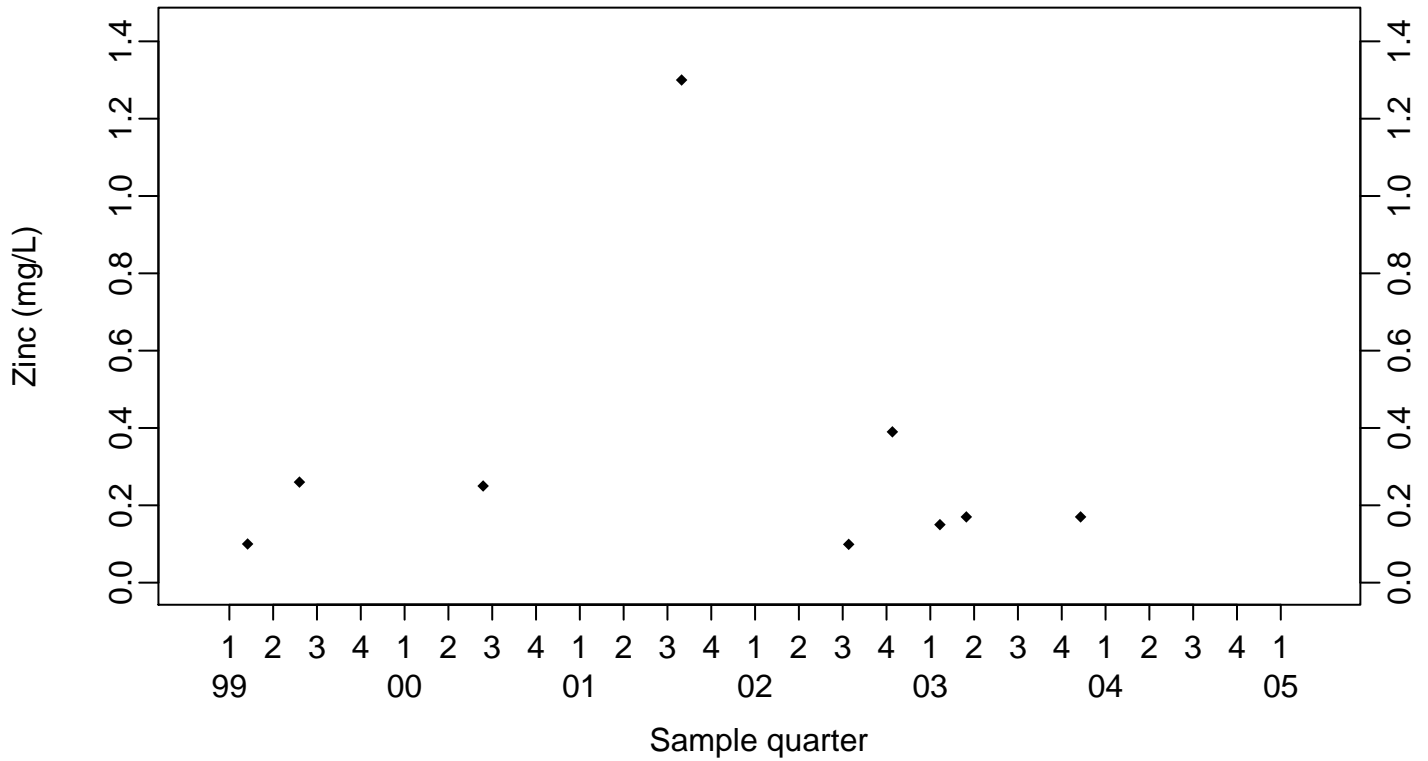
Retention Tank B827C/D



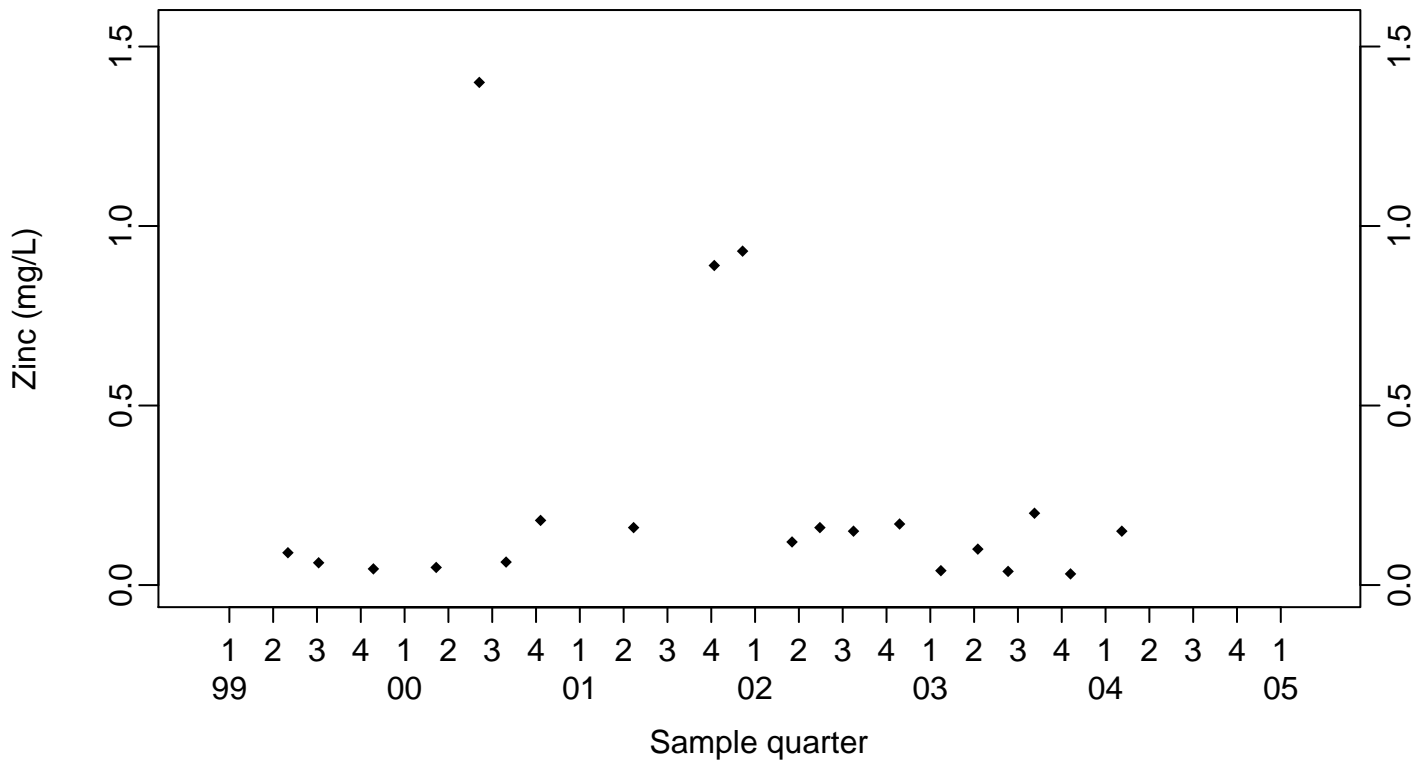
Surface Impoundments Process Water Zinc (mg/L)

Retention Tank B827E

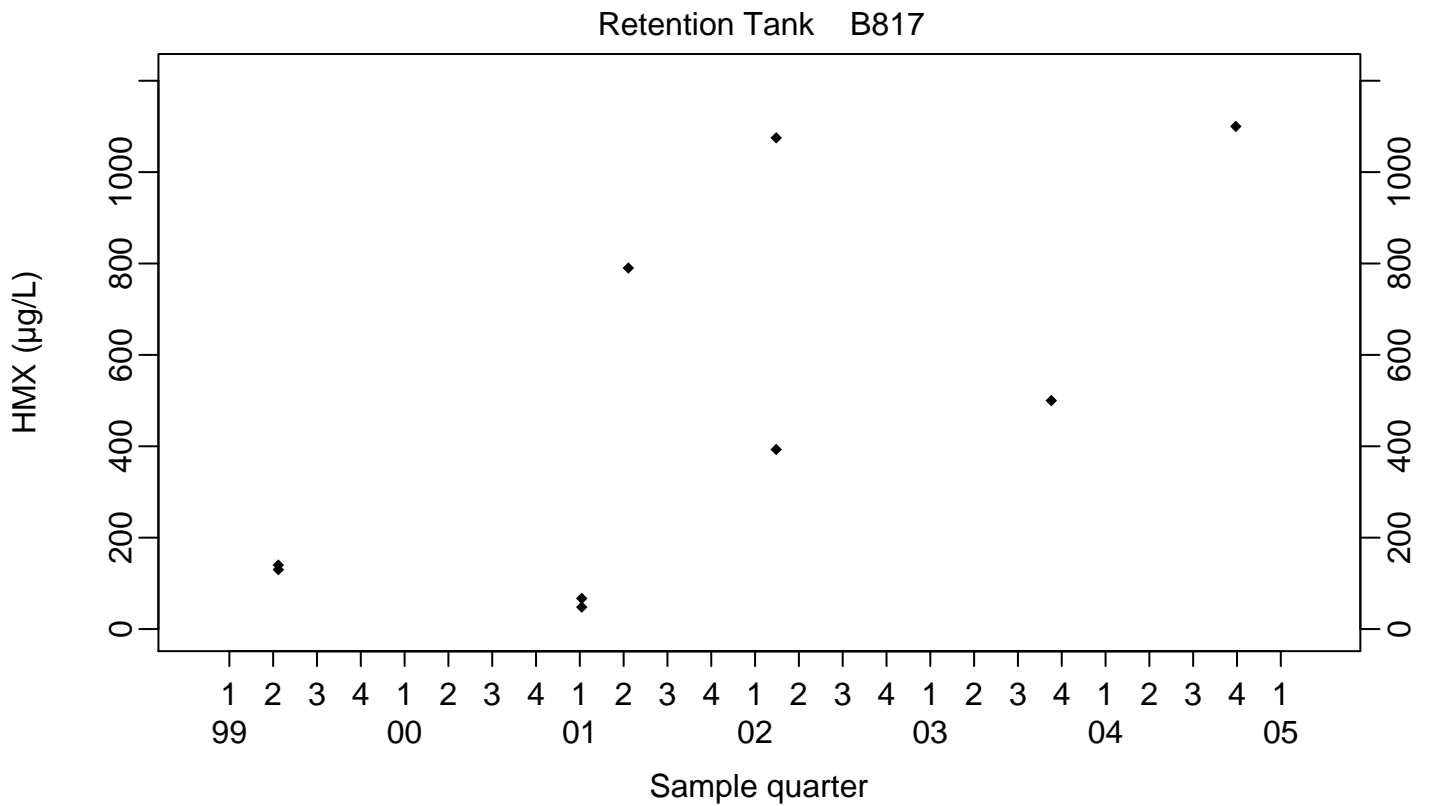
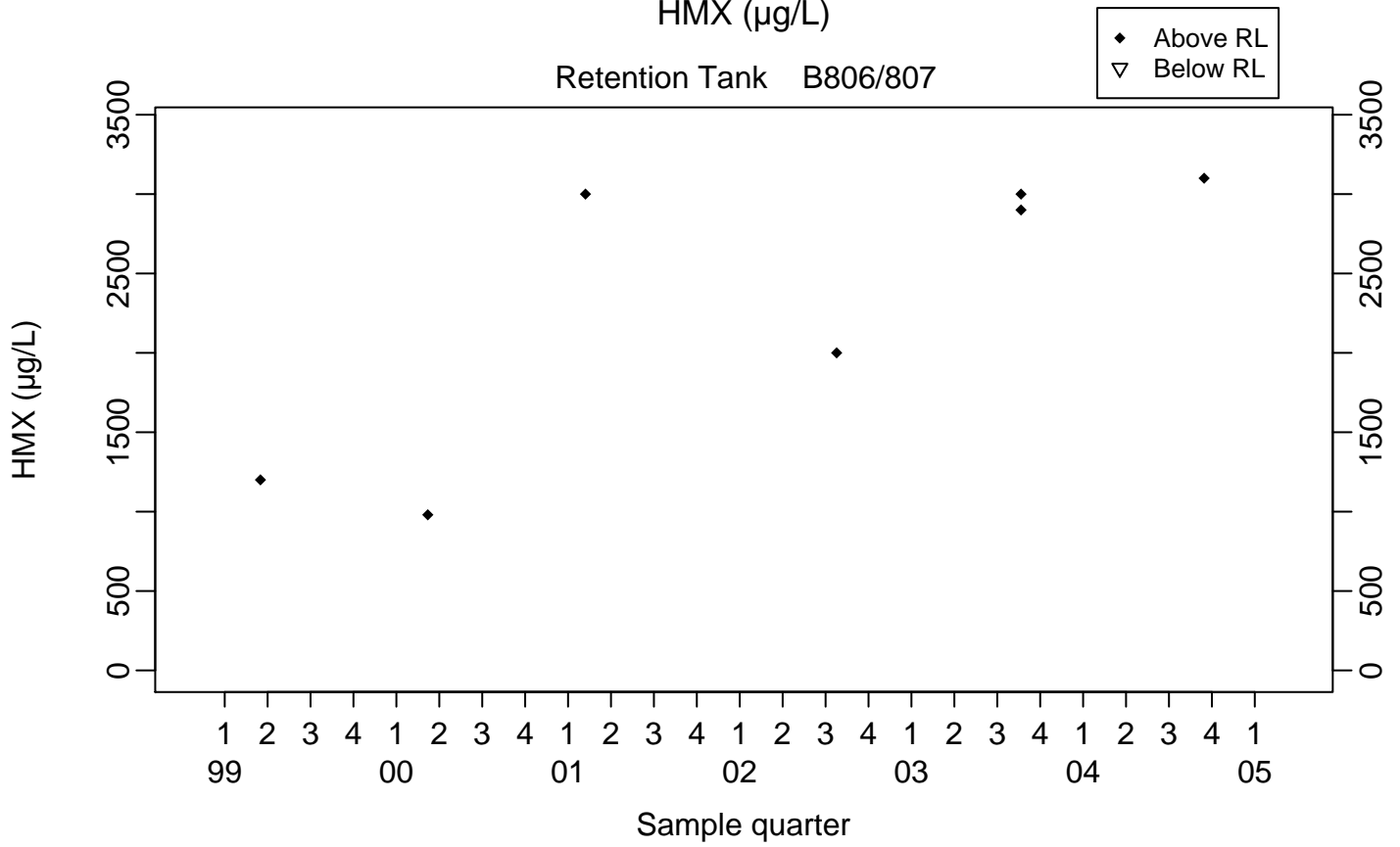
◆ Above RL
▽ Below RL



Retention Tank B851



Surface Impoundments Process Water HMX ($\mu\text{g/L}$)

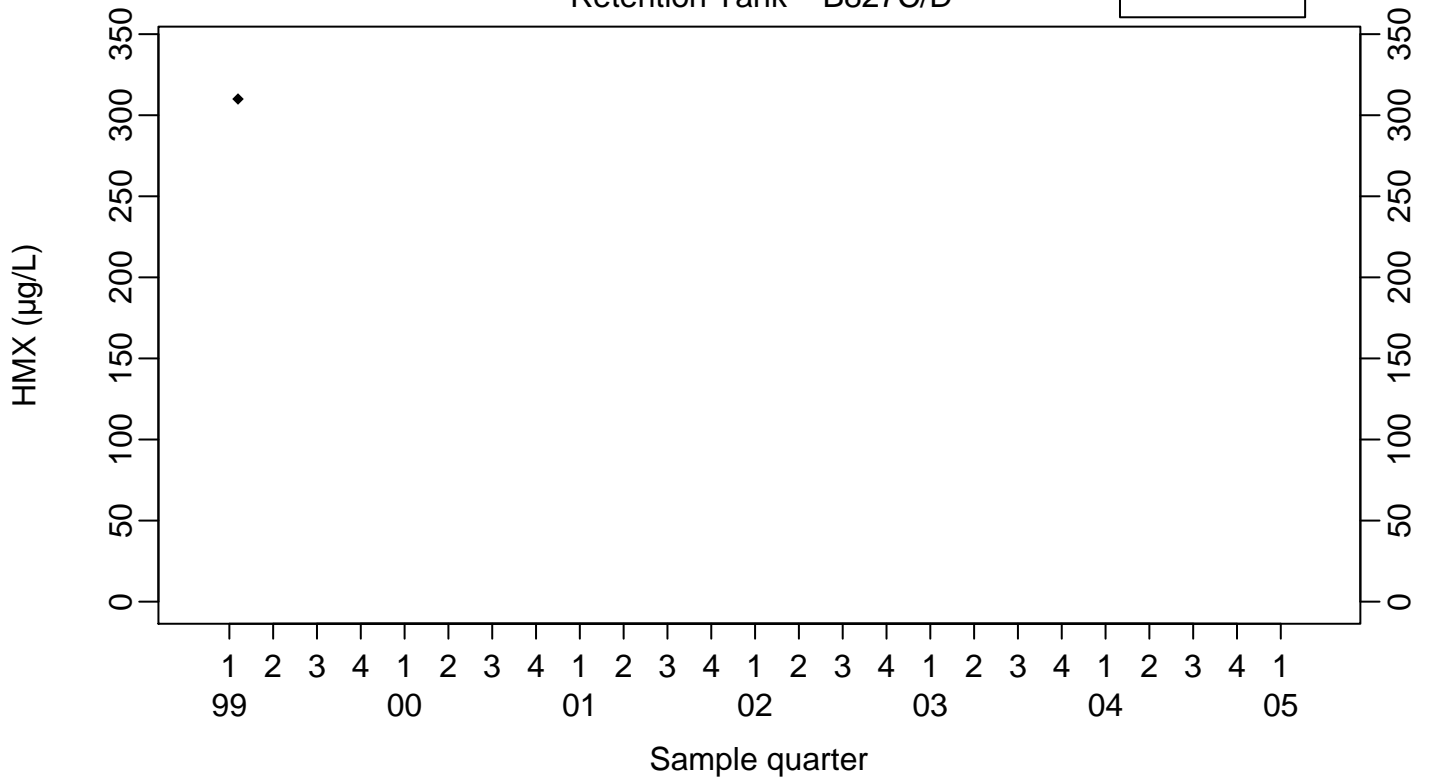


Surface Impoundments Process Water

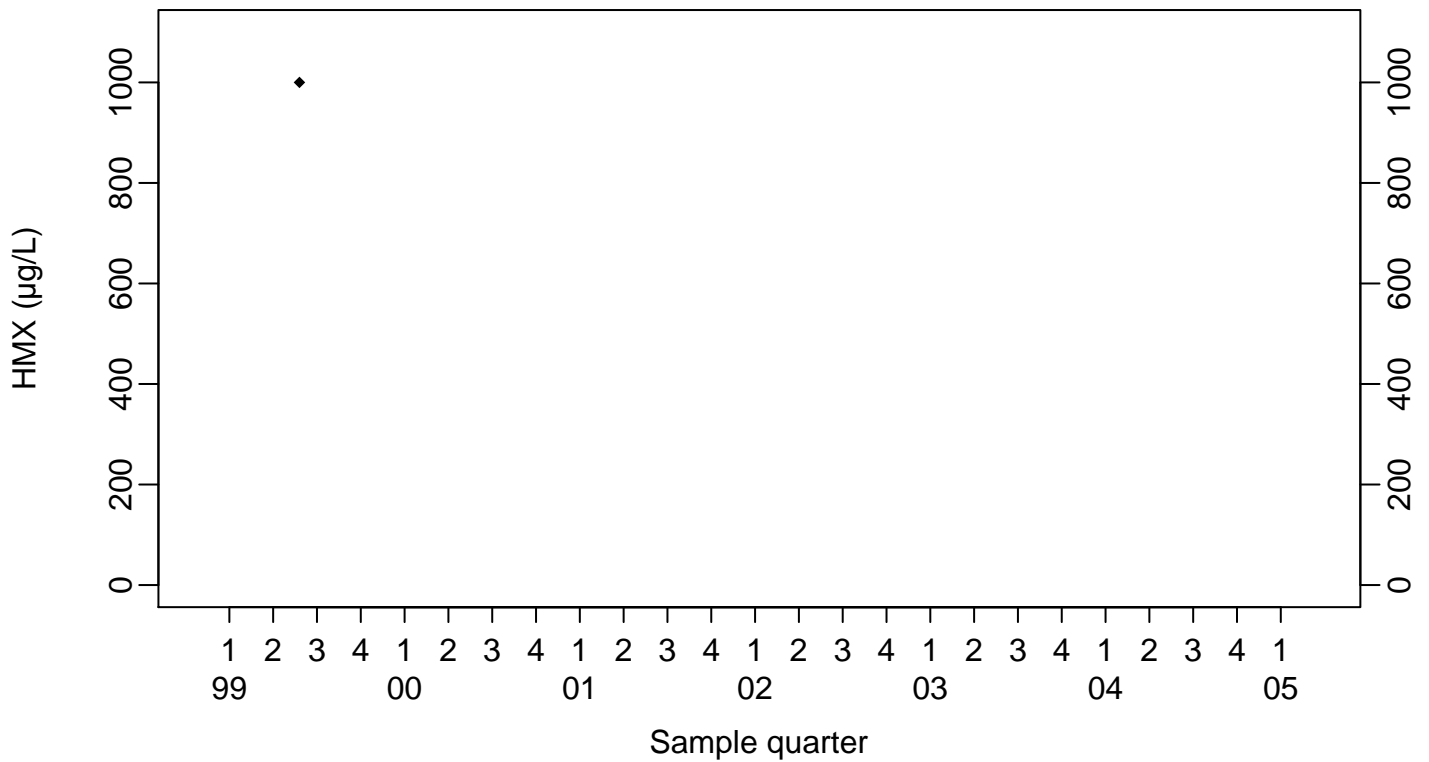
HMX ($\mu\text{g/L}$)

Retention Tank B827C/D

◆	Above RL
▽	Below RL



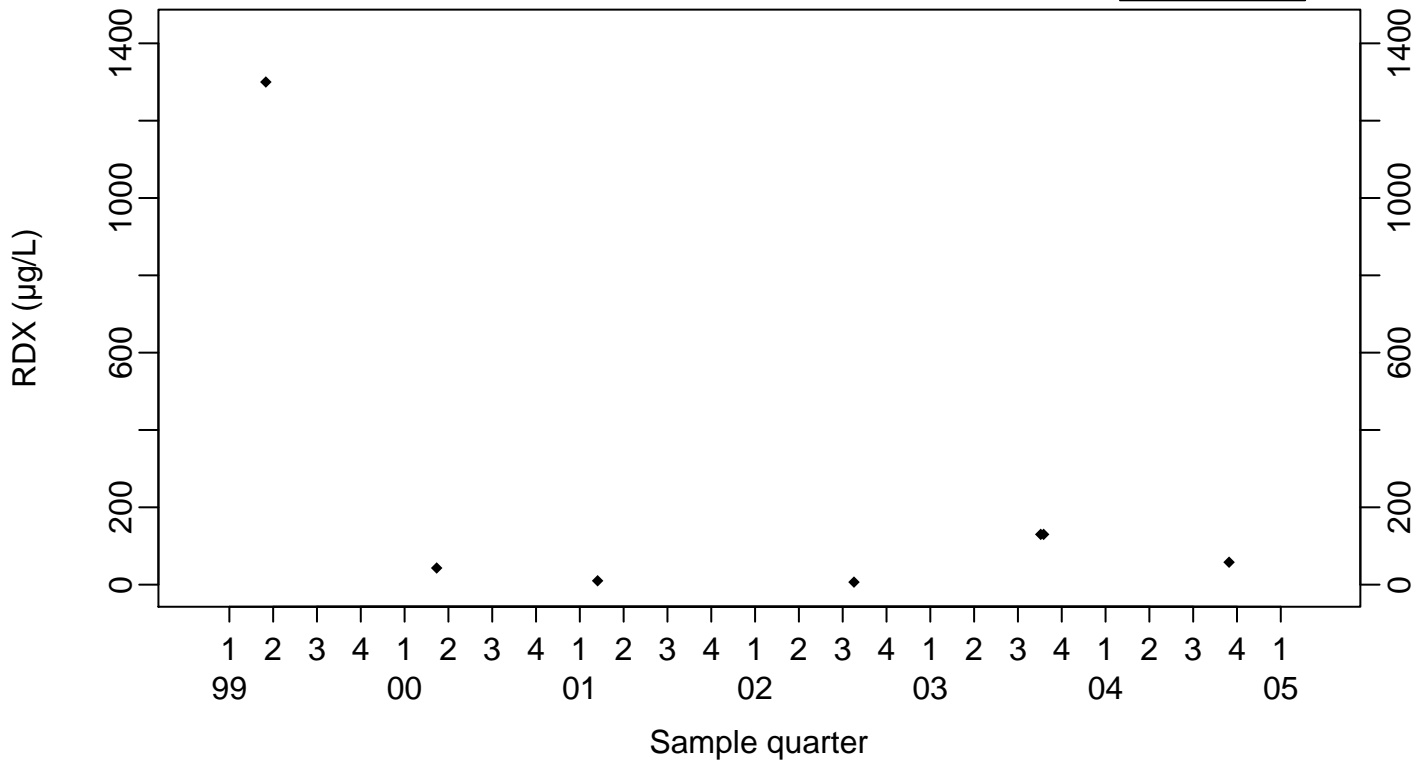
Retention Tank B827E



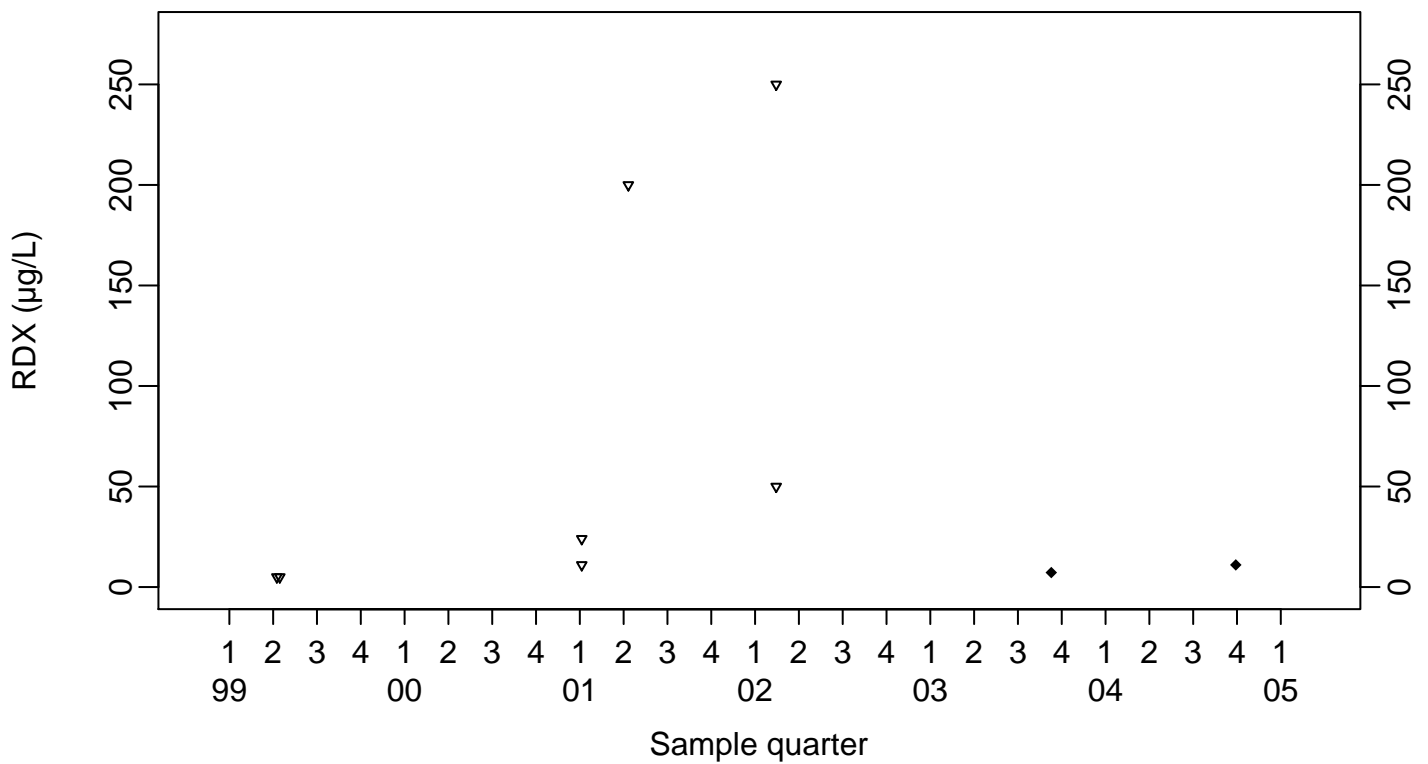
Surface Impoundments Process Water RDX ($\mu\text{g/L}$)

Retention Tank B806/807

◆ Above RL
▽ Below RL



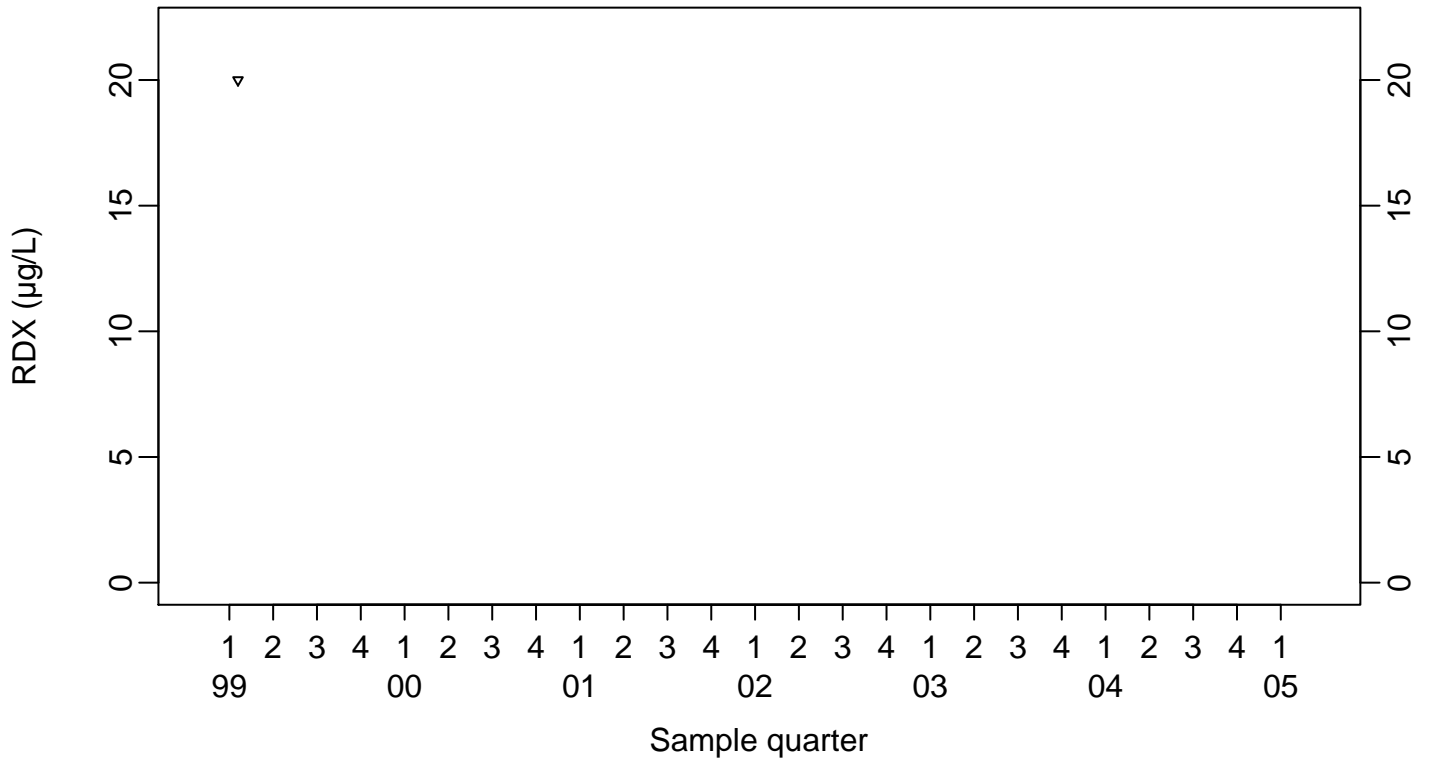
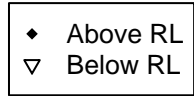
Retention Tank B817



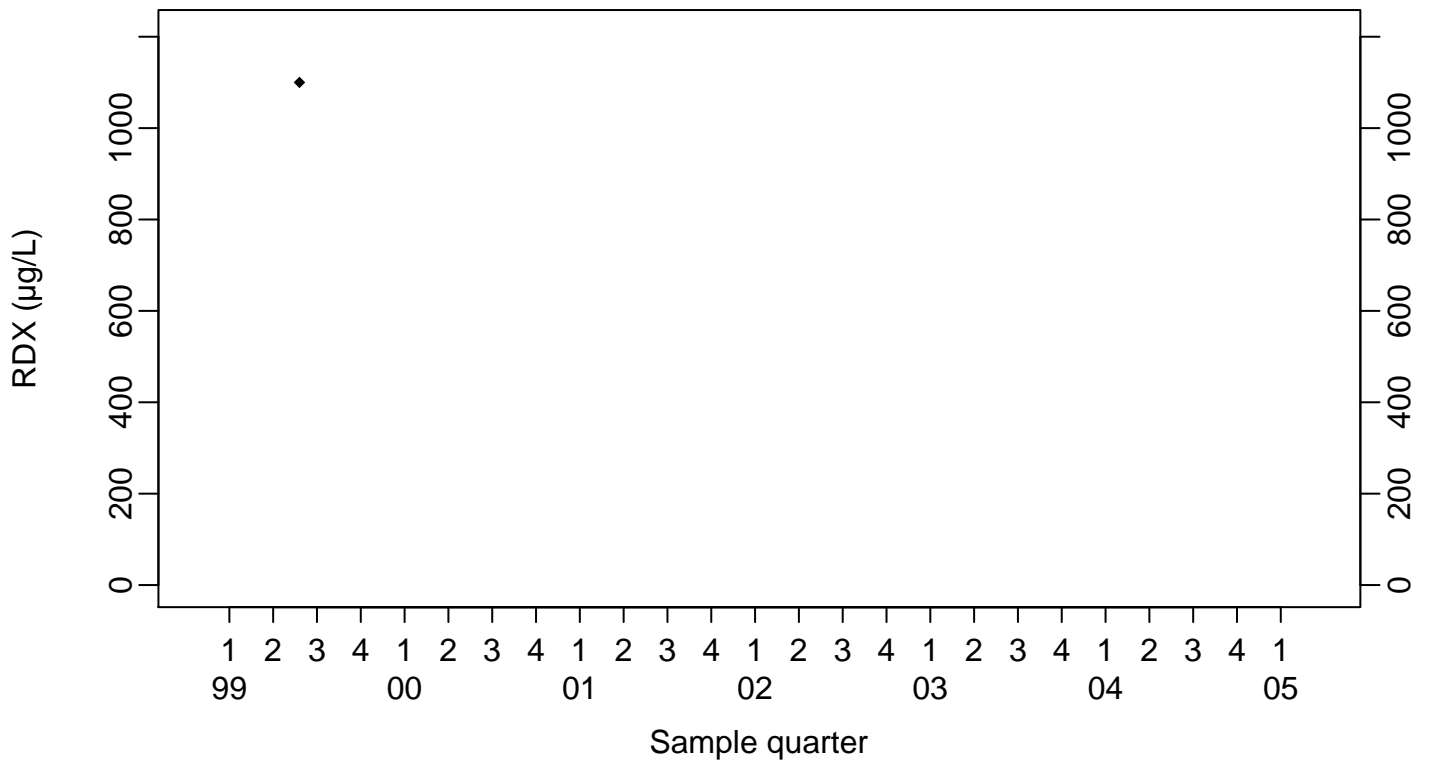
Surface Impoundments Process Water

RDX ($\mu\text{g/L}$)

Retention Tank B827C/D



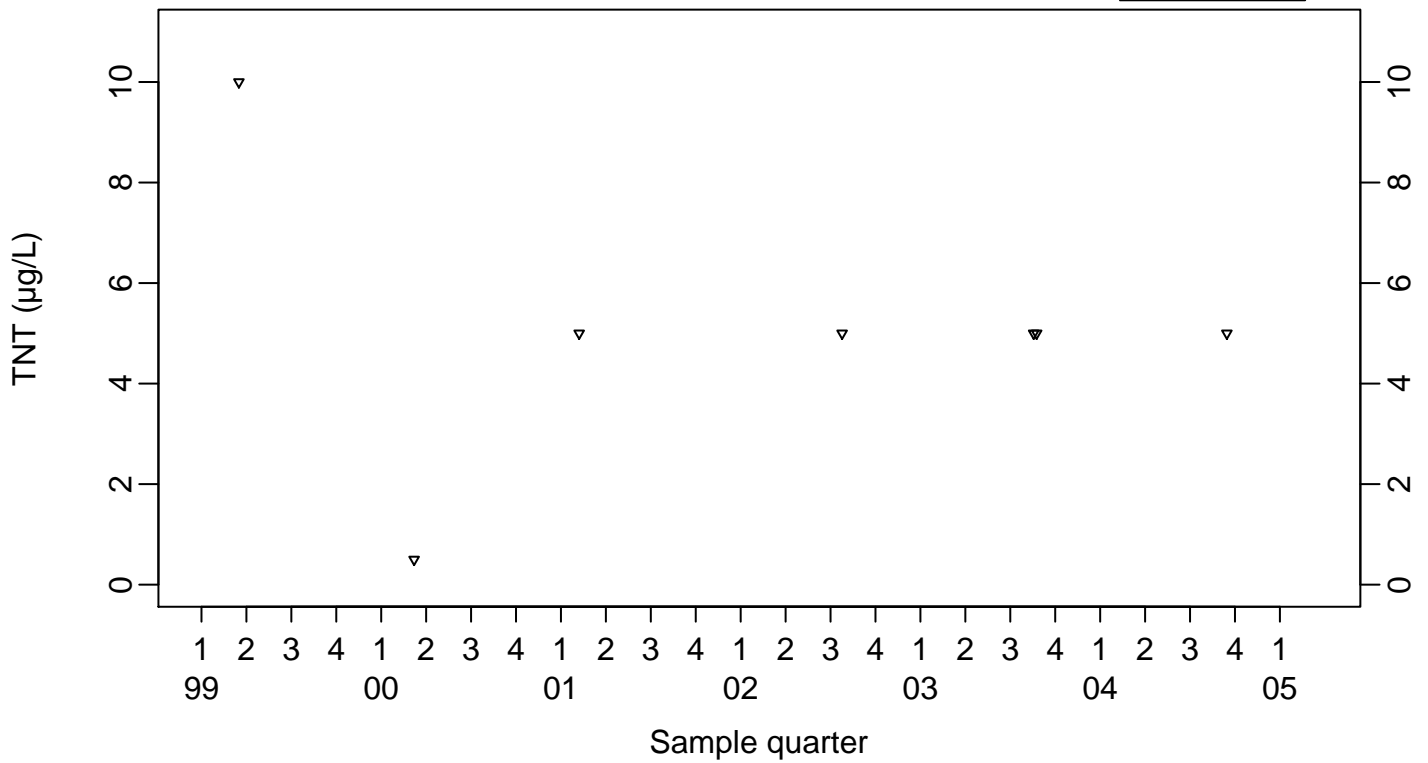
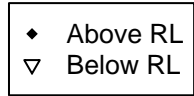
Retention Tank B827E



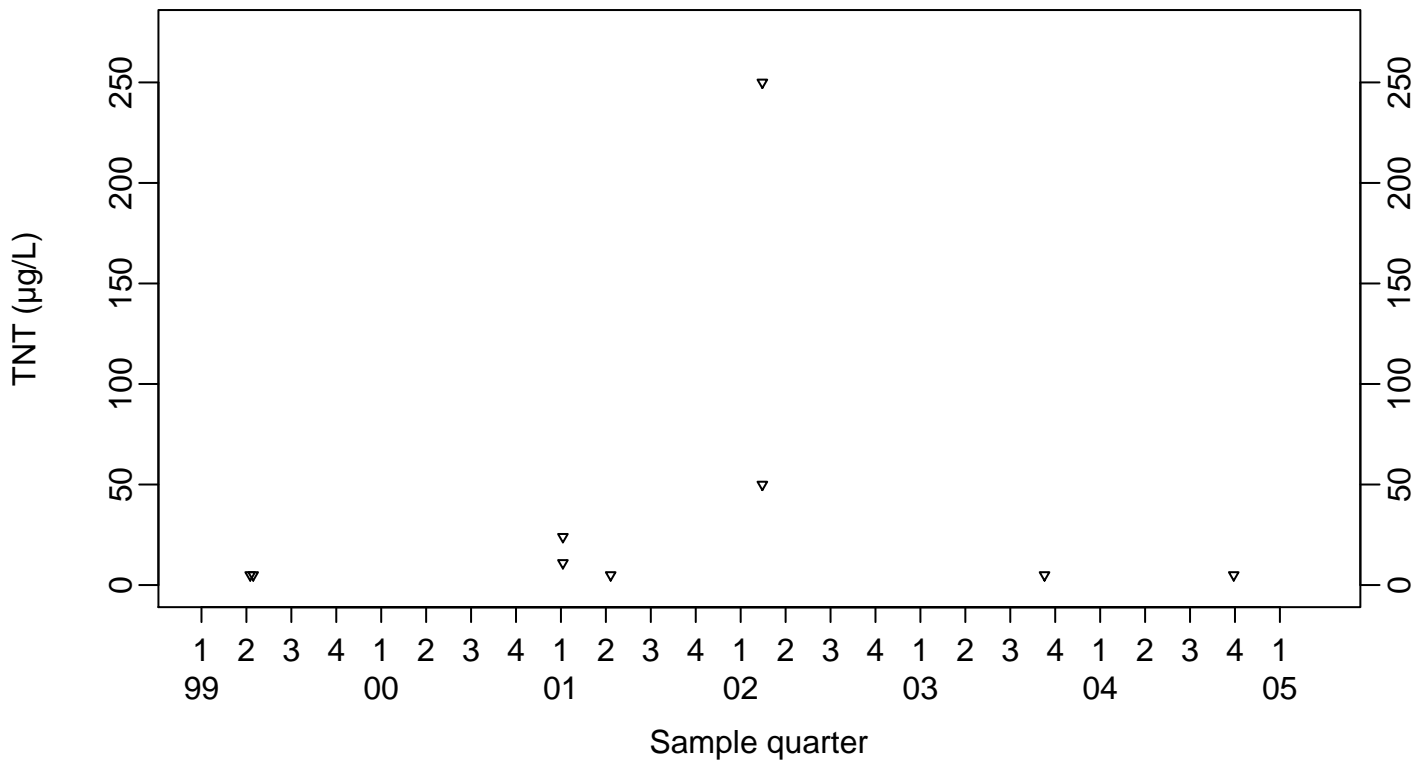
Surface Impoundments Process Water

TNT ($\mu\text{g/L}$)

Retention Tank B806/807



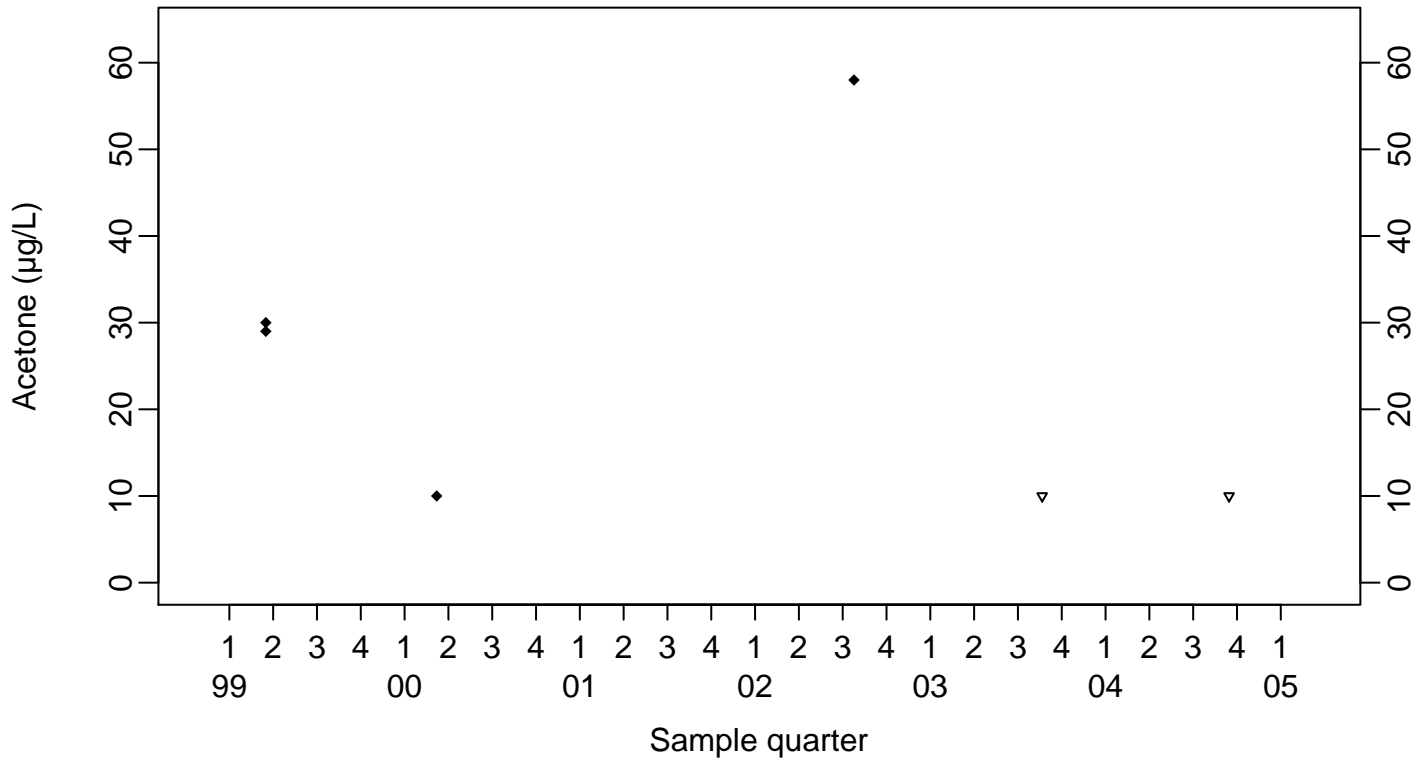
Retention Tank B817



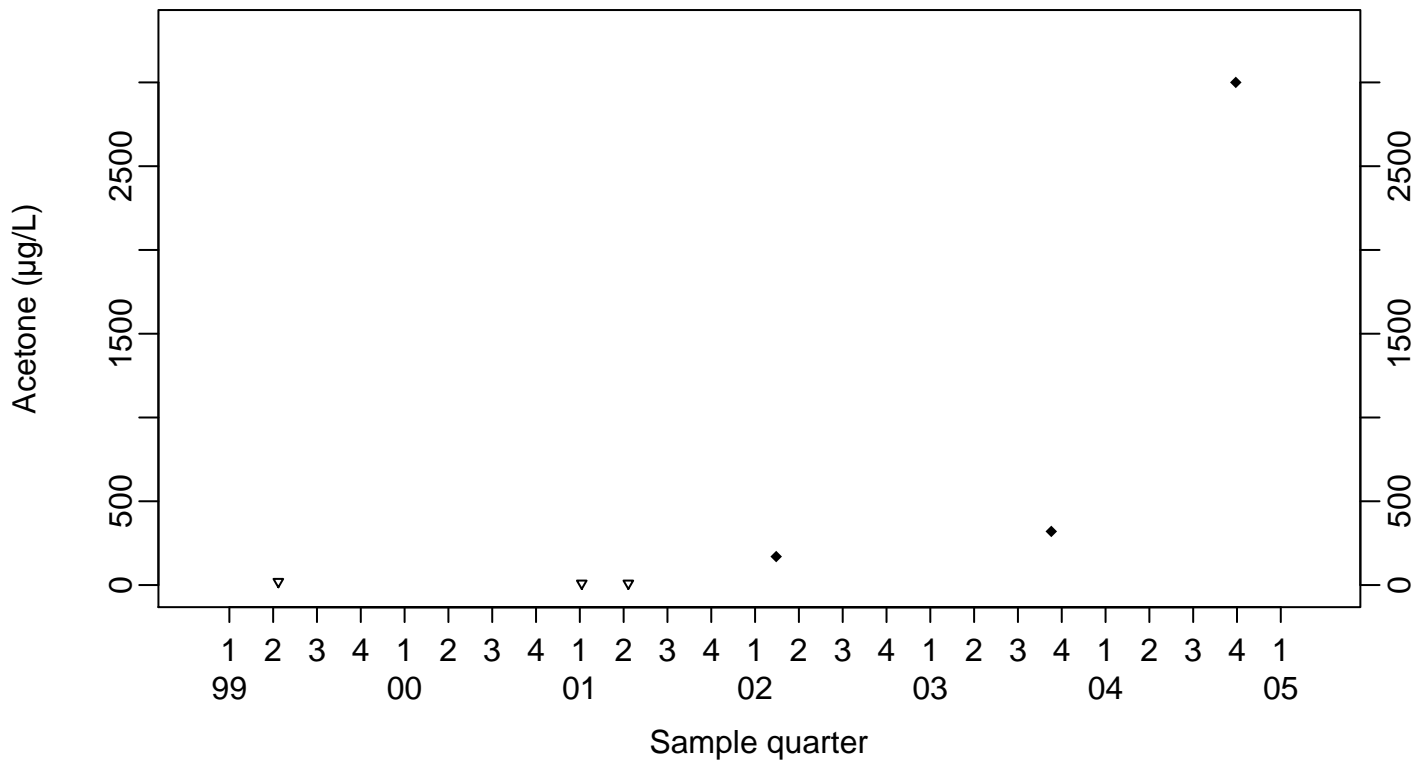
Surface Impoundments Process Water Acetone ($\mu\text{g/L}$)

Retention Tank B806/807

◆ Above RL
▽ Below RL



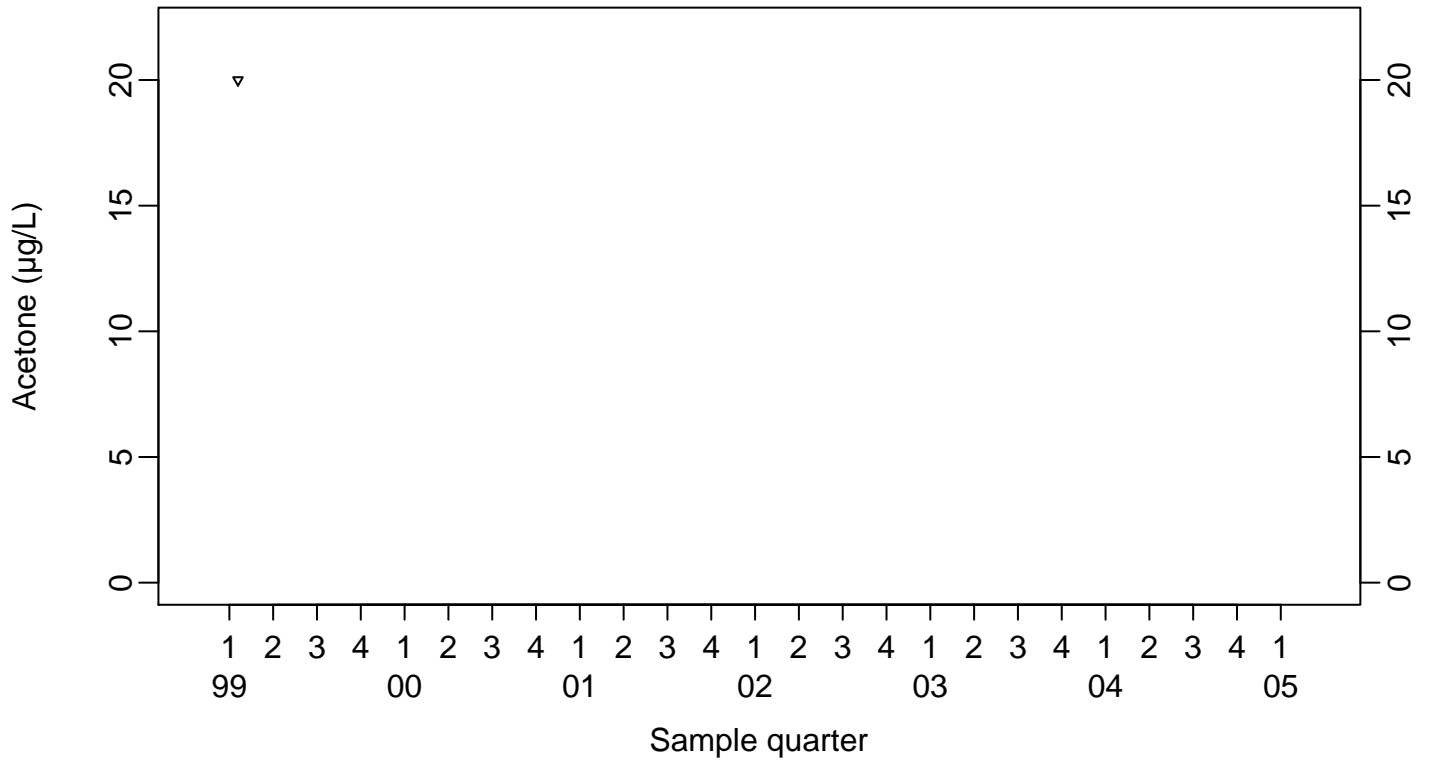
Retention Tank B817



Surface Impoundments Process Water Acetone ($\mu\text{g/L}$)

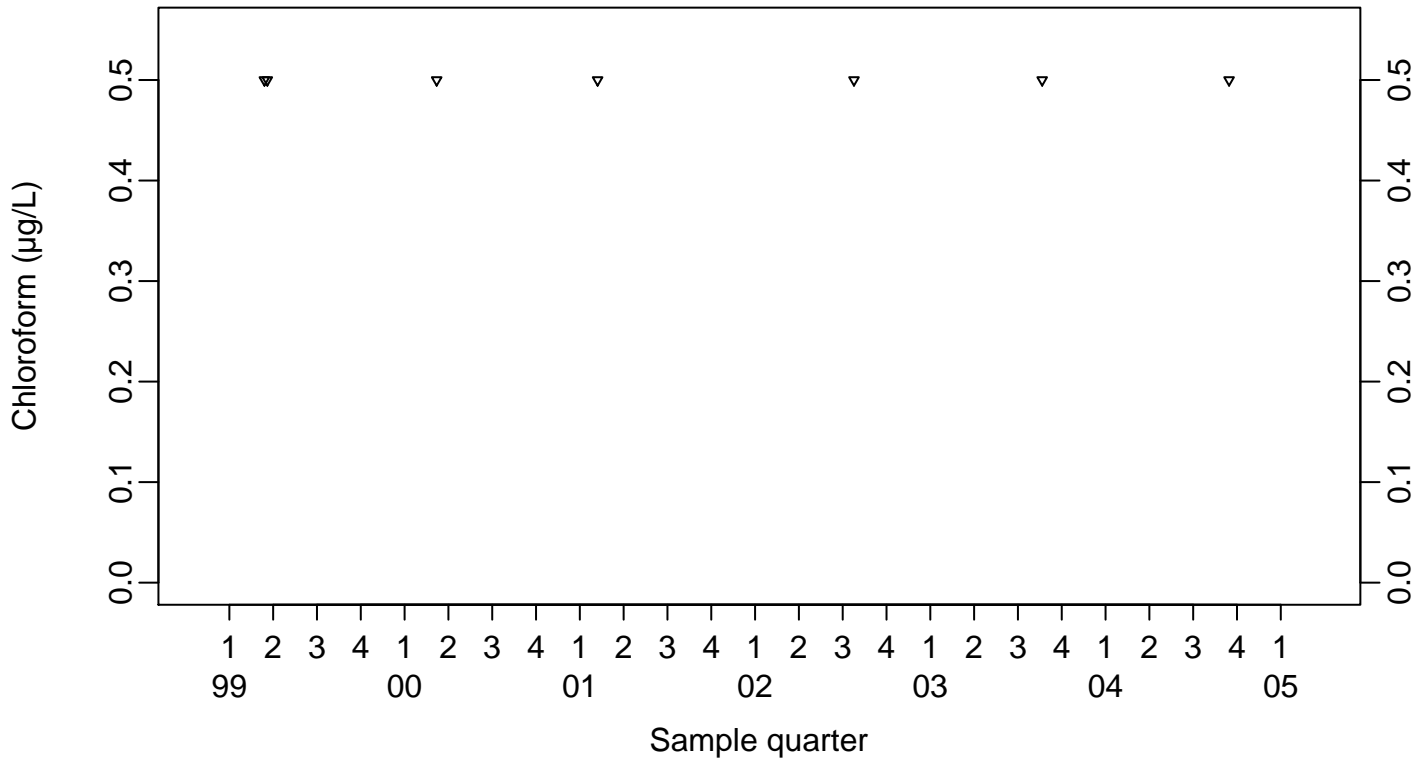
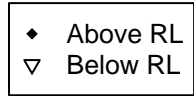
Retention Tank B827C/D

◆	Above RL
▽	Below RL

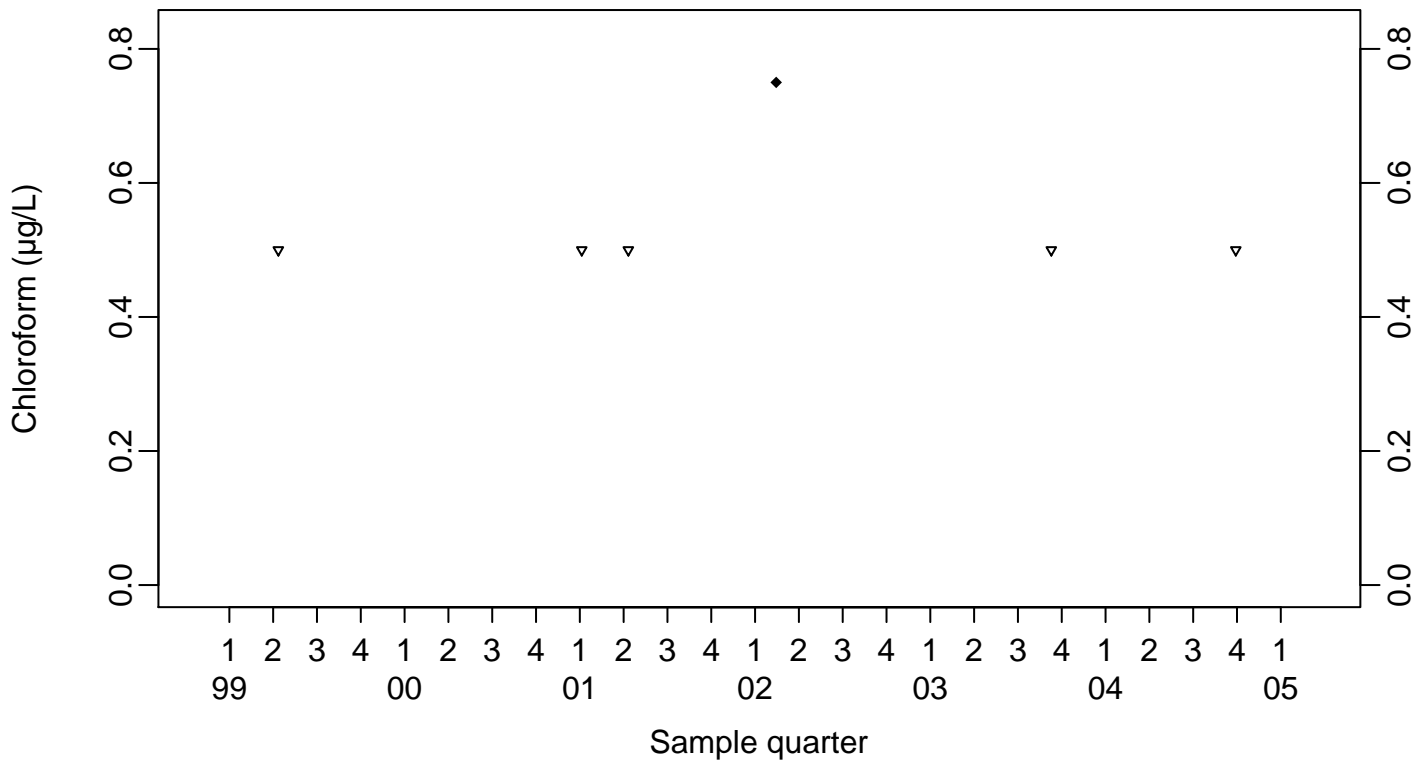


Surface Impoundments Process Water Chloroform ($\mu\text{g/L}$)

Retention Tank B806/807



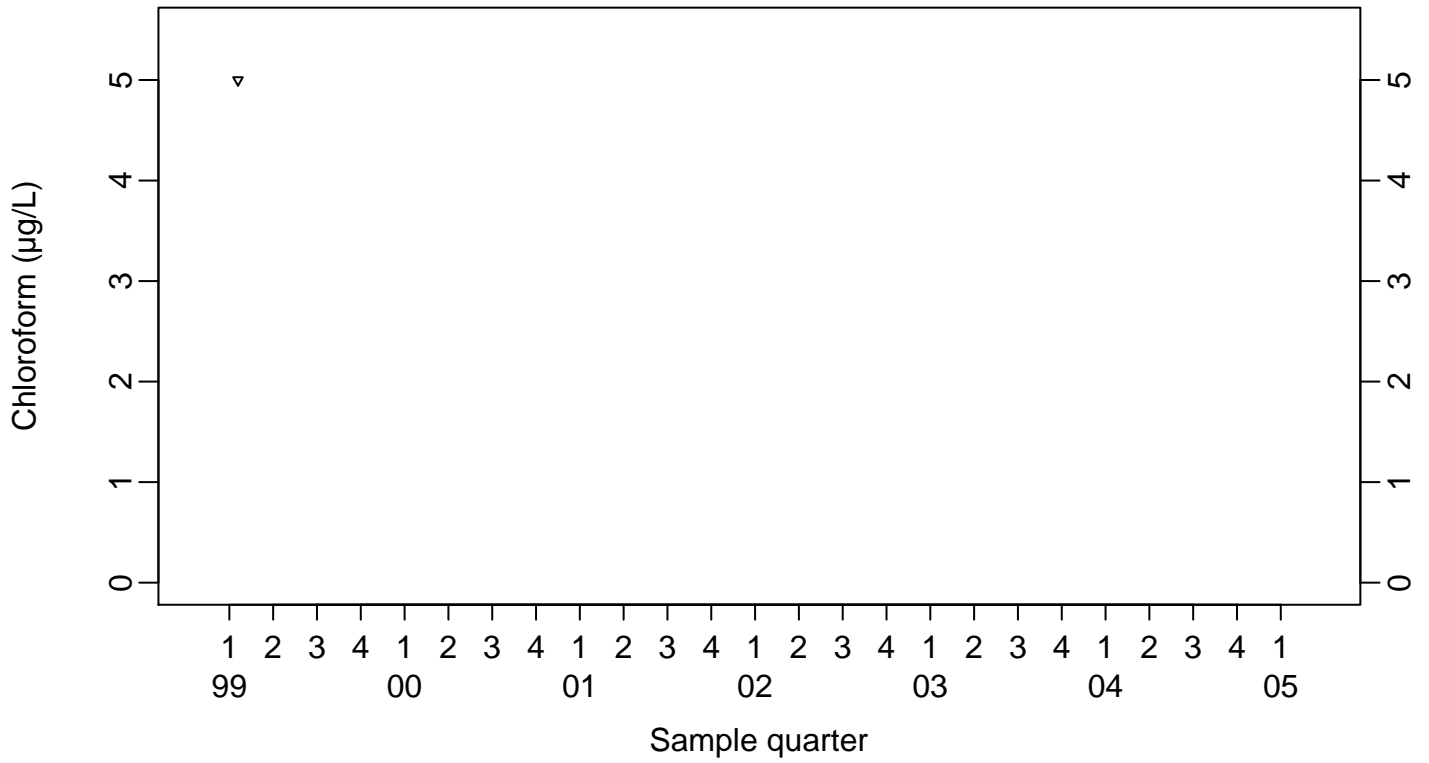
Retention Tank B817



Surface Impoundments Process Water Chloroform ($\mu\text{g/L}$)

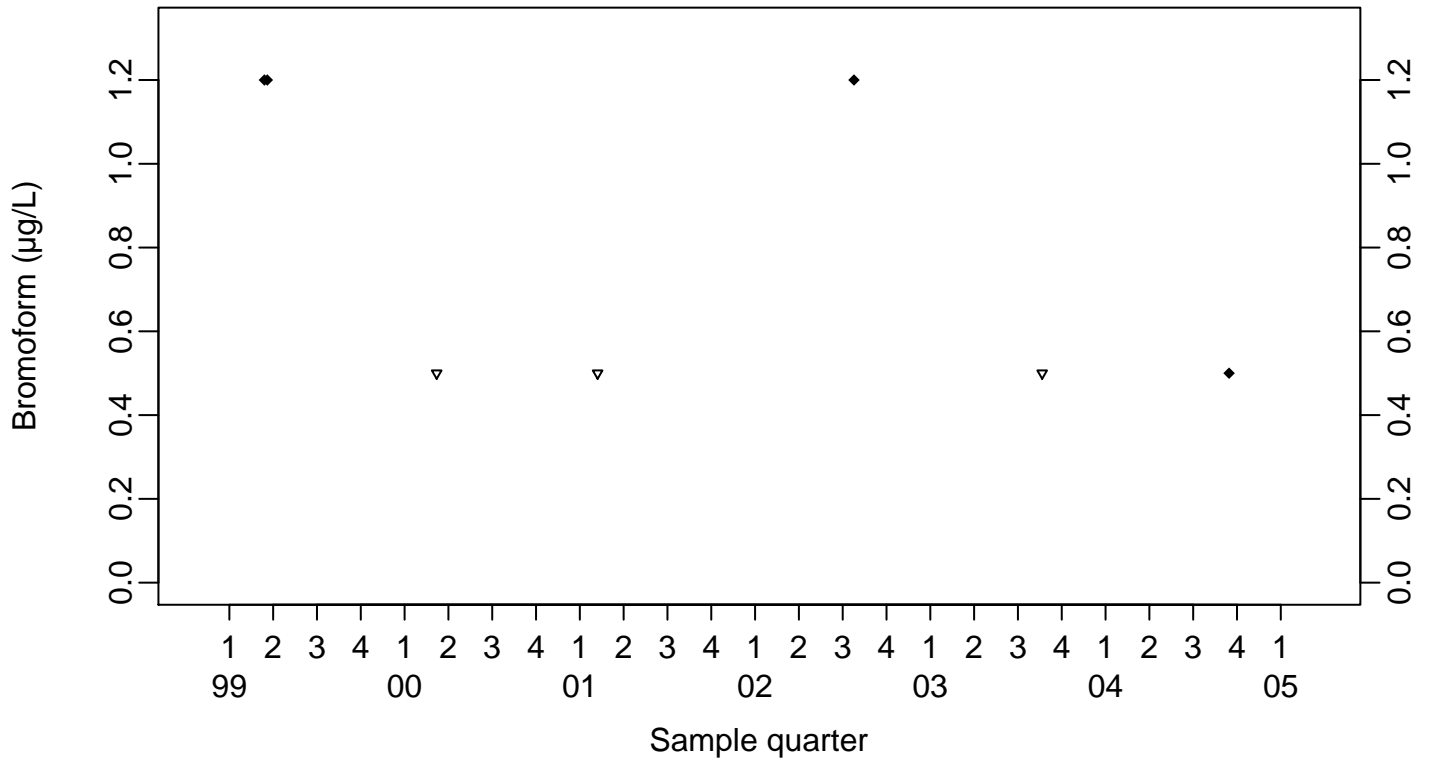
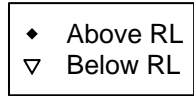
Retention Tank B827C/D

◆ Above RL
▽ Below RL

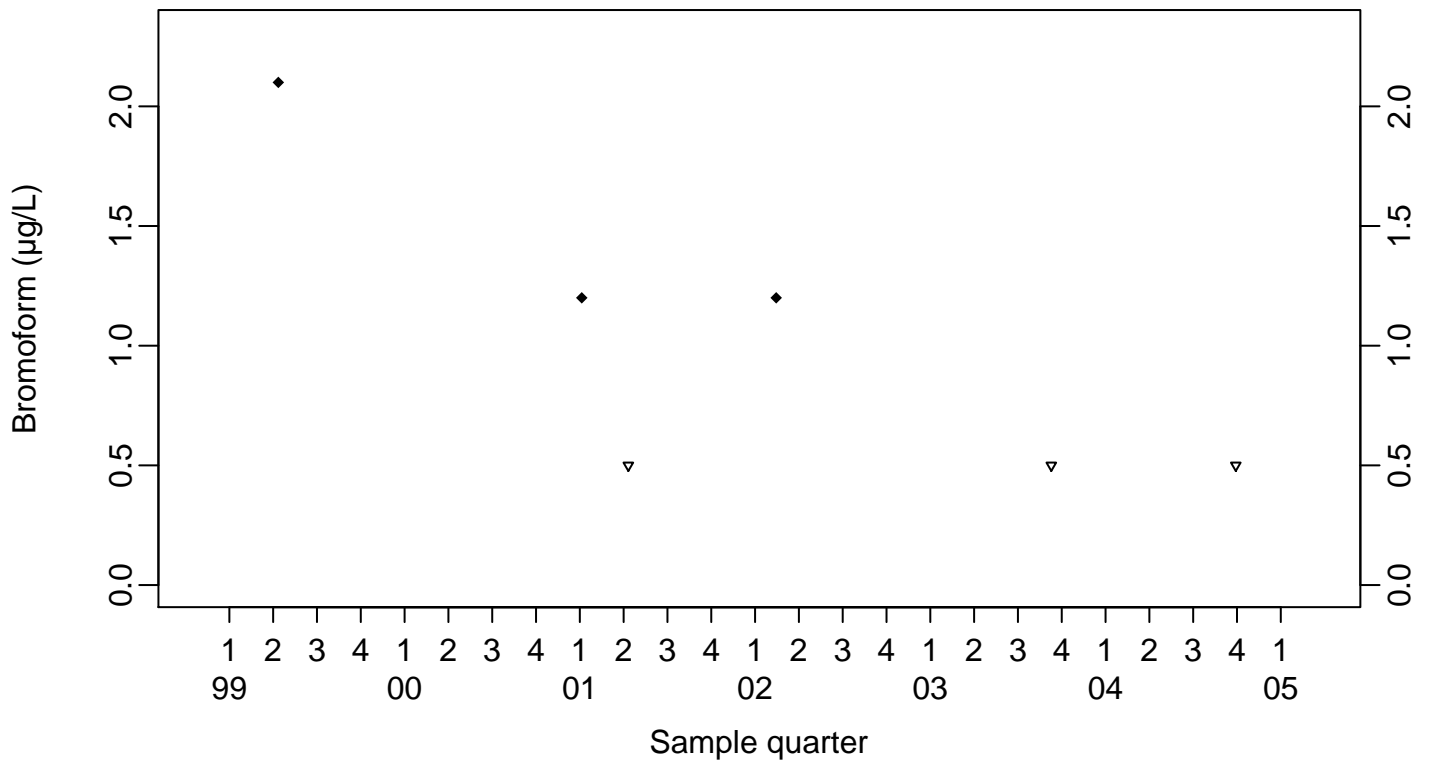


Surface Impoundments Process Water Bromoform ($\mu\text{g/L}$)

Retention Tank B806/807



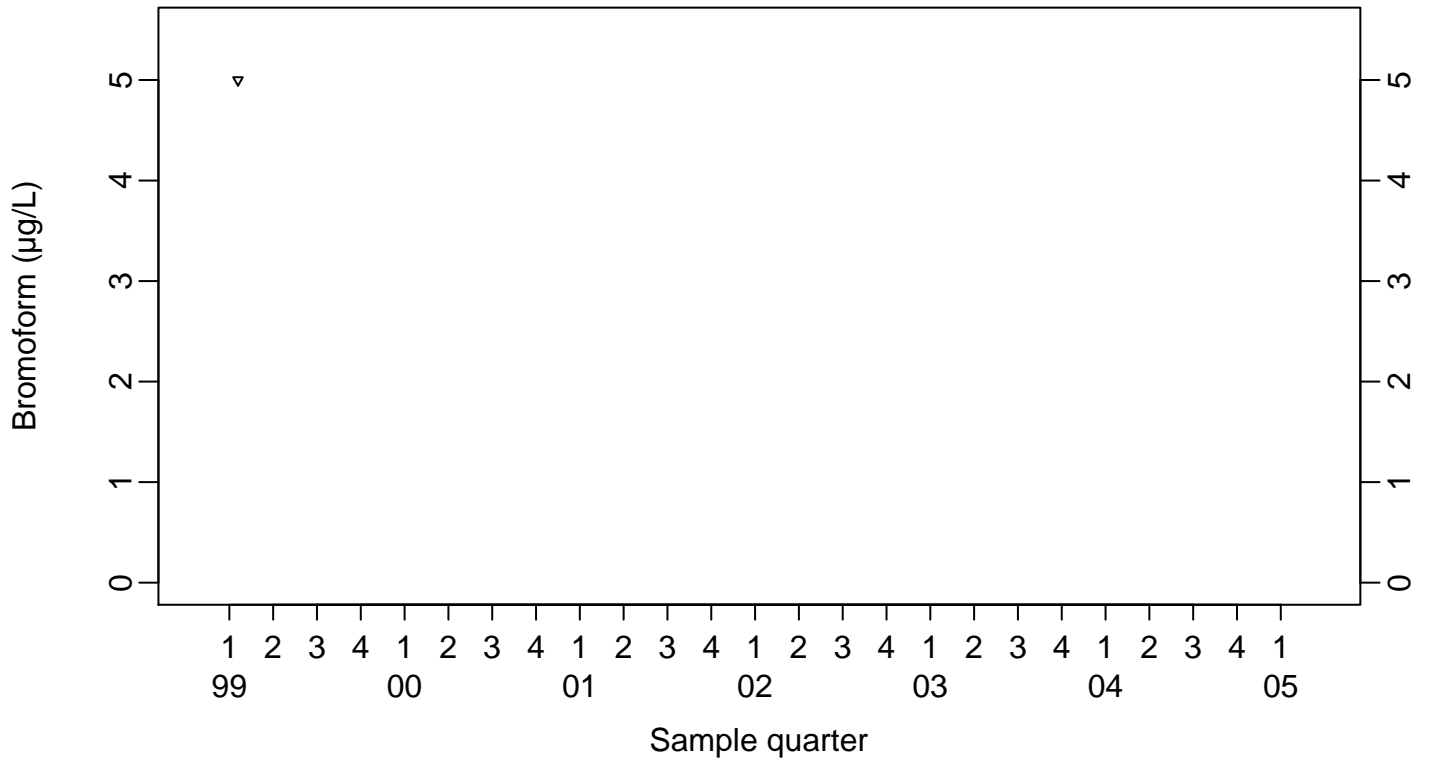
Retention Tank B817



Surface Impoundments Process Water Bromoform ($\mu\text{g/L}$)

Retention Tank B827C/D

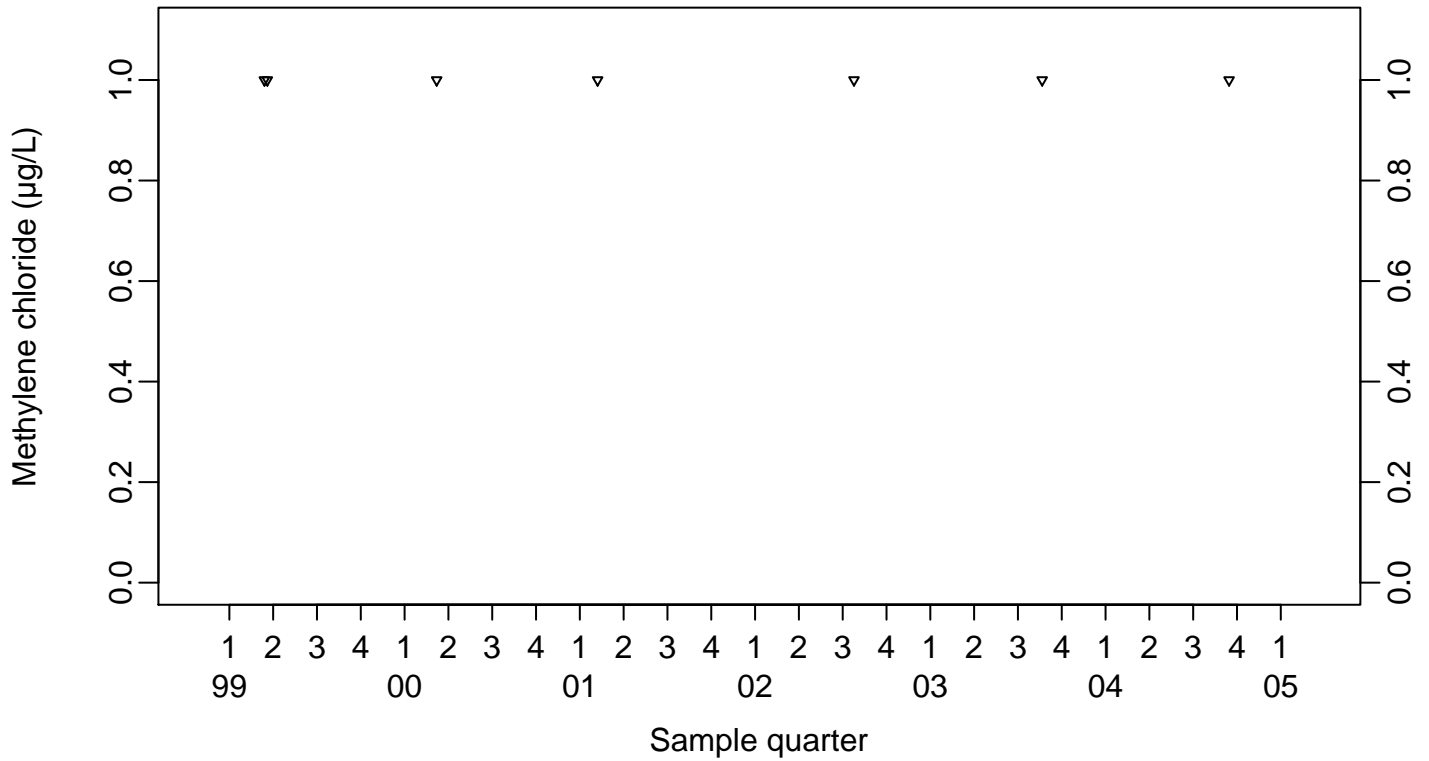
◆ Above RL
▽ Below RL



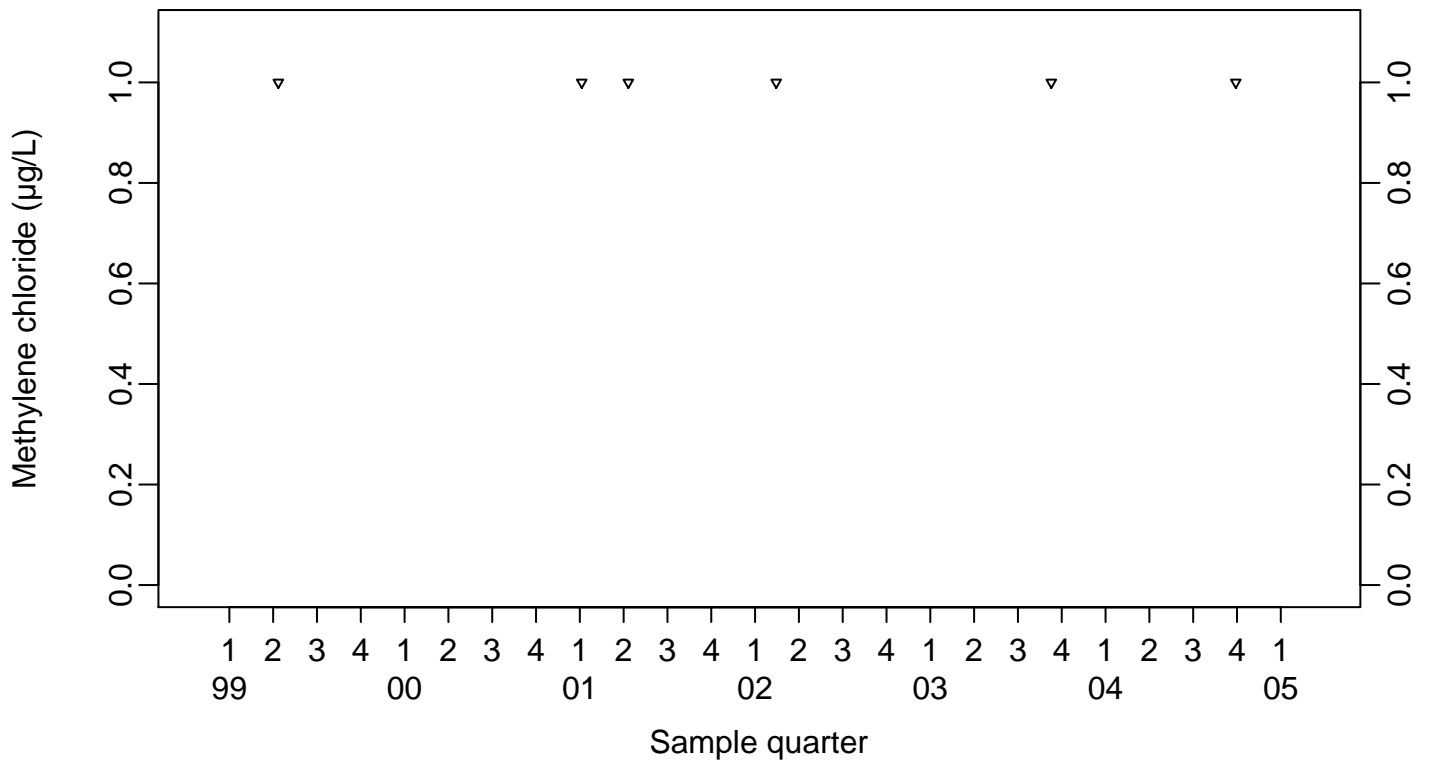
Surface Impoundments Process Water Methylene chloride ($\mu\text{g/L}$)

Retention Tank B806/807

◆ Above RL
▽ Below RL



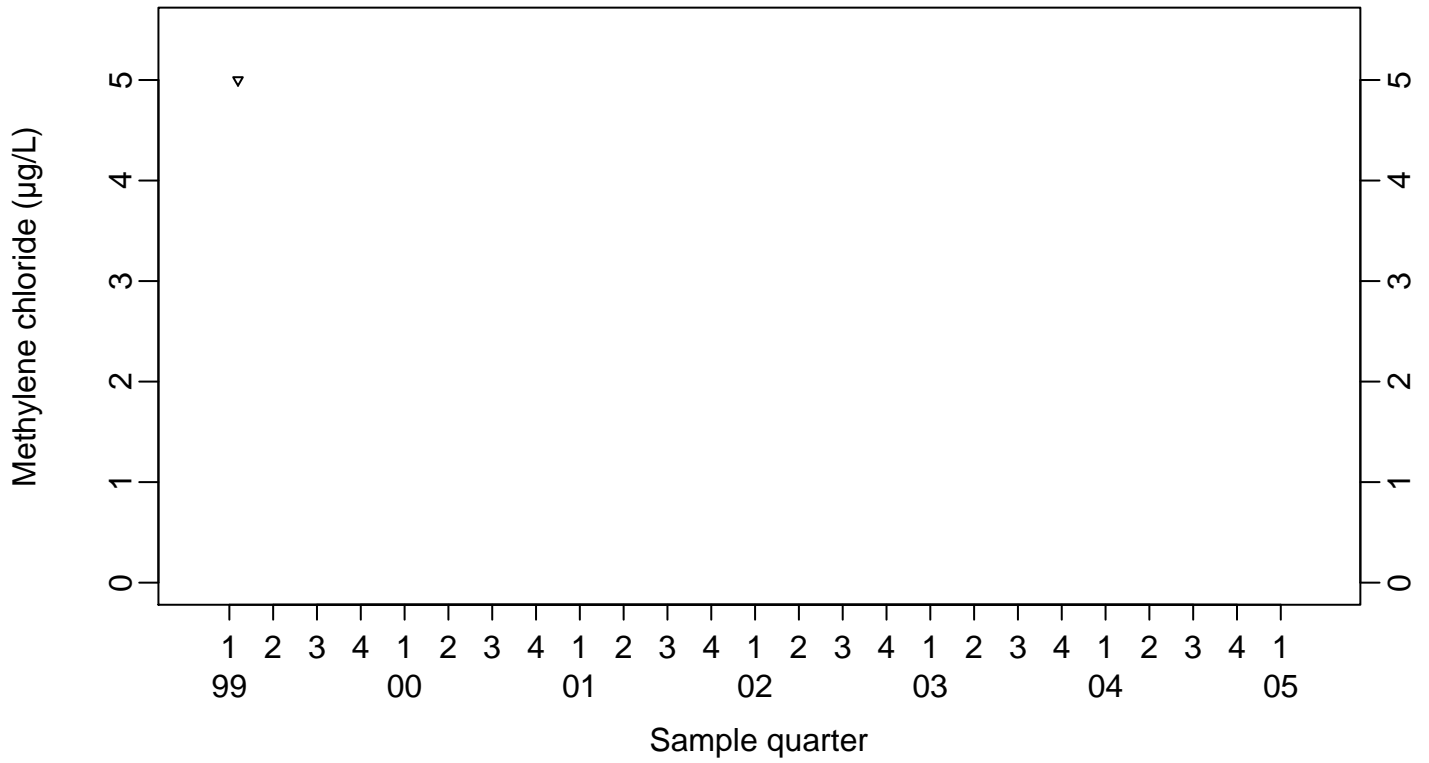
Retention Tank B817



Surface Impoundments Process Water Methylene chloride ($\mu\text{g/L}$)

Retention Tank B827C/D

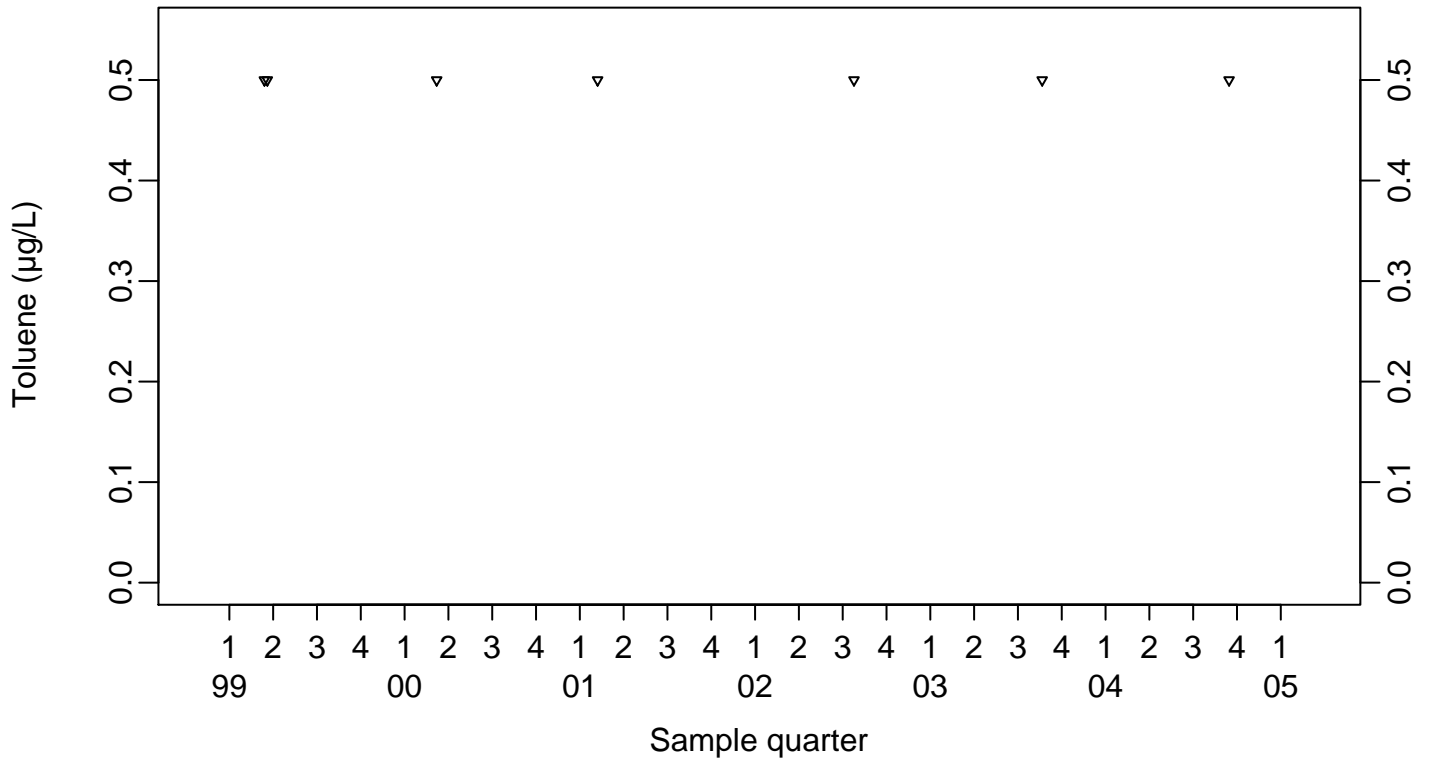
◆ Above RL
▽ Below RL



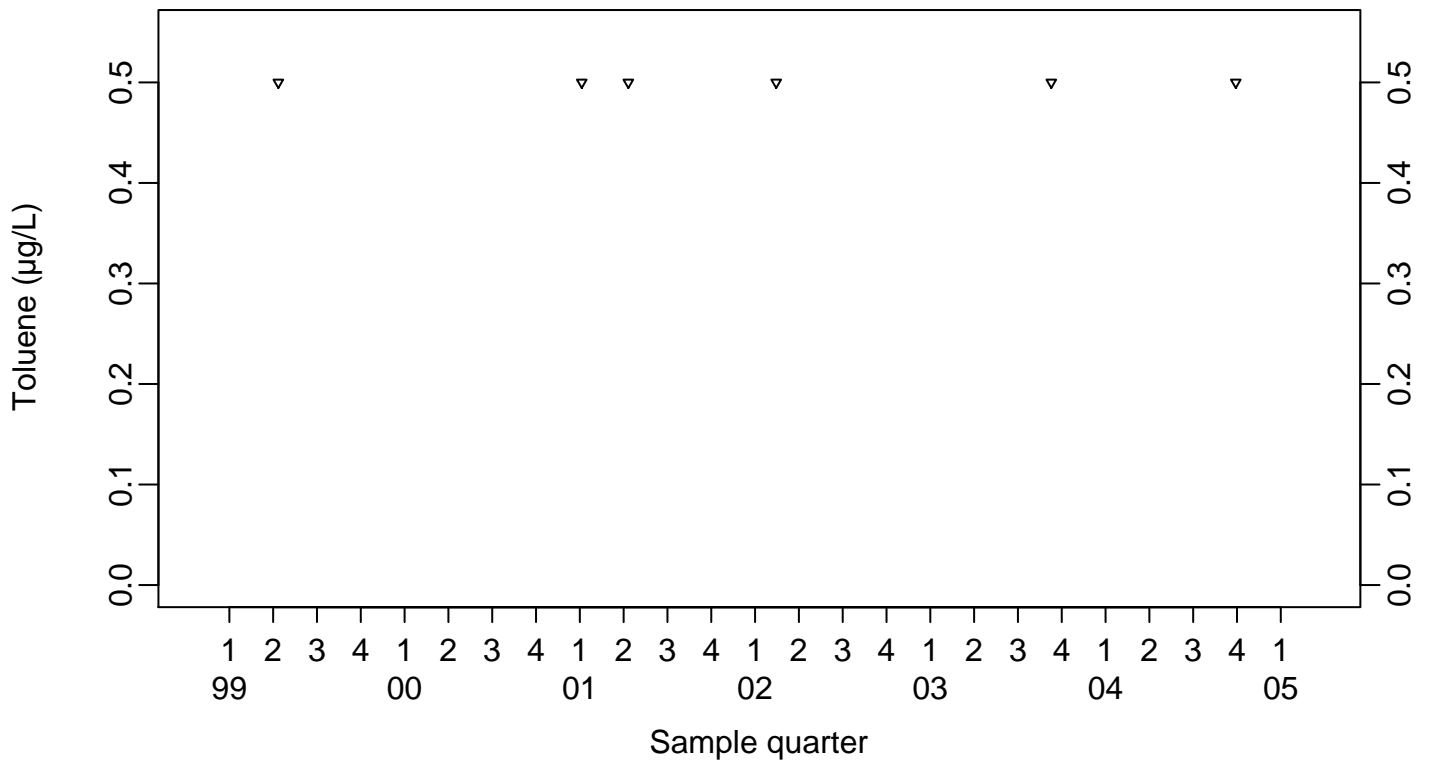
Surface Impoundments Process Water Toluene ($\mu\text{g/L}$)

Retention Tank B806/807

◆ Above RL
▽ Below RL



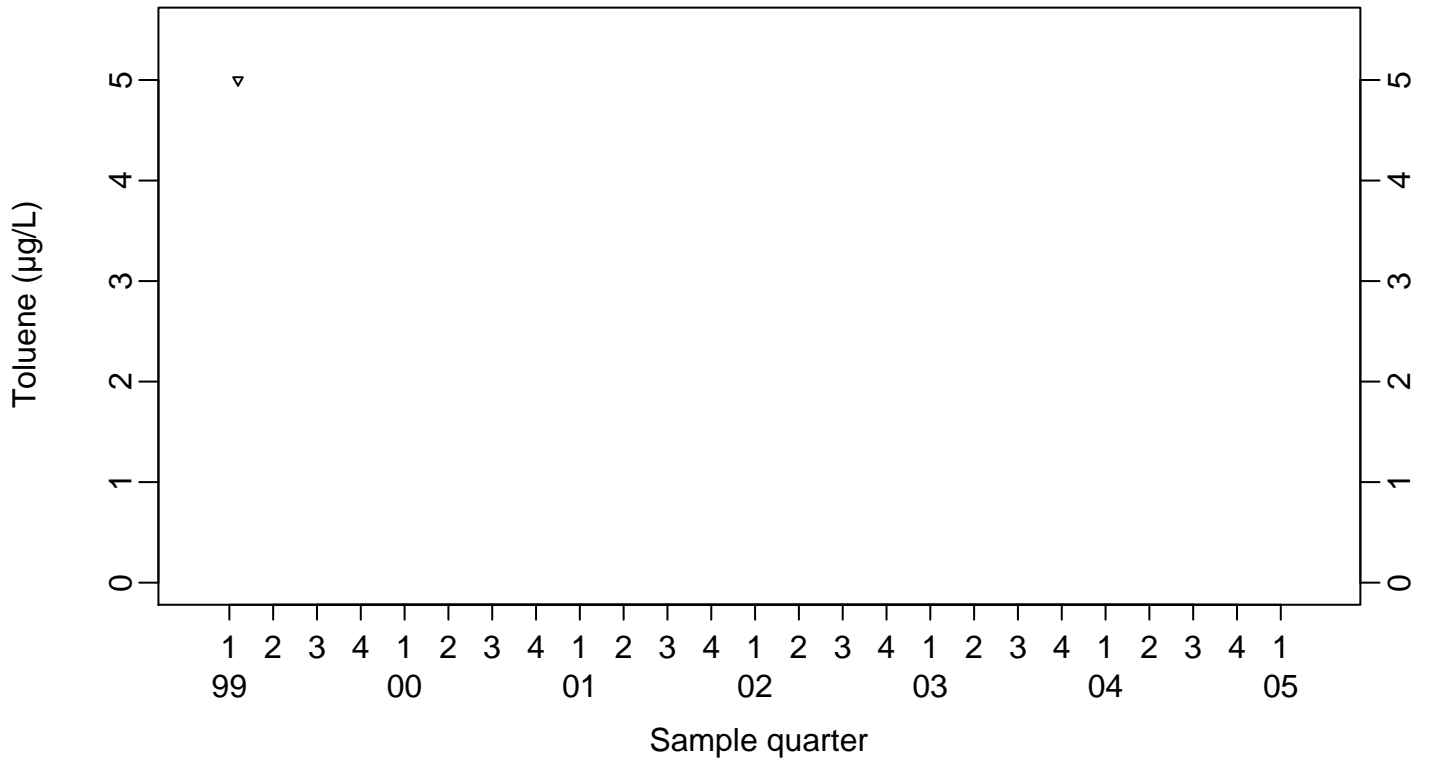
Retention Tank B817



Surface Impoundments Process Water Toluene ($\mu\text{g/L}$)

Retention Tank B827C/D

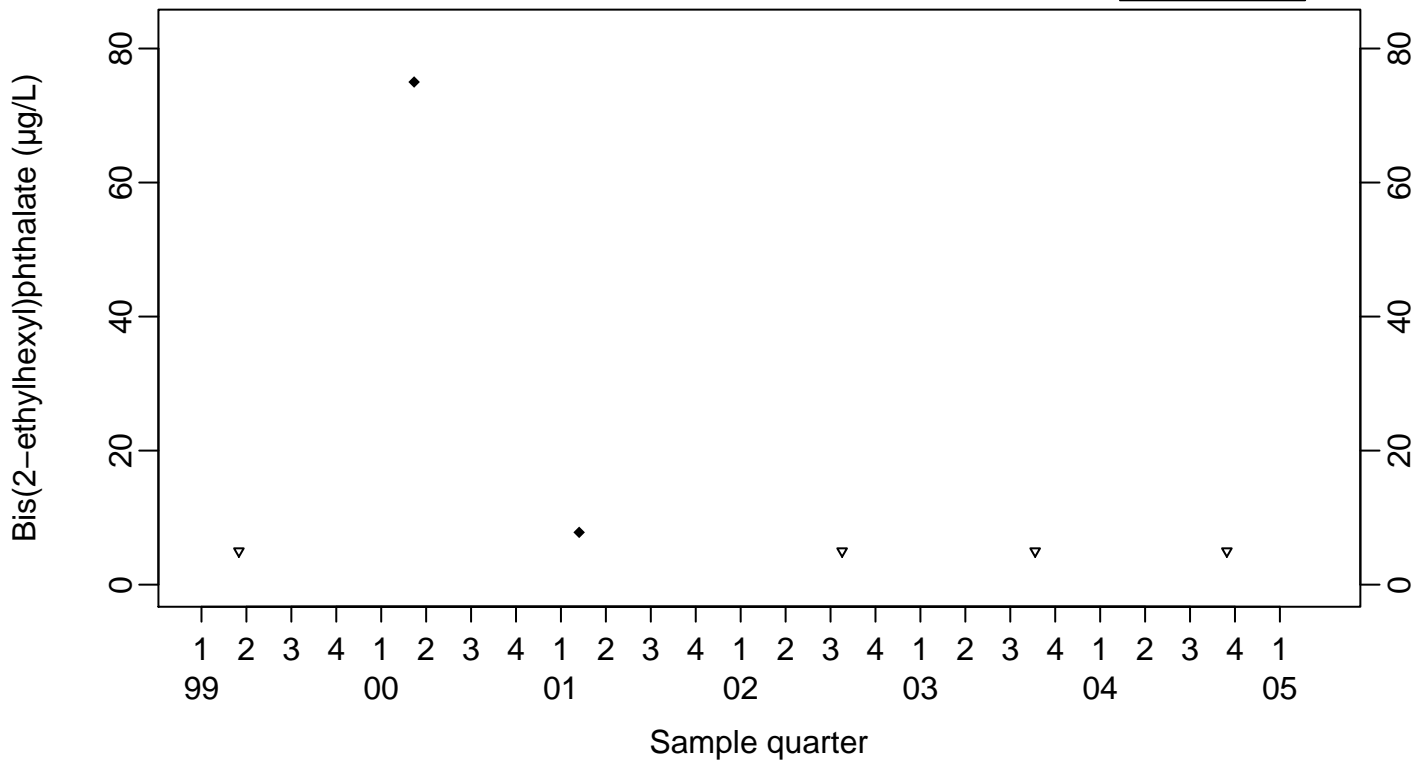
◆ Above RL
▽ Below RL



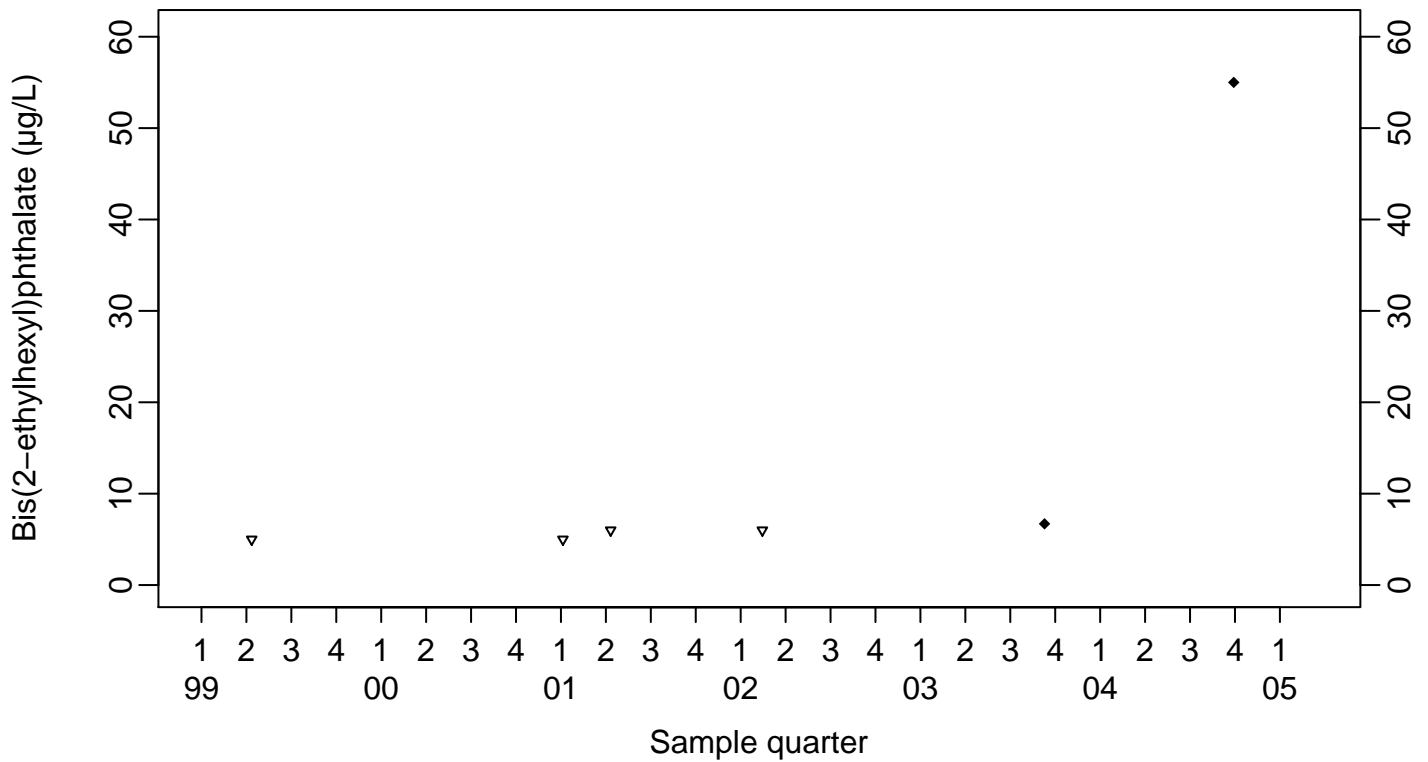
Surface Impoundments Process Water Bis(2-ethylhexyl)phthalate ($\mu\text{g/L}$)

Retention Tank B806/807

◆ Above RL
▽ Below RL



Retention Tank B817



Annual Summary Tables of Surface Impoundments Process Water Monitoring Data

Table A-1.1 Photographic process rinsewater monitoring, Building 801, constituents of concern required by WDR 96-248.

Parameter	Building 801 Sampled 2/12/04			WDR Effluent Limits ^b
	MDL ^a	Reporting Limit	Result	
General				
pH (unitless)	0.05	0.05	6.8	2<pH≤12.5
Metals (mg/L)				
Antimony	0.0005	0.005	0.0009 est ^c	15 ^d
Arsenic	0.0002	0.002	< 0.002	5
Barium	0.00059	0.025	0.012 est	100
Beryllium	0.00005	0.0002	0.0001 est	0.75 ^d
Cadmium	0.00007	0.0005	0.0018	1
Chromium	0.0004	0.001	0.004	5
Cobalt	0.0017	0.05	< 0.05	80
Copper	0.04	0.1	0.67	25
Lead	0.006	0.05	0.01 est	5
Lithium	0.0008	0.02	0.024	NL ^e
Manganese	0.0013	0.01	0.016	NL
Molybdenum	0.0022	0.025	0.012 est	350
Nickel	0.0002	0.002	0.015	20
Potassium	0.044	1	15	NL
Silver	0.0014	0.02	0.06	5
Thallium	0.00015	0.001	< 0.001	7 ^d
Vanadium	0.0018	0.01	0.0032 est	24 ^d
Zinc	0.0039	0.02	0.15	250

a MDL = Method detection limit

b These discharge limits are found in the Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the *Amended Report of Waste Discharge* (Fisher, 1995)

c Results followed by "est" are compounds detected with concentrations estimated between the MDL and the reporting limit for that compound

d California soluble threshold limit concentration (STLC), i.e., hazardous waste limit, not noted in WDR 96-248

e NL = No limit

Table A-1.2 Photographic process rinsewater monitoring, Building 823, constituents of concern required by WDR 96-248.

Parameter	MDL ^a range	Reporting limit range	3/18/04 result	6/23/04 result	9/17/04 result	11/23/04 result	WDR effluent limits ^b
General							
pH (unitless)	2.0	2.0	8.0	7.3	7.4	8.2	2<pH≤12.5
Metals (mg/L)							
Antimony	0.0002 - 0.00079	0.0005 - 0.002	< 0.002	0.00031 est ^c	0.0002 est	0.00028 est	15 ^d
Arsenic	0.0002 - 0.00042	0.001	< 0.001	0.002	0.0036	0.0012	5
Barium	0.000037 - 0.00024	0.001	0.012	0.022	0.012	0.008	100
Beryllium	0.000012 - 0.00014	0.0005	< 0.0005	0.000014 est	< 0.0005	< 0.0005	0.75 ^d
Cadmium	0.000014 - 0.000047	0.00025 - 0.001	0.00028 est	0.00028	0.0019	0.00012 est	1
Chromium	0.00013 - 0.00038	0.001 - 0.002	0.00082 est	0.0021	0.0029	0.0025	5
Cobalt	0.000009 - 0.000058	0.001	0.000069 est	0.00015 est	0.00015 est	0.000074 est	80
Copper	0.00006 - 0.00026	0.0005 - 0.002	0.061	0.12	0.033	0.038	25
Lead	0.000012 - 0.000095	0.0005 - 0.001	0.0015	0.0062	0.0026	0.0015	5
Lithium	0.01 - 0.045	0.005 - 0.05	0.065	0.058	0.052	NA ^e	NL ^f
Manganese	0.00015 - 0.00022	0.001 - 0.01	0.0089	0.016	0.025	0.009 est	NL
Molybdenum	0.000015 - 0.00012	0.001	0.019	0.011	0.0097	0.019	350
Nickel	0.000035 - 0.00014	0.001	0.0015	0.0033	0.0042	0.0034	20
Potassium	0.3	1.0 – 2.0	10.0	27.0	13.0	12.0	NL
Silver	0.00003 - 0.0006	0.00025 - 0.005	0.0062	0.59	0.089	0.18	5
Thallium	0.000002 - 0.00011	0.001	0.00029 est	0.0003 est	0.00012 est	< 0.001	7 ^d
Vanadium	0.00061 - 0.00068	0.001	< 0.001	< 0.001	< 0.001	< 0.001	24 ^d
Zinc	0.0013 - 0.0016	0.005 - 0.02	0.039	0.096	0.084	0.089	250

a MDL = Method detection limit

b These discharge limits are found in the Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the *Amended Report of Waste Discharge* (Fisher 1995)

c Results followed by "est" have estimated values between the MDL and the reporting limit for that compound

d California soluble threshold limit concentration (STLC), i.e., hazardous waste limit, not noted in WDR 96-248

e NA = Not applicable

f NL = No limit

Table A-1.3 Photographic process rinsewater monitoring, Building 851, constituents of concern required by WDR 96-248.

Parameter	Building 851 Sampled 2/4/04			WDR Effluent Limits ^b
	MDL ^a	Reporting Limit	Result	
General				
pH (unitless)	2.0	2.0	7.6	2<pH≤12.5
Metals (mg/L)				
Antimony	0.00079	0.002	< 0.002	15 ^c
Arsenic	0.00042	0.001	< 0.001	5
Barium	0.00024	0.001	0.029	100
Beryllium	0.00014	0.0005	< 0.0005	0.75 ^c
Cadmium	0.000047	0.001	< 0.001	1
Chromium	0.00038	0.001	0.0081	5
Cobalt	0.000058	0.001	0.00039 est ^d	80
Copper	0.00026	0.002	0.088	25
Lead	0.000095	0.001	0.0041	5
Lithium	0.01	0.01	0.056	NL ^e
Manganese	0.00022	0.001	0.035	NL
Molybdenum	0.00012	0.001	0.02	350
Nickel	0.00014	0.001	0.012	20
Potassium	0.3	1.0	20.0	NL
Silver	0.00017	0.001	0.0027	5
Thallium	0.00011	0.001	0.00019 est	7 ^c
Vanadium	0.00061	0.001	0.0029	24 ^c
Zinc	0.0016	0.02	0.15	250

a MDL = Method detection limit

b These discharge limits are found in the Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the *Amended Report of Waste Discharge* (Fisher, 1995)

c California soluble threshold limit concentration (STLC), i.e., hazardous waste limit, not noted in WDR 96-248

d Results followed by "est" are compounds detected with concentrations estimated between the MDL and the reporting limit for that compound

e NL = No limit

Table A-2.1 Chemistry area process wastewater monitoring, Building 827C/D, constituents of concern required by WDR 96-248.

Parameter	MDL ^a range	Reporting limit range	11/10/03 results (discharged 3/4/04)				3/16/04 result (disc. 5/18/04)	WDR effluent limits ^b
			Part 1	Part 2	Part 3	Part 4		
Energetic materials ($\mu\text{g/L}$)								
HMX	3.63 - 18.15	5 - 30	960	1300	1400	1000	340	NL ^c
RDX	3.19 - 15.95	5 - 30	< 5	24	28 est ^d	20 est	< 5	NL
TATB ^e	5 - 50	20 - 100	< 100	< 100	< 100	< 100	< 20	NL
Volatile organic compounds ($\mu\text{g/L}$)^f								
1,1,1-Trichloroethane	0.11	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	100,000
1,2-Dichloroethane	0.063	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	500
2-Butanone	1.3	20	< 20	< 20	< 20	< 20	< 20	200,000
Acetone	2.8	10	< 10	< 10	< 10	< 10	< 10	1,000,000
Bromoform	0.08	0.5	0.3 est	0.19 est	0.26 est	< 0.5	< 0.5	100,000
Chlorobenzene	0.064	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	100,000
Chloroform	0.055	0.5	0.53	0.46 est	< 0.5	0.22 est	< 0.5	100,000
Dibromochloromethane	0.063	0.5	0.17 est	0.09 est	0.16 est	< 0.5	< 0.5	100,000
Ethanol	40	1000	< 1000	< 1000	< 1000	< 1000	< 1000	1,000,000
Freon 113	0.05	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	100,000
Methylene chloride	0.17	1	< 1	< 1	< 1	< 1	< 1	100,000
Methyl isobutyl ketone	1.1	20	< 20	< 20	< 20	< 20	< 20	1,000,000
Naphthalene	0.13	0.5	< 0.5	0.23 est	0.16 est	< 0.5	< 0.5	200,000
Styrene	0.091	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1,000,000
Tetrachloroethene	0.11	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	700
Toluene	0.069	0.5	0.09 est	< 0.5	< 0.5	< 0.5	< 0.5	200,000
Trichloroethene	0.079	0.5	0.13 est	0.16 est	0.11 est	0.19 est	< 0.5	500
Vinyl chloride	0.064	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	200
Semivolatile organic compounds ($\mu\text{g/L}$)^f								
Dimethyl sulfoxide (DMSO)	0.037 - 0.041	10 - 20	< 10	< 20	< 20	< 10	< 10	1,000,000

a MDL = Method detection limit

b These discharge limits are found in the Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996 or in Appendix C of the *Amended Report of Waste Discharge* (Fisher

c NL = No limit

d Results followed by "est" are compounds detected with concentrations estimated between the MDL and the reporting limit for that compound

e Analyzed using an uncertified method (there is no certified method for analysis of TATB)

f No other volatile or semivolatile organic compounds were detected via EPA Methods 624 or 625

Table A-2.2 Chemistry area process wastewater monitoring, Building 827E, constituents of concern required by WDR 96-248.

Parameter	Building 827E Sampled 11/10/03, discharged 3/4/04			WDR Effluent Limits ^b
	MDL ^a	Reporting Limit	Result	
Energetic materials ($\mu\text{g/L}$)				
HMX	14.52	20	510	NL ^c
RDX	12.76	20	360	NL
TATB ^d	50	100	< 100	NL
Volatile organic compounds ($\mu\text{g/L}$)^e				
1,1,1-Trichloroethane	0.11	0.5	< 0.5	100,000
1,2-Dichloroethane	0.063	0.5	< 0.5	500
2-Butanone	1.3	20	< 20	200,000
Acetone	2.8	10	< 10	1,000,000
Bromoform	0.08	0.5	< 0.5	100,000
Chlorobenzene	0.064	0.5	< 0.5	100,000
Chloroform	0.055	0.5	0.15 est ^f	100,000
Dibromochloromethane	0.063	0.5	0.11 est	100,000
Ethanol	40	1000	< 1000	1,000,000
Freon 113	0.05	0.5	< 0.5	100,000
Methylene chloride	0.17	1	< 1	100,000
Methyl isobutyl ketone	1.1	20	< 20	1,000,000
Styrene	0.091	0.5	< 0.5	1,000,000
Tetrachloroethene	0.11	0.5	< 0.5	700
Toluene	0.069	0.5	< 0.5	200,000
Trichloroethene	0.079	0.5	0.2 est	500
Vinyl chloride	0.064	0.5	< 0.5	200
Semivolatile organic compounds ($\mu\text{g/L}$)^e				
Dimethyl sulfoxide (DMSO)	0.04	20	< 20	1,000,000

a MDL = Method detection limit

b These discharge limits are found in the Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996 or in Appendix C of the *Amended Report of Waste Discharge* (Fisher

c NL = No limit

d Analyzed using an uncertified method (there is no certified method for analysis of TATB)

e No other volatile or semivolatile organic compounds were detected via EPA Methods 624 or 625.

f Results followed by "est" are compounds detected with concentrations estimated between the MDL and the reporting limit for that compound.

Table A-2.3 Chemistry area process wastewater monitoring, Building 827C/D, other constituents.

Parameter	MDL ^a range	Reporting limit range	11/10/03 results (discharged 3/4/04)				3/16/04 result (disc. 5/18/04)	WDR effluent limits ^b
			Part 1	Part 2	Part 3	Part 4		
General								
pH (unitless)	NAFL ^c	NAFL	10.3	10.3	10.3	10.3	9.3	2<pH≤12.5
Metals (mg/L)								
Antimony	0.016	0.016	0.037	< 0.016	< 0.016	< 0.016	< 0.016	15 ^d
Arsenic	0.02	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	5
Barium	0.001	0.001	0.0085	0.026	0.016	0.024	0.015	100
Beryllium	0.0086	0.0086	0.036	< 0.0086	< 0.0086	< 0.0086	0.059	0.75 ^d
Cadmium	0.0008	0.0008	0.0051	0.0035	0.0062	0.004	0.0018	1
Chromium	0.0015	0.0015	0.004	0.0053	0.0058	0.013	0.017	5
Cobalt	0.0014	0.0014	< 0.0014	< 0.0014	< 0.0014	< 0.0014	< 0.0014	80
Copper	0.0049	0.0049	0.07	0.059	0.069	0.076	0.24	25
Lead	0.014	0.014	< 0.014	< 0.014	< 0.014	0.016	< 0.014	5
Manganese	0.0063	0.0063	0.027	0.026	0.028	0.044	0.046	NL ^e
Mercury	0.00045 - 0.0018	0.00045 - 0.0018	< 0.00045	< 0.00045	< 0.00045	< 0.00045	< 0.0018	0.2 ^d
Molybdenum	0.003	0.003	0.03	0.011	0.012	0.019	0.018	350
Nickel	0.023	0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	20
Potassium	0.095	0.095	14.9	14.9	15.4	15.3	4.8	NL
Selenium	0.024	0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	1 ^d
Silver	0.0025	0.0025	< 0.0025	0.0044	< 0.0025	< 0.0025	< 0.0025	5
Thallium	0.055	0.055	< 0.055	< 0.055	< 0.055	< 0.055	< 0.055	7 ^d
Vanadium	0.002	0.002	< 0.002	0.0028	< 0.002	< 0.002	< 0.002	24 ^d
Zinc	0.014	0.014	0.16	0.14	0.16	0.3	0.79	250

a MDL = Method detection limit

b These discharge limits are found in the Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996 or in Appendix C of the *Amended Report of Waste Discharge* (Fisher

c NAFL = Not available from laboratory

d California soluble threshold limit concentration (STLC), i.e., hazardous waste limit, not noted in WDR 96-248

e NL = No limit

Table A-2.4 Chemistry area process wastewater monitoring, Building 827E, other constituents.

Parameter	Building 827E Sampled 11/10/03, discharged 3/4/04			WDR Effluent Limits ^b
	MDL ^a	Reporting Limit	Result	
General				
pH (unitless)	NAFL ^c	NAFL	9.4	2<pH≤12.5
Metals (mg/L)				
Antimony	0.016	0.016	< 0.016	15 ^d
Arsenic	0.02	0.02	< 0.02	5
Barium	0.001	0.001	0.032	100
Beryllium	0.0086	0.0086	< 0.0086	0.75 ^d
Cadmium	0.0008	0.0008	0.0098	1
Chromium	0.0015	0.0015	0.0052	5
Cobalt	0.0014	0.0014	0.0039	80
Copper	0.0049	0.0049	0.14	25
Lead	0.014	0.014	< 0.014	5
Manganese	0.0063	0.0063	0.048	NL ^e
Mercury	0.00045	0.00045	< 0.00045	0.2 ^d
Molybdenum	0.003	0.003	0.024	350
Nickel	0.023	0.023	0.037	20
Potassium	0.095	0.095	7.1	NL
Selenium	0.024	0.024	< 0.024	1 ^d
Silver	0.0025	0.0025	< 0.0025	5
Thallium	0.055	0.055	< 0.055	7 ^d
Vanadium	0.002	0.002	0.014	24 ^d
Zinc	0.014	0.014	0.17	250

a MDL = Method detection limit

b These discharge limits are found in the Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the *Amended Report of Waste Discharge* (Fisher, 1995)

c NAFL= Not available from laboratory

d California soluble threshold limit concentration (STLC), i.e., hazardous waste limit, not noted in WDR 96-248

e NL = No limit

Table A-3.1 Explosive process area wastewater monitoring, Building 806/807, constituents of concern required by WDR 96-248.

Parameter	Building 806/807 Sampled: 9/15/04			
	MDL ^a	Reporting Limit	Result	WDR Effluent Limits ^b
Metals (mg/L)				
Aluminum	0.0098	0.05	0.41	NL ^c
Arsenic	0.0009	0.002	< 0.002	5
Barium	0.000027	0.025	0.0403	100
Cadmium	0.000011	0.0005	0.00066	1
Chromium	0.00064	0.001	0.0013	5
Cobalt	0.0000073	0.05	0.00022 est ^d	80
Copper	0.007	0.02	0.12	25
Lead	0.00002	0.005	0.0049 est	5
Manganese	0.000046	0.01	0.0147	NL
Molybdenum	0.000015	0.025	0.024 est	350
Nickel	0.000034	0.002	0.0021	20
Potassium	0.095	1.0	8.6	NL
Silver	0.000008	0.001	0.00092 est	5
Zinc	0.0021	0.01	0.0485	250
Energetic materials (µg/L)				
PETN	NA ^e	NA	NA	NL
RDX	3.19	5	58	NL
HMX	3.63	100	3,100	NL
TATB ^f	5	20	< 20	NL
TNT	3.87	5	< 5	NL
Semivolatile organic compounds (µg/L)^g				
Benzyl alcohol	0.25	2	< 2	1,000,000
bis(2-ethylhexyl)phthalate	0.3	5	3.3 est	1,000,000
Dimethyl phthalate	0.22	5	0.62 est	1,000,000
Dimethyl sulfoxide (DMSO)	0.027	10	< 10	1,000,000
Naphthalene	0.3	5	< 5	200,000
meta- & para-Cresol	0.45	2	< 2	50,000
ortho-Cresol	0.21	5	< 5	50,000

(continued)

Table A-3.1 Explosive process area wastewater monitoring, Building 806/807, constituents of concern required by WDR 96-248 (concluded).

Parameter	Building 806/807 Sampled: 9/15/04			
	MDL	Reporting Limit	Result	WDR Effluent Limits
Volatile organic compounds ($\mu\text{g/L}$)^g				
1,1,1-Trichloroethane	0.13	0.5	< 0.5	100,000
1,2-Dichloroethane	0.18	0.5	< 0.5	500
2-Butanone	1.3	20	< 20	200,000
Acetone	4.7	10	< 10	1,000,000
Bromoform	0.063	0.5	0.5	100,000
Chlorobenzene	0.093	0.5	< 0.5	100,000
Dibromochloromethane	0.068	0.5	0.19 est	100,000
Ethanol	51	1,000	< 1,000	1,000,000
Freon 113	0.078	0.5	< 0.5	100,000
Methyl isobutyl ketone	1	20	< 20	1,000,000
Methylene chloride	0.15	1	< 1	100,000
Naphthalene	0.035	0.5	< 0.5	200,000
Styrene	0.076	0.5	< 0.5	1,000,000
Tetrachloroethene	0.069	0.5	< 0.5	700
Toluene	0.15	0.5	< 0.5	200,000
Vinyl chloride	0.17	0.5	< 0.5	200

a MDL = Method detection limit

b These discharge limits are found either in the Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the Amended Report of Waste Discharge (1995)

c NL = No limit

d Results followed by "est" are compounds detected with concentrations estimated between the MDL and the reporting limit for that compound

e NA = Not applicable

f Analyzed using an uncertified method (there is no certified method for analysis of TATB)

g No other volatile or semivolatile organic compounds were detected via EPA Methods 624 or 625

Table A-3.2 Explosive process area wastewater monitoring, Building 817, constituents of concern required by WDR 96-248.

Parameter	Building 817 Sampled: 9/29/04			
	MDL ^a	Reporting Limit	Result	WDR Effluent Limits ^b
Metals (mg/L)				
Aluminum	0.02	0.05	2.4	NL ^c
Arsenic	0.0009	0.002	0.0046	5
Barium	0.000027	0.025	0.0634	100
Cadmium	0.000011	0.0005	0.0026	1
Chromium	0.00064	0.001	0.0455	5
Cobalt	0.0000073	0.05	0.0029 est ^d	80
Copper	0.007	0.02	0.15	25
Lead	0.00002	0.005	0.0171	5
Manganese	0.000046	0.01	0.146	NL
Molybdenum	0.000015	0.025	0.0661	350
Nickel	0.000034	0.002	0.108	20
Potassium	0.065	1.0	9.3	NL
Silver	0.000008	0.001	0.00057 est	5
Zinc	0.0021	0.01	0.279	250
Energetic materials (µg/L)				
PETN	NA ^e	NA	NA	NL
RDX	3.19	5	11	NL
HMX	3.63	30	1,100	NL
TATB ^f	5	20	< 20	NL
TNT	3.87	5	< 5	NL
Semivolatile organic compounds (µg/L)^g				
Benzoic acid	7.1	50	130	1,000,000
Benzyl alcohol	1.4	10	< 10	1,000,000
bis(2-ethylhexyl)phthalate	1.6	30	55	1,000,000
Diethyl phthalate	1.5	30	2.2 est	1,000,000
Dimethyl sulfoxide (DMSO)	0.15	50	< 50	1,000,000
Naphthalene	1.6	30	< 30	200,000
meta- & para-Cresol	2.4	10	13	50,000
ortho-Cresol	1.1	30	< 30	50,000
Phenol	0.87	30	6.4 est	1,000,000

(continued)

Table A-3.2 Explosive process area wastewater monitoring, Building 817, constituents of concern required by WDR 96-248 (concluded).

Parameter	Building 817 Sampled: 9/29/04			
	MDL	Reporting Limit	Result	WDR Effluent Limits
Volatile organic compounds ($\mu\text{g/L}$)^g				
1,1,1-Trichloroethane	0.13	0.5	< 0.5	100,000
1,2-Dichloroethane	0.18	0.5	< 0.5	500
2-Butanone	13	200	1,400	200,000
Acetone	47	100	3,000	1,000,000
Benzene	0.09	0.5	0.56	500
Bromoform	0.063	0.5	0.22 est	100,000
Carbon disulfide	0.23	5	0.37 est	1,000,000
Chlorobenzene	0.093	0.5	< 0.5	100,000
Dibromochloromethane	0.068	0.5	0.16 est	100,000
Ethanol	51	1,000	5,600	1,000,000
Freon 113	0.078	0.5	< 0.5	100,000
Methyl isobutyl ketone	1	20	2.2 est	1,000,000
Methylene chloride	0.15	1	< 1	100,000
Naphthalene	0.035	0.5	< 0.5	200,000
Styrene	0.076	0.5	< 0.5	1,000,000
Tetrachloroethene	0.069	0.5	< 0.5	700
Toluene	0.15	0.5	< 0.5	200,000
Vinyl chloride	0.17	0.5	< 0.5	200

a MDL = Method detection limit

b These discharge limits are found either in the Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the Amended Report of Waste Discharge (1995)

c NL = No limit

d Results followed by "est" are compounds detected with concentrations estimated between the MDL and the reporting limit for that compound

e NA = Not applicable

f Analyzed using an uncertified method (there is no certified method for analysis of TATB)

g No other volatile or semivolatile organic compounds were detected via EPA Methods 624 or 625

Appendix B

Annual Summary Plots and Tables of Surface Impoundments Ground Water Monitoring Data

Appendix B

This appendix contains graphical and tabular summaries of ground water monitoring data from the surface impoundments ground water monitoring network. The constituents of concern for WDR 96-248 are shown graphically, and the tables at the end of this appendix list all 2004 ground water data. The data plots contain all monitoring data available since 1999.

These plots display the field parameter of ground water elevation, followed by volatile organic compounds (VOCs), trace metals, photographic chemicals (cresols), minerals and nutrients, energetic compounds, and finally, semi-volatile organic compounds (SVOCs). The upgradient (background) monitoring well W-817-01 is always plotted first for each analyte.

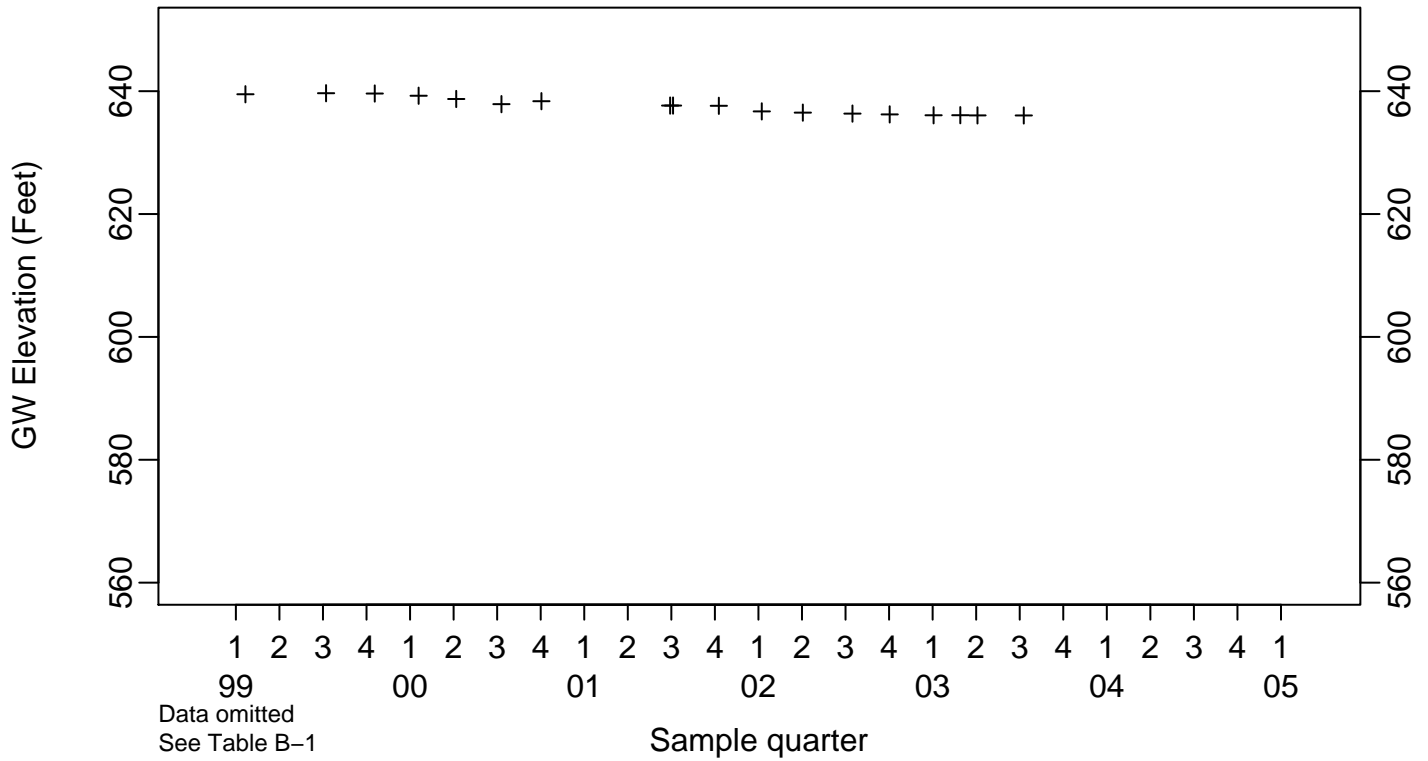
Each two-dimensional graph shows concentration plotted on the vertical axis versus time (years divided into four quarterly sampling periods) on the horizontal axis. Units of measure are given on the vertical axis label and in the header at the top of each page. Values above the analytical reporting limit for each analyte are plotted as solid diamonds, values below the reporting limit are plotted as open inverted triangles, and estimated values between the reporting limit and the method detection limit are plotted as crosses. The current statistical limits (SLs) for constituents of concern specified in WDR 96-248 are shown as horizontal dashed lines on the graph.

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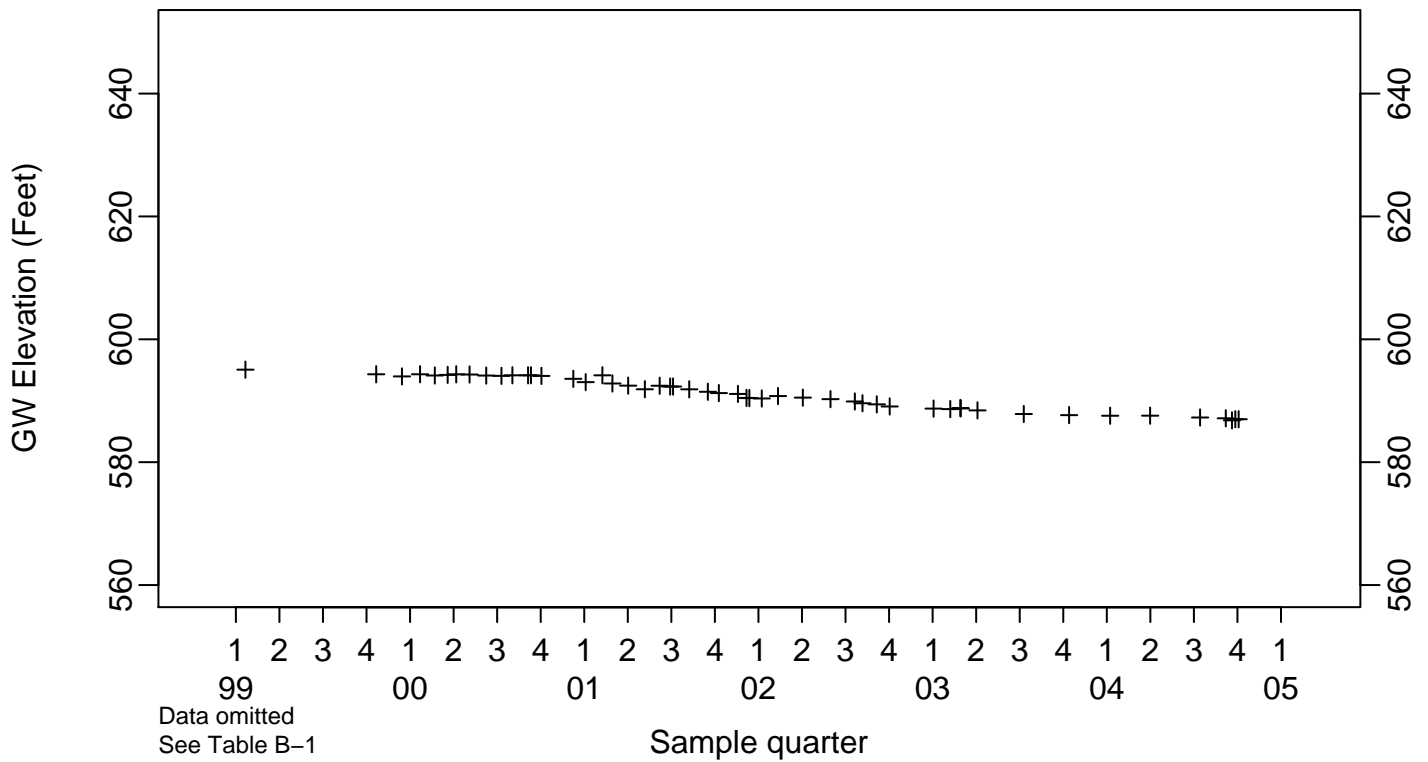
Annual Plots of Surface Impoundments Ground Water Monitoring Data

Surface Impoundments Ground Water GW Elevation (Feet)

Background Monitoring Point W-817-01

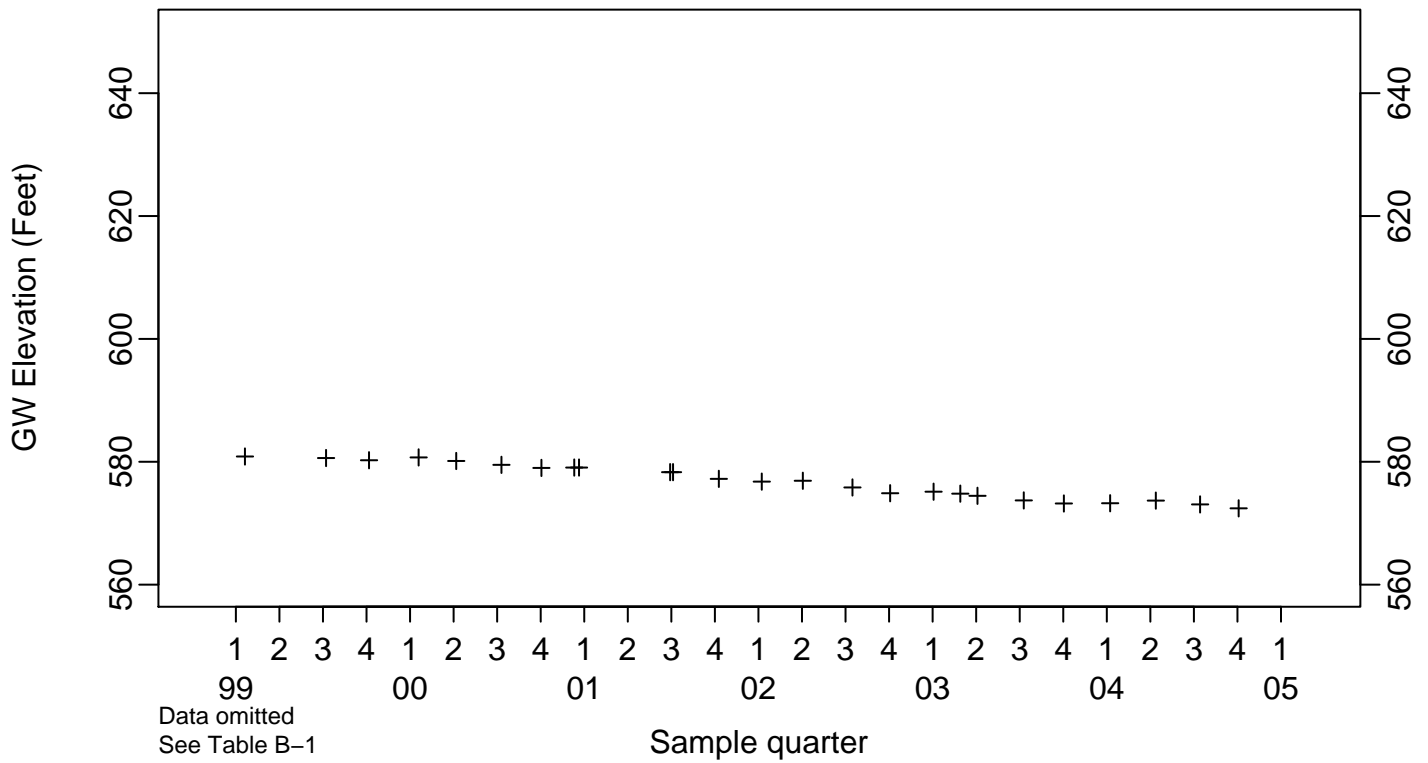


Compliance Monitoring Point W-817-02

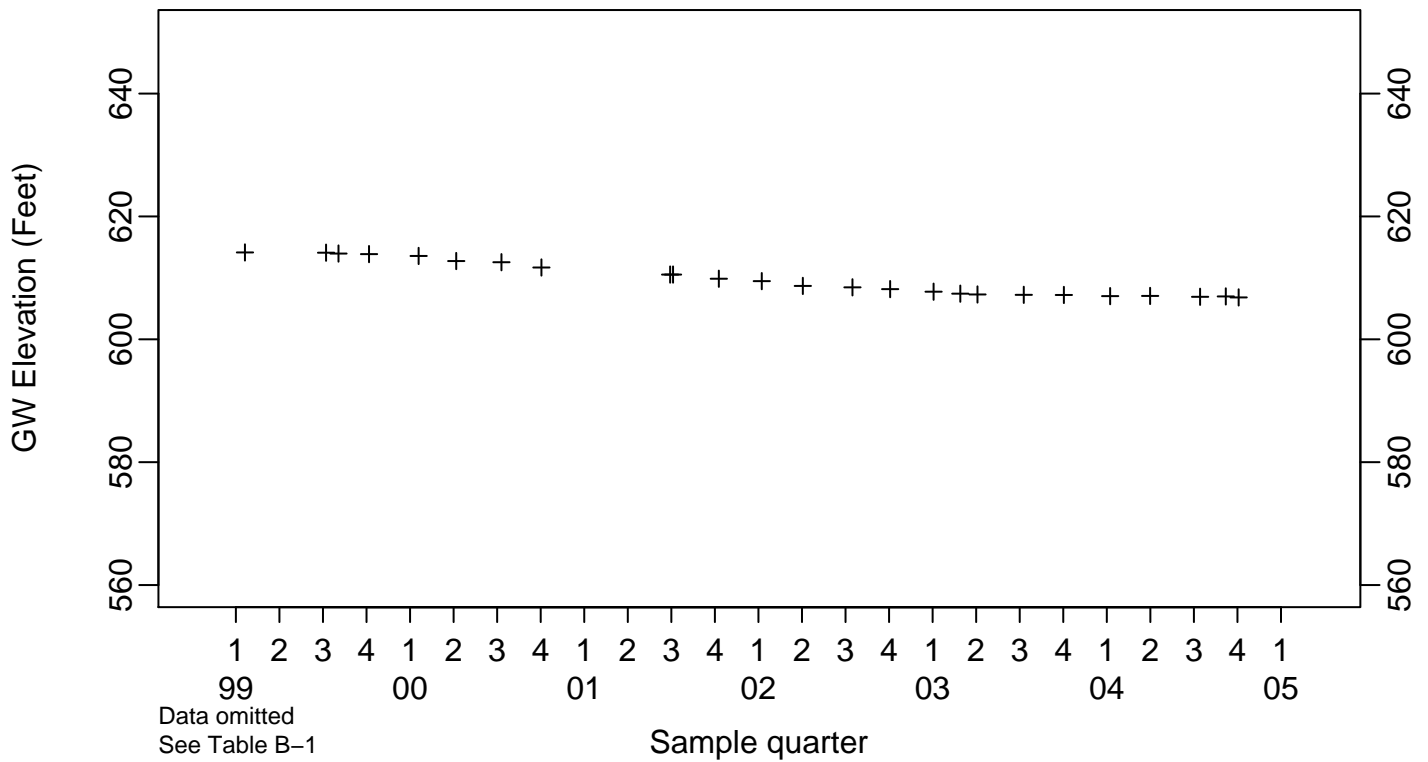


Surface Impoundments Ground Water GW Elevation (Feet)

Compliance Monitoring Point W-817-03



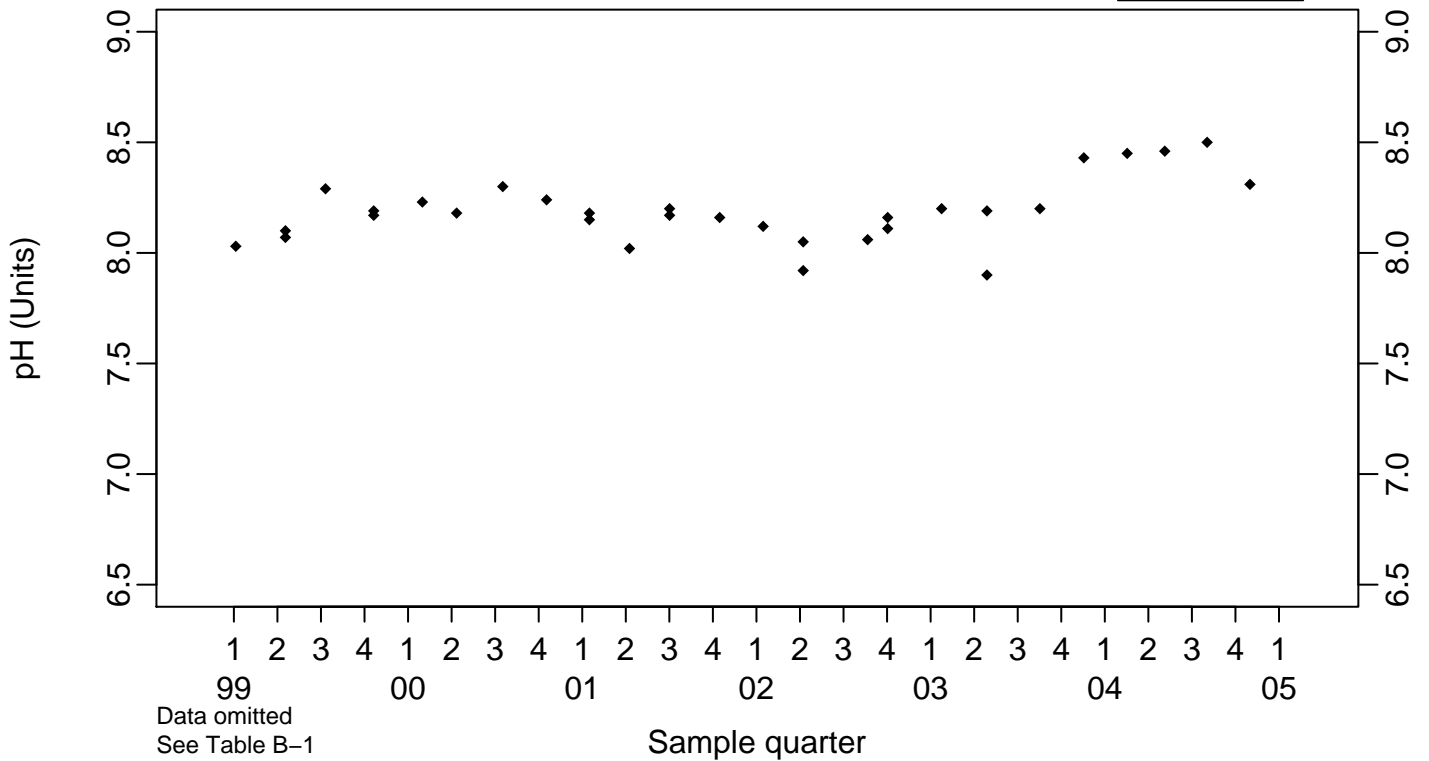
Compliance Monitoring Point W-817-04



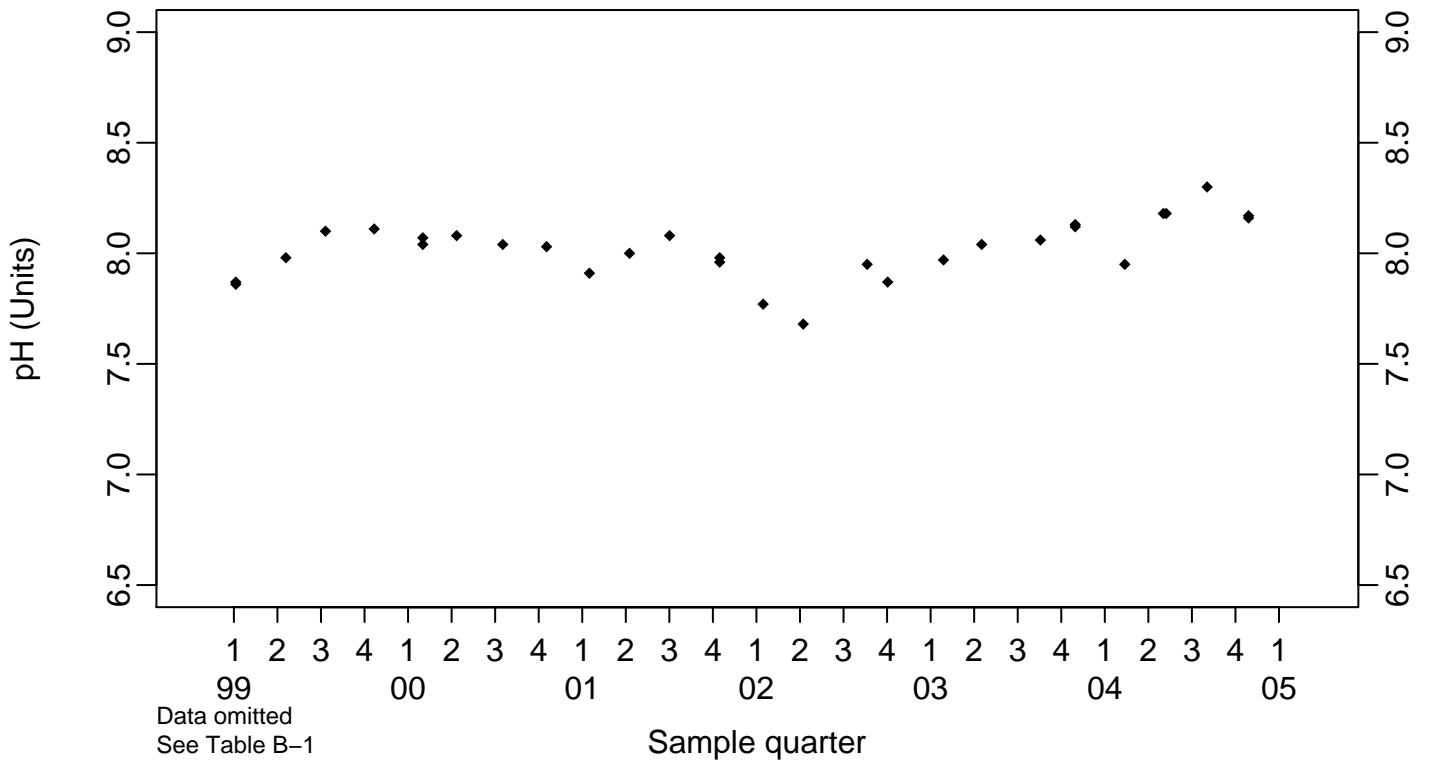
Surface Impoundments Ground Water pH (Units)

Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



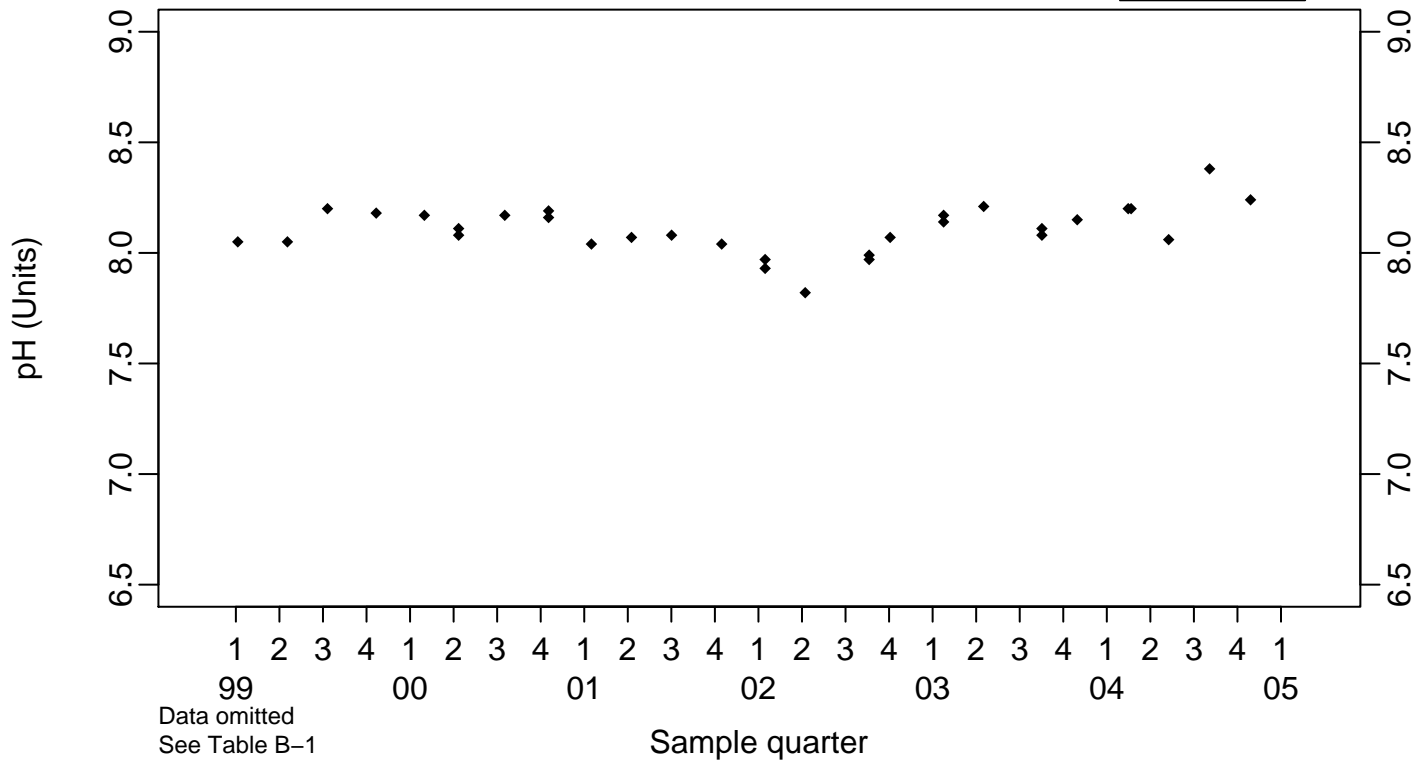
Compliance Monitoring Point W-817-02



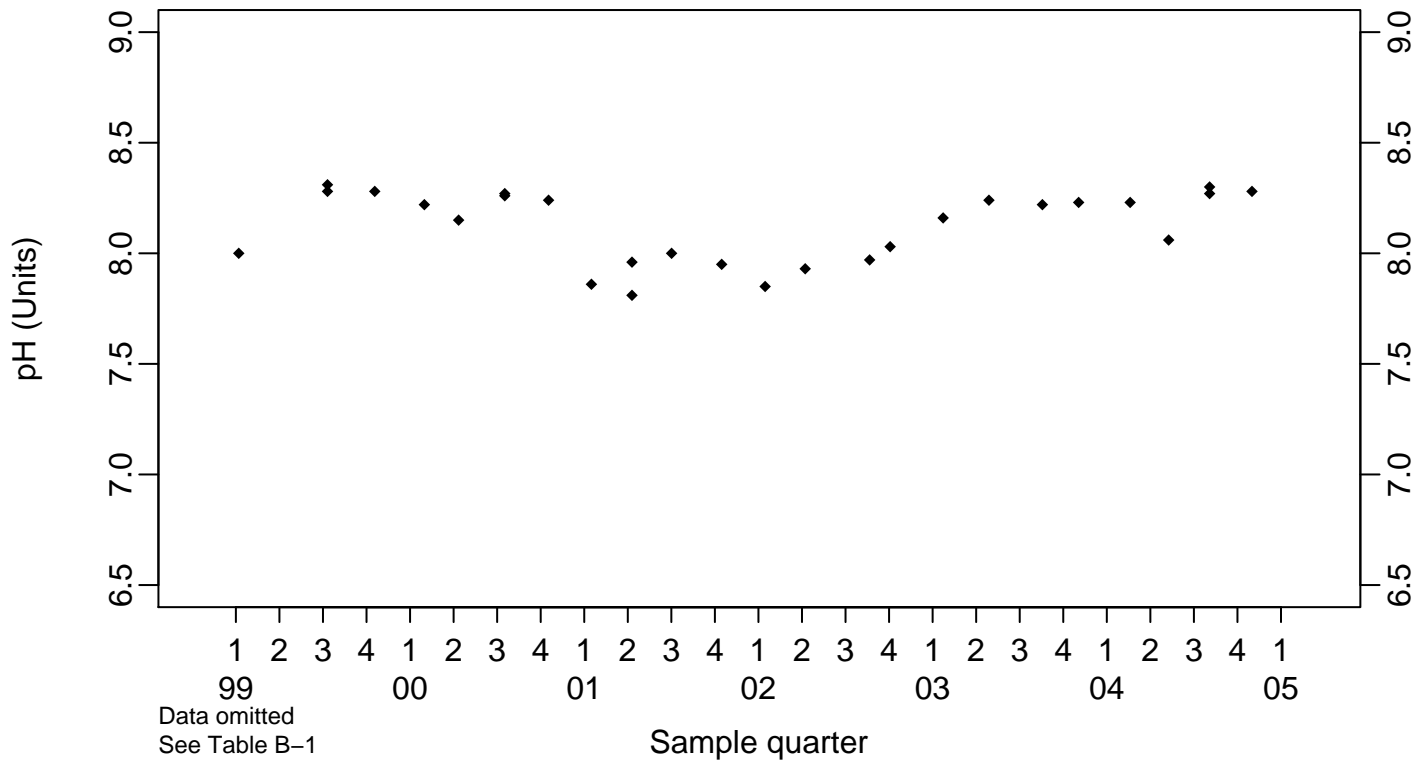
Surface Impoundments Ground Water pH (Units)

Compliance Monitoring Point W-817-03

◆ Above RL
▽ Below RL



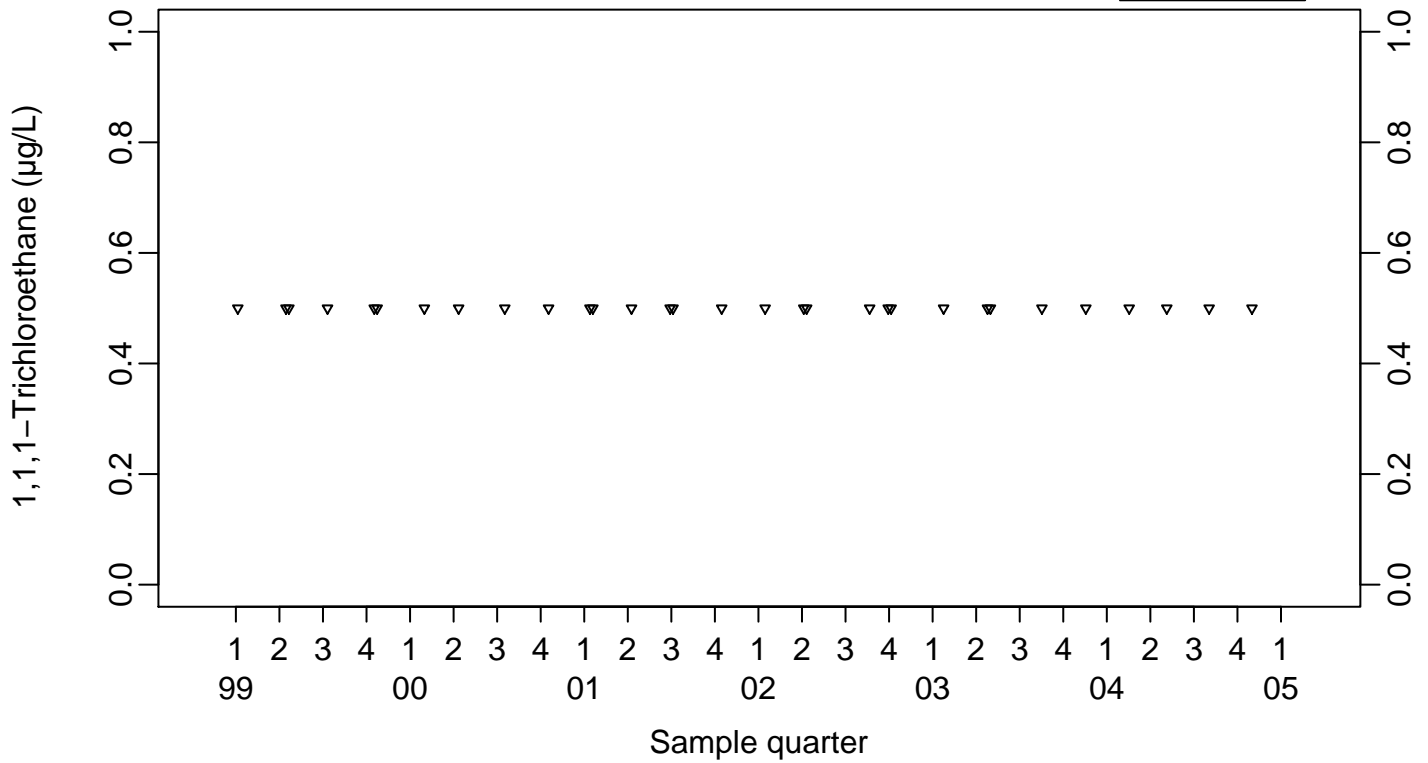
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water 1,1,1-Trichloroethane ($\mu\text{g/L}$)

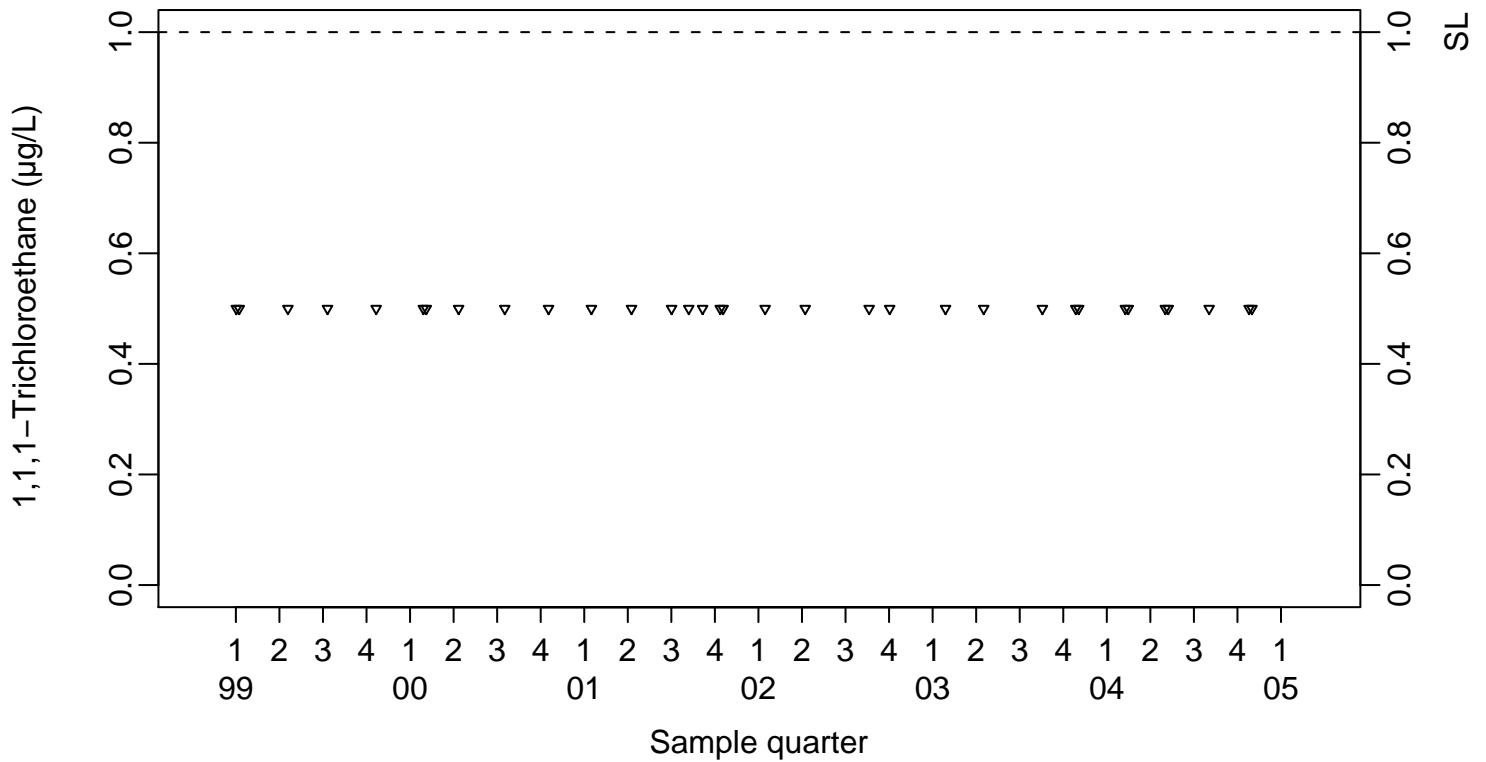
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



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Compliance Monitoring Point W-817-02

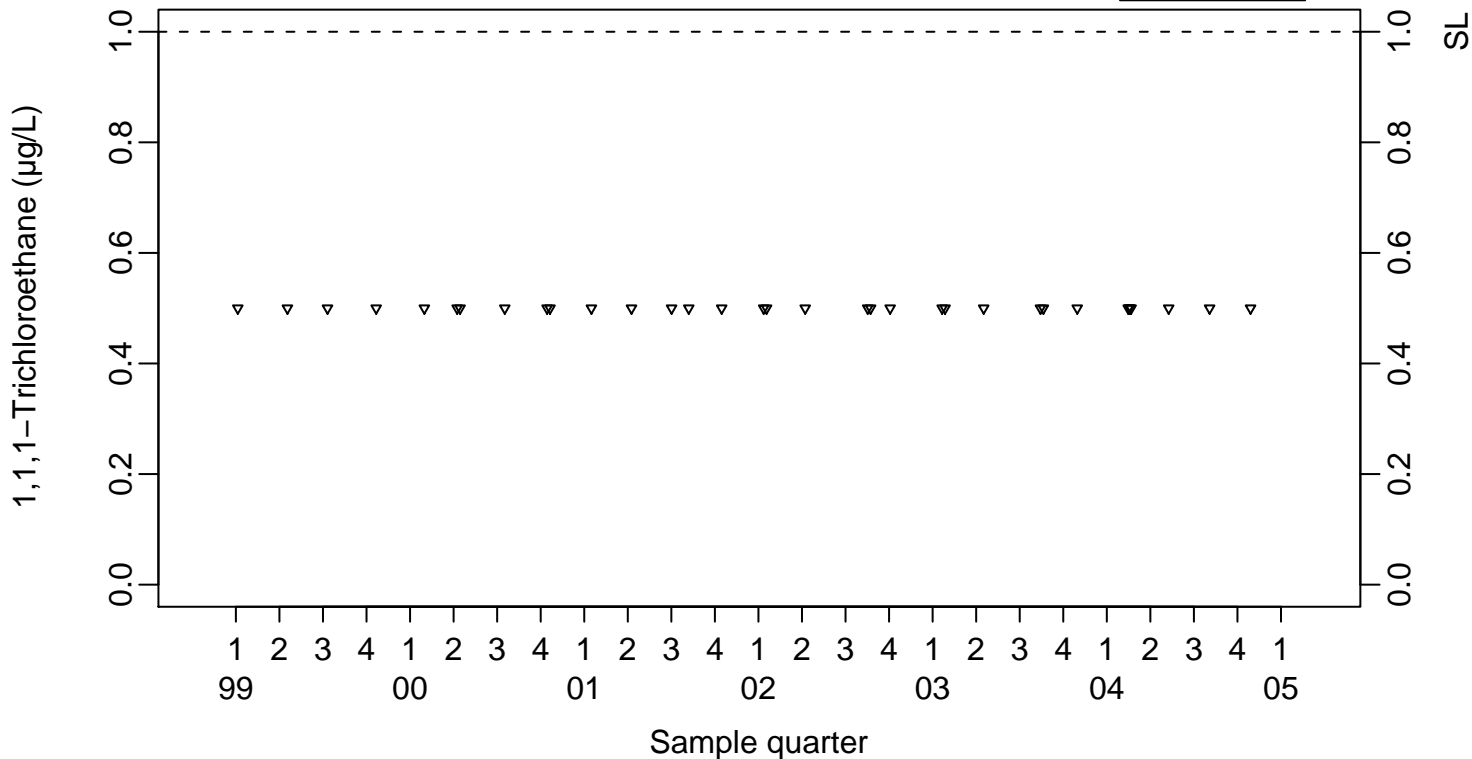


Surface Impoundments Ground Water 1,1,1-Trichloroethane ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

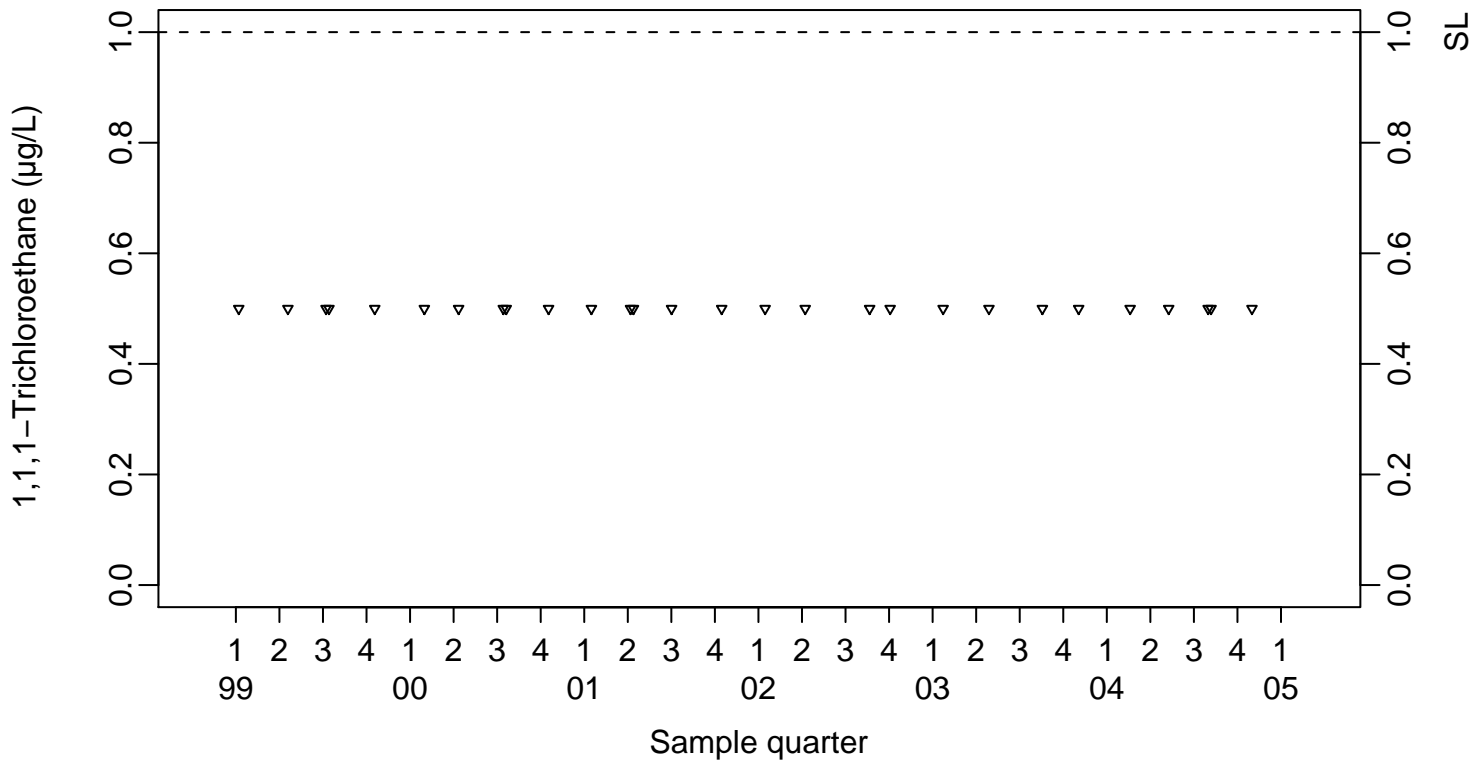
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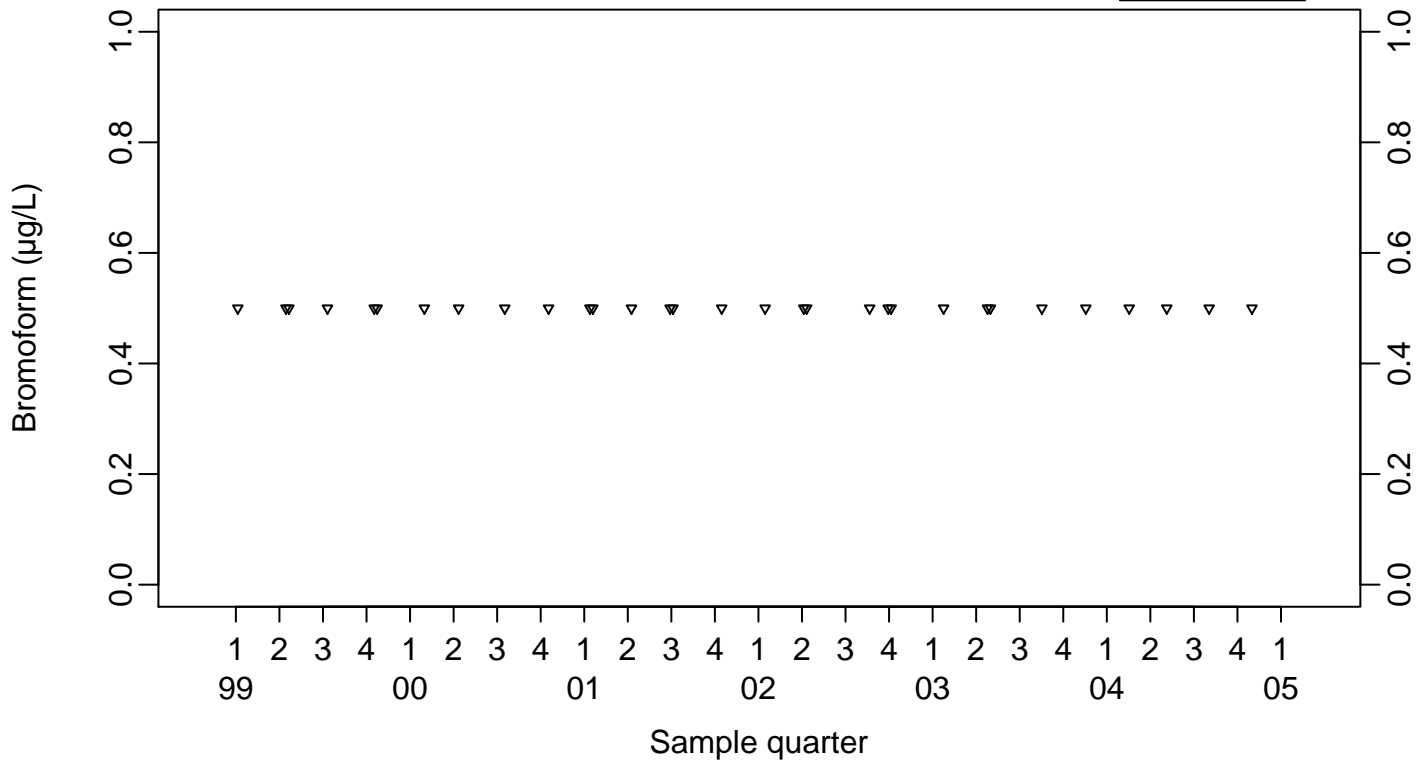
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Bromoform ($\mu\text{g/L}$)

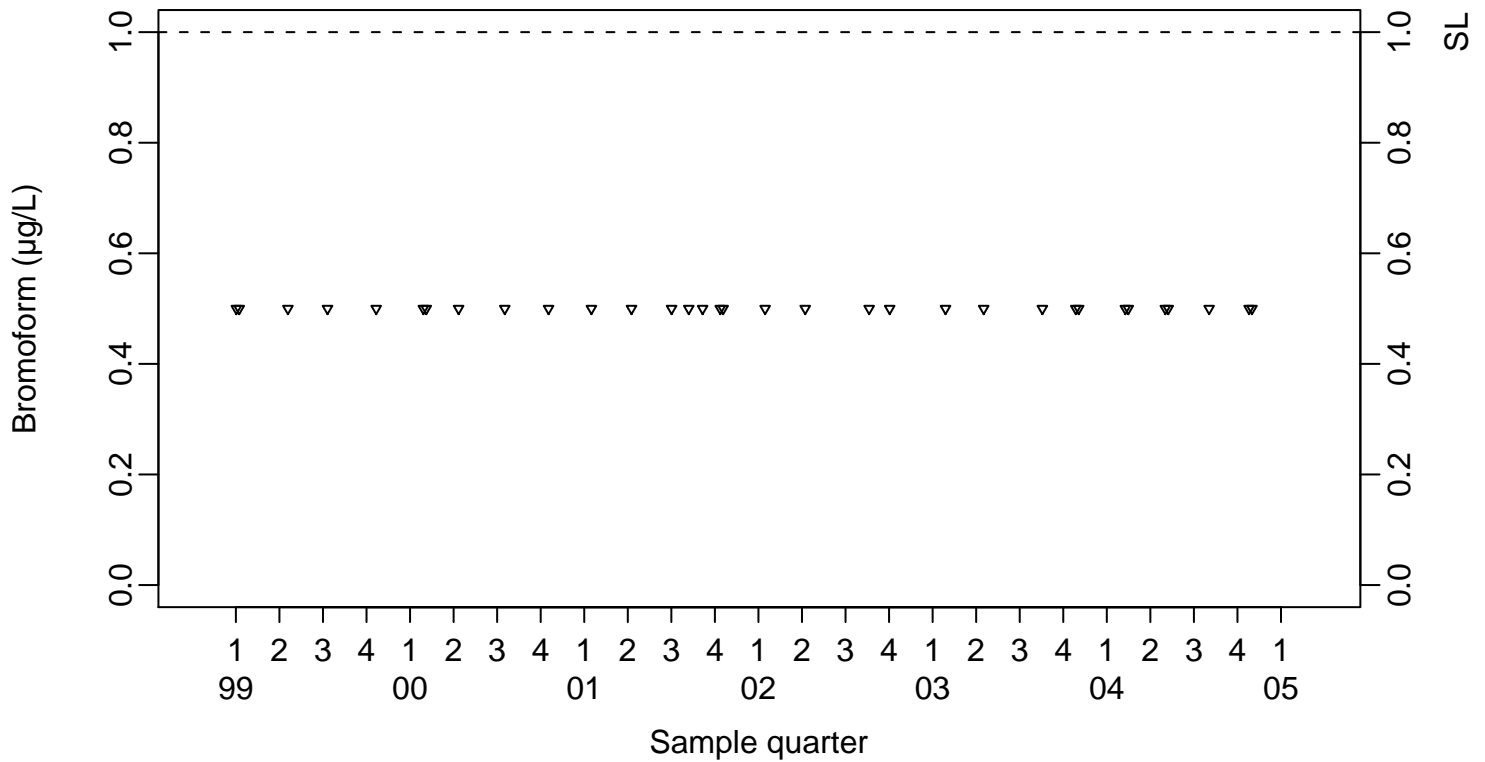
Background Monitoring Point W-817-01

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Compliance Monitoring Point W-817-02

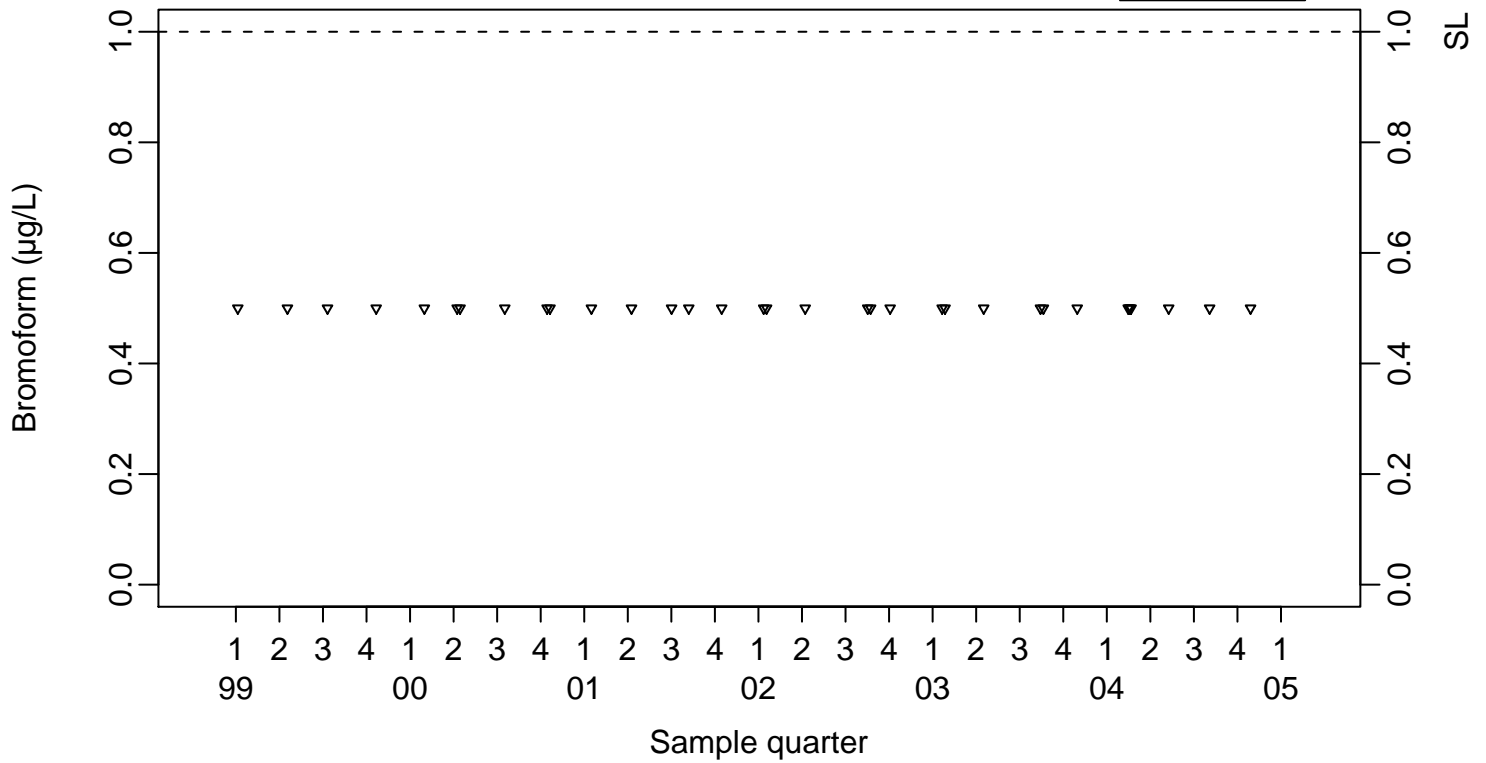


Surface Impoundments Ground Water Bromoform ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

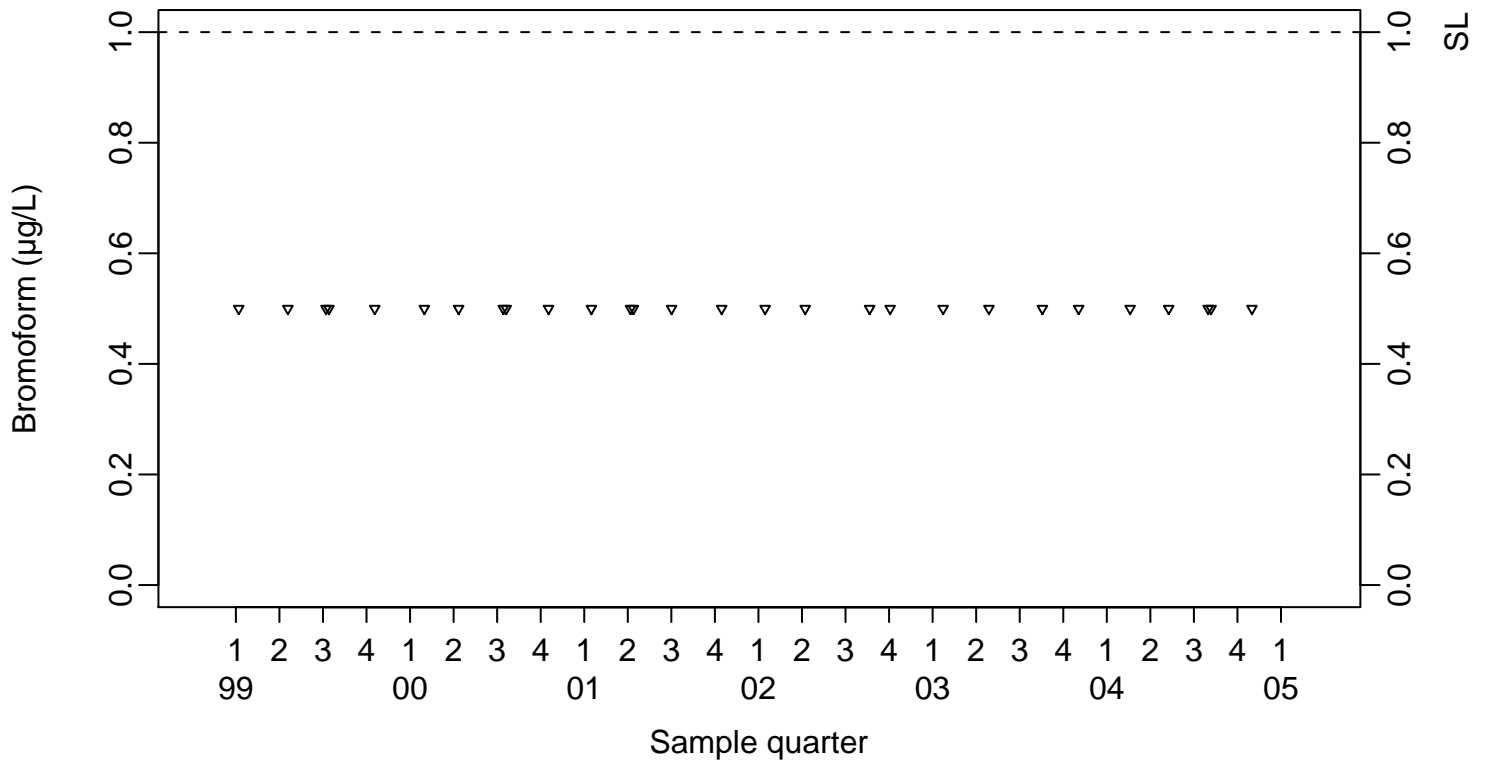
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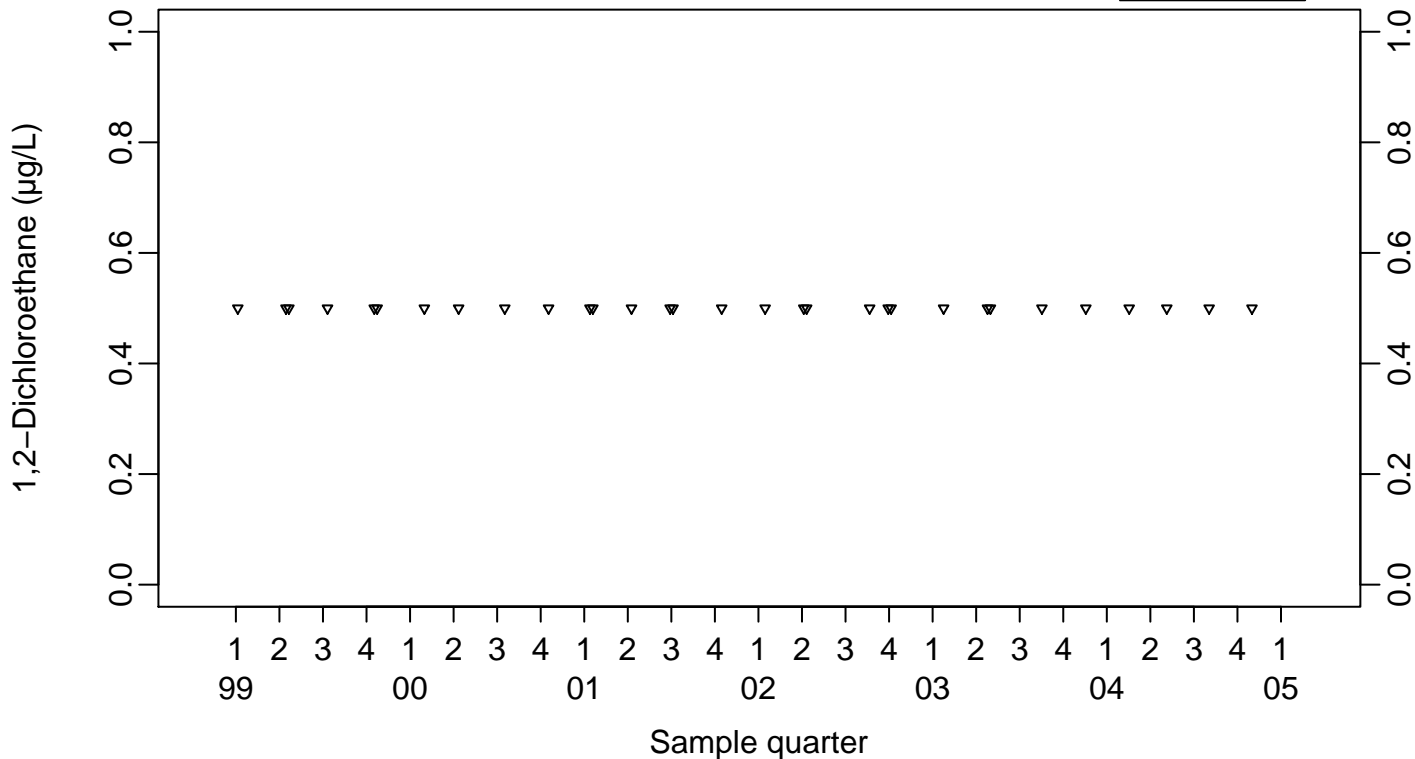
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water 1,2-Dichloroethane ($\mu\text{g/L}$)

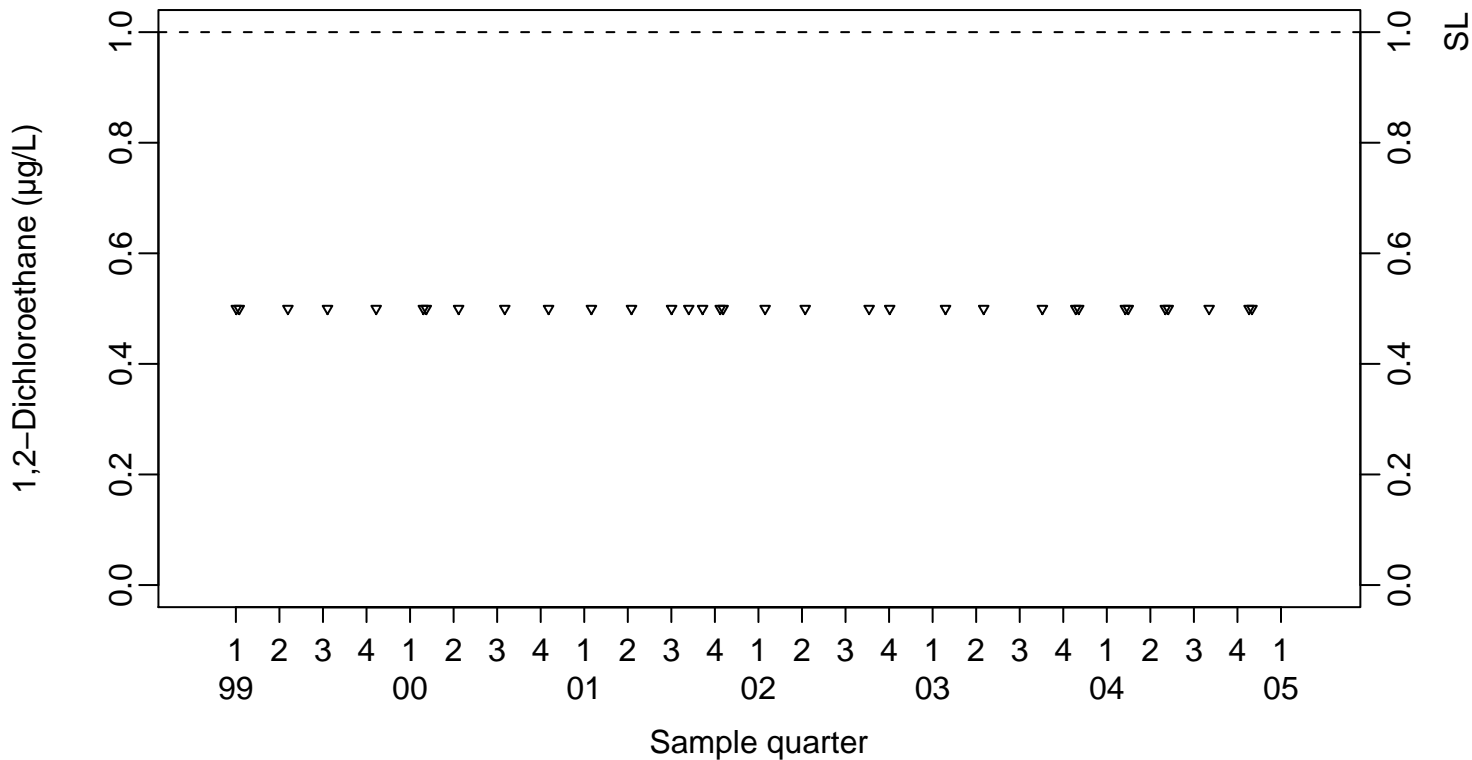
Background Monitoring Point W-817-01

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Compliance Monitoring Point W-817-02

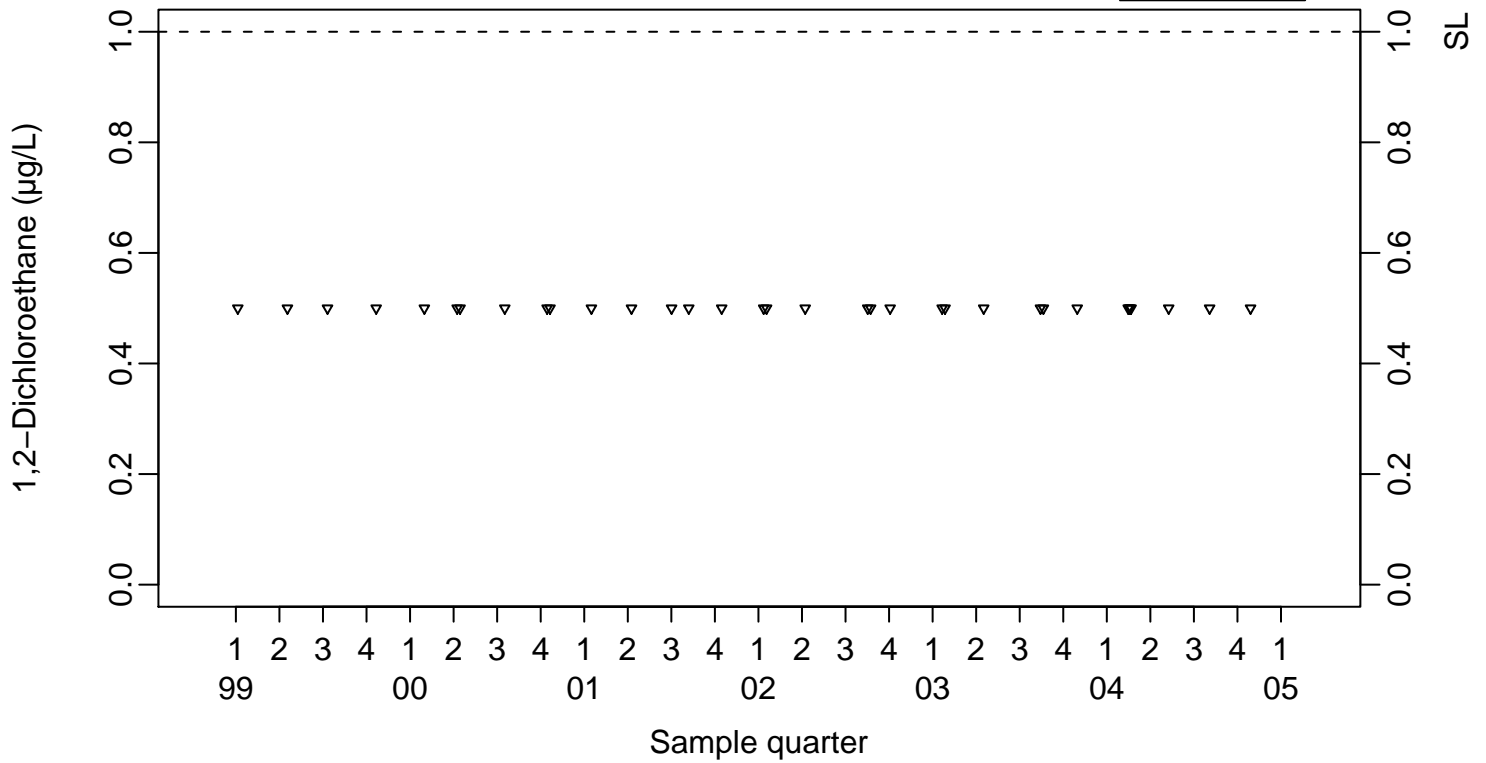


Surface Impoundments Ground Water 1,2-Dichloroethane ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

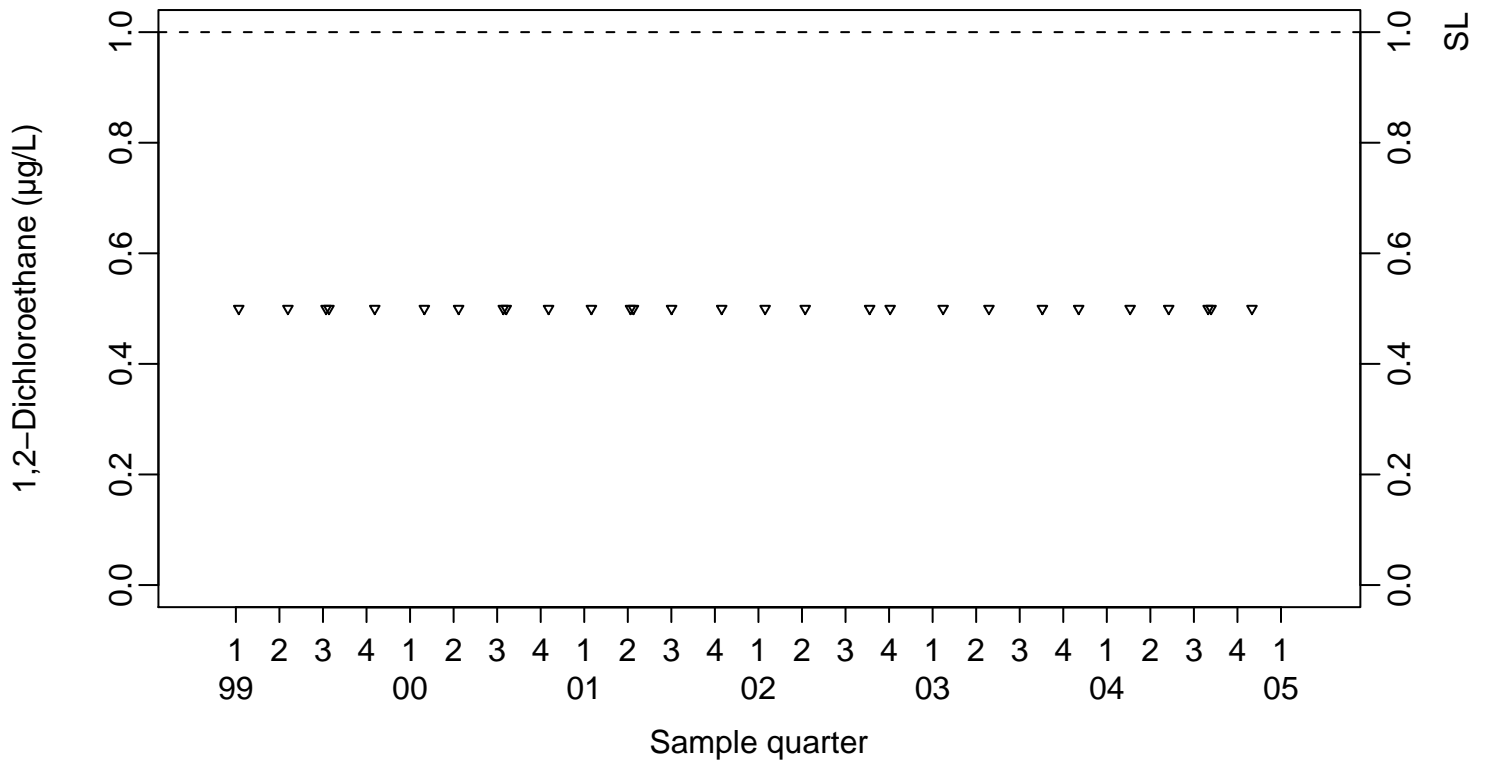
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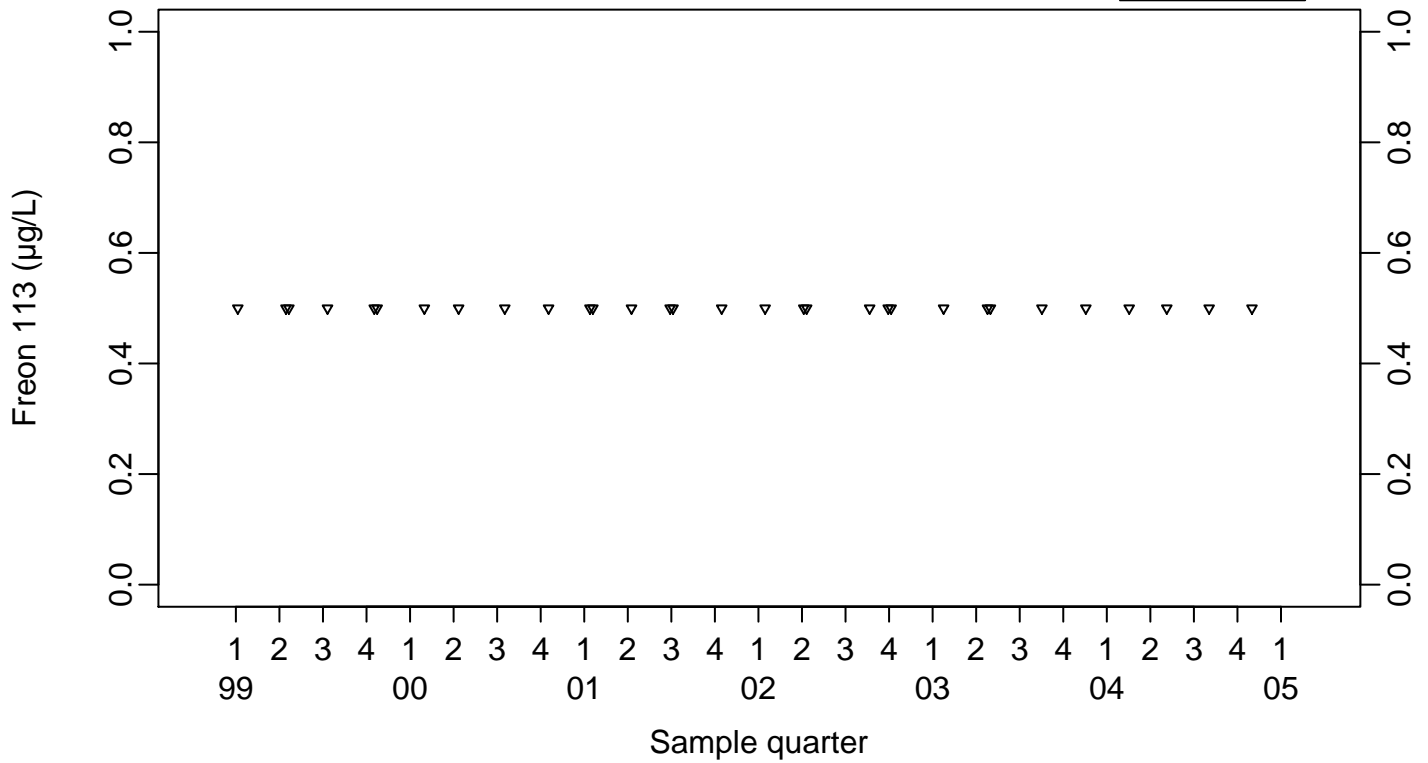
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Freon 113 ($\mu\text{g/L}$)

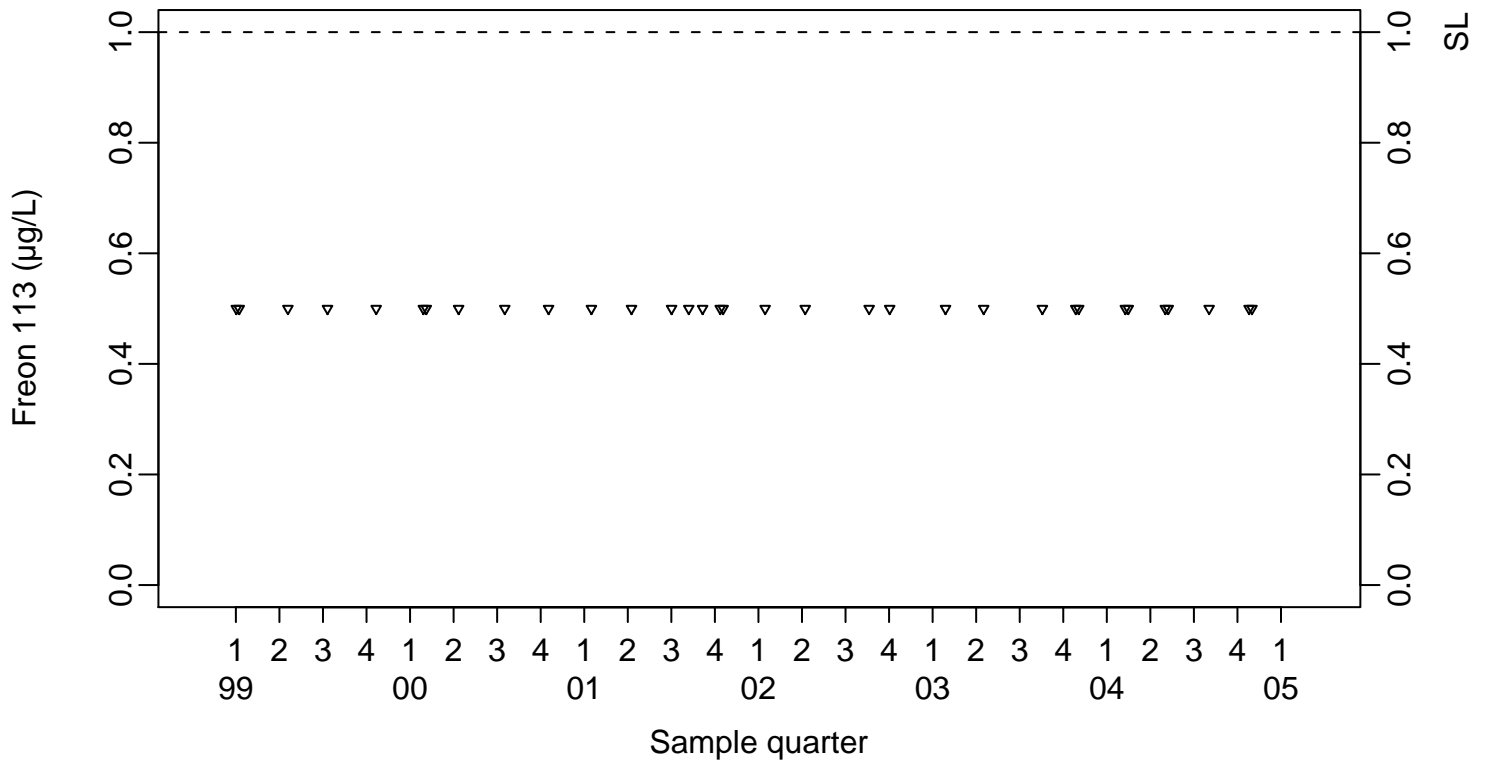
Background Monitoring Point W-817-01

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Compliance Monitoring Point W-817-02

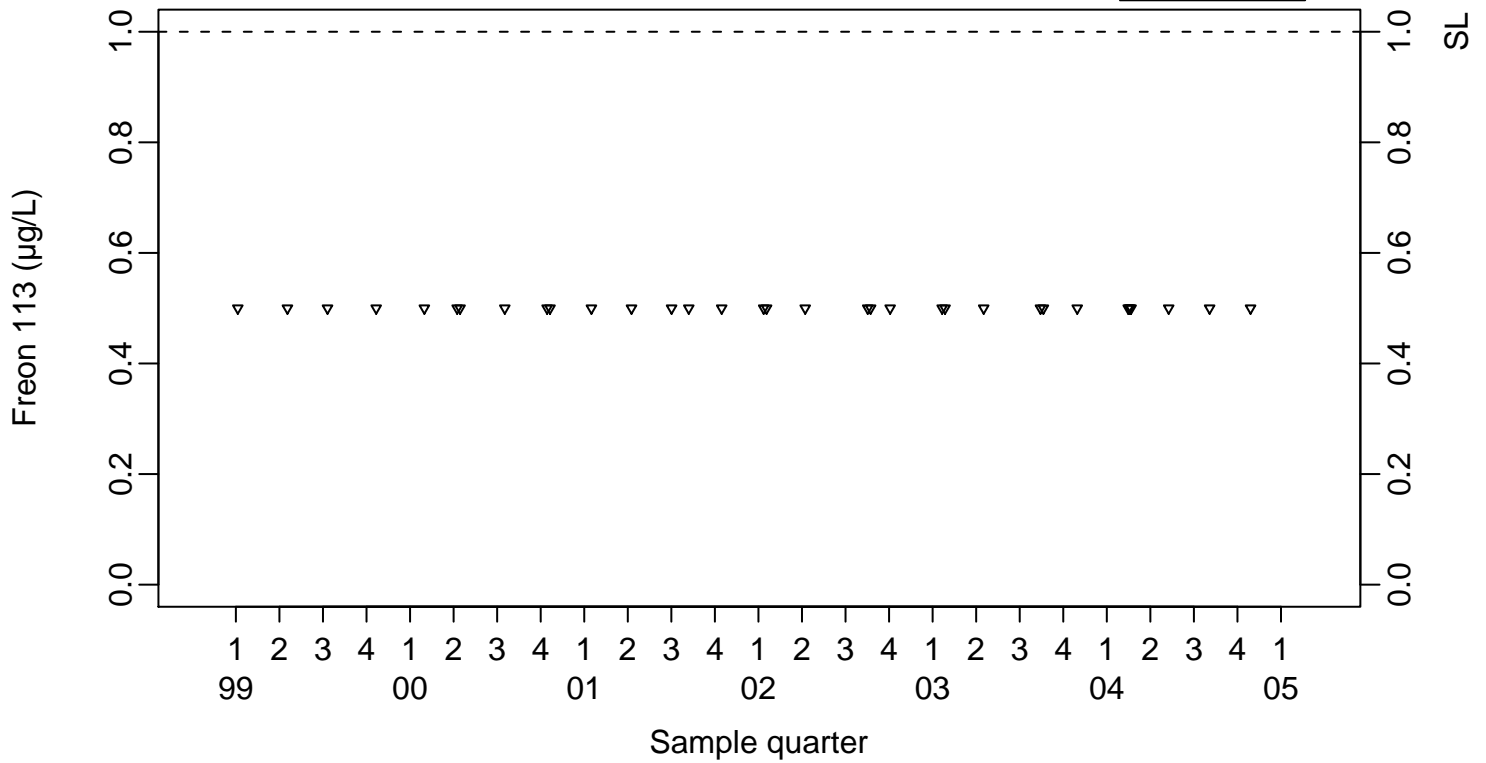


Surface Impoundments Ground Water Freon 113 ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

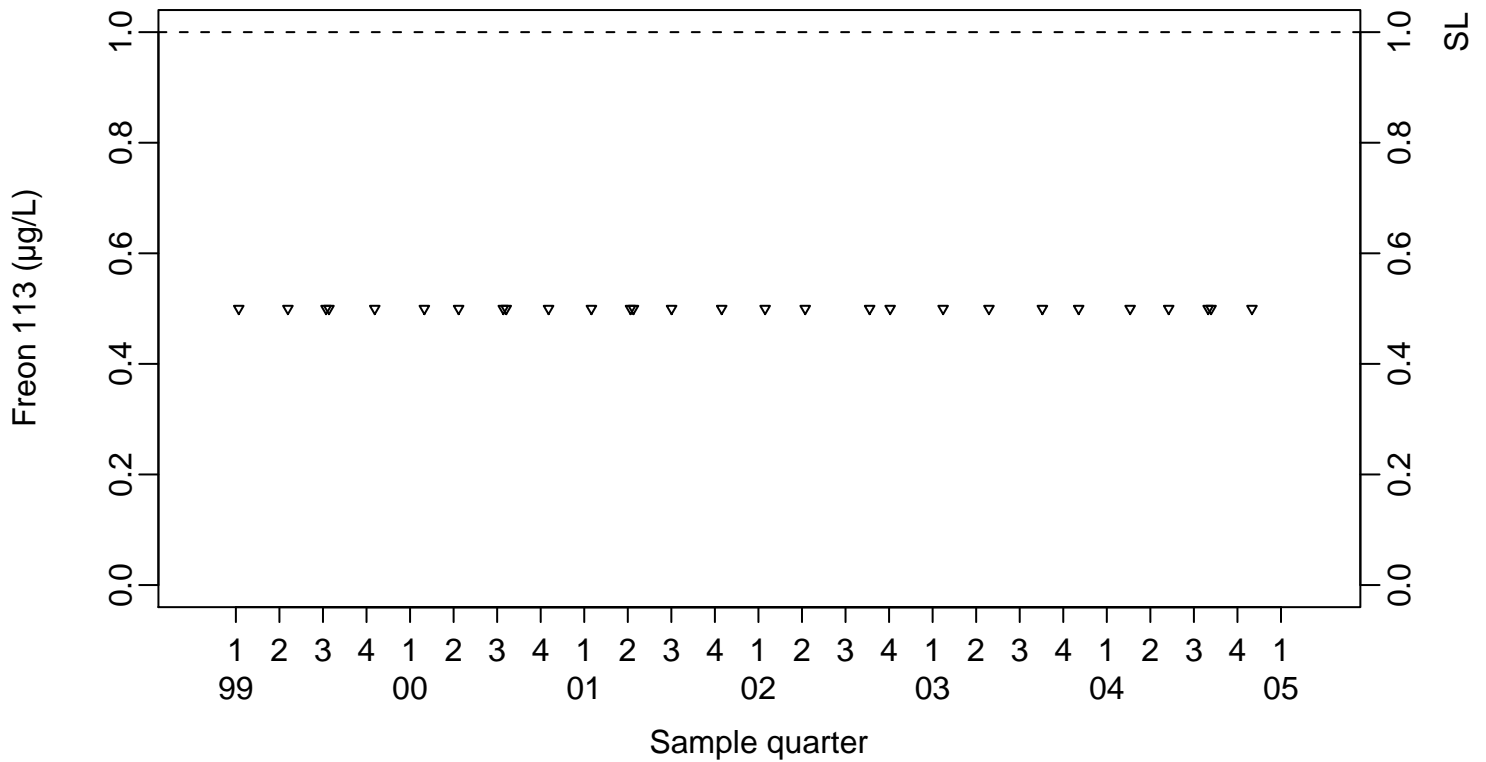
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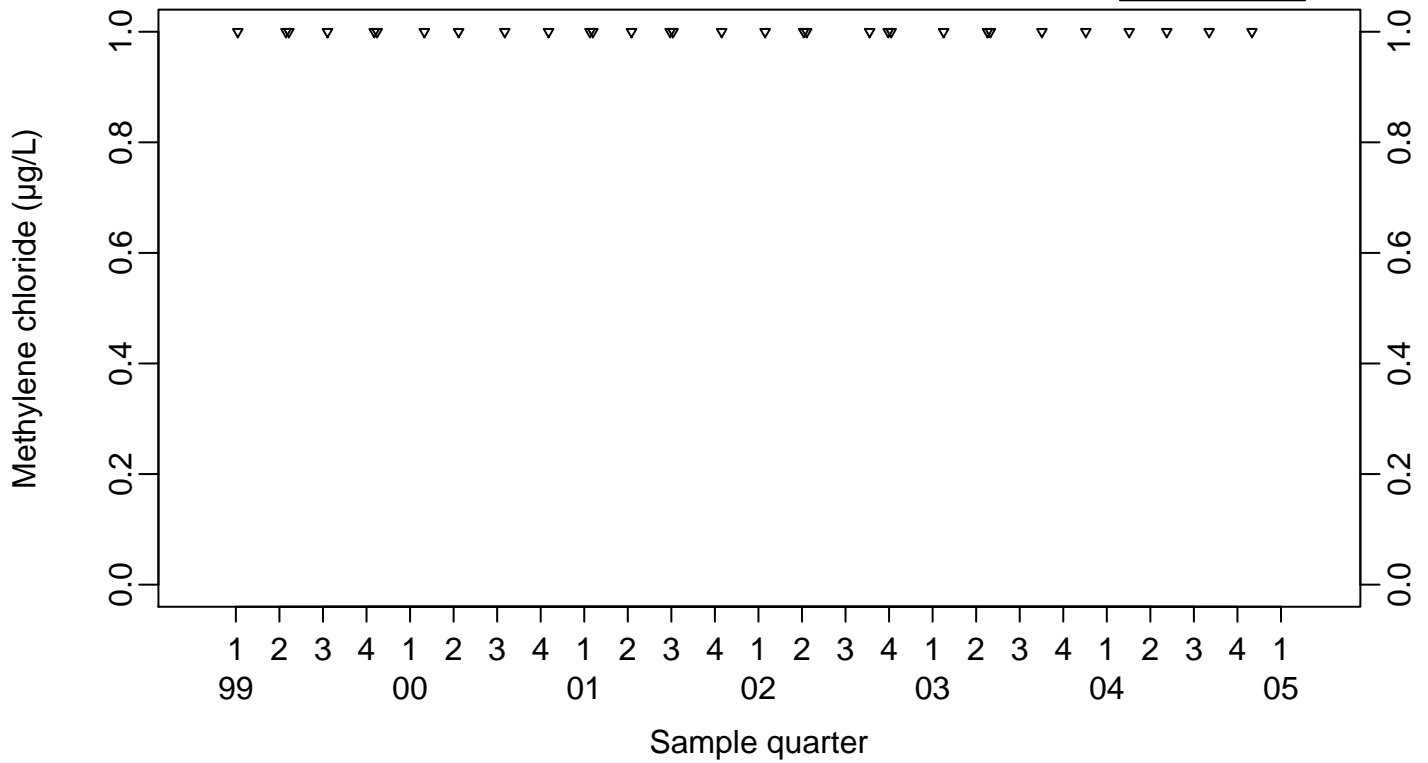
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Methylene chloride ($\mu\text{g/L}$)

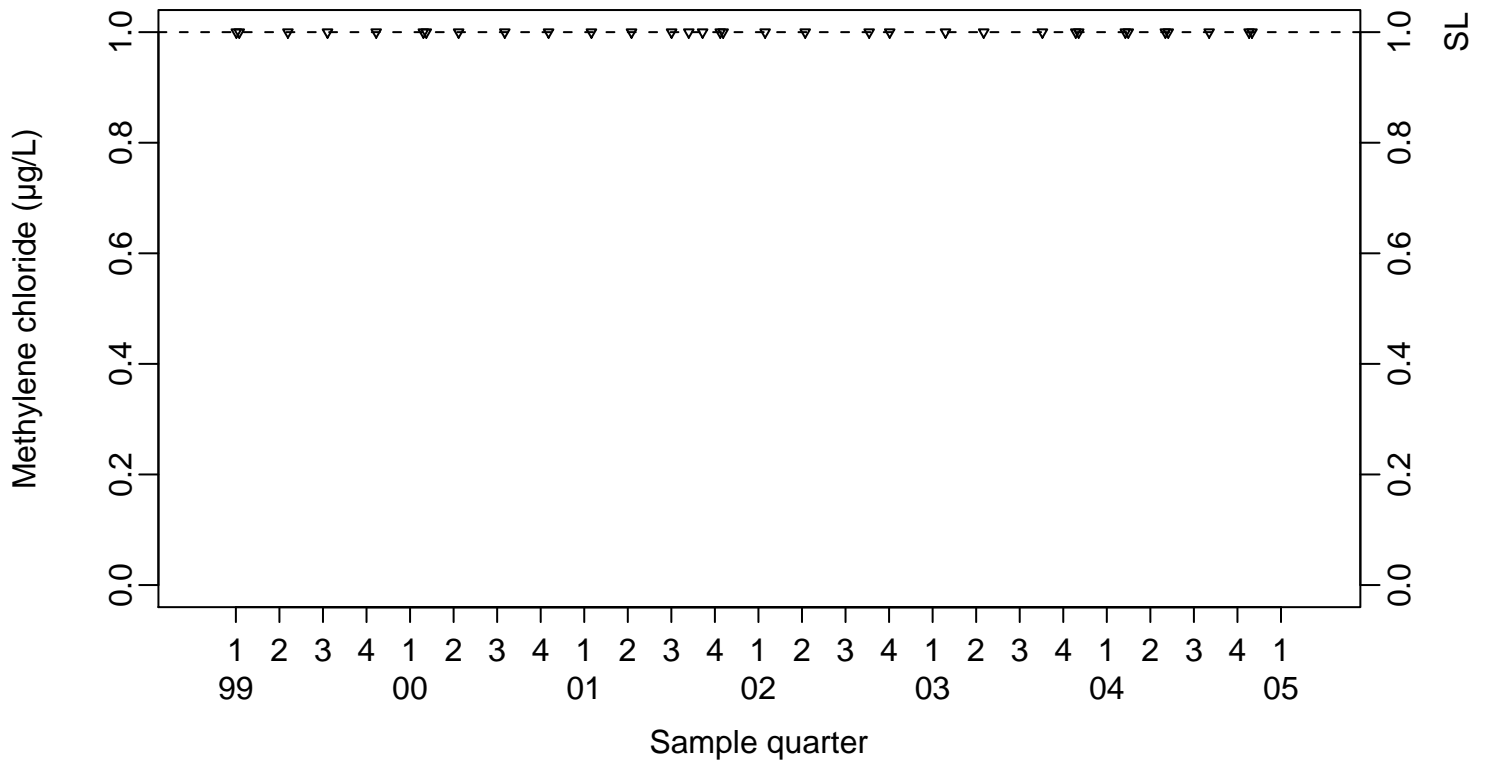
Background Monitoring Point W-817-01

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Compliance Monitoring Point W-817-02

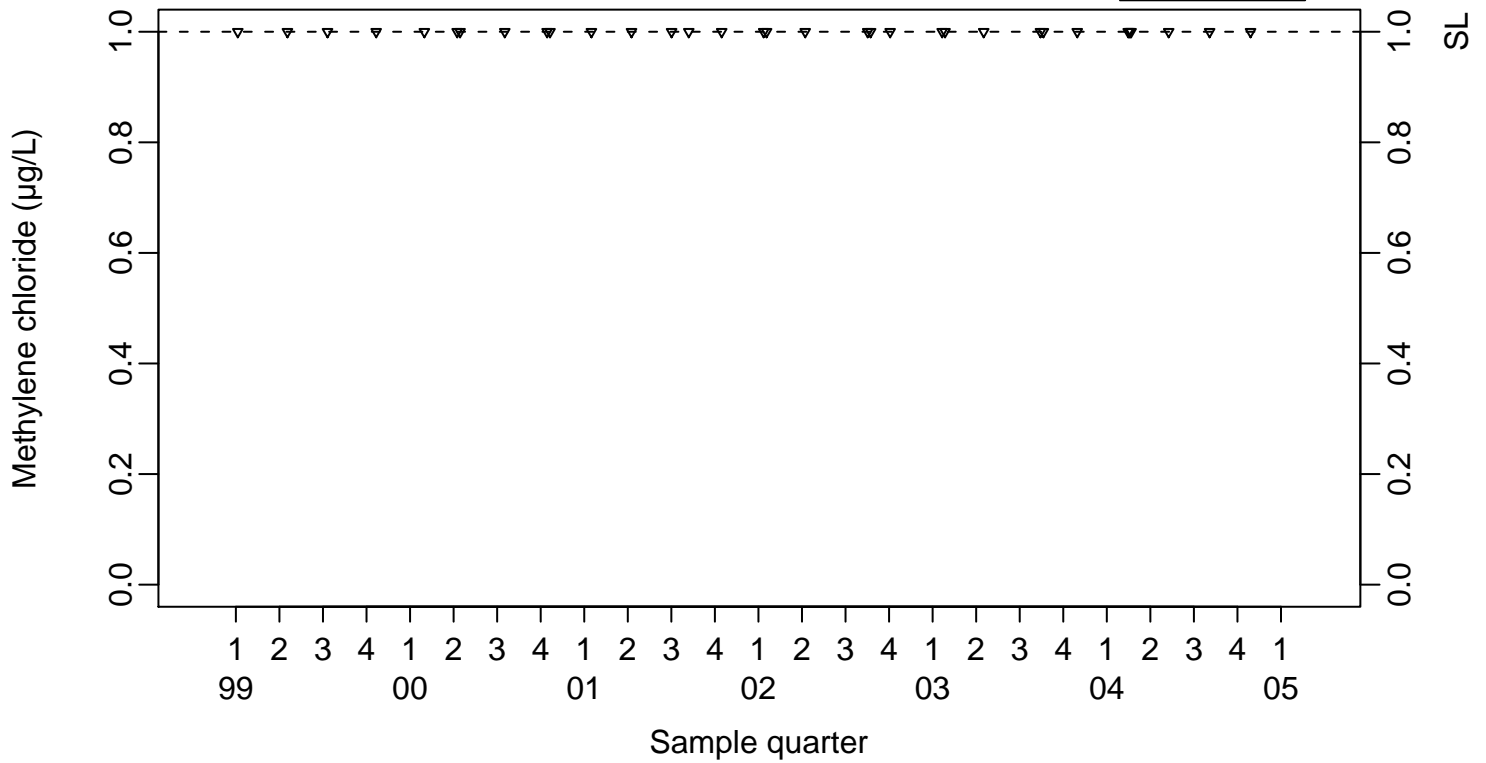


Surface Impoundments Ground Water Methylene chloride ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

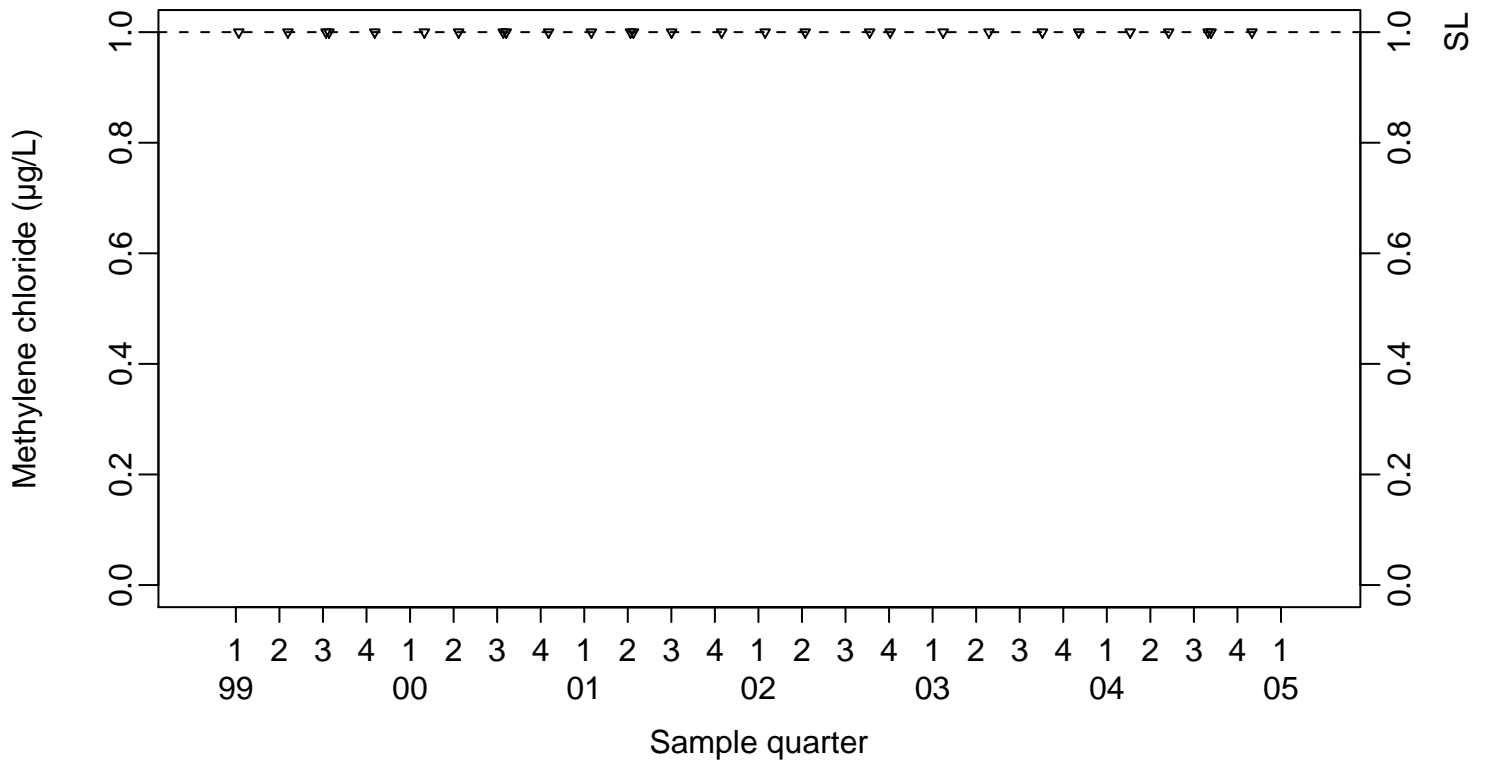
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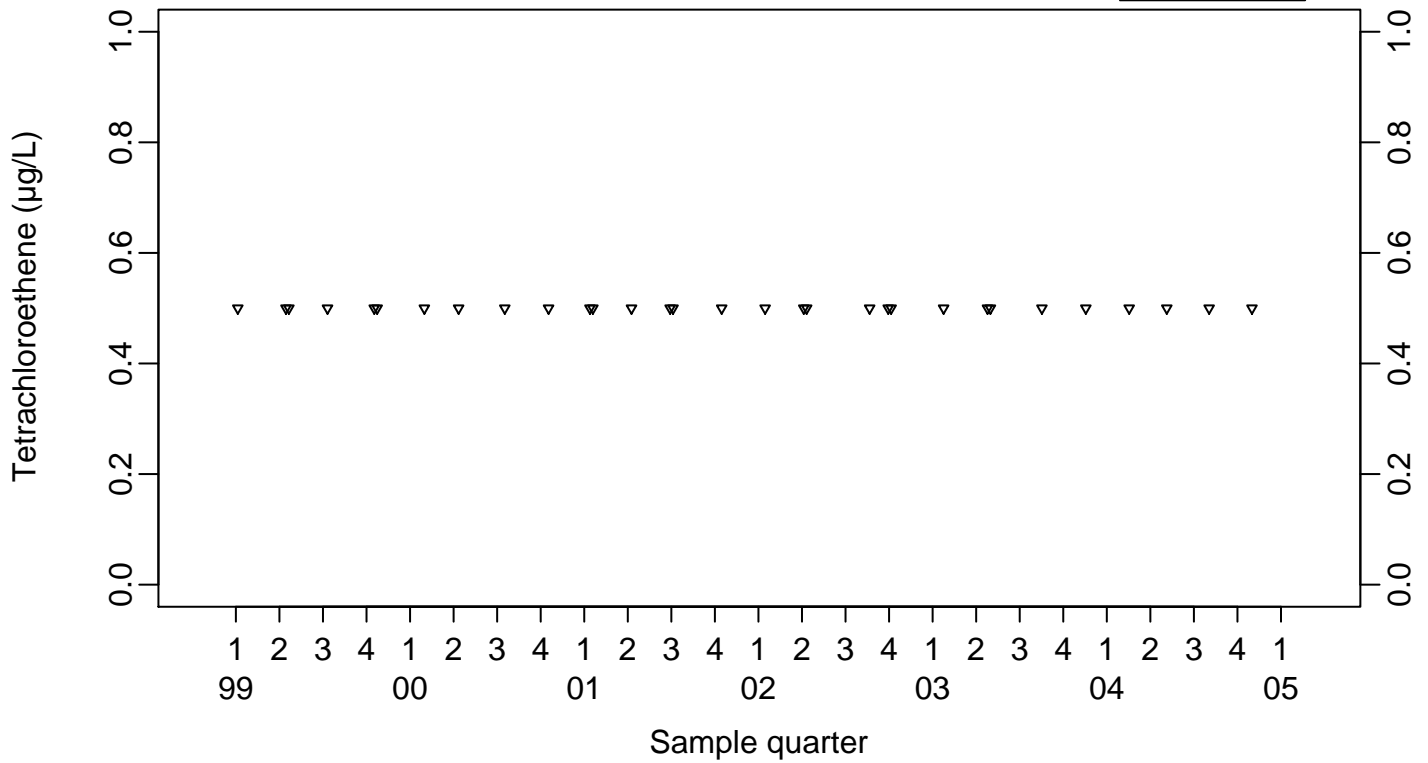
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Tetrachloroethene ($\mu\text{g/L}$)

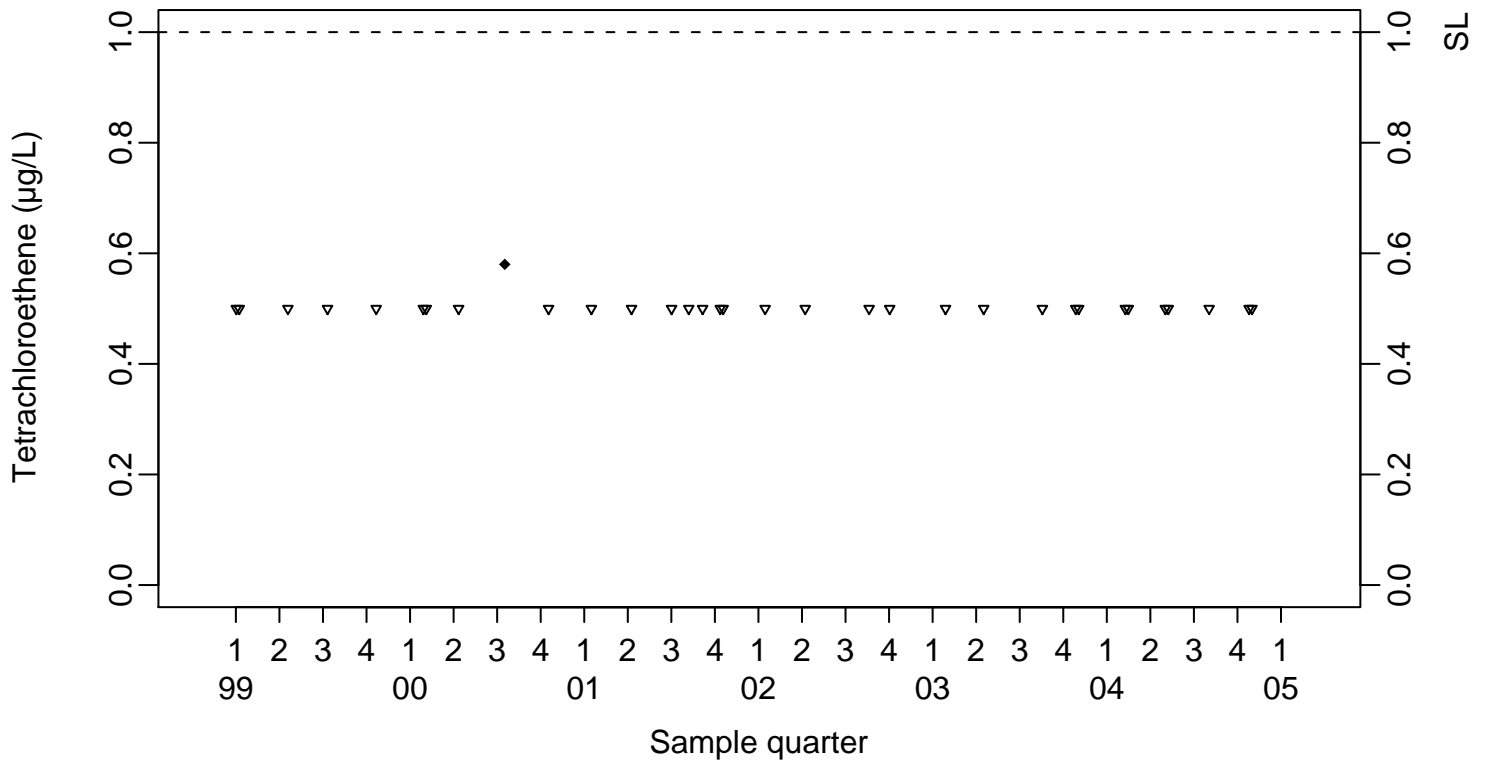
Background Monitoring Point W-817-01

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Compliance Monitoring Point W-817-02

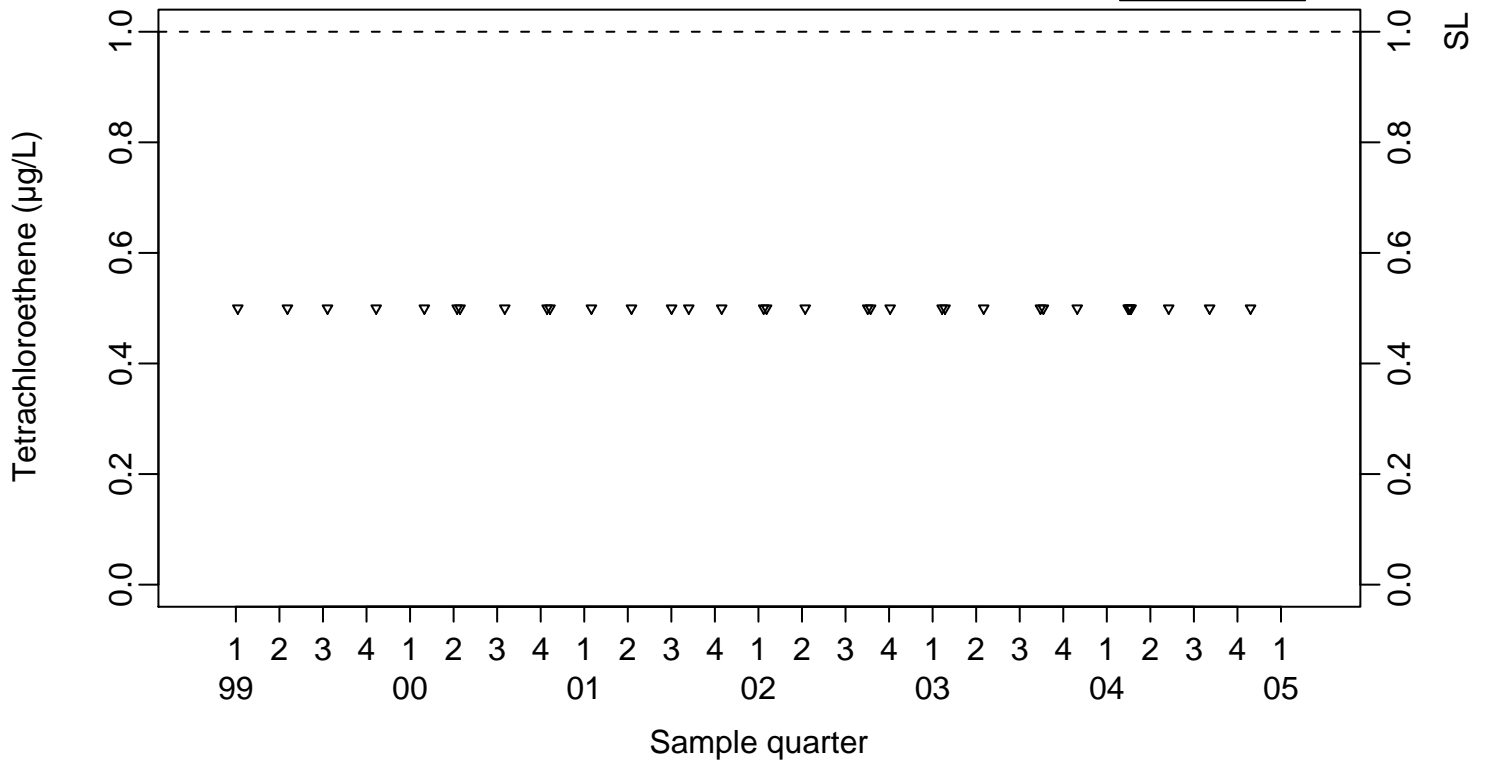


Surface Impoundments Ground Water Tetrachloroethene ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

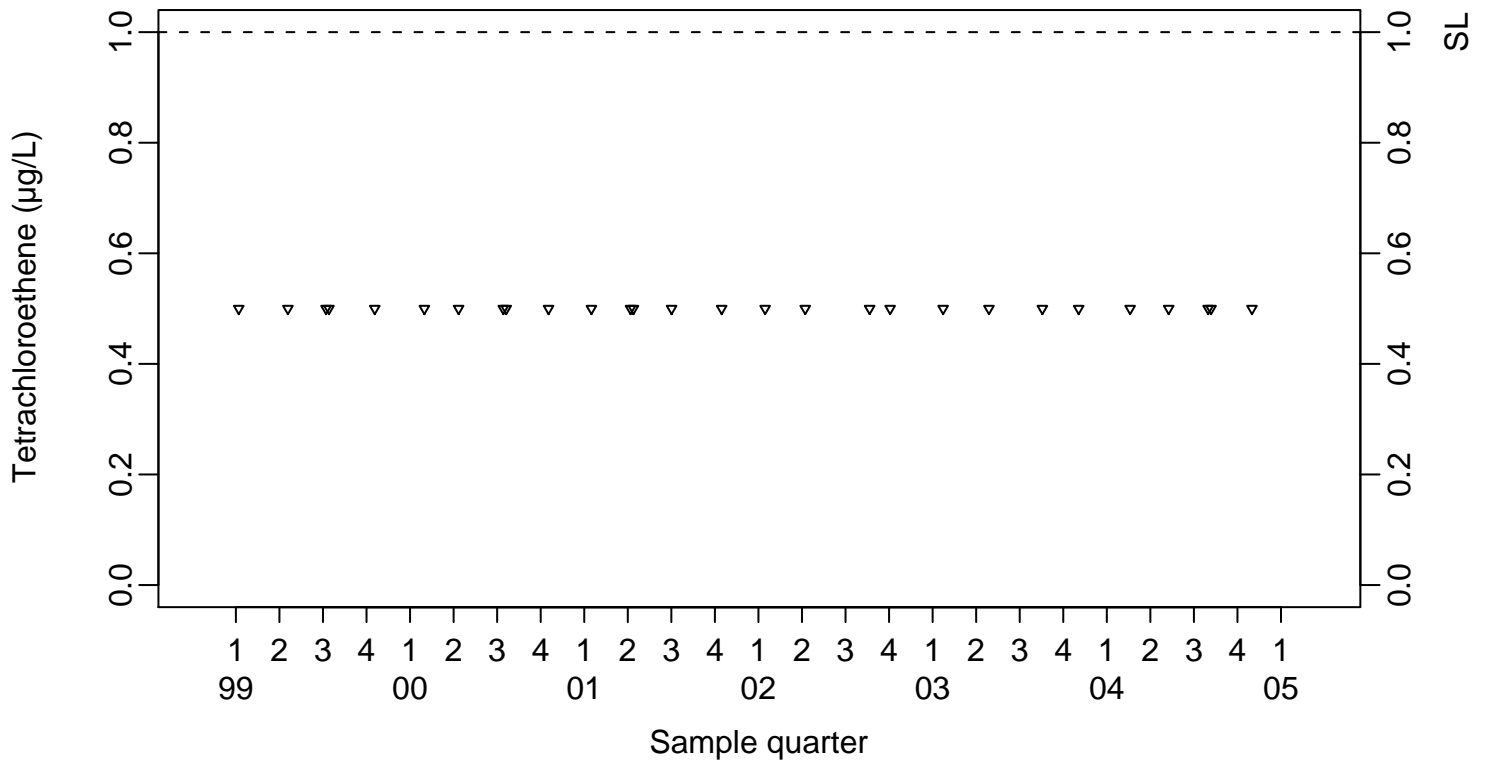
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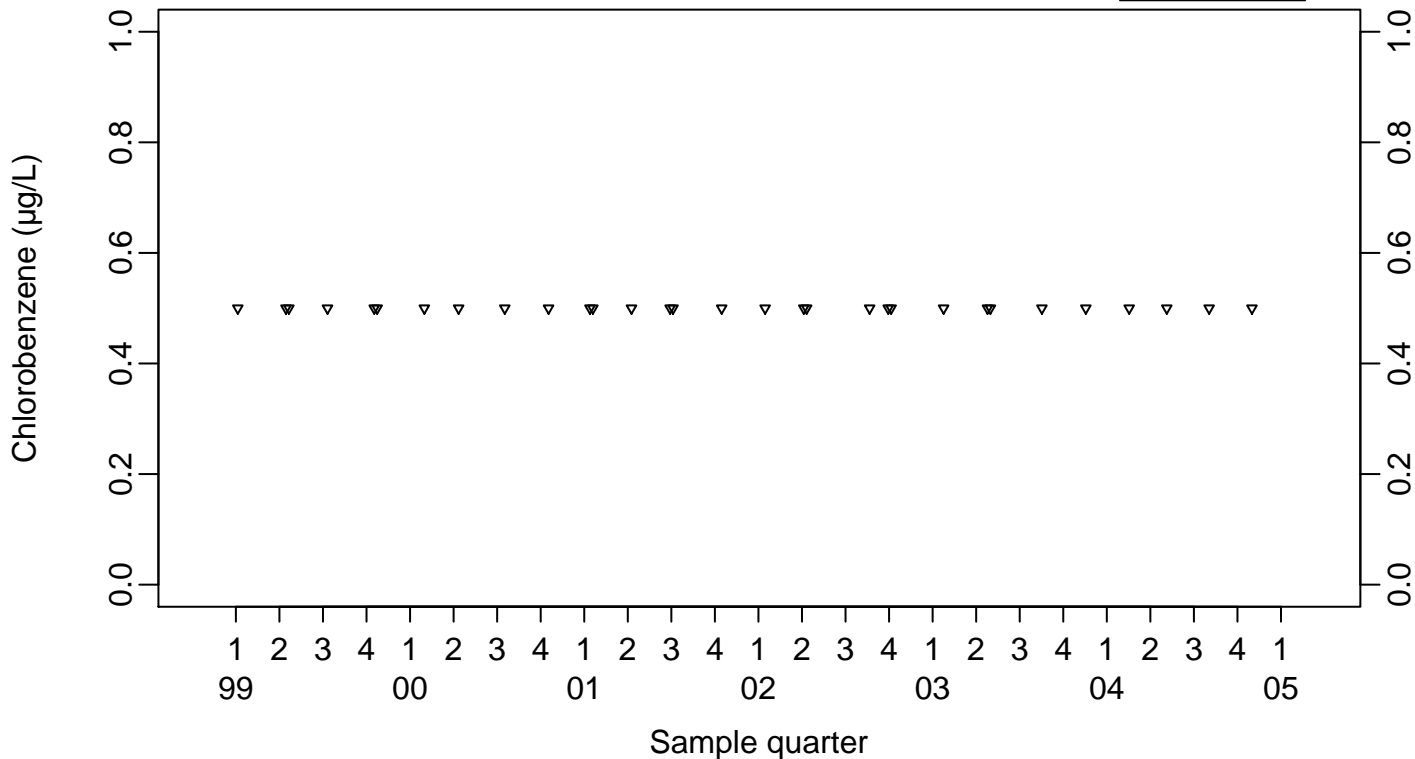
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Chlorobenzene ($\mu\text{g/L}$)

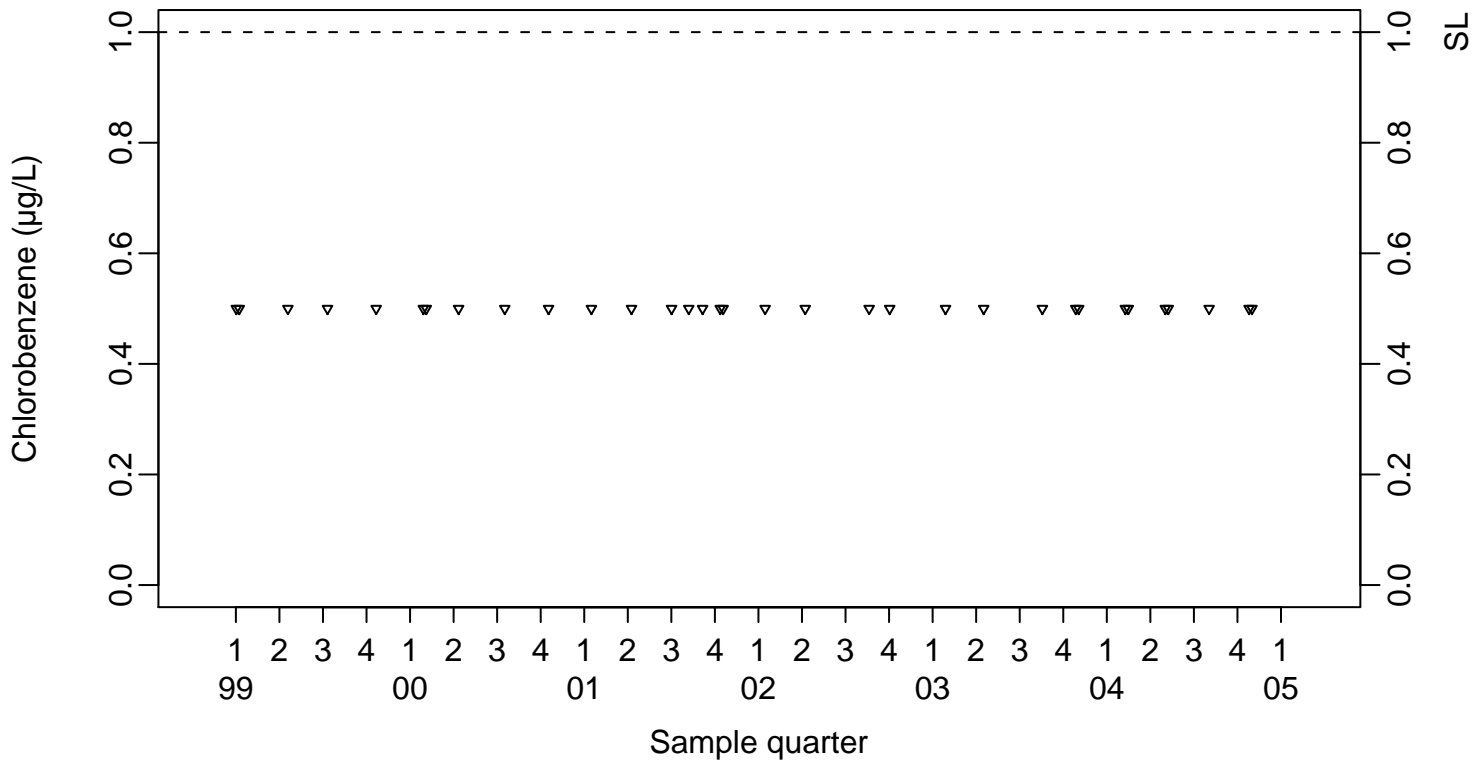
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=1

Compliance Monitoring Point W-817-02

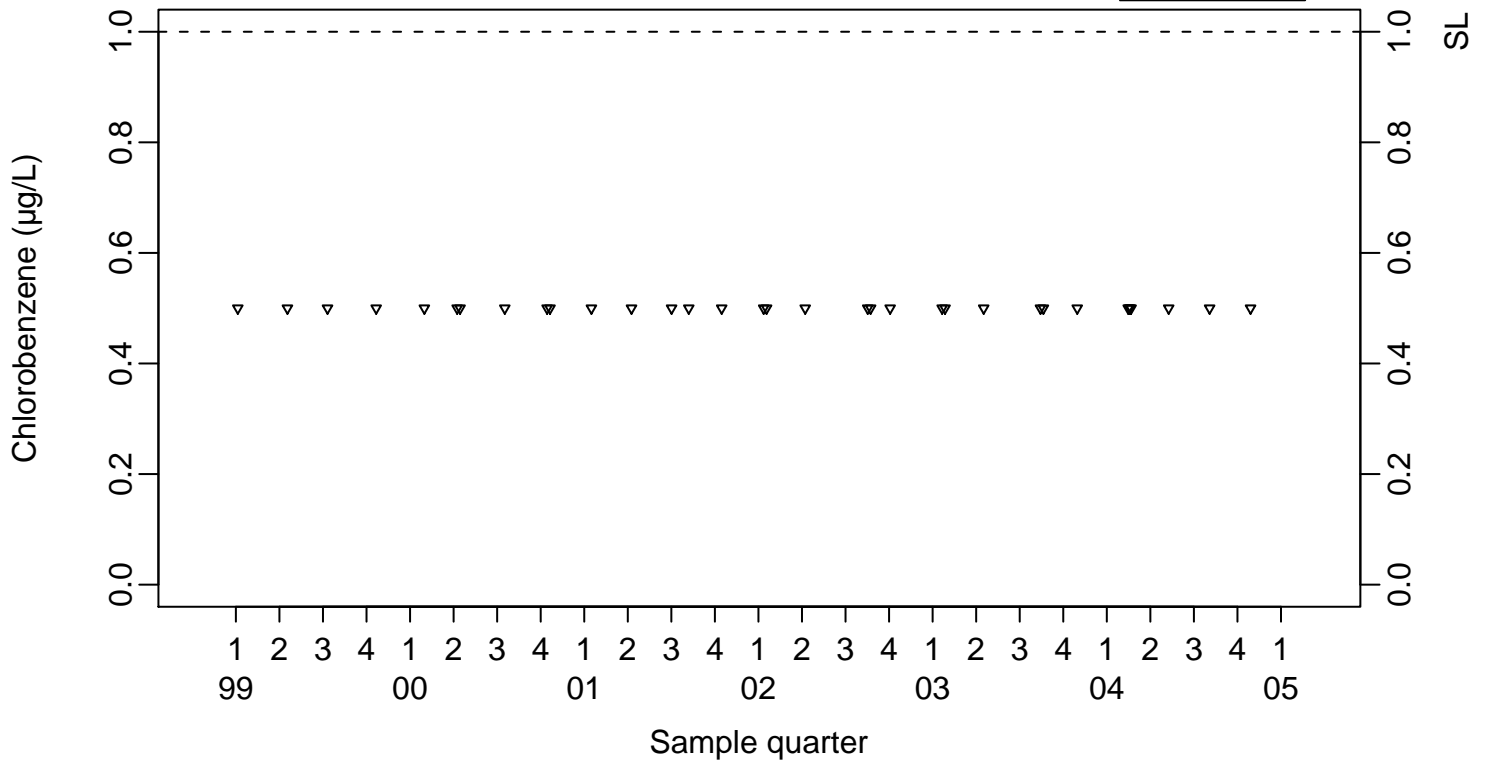


Surface Impoundments Ground Water Chlorobenzene ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

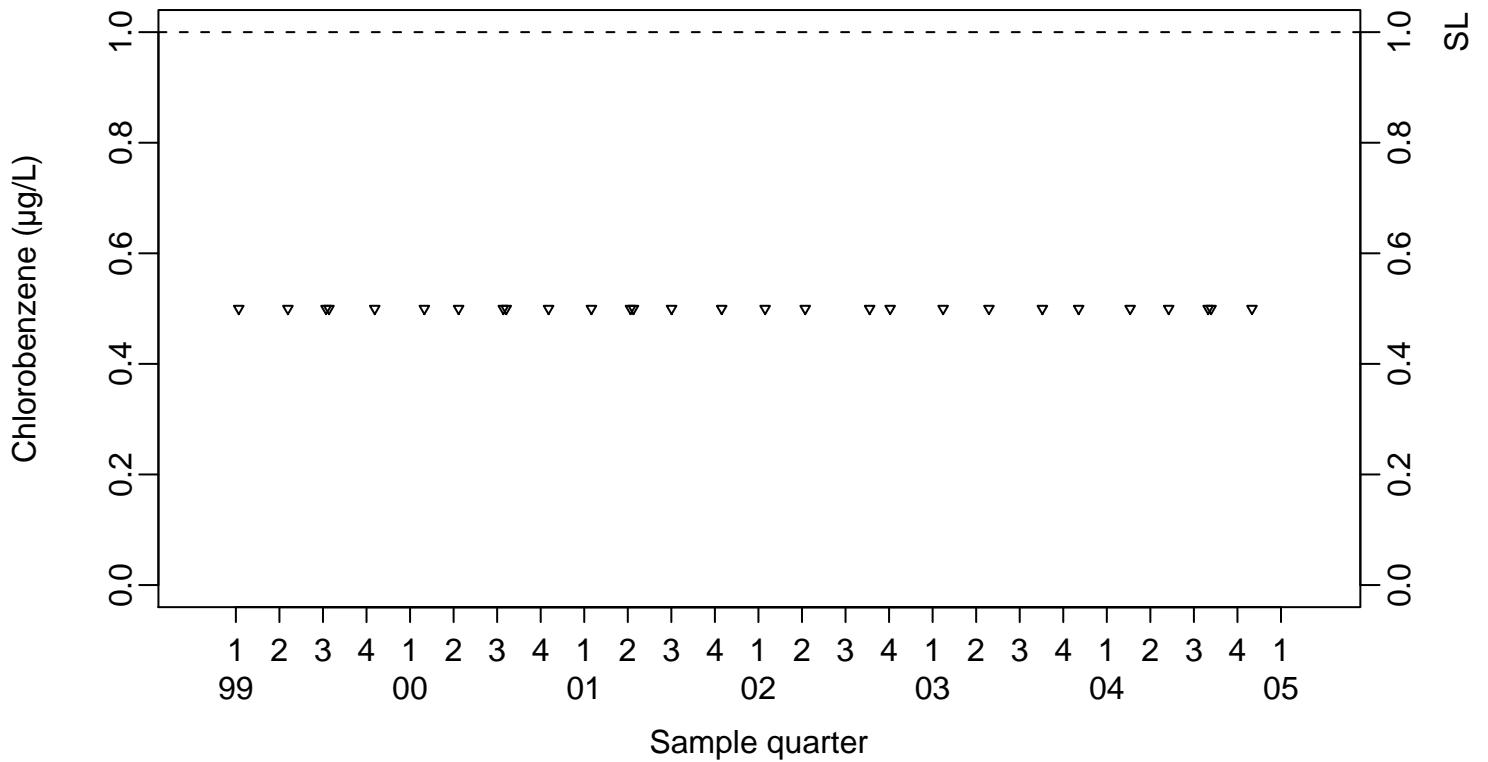
SL=1

◆ Above RL
▽ Below RL



SL=1

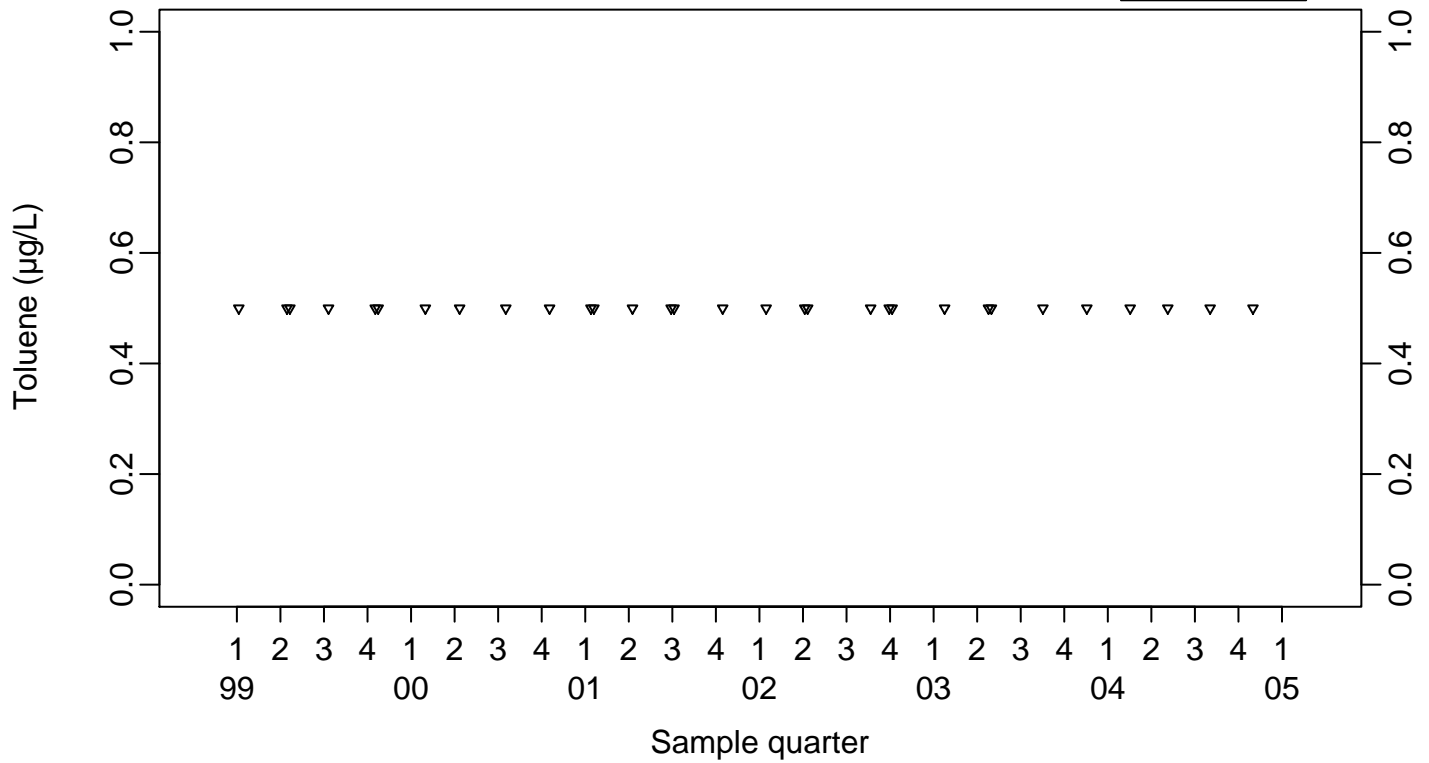
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Toluene ($\mu\text{g/L}$)

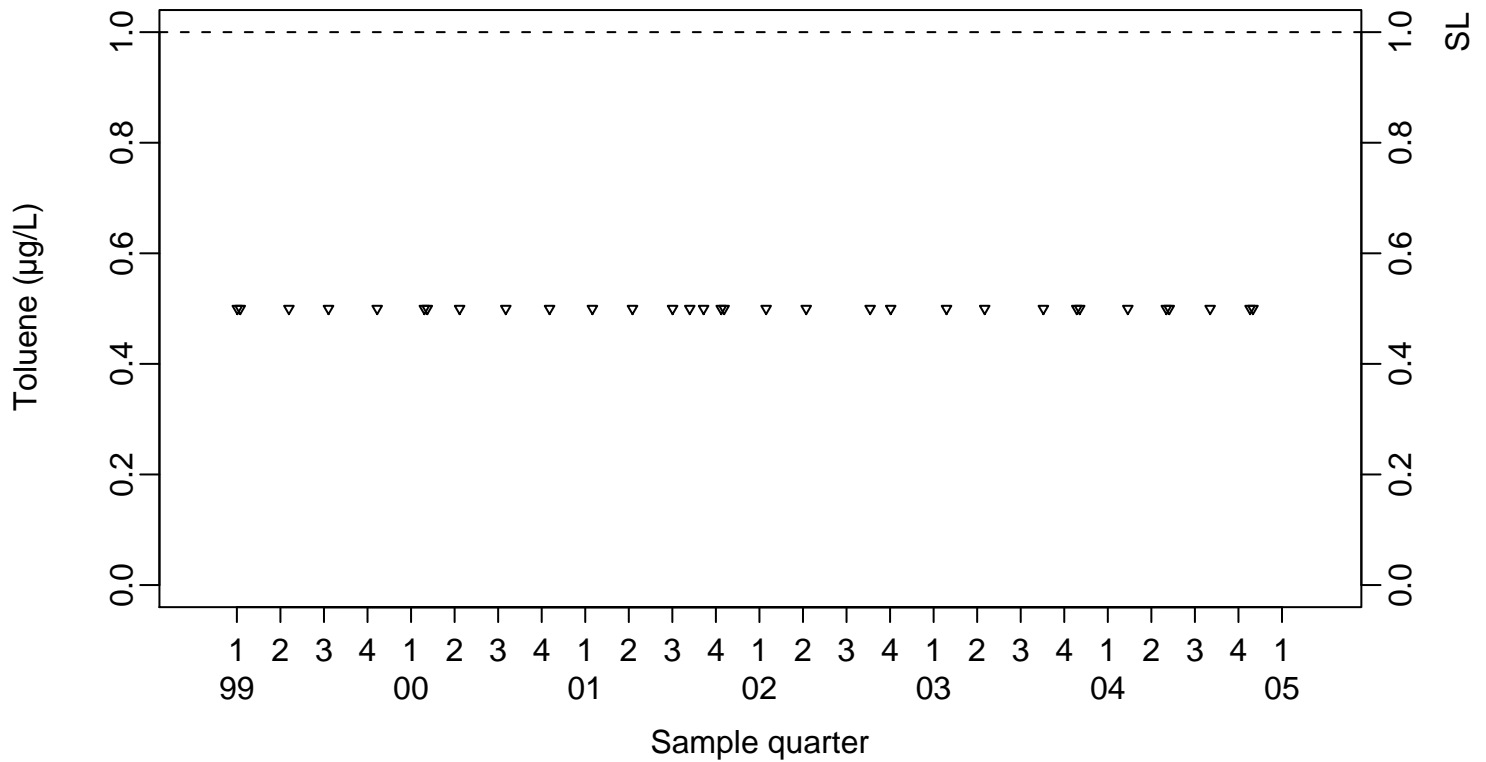
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=1

Compliance Monitoring Point W-817-02

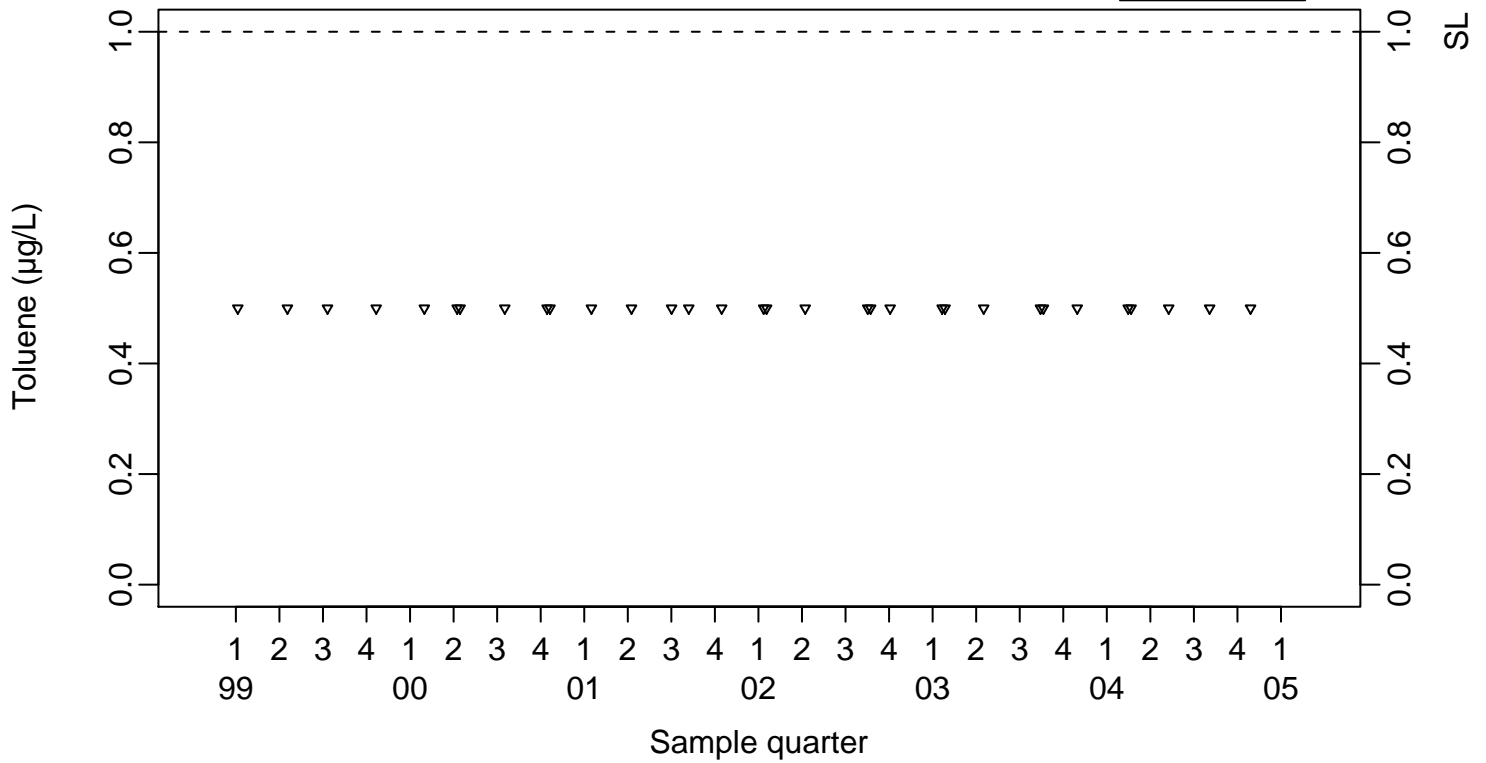


Surface Impoundments Ground Water Toluene ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

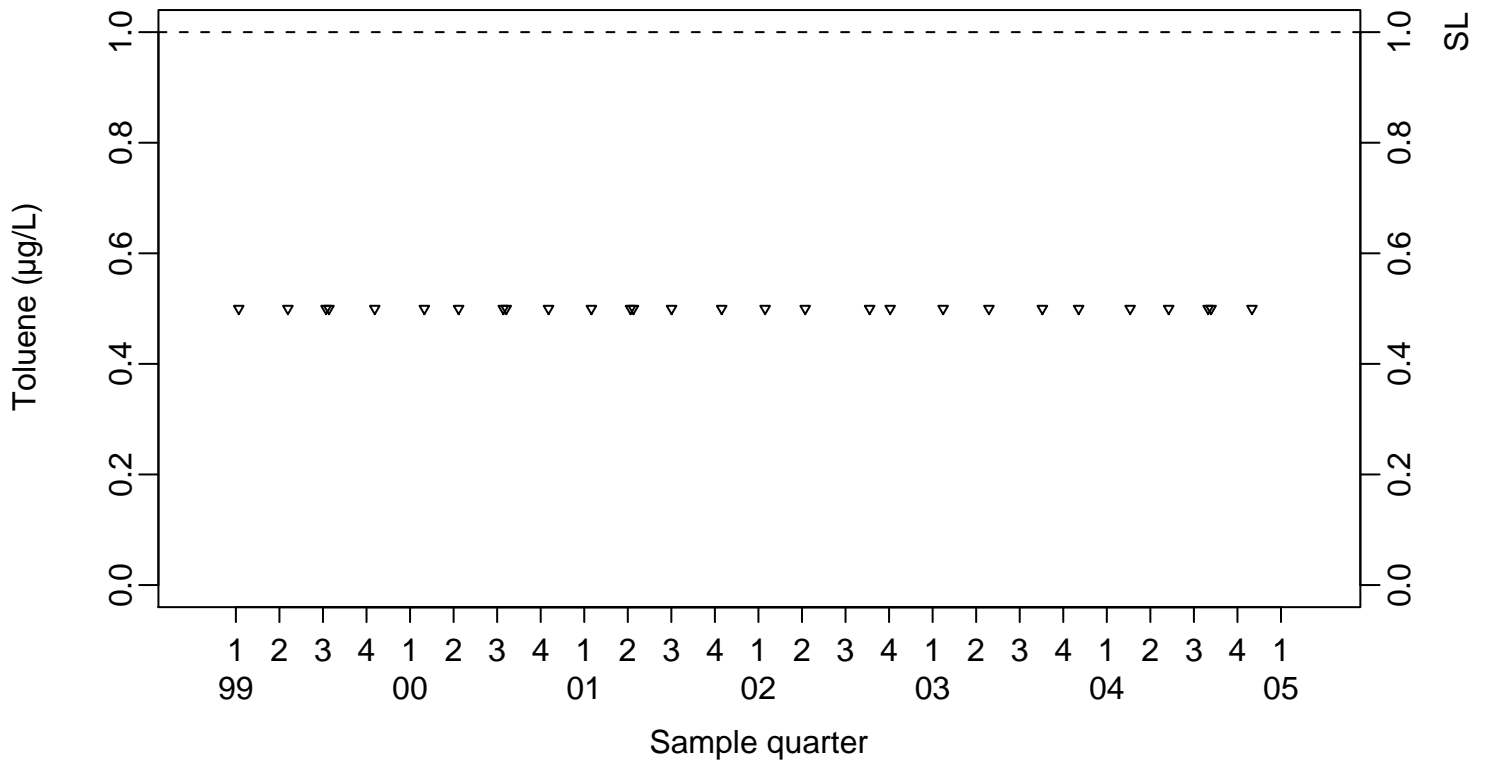
SL=1

◆ Above RL
▽ Below RL



SL=1

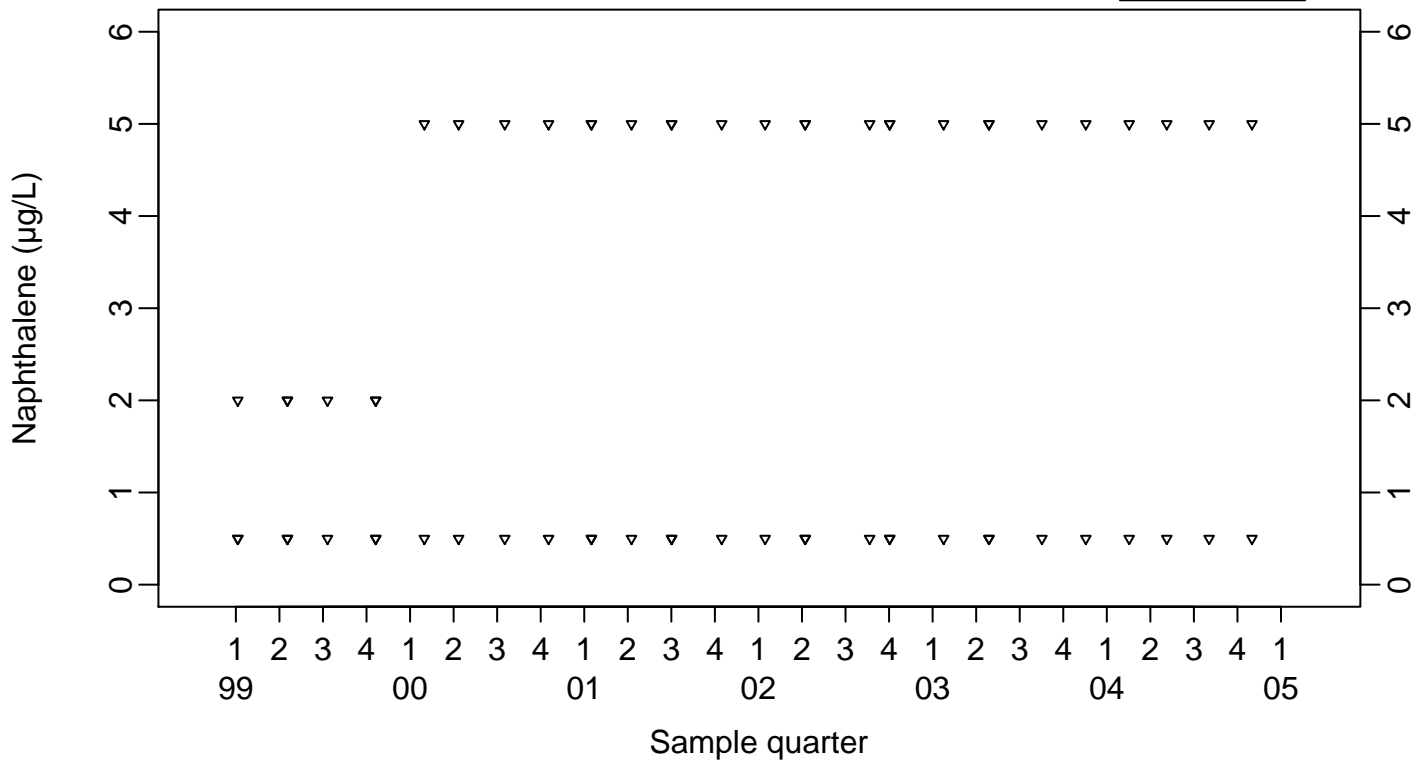
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Naphthalene ($\mu\text{g/L}$)

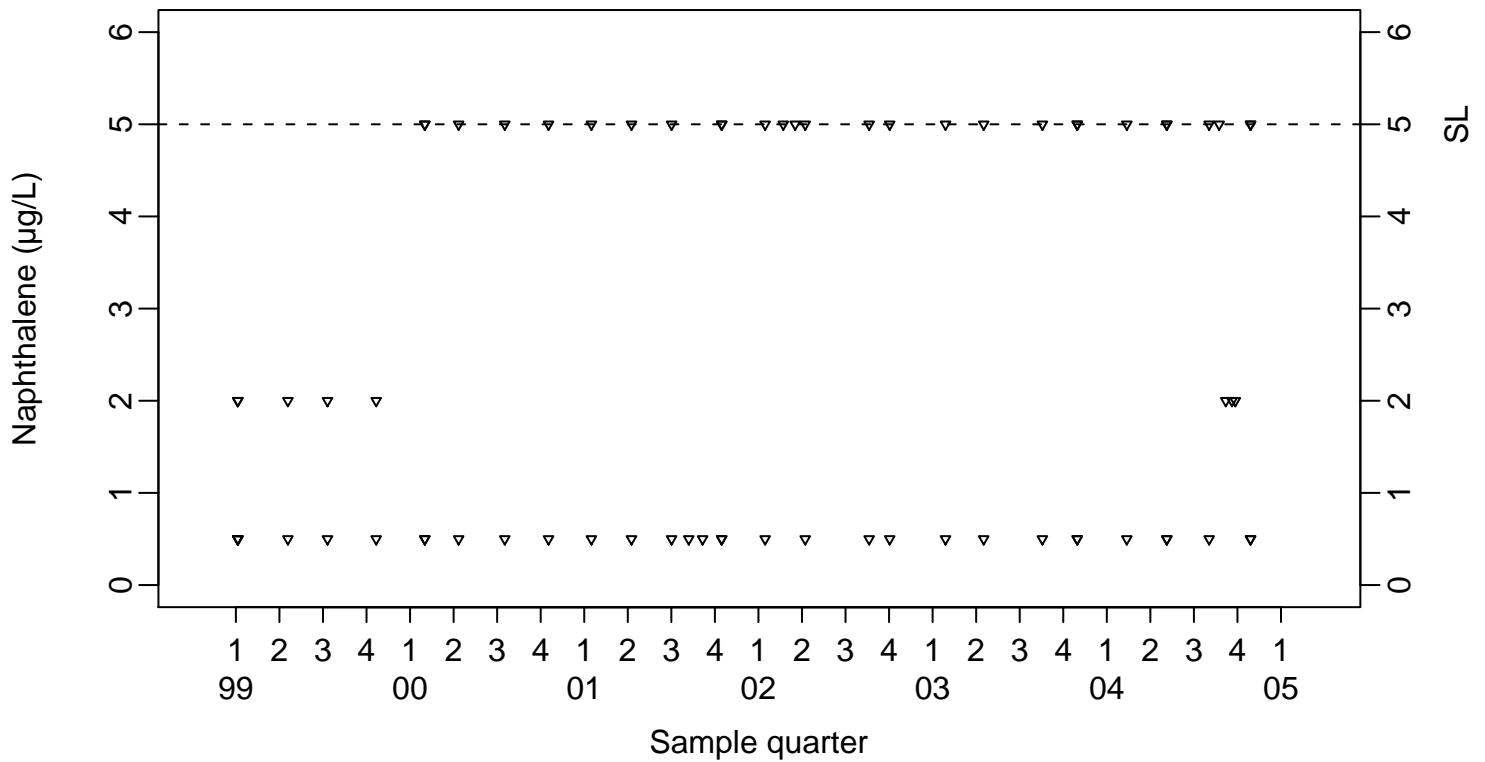
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=5

Compliance Monitoring Point W-817-02

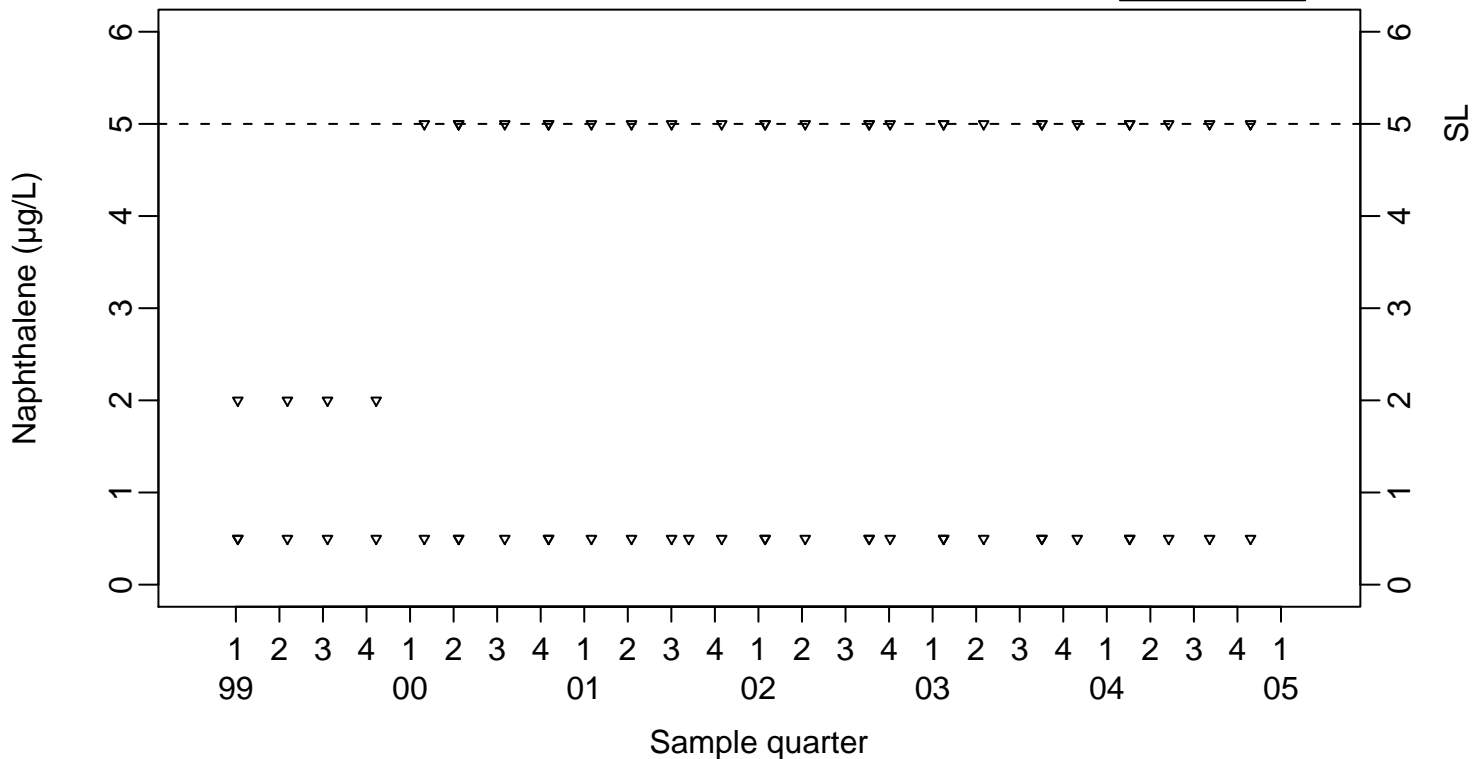


Surface Impoundments Ground Water Naphthalene ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

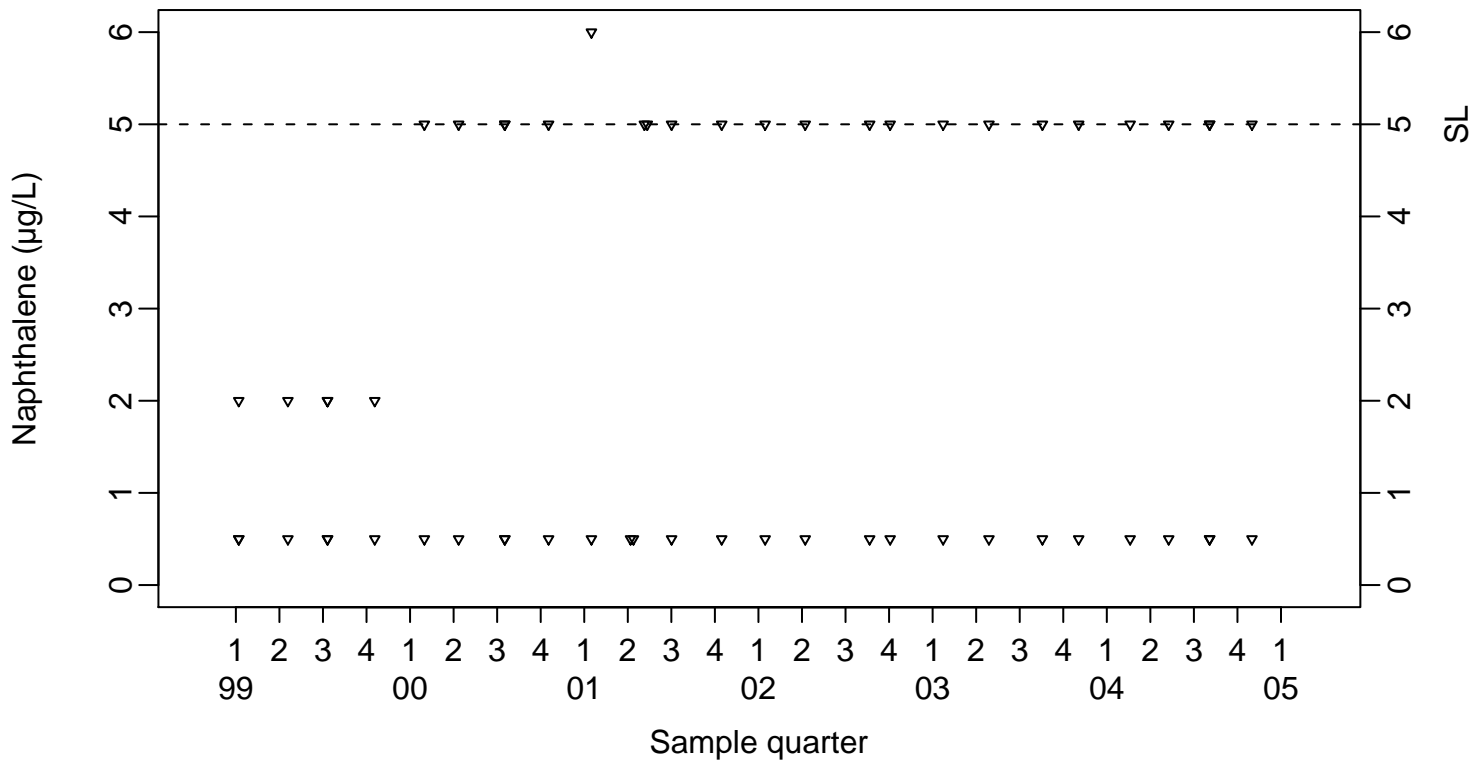
SL=5

◆ Above RL
▽ Below RL



SL=5

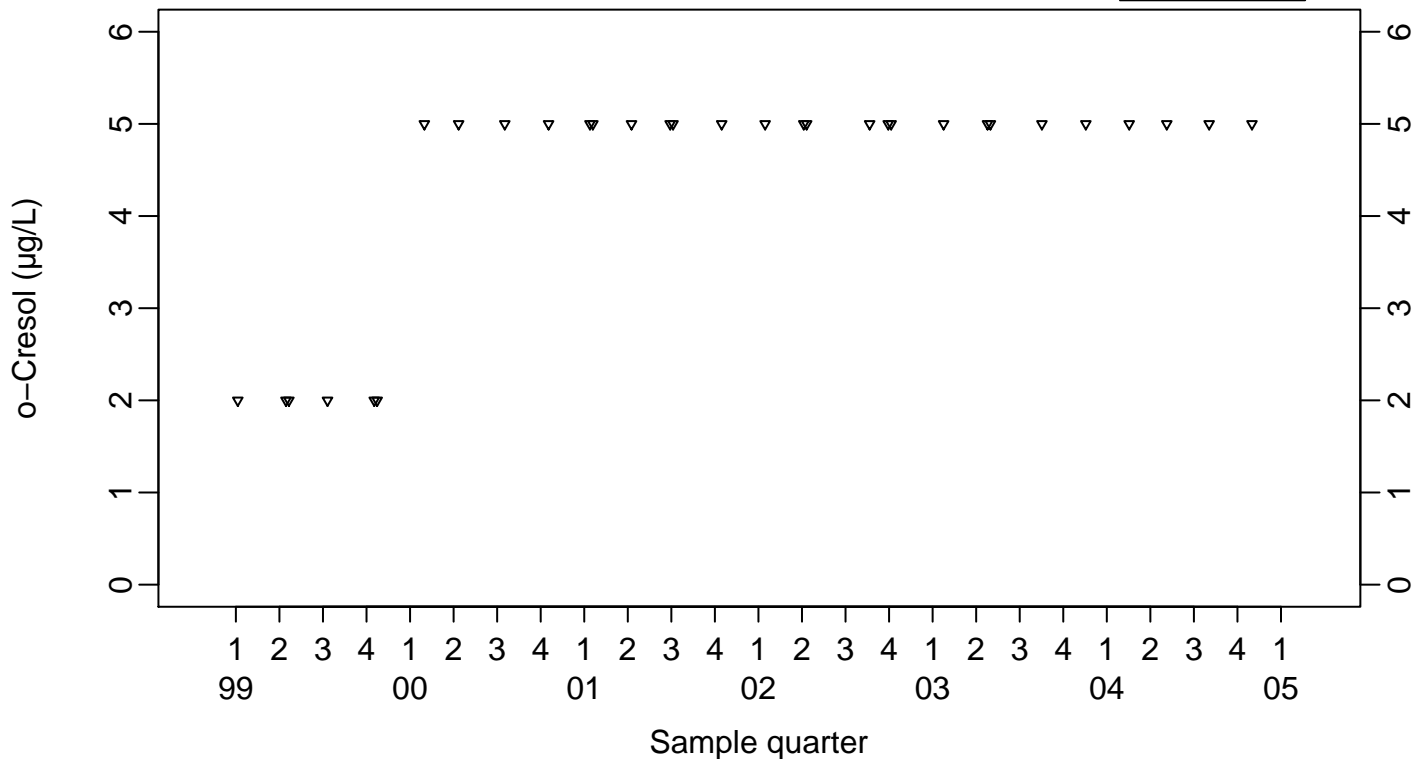
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water
 o-Cresol ($\mu\text{g/L}$)

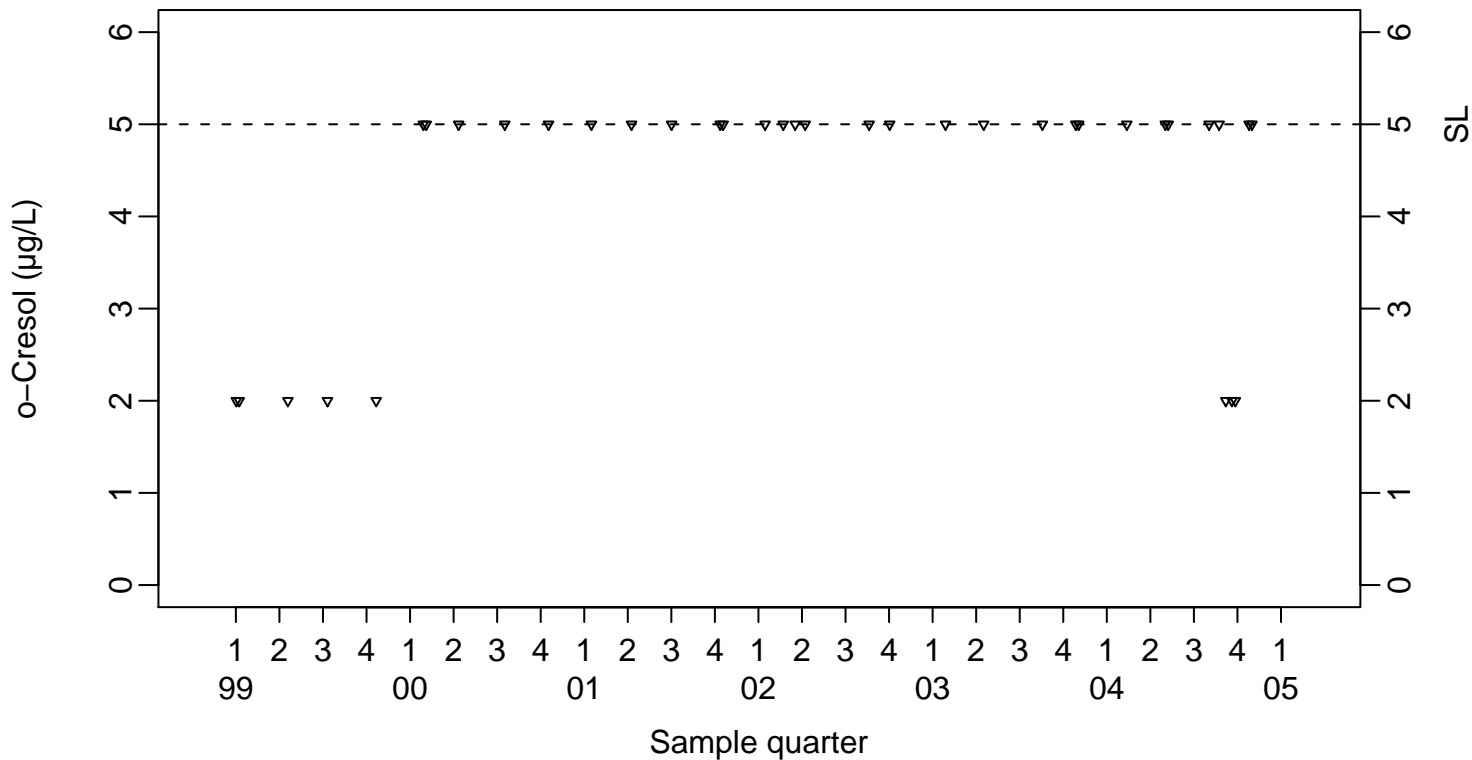
Background Monitoring Point W-817-01

◆ Above RL
 ▼ Below RL



SL=5

Compliance Monitoring Point W-817-02

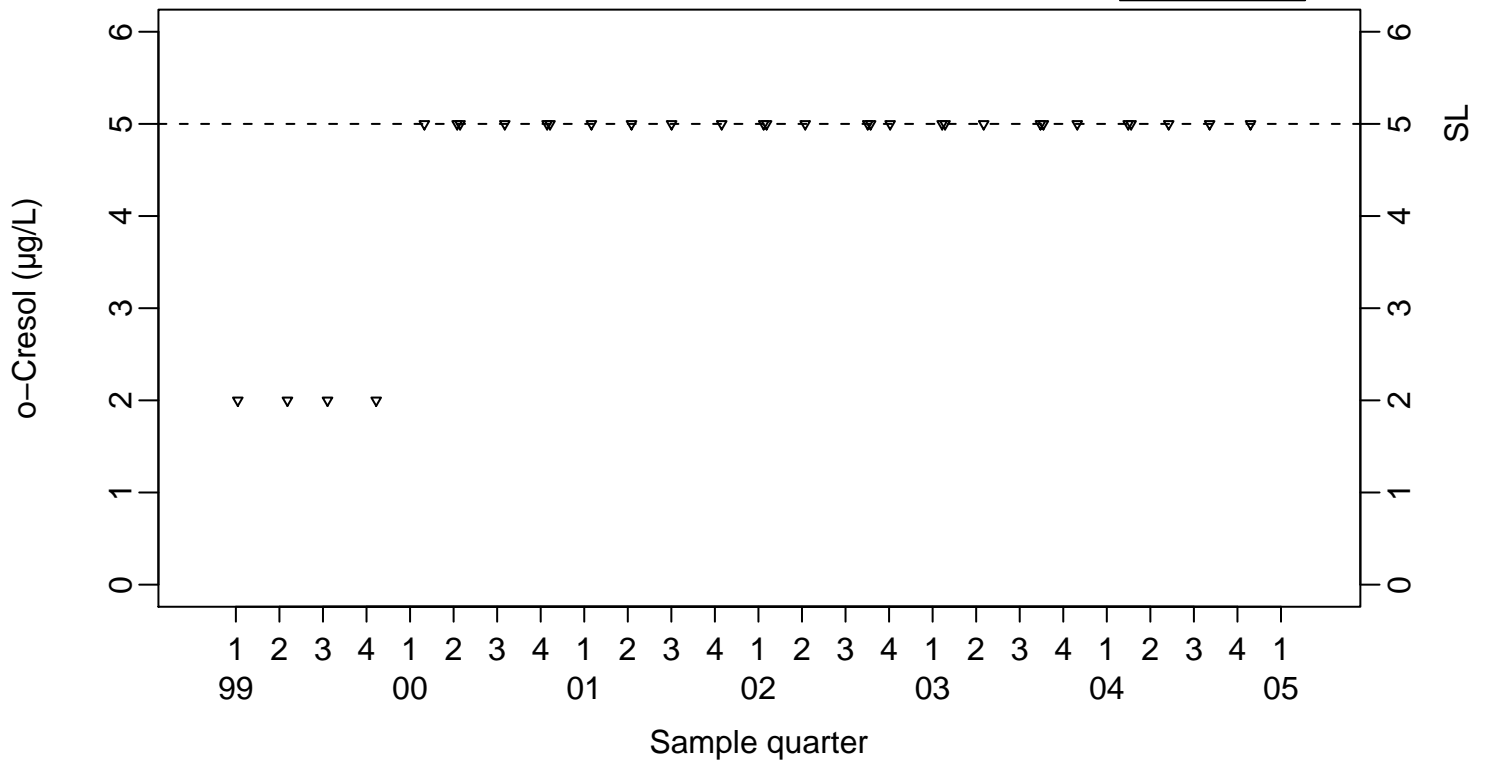


Surface Impoundments Ground Water o-Cresol ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

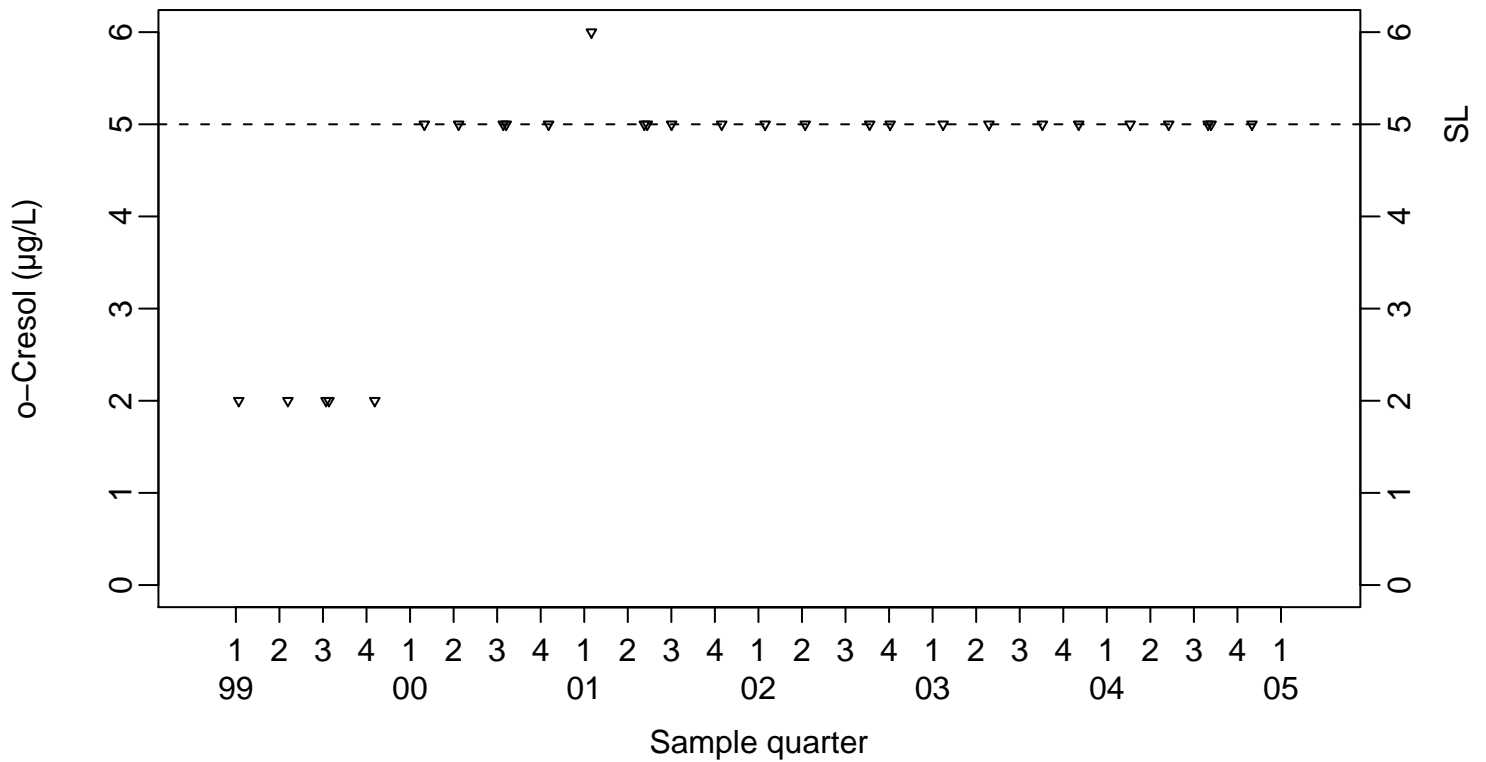
SL=5

◆ Above RL
▽ Below RL



SL=5

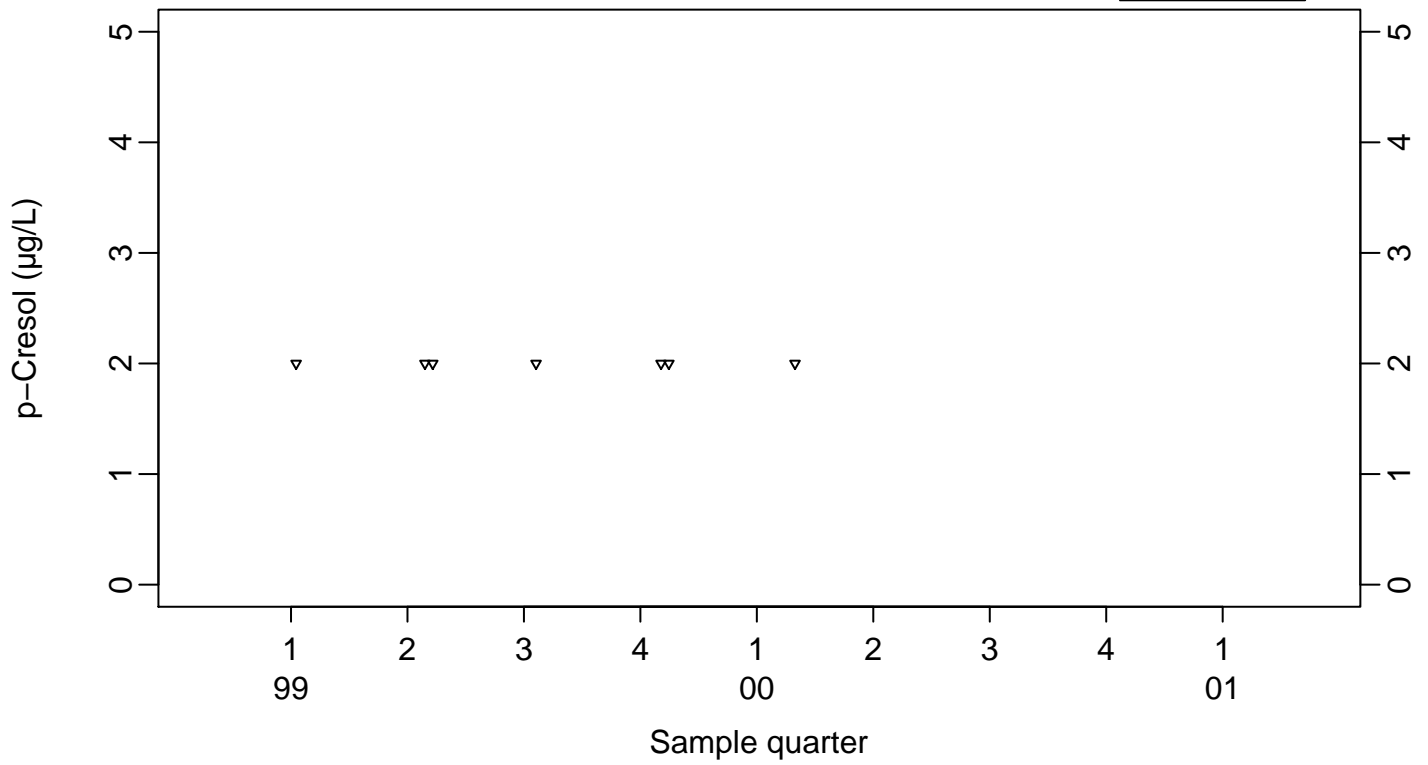
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water p-Cresol ($\mu\text{g/L}$)

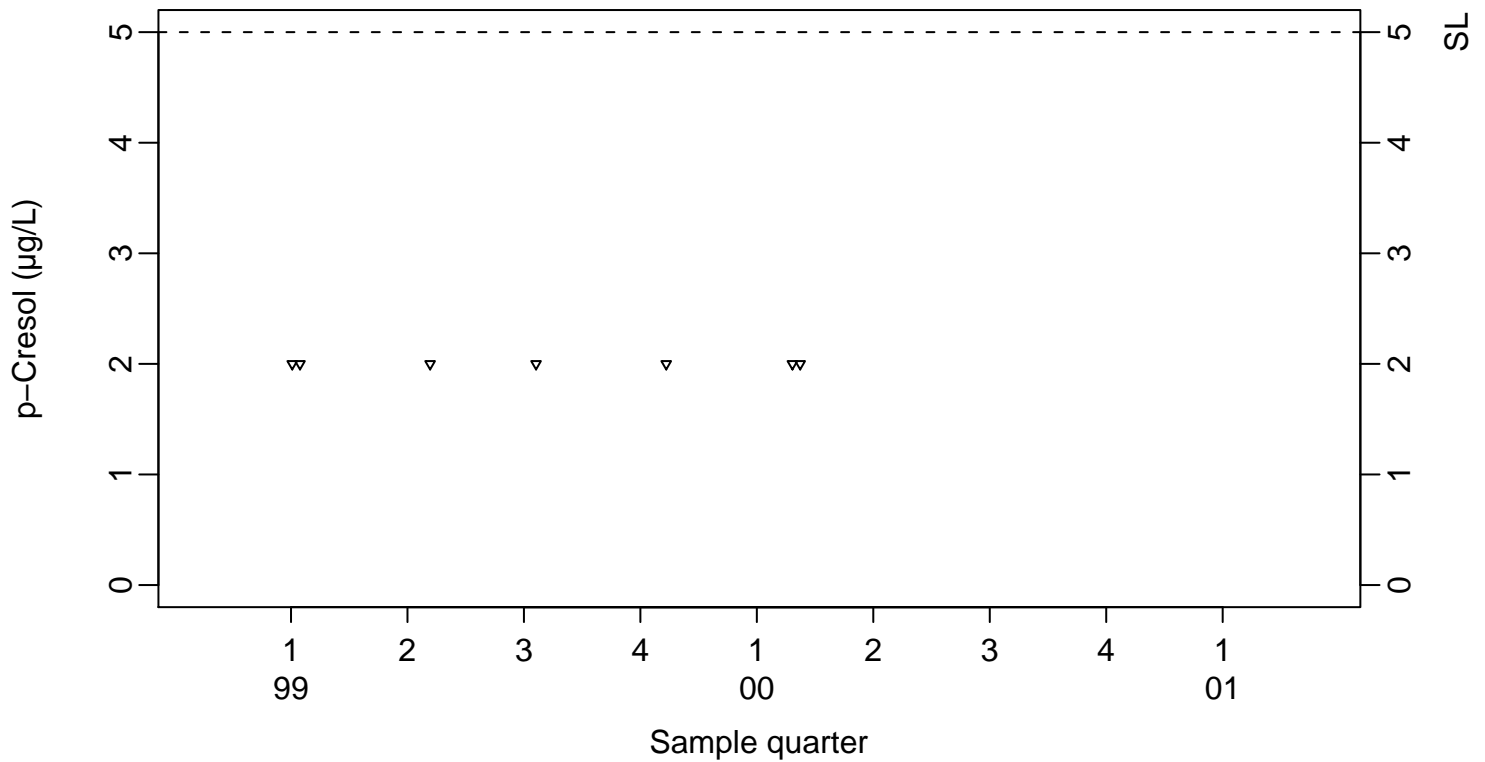
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=5

Compliance Monitoring Point W-817-02

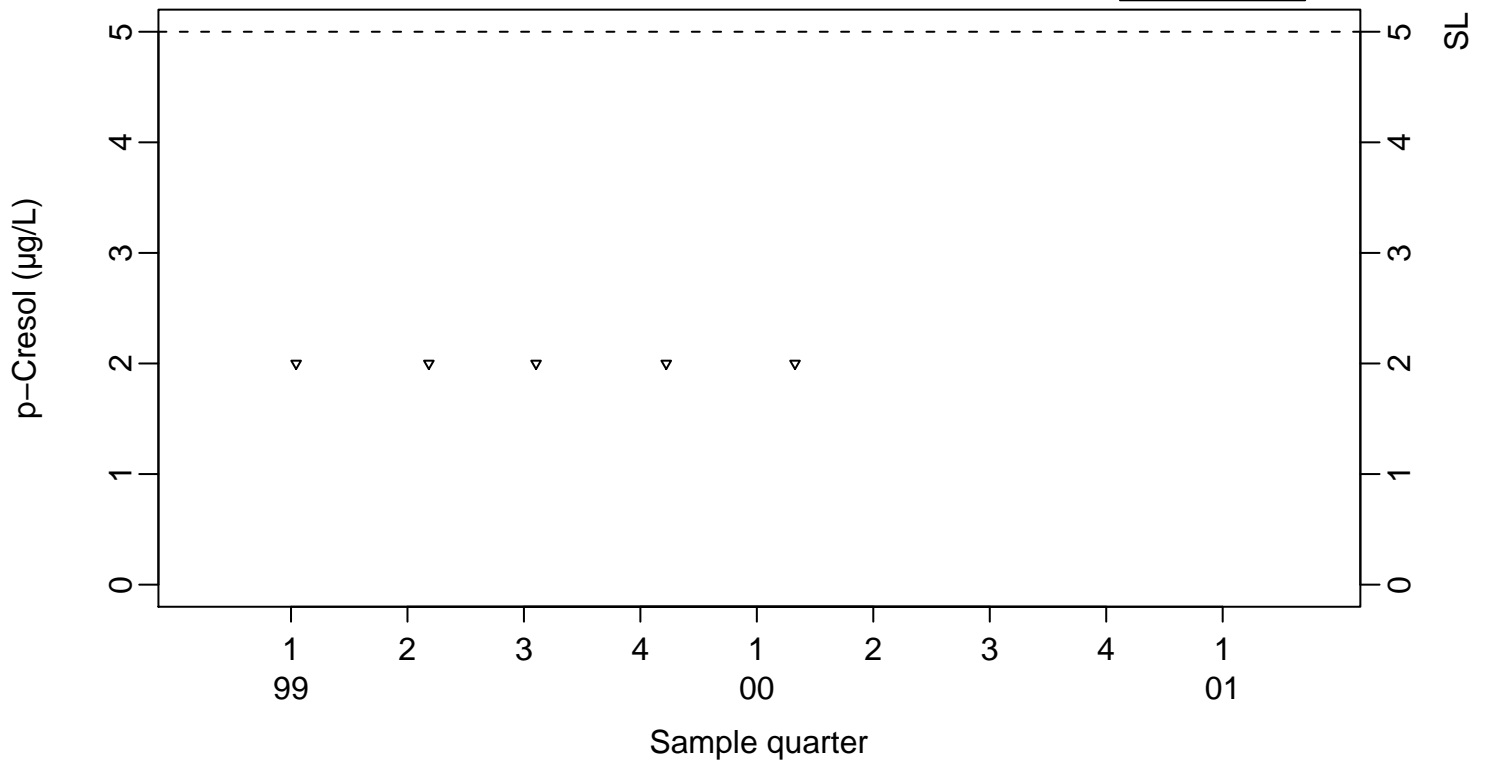


Surface Impoundments Ground Water p-Cresol ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

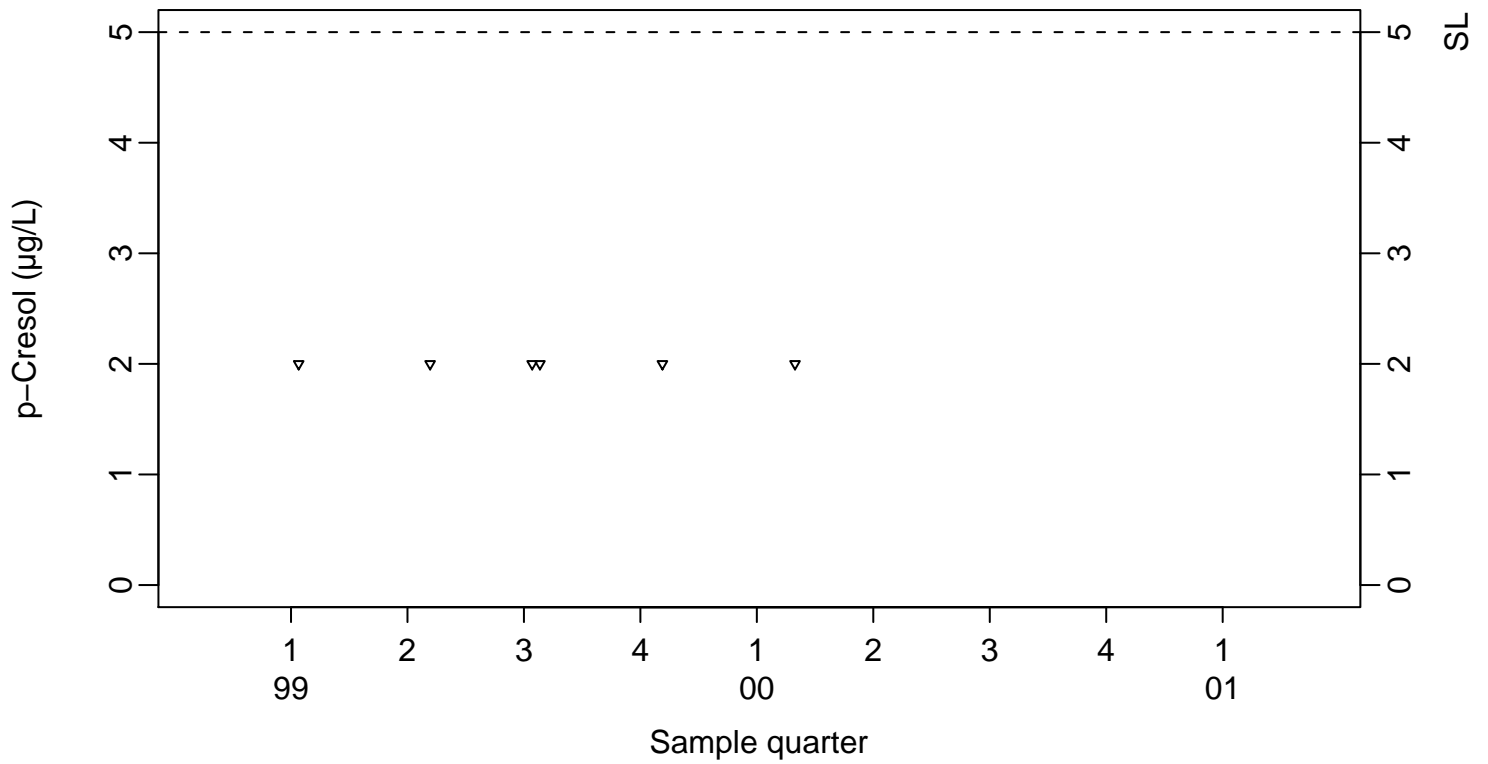
SL=5

◆ Above RL
▽ Below RL



SL=5

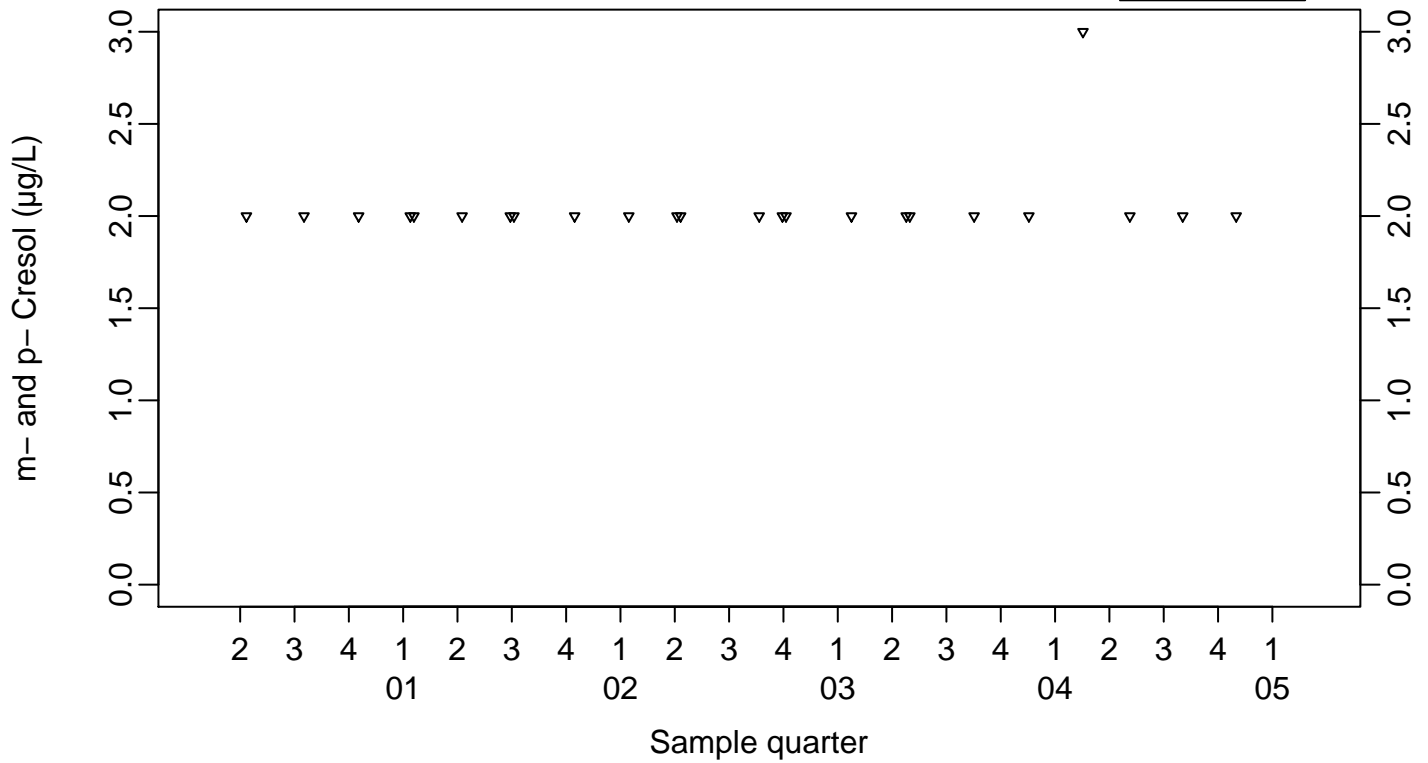
Compliance Monitoring Point W-817-04



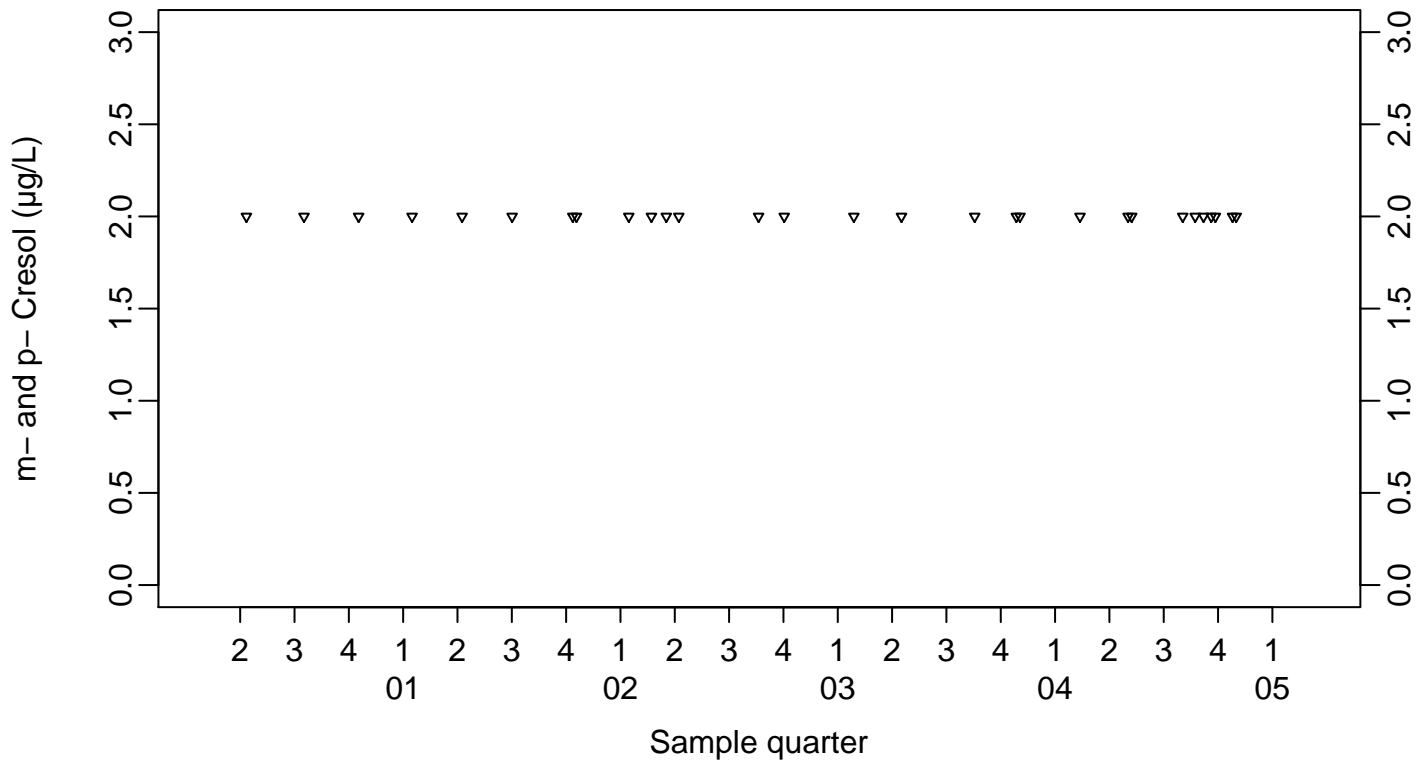
Surface Impoundments Ground Water m- and p- Cresol ($\mu\text{g/L}$)

Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL

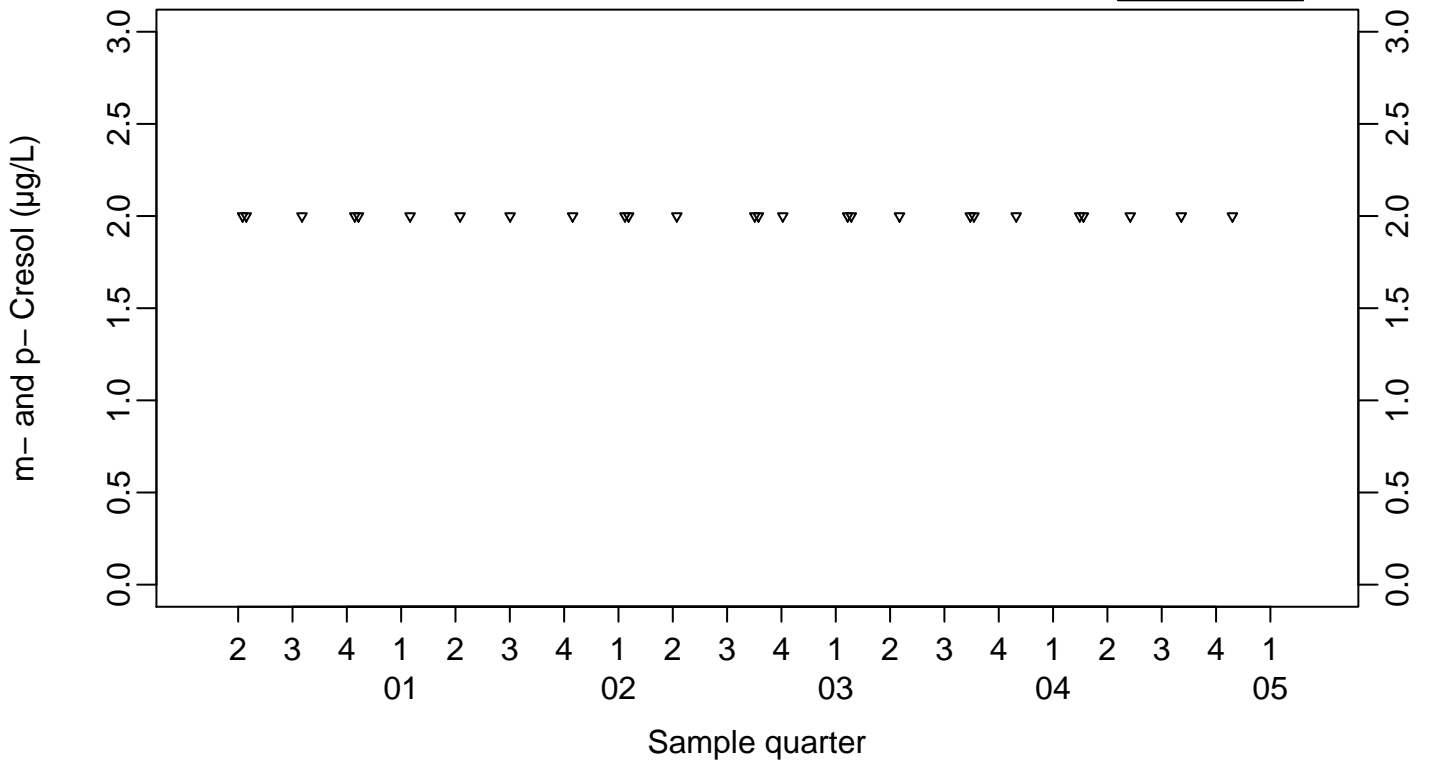
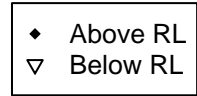


Compliance Monitoring Point W-817-02

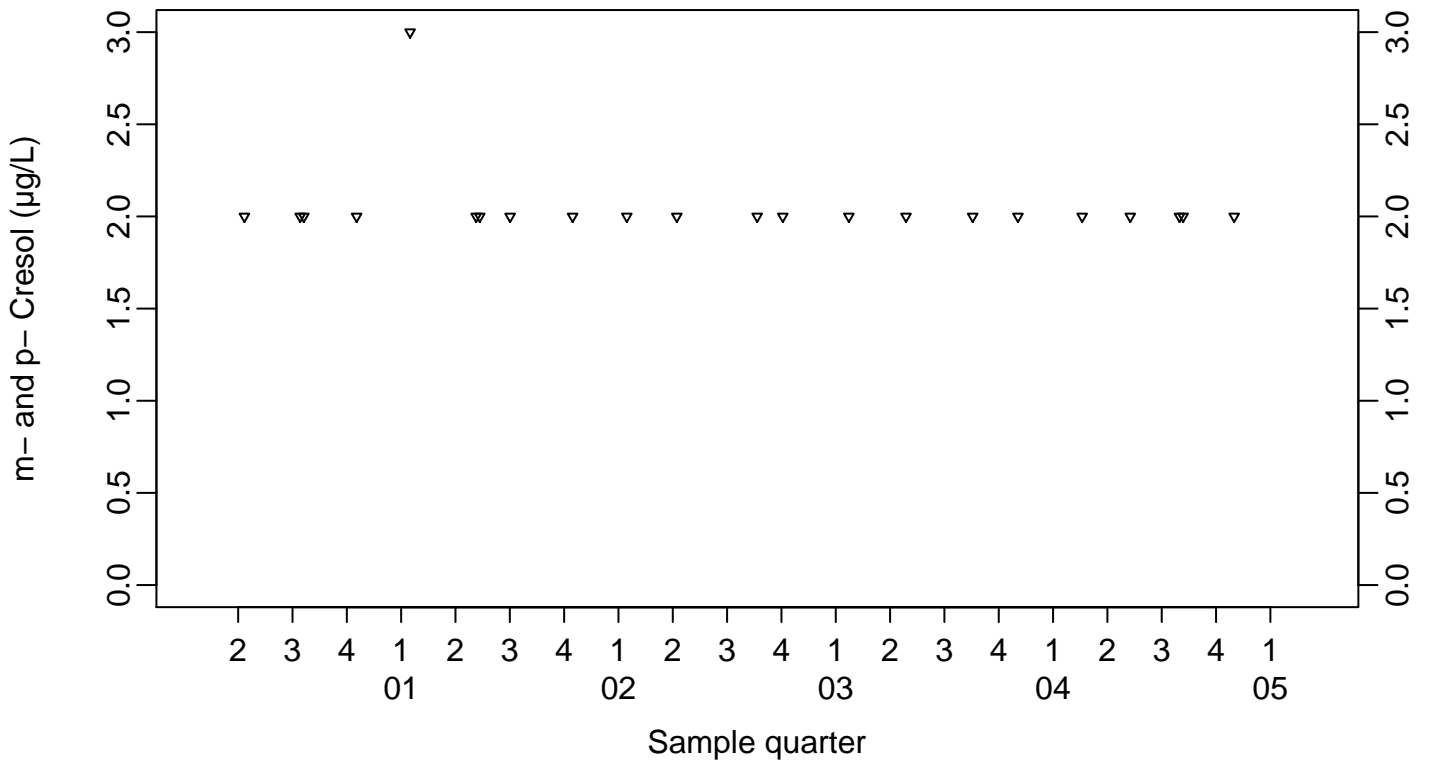


Surface Impoundments Ground Water m- and p- Cresol ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03



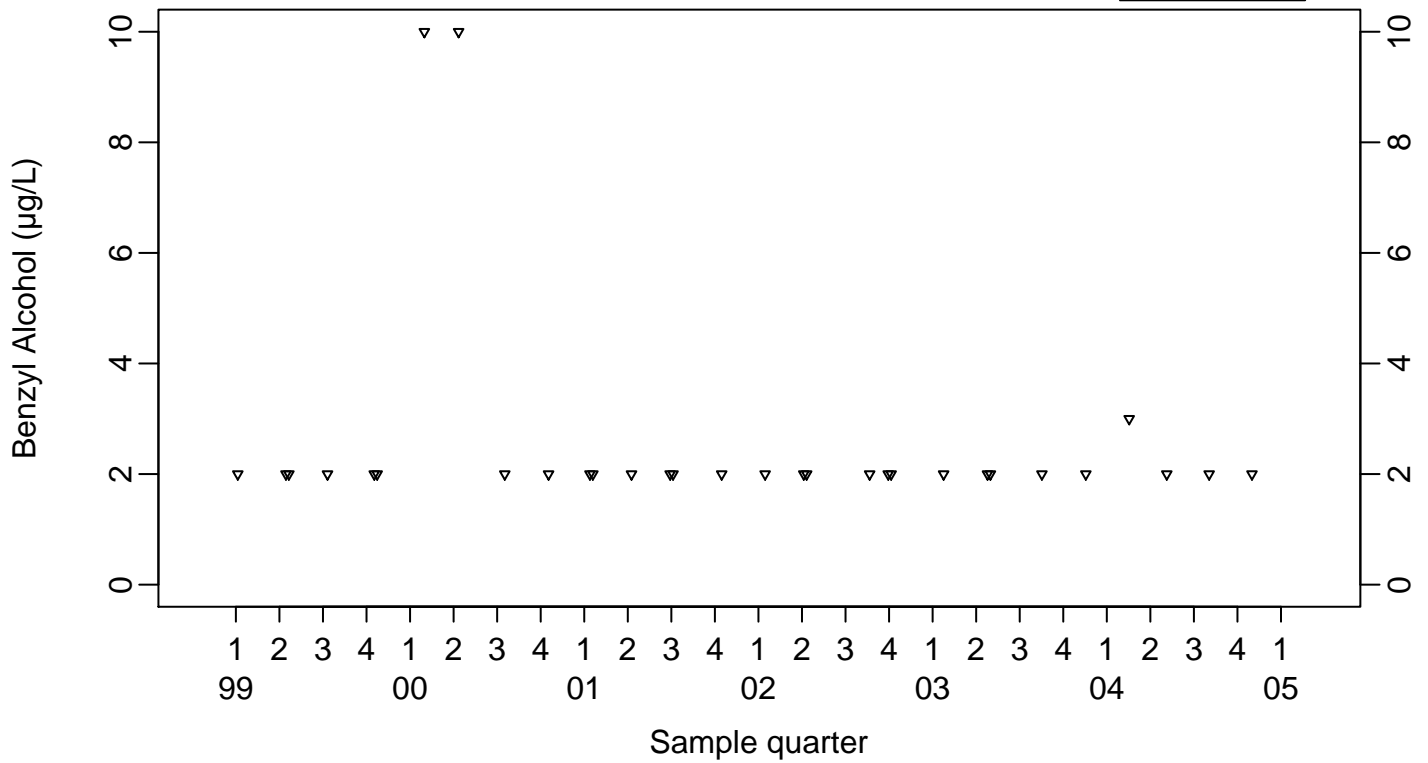
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Benzyl Alcohol ($\mu\text{g/L}$)

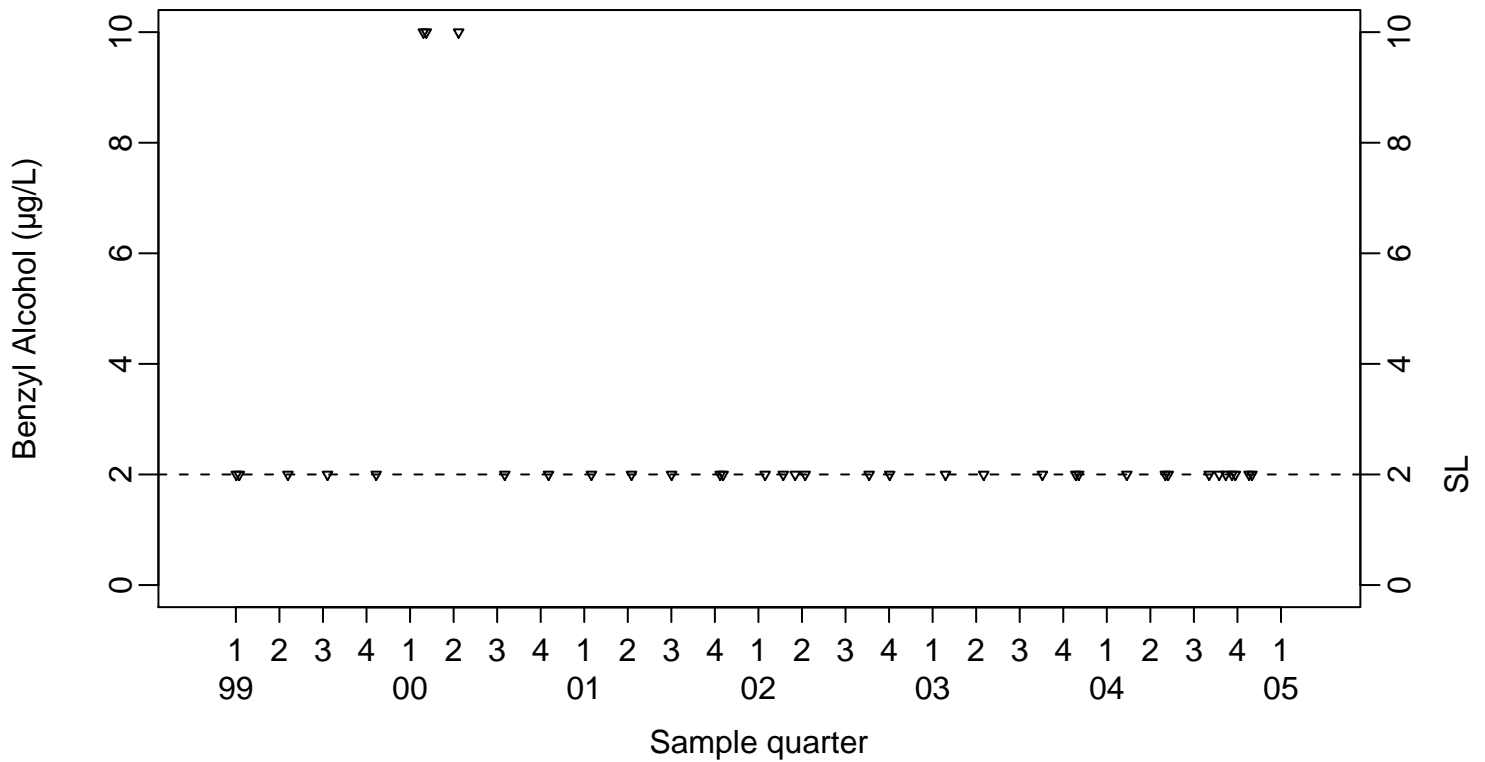
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=2

Compliance Monitoring Point W-817-02

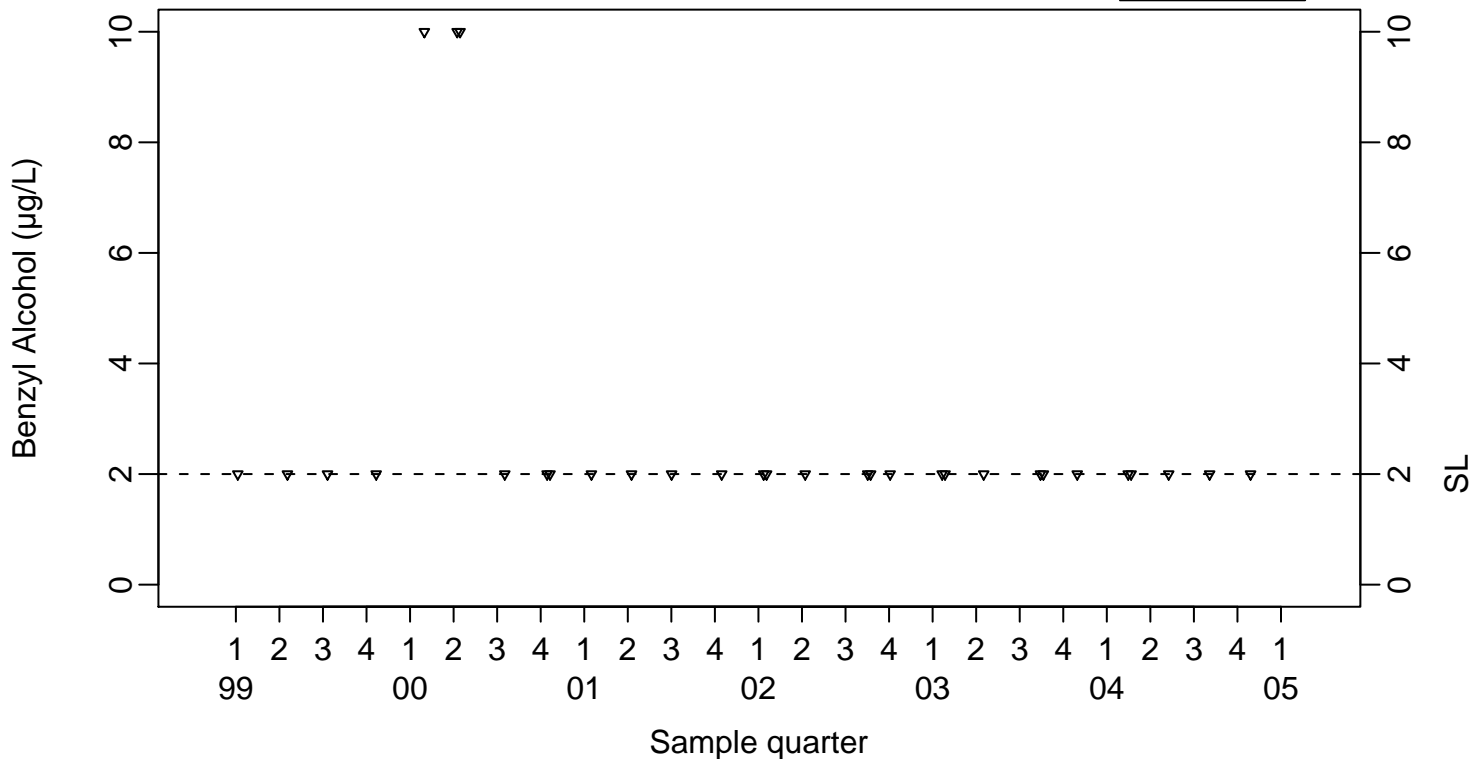


Surface Impoundments Ground Water Benzyl Alcohol ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

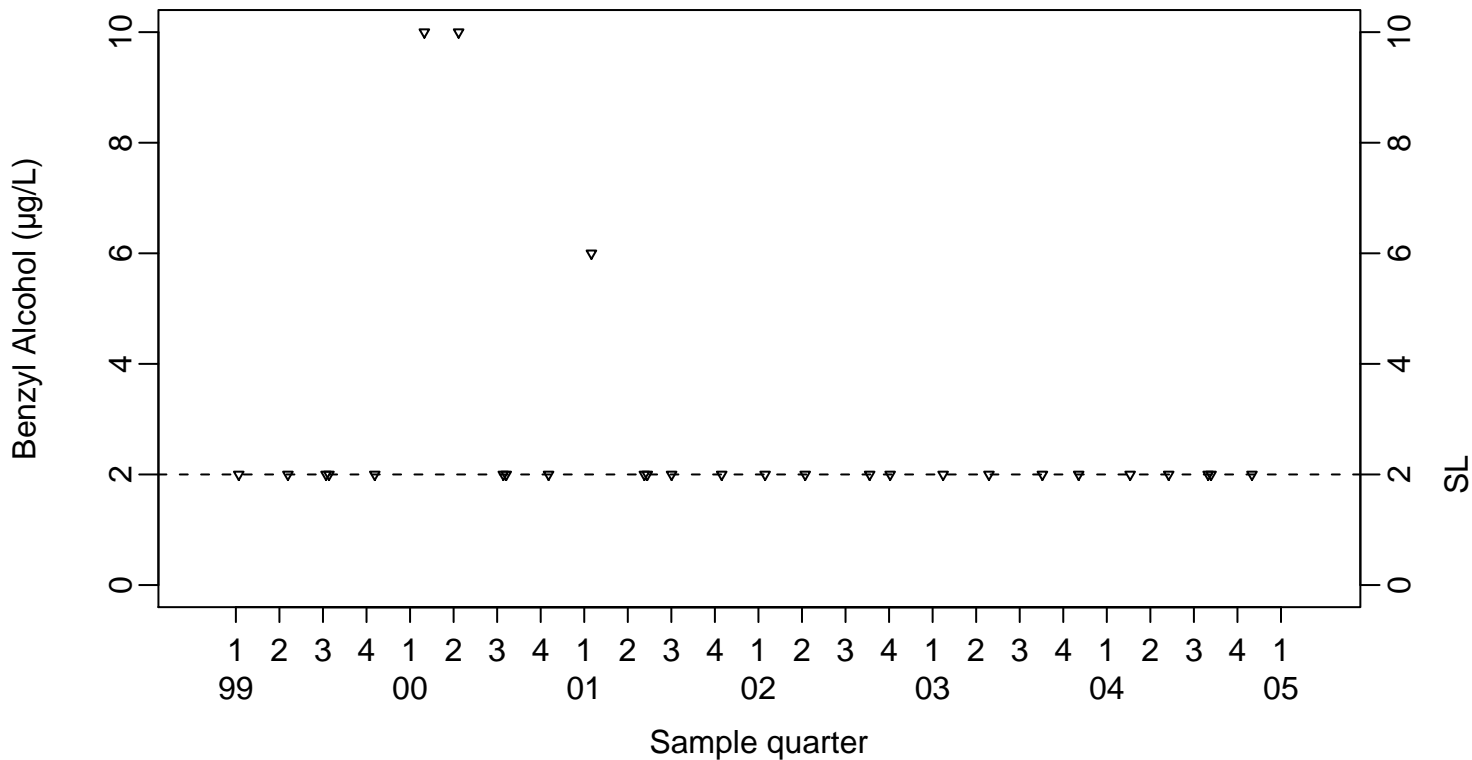
SL=2

◆ Above RL
▽ Below RL



SL=2

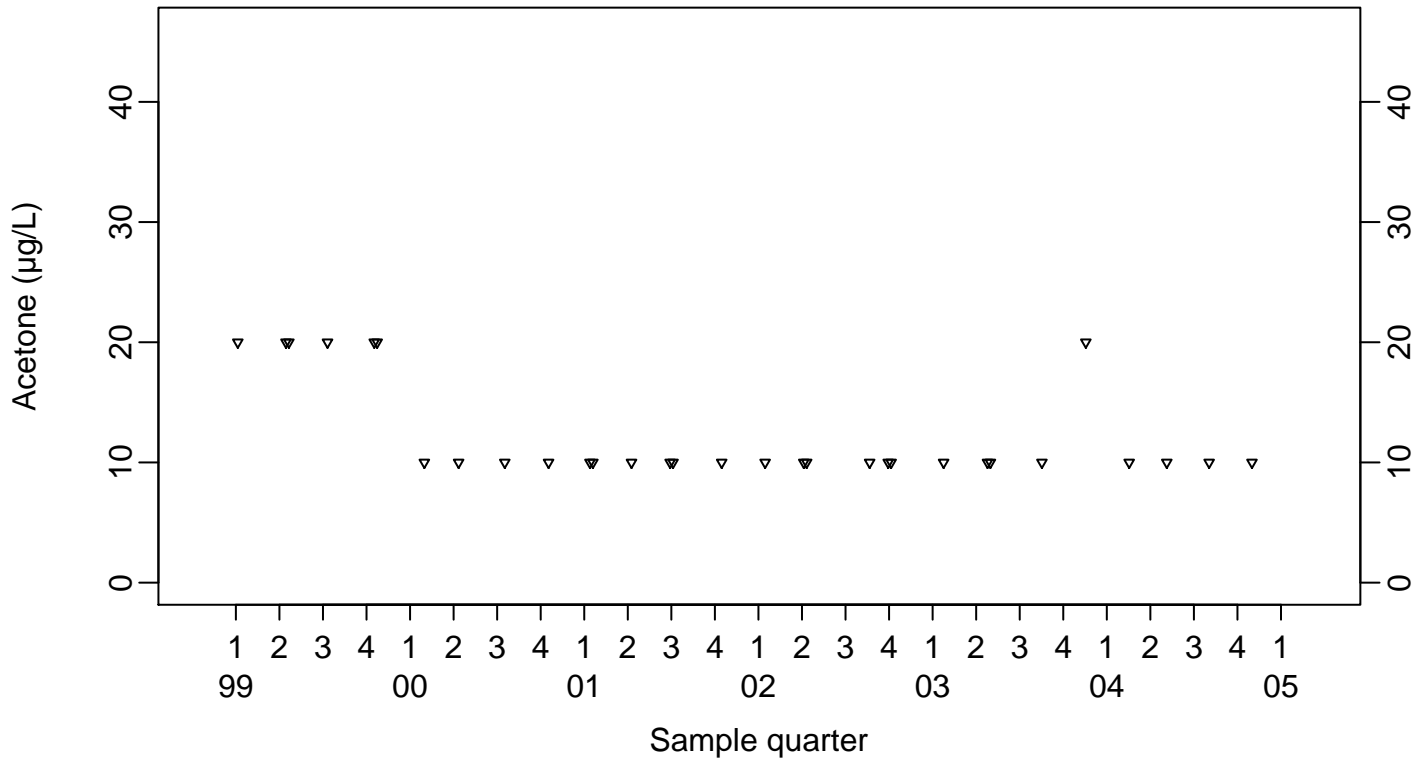
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Acetone ($\mu\text{g/L}$)

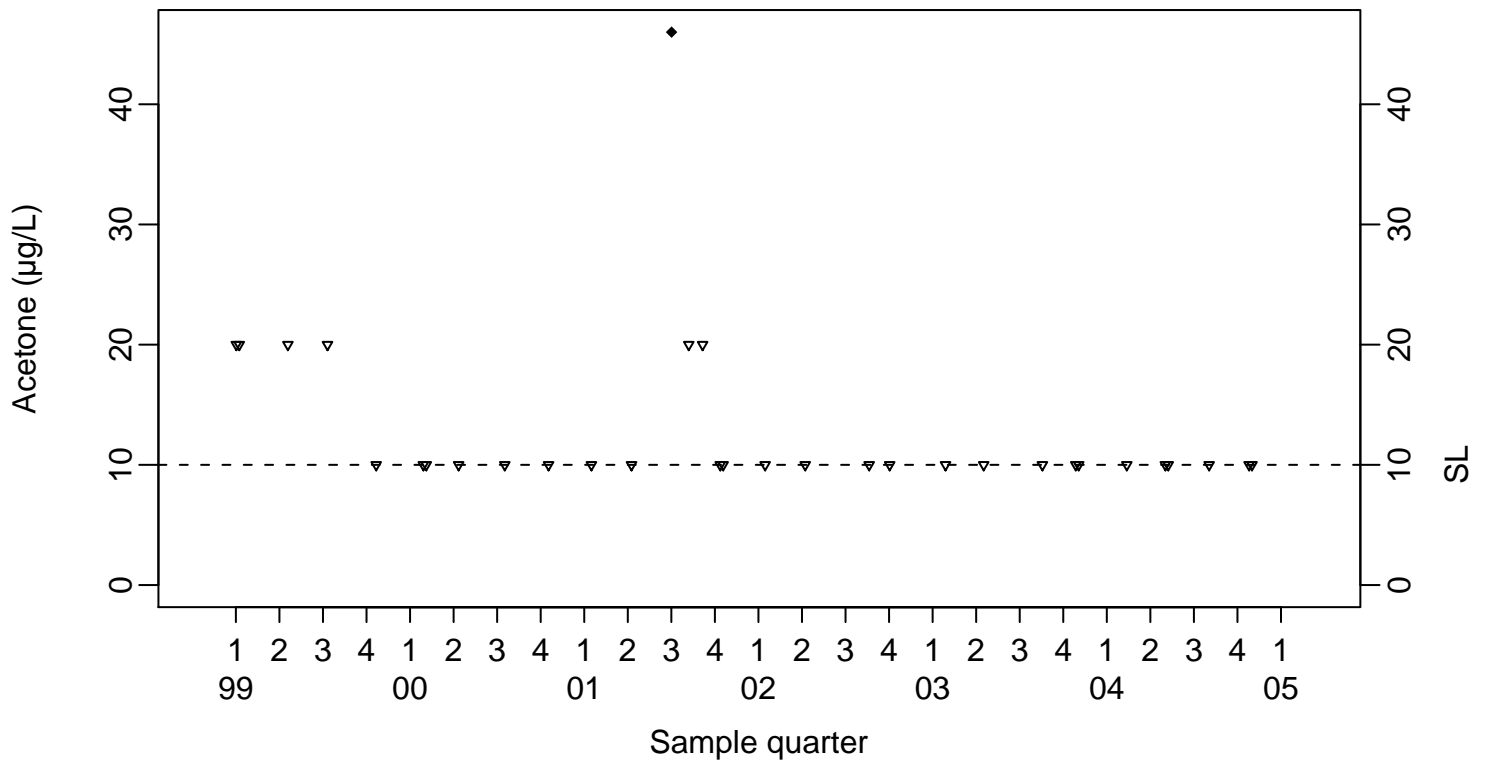
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=10

Compliance Monitoring Point W-817-02

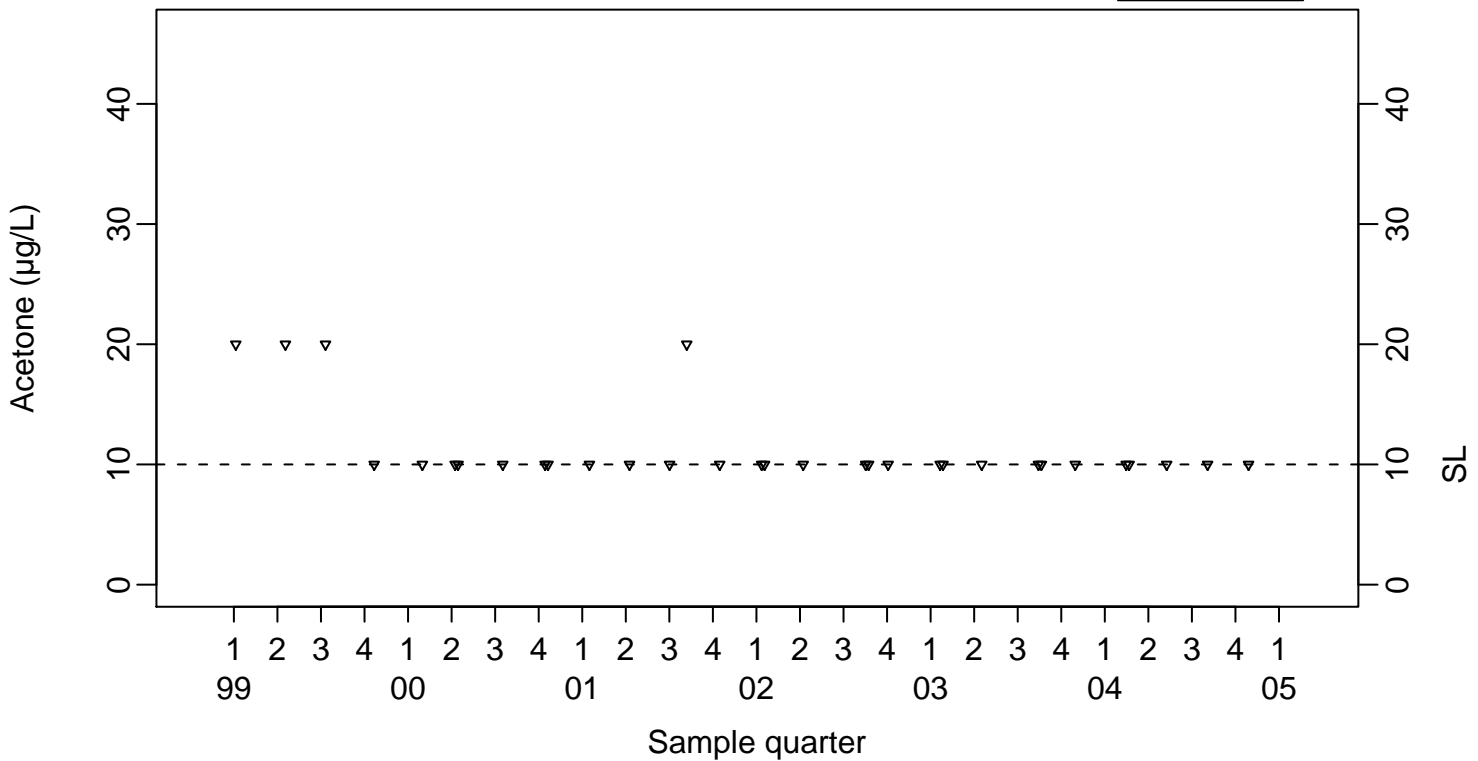


Surface Impoundments Ground Water Acetone ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

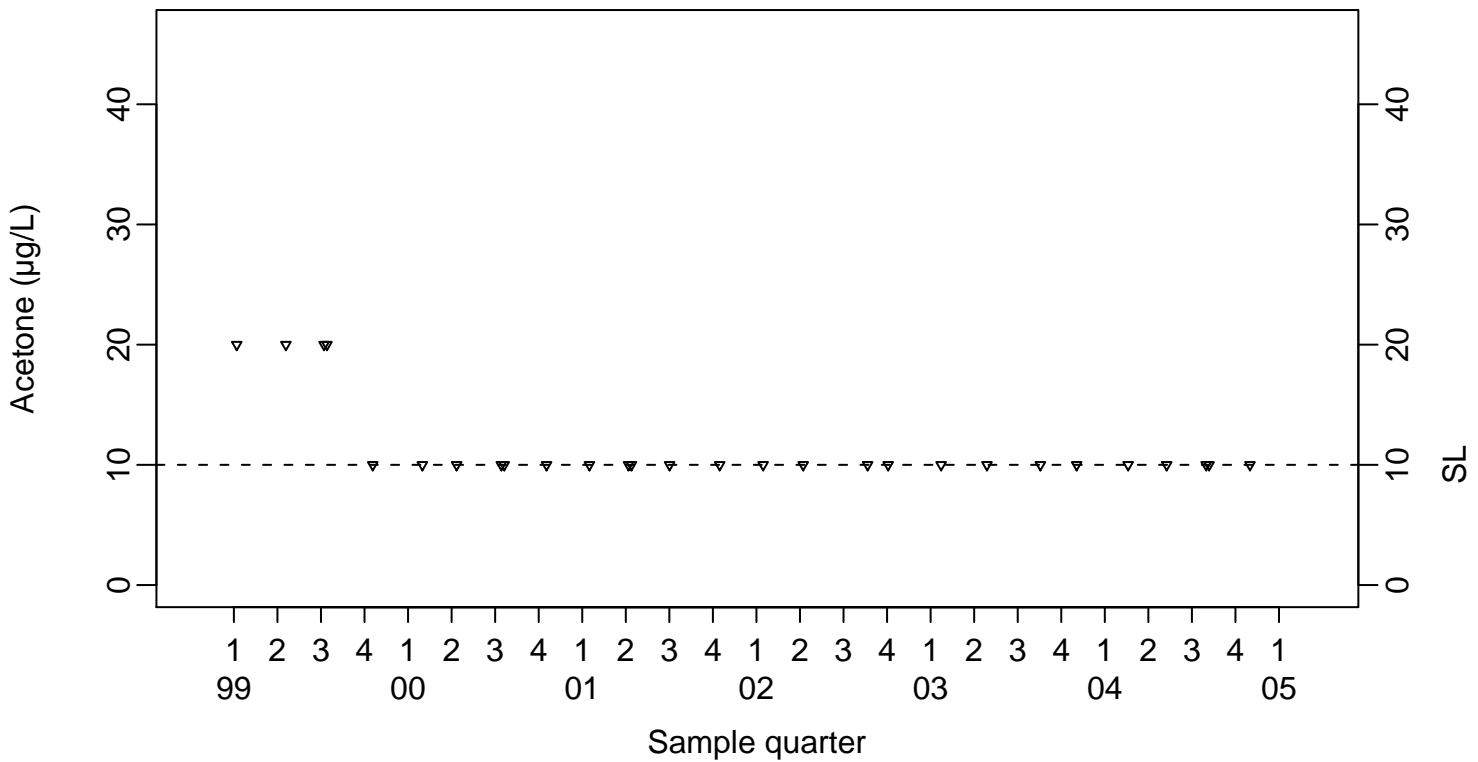
SL=10

◆ Above RL
▽ Below RL



SL=10

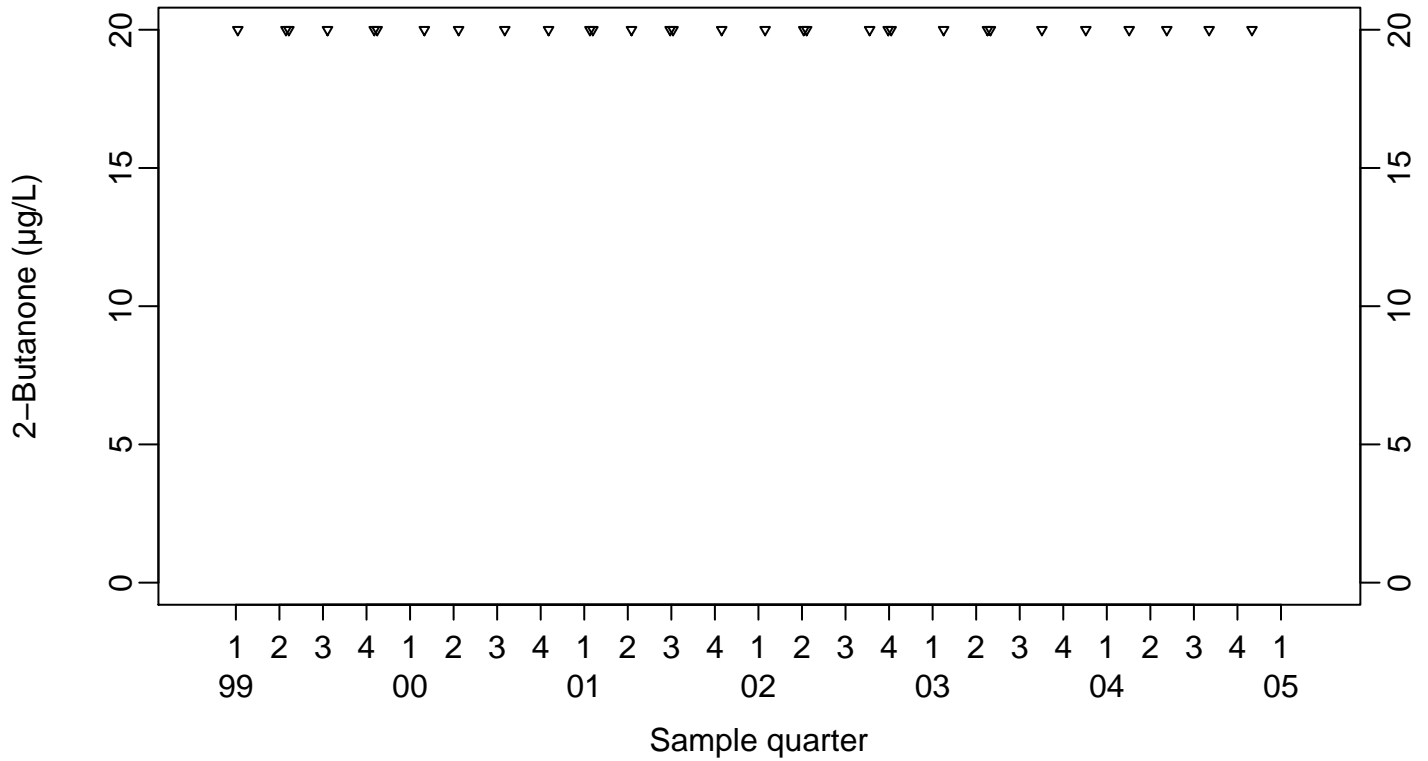
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water 2-Butanone ($\mu\text{g/L}$)

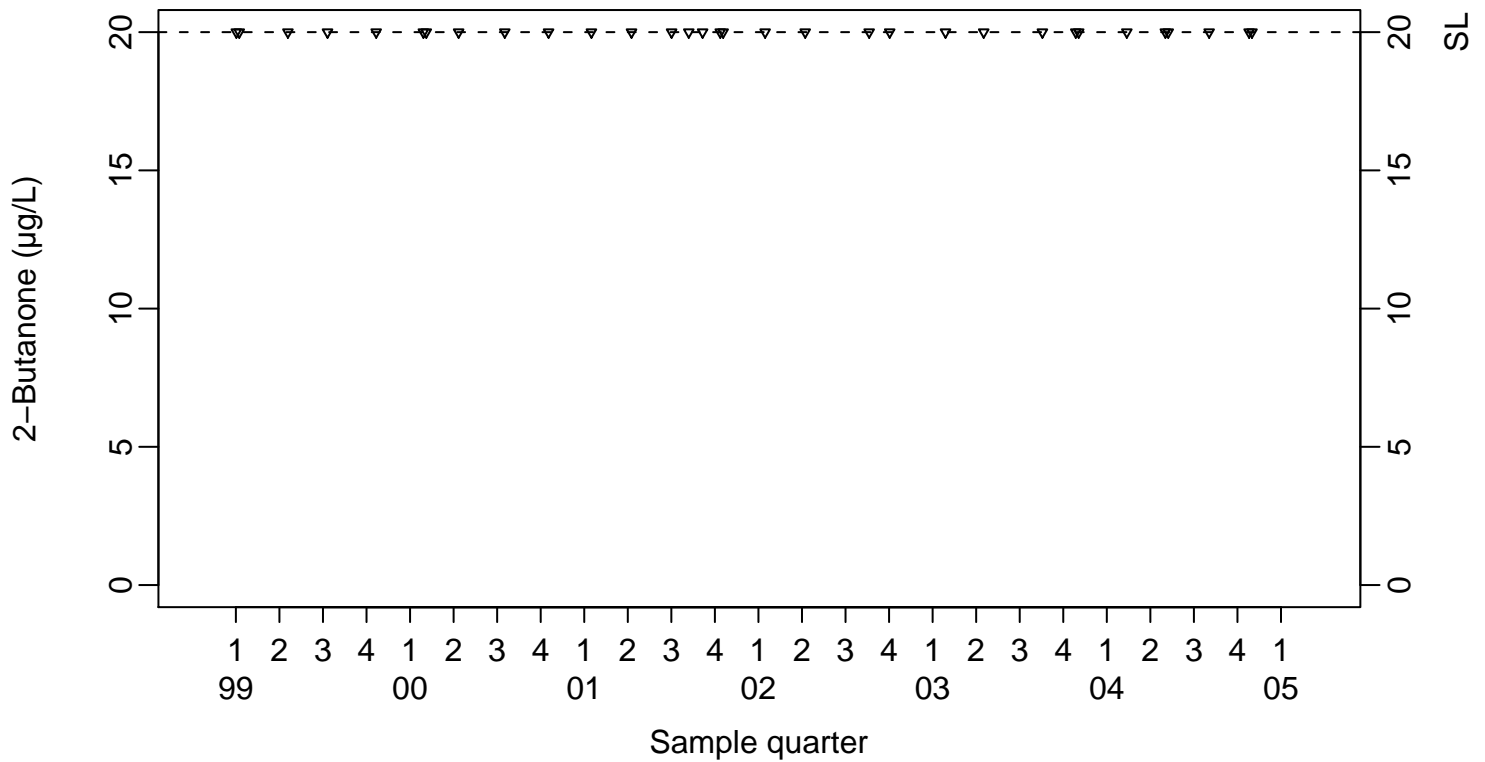
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=20

Compliance Monitoring Point W-817-02

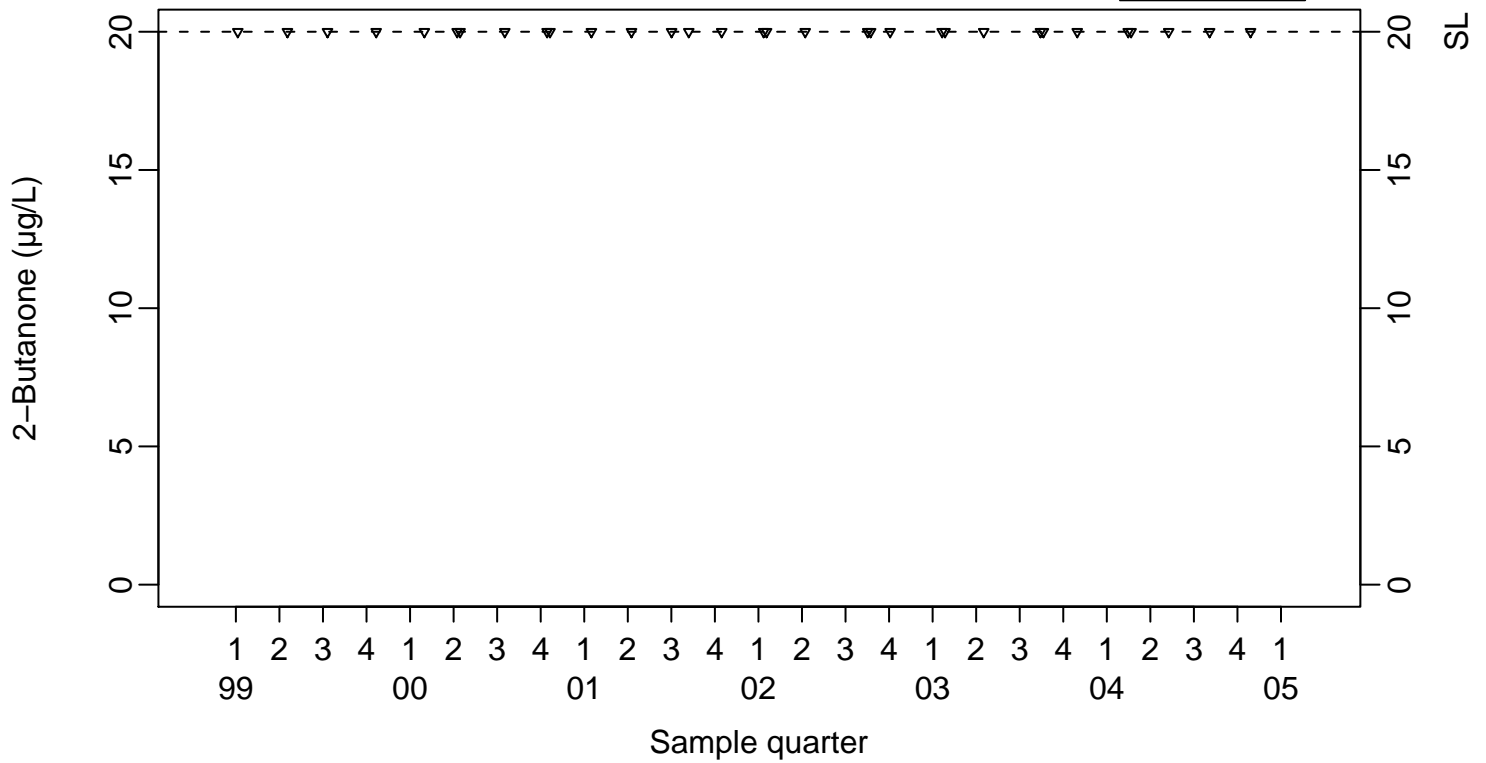


Surface Impoundments Ground Water 2-Butanone ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

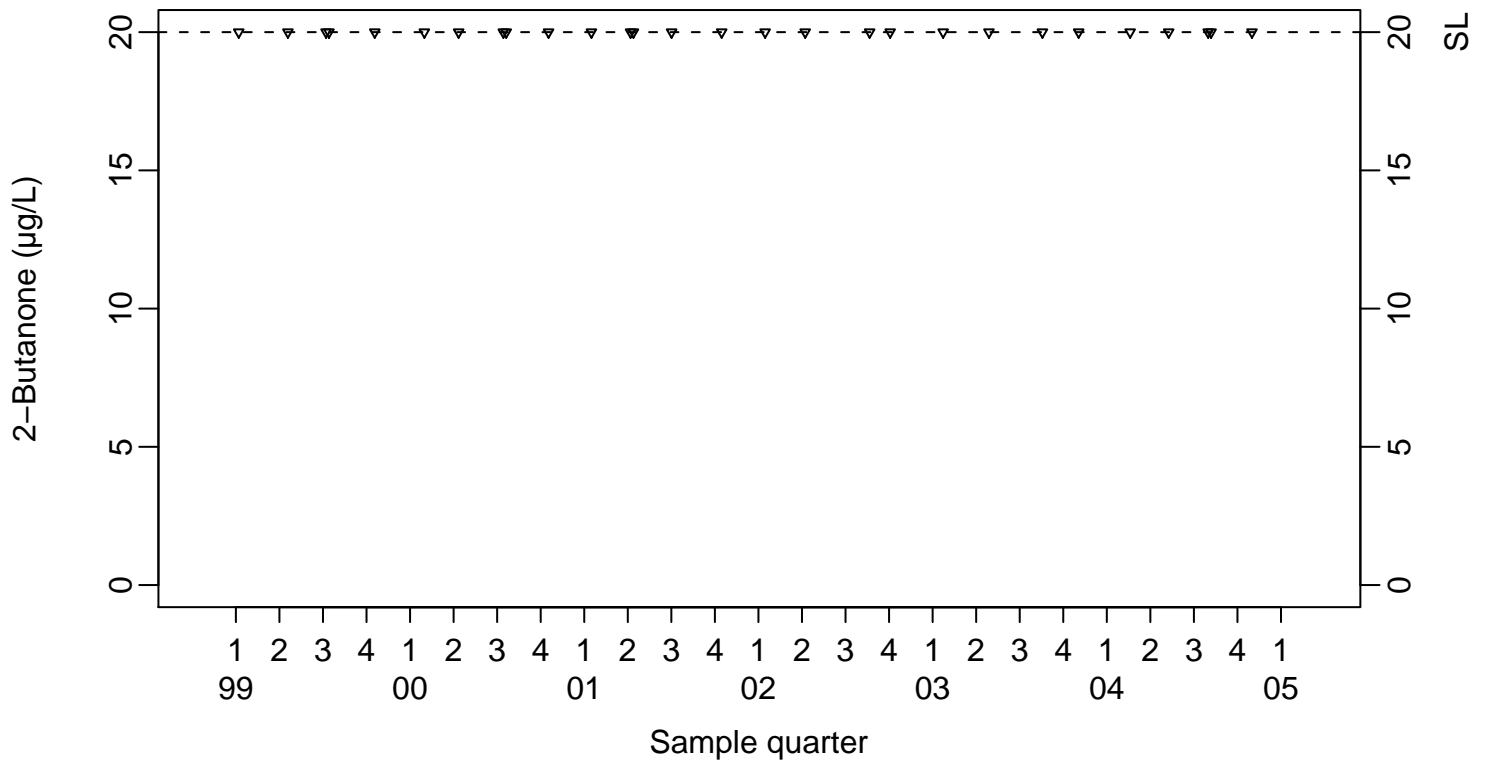
SL=20

◆ Above RL
▽ Below RL



SL=20

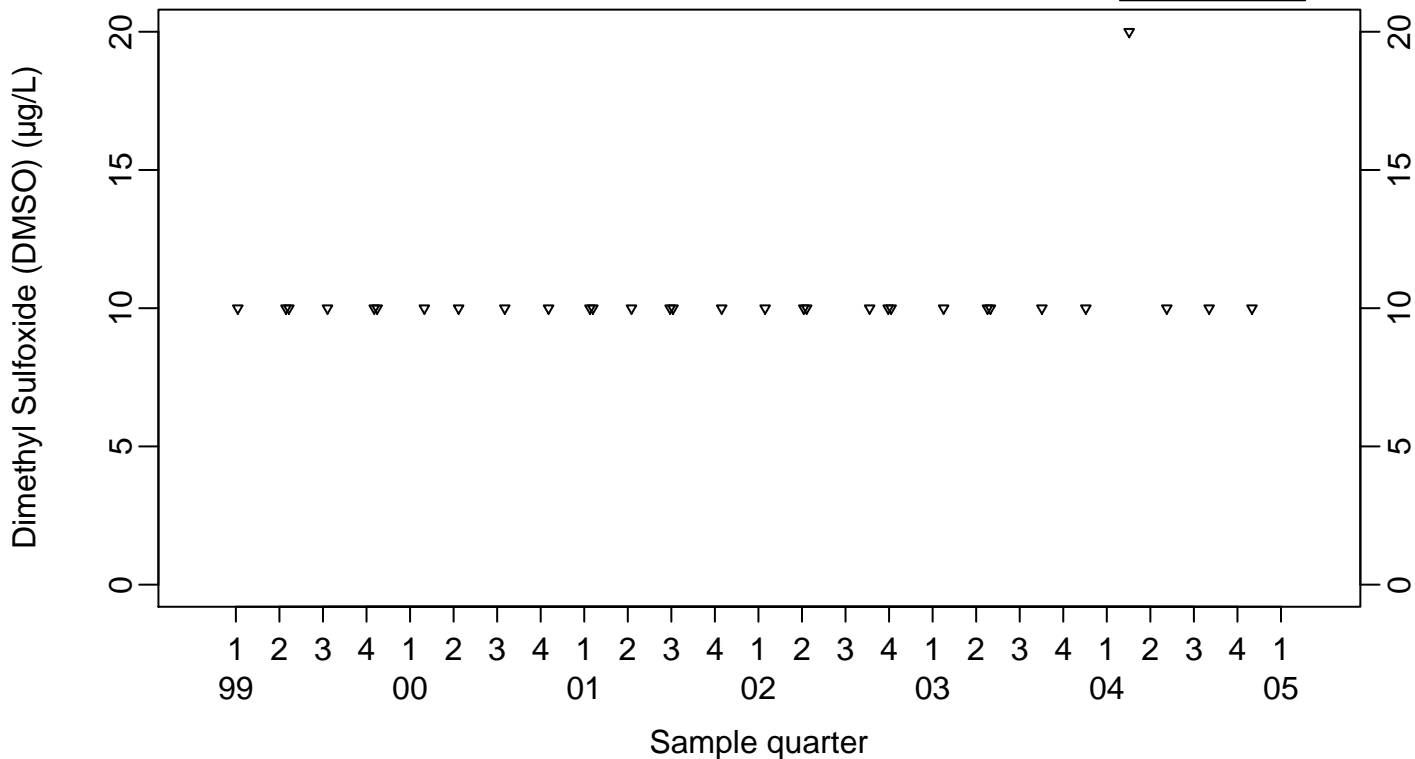
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Dimethyl Sulfoxide (DMSO) ($\mu\text{g/L}$)

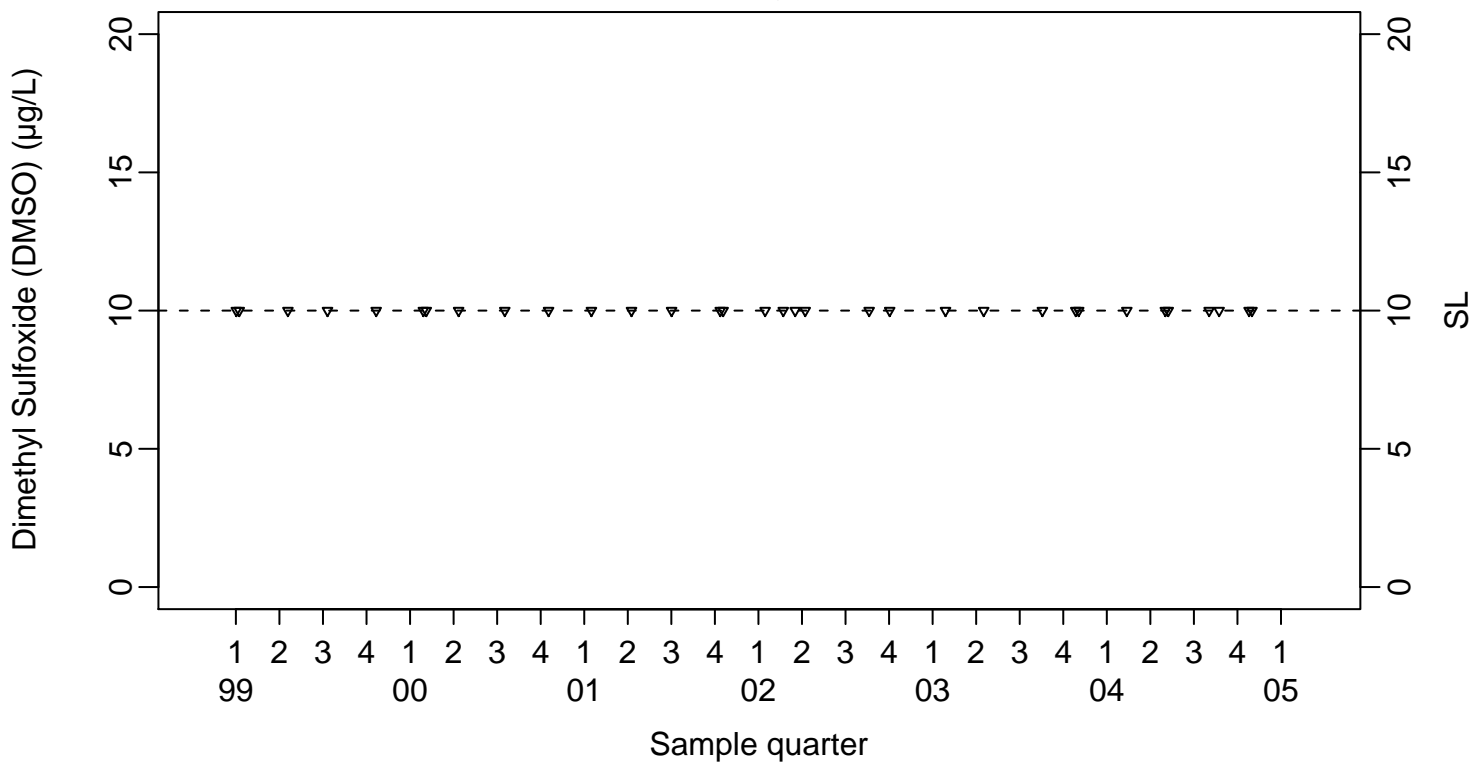
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=10

Compliance Monitoring Point W-817-02

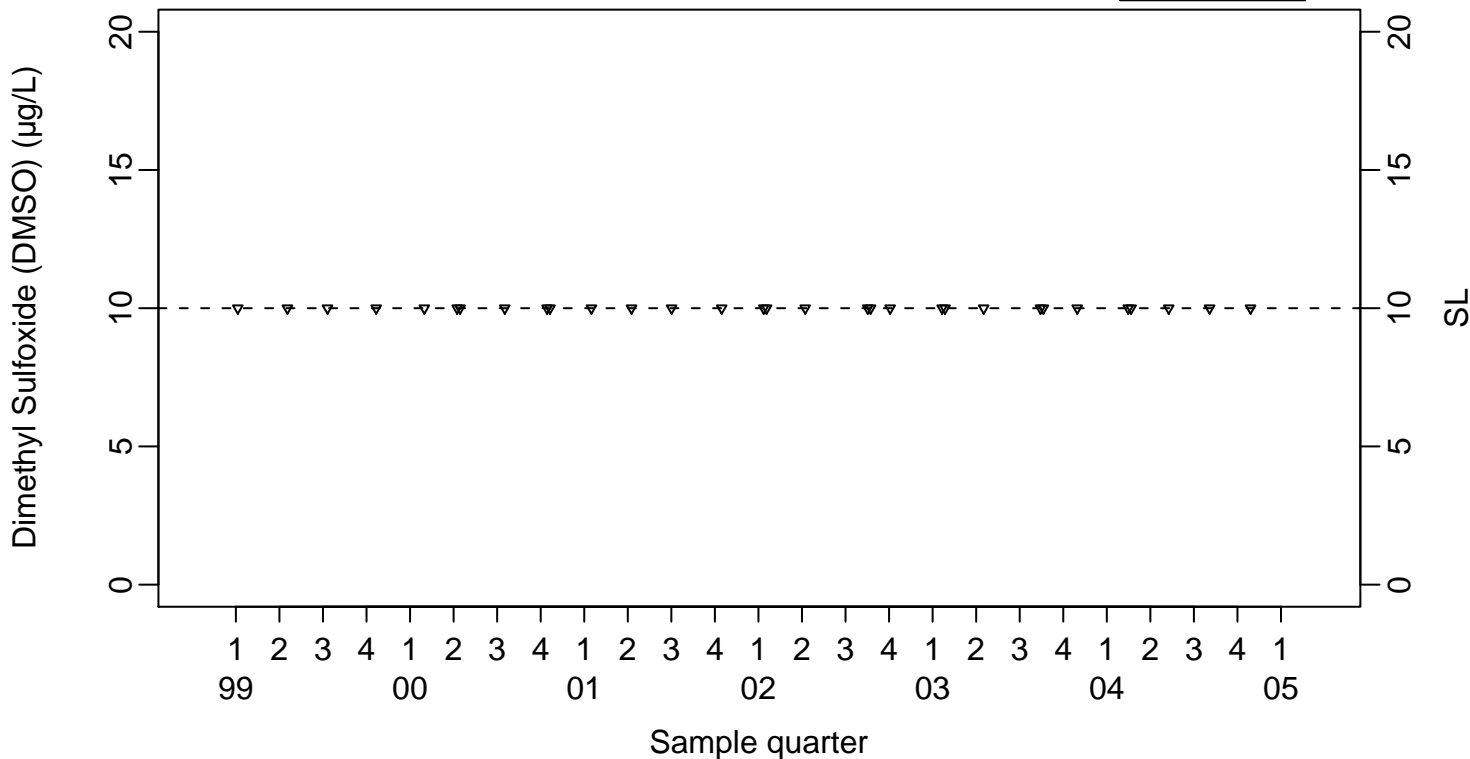


Surface Impoundments Ground Water Dimethyl Sulfoxide (DMSO) ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

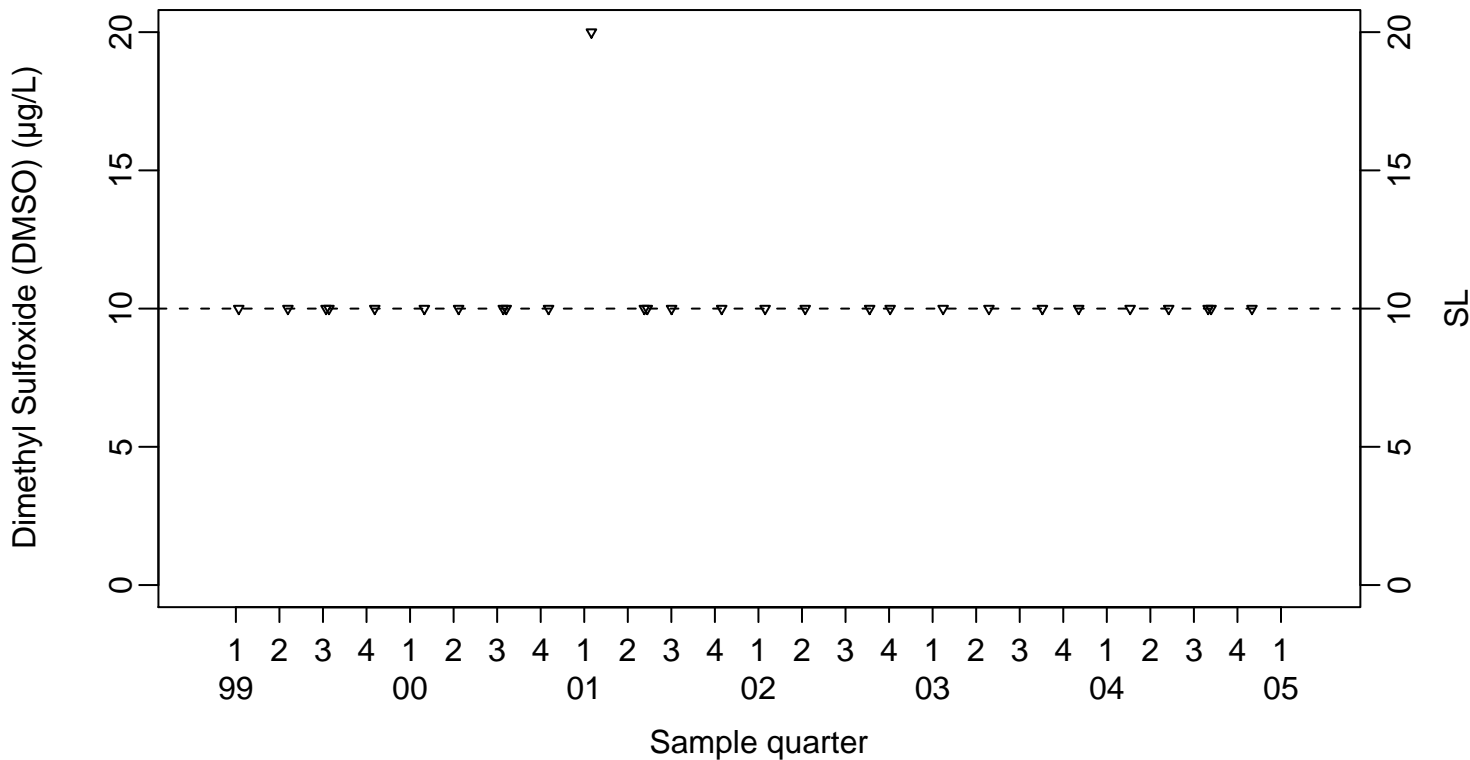
SL=10

◆ Above RL
▽ Below RL

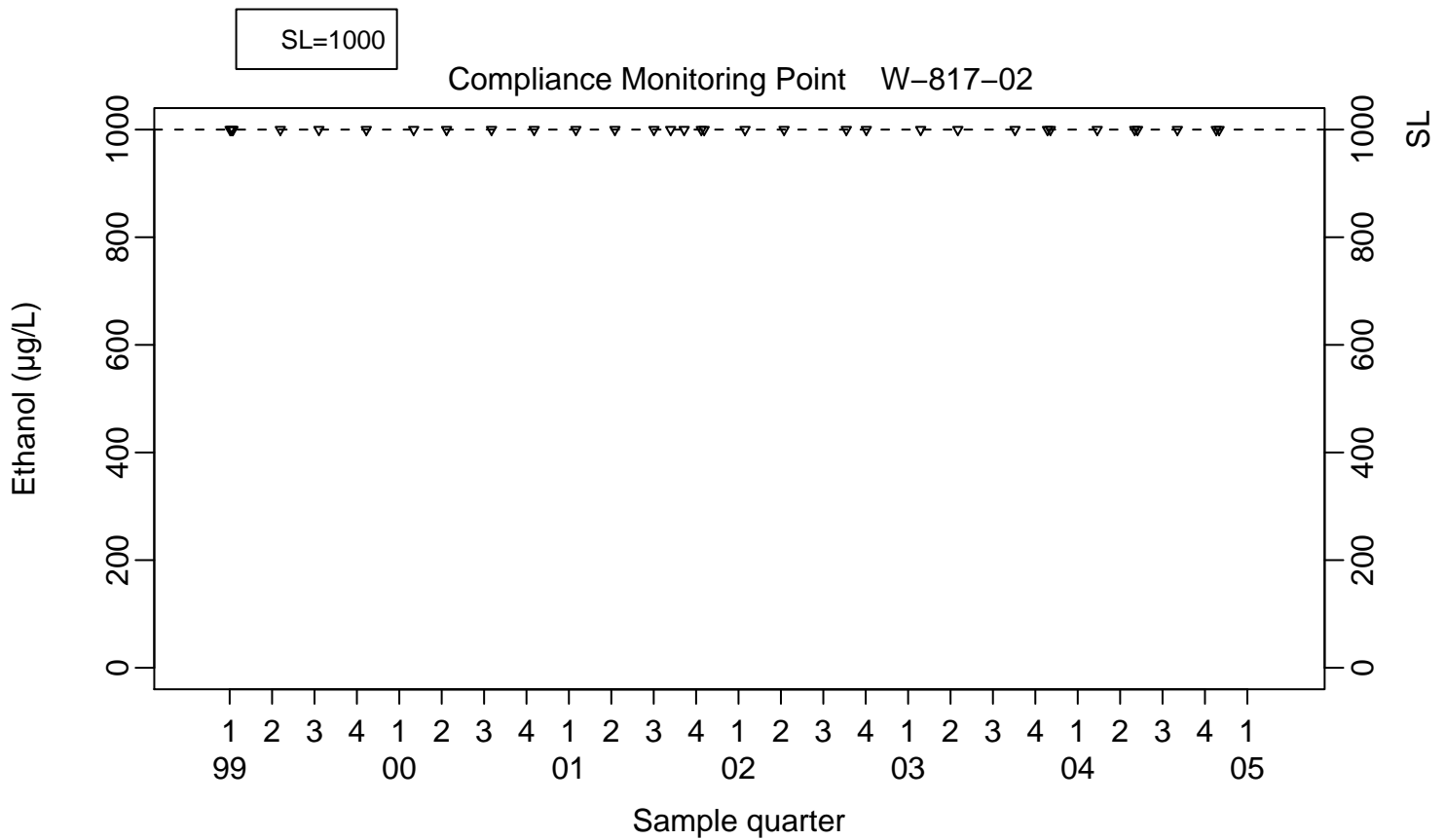
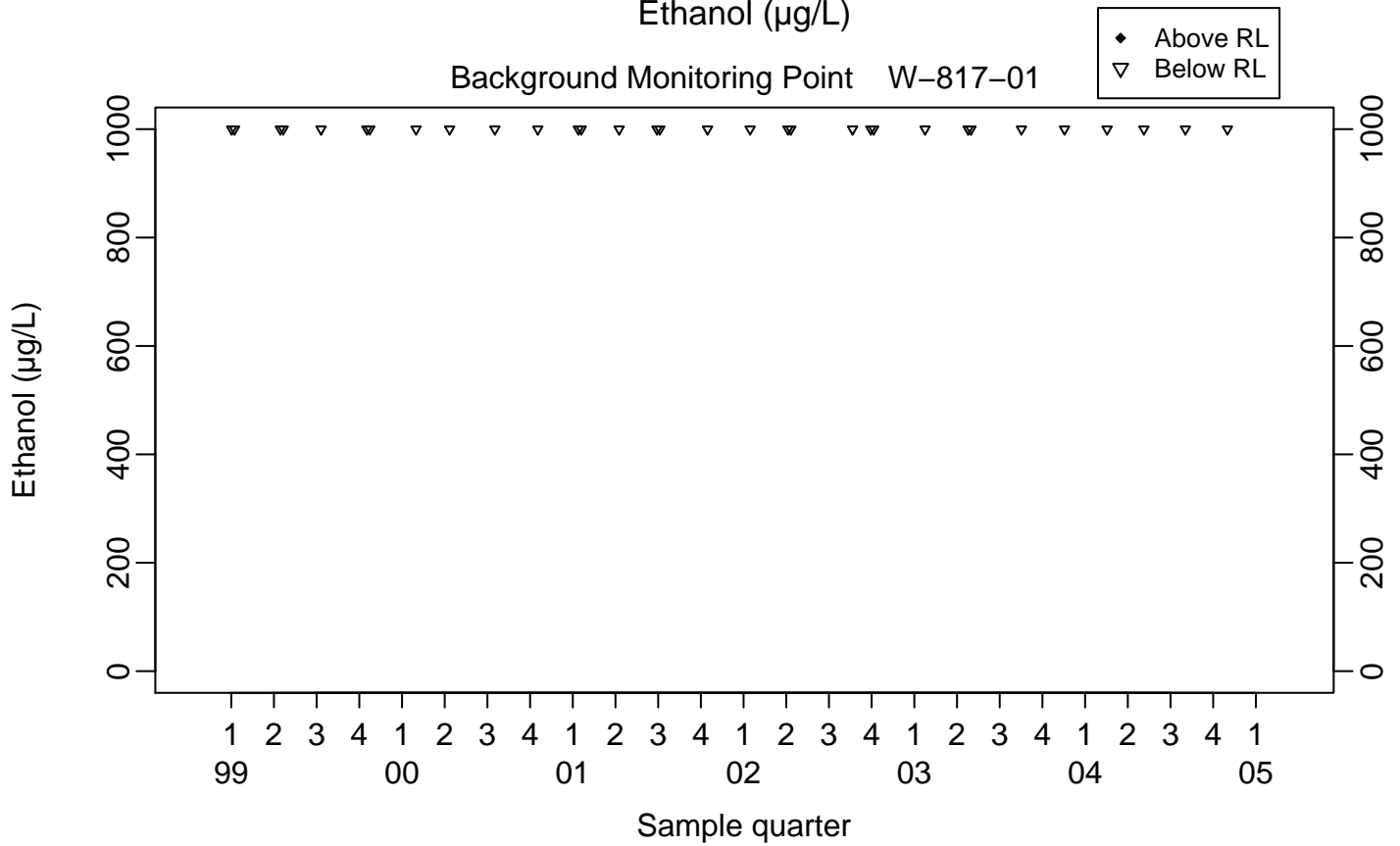


SL=10

Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Ethanol ($\mu\text{g/L}$)

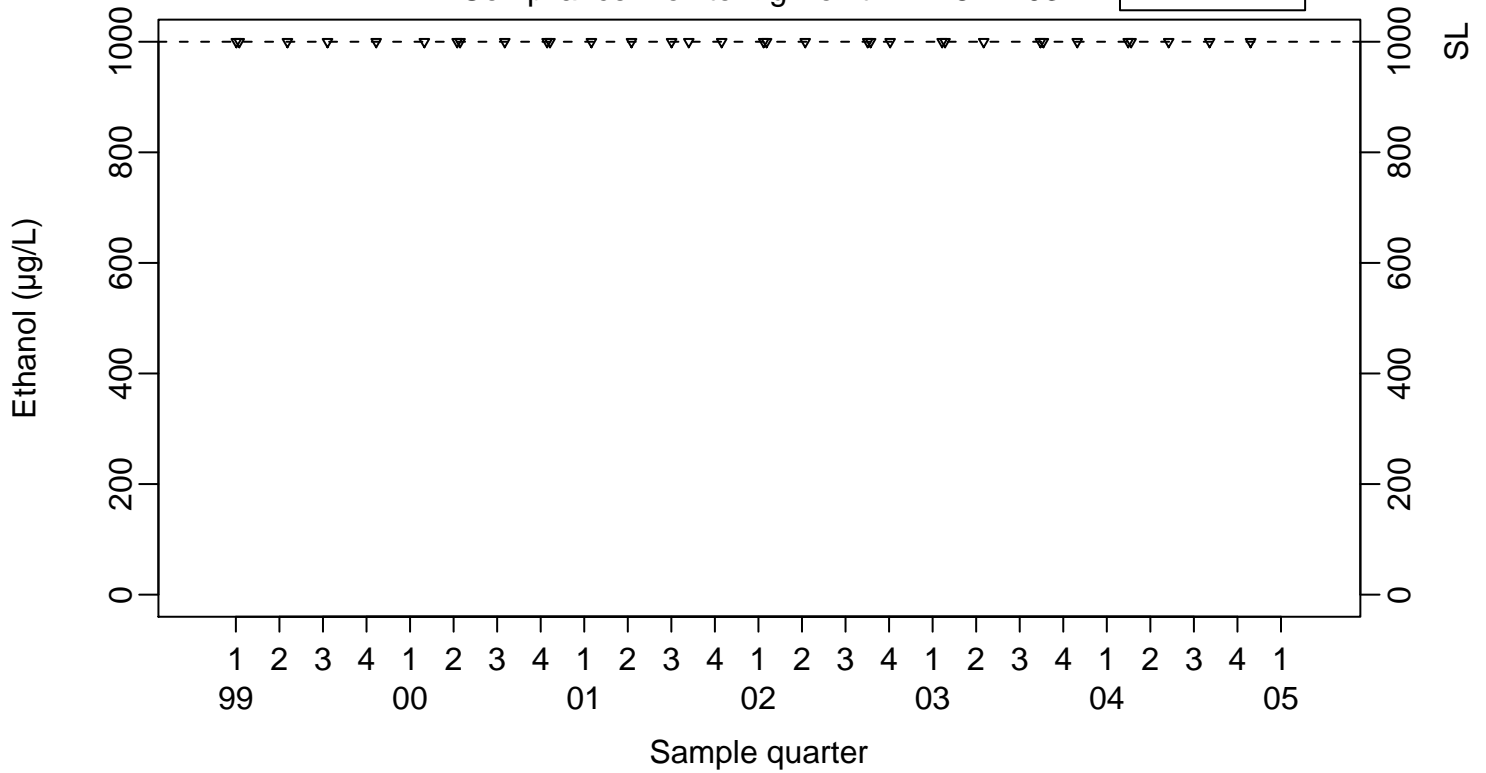


Surface Impoundments Ground Water Ethanol ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

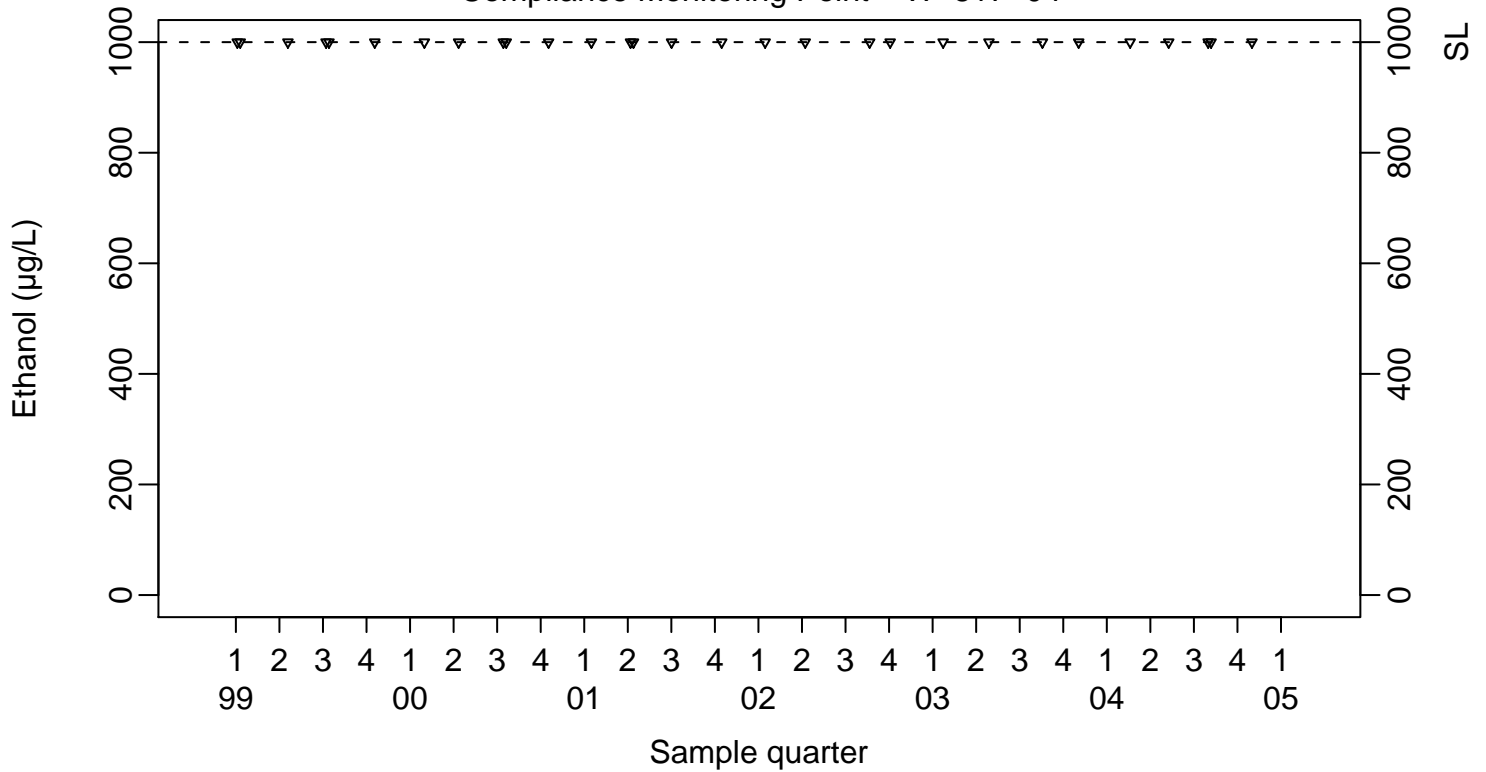
SL=1000

◆ Above RL
▽ Below RL



SL=1000

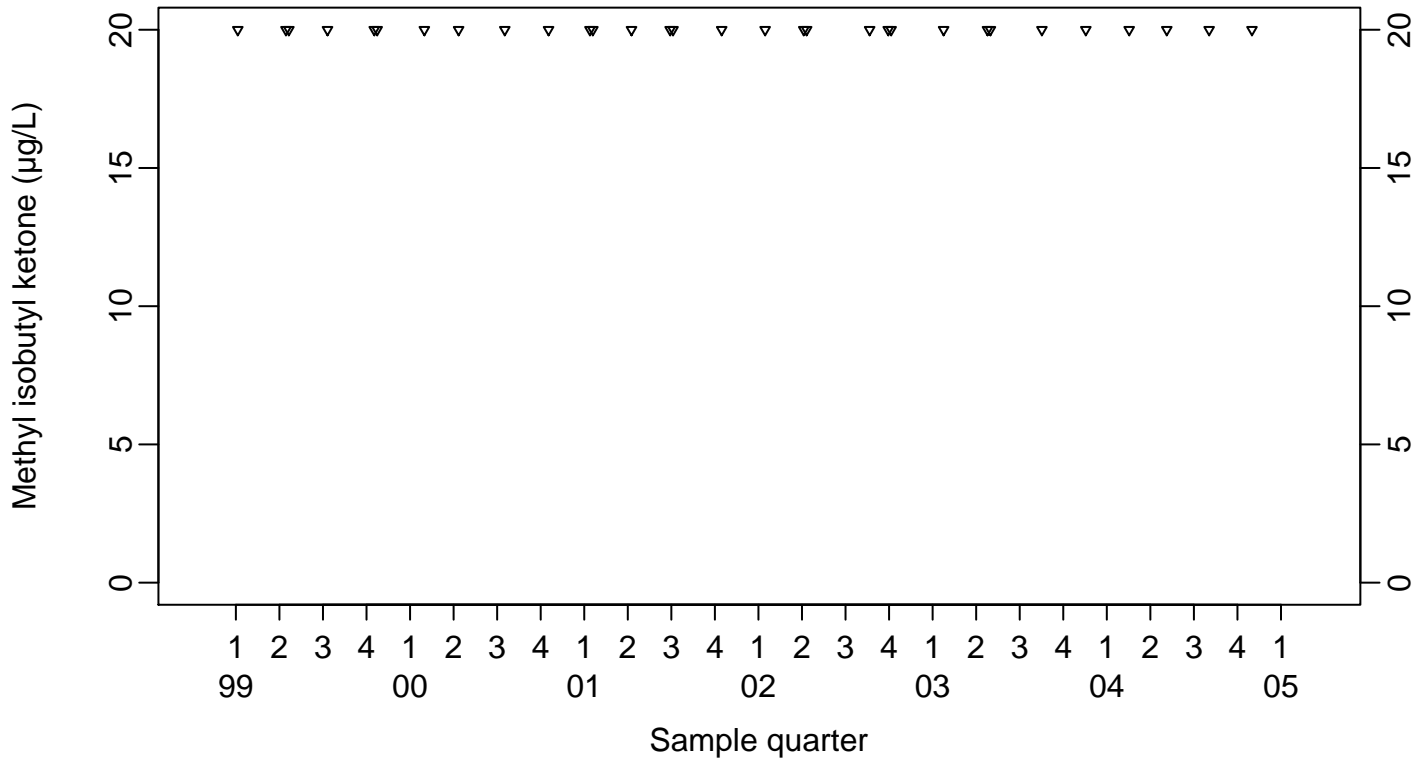
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Methyl isobutyl ketone ($\mu\text{g/L}$)

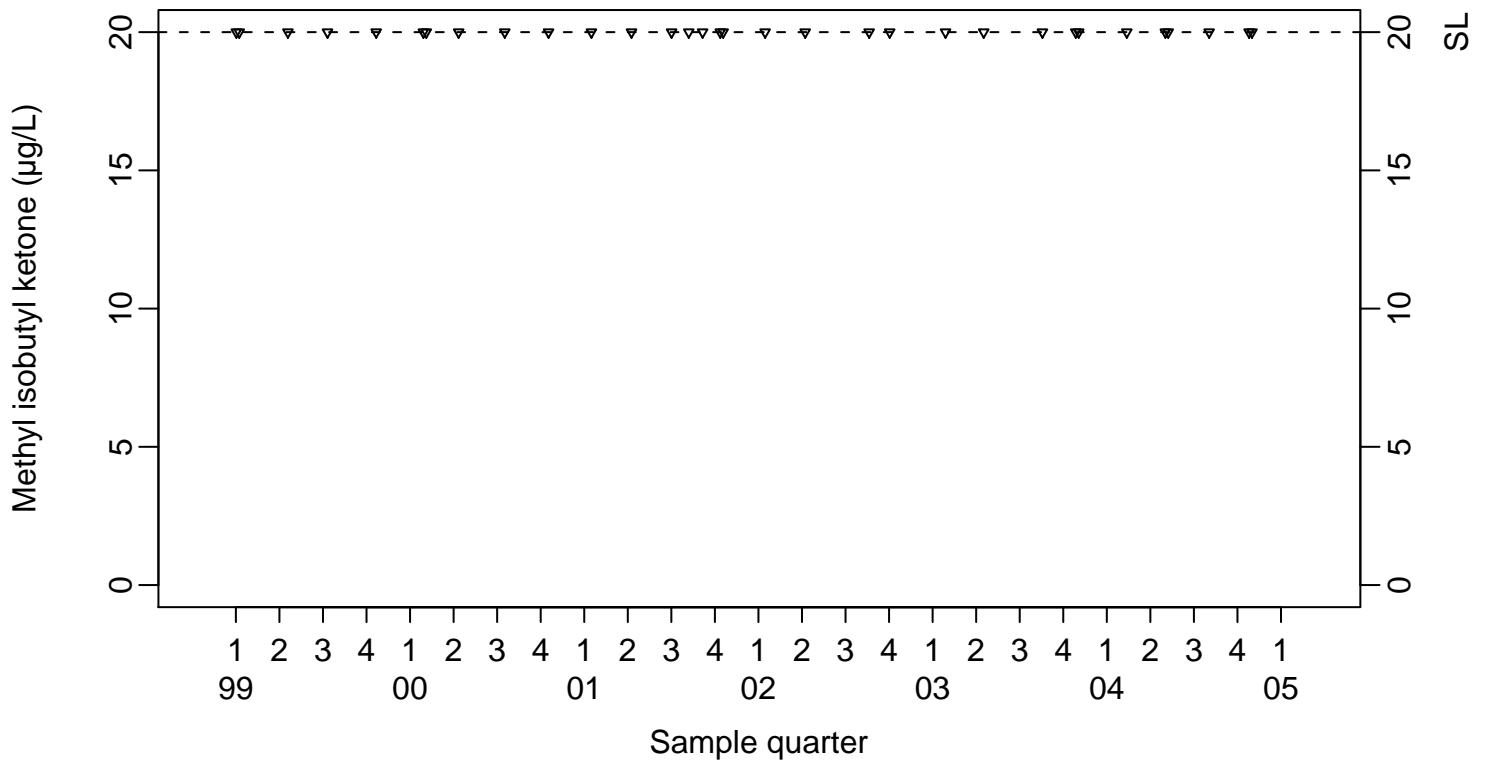
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=20

Compliance Monitoring Point W-817-02

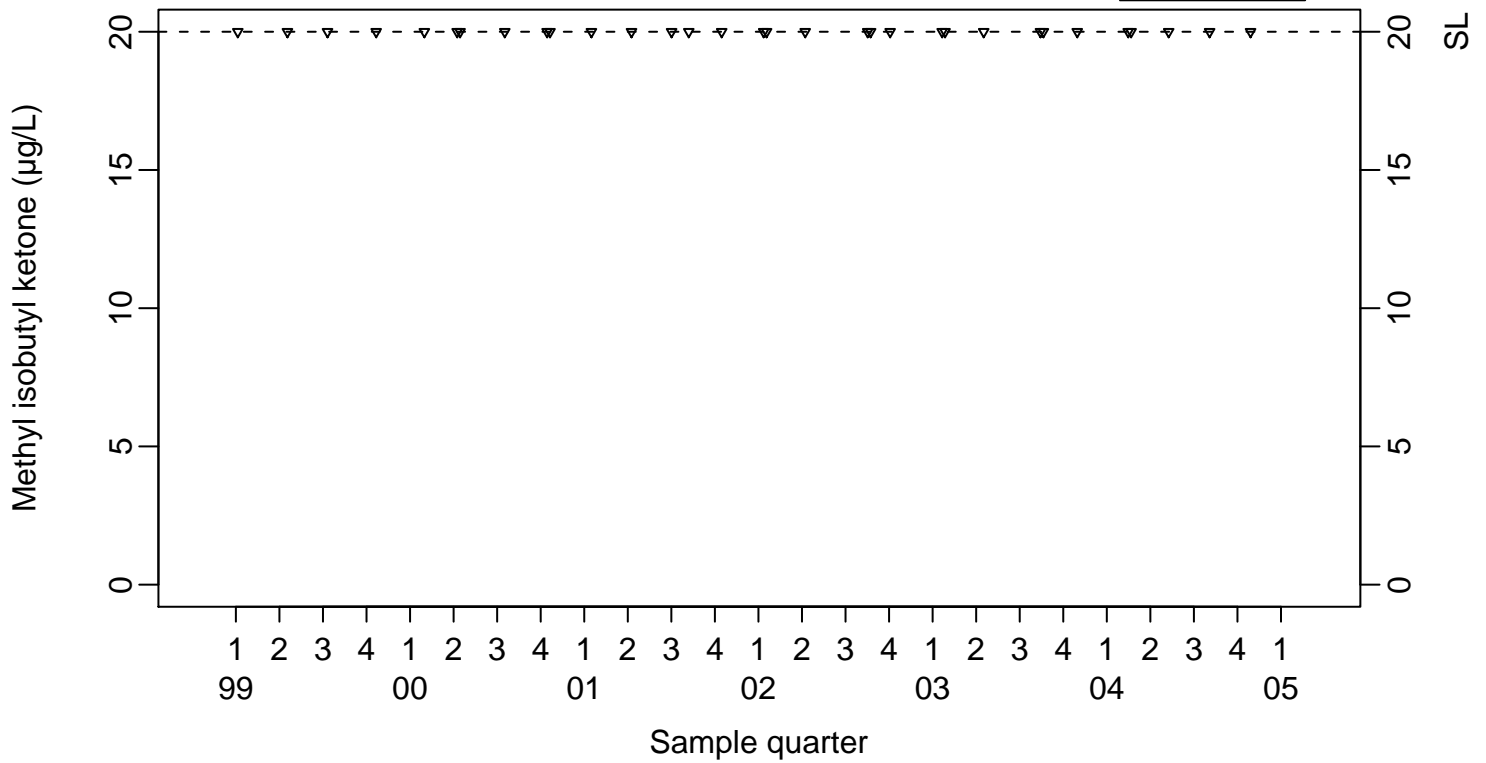


Surface Impoundments Ground Water Methyl isobutyl ketone ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

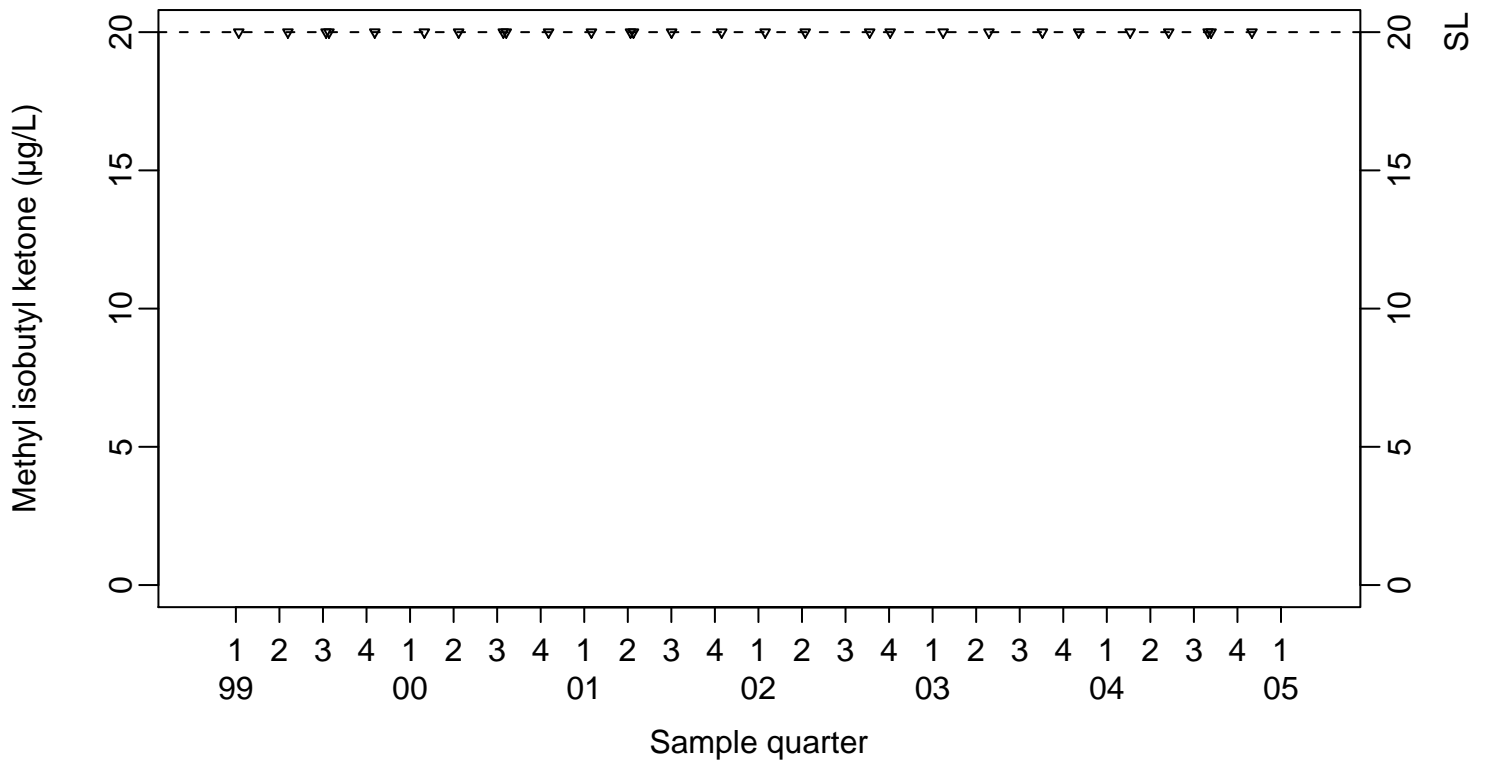
SL=20

◆ Above RL
▽ Below RL



SL=20

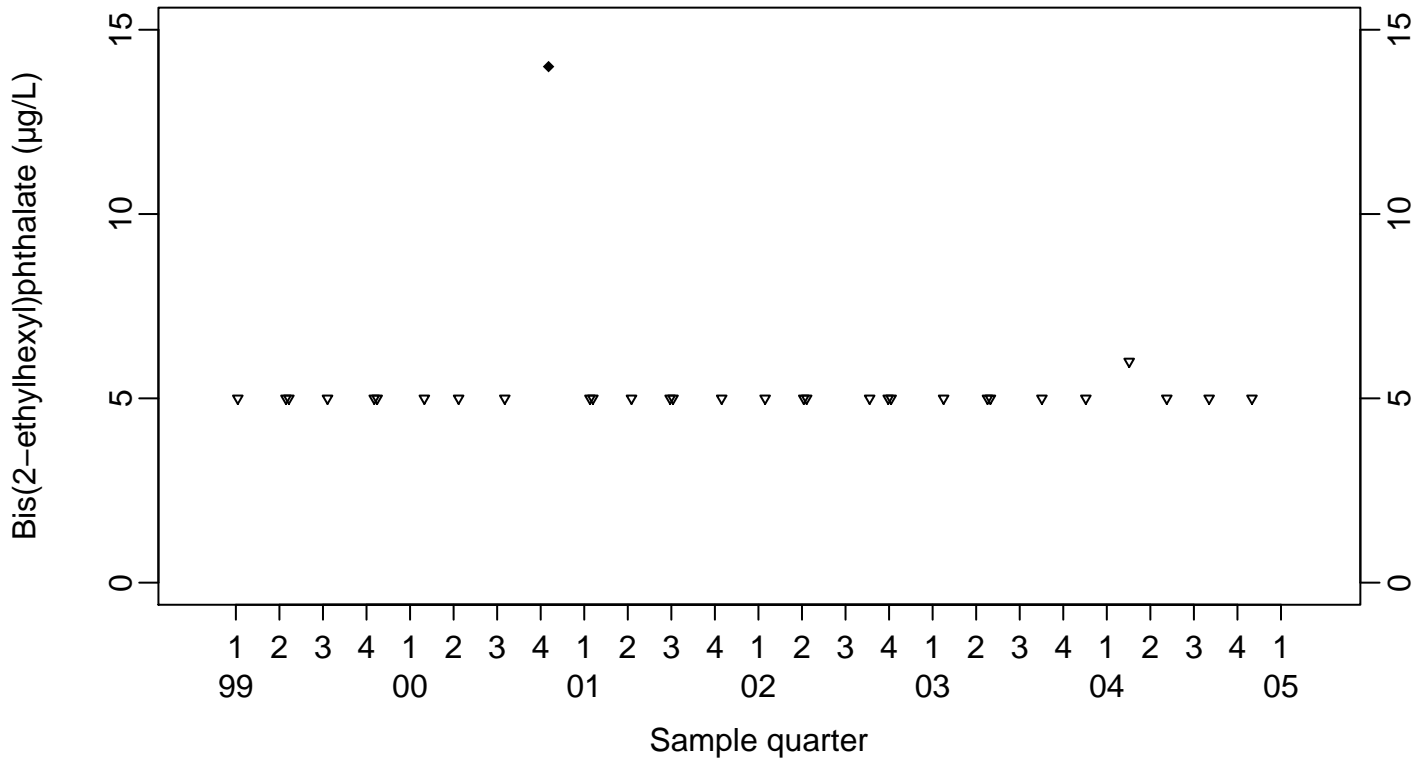
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Bis(2-ethylhexyl)phthalate ($\mu\text{g/L}$)

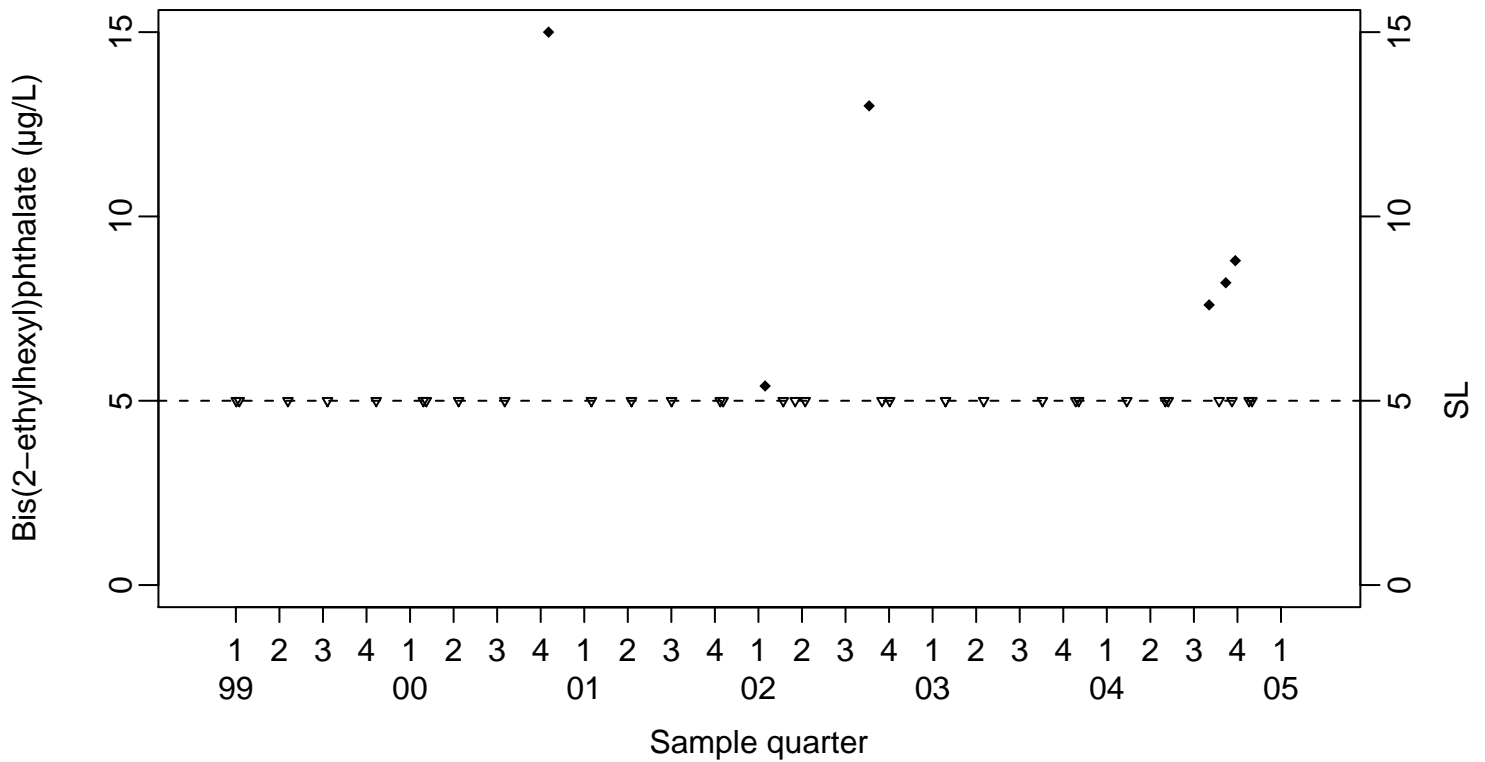
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=5

Compliance Monitoring Point W-817-02

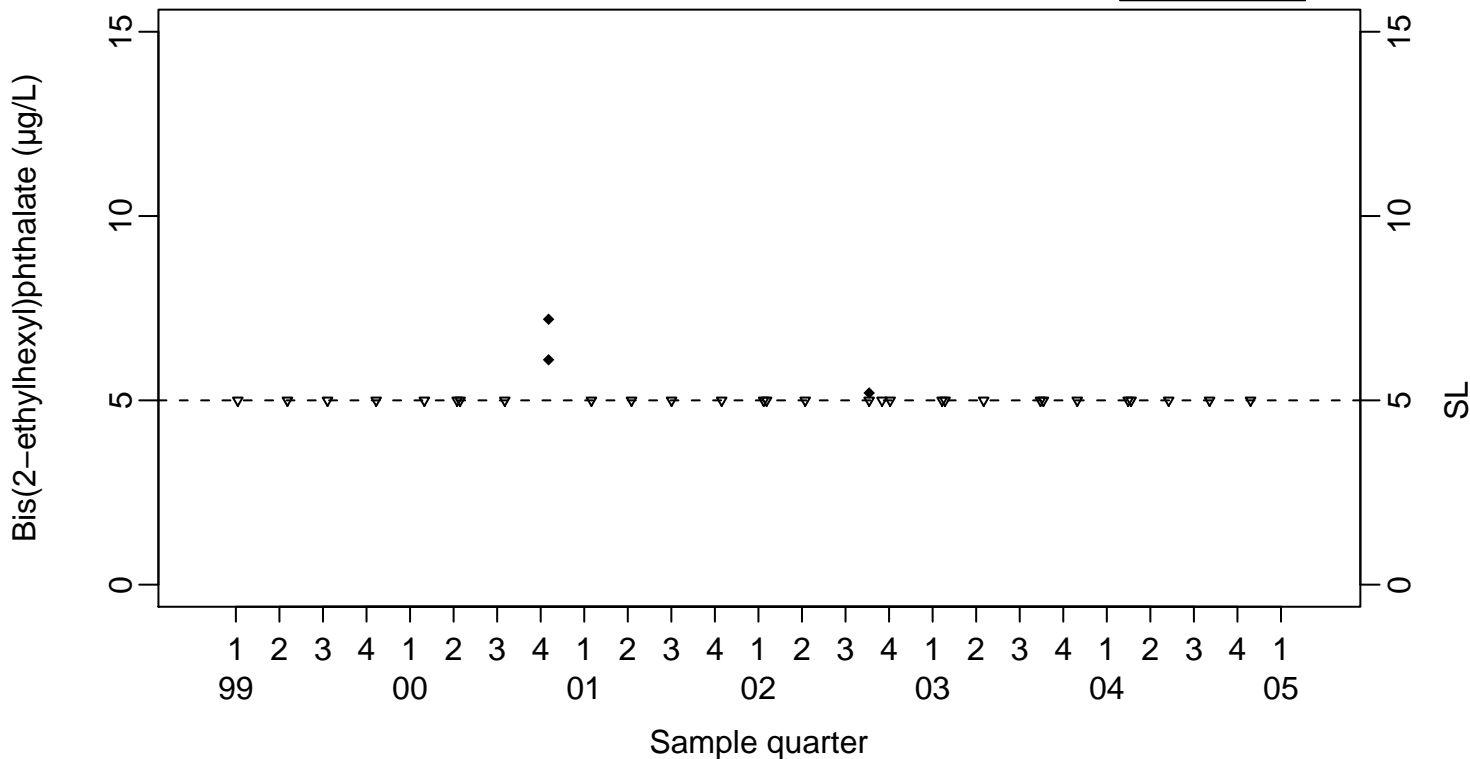


Surface Impoundments Ground Water Bis(2-ethylhexyl)phthalate ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

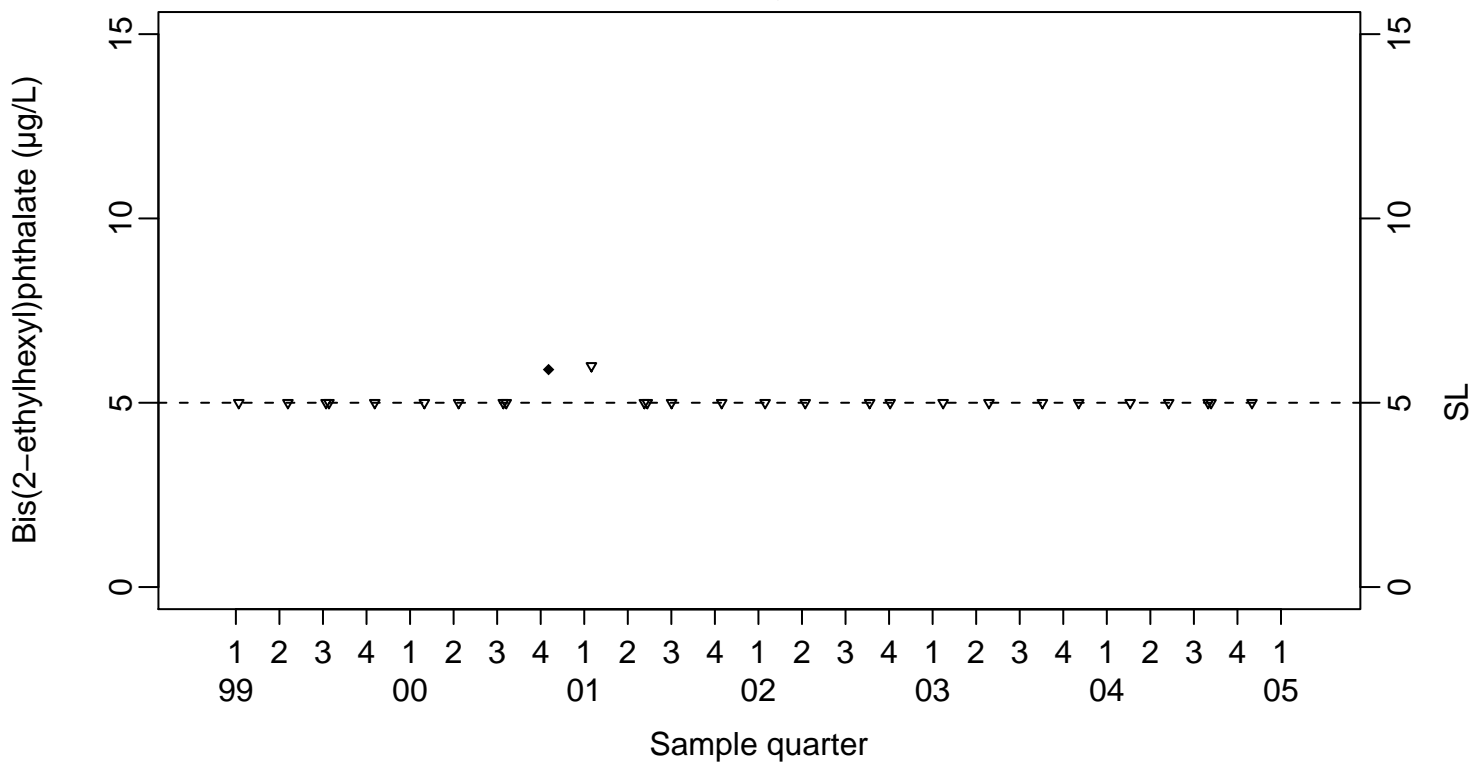
SL=5

◆ Above RL
▽ Below RL



SL=5

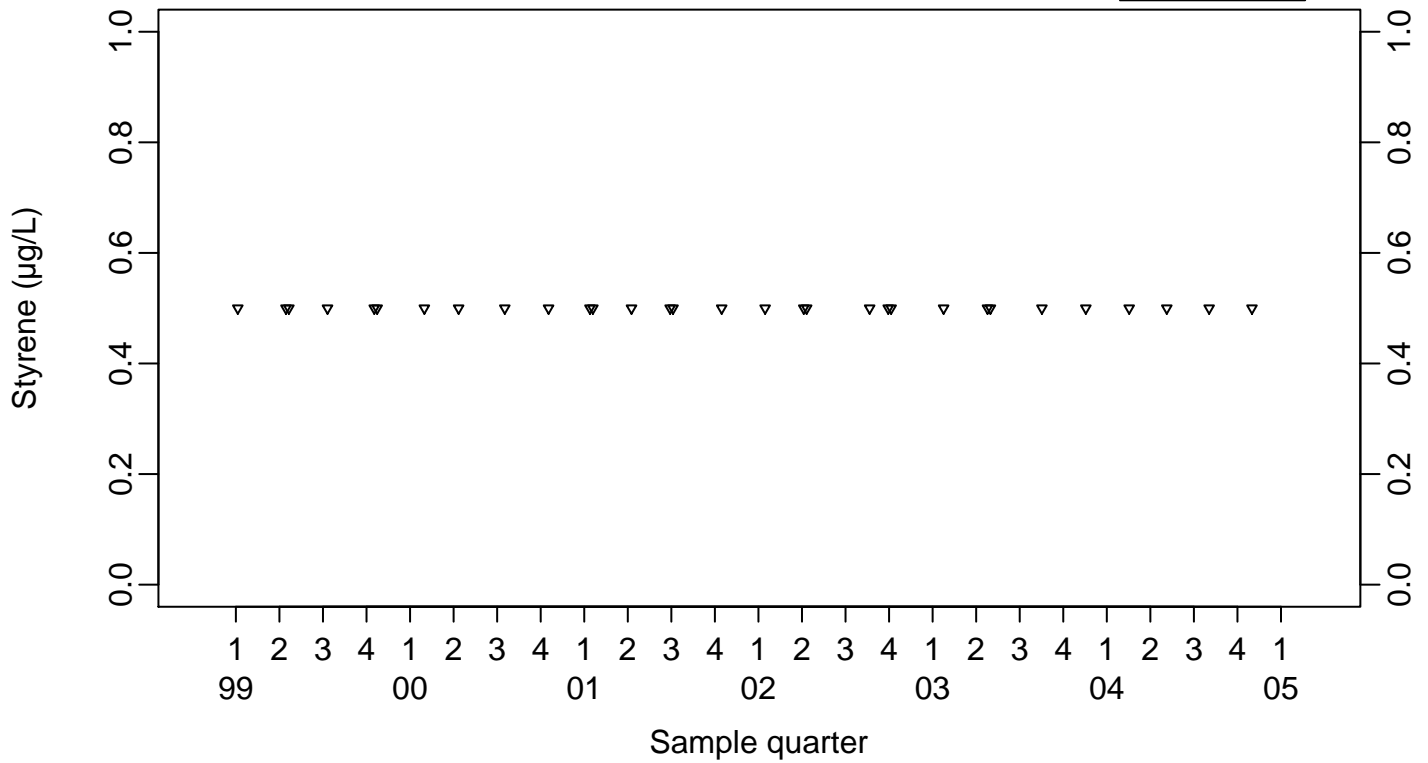
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Styrene ($\mu\text{g/L}$)

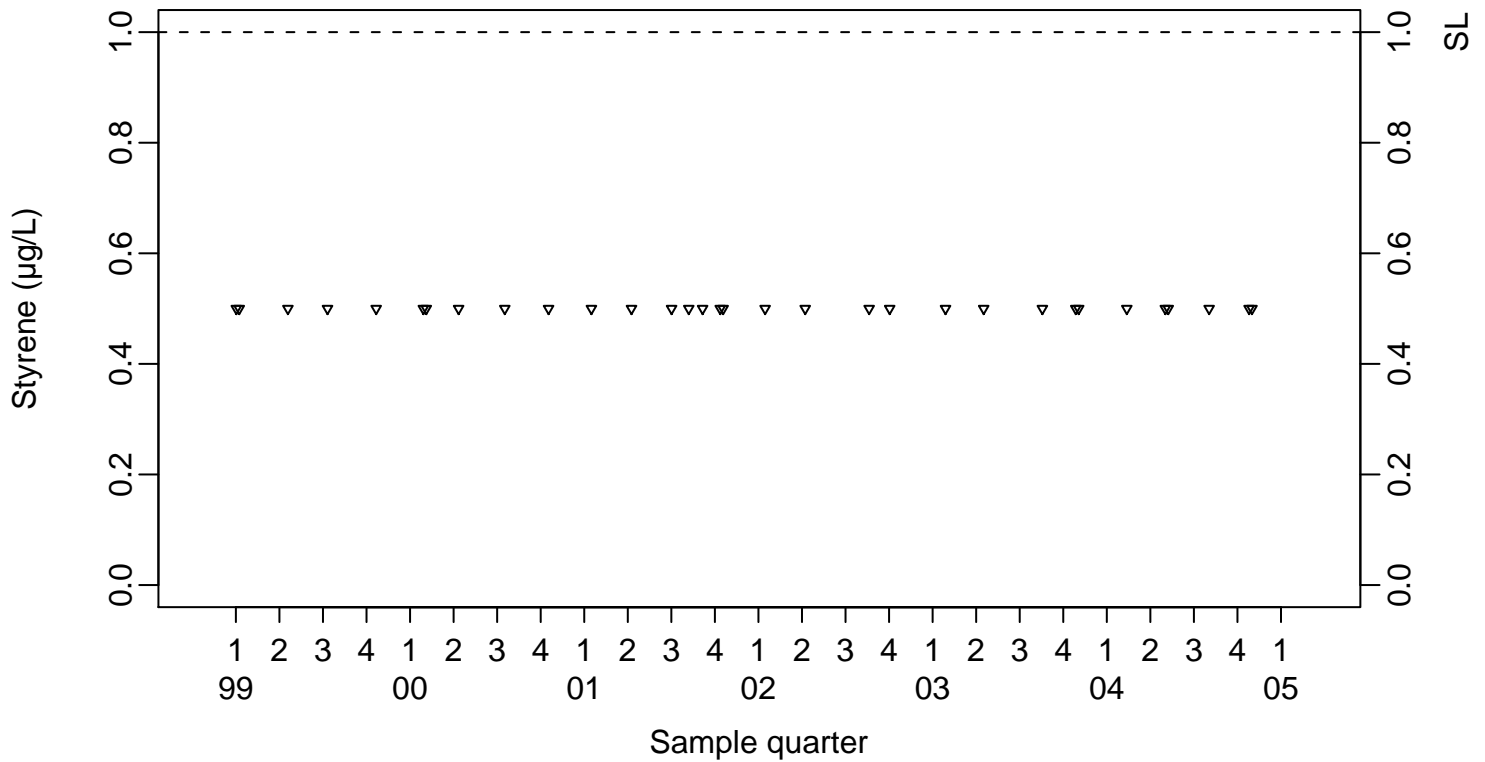
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=1

Compliance Monitoring Point W-817-02

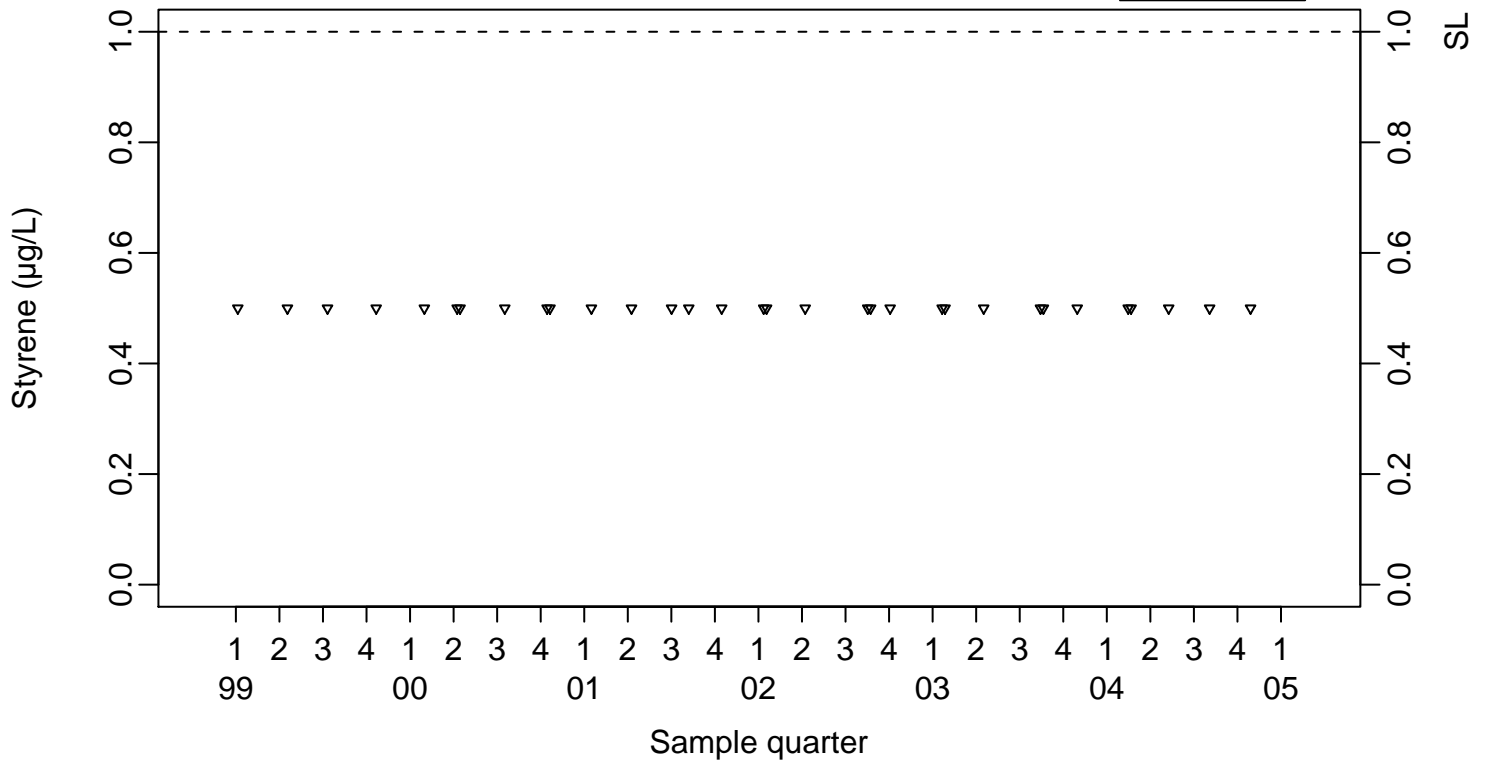


Surface Impoundments Ground Water Styrene ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

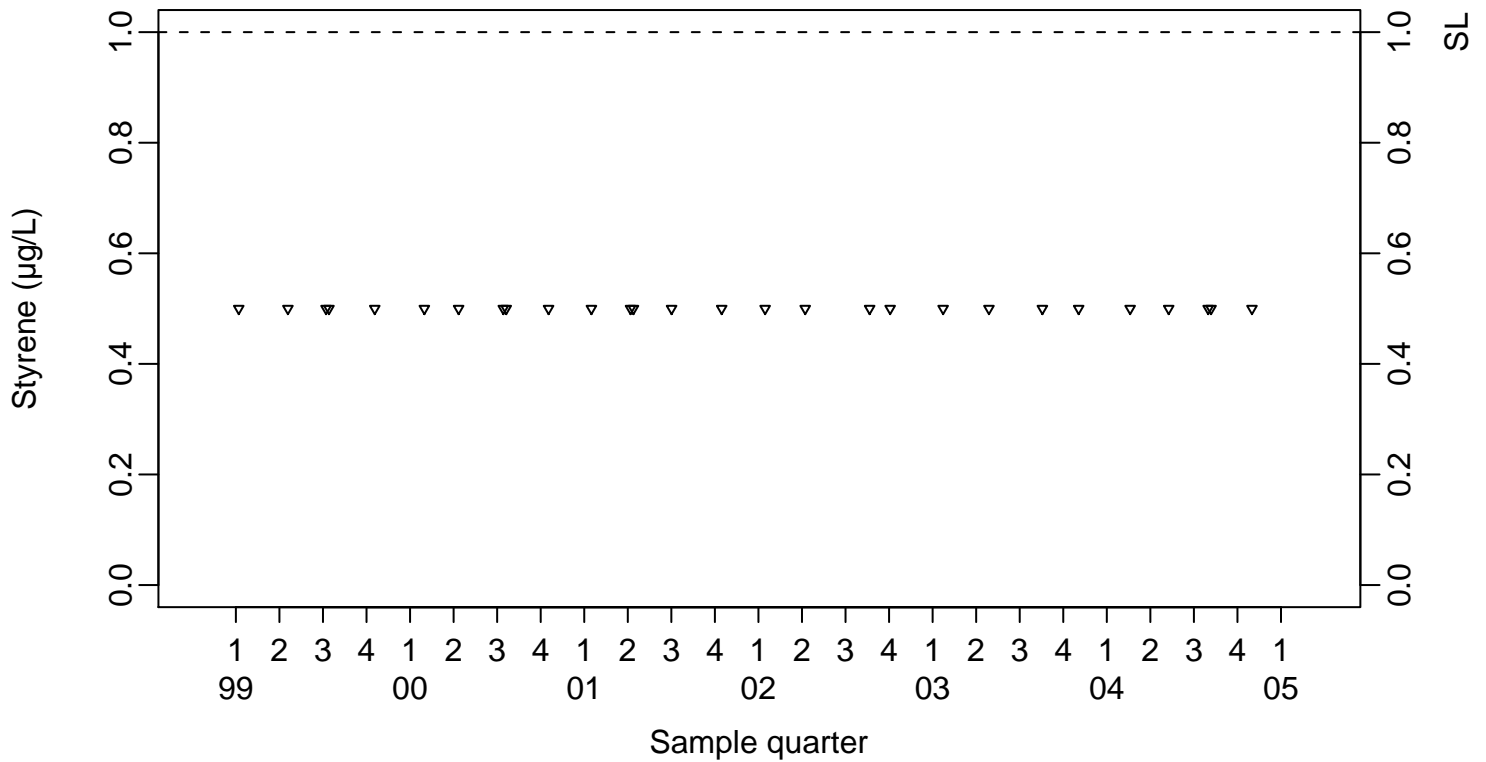
SL=1

◆ Above RL
▽ Below RL



SL=1

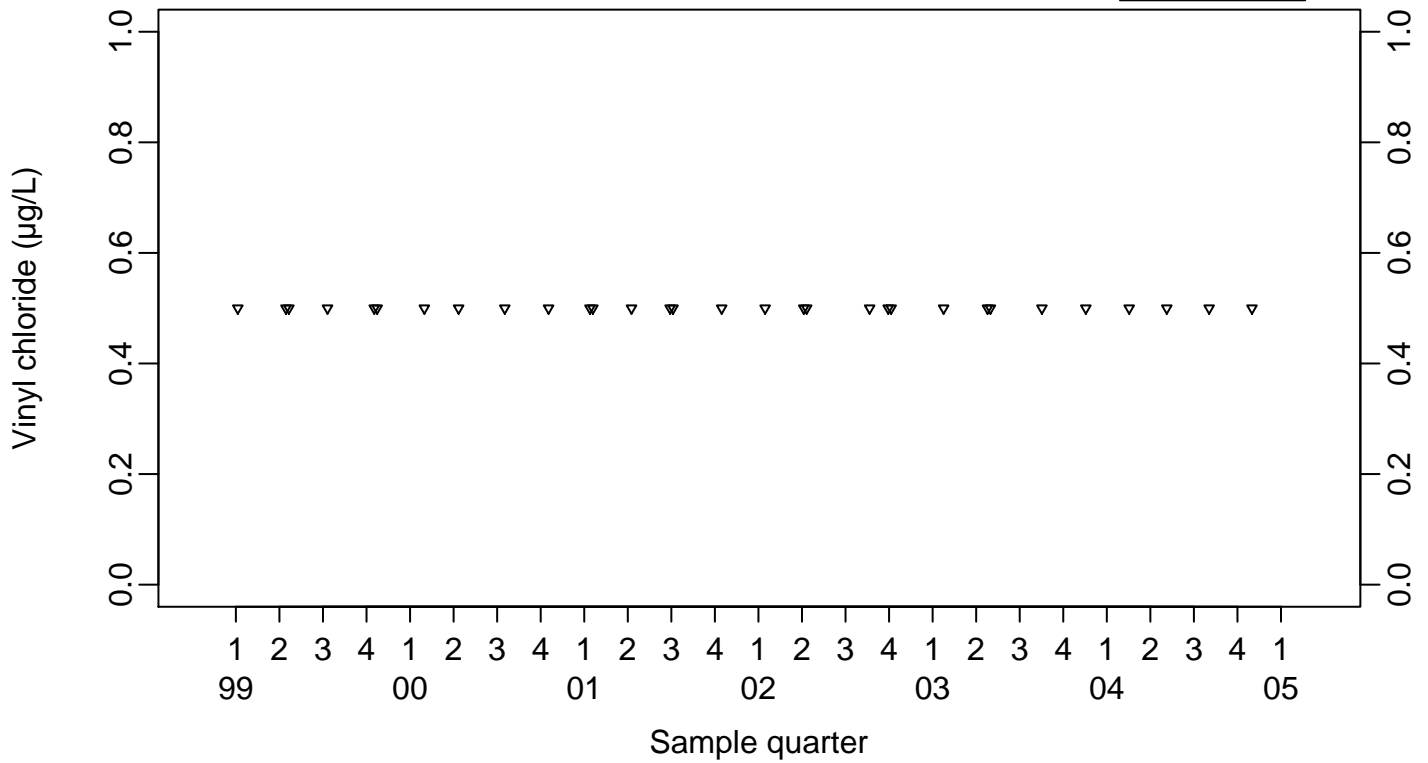
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Vinyl chloride ($\mu\text{g/L}$)

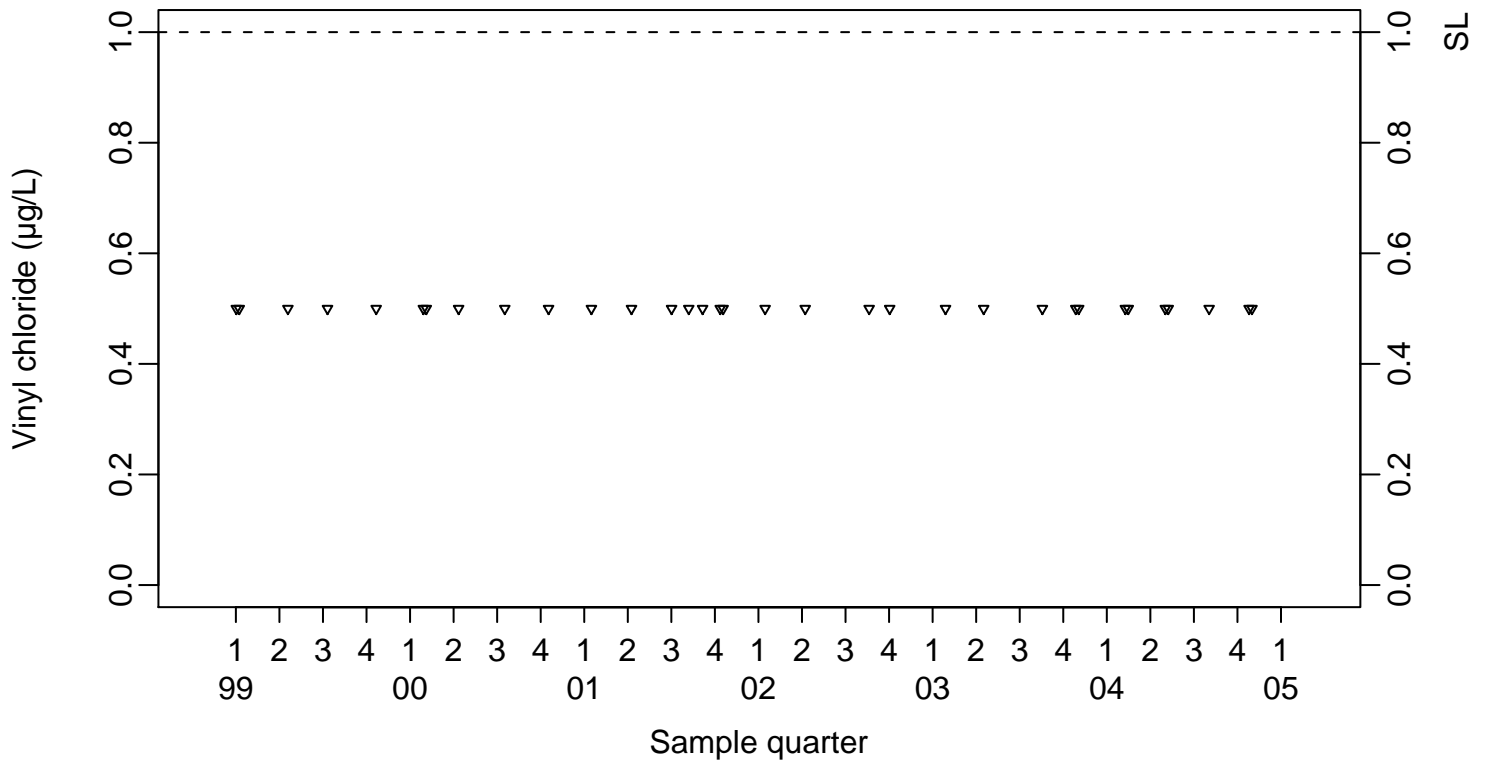
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=1

Compliance Monitoring Point W-817-02

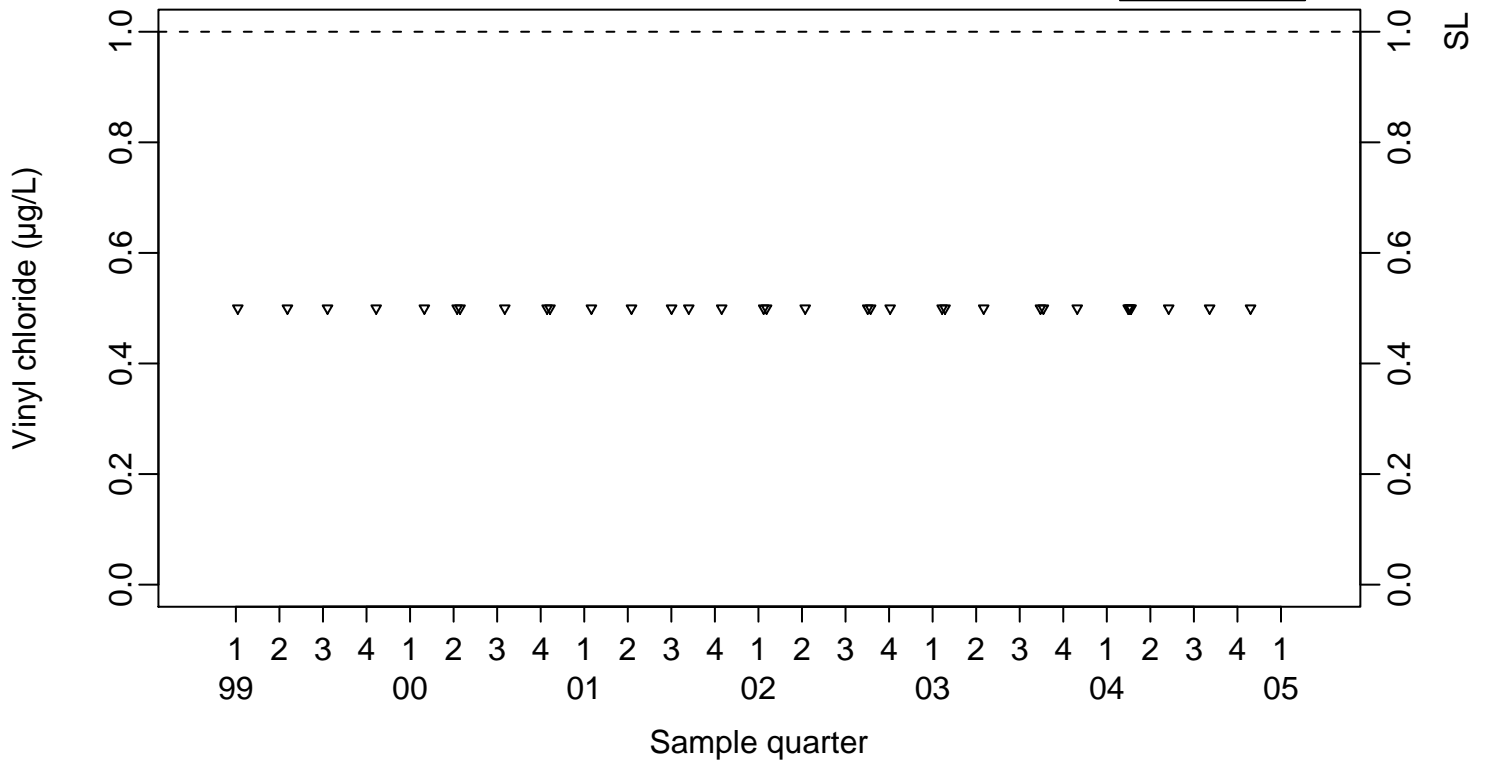


Surface Impoundments Ground Water Vinyl chloride ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

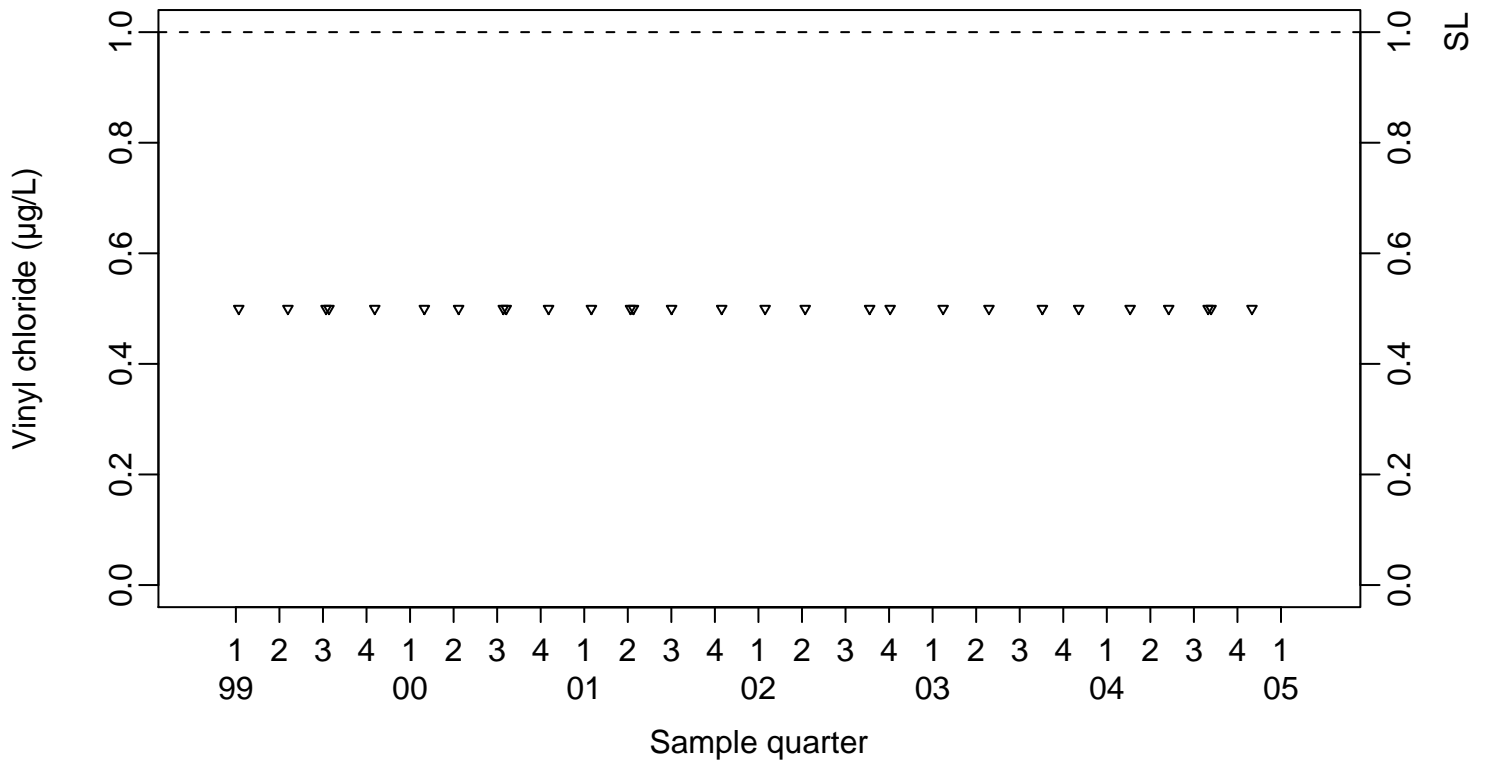
SL=1

◆ Above RL
▽ Below RL



SL=1

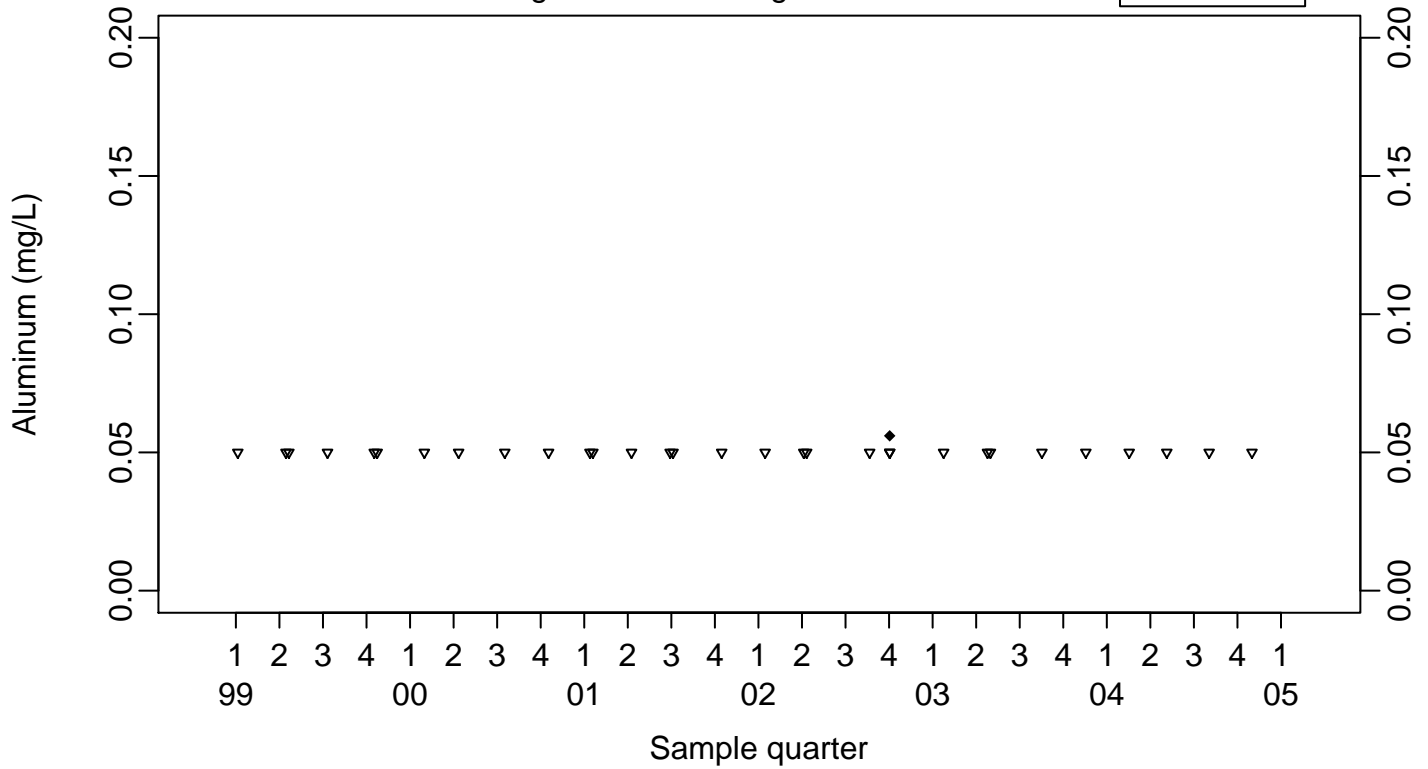
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Aluminum (mg/L)

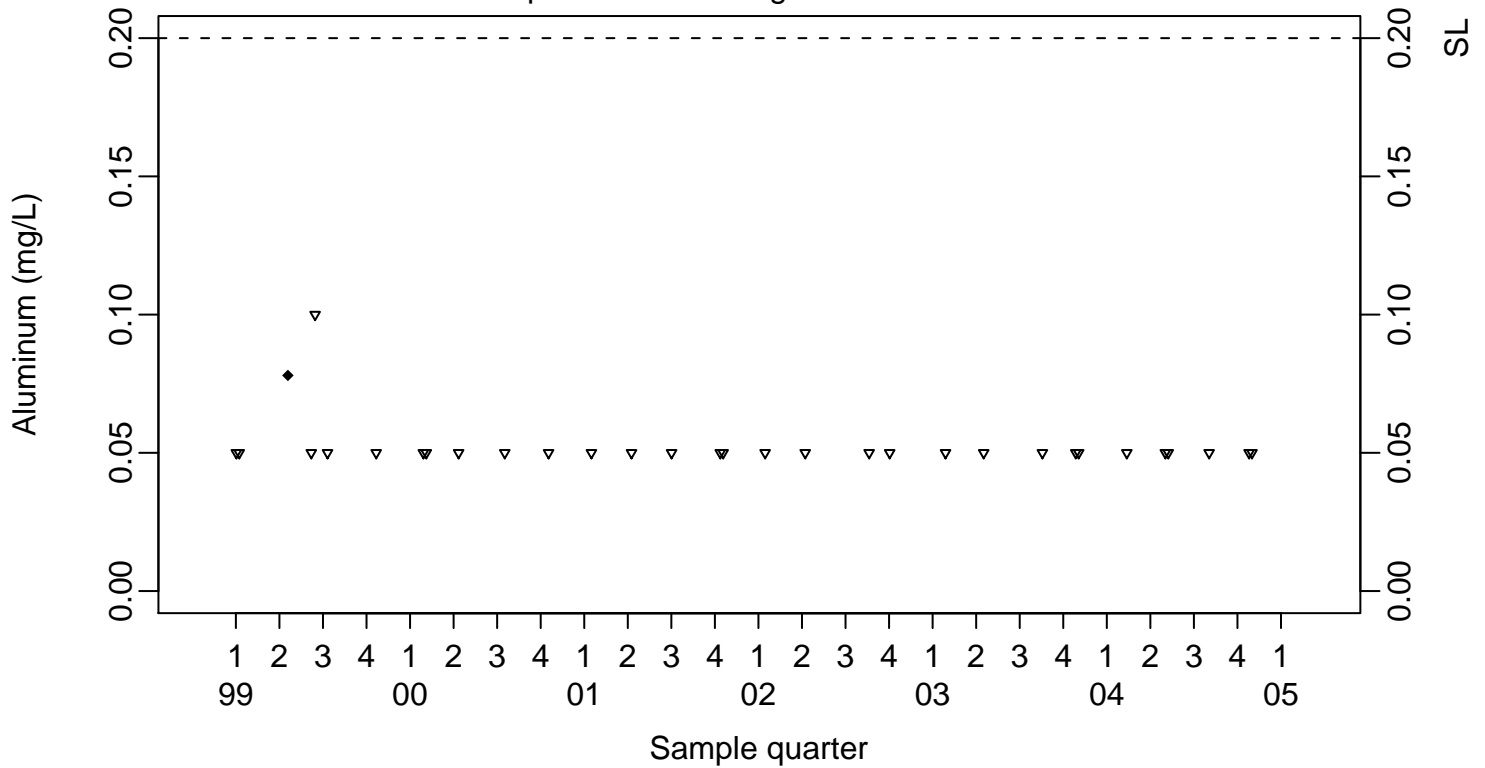
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=0.2

Compliance Monitoring Point W-817-02

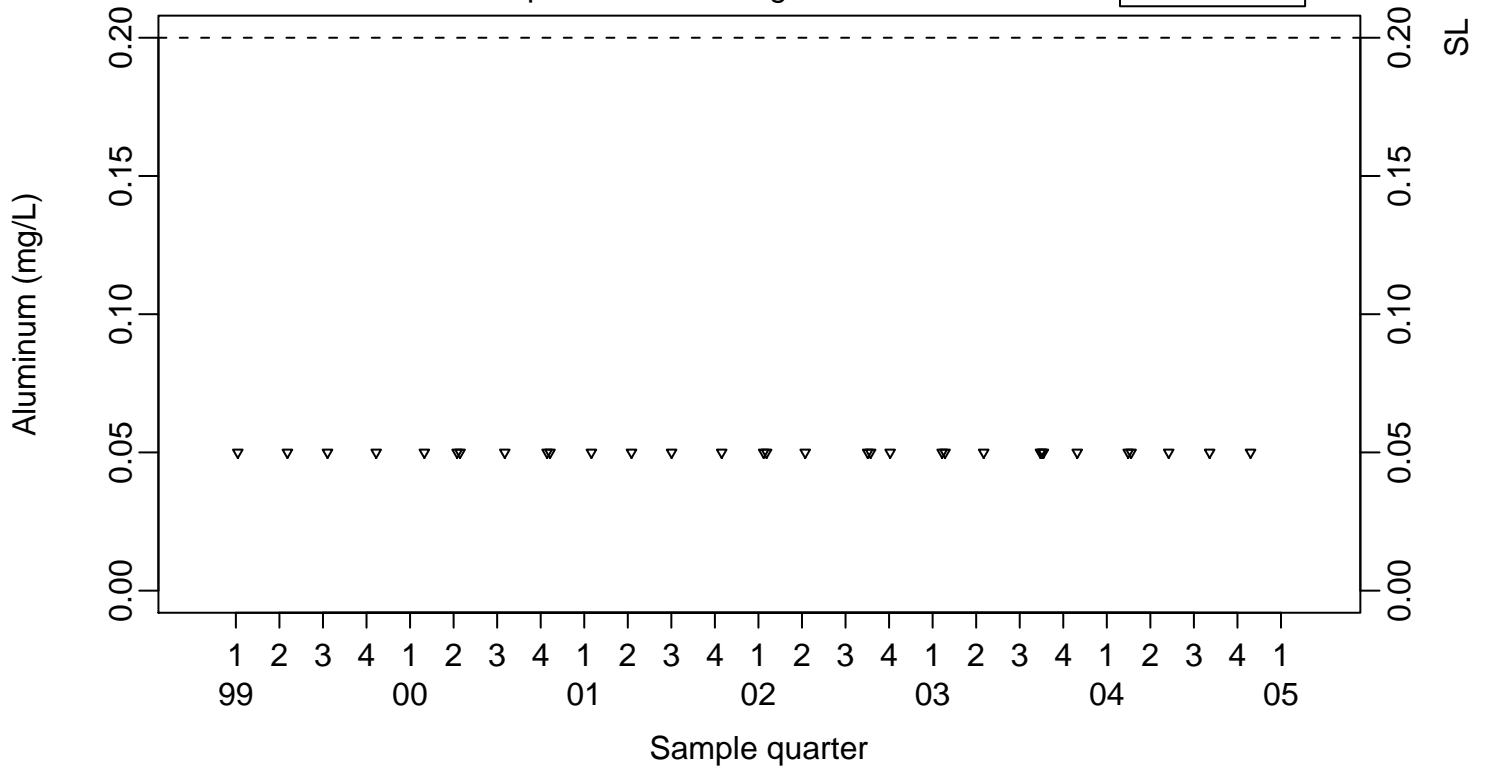


Surface Impoundments Ground Water Aluminum (mg/L)

Compliance Monitoring Point W-817-03

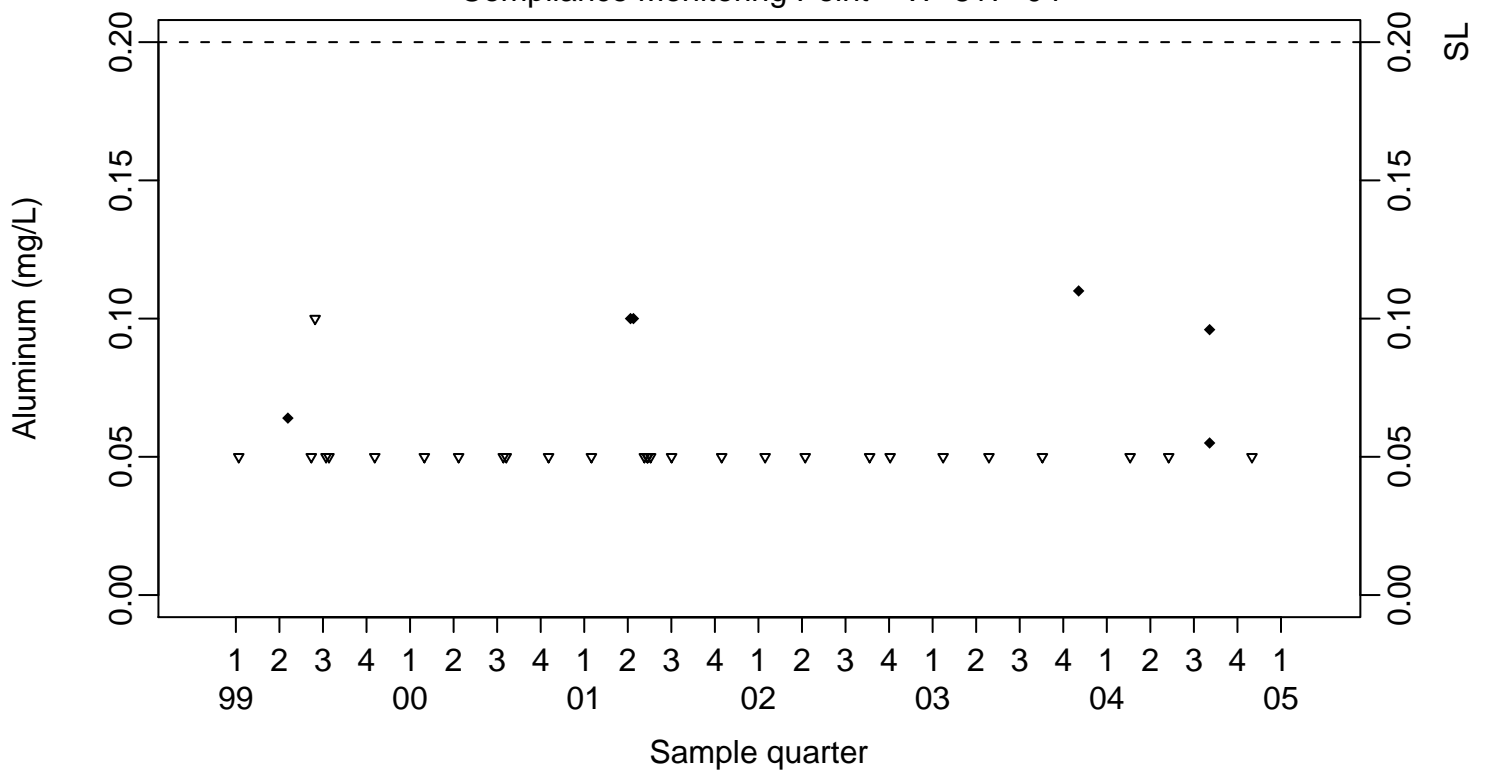
SL=0.2

◆ Above RL
▽ Below RL



Compliance Monitoring Point W-817-04

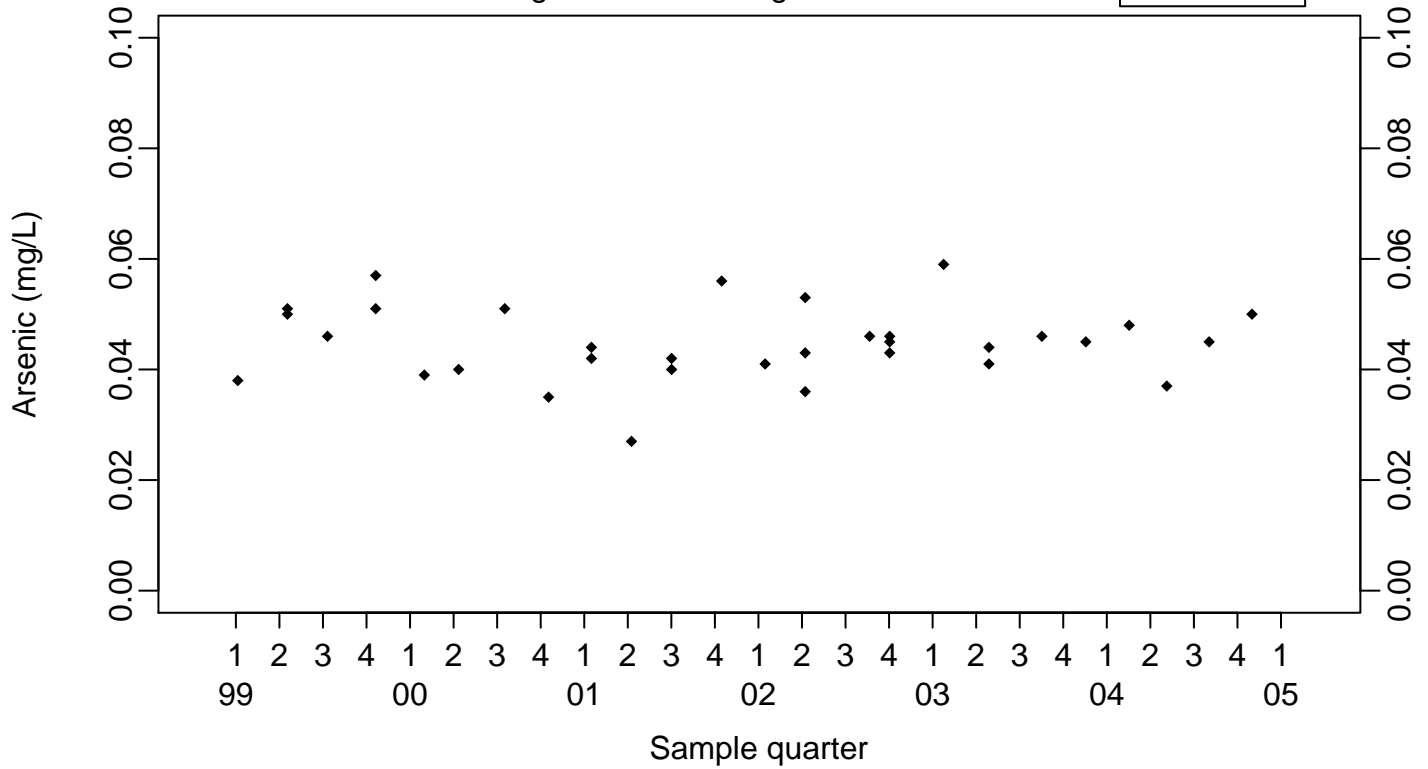
SL=0.2



Surface Impoundments Ground Water
 Arsenic (mg/L)

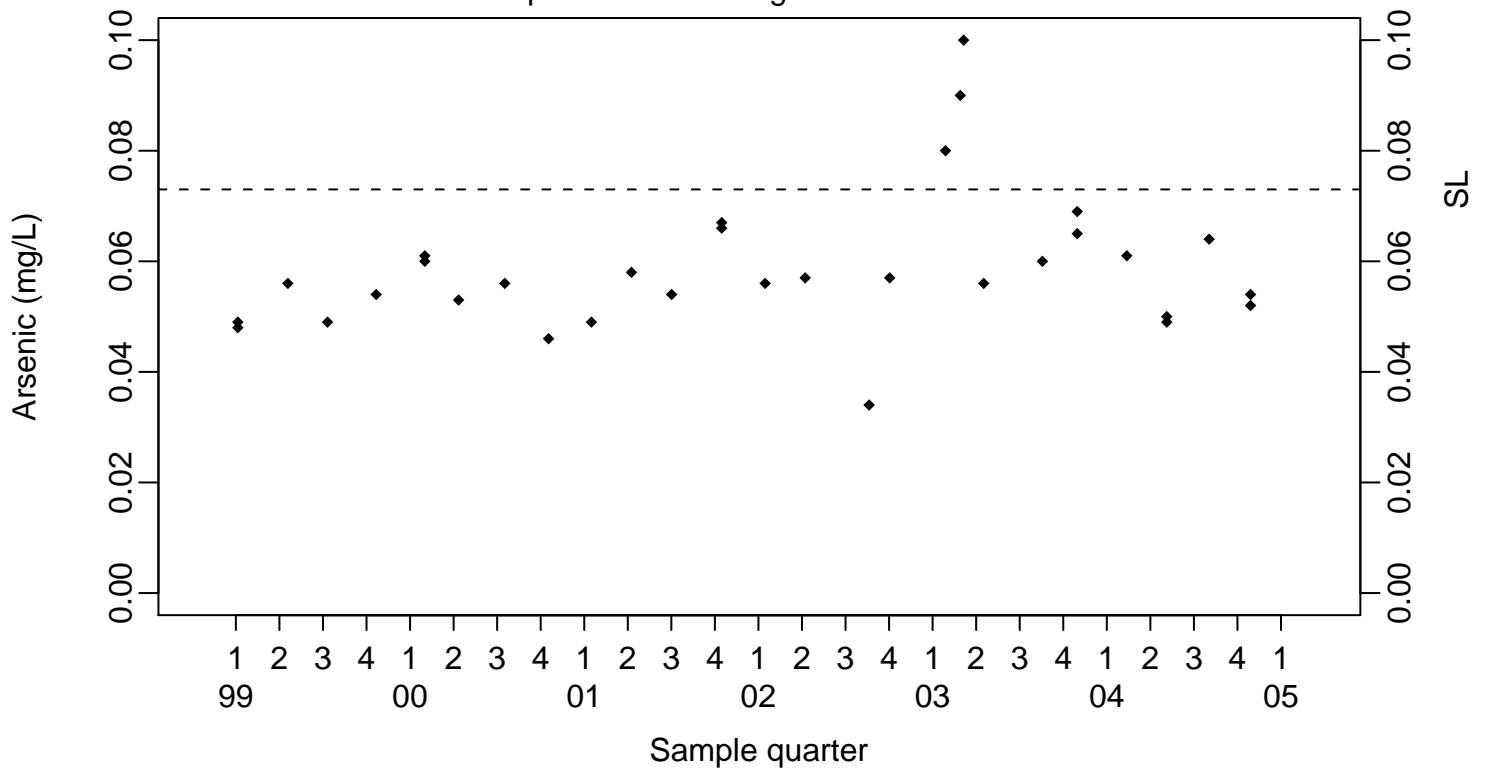
Background Monitoring Point W-817-01

◆ Above RL
 ▼ Below RL



SL=0.073

Compliance Monitoring Point W-817-02

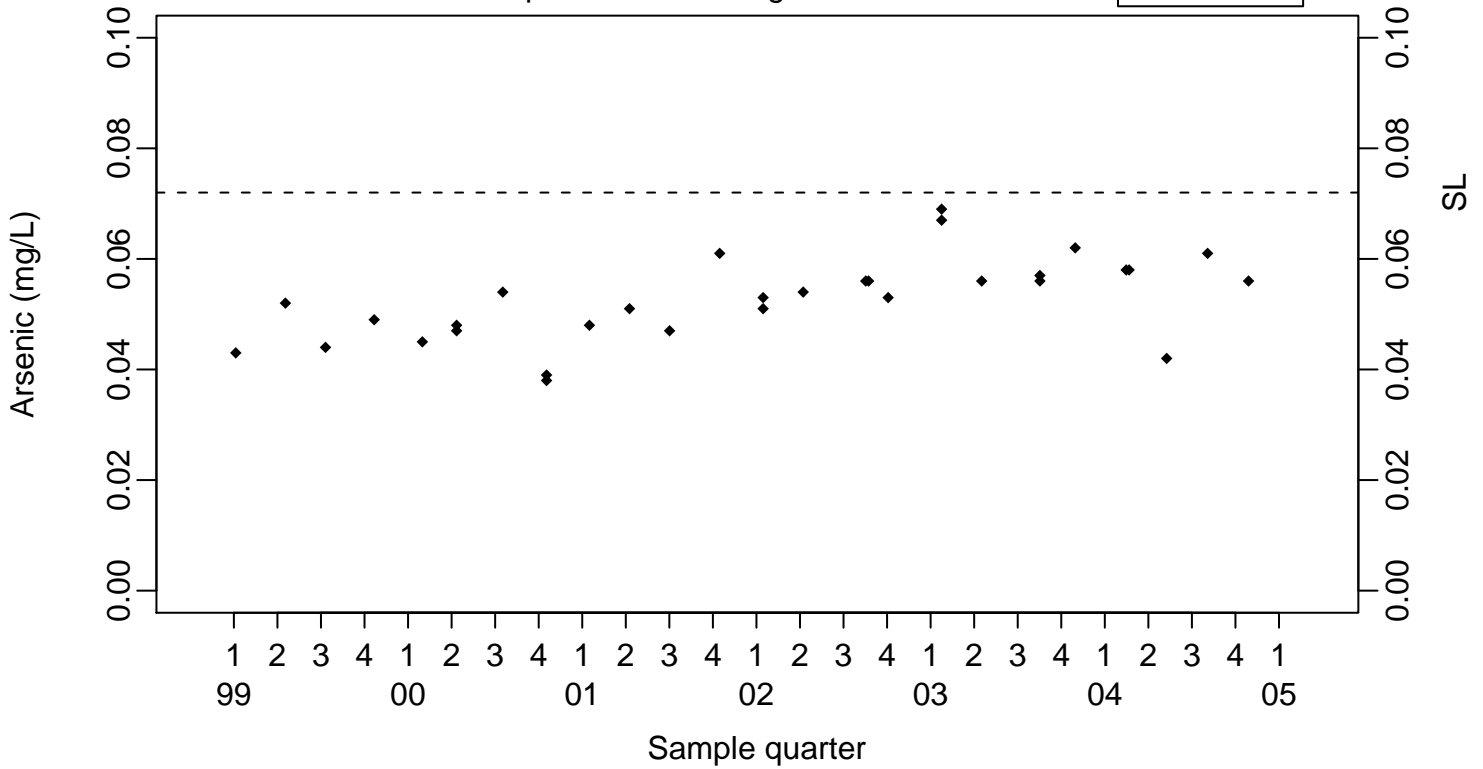


Surface Impoundments Ground Water Arsenic (mg/L)

Compliance Monitoring Point W-817-03

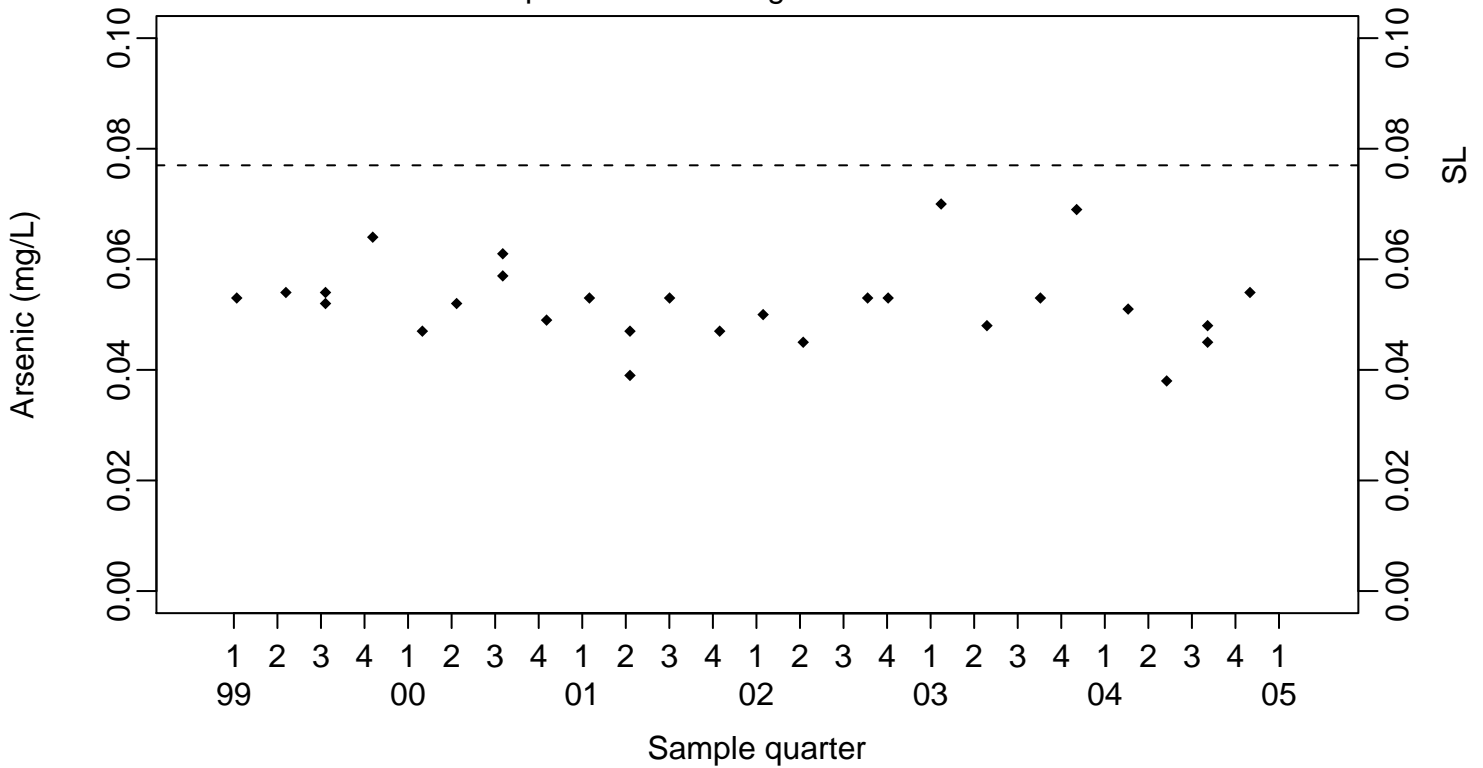
SL=0.072

◆ Above RL
▽ Below RL

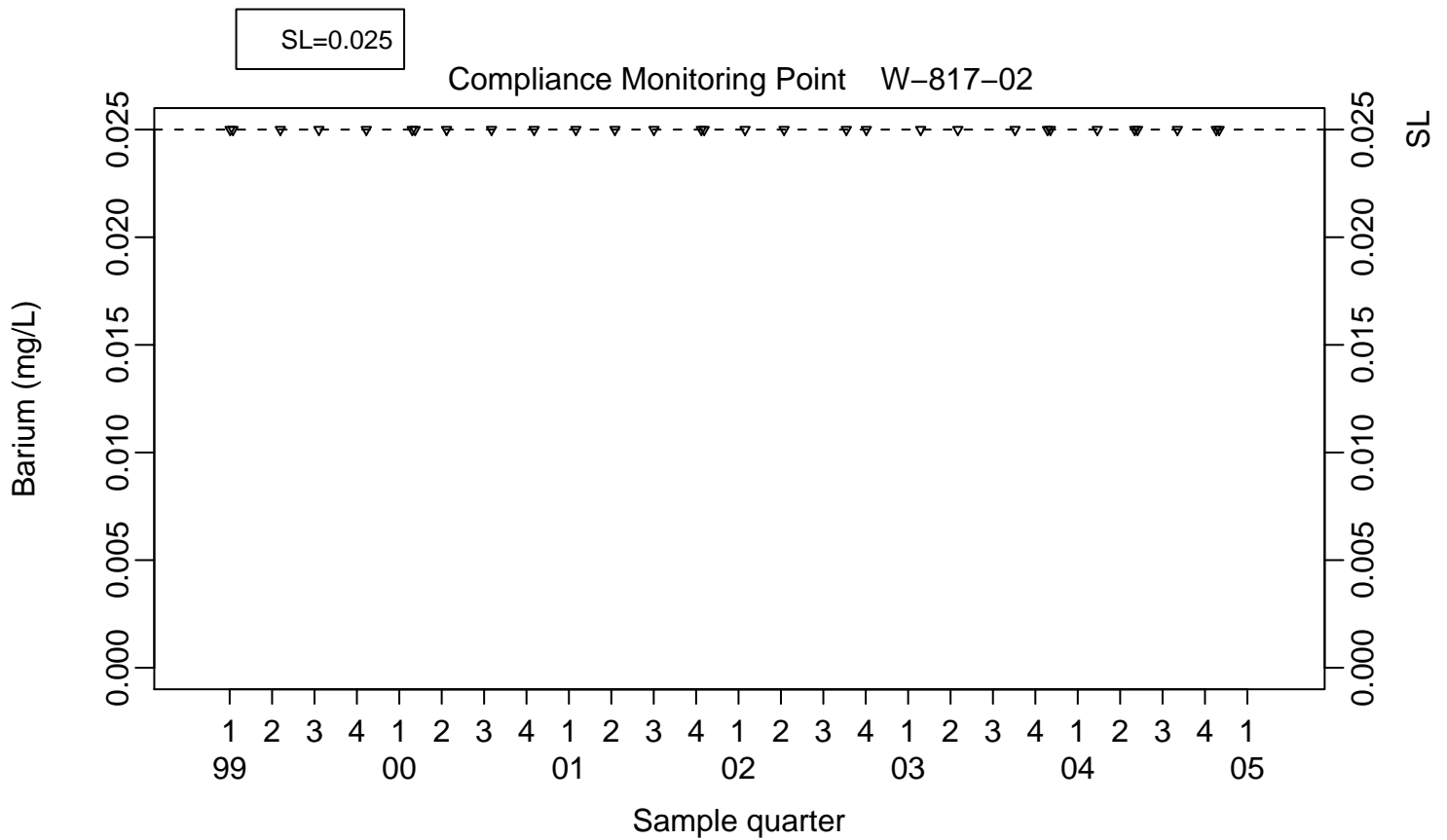
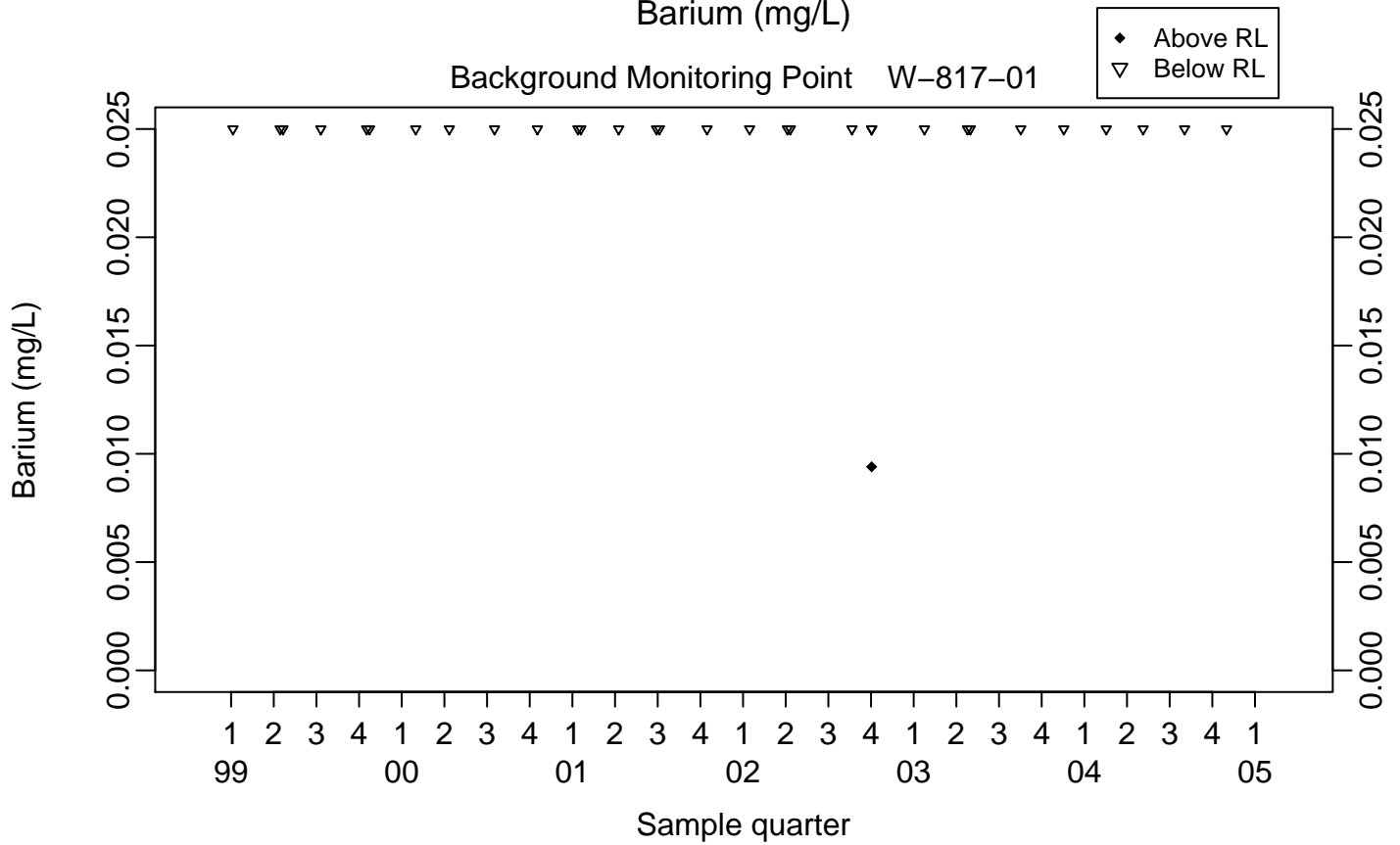


Compliance Monitoring Point W-817-04

SL=0.077



Surface Impoundments Ground Water Barium (mg/L)

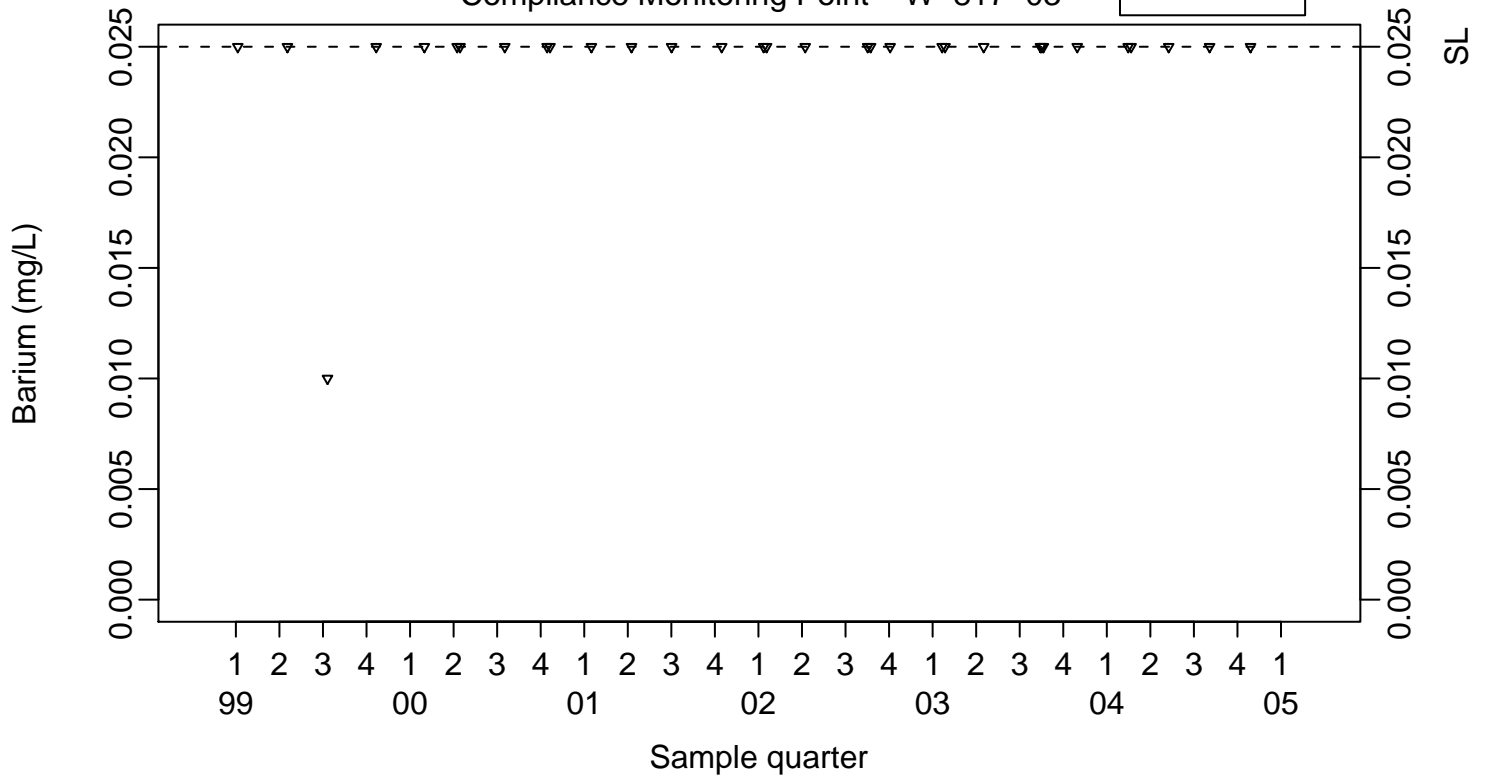


Surface Impoundments Ground Water Barium (mg/L)

Compliance Monitoring Point W-817-03

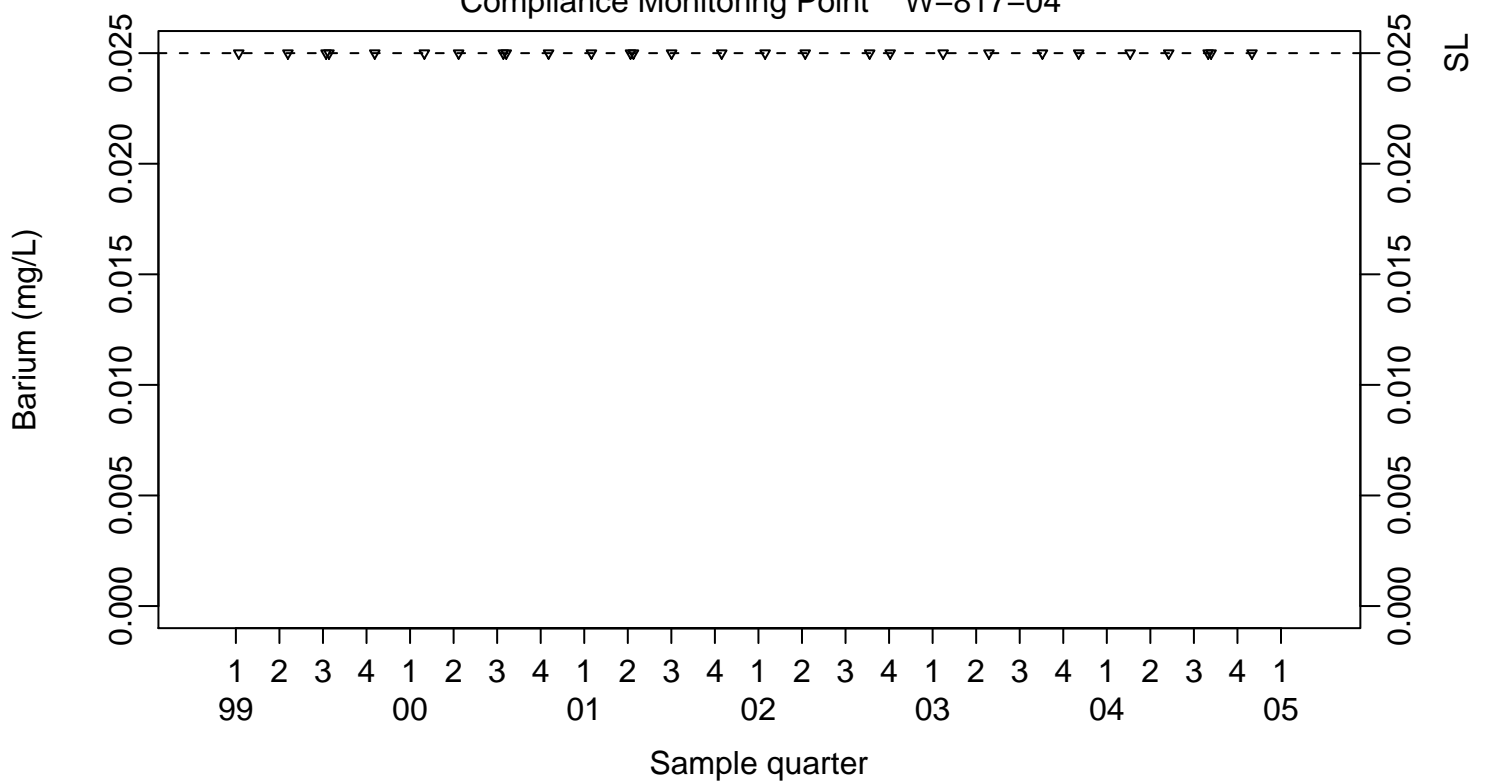
SL=0.025

◆ Above RL
▽ Below RL



Compliance Monitoring Point W-817-04

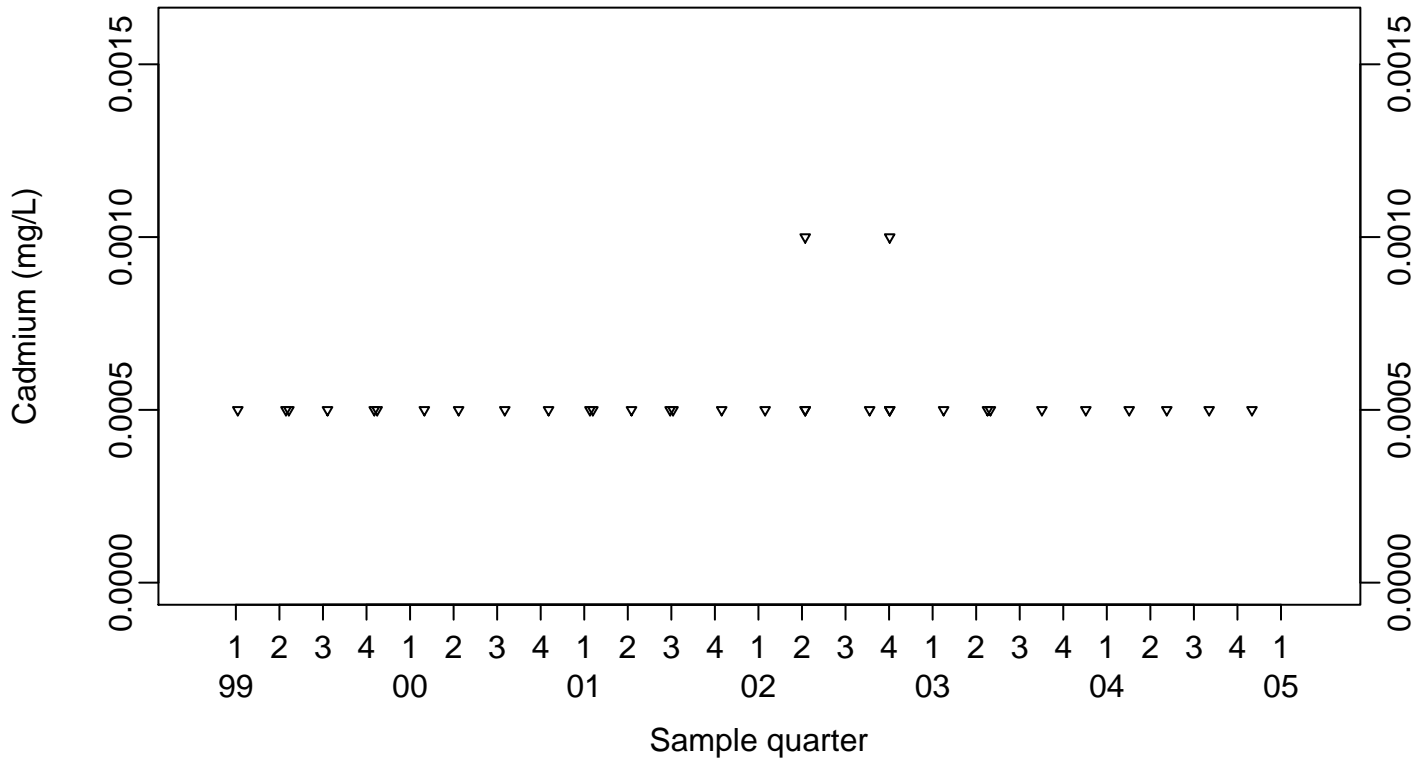
SL=0.025



Surface Impoundments Ground Water Cadmium (mg/L)

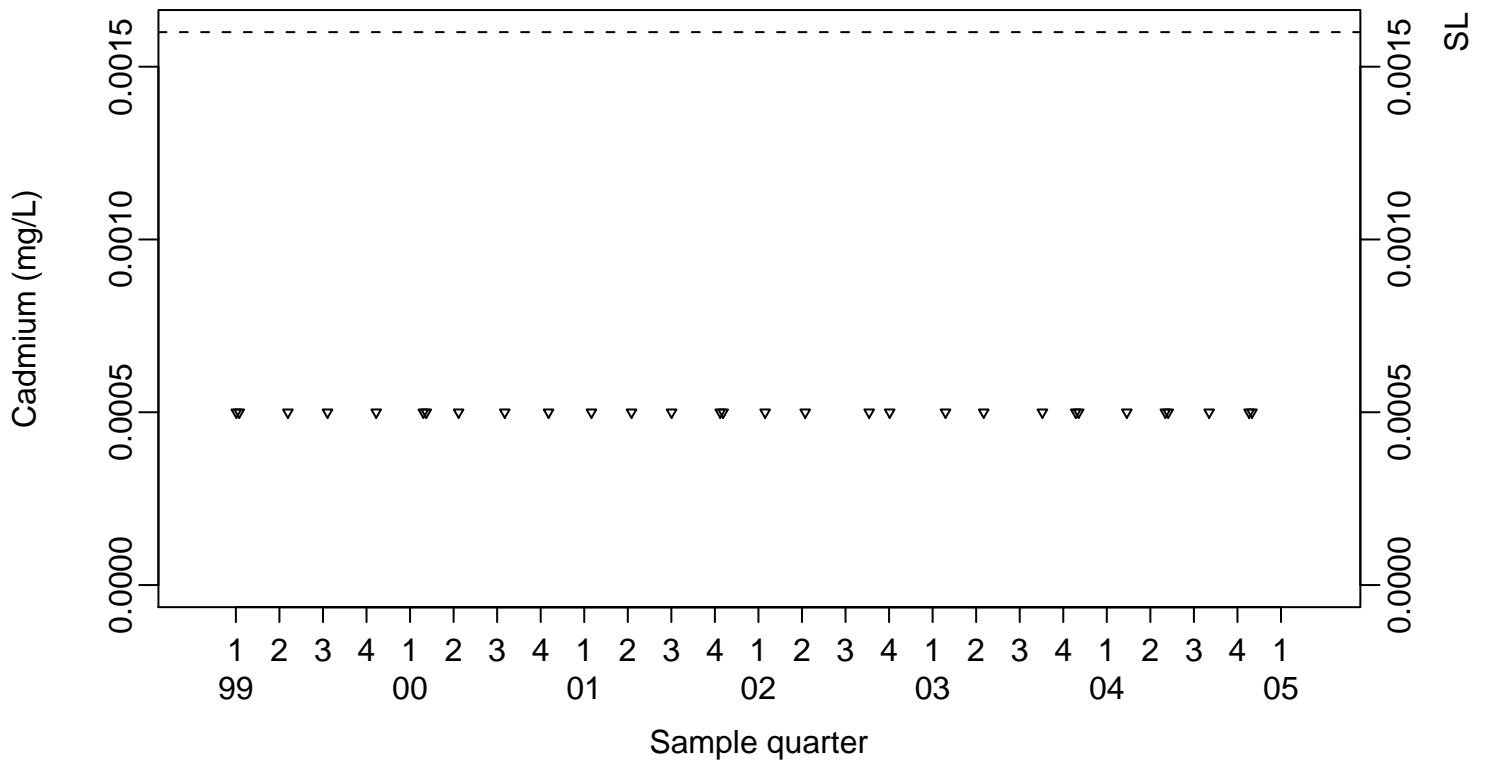
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=0.0016

Compliance Monitoring Point W-817-02

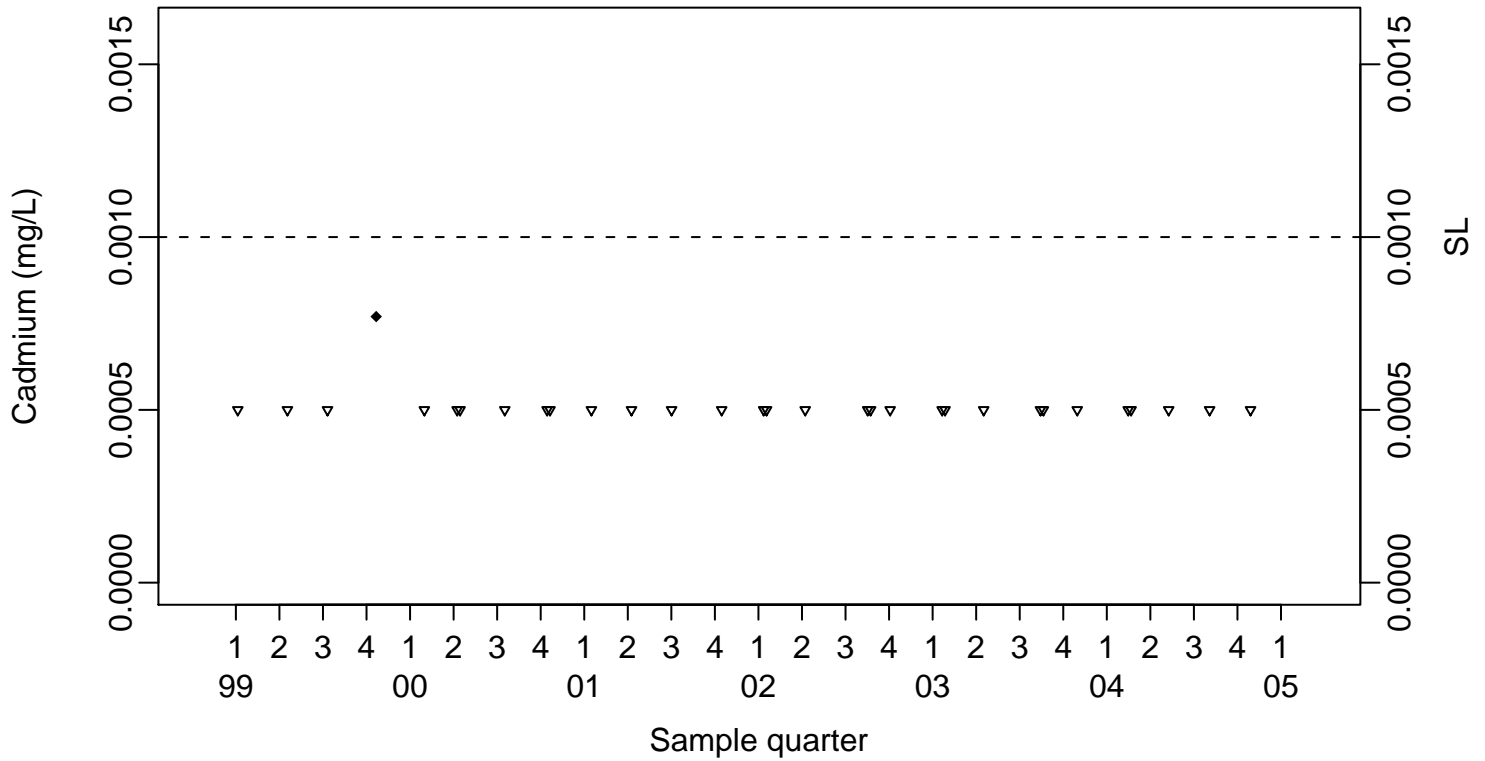


Surface Impoundments Ground Water Cadmium (mg/L)

Compliance Monitoring Point W-817-03

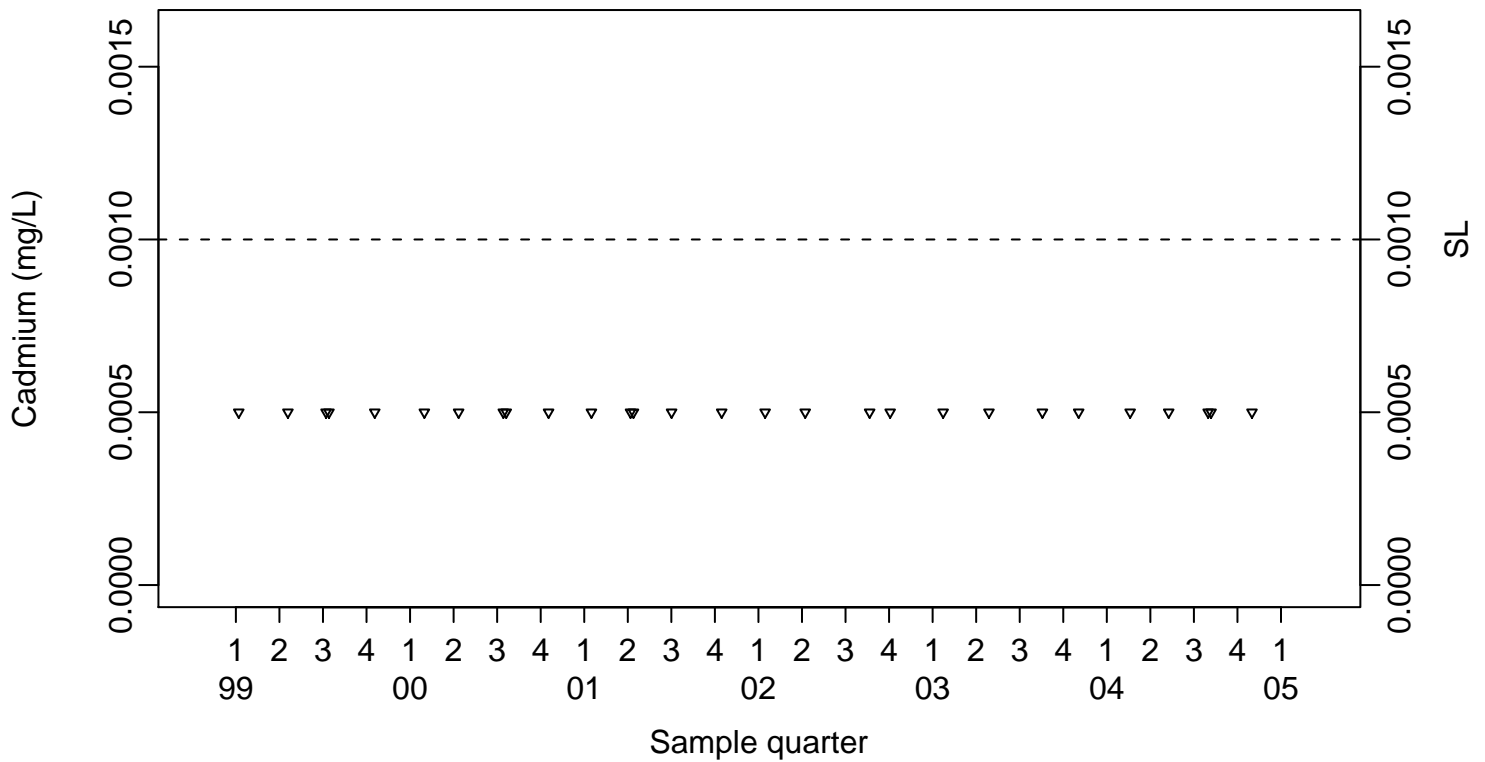
SL=0.001

◆ Above RL
▽ Below RL



SL=0.001

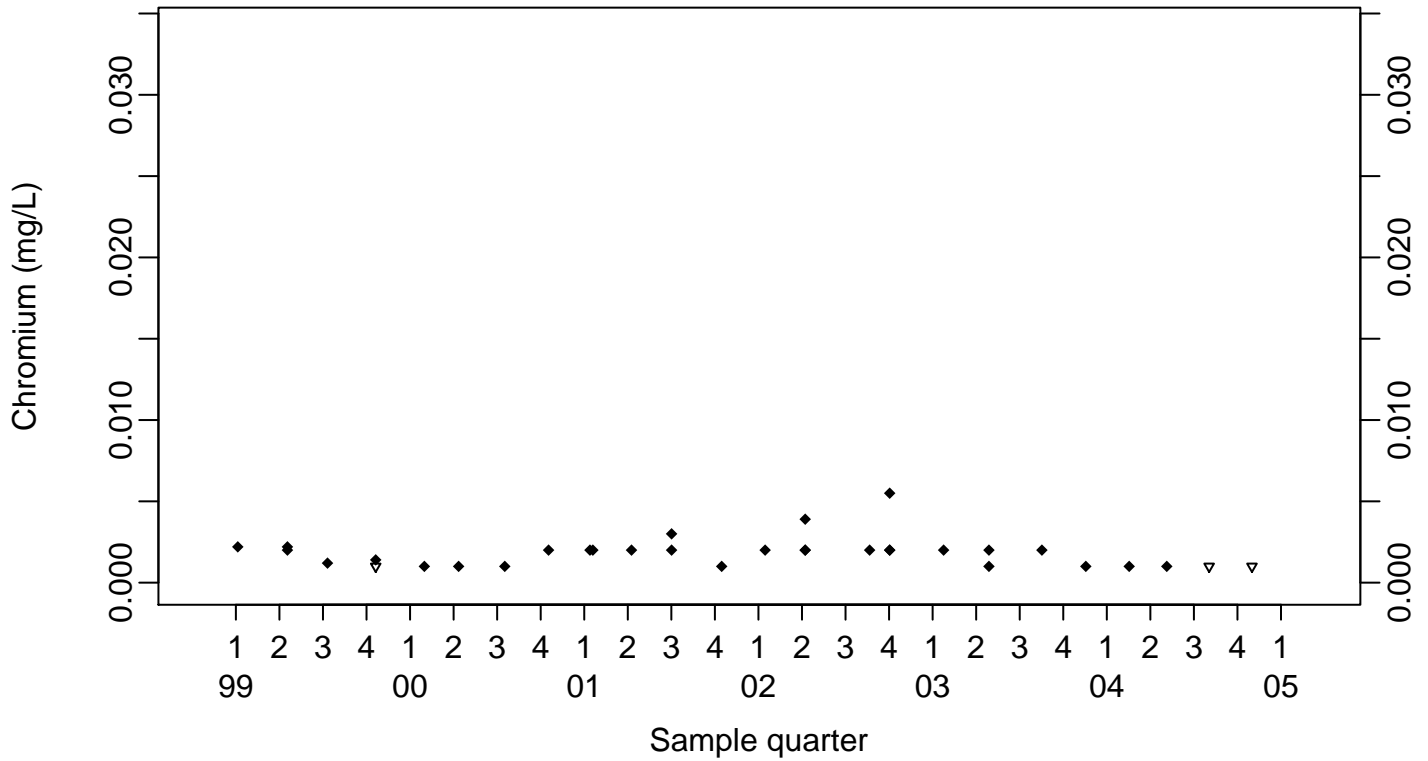
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water
 Chromium (mg/L)

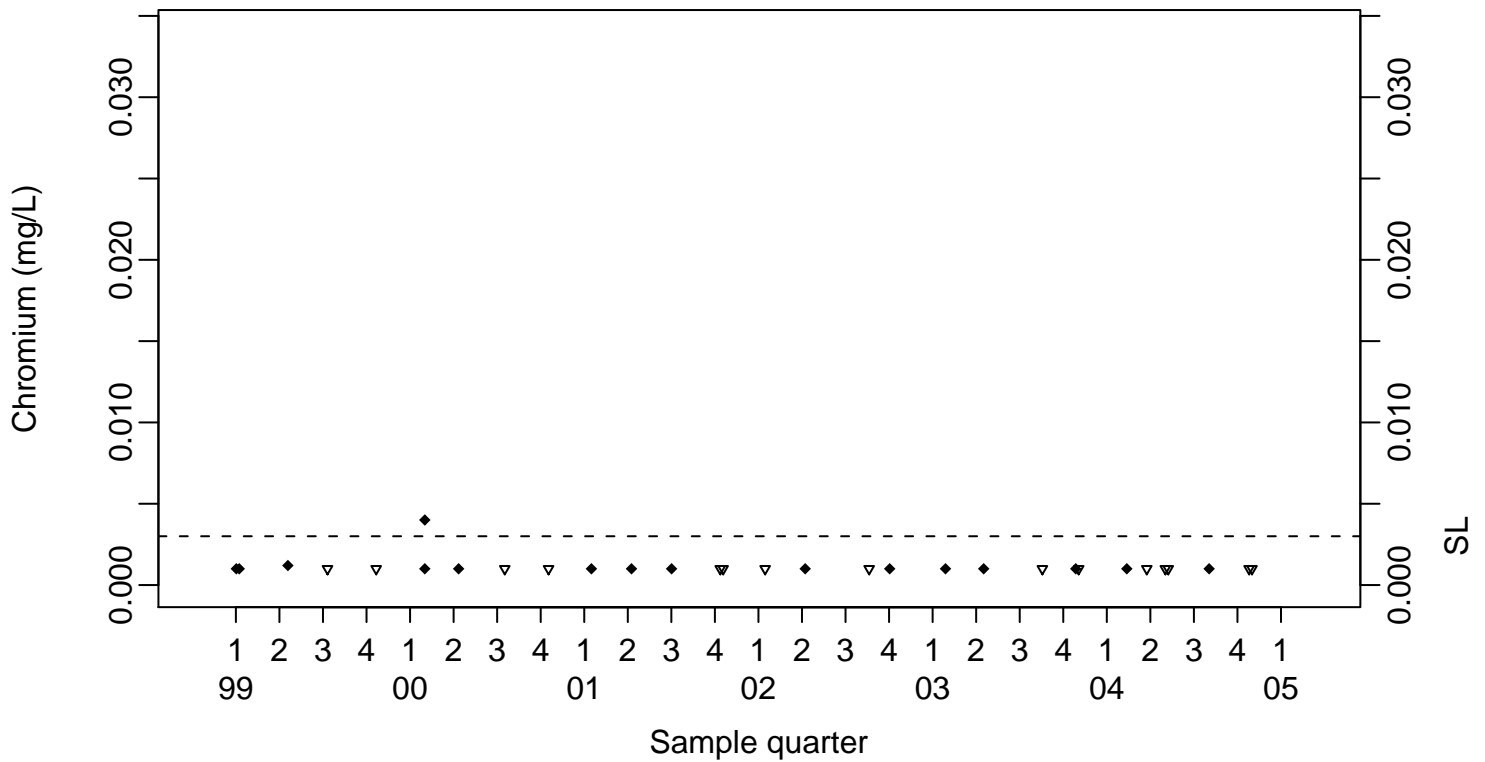
Background Monitoring Point W-817-01

◆ Above RL
 ▼ Below RL



SL=0.003

Compliance Monitoring Point W-817-02

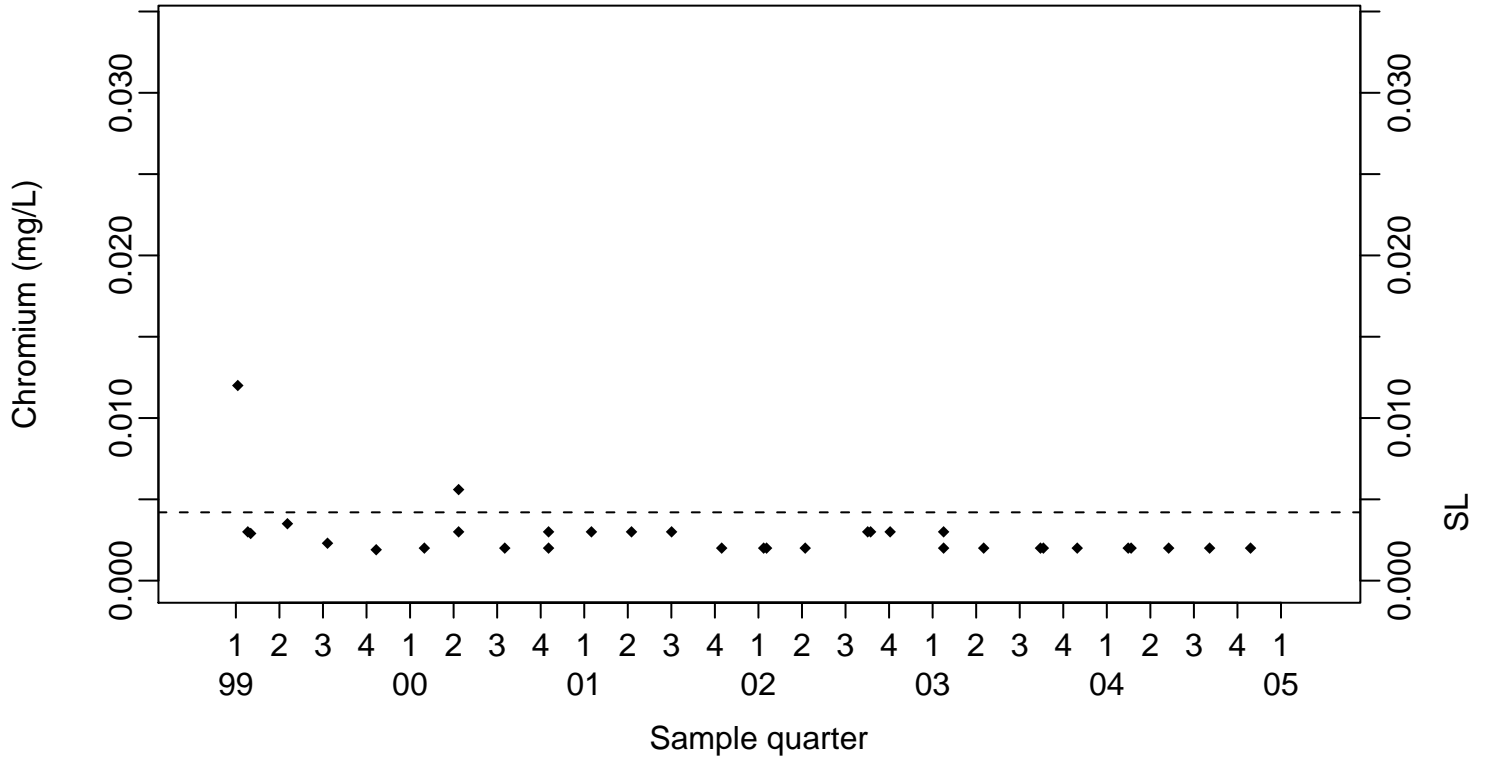


Surface Impoundments Ground Water Chromium (mg/L)

SL=0.0042

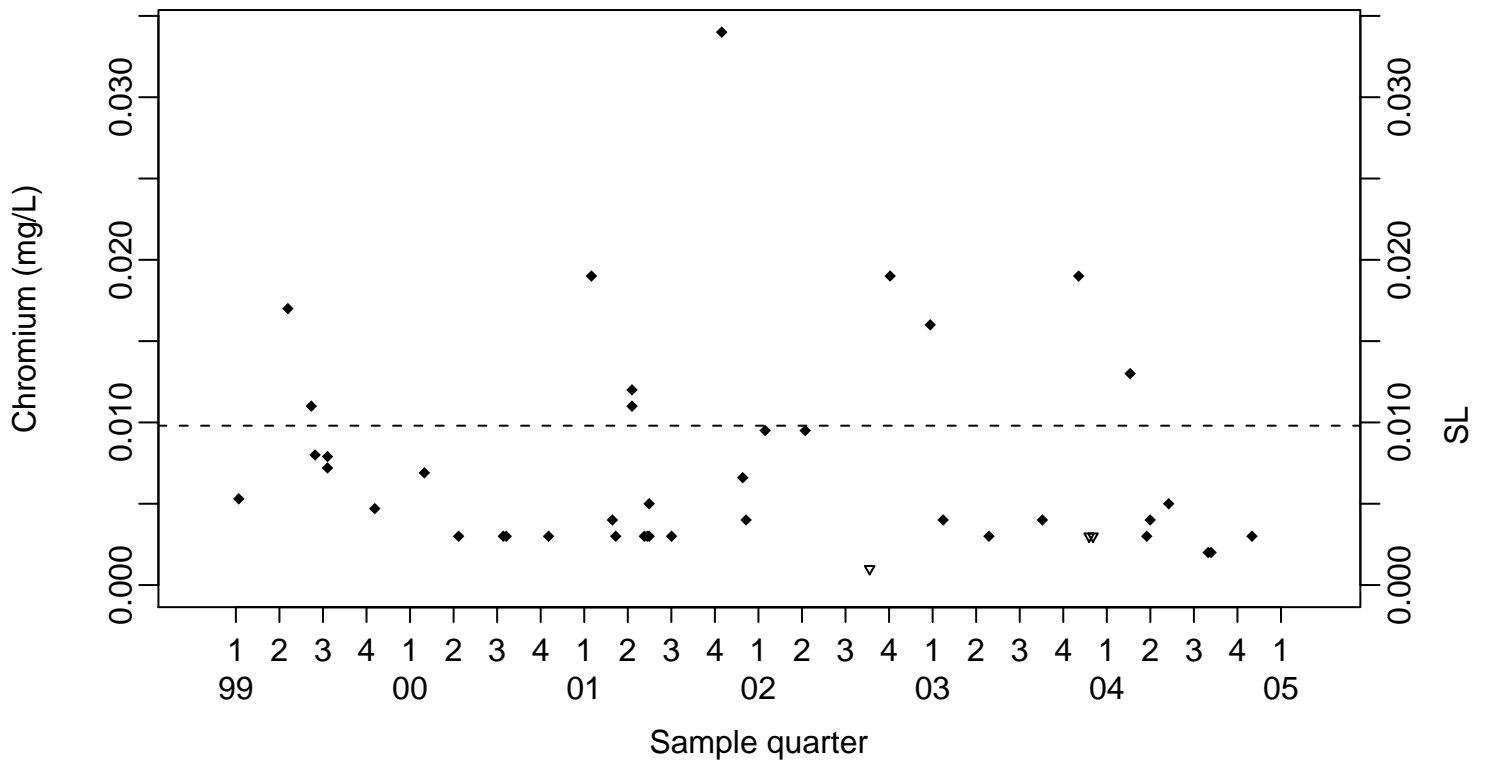
◆ Above RL
▽ Below RL

Compliance Monitoring Point W-817-03

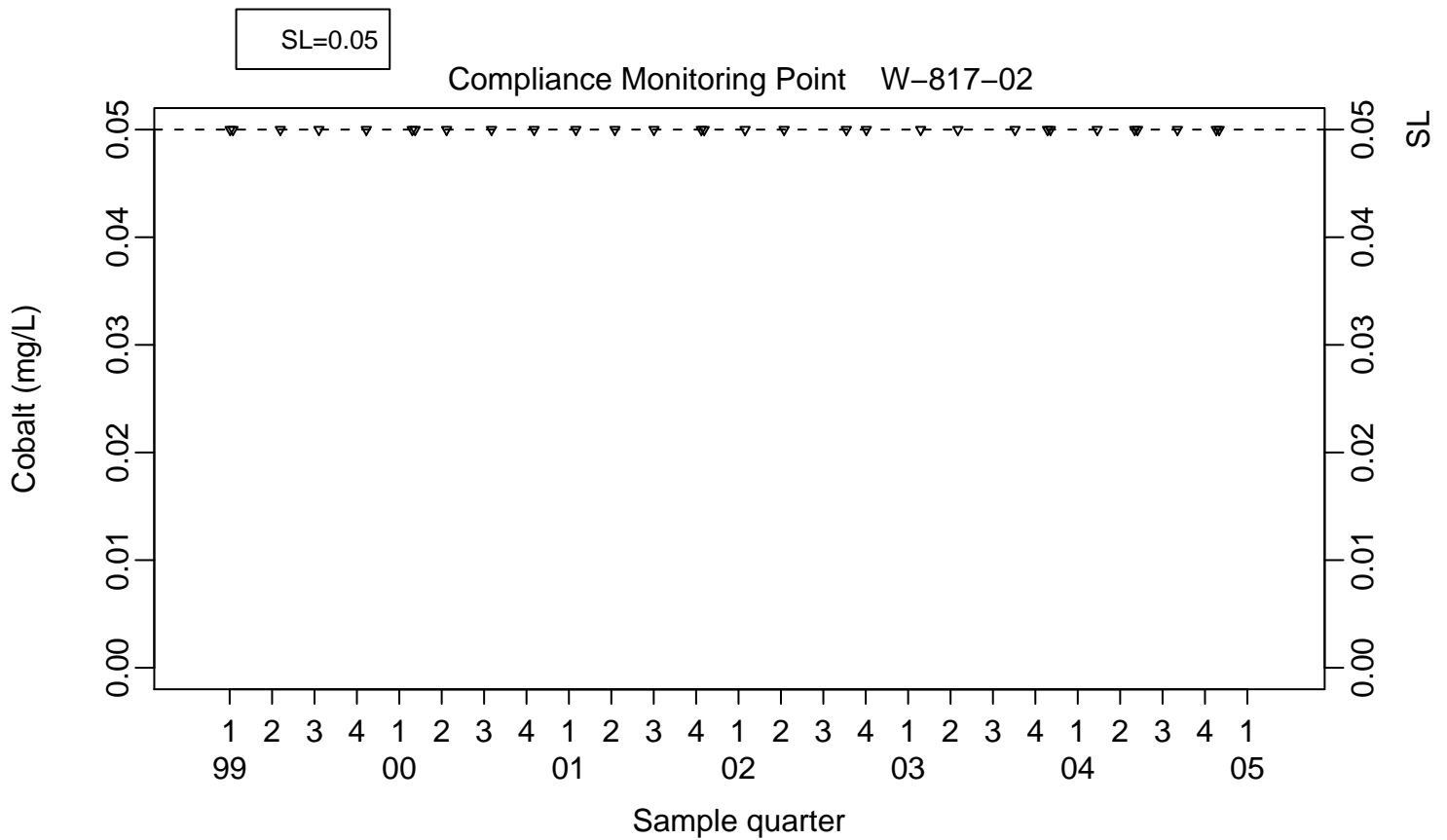
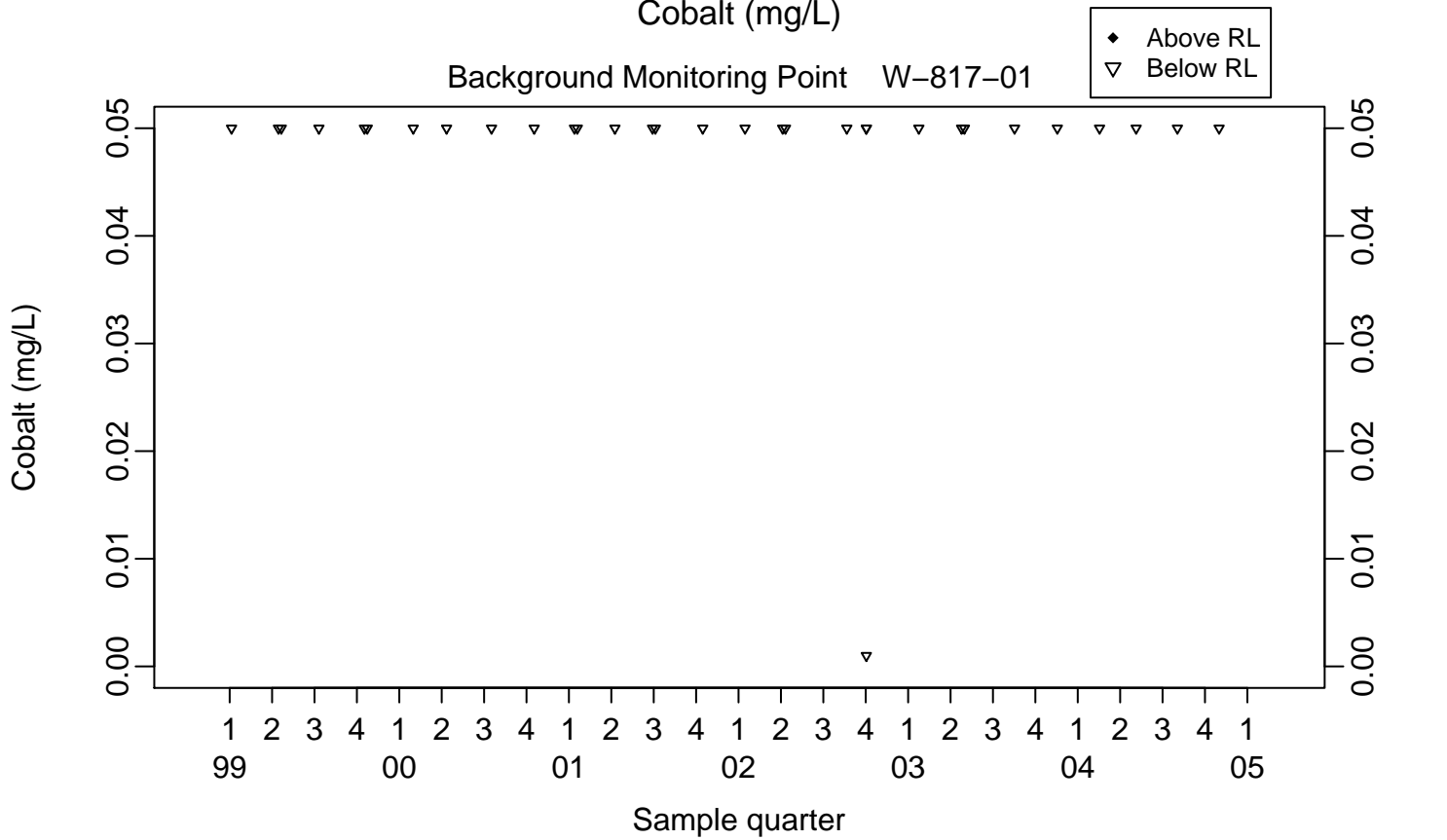


SL=0.0098

Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Cobalt (mg/L)

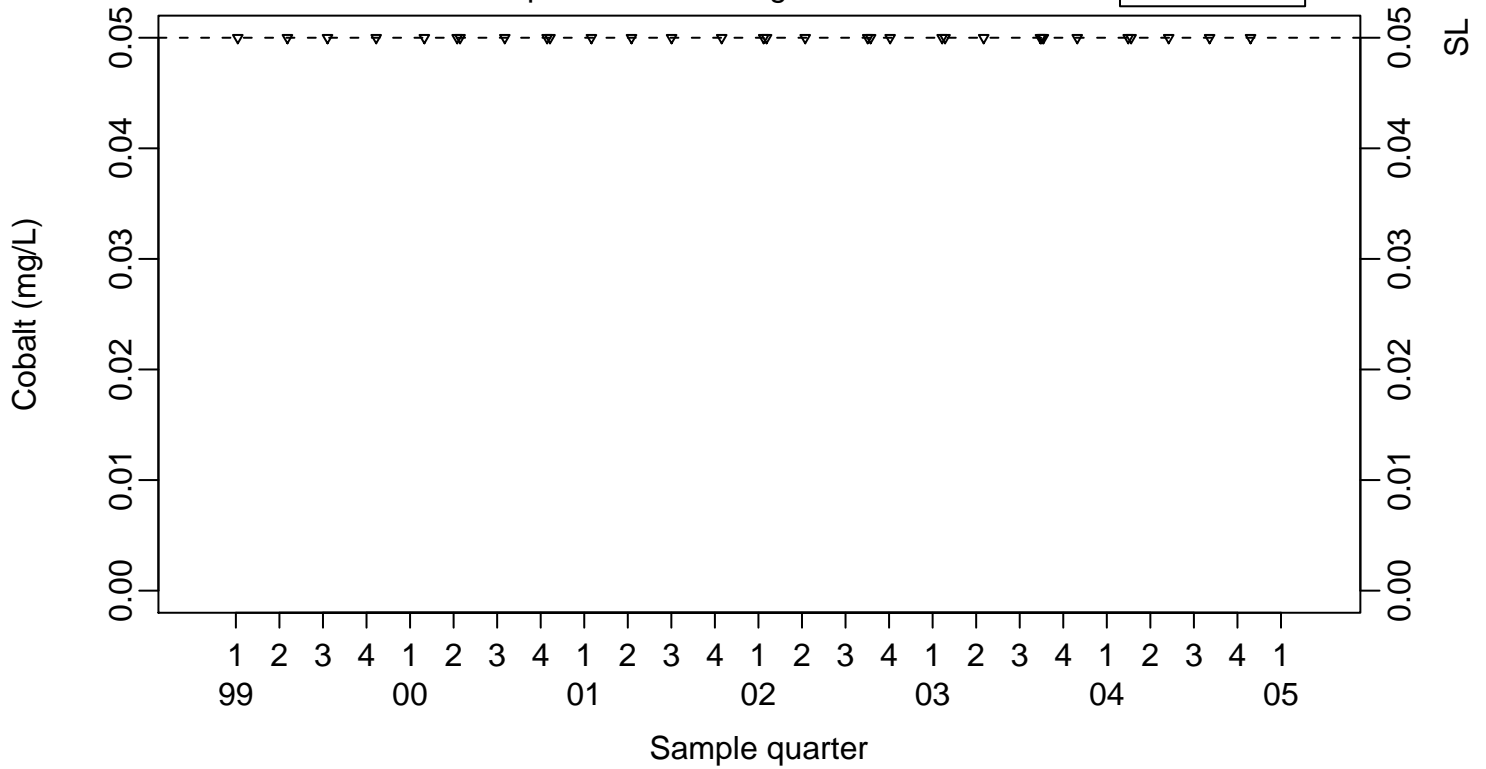


Surface Impoundments Ground Water Cobalt (mg/L)

Compliance Monitoring Point W-817-03

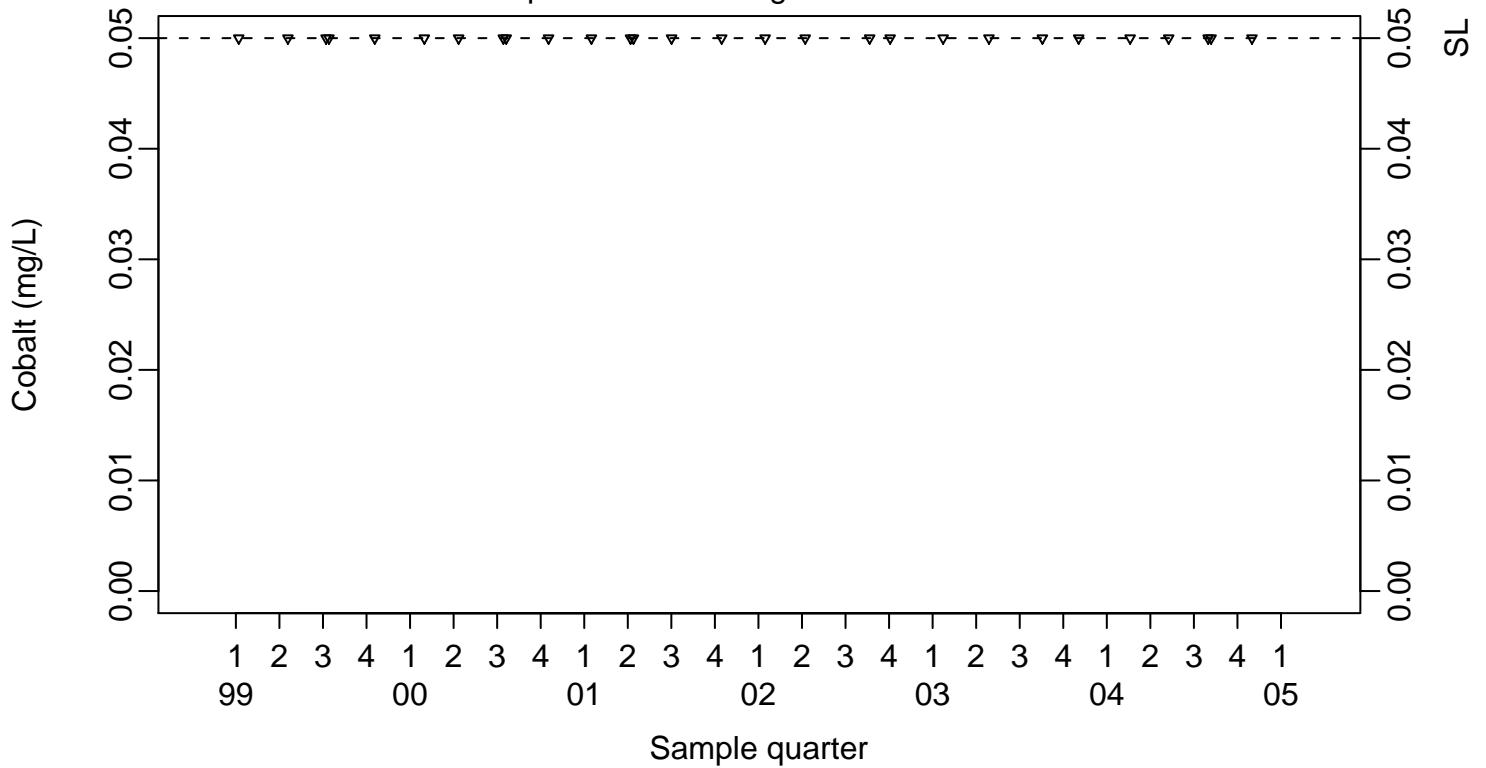
SL=0.05

◆ Above RL
▽ Below RL



SL=0.05

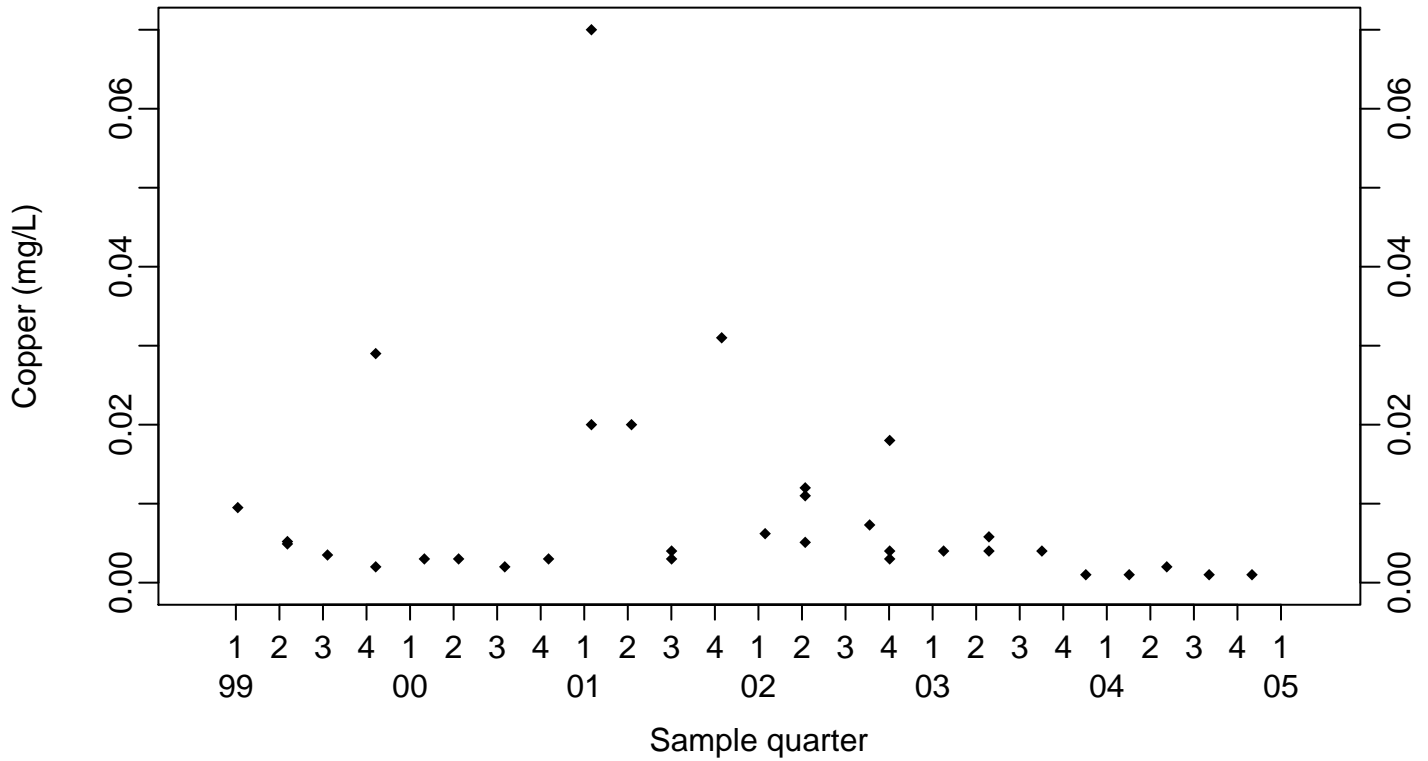
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Copper (mg/L)

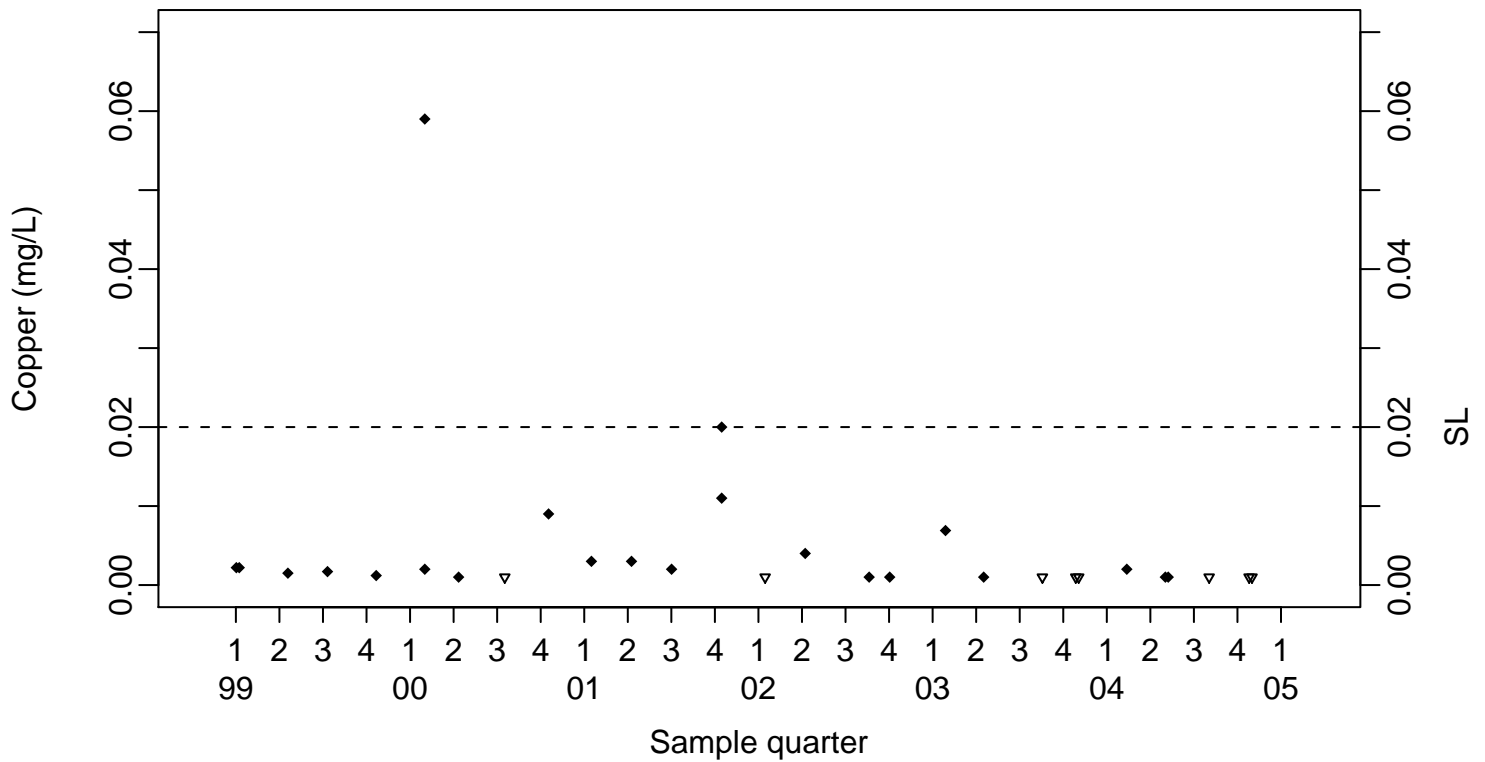
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=0.02

Compliance Monitoring Point W-817-02

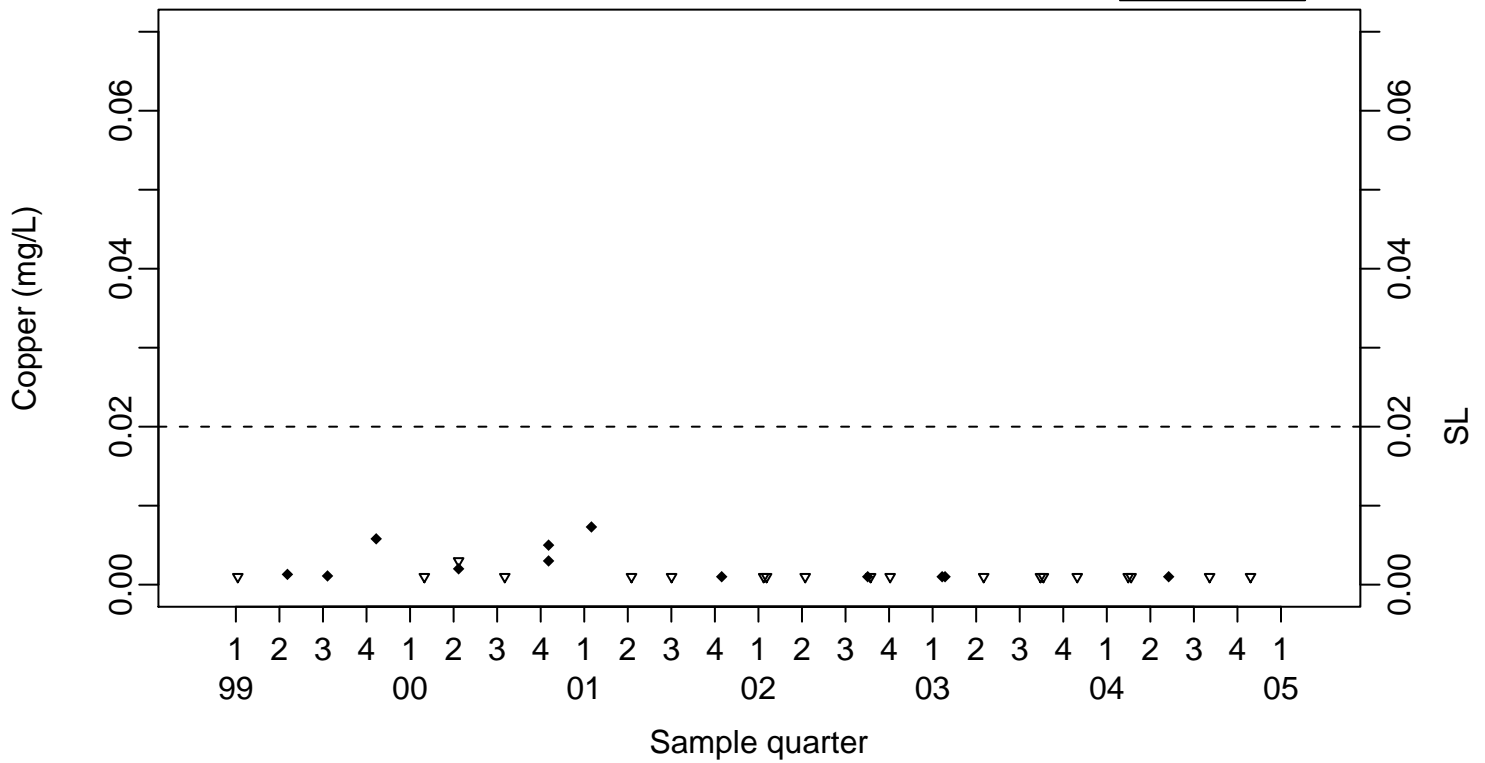


Surface Impoundments Ground Water Copper (mg/L)

Compliance Monitoring Point W-817-03

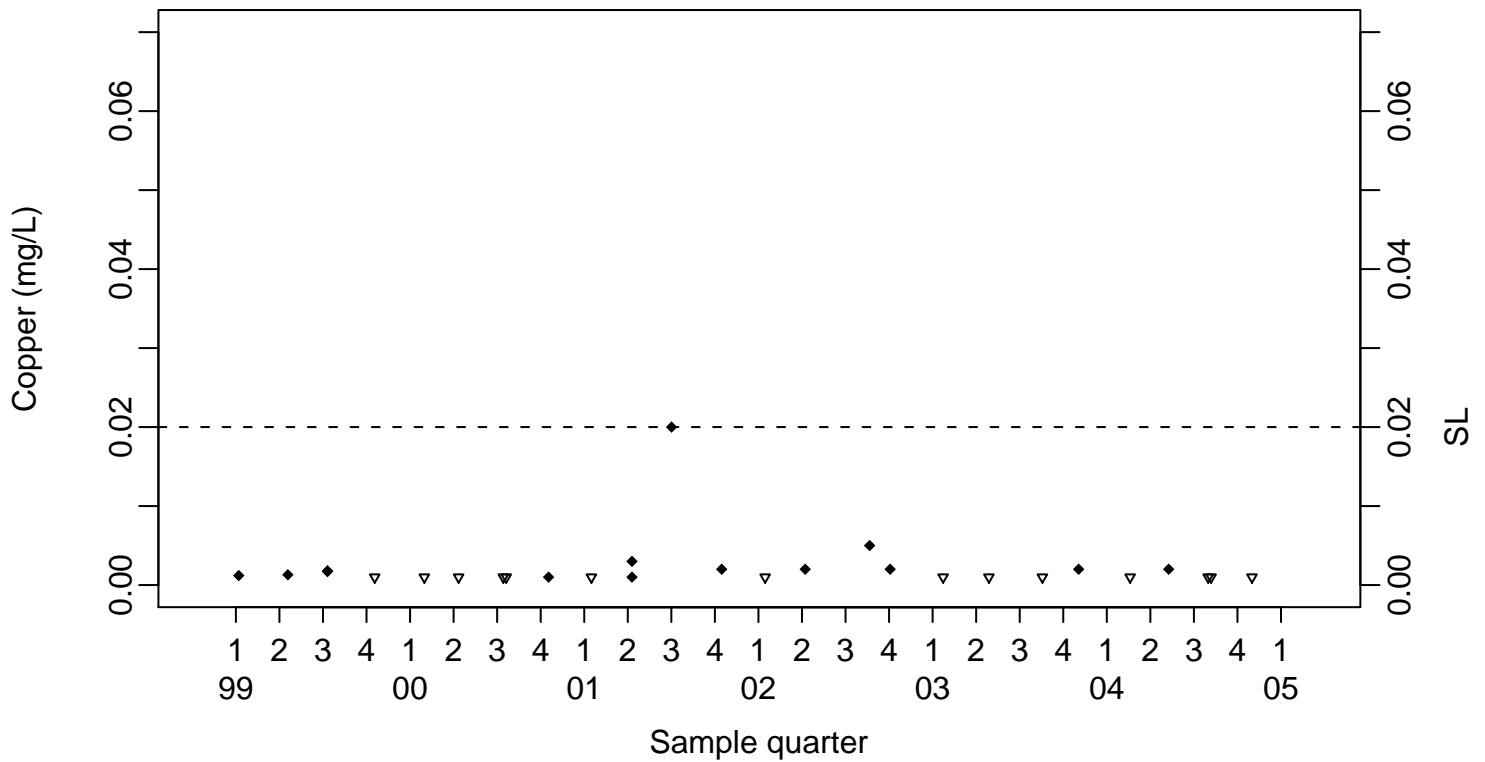
SL=0.02

◆ Above RL
▽ Below RL



SL=0.02

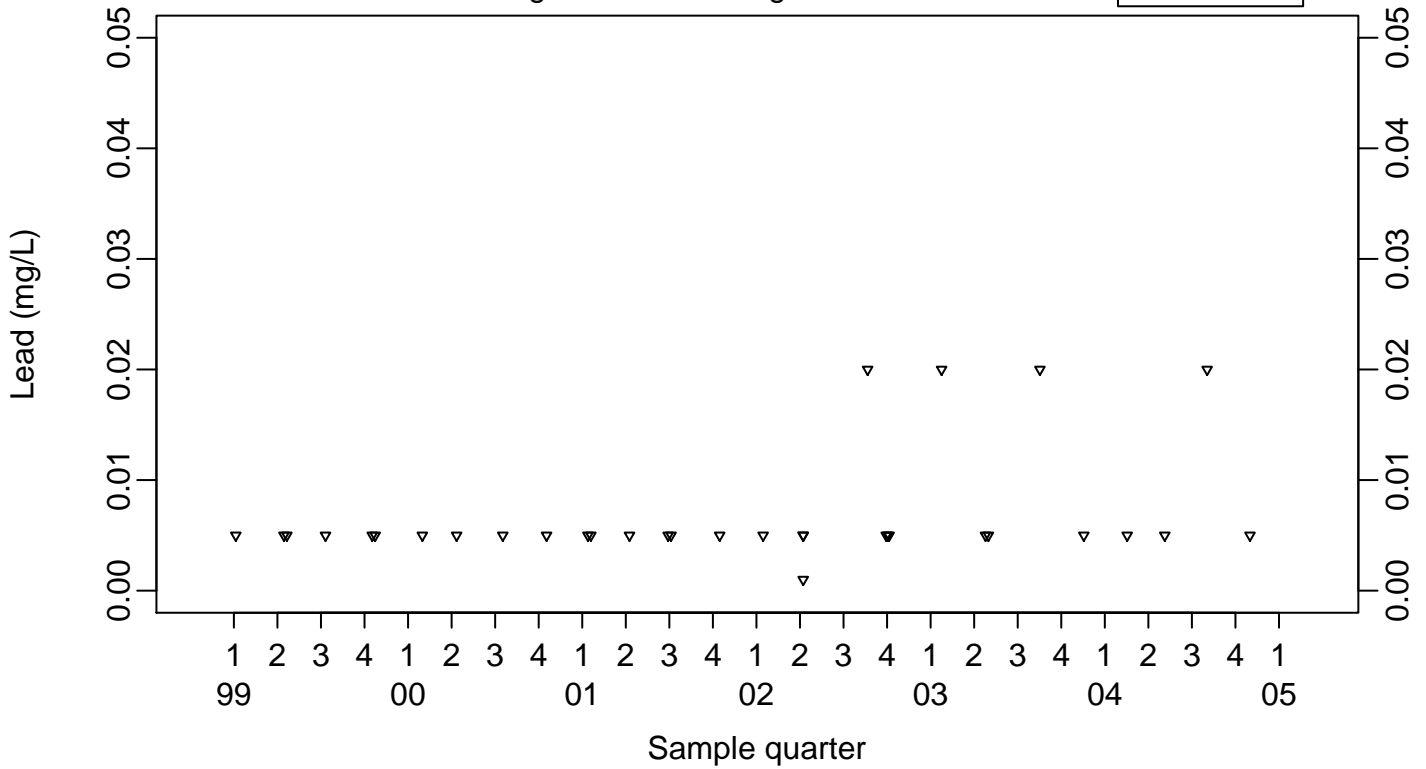
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Lead (mg/L)

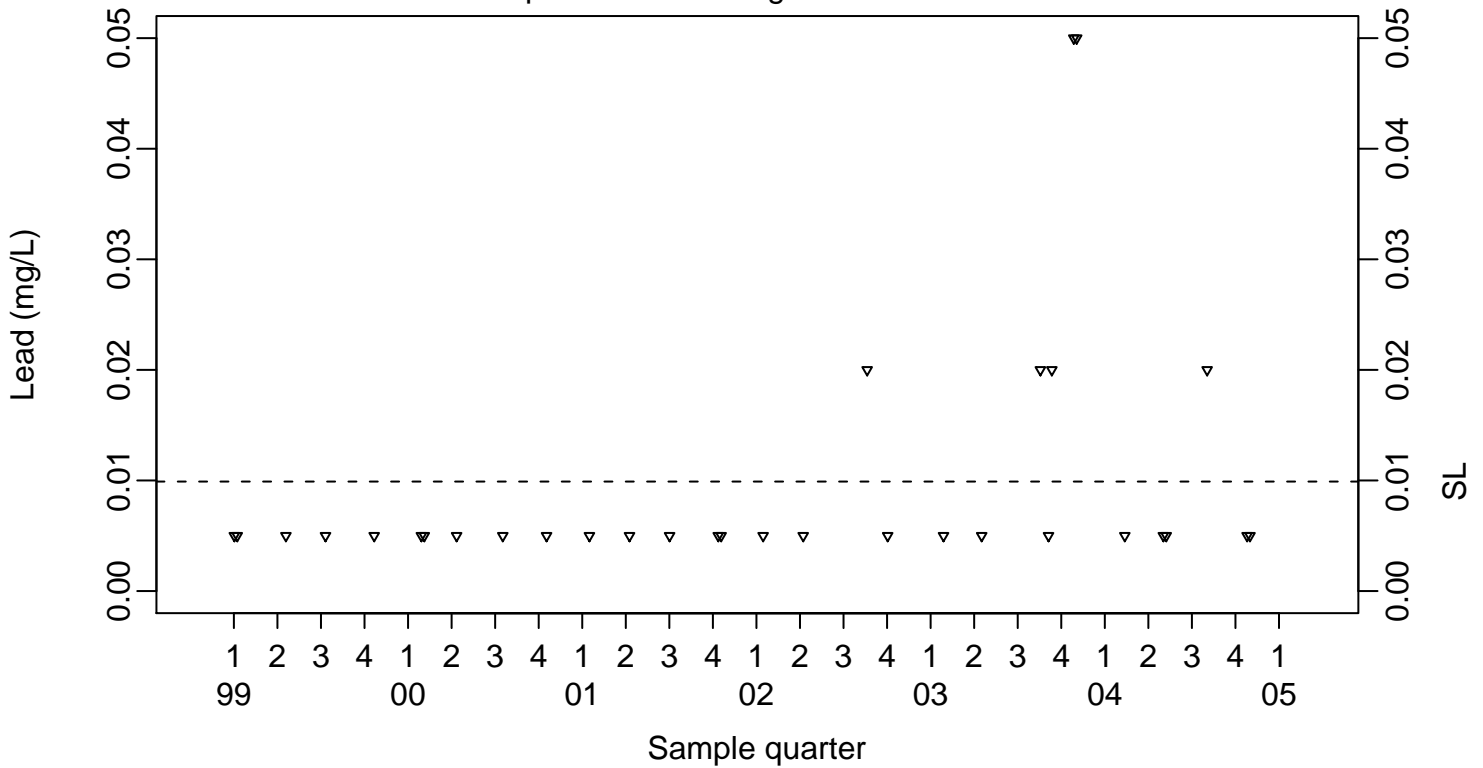
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=0.0099

Compliance Monitoring Point W-817-02

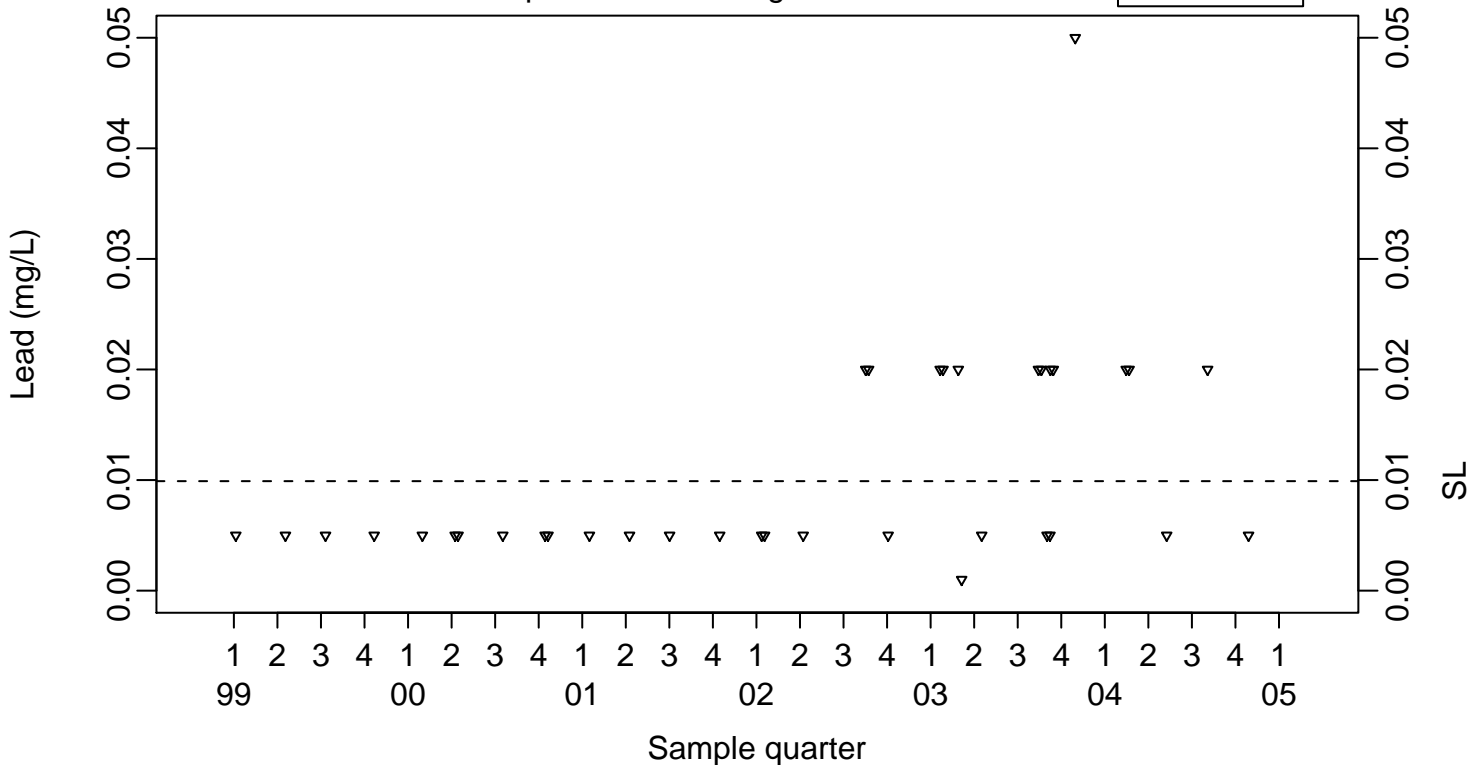


Surface Impoundments Ground Water Lead (mg/L)

SL=0.0099

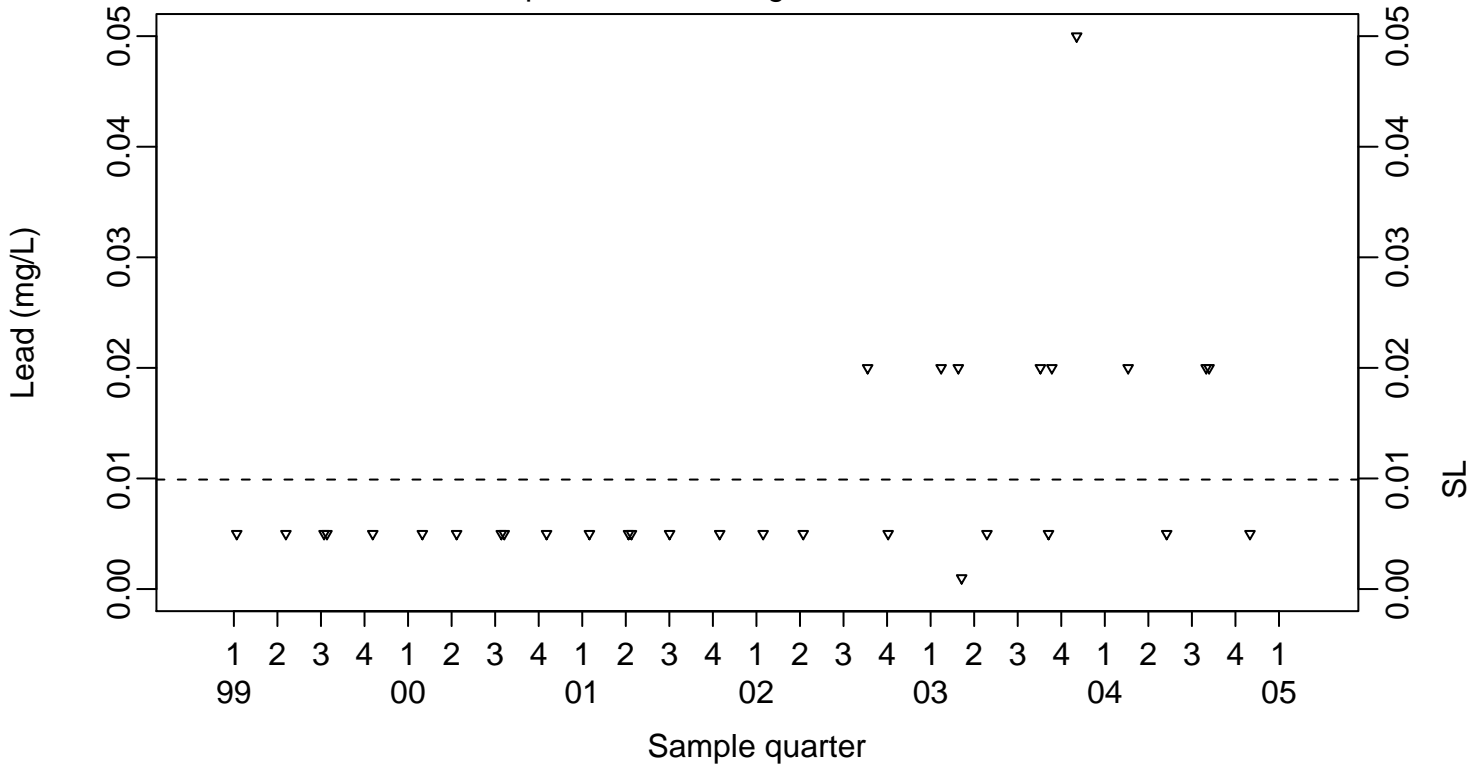
◆ Above RL
▽ Below RL

Compliance Monitoring Point W-817-03



SL=0.0099

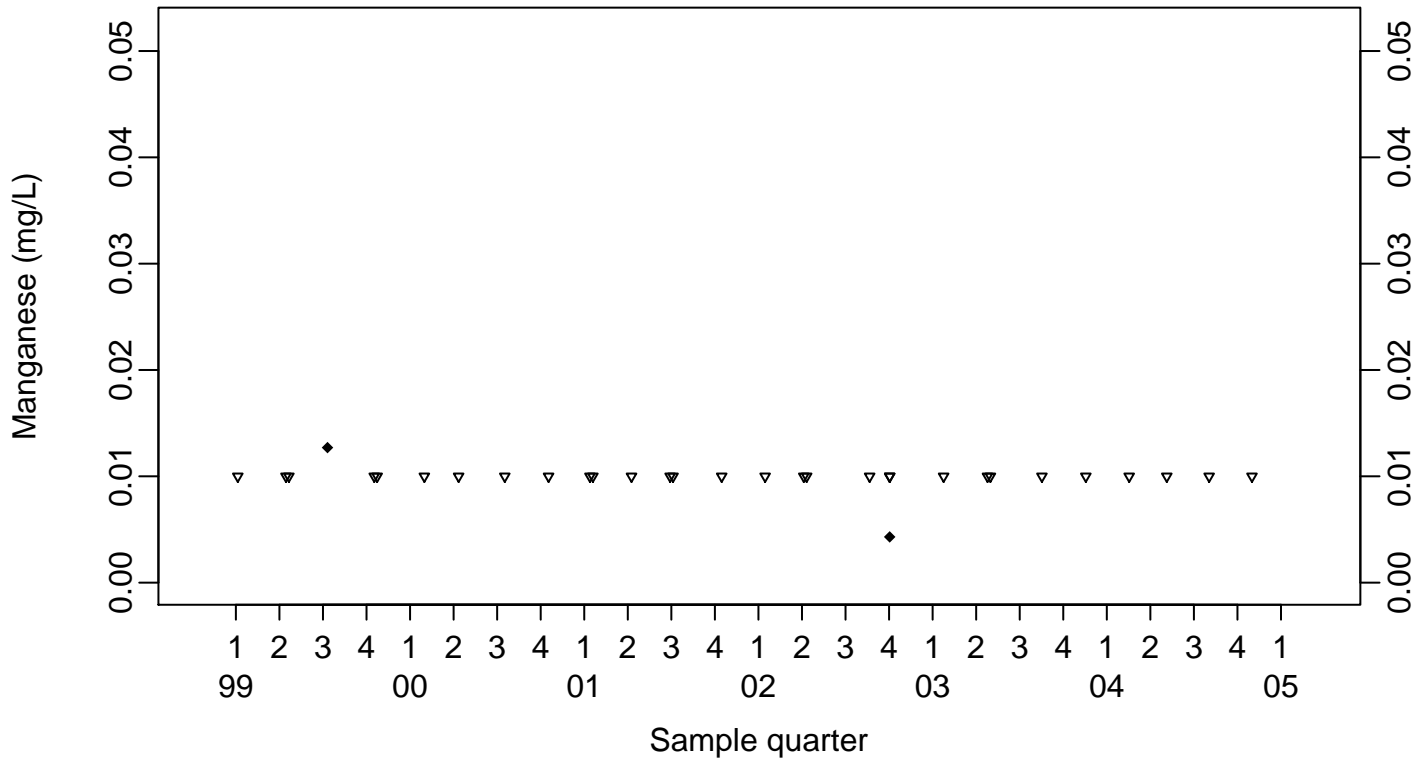
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Manganese (mg/L)

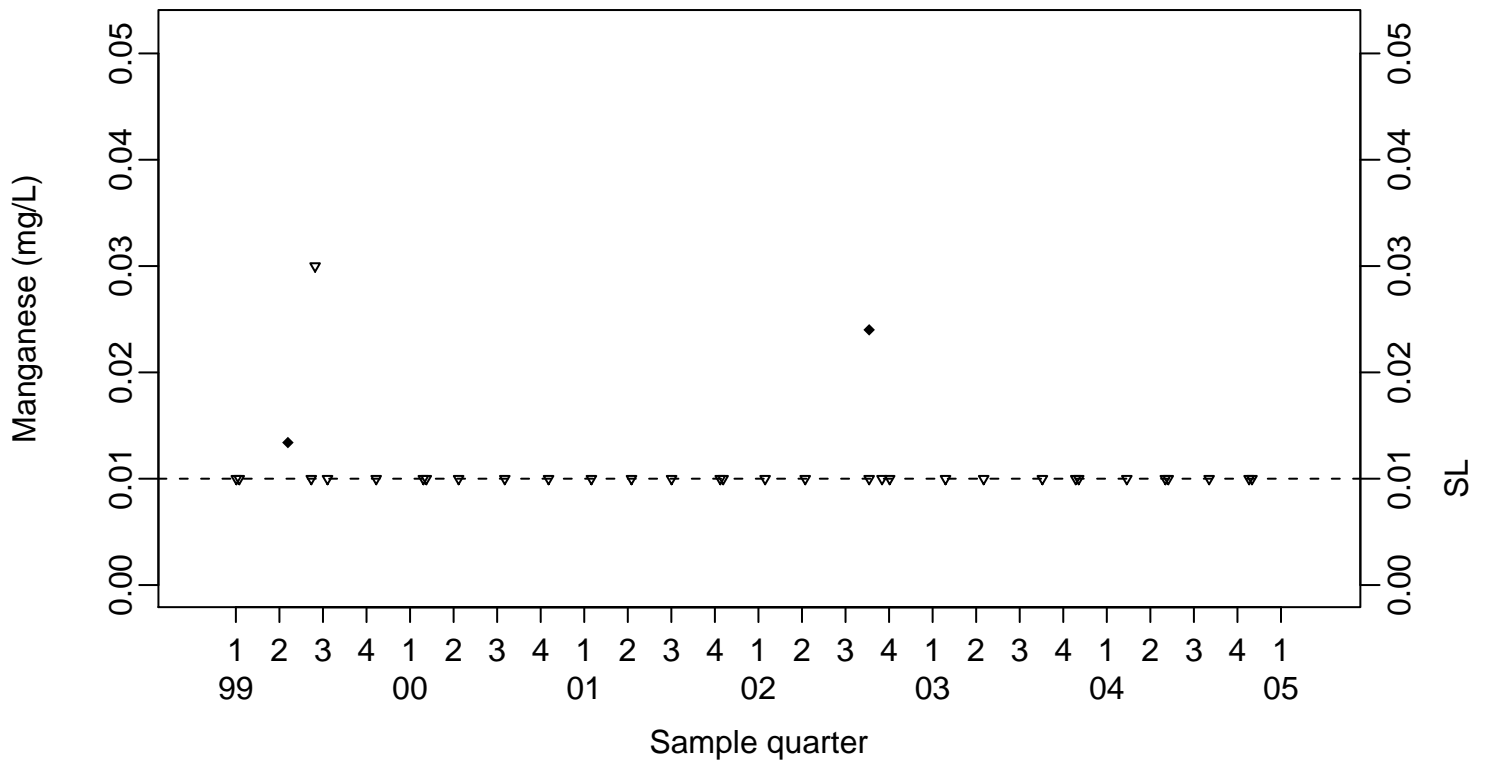
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=0.01

Compliance Monitoring Point W-817-02

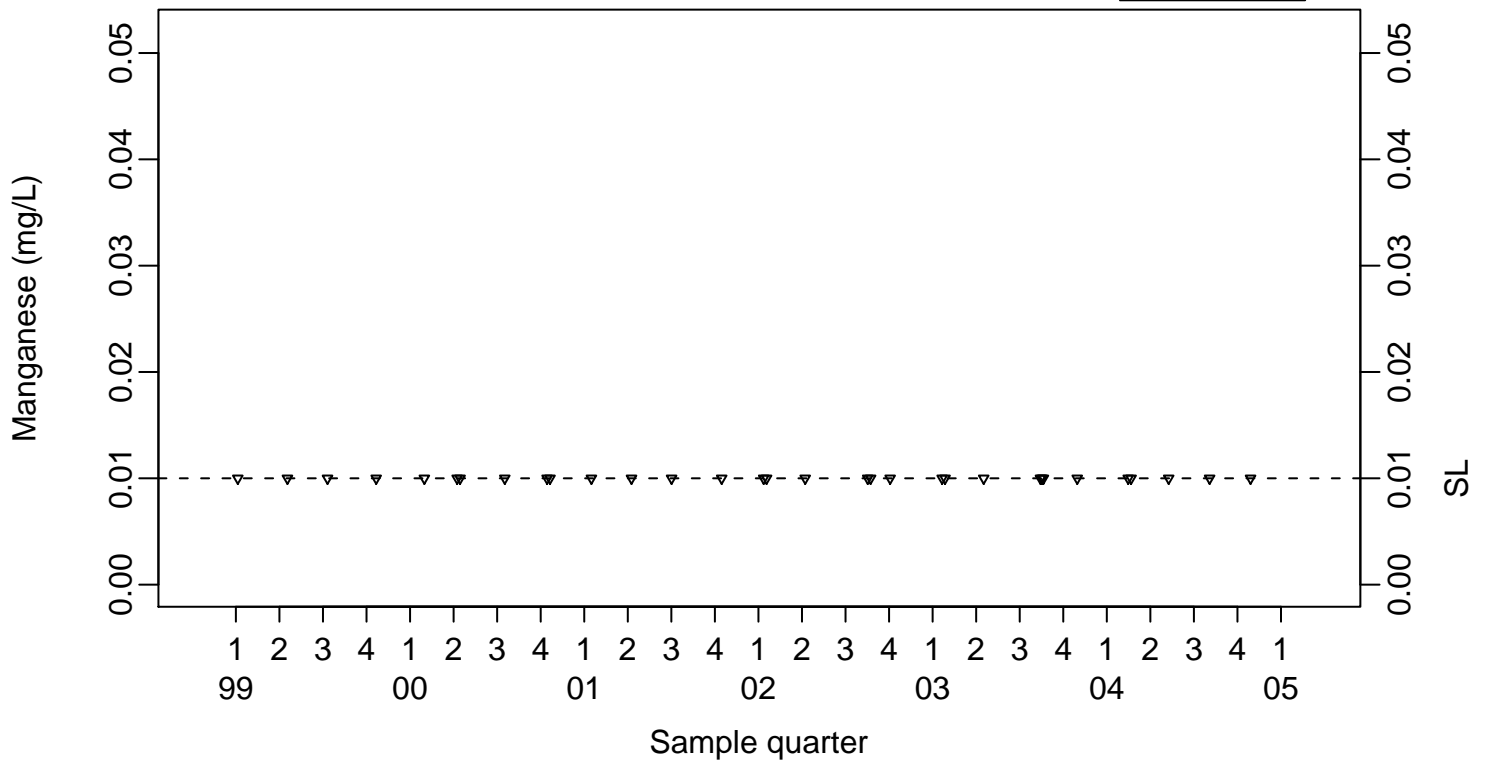


Surface Impoundments Ground Water Manganese (mg/L)

Compliance Monitoring Point W-817-03

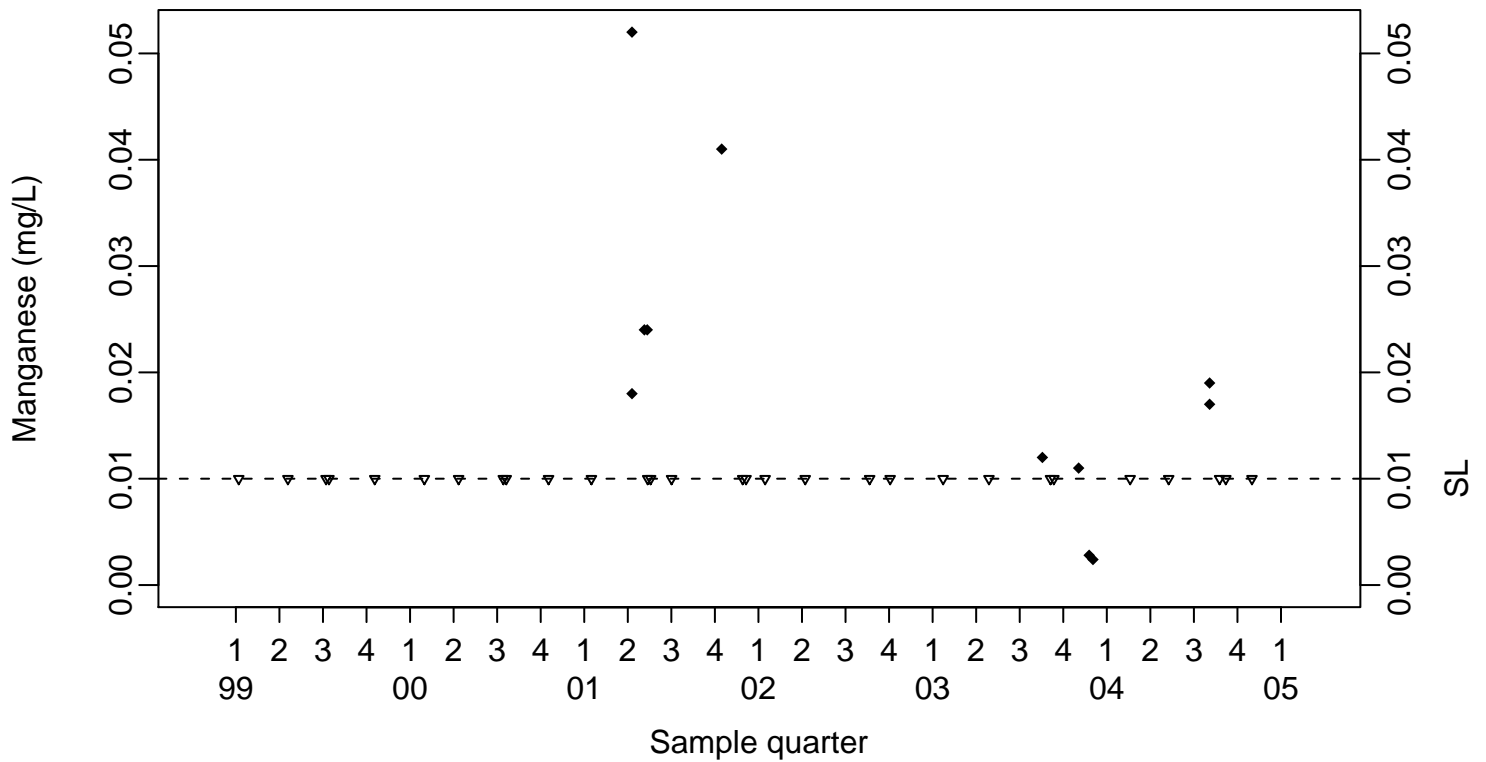
SL=0.01

◆ Above RL
▽ Below RL



SL=0.01

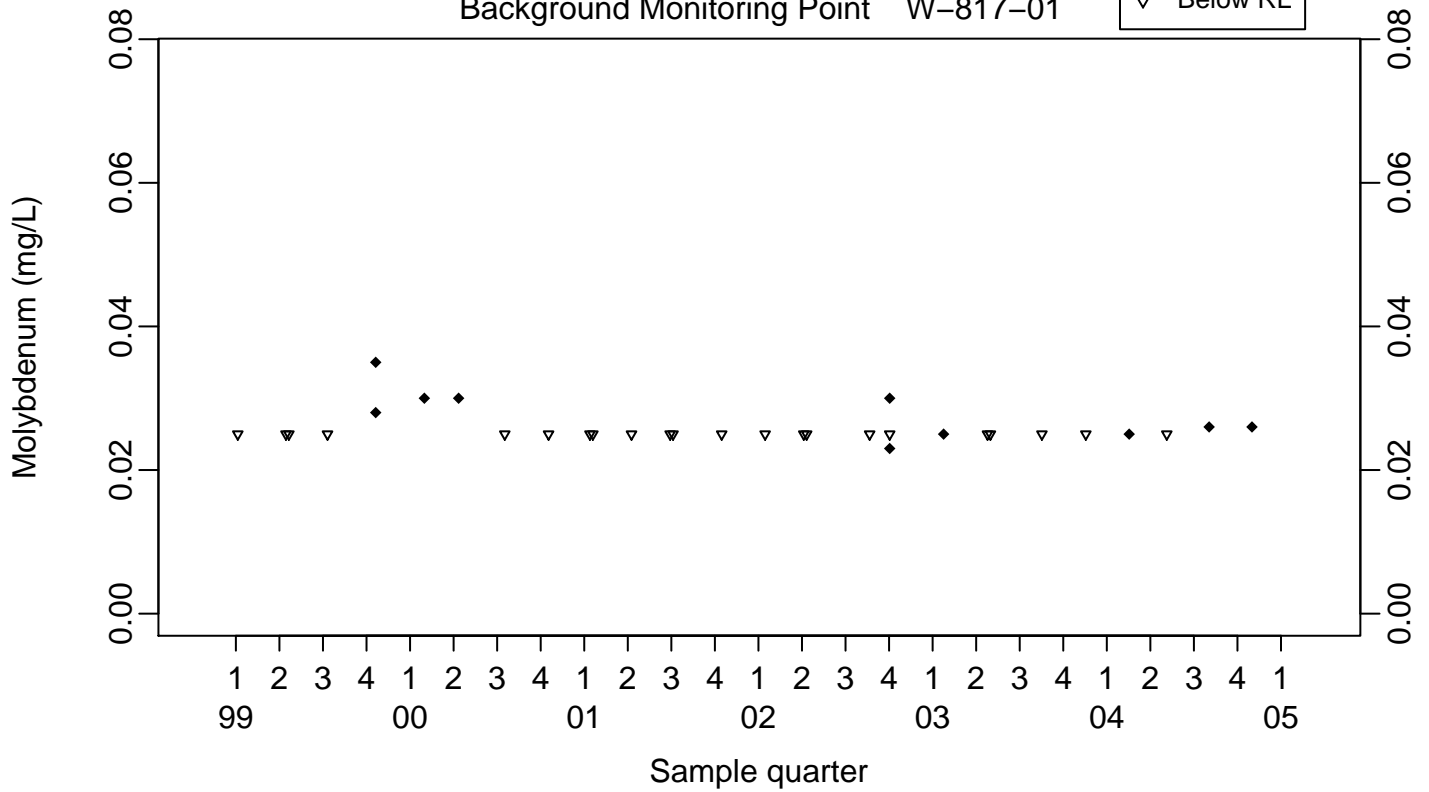
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water
 Molybdenum (mg/L)

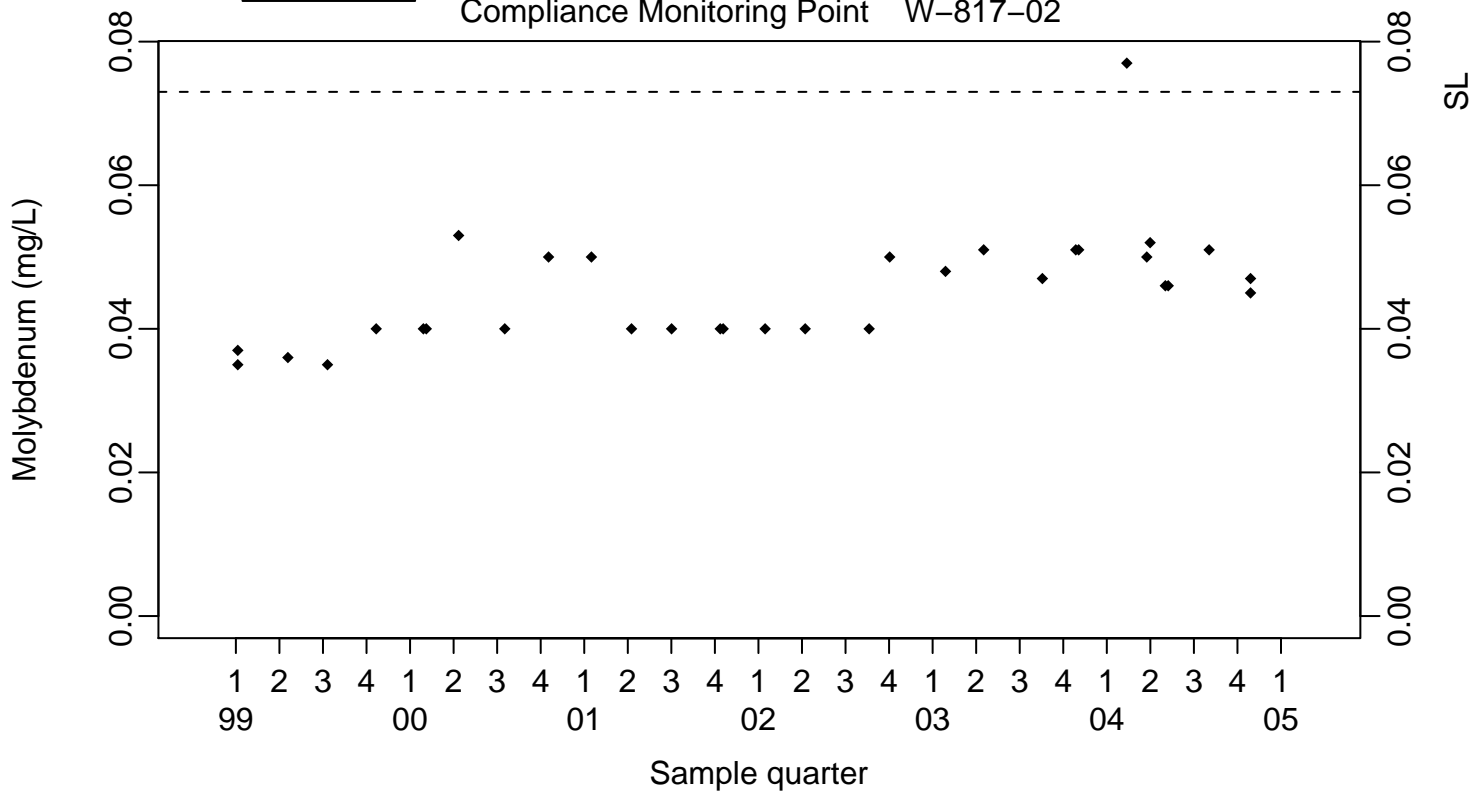
Background Monitoring Point W-817-01

◆ Above RL
 ▼ Below RL



SL=0.073

Compliance Monitoring Point W-817-02

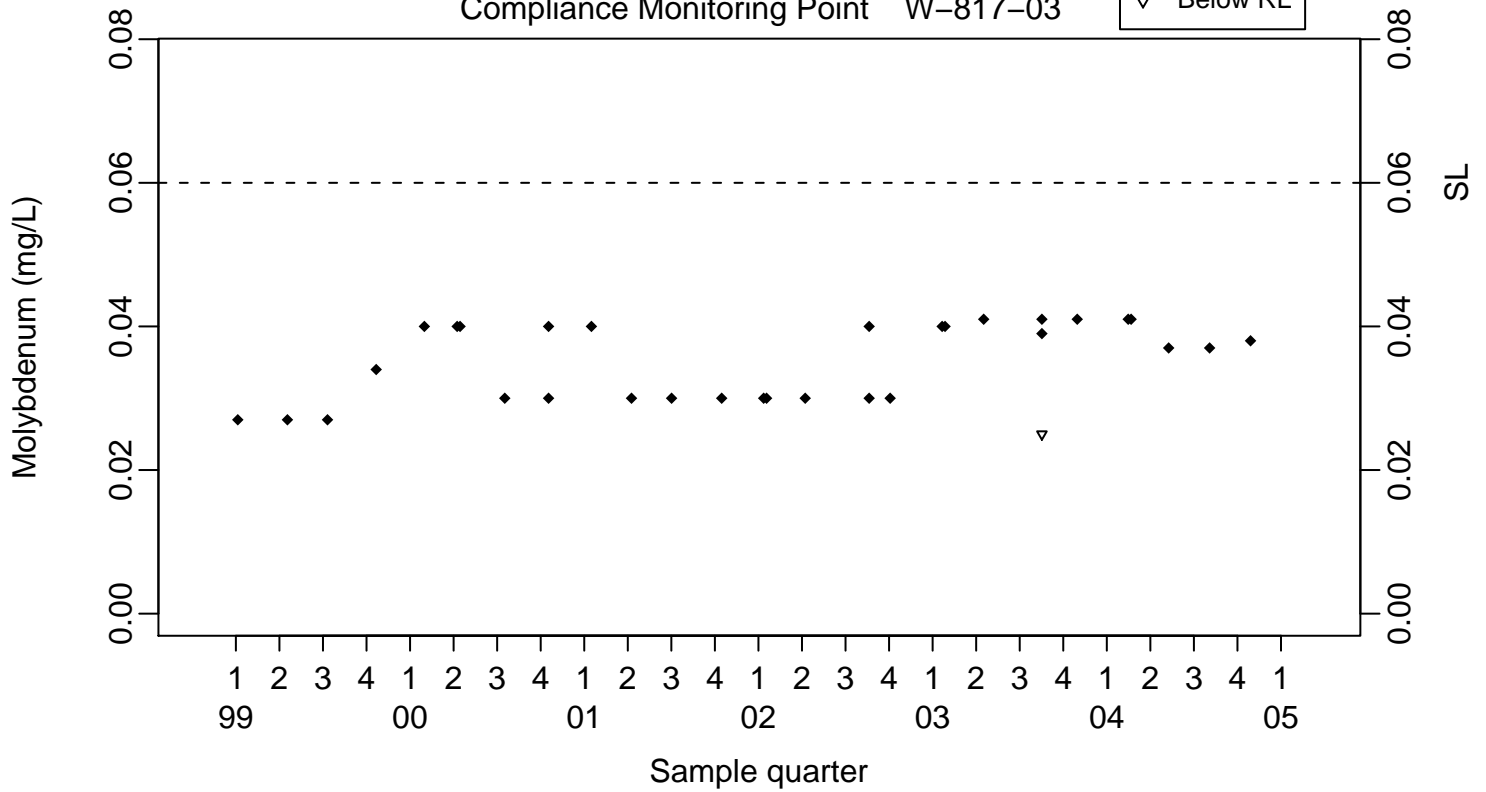


Surface Impoundments Ground Water Molybdenum (mg/L)

Compliance Monitoring Point W-817-03

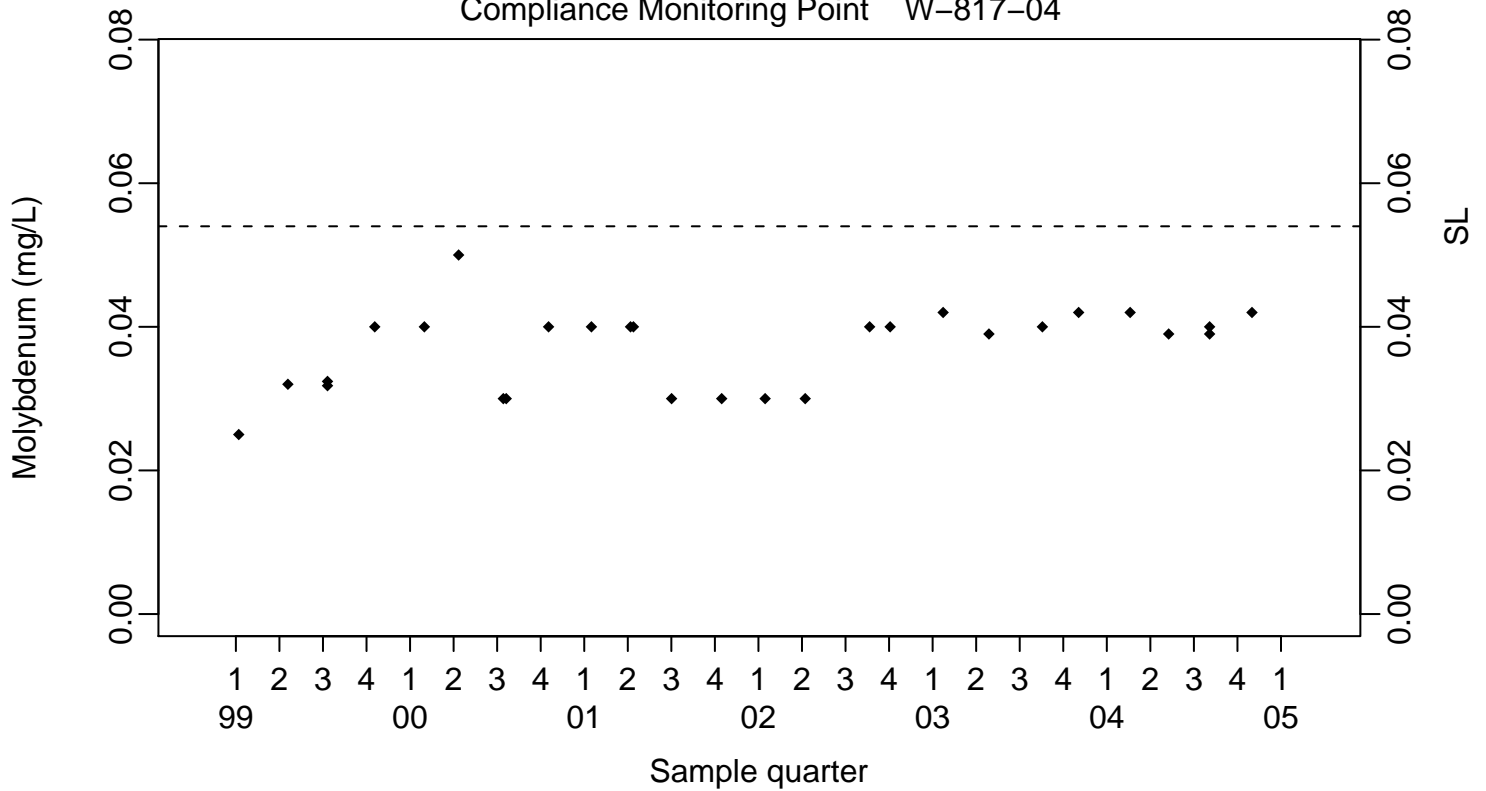
SL=0.06

◆ Above RL
▽ Below RL



Compliance Monitoring Point W-817-04

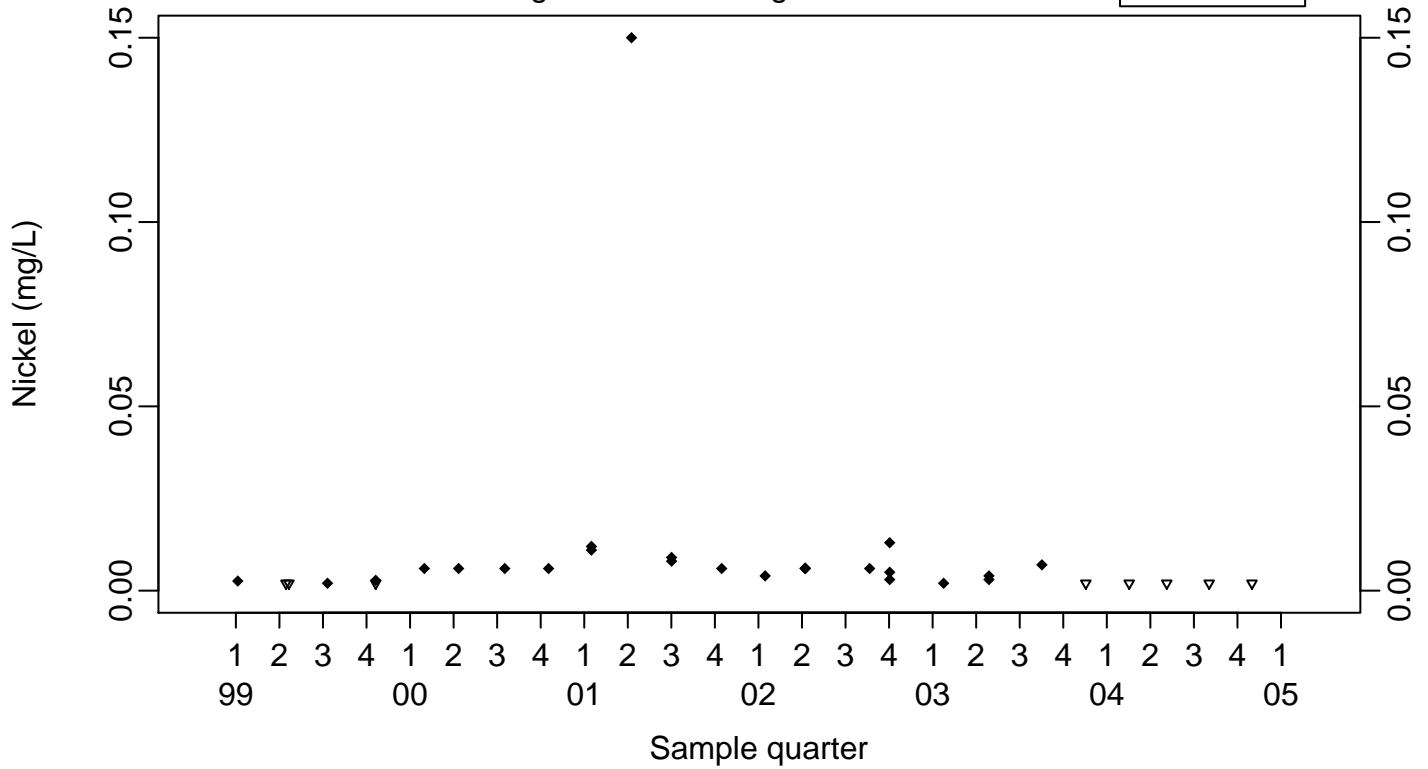
SL=0.054



Surface Impoundments Ground Water Nickel (mg/L)

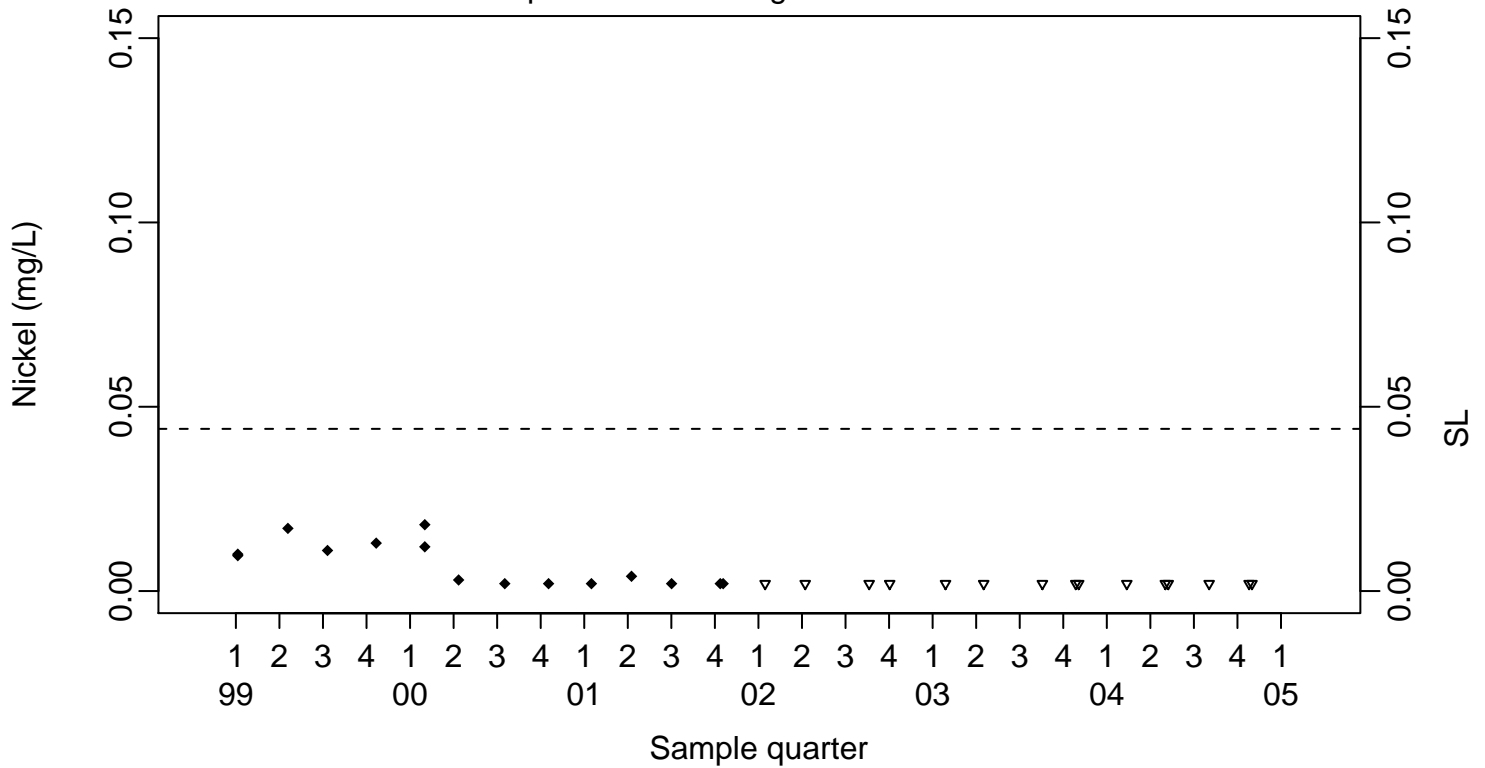
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=0.044

Compliance Monitoring Point W-817-02

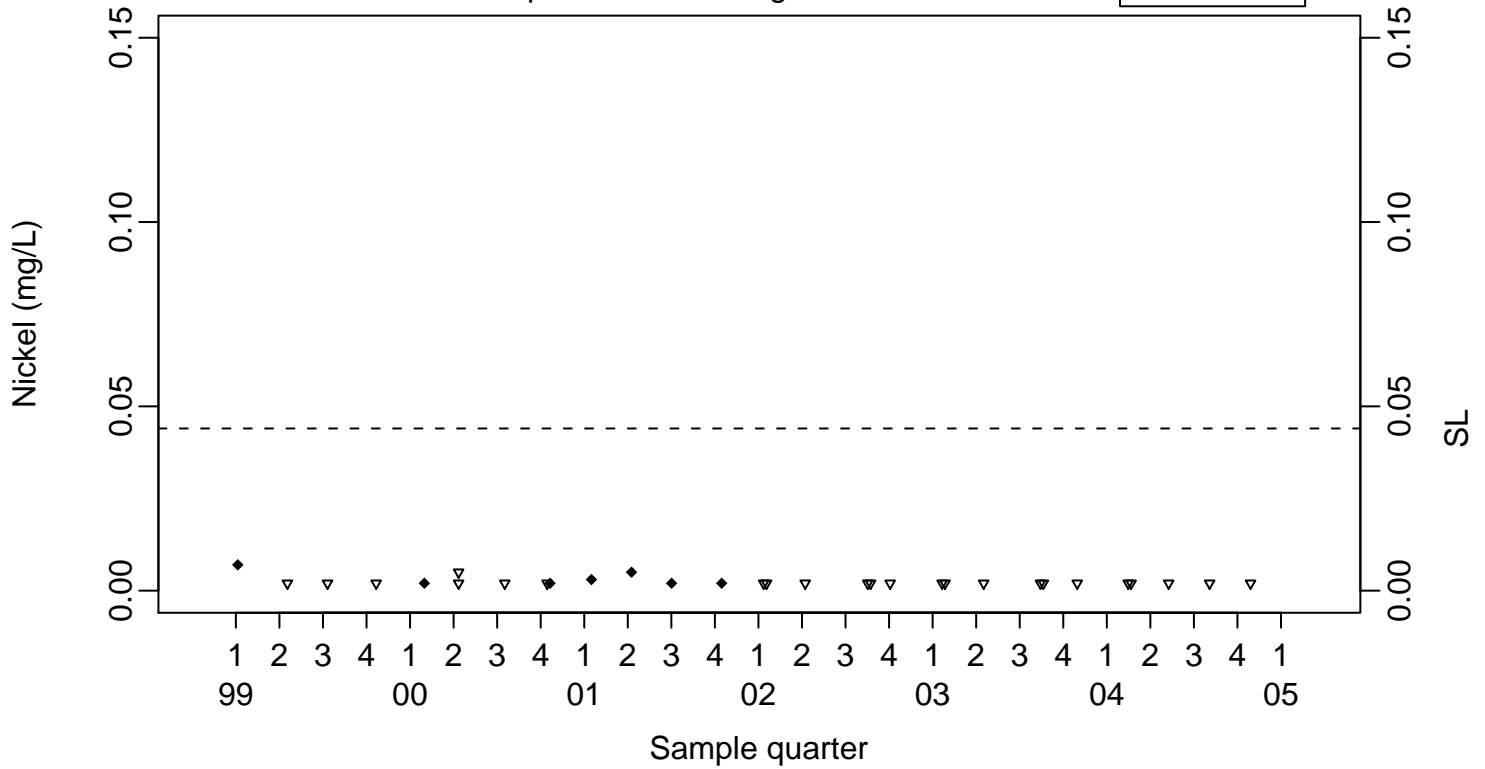


Surface Impoundments Ground Water Nickel (mg/L)

SL=0.044

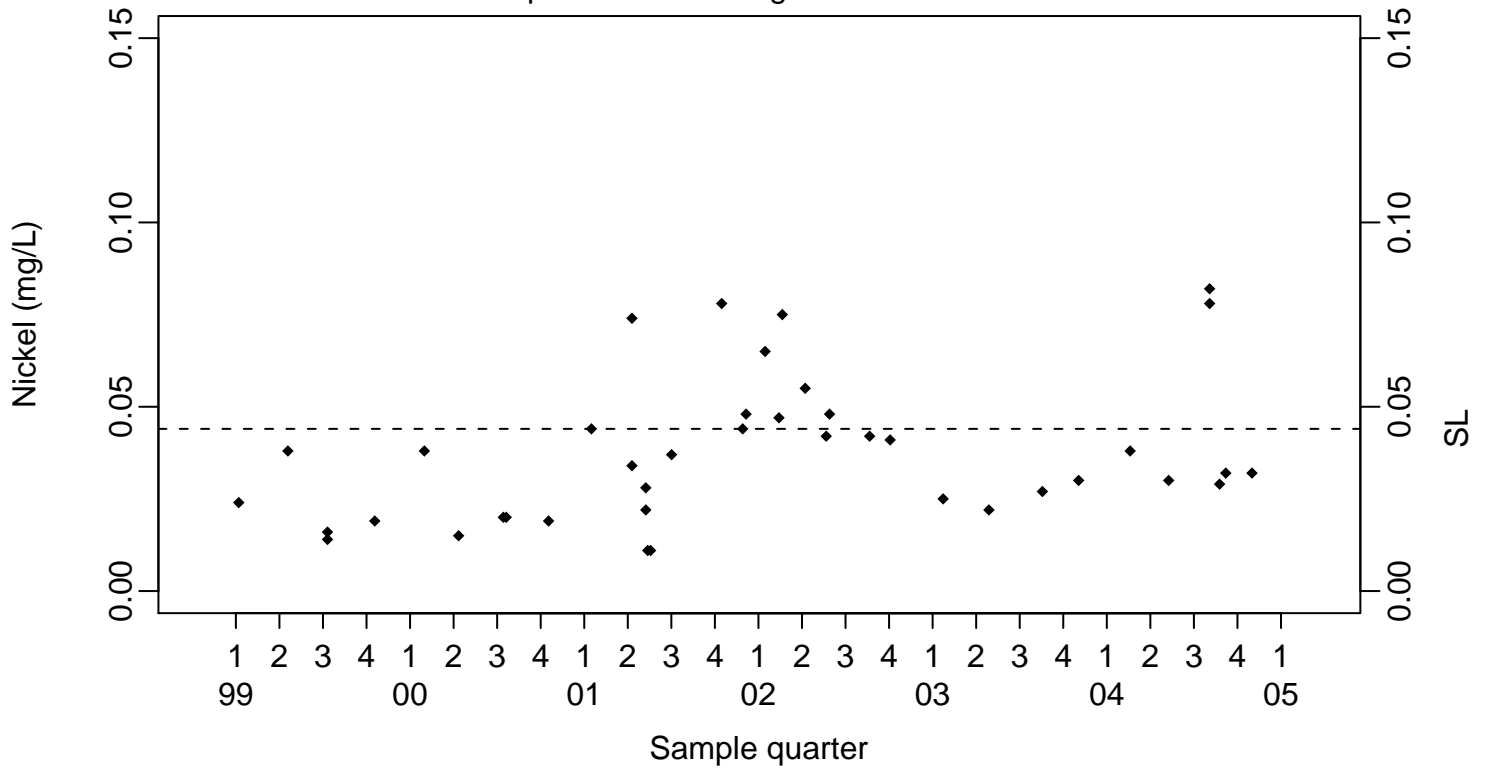
◆ Above RL
▽ Below RL

Compliance Monitoring Point W-817-03



SL=0.044

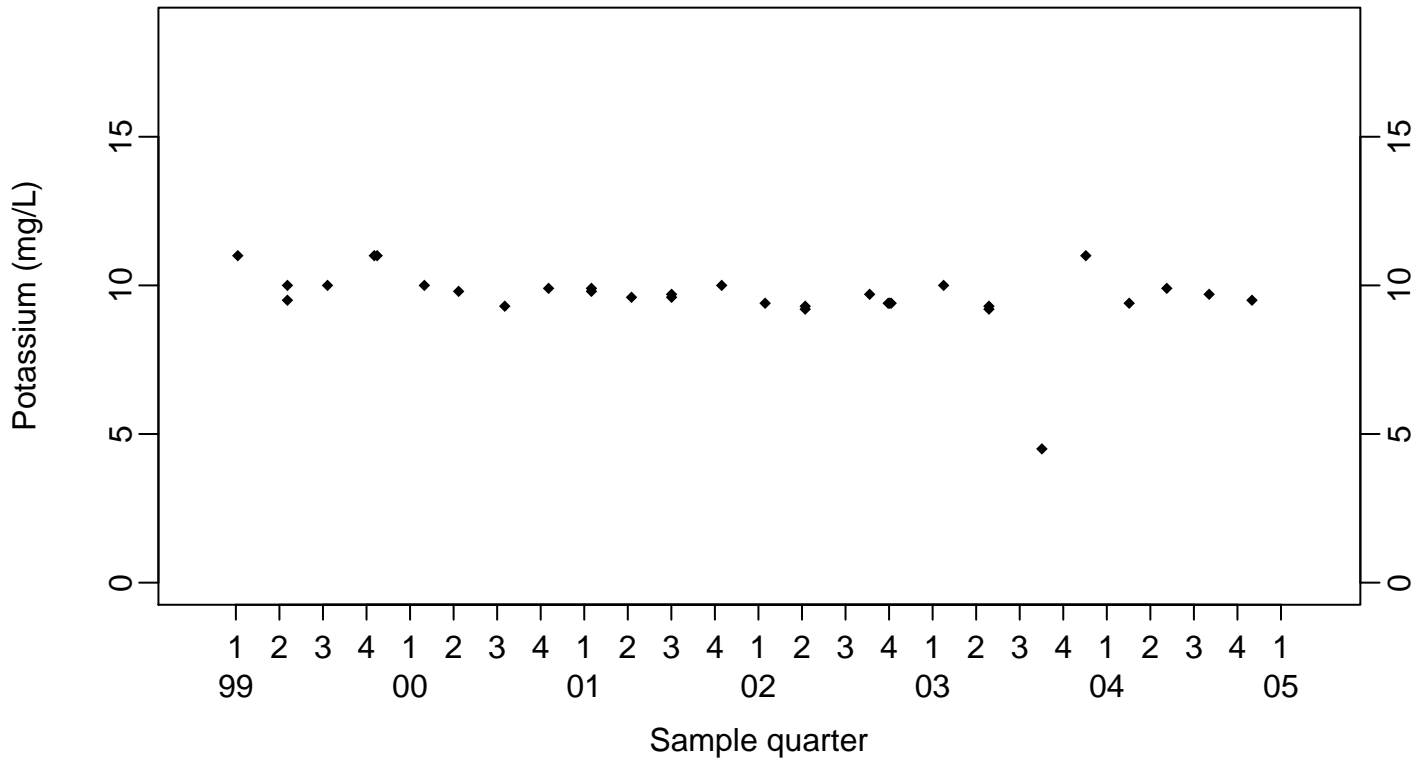
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Potassium (mg/L)

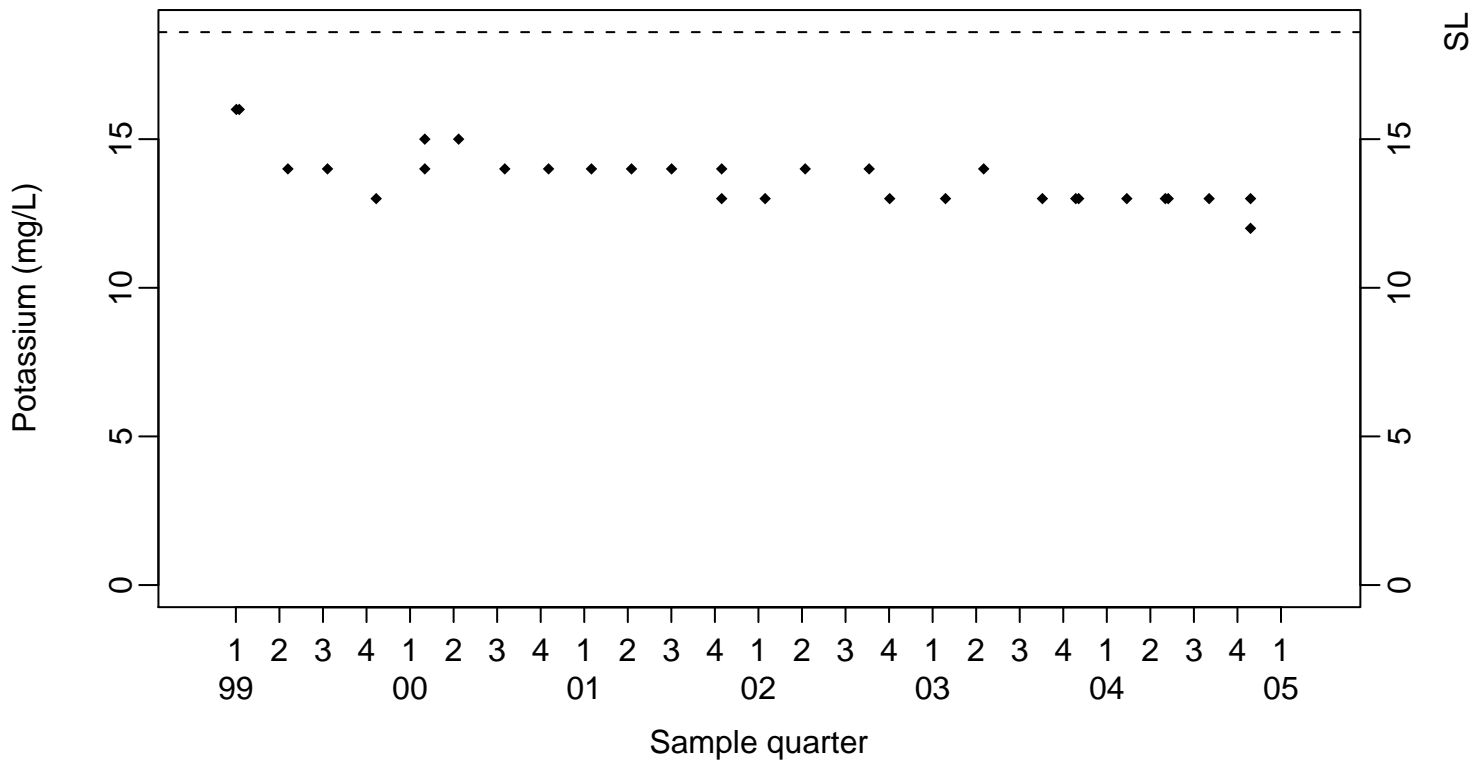
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=18.6

Compliance Monitoring Point W-817-02

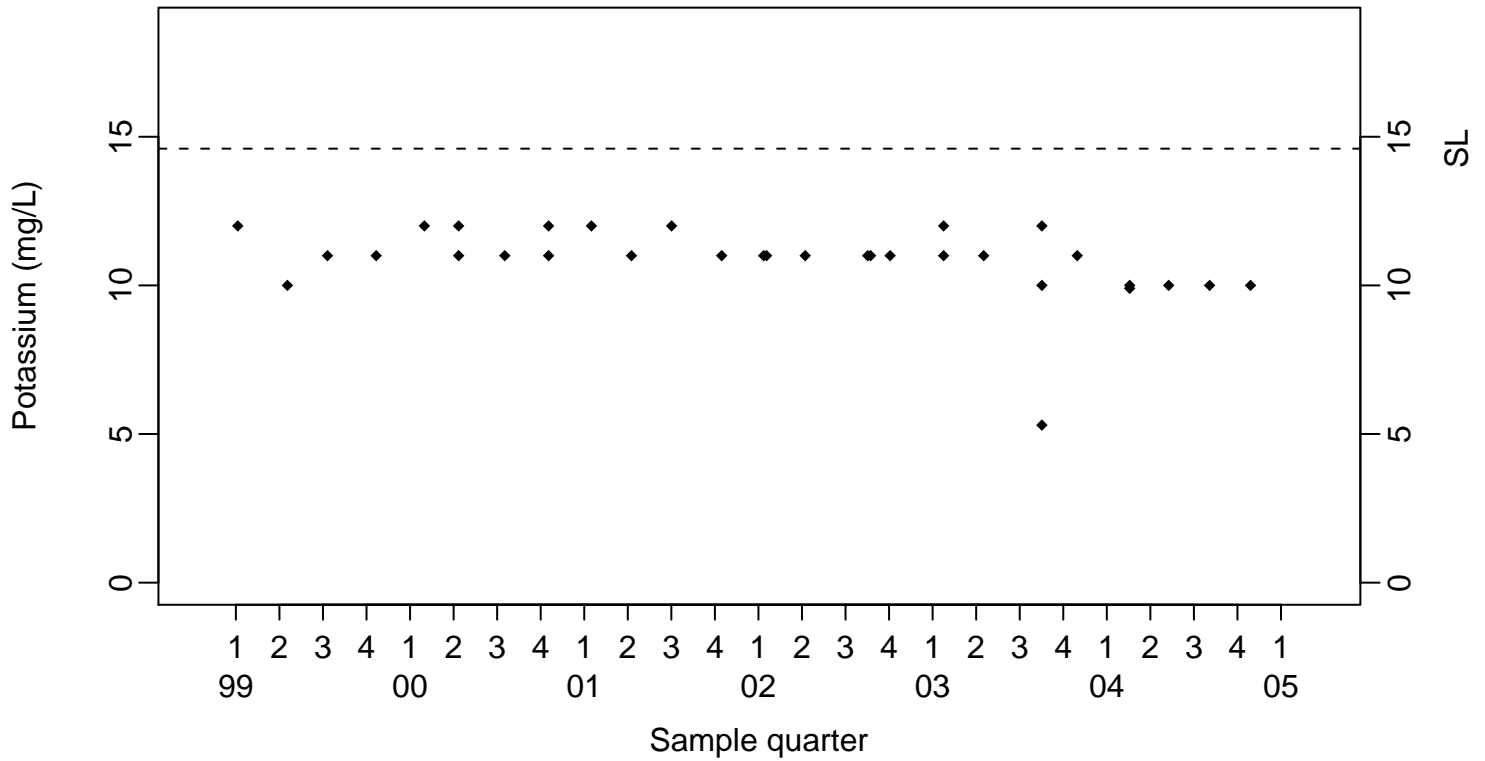


Surface Impoundments Ground Water Potassium (mg/L)

SL=14.6

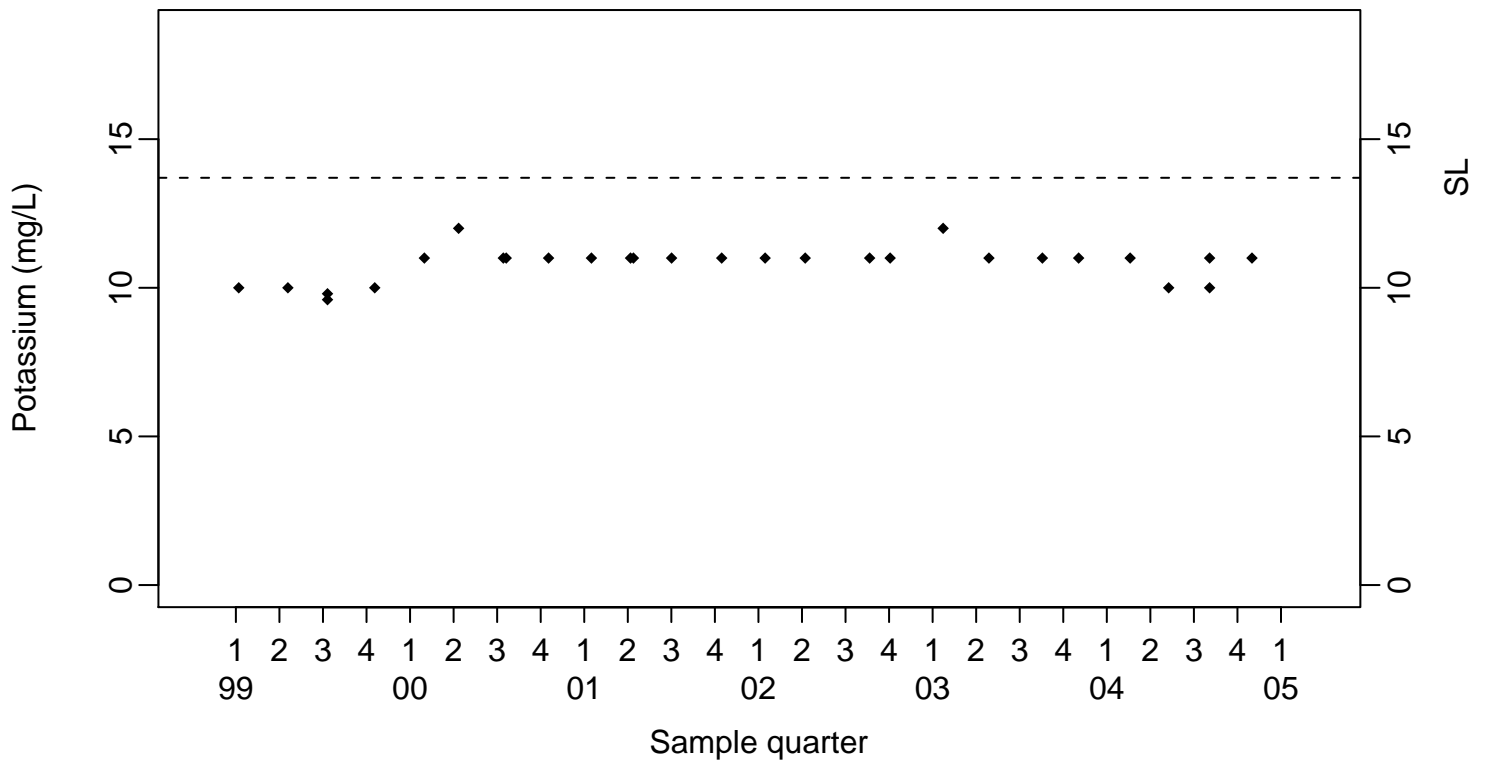
◆ Above RL
▽ Below RL

Compliance Monitoring Point W-817-03



SL=13.7

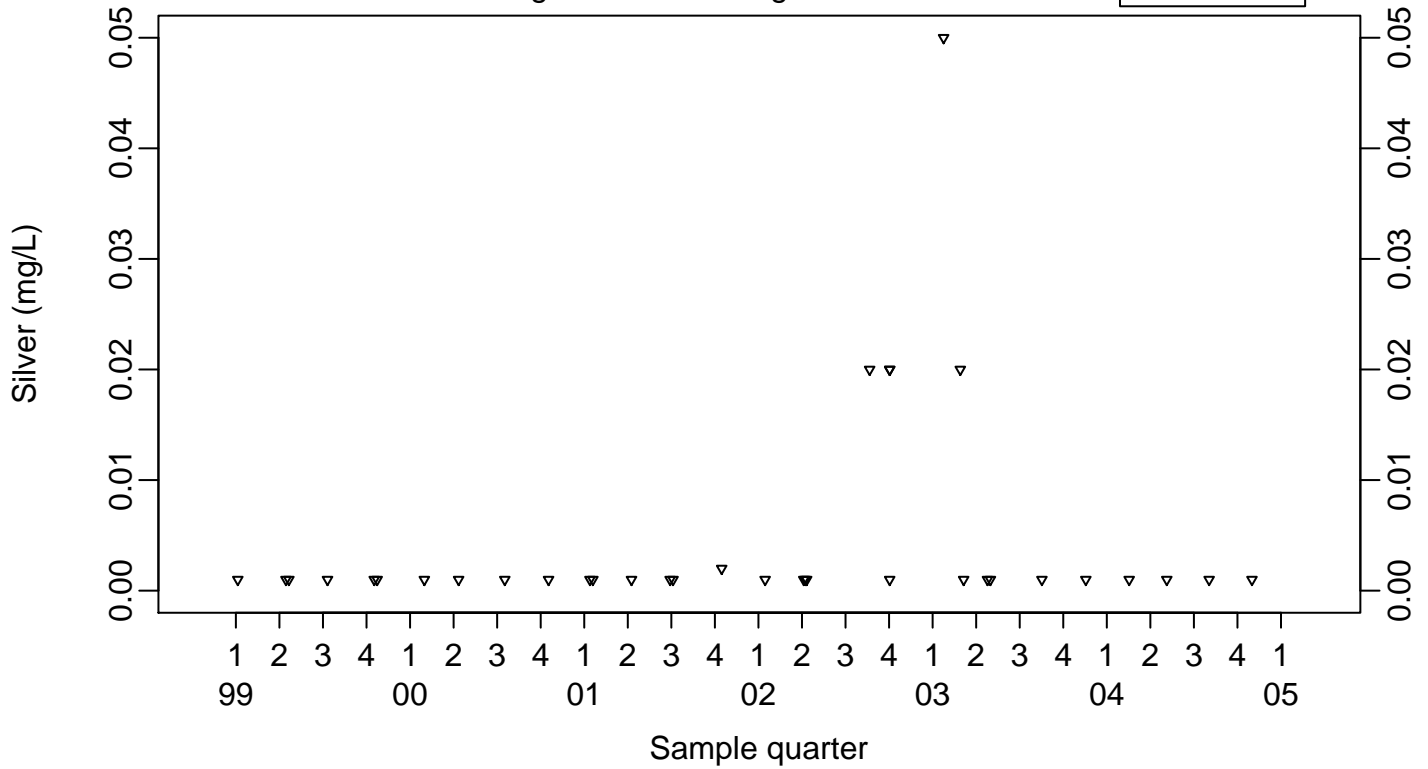
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Silver (mg/L)

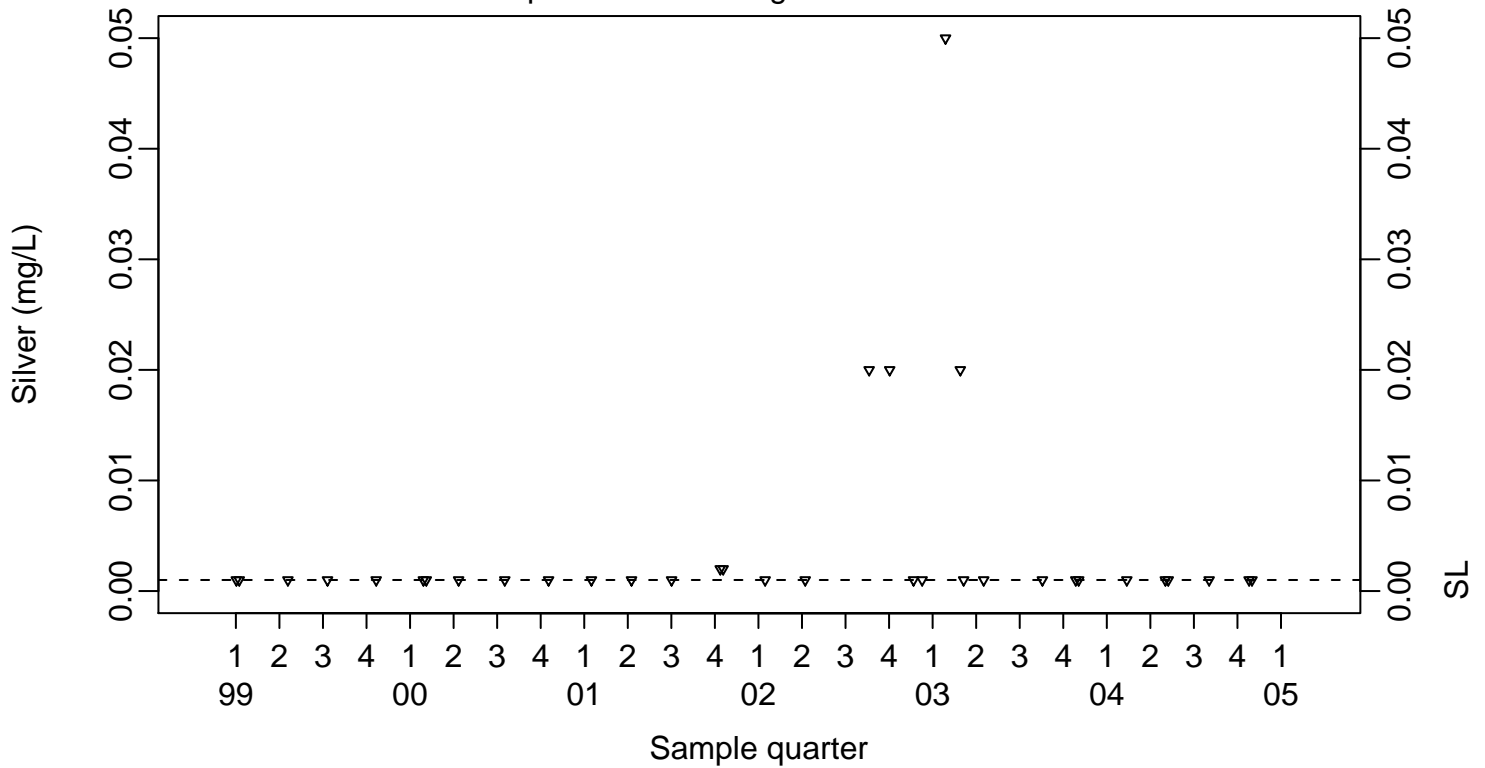
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=0.001

Compliance Monitoring Point W-817-02

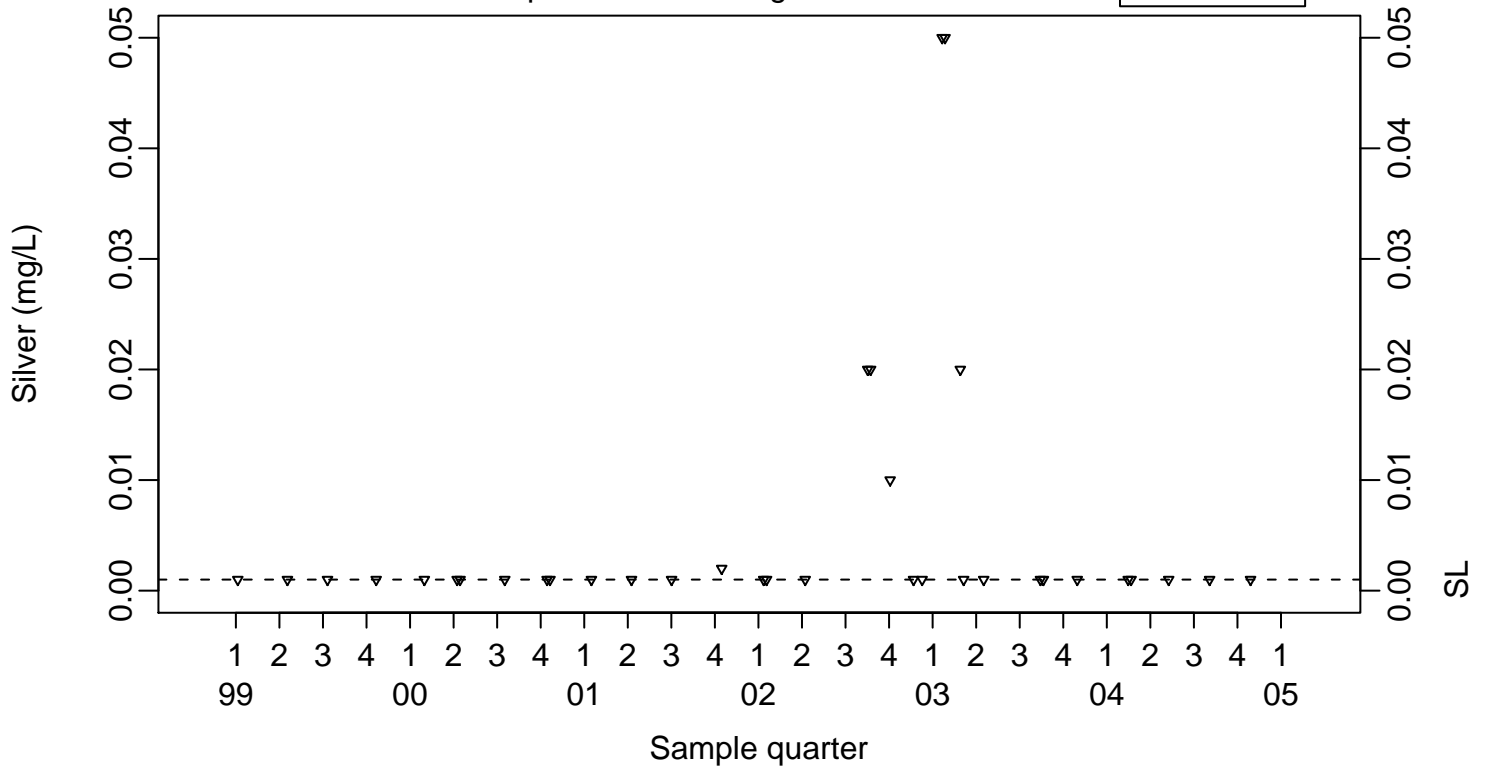


Surface Impoundments Ground Water Silver (mg/L)

SL=0.001

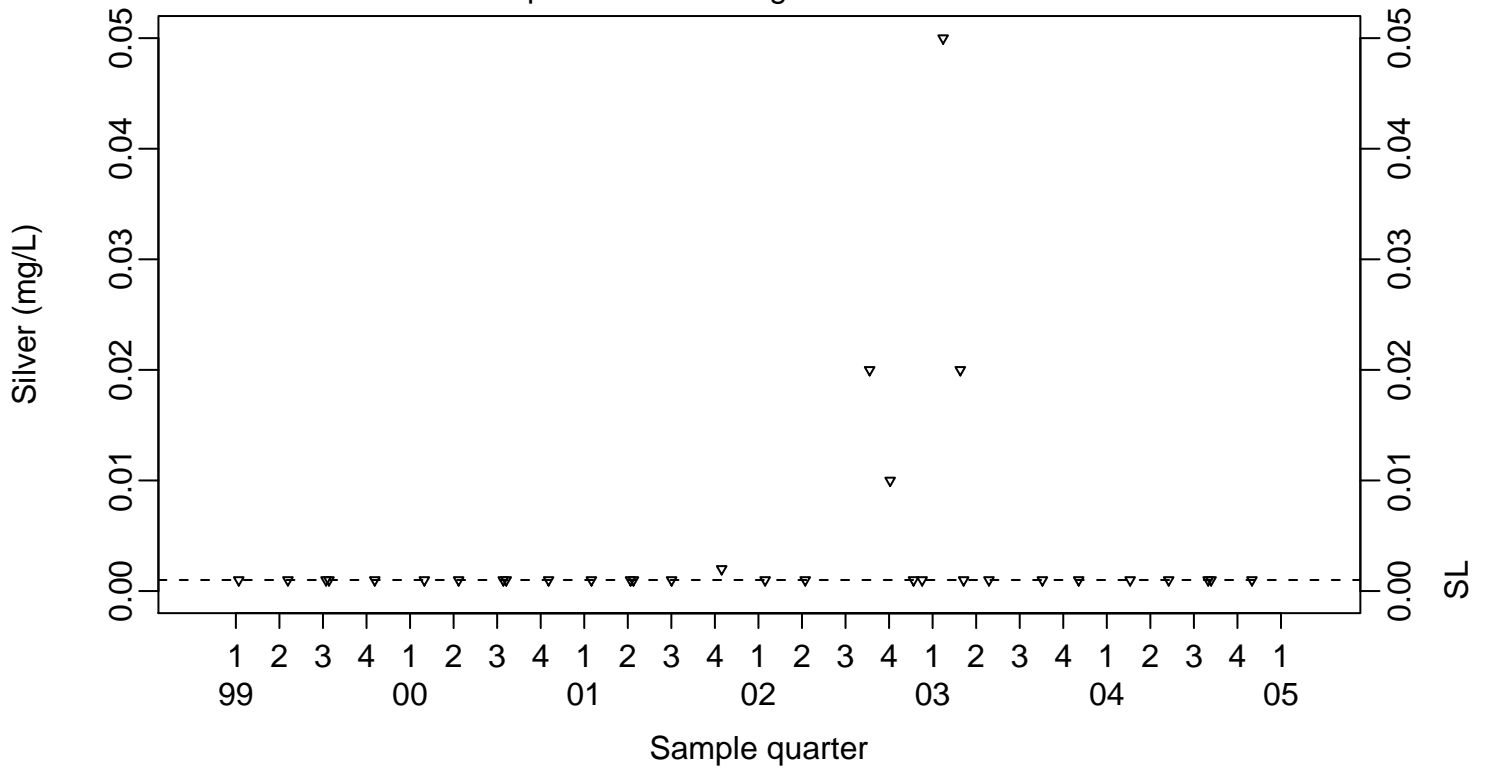
◆ Above RL
▽ Below RL

Compliance Monitoring Point W-817-03



SL=0.001

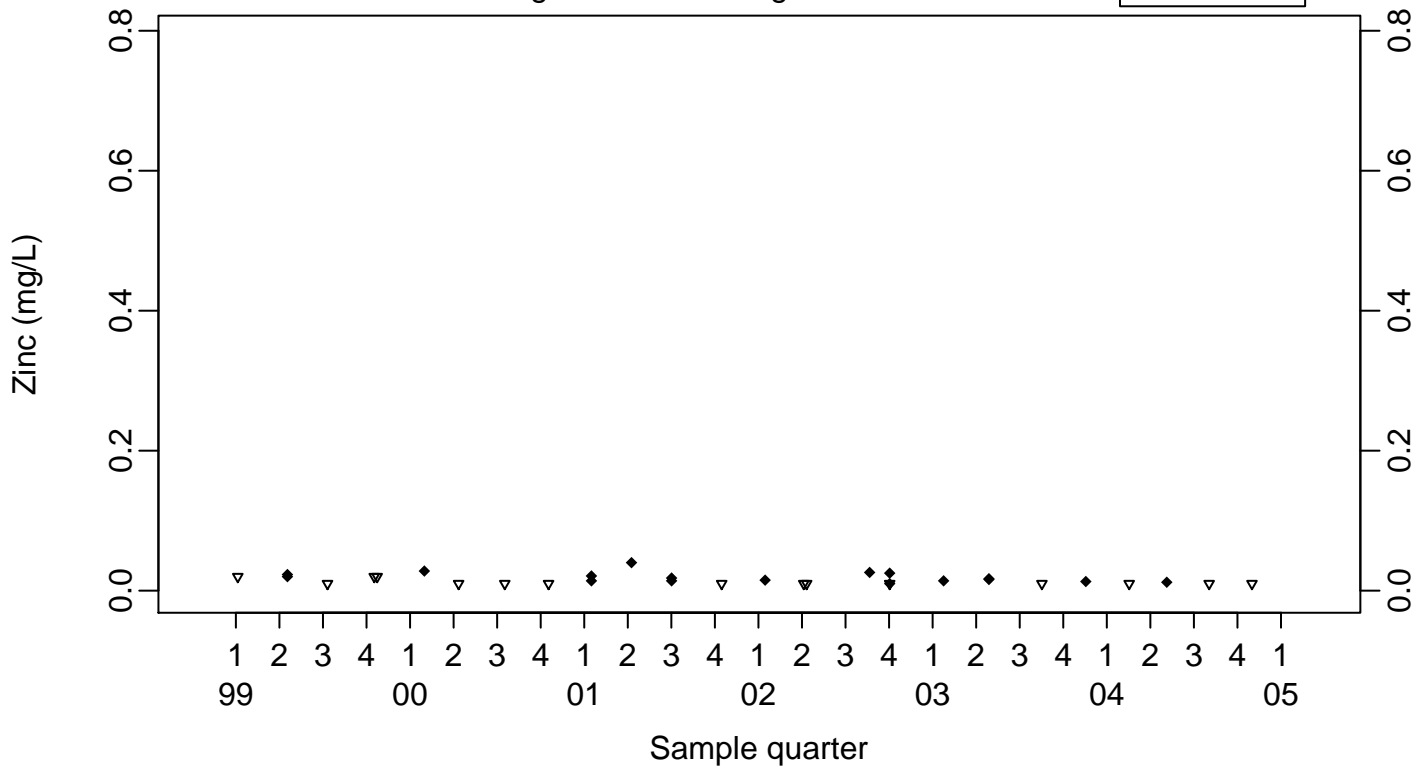
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Zinc (mg/L)

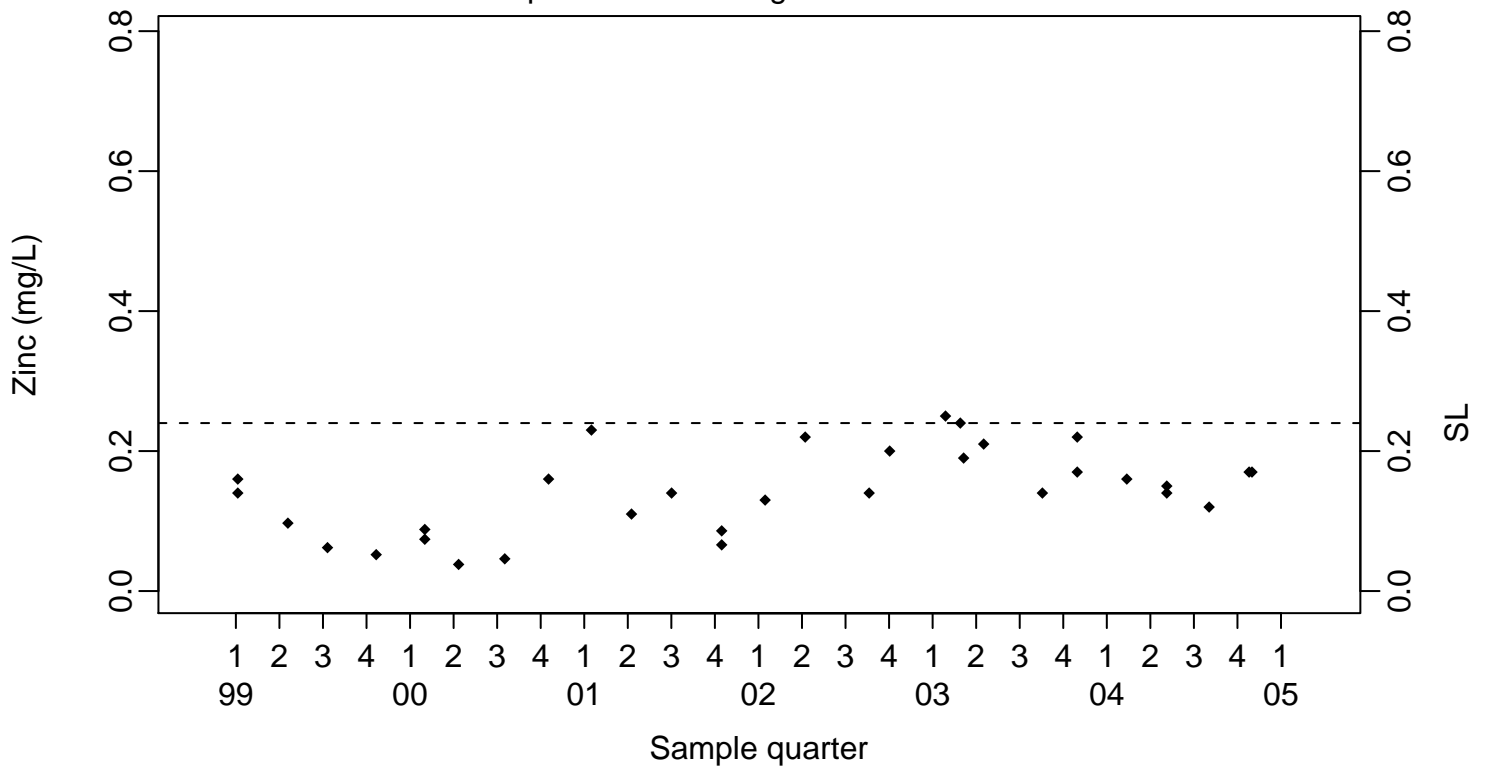
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=0.24

Compliance Monitoring Point W-817-02

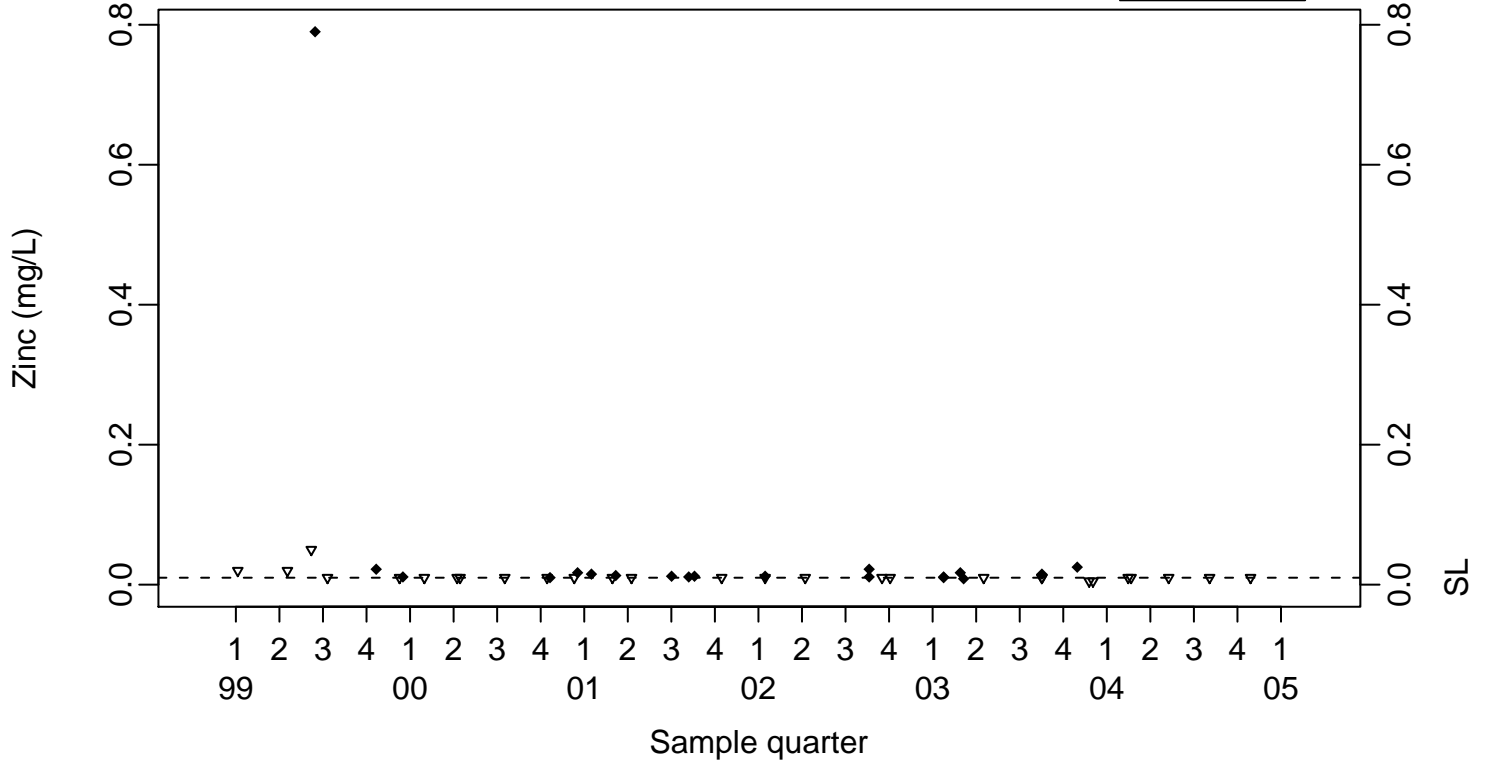


Surface Impoundments Ground Water Zinc (mg/L)

Compliance Monitoring Point W-817-03

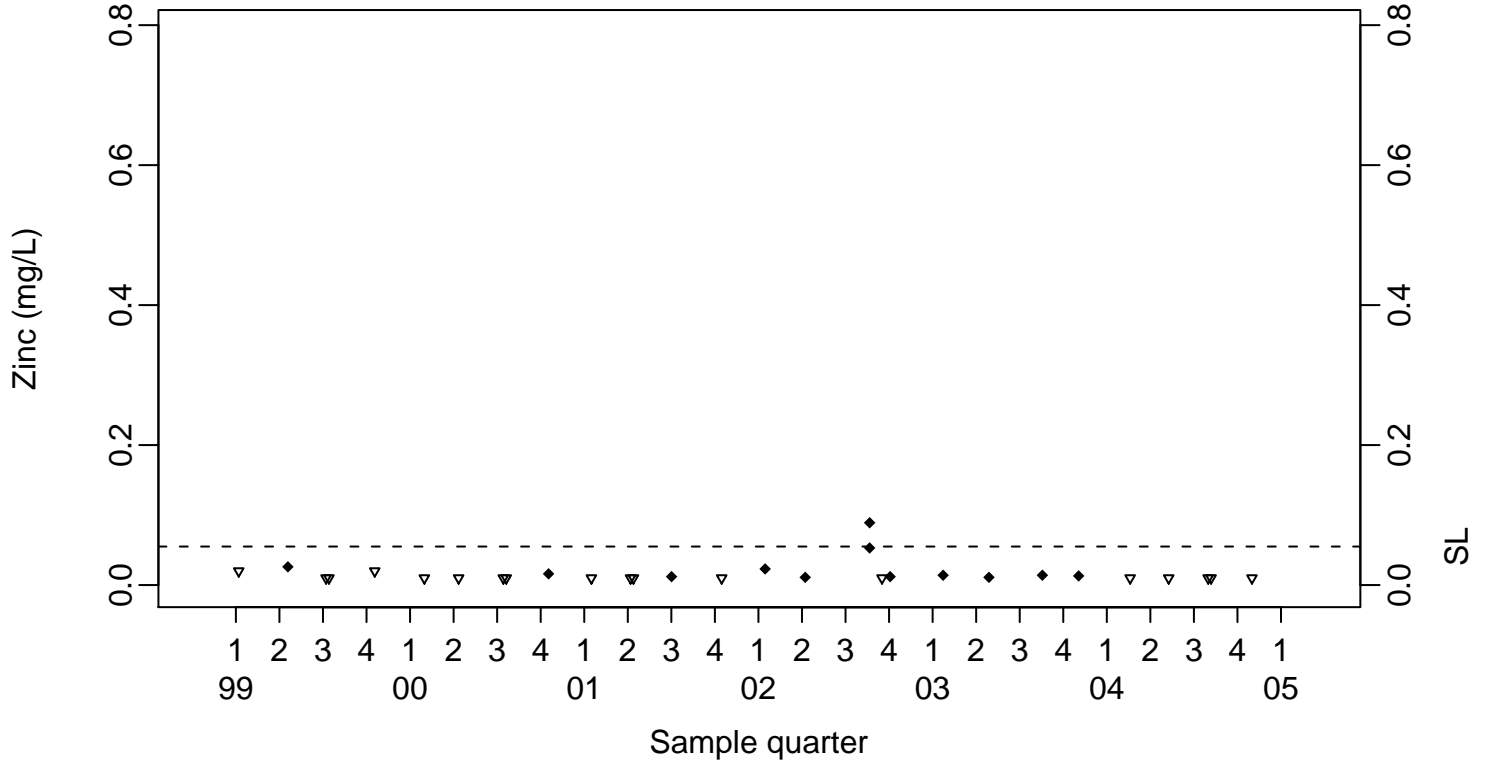
SL=0.0099

◆ Above RL
▽ Below RL



Compliance Monitoring Point W-817-04

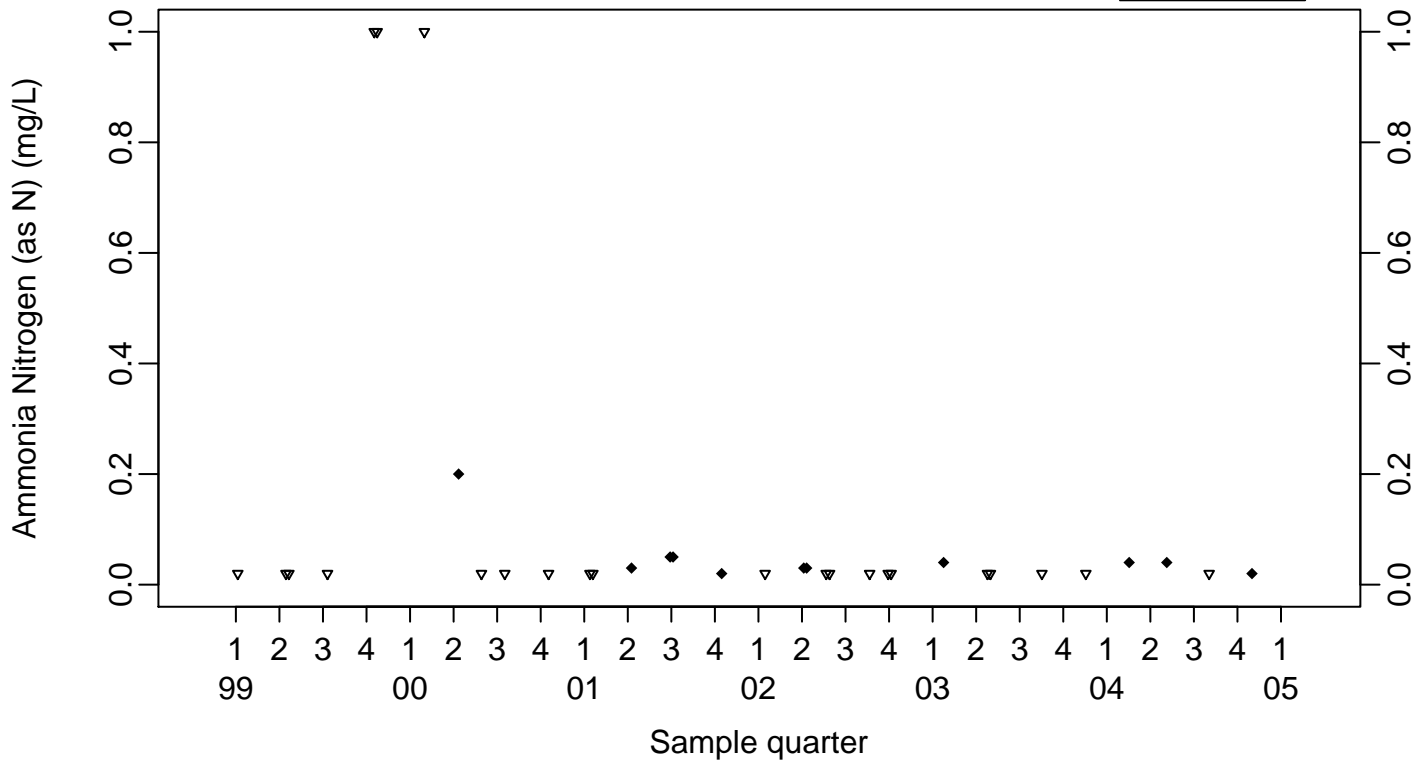
SL=0.055



Surface Impoundments Ground Water Ammonia Nitrogen (as N) (mg/L)

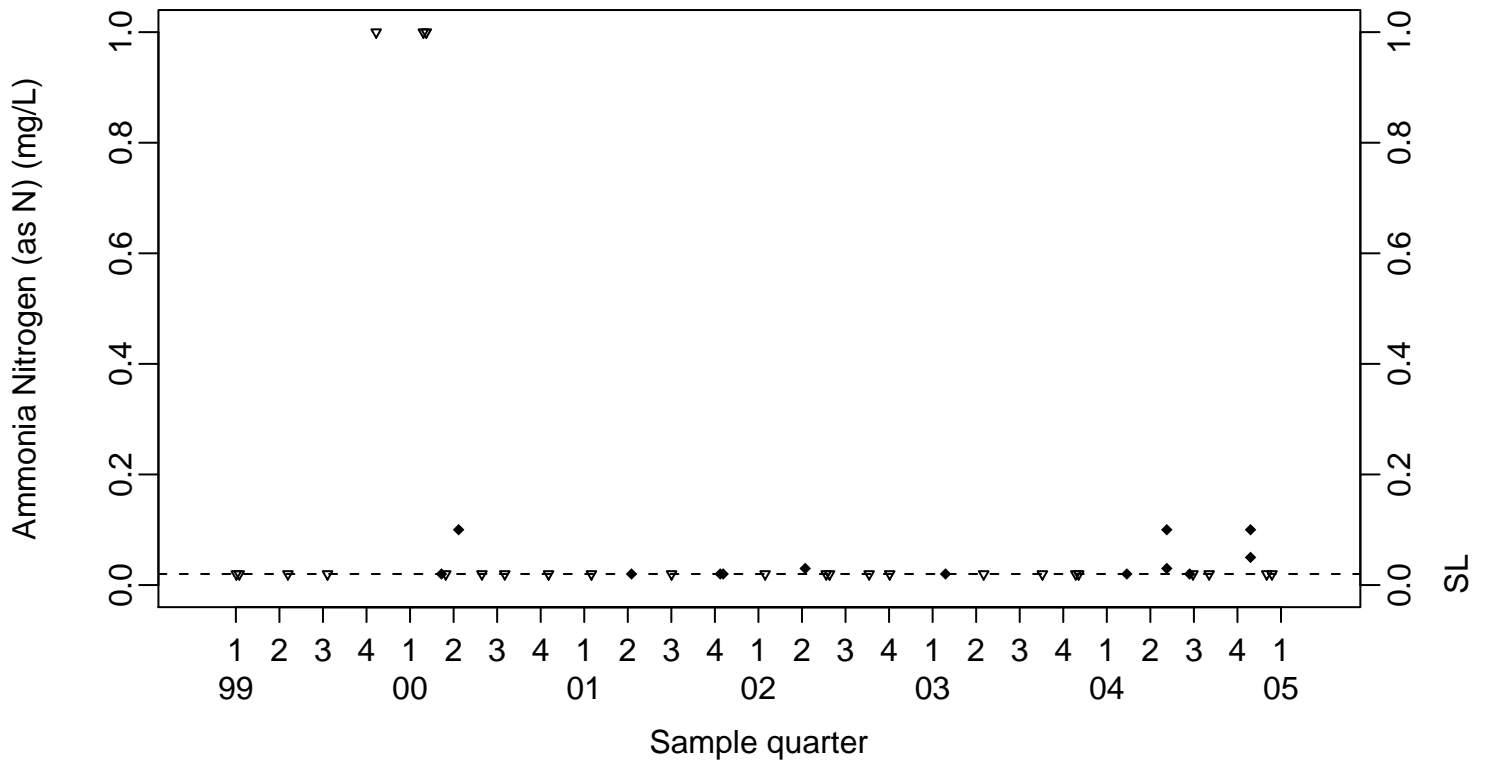
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=0.02

Compliance Monitoring Point W-817-02

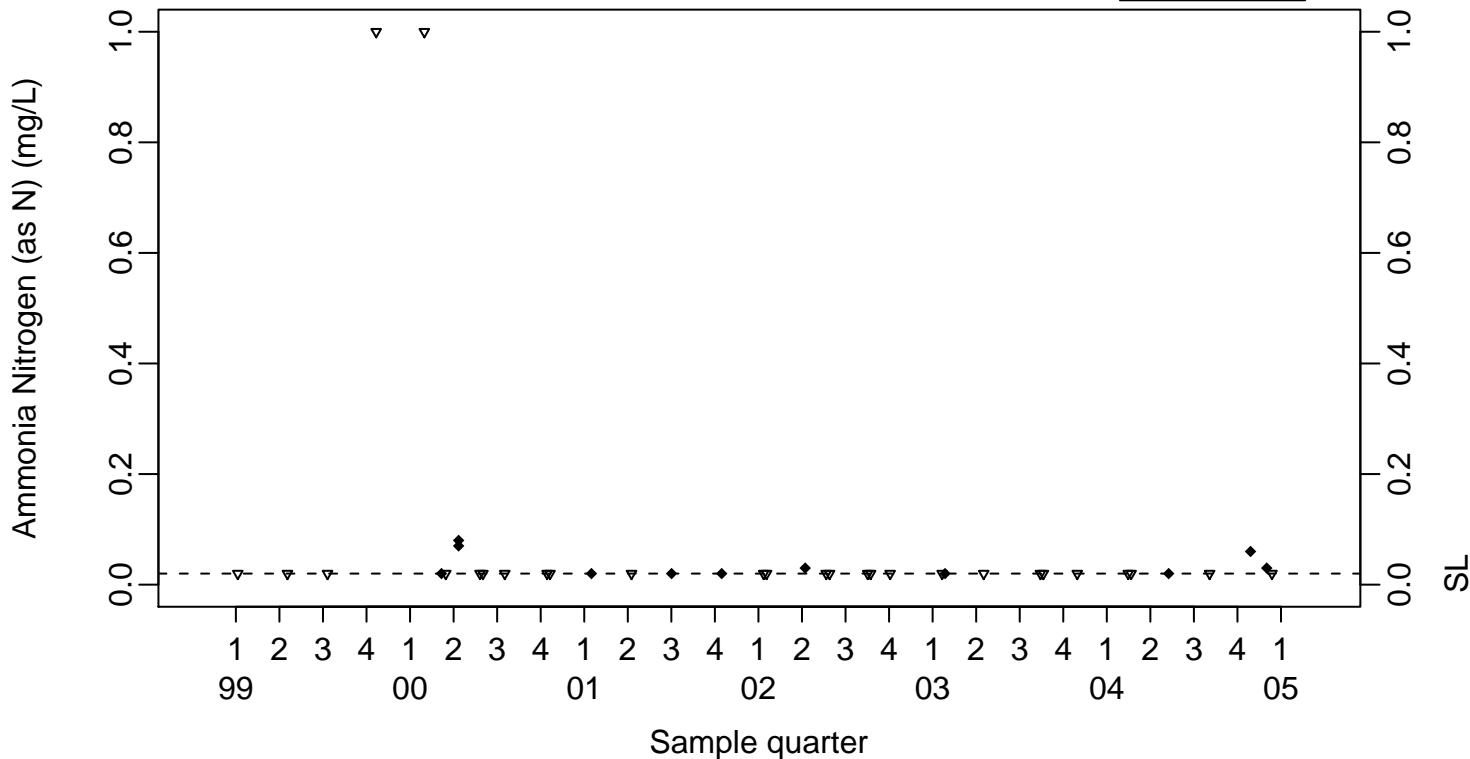


Surface Impoundments Ground Water Ammonia Nitrogen (as N) (mg/L)

Compliance Monitoring Point W-817-03

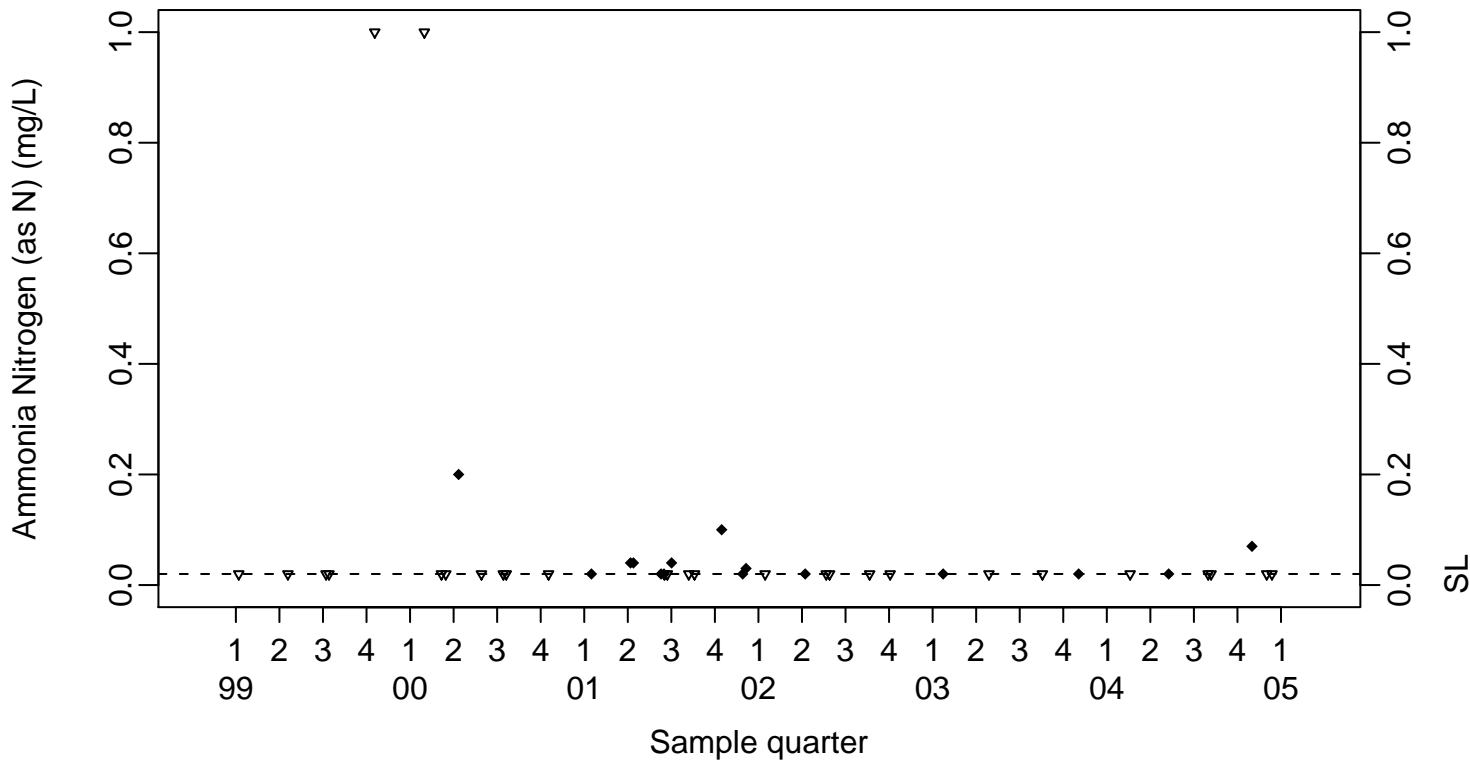
SL=0.02

◆ Above RL
▽ Below RL



SL=0.02

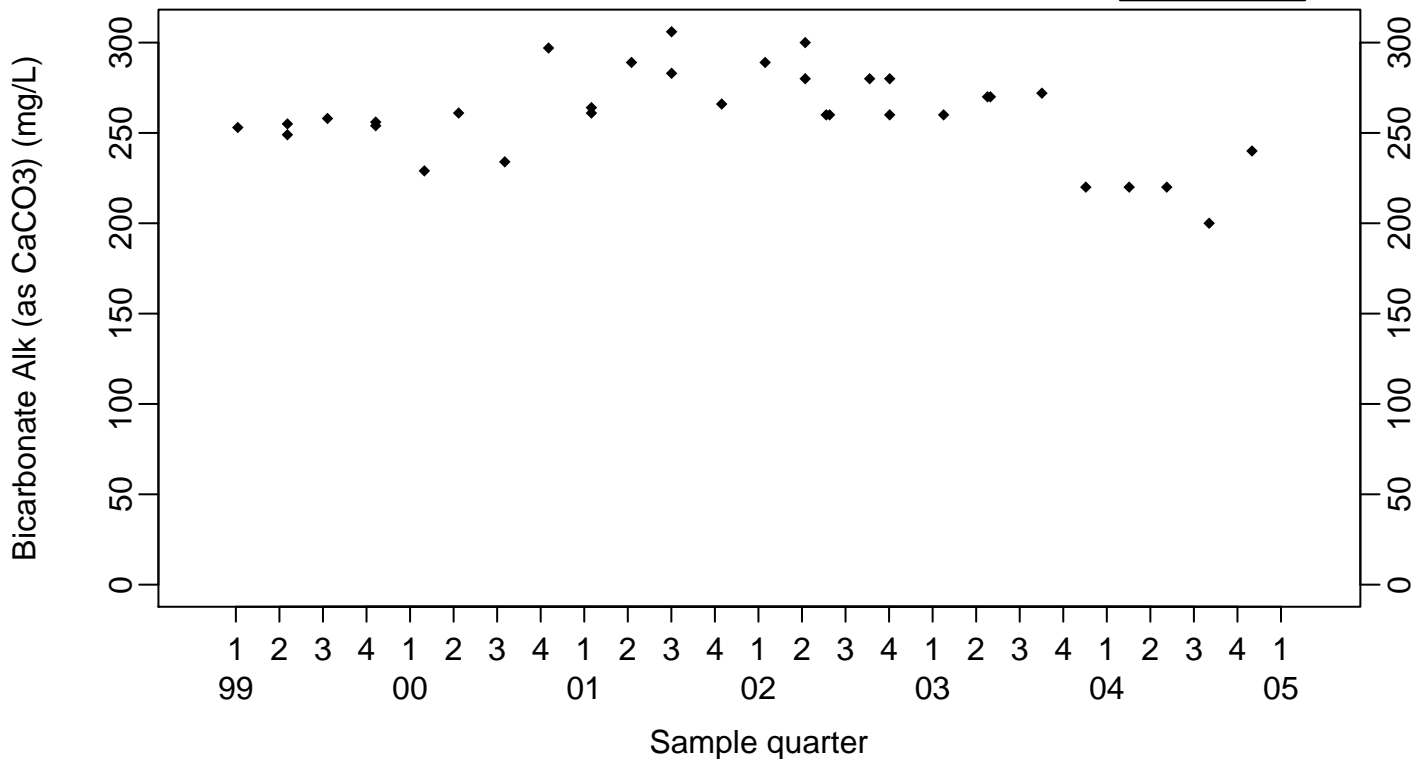
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Bicarbonate Alk (as CaCO3) (mg/L)

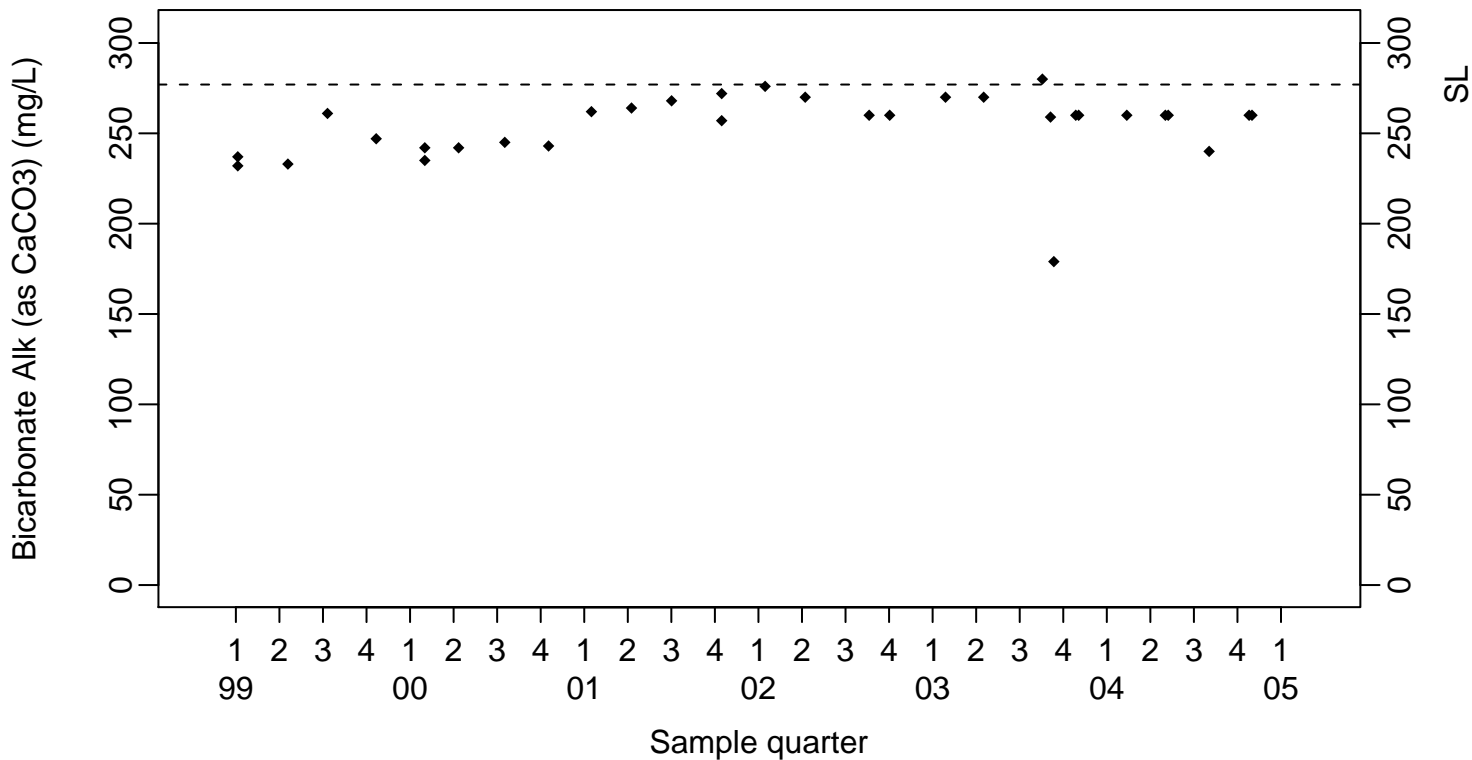
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=277

Compliance Monitoring Point W-817-02

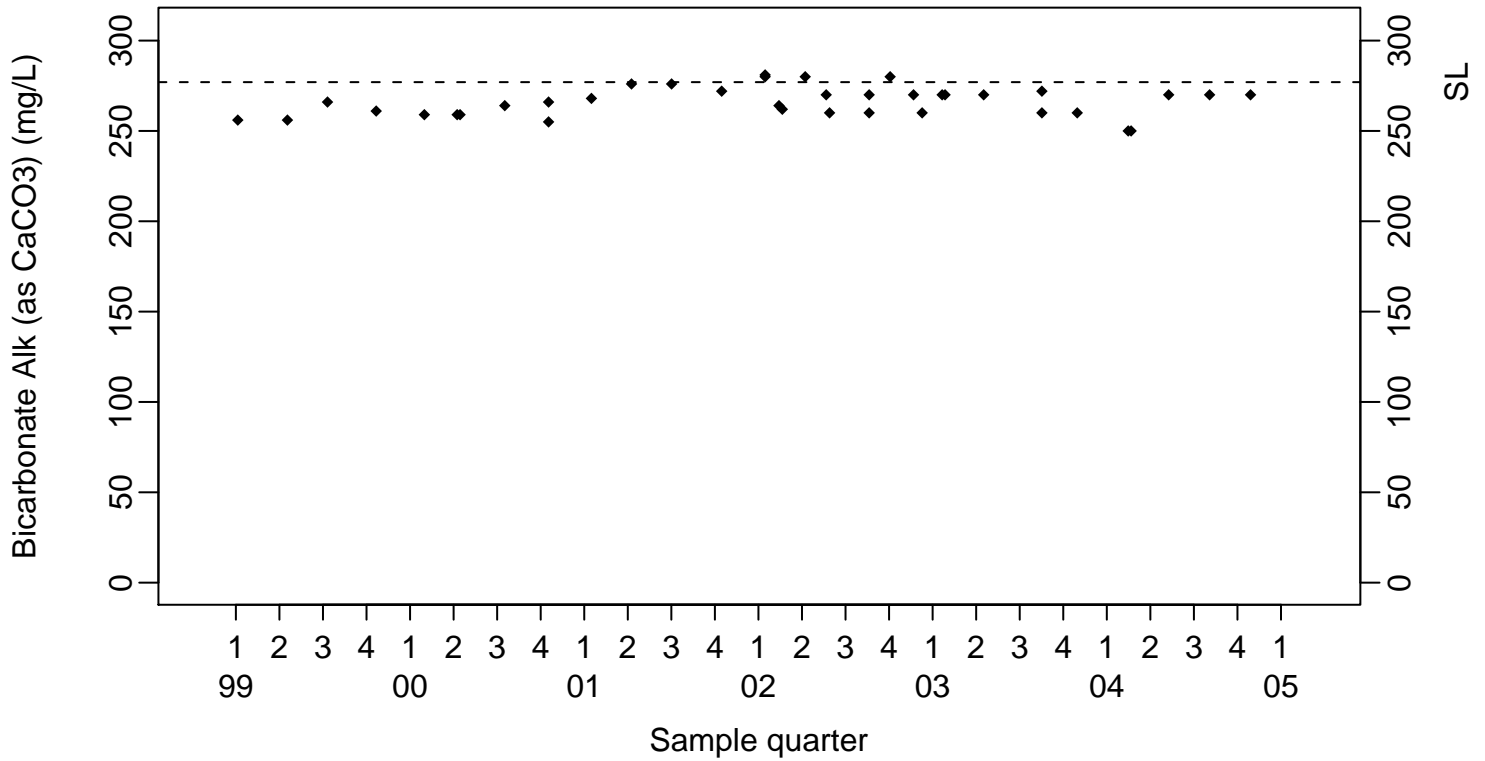


Surface Impoundments Ground Water Bicarbonate Alk (as CaCO3) (mg/L)

SL=277

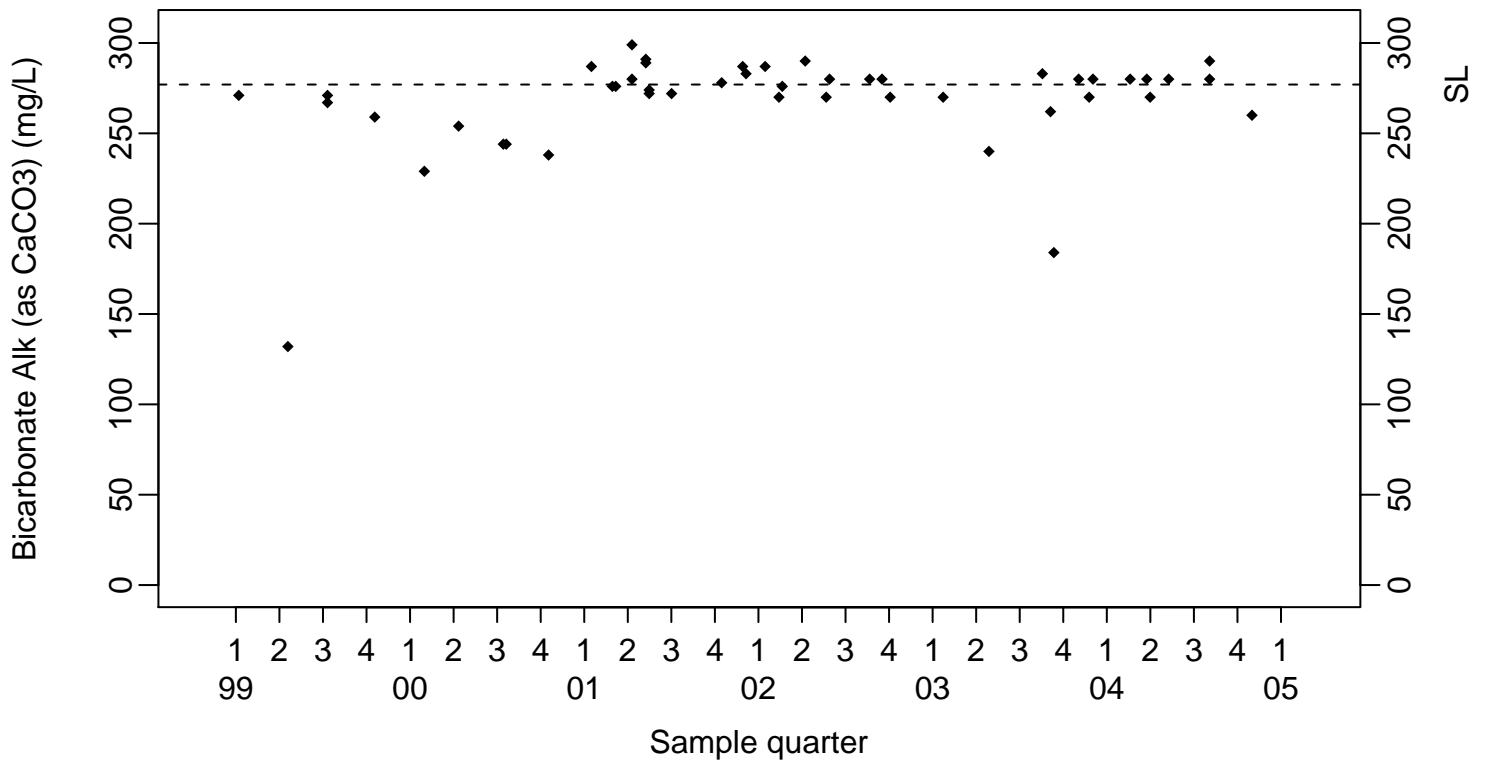
◆ Above RL
▽ Below RL

Compliance Monitoring Point W-817-03



SL=277

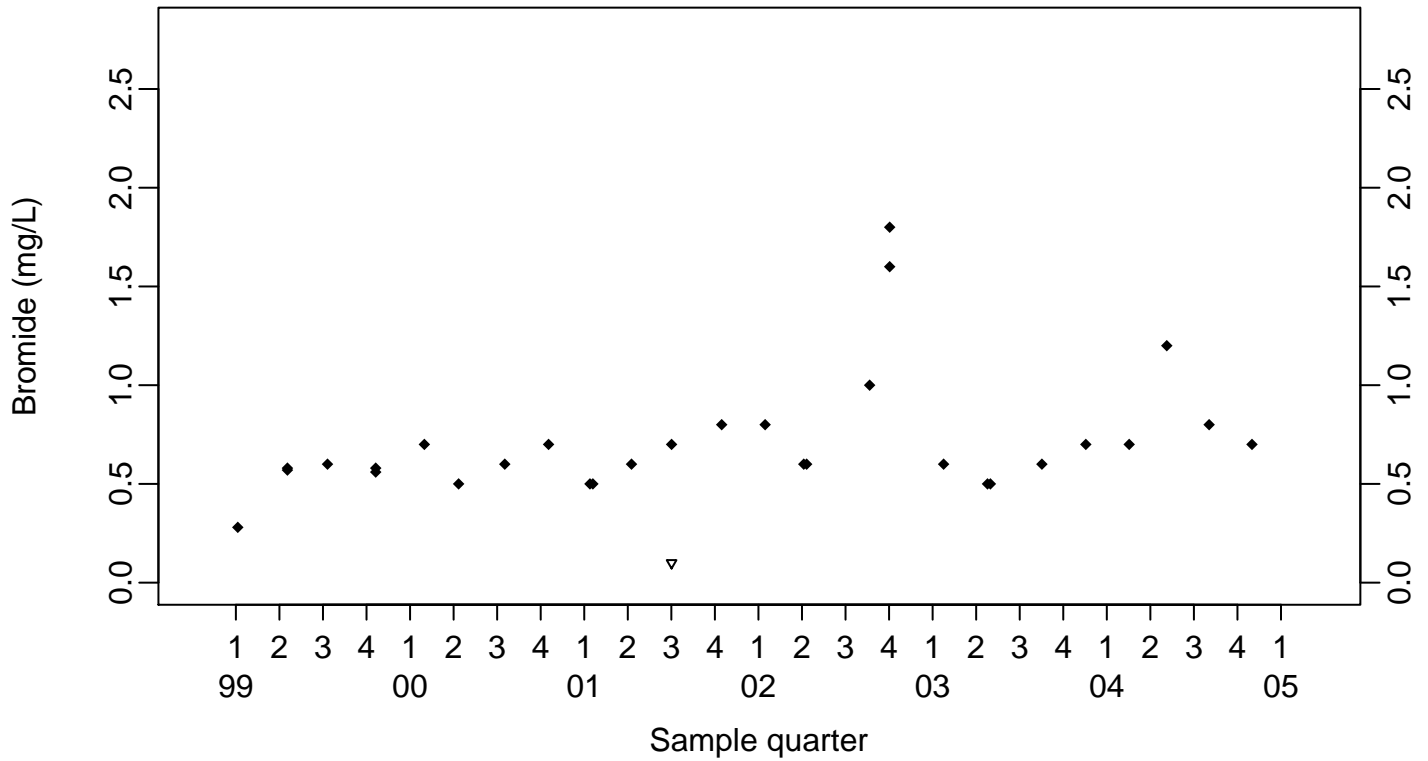
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Bromide (mg/L)

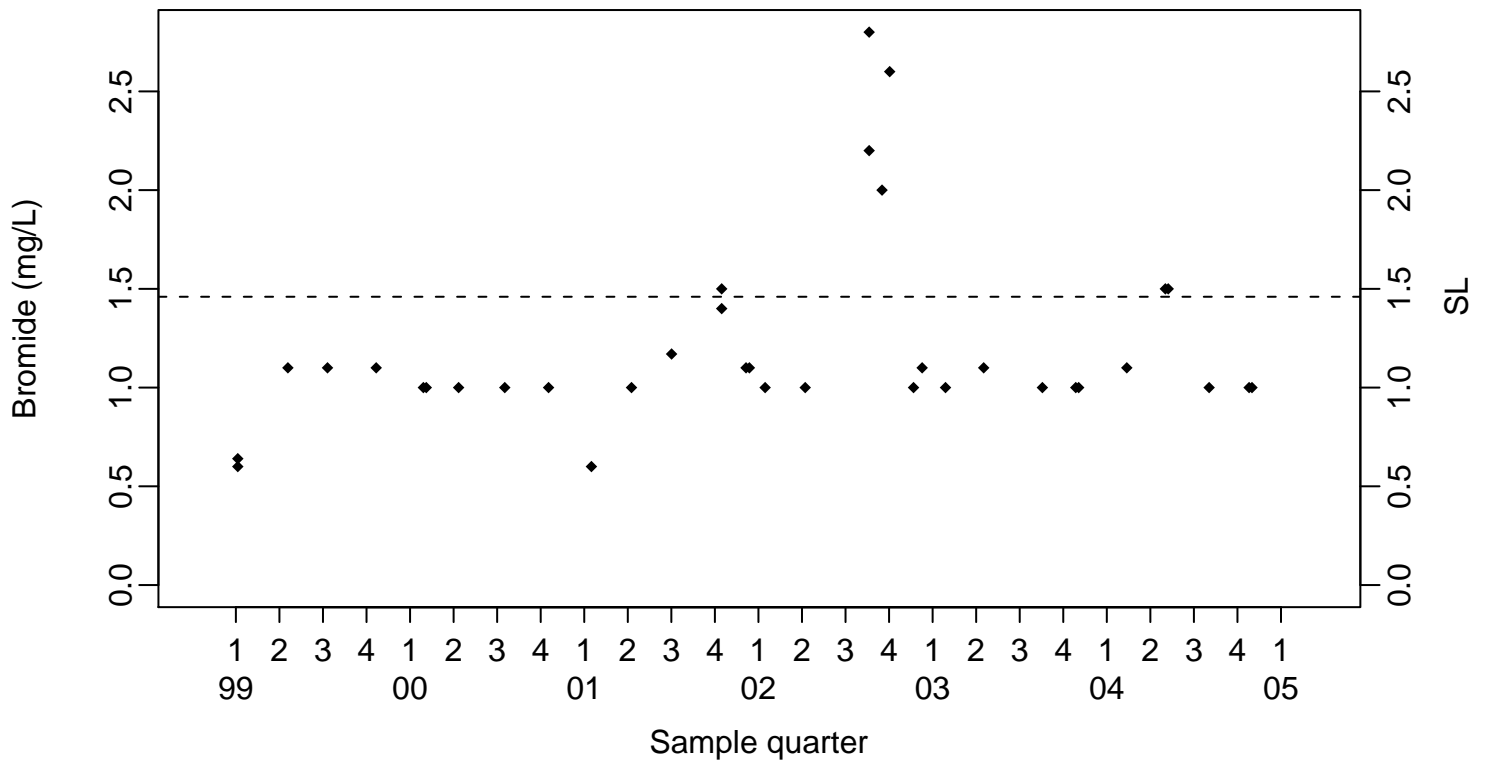
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=1.46

Compliance Monitoring Point W-817-02

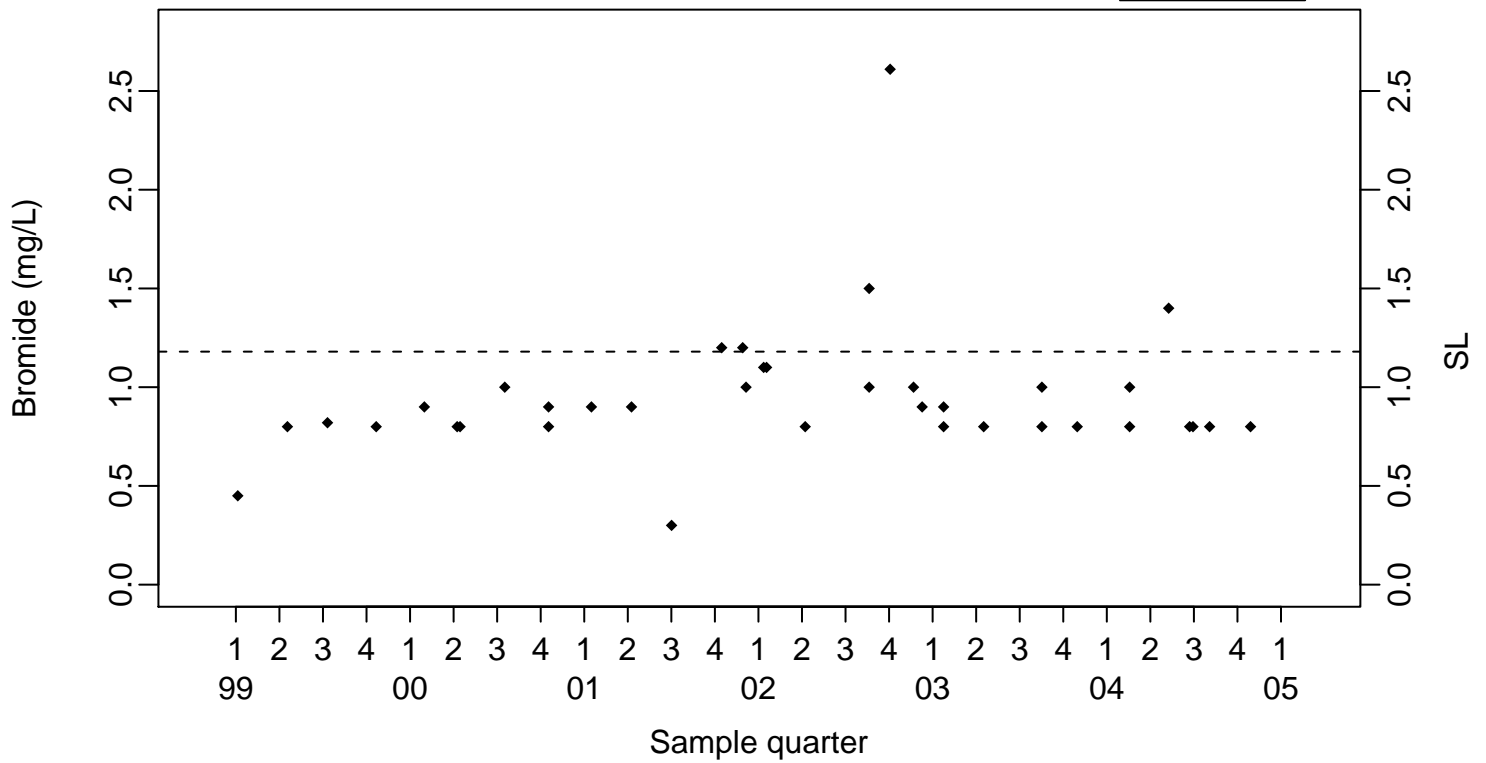


Surface Impoundments Ground Water Bromide (mg/L)

Compliance Monitoring Point W-817-03

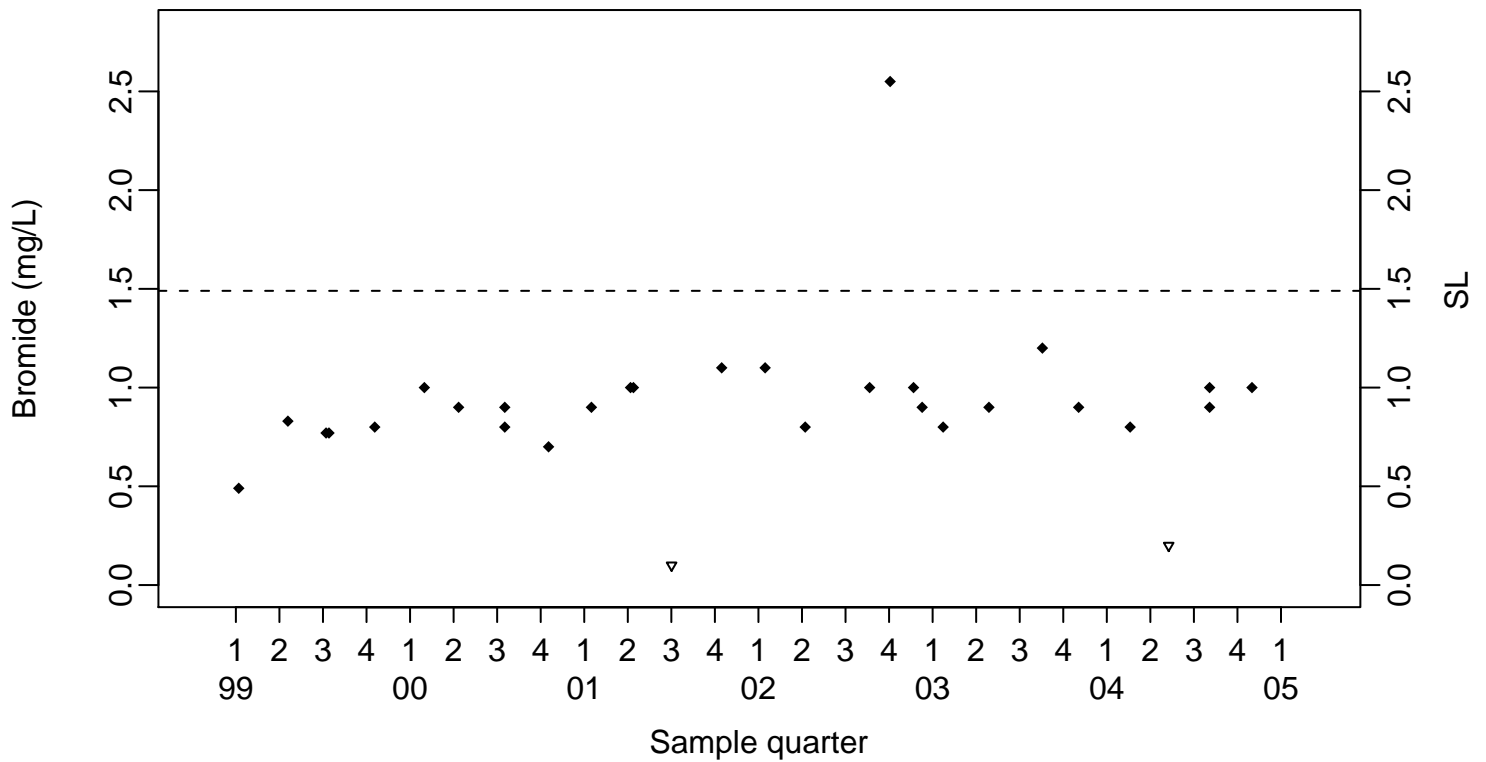
SL=1.18

◆ Above RL
▽ Below RL



Compliance Monitoring Point W-817-04

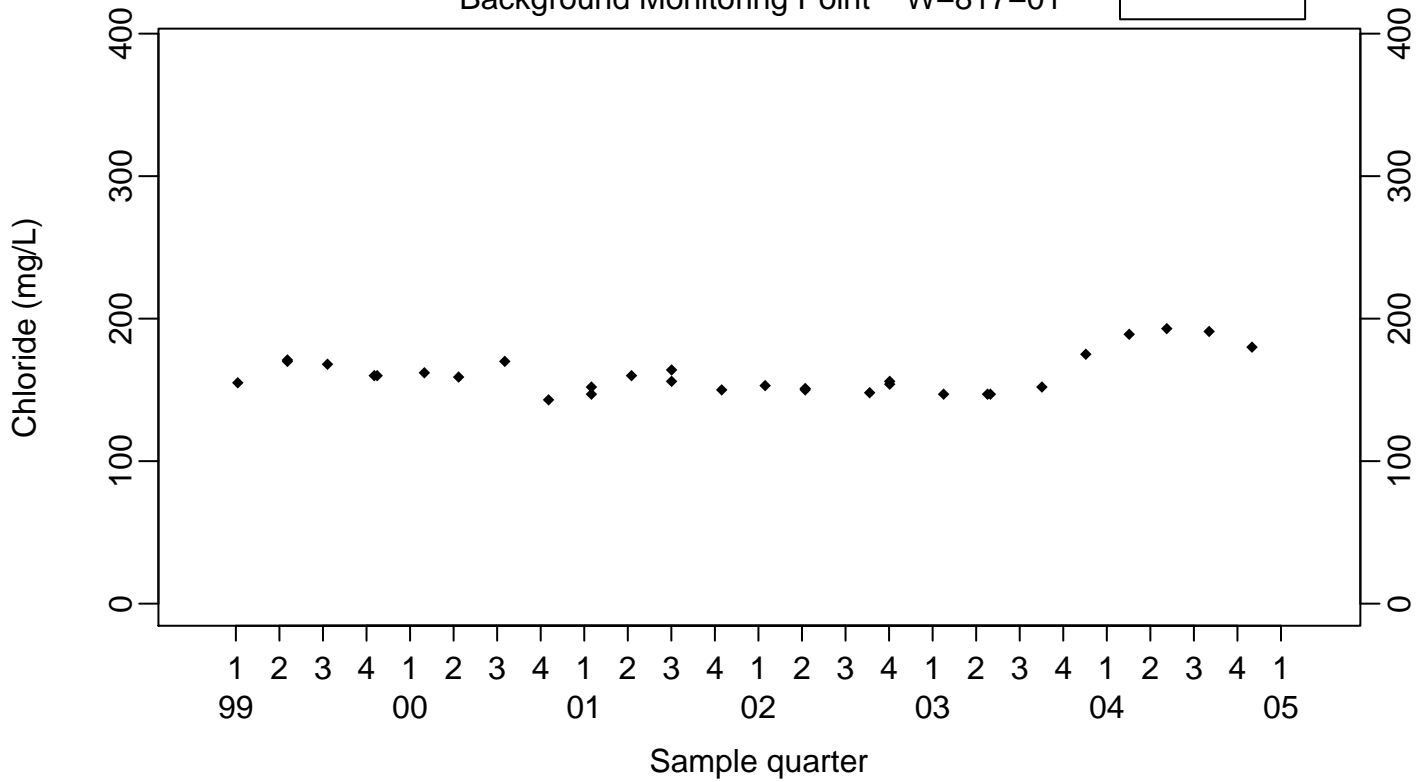
SL=1.49



Surface Impoundments Ground Water Chloride (mg/L)

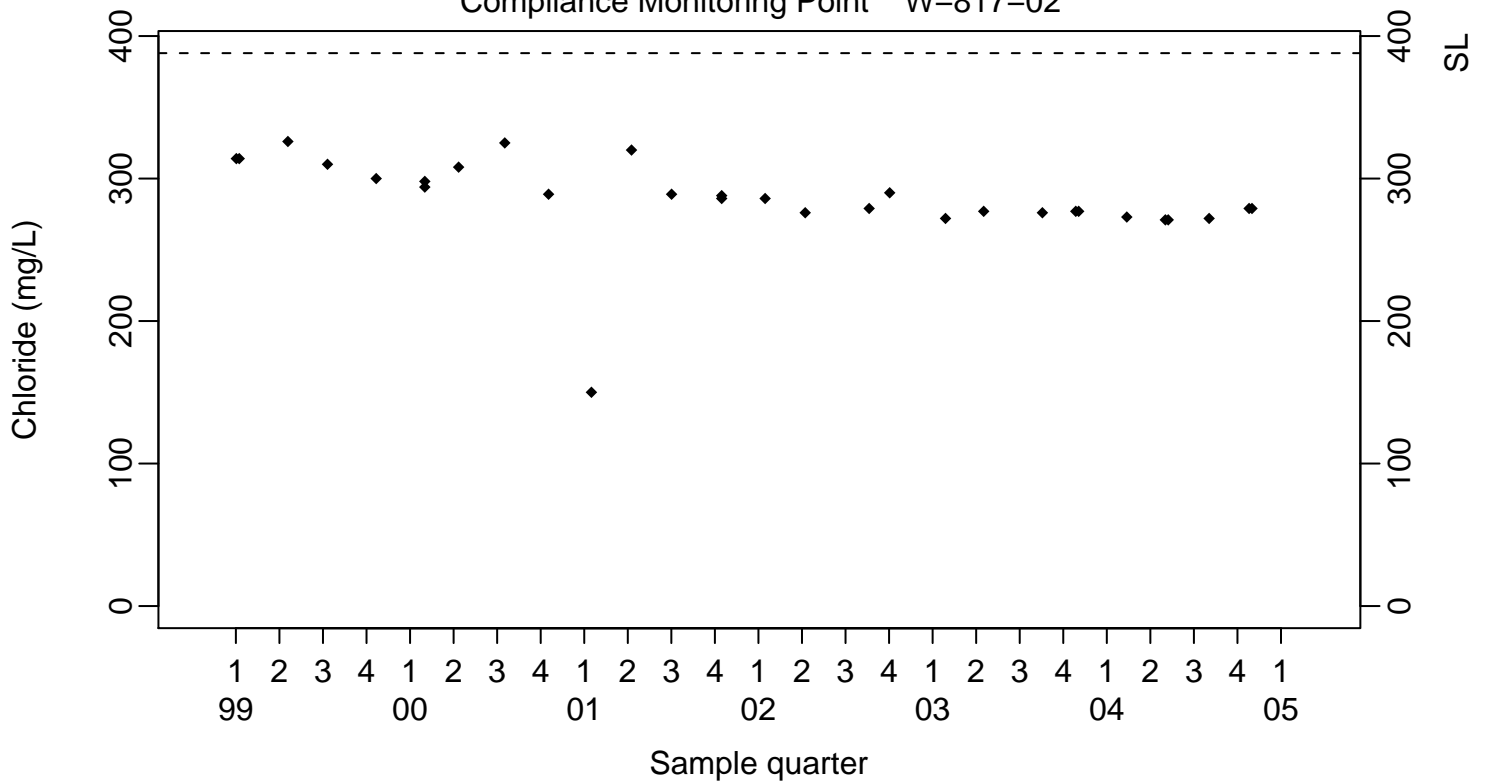
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=388

Compliance Monitoring Point W-817-02

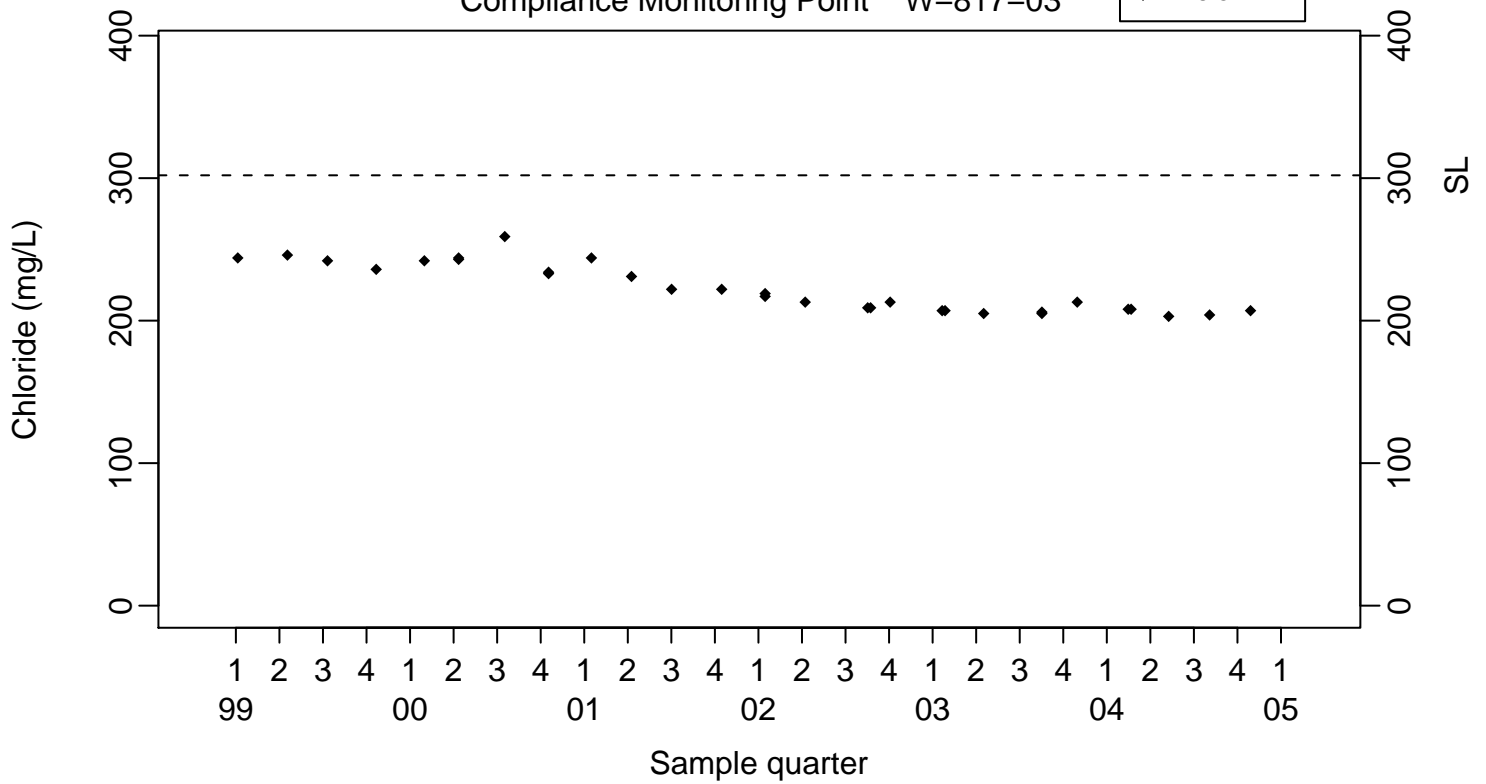


Surface Impoundments Ground Water Chloride (mg/L)

Compliance Monitoring Point W-817-03

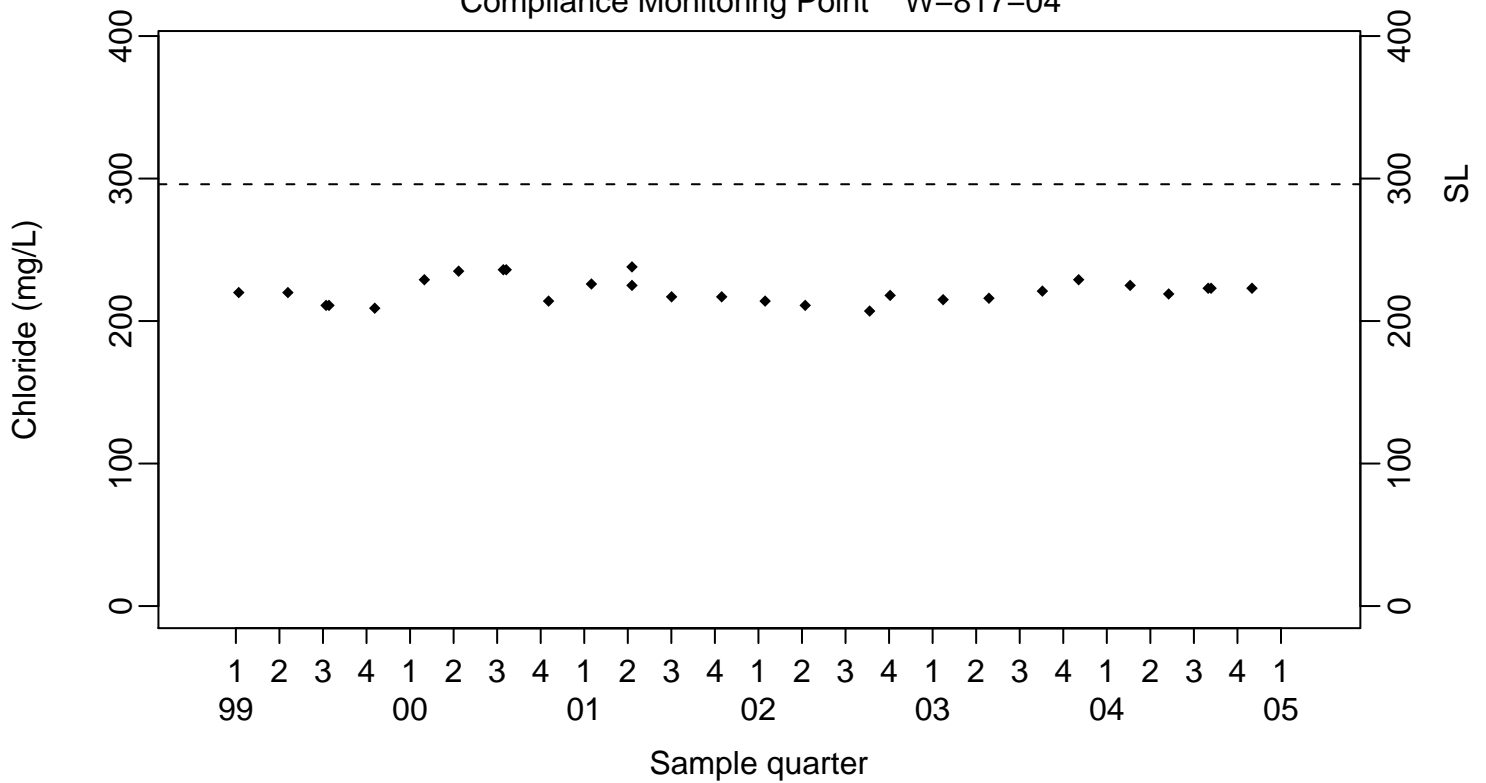
SL=302

◆ Above RL
▽ Below RL



SL=296

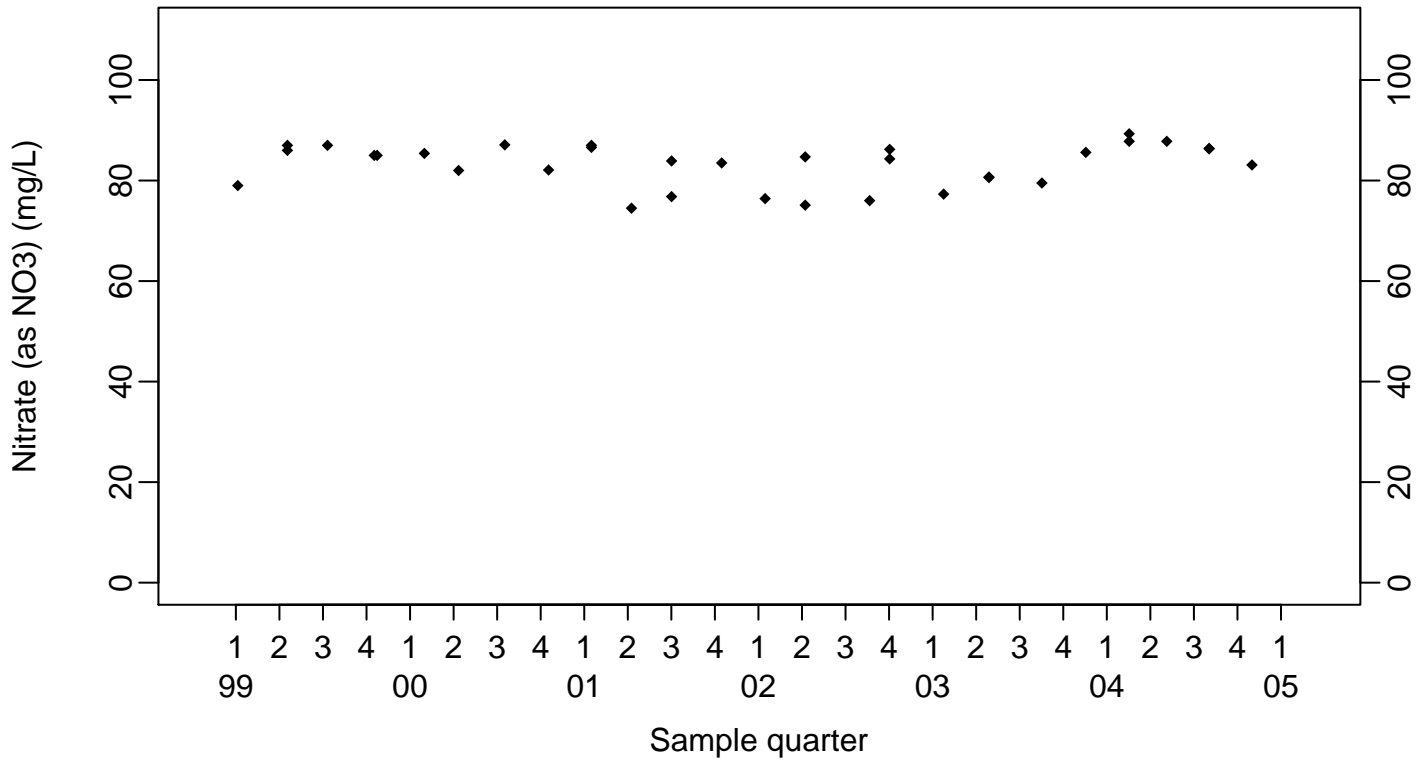
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Nitrate (as NO3) (mg/L)

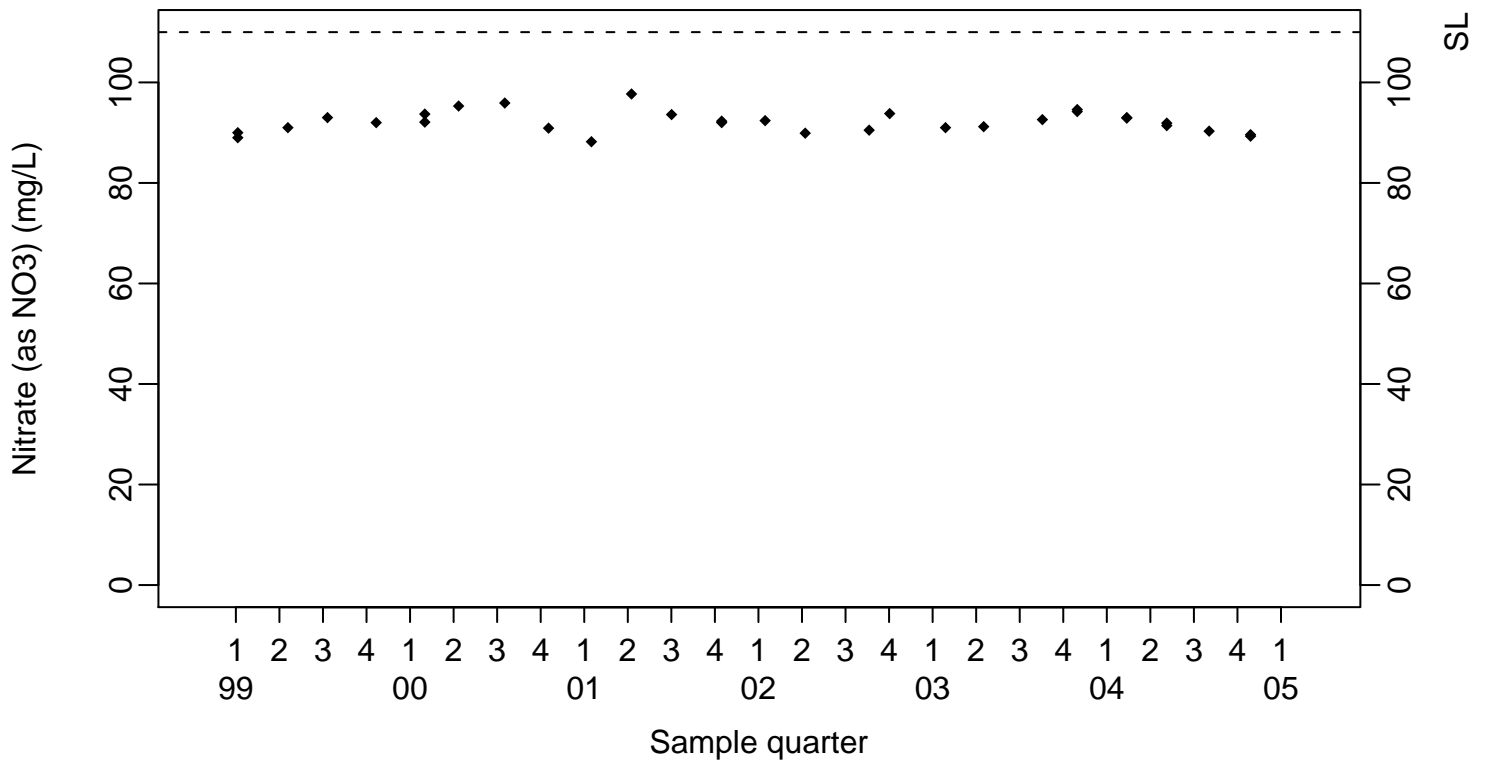
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=110

Compliance Monitoring Point W-817-02

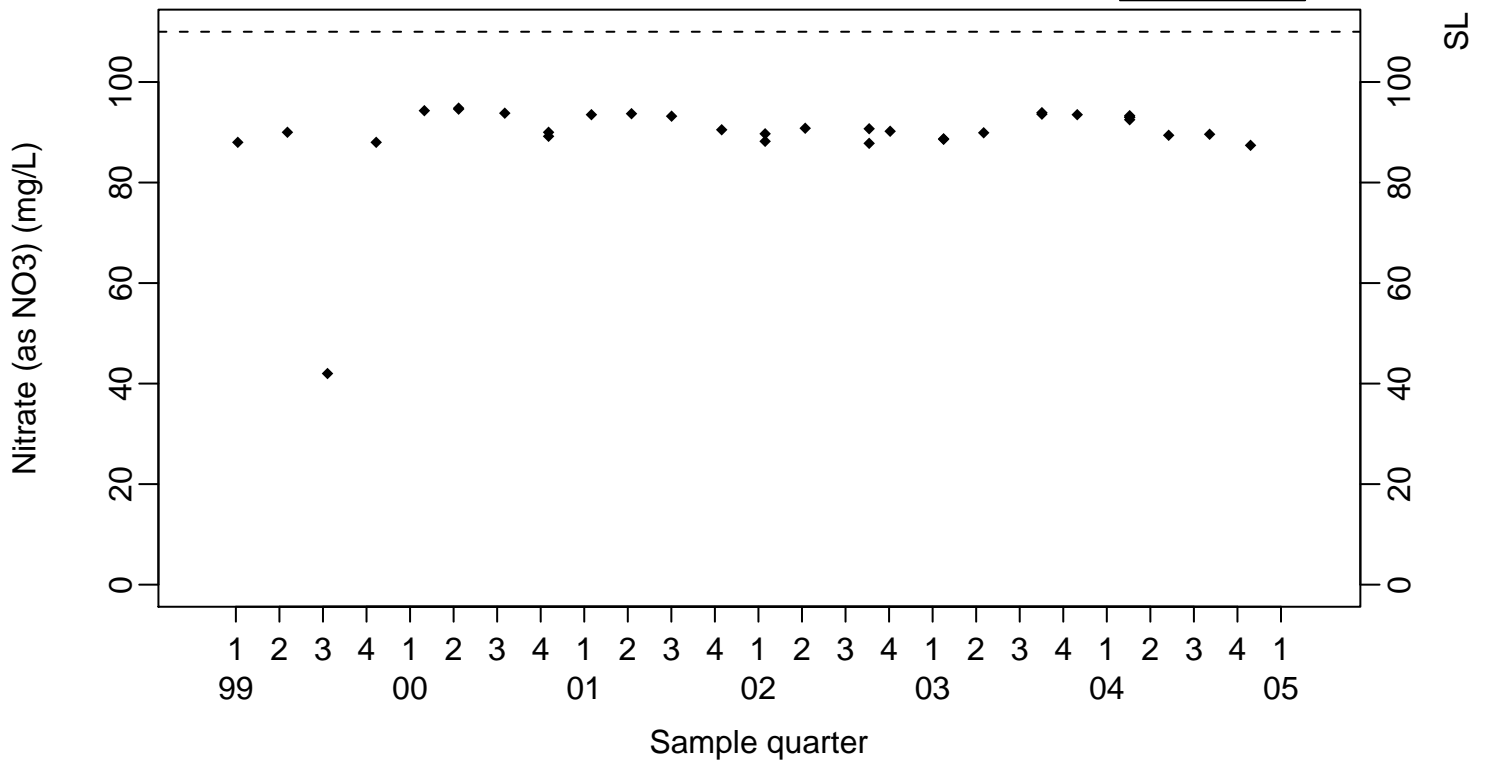


Surface Impoundments Ground Water Nitrate (as NO3) (mg/L)

Compliance Monitoring Point W-817-03

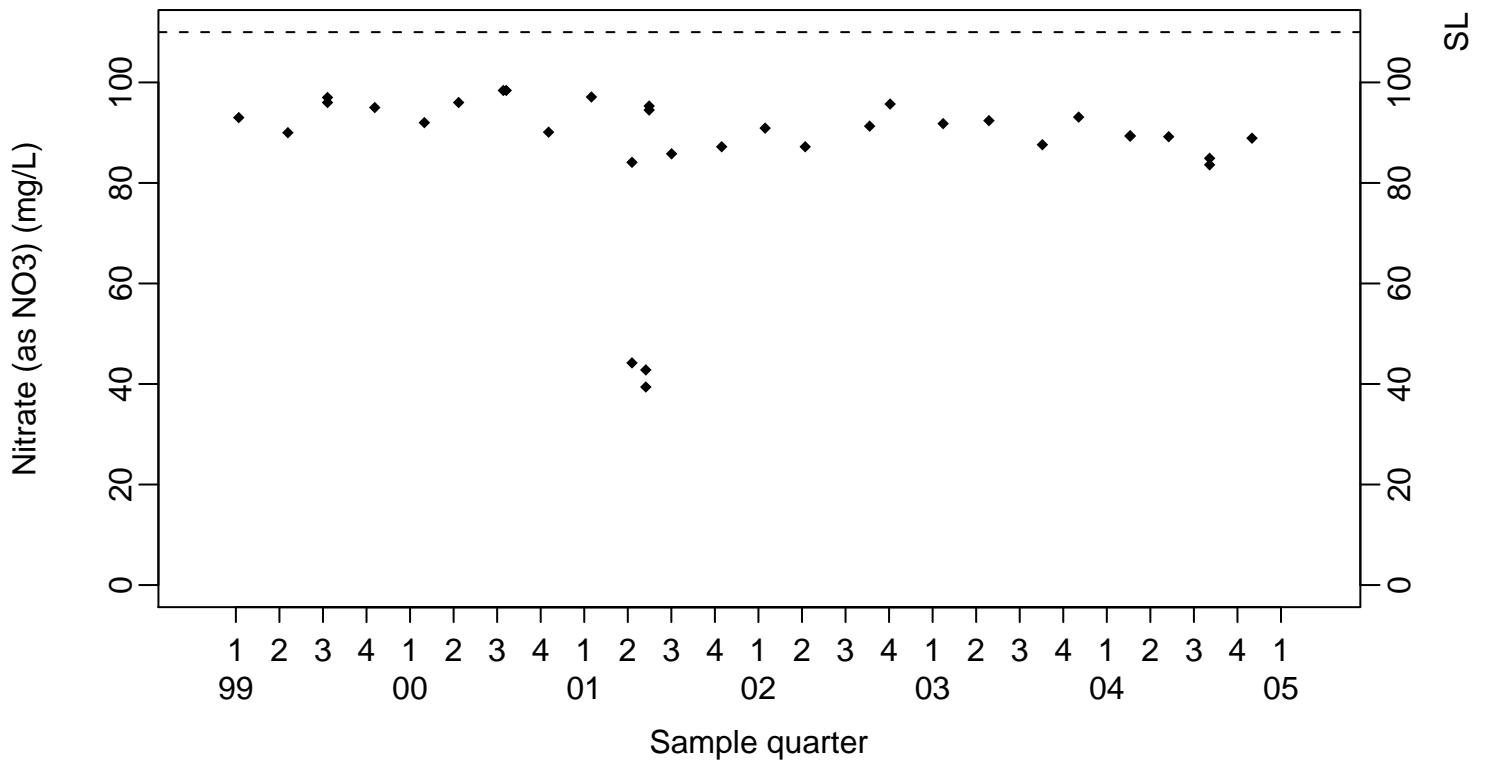
SL=110

◆ Above RL
▽ Below RL



SL=110

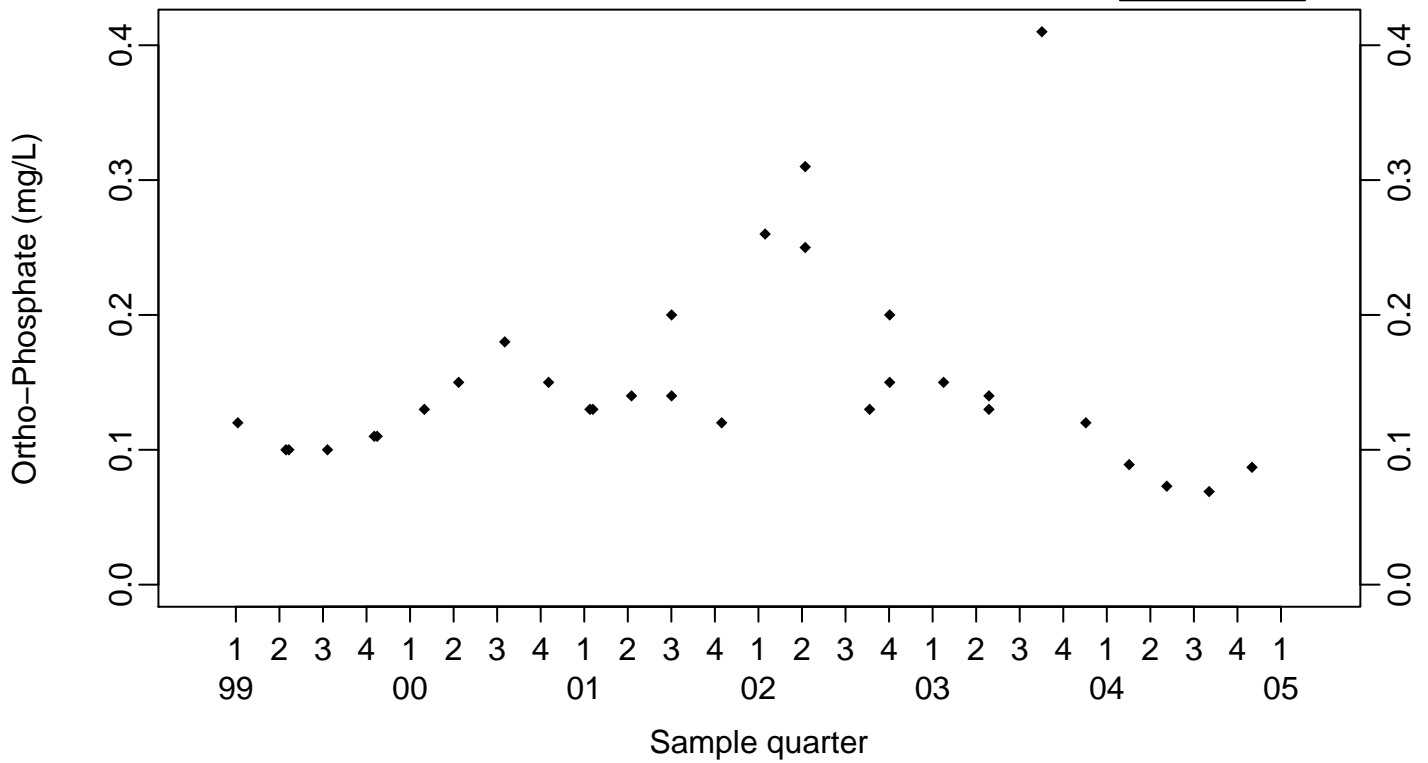
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water
 Ortho-Phosphate (mg/L)

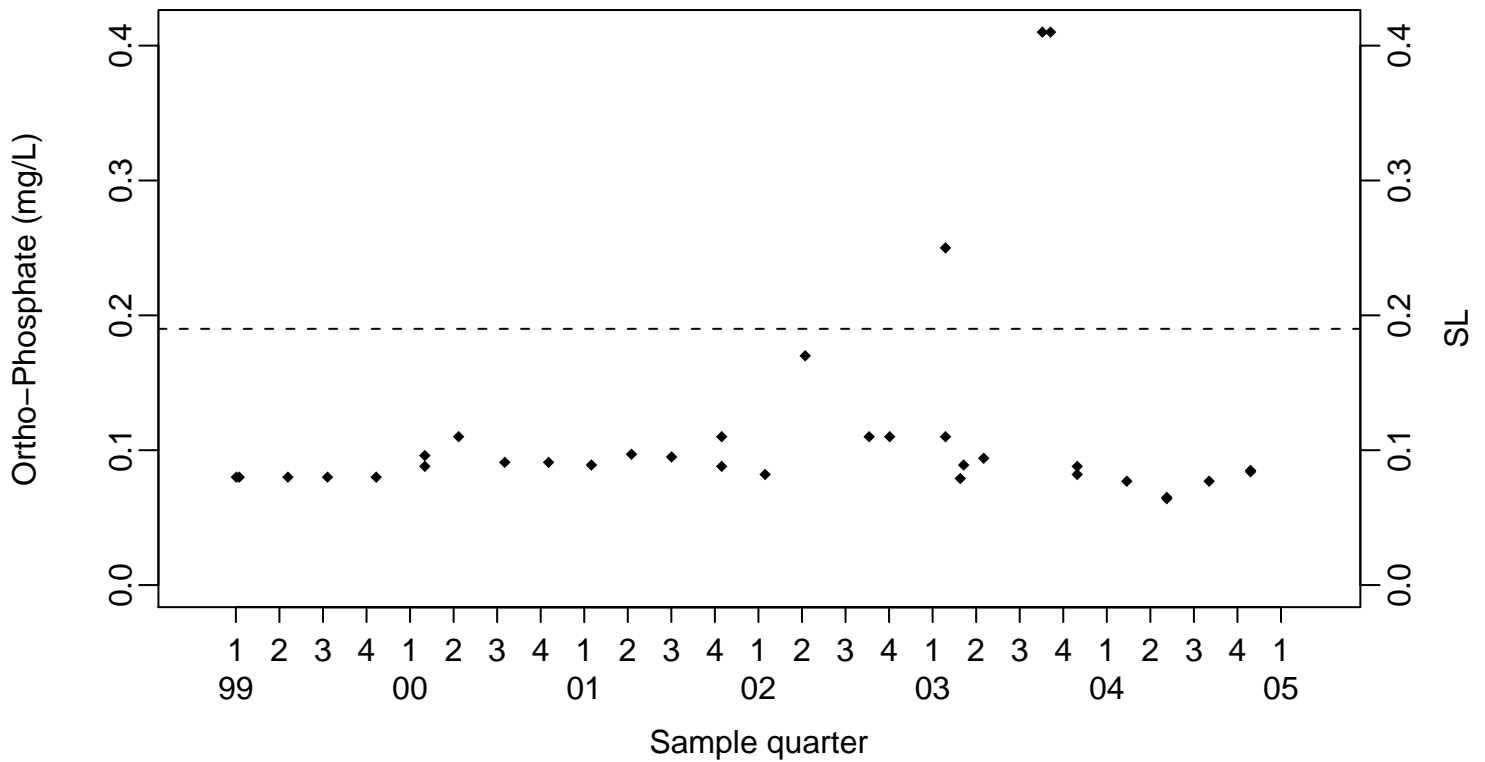
Background Monitoring Point W-817-01

◆ Above RL
 ▼ Below RL



SL=0.19

Compliance Monitoring Point W-817-02

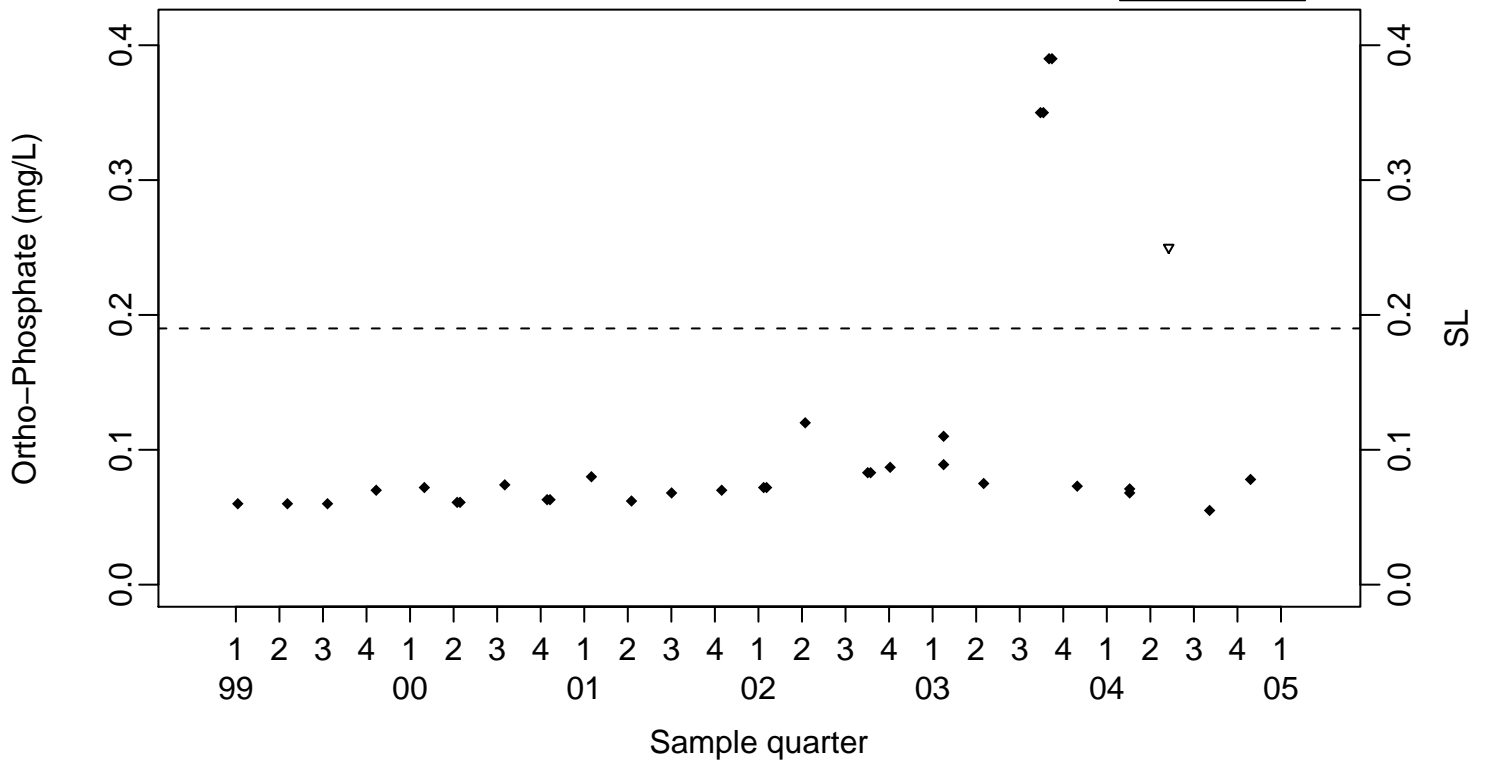


Surface Impoundments Ground Water Ortho-Phosphate (mg/L)

Compliance Monitoring Point W-817-03

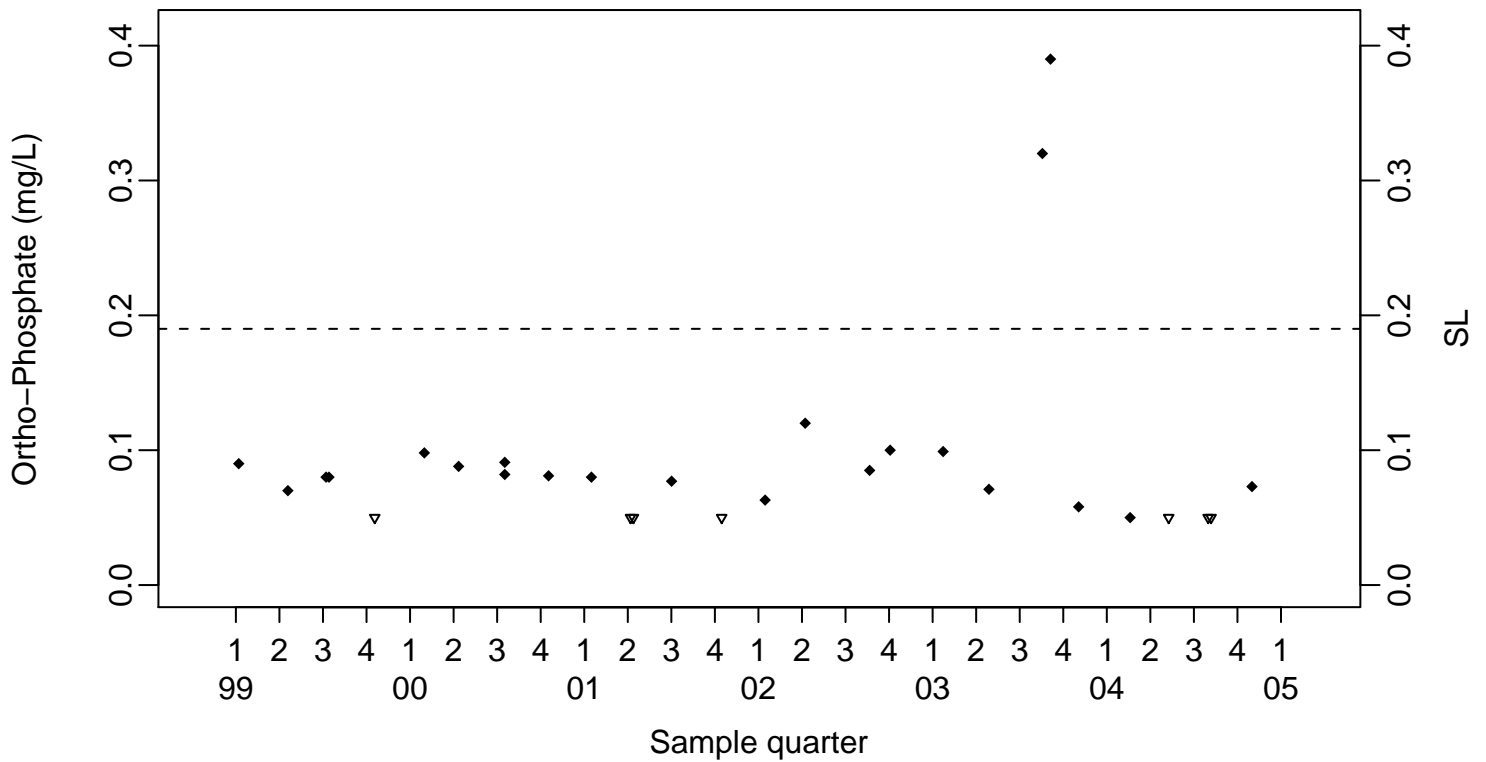
SL=0.19

◆ Above RL
▽ Below RL



Compliance Monitoring Point W-817-04

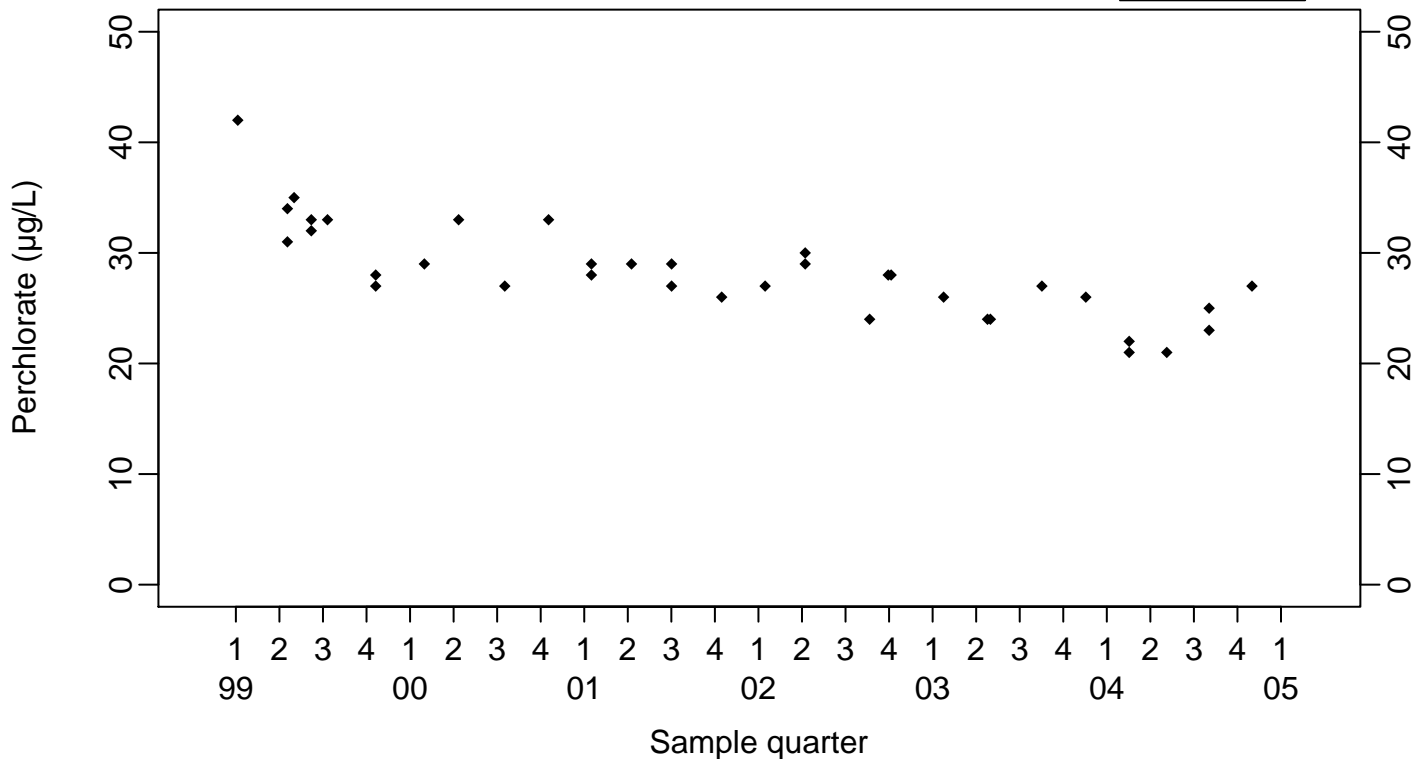
SL=0.19



Surface Impoundments Ground Water Perchlorate ($\mu\text{g/L}$)

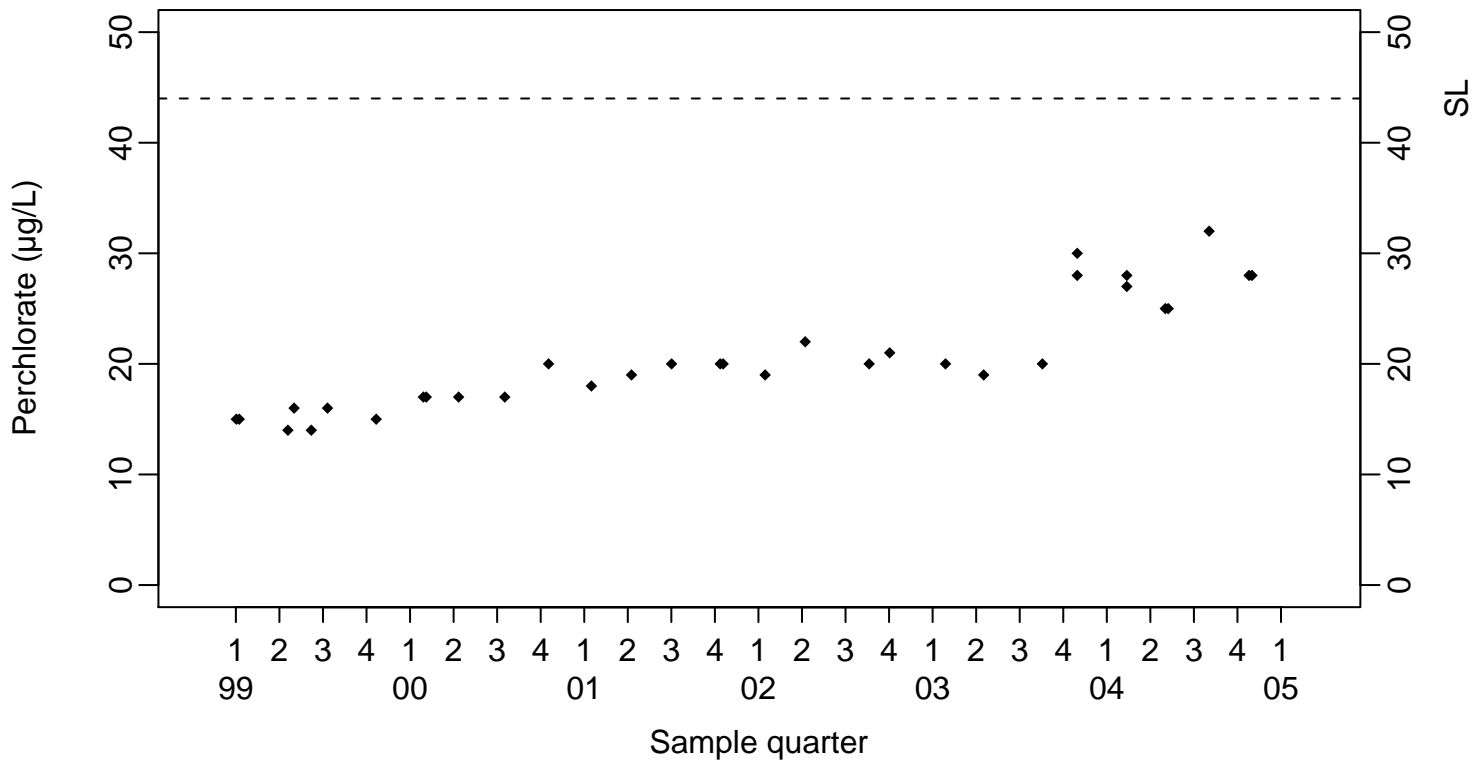
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=44

Compliance Monitoring Point W-817-02

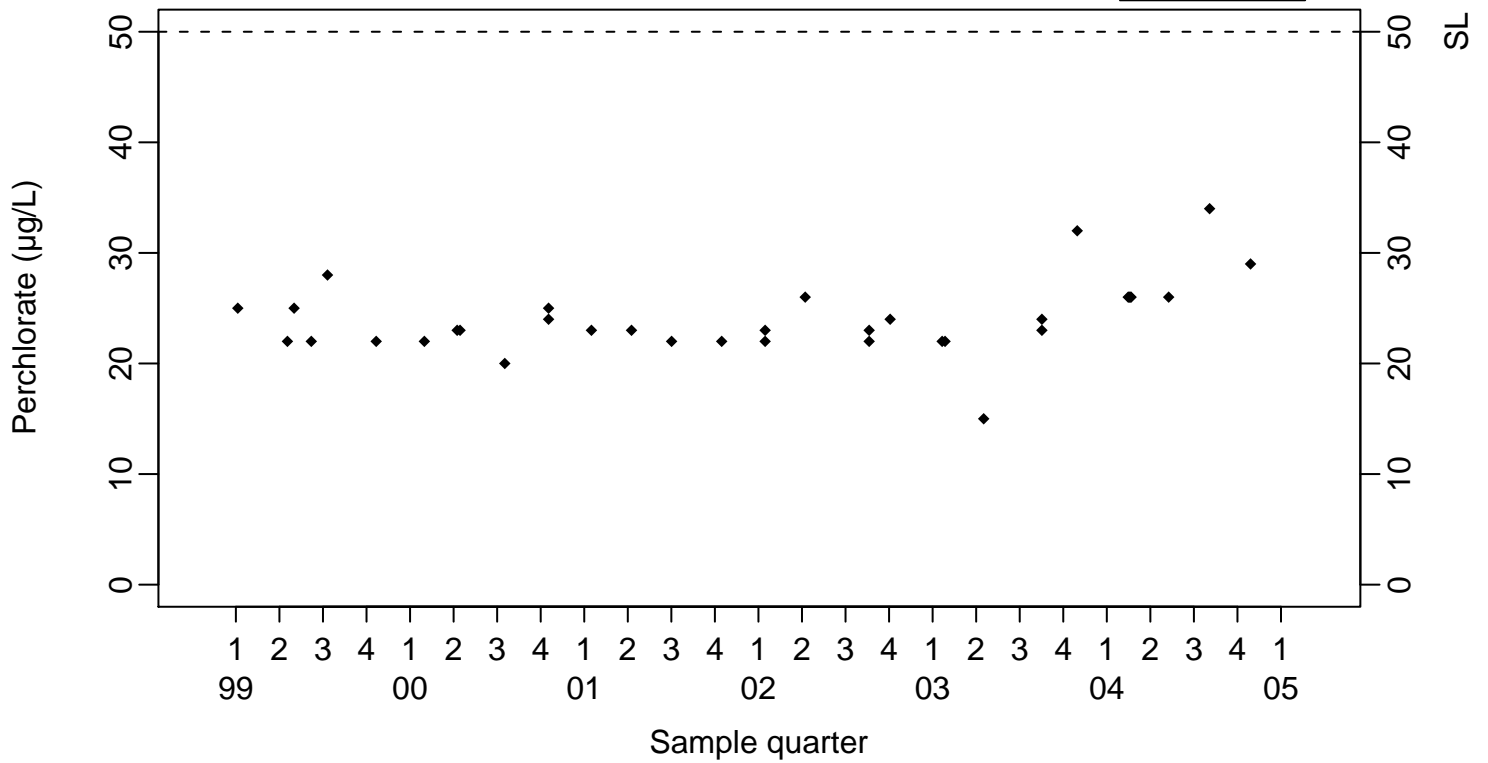


Surface Impoundments Ground Water Perchlorate ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

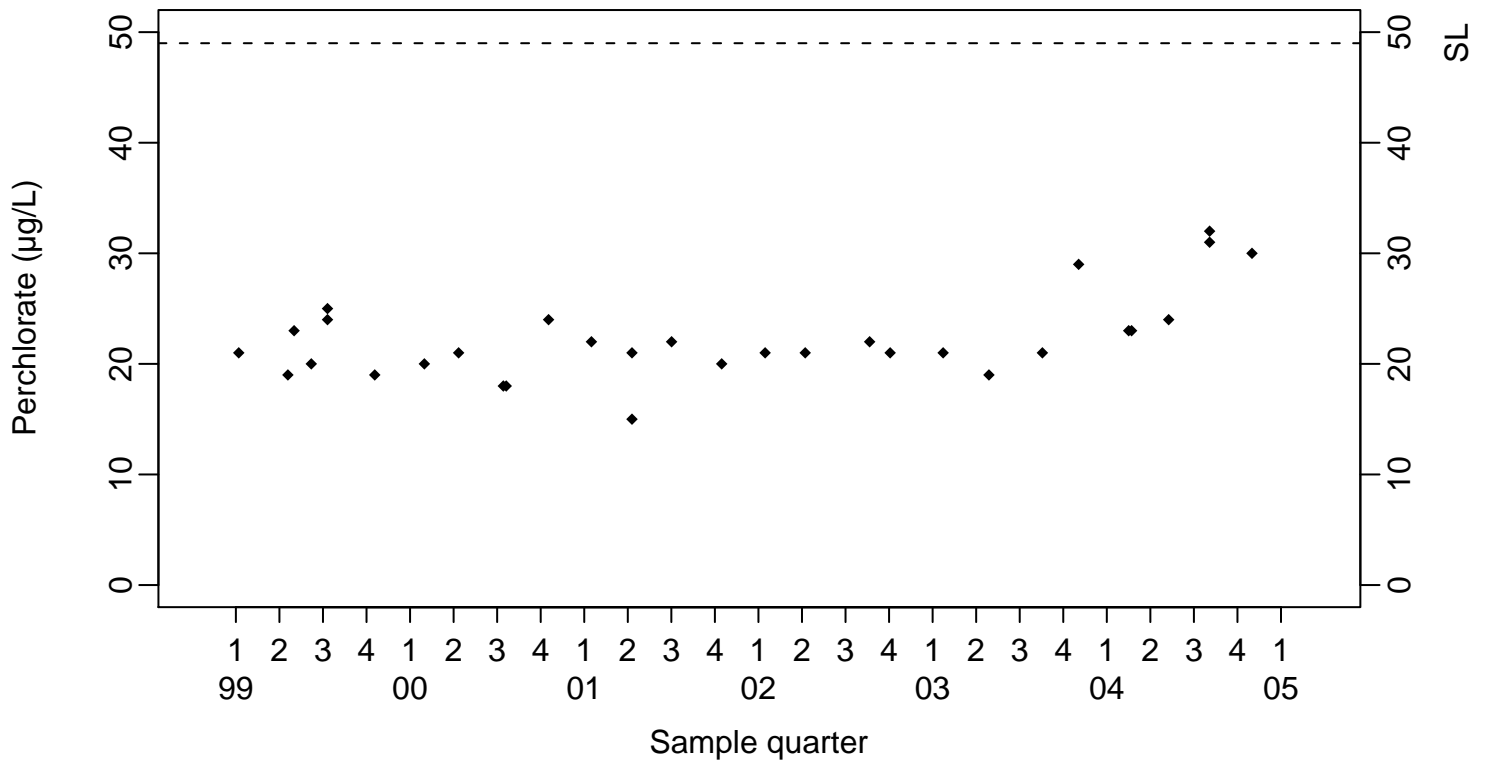
SL=50

◆ Above RL
▽ Below RL



SL=49

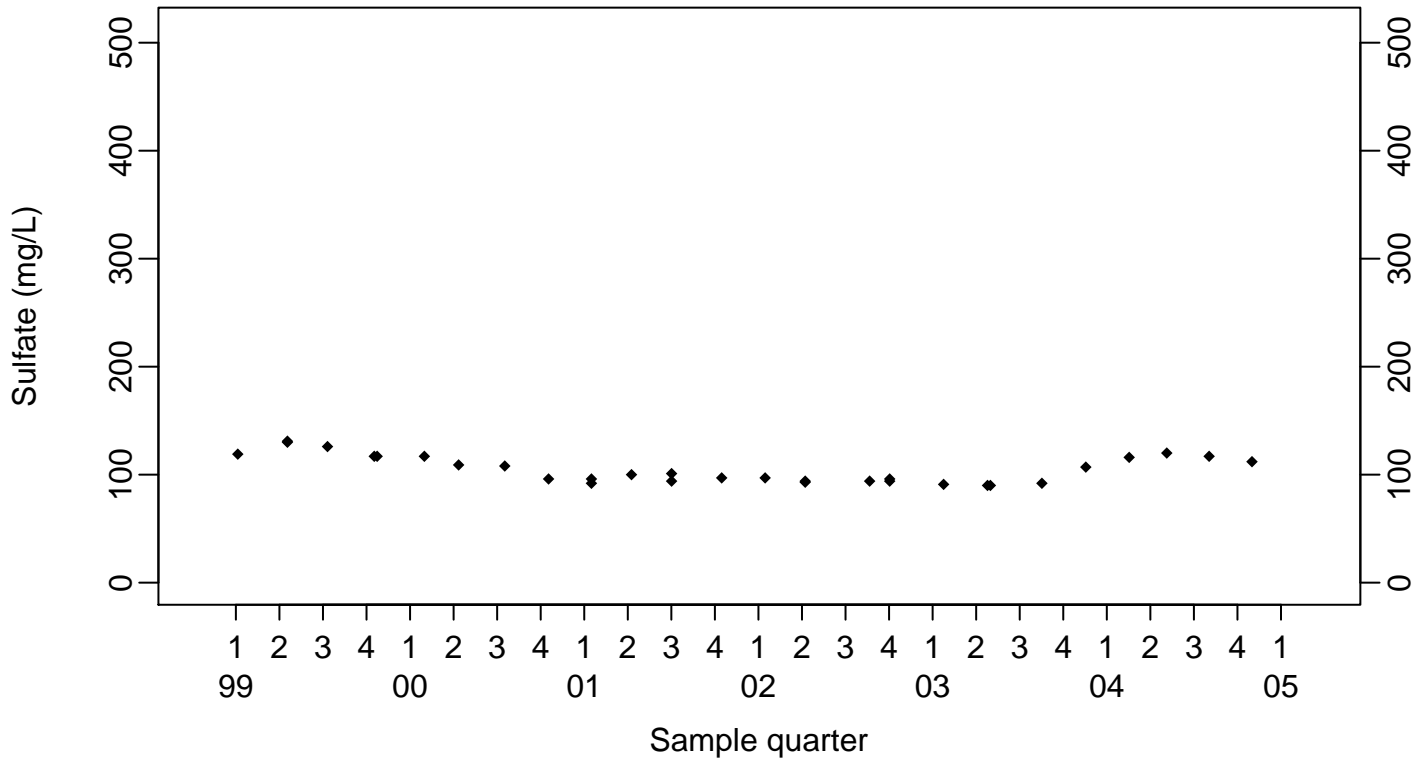
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water Sulfate (mg/L)

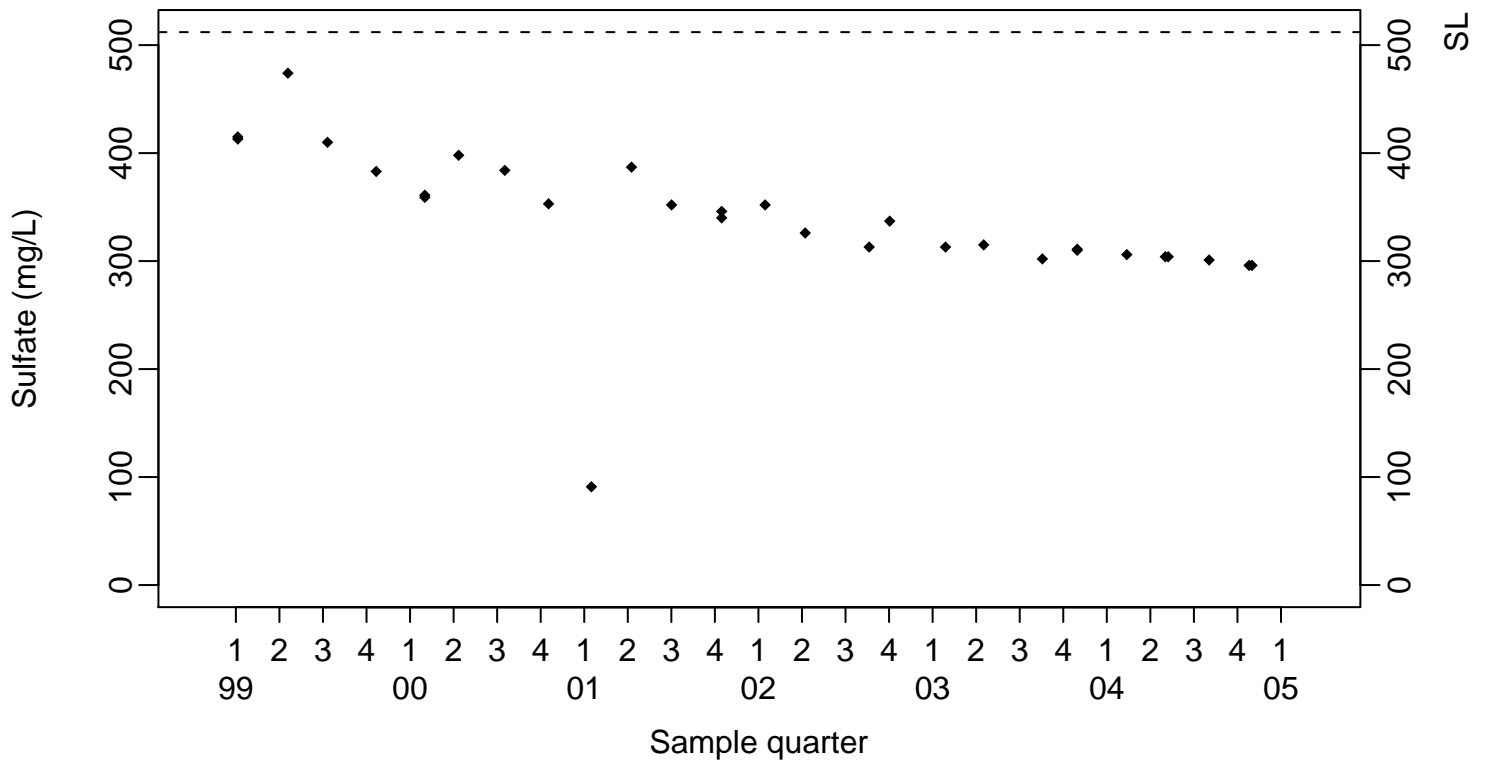
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=512

Compliance Monitoring Point W-817-02

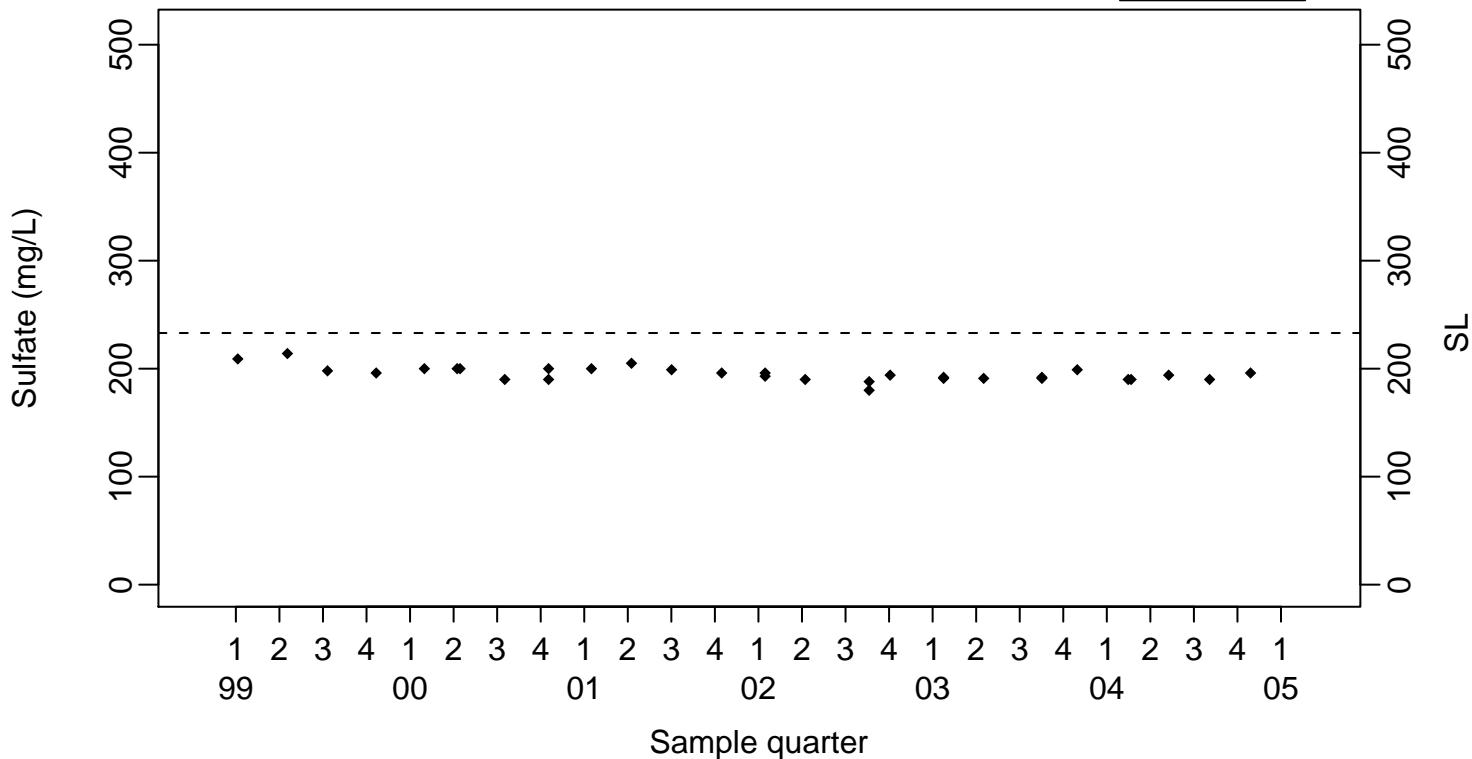


Surface Impoundments Ground Water Sulfate (mg/L)

SL=233

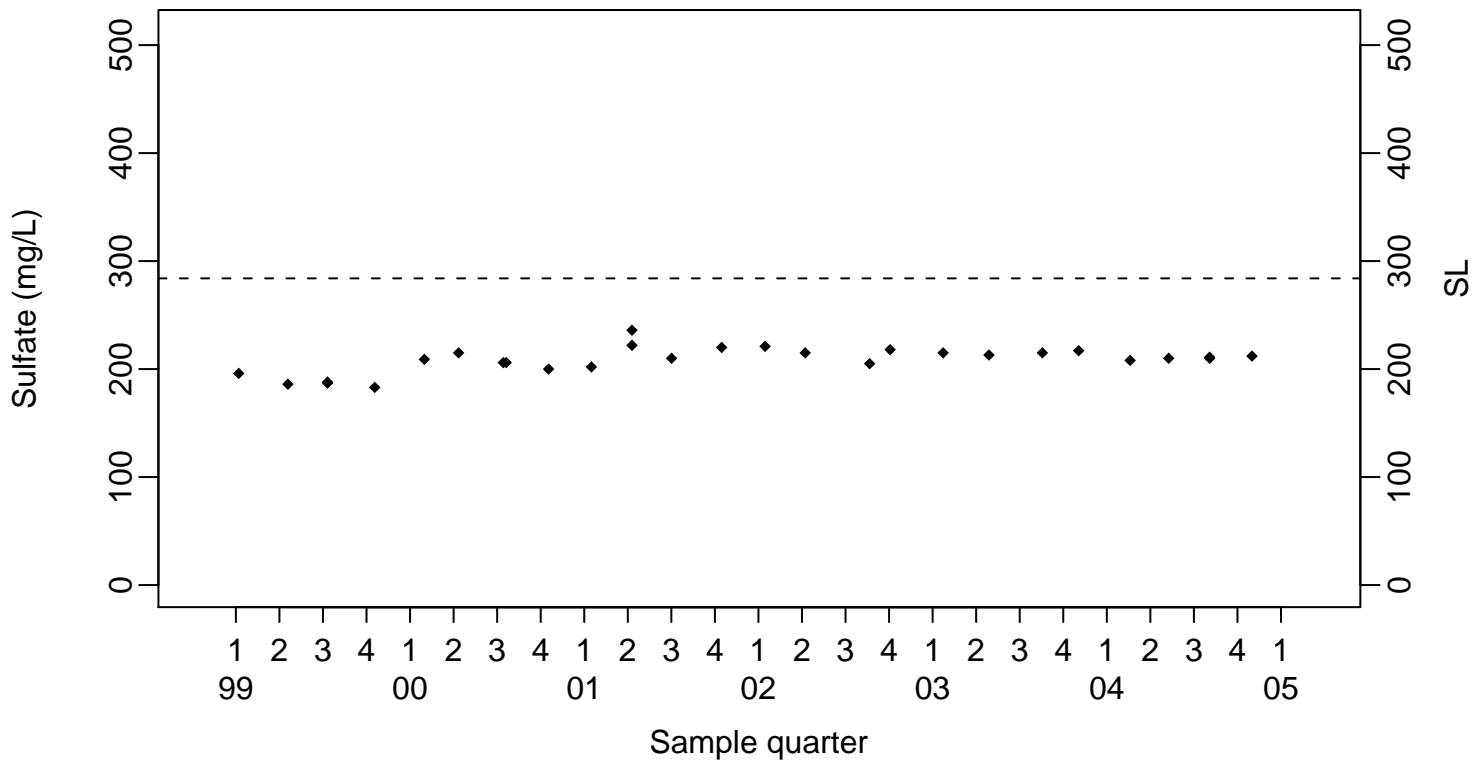
Compliance Monitoring Point W-817-03

◆ Above RL
▽ Below RL



SL=284

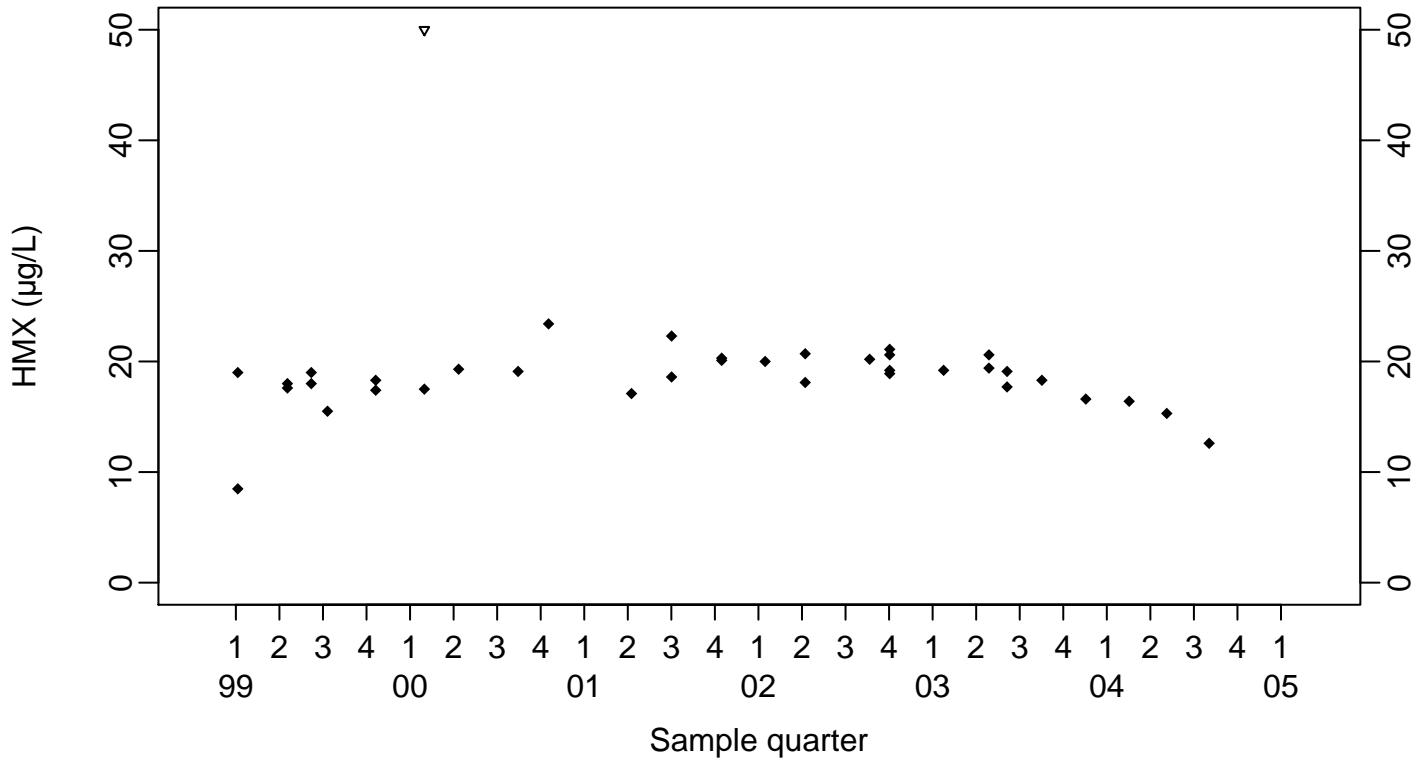
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water HMX ($\mu\text{g/L}$)

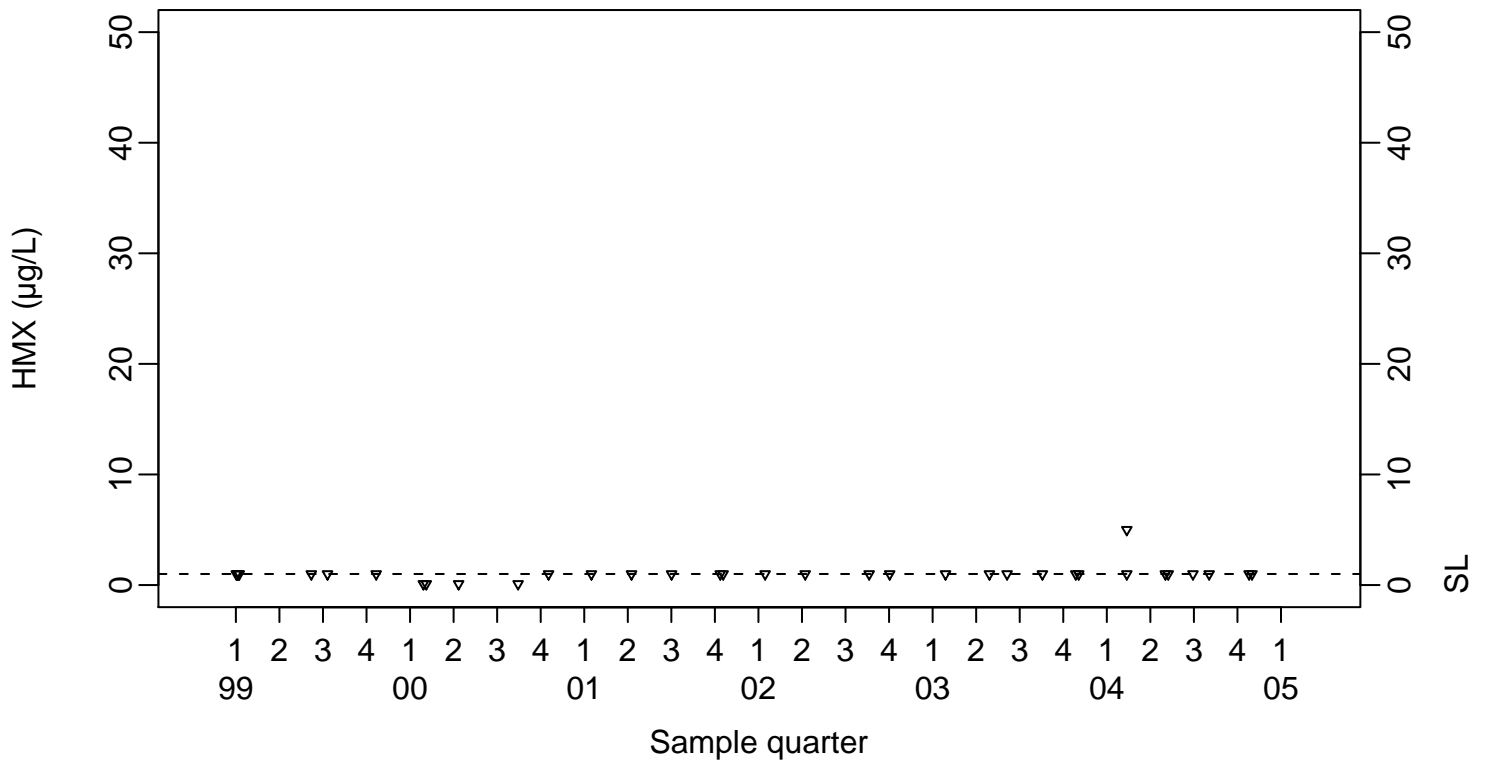
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=1

Compliance Monitoring Point W-817-02

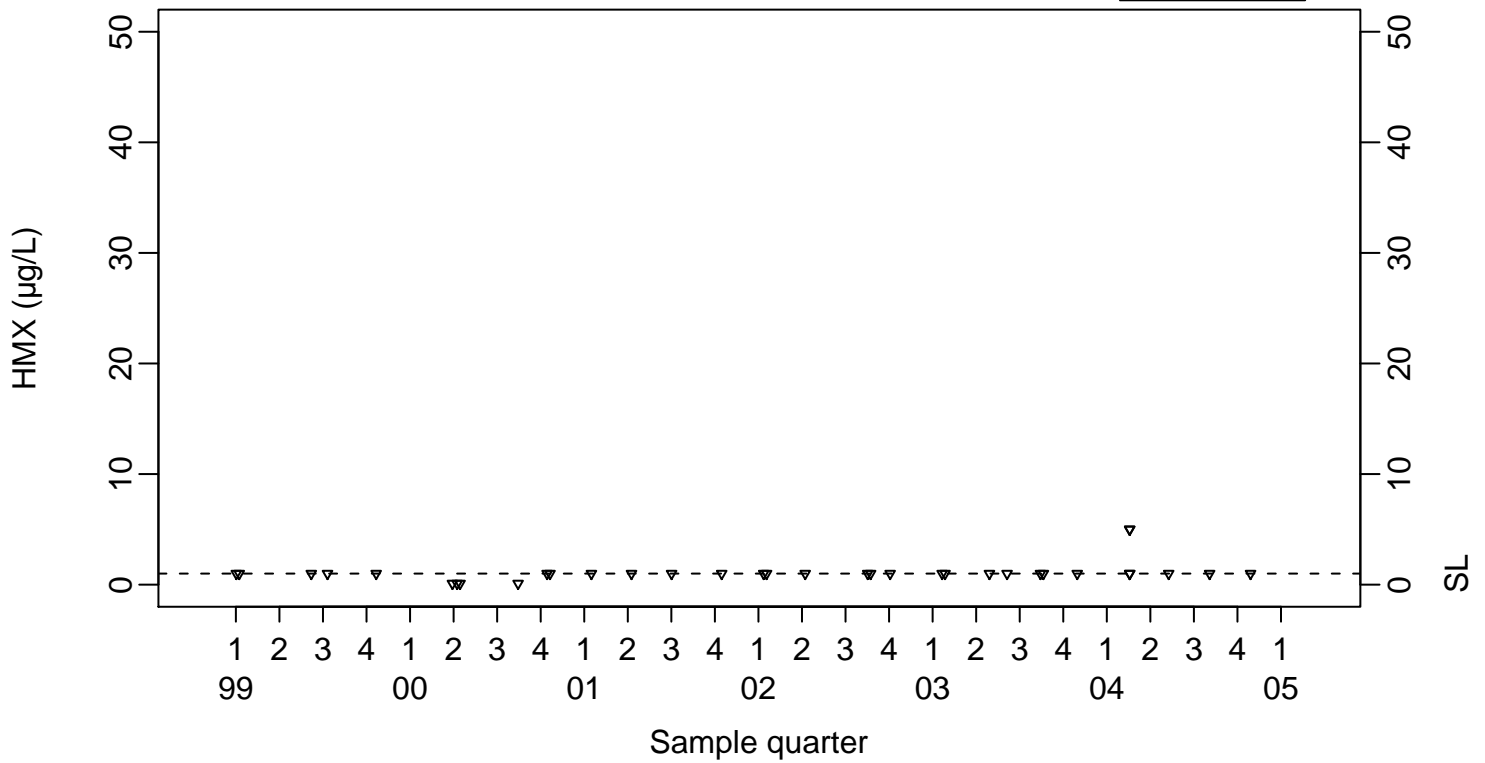


Surface Impoundments Ground Water HMX ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

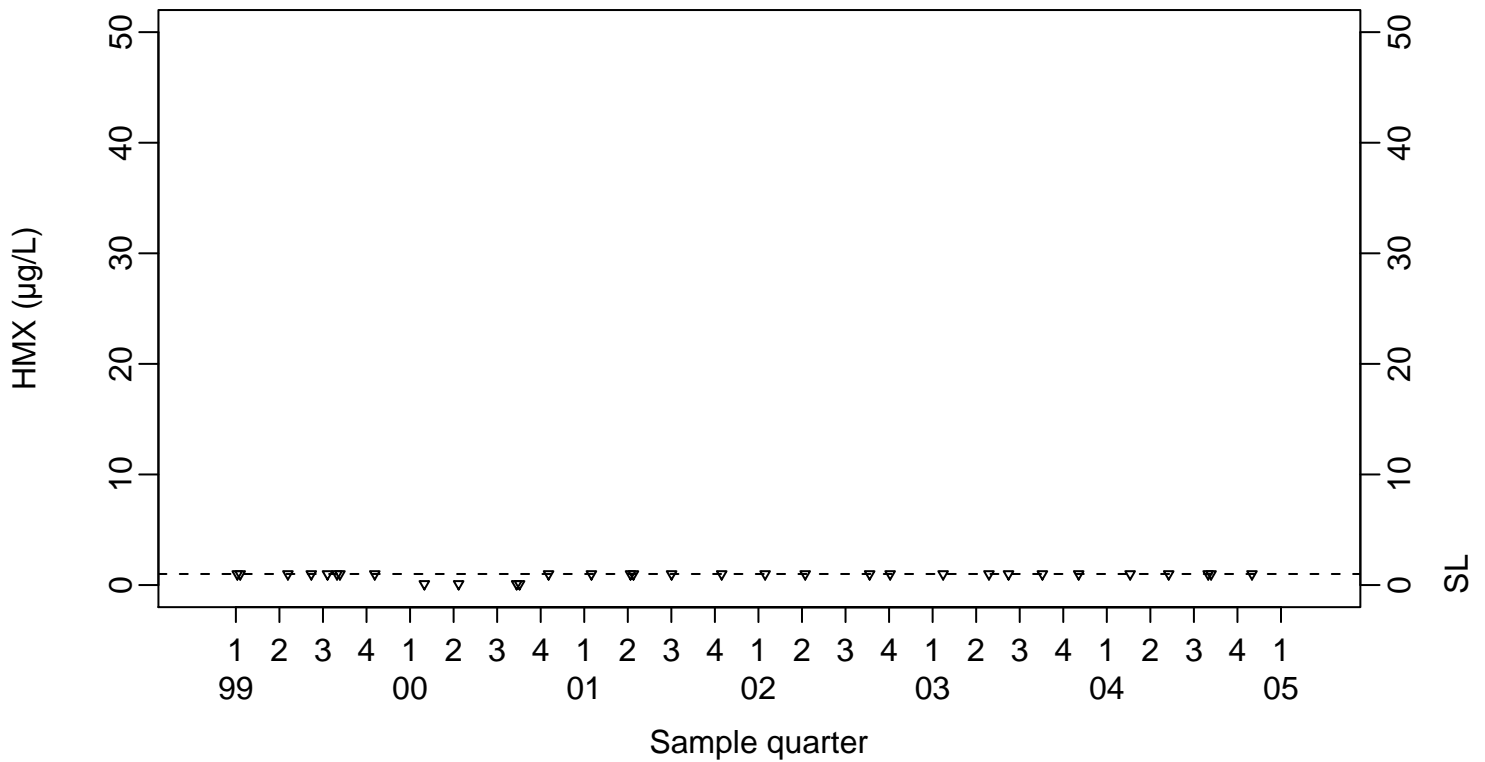
SL=1

◆ Above RL
▽ Below RL



SL=1

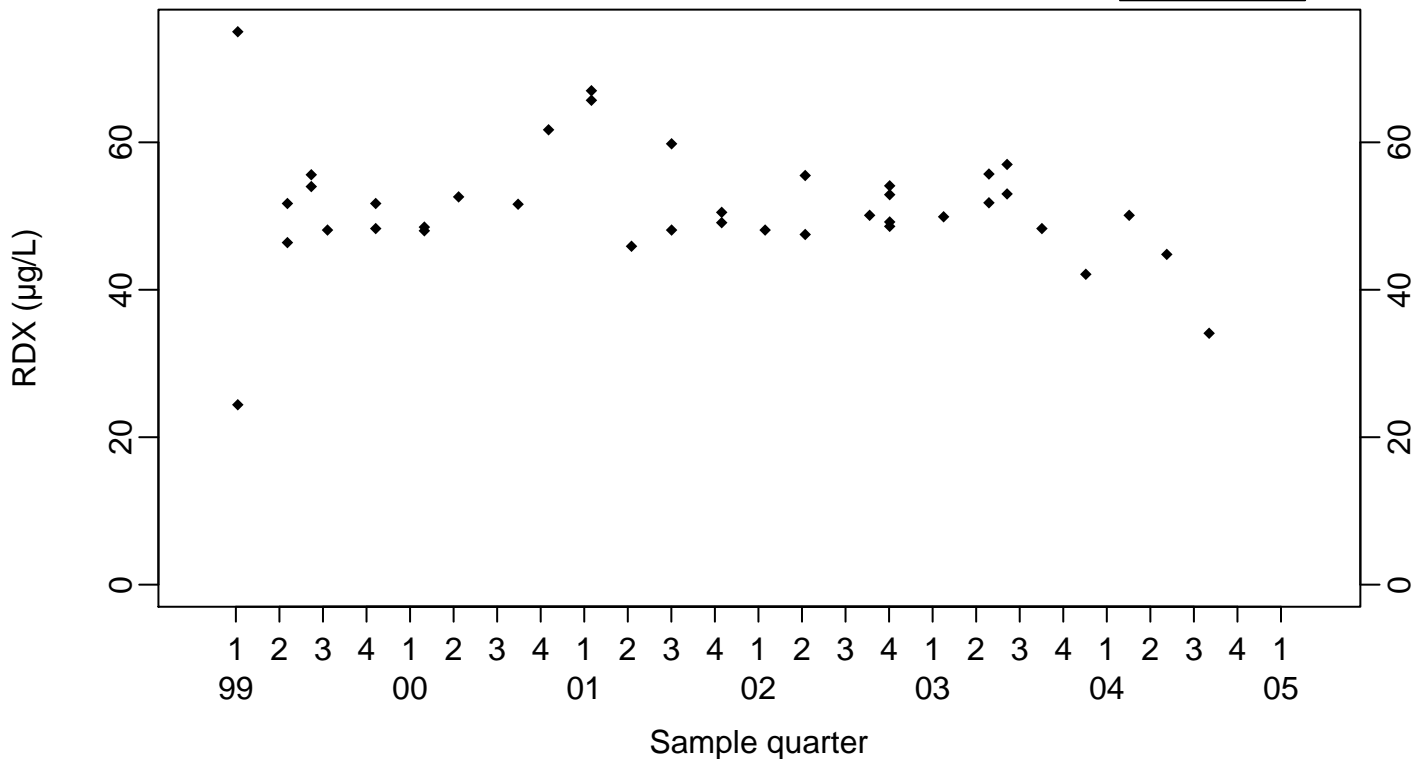
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water RDX ($\mu\text{g/L}$)

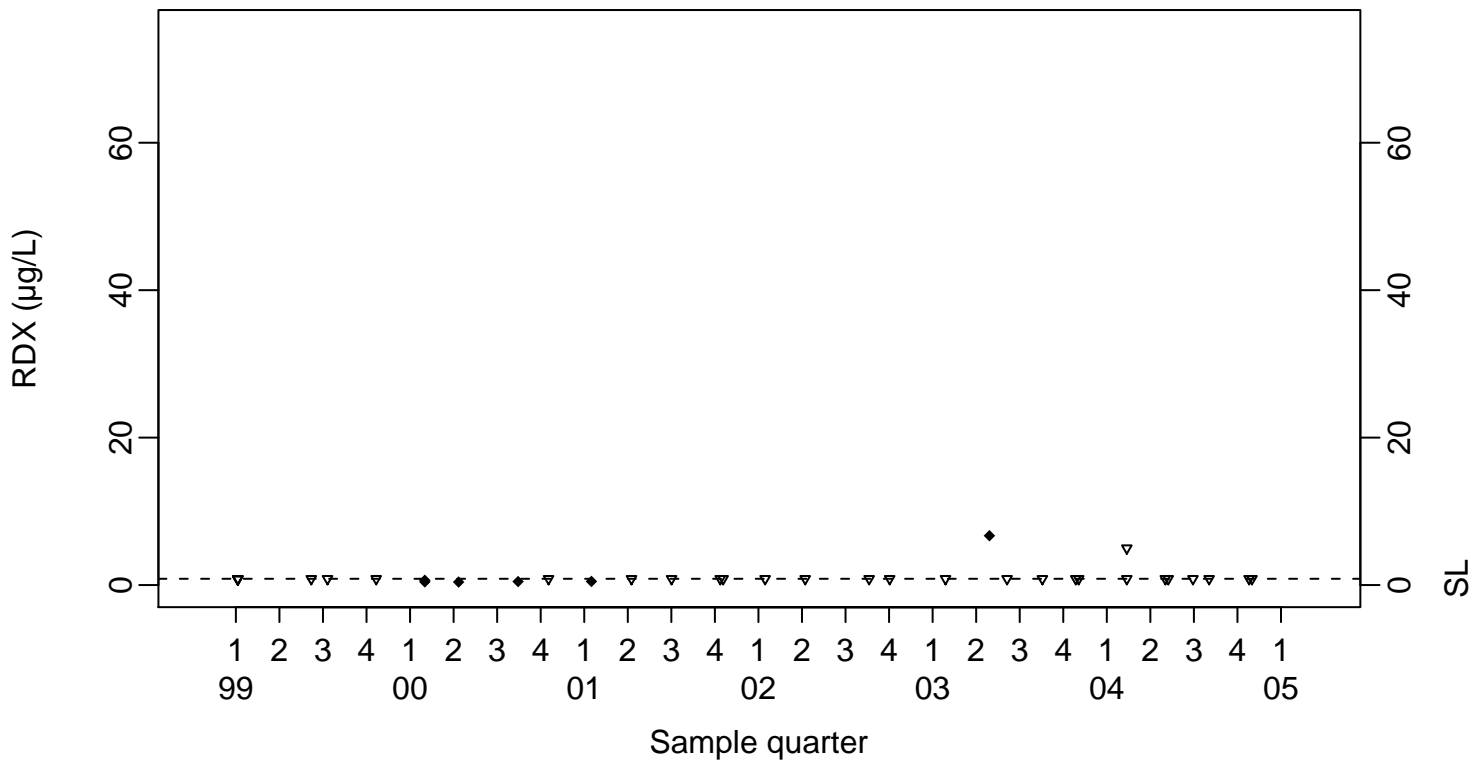
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=0.85

Compliance Monitoring Point W-817-02

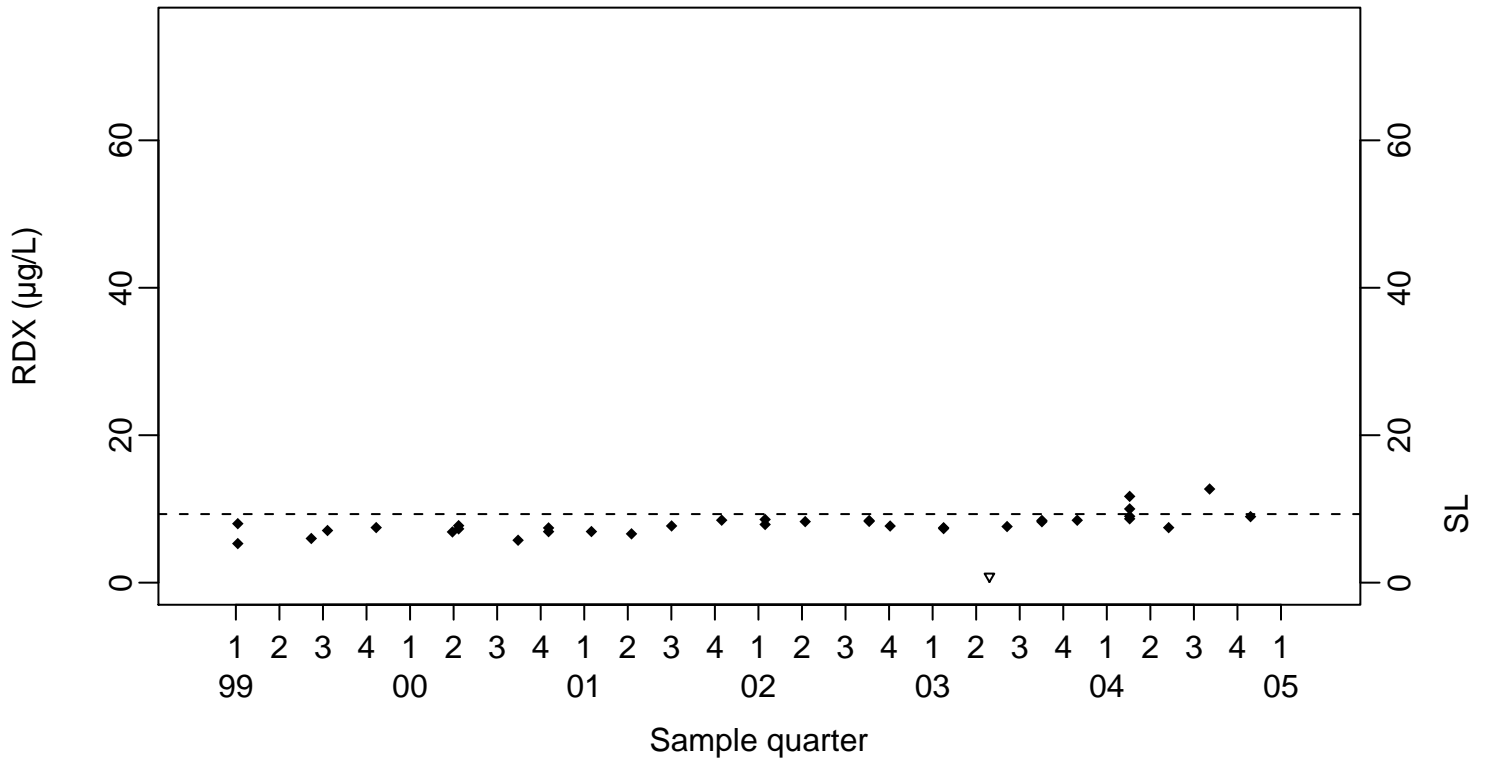


Surface Impoundments Ground Water RDX ($\mu\text{g/L}$)

SL=9.3

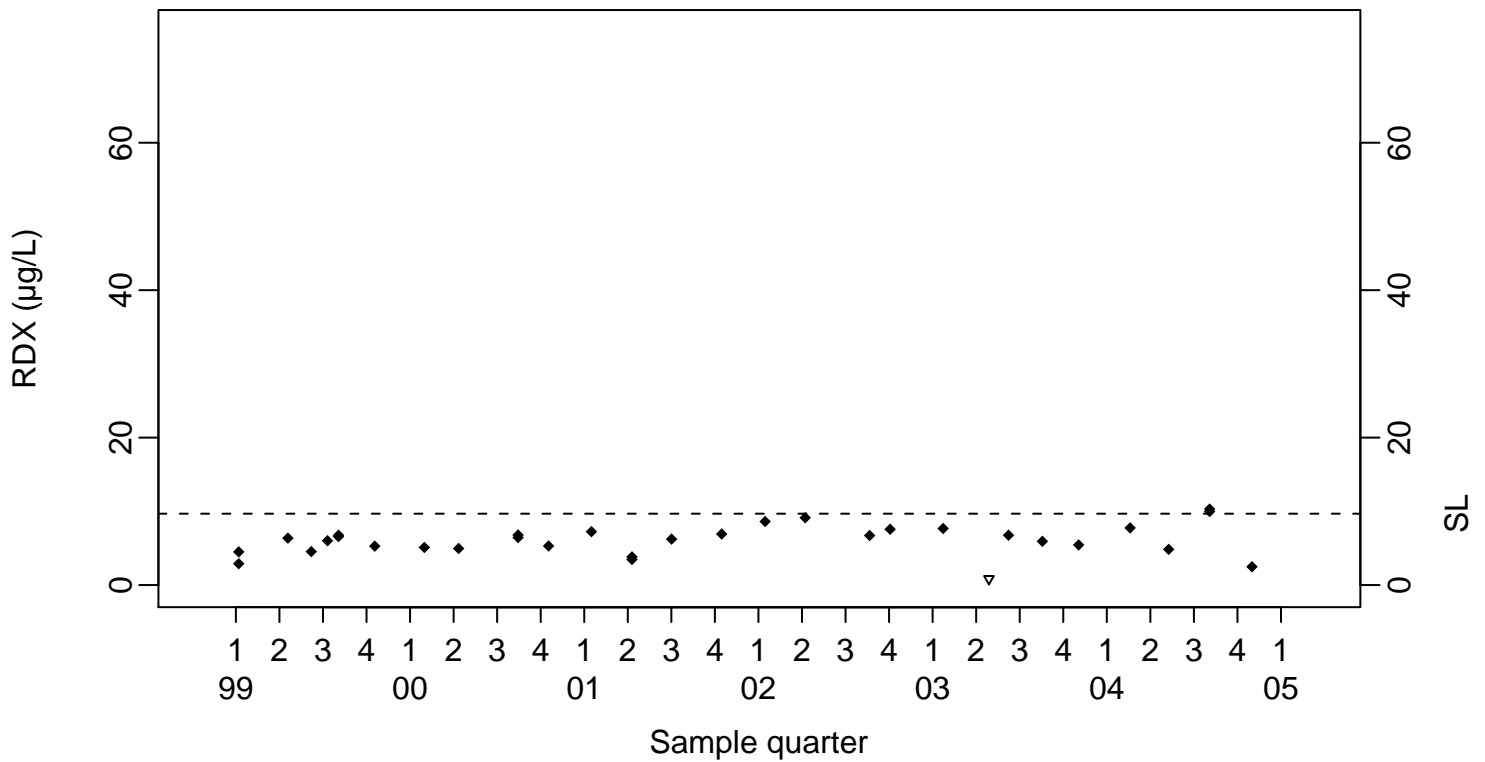
Compliance Monitoring Point W-817-03

◆ Above RL
▽ Below RL



SL=9.68

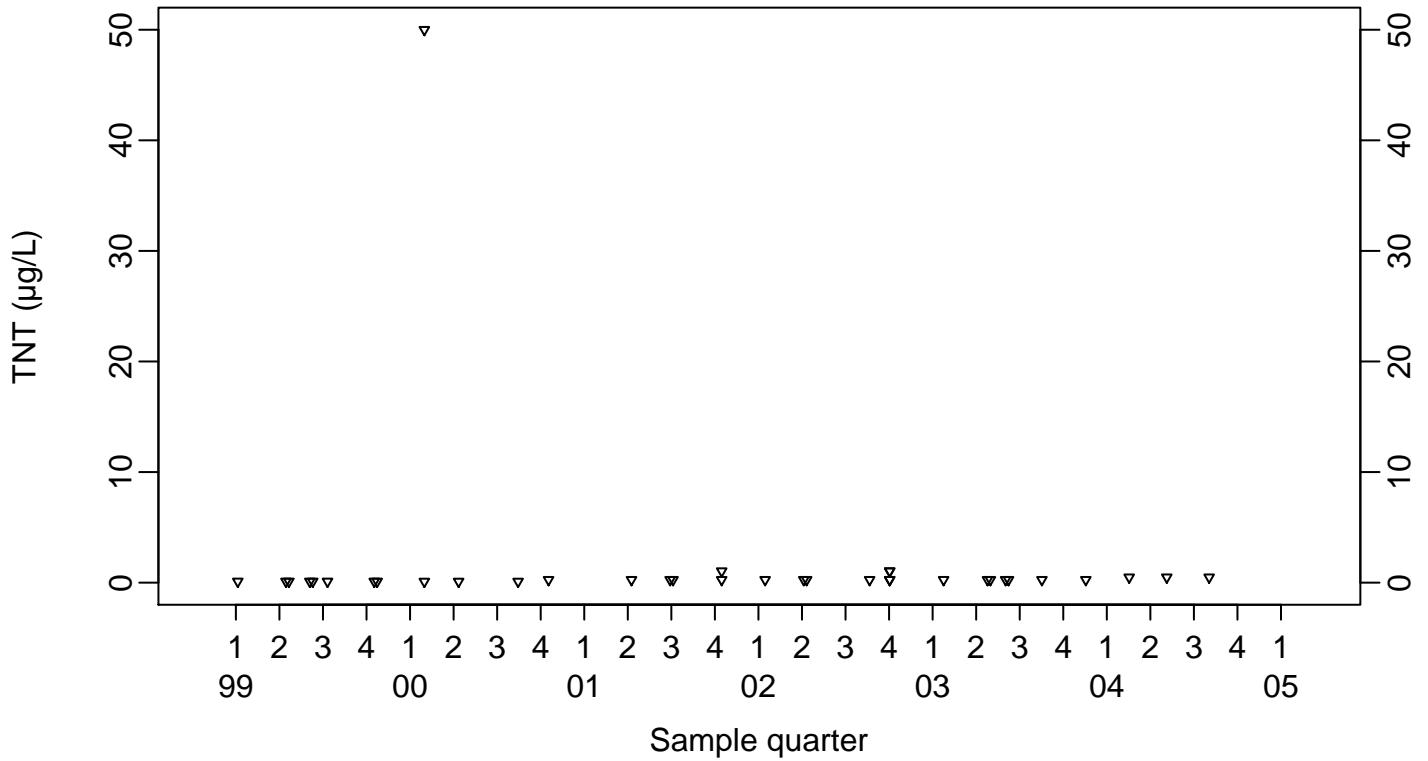
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water TNT ($\mu\text{g/L}$)

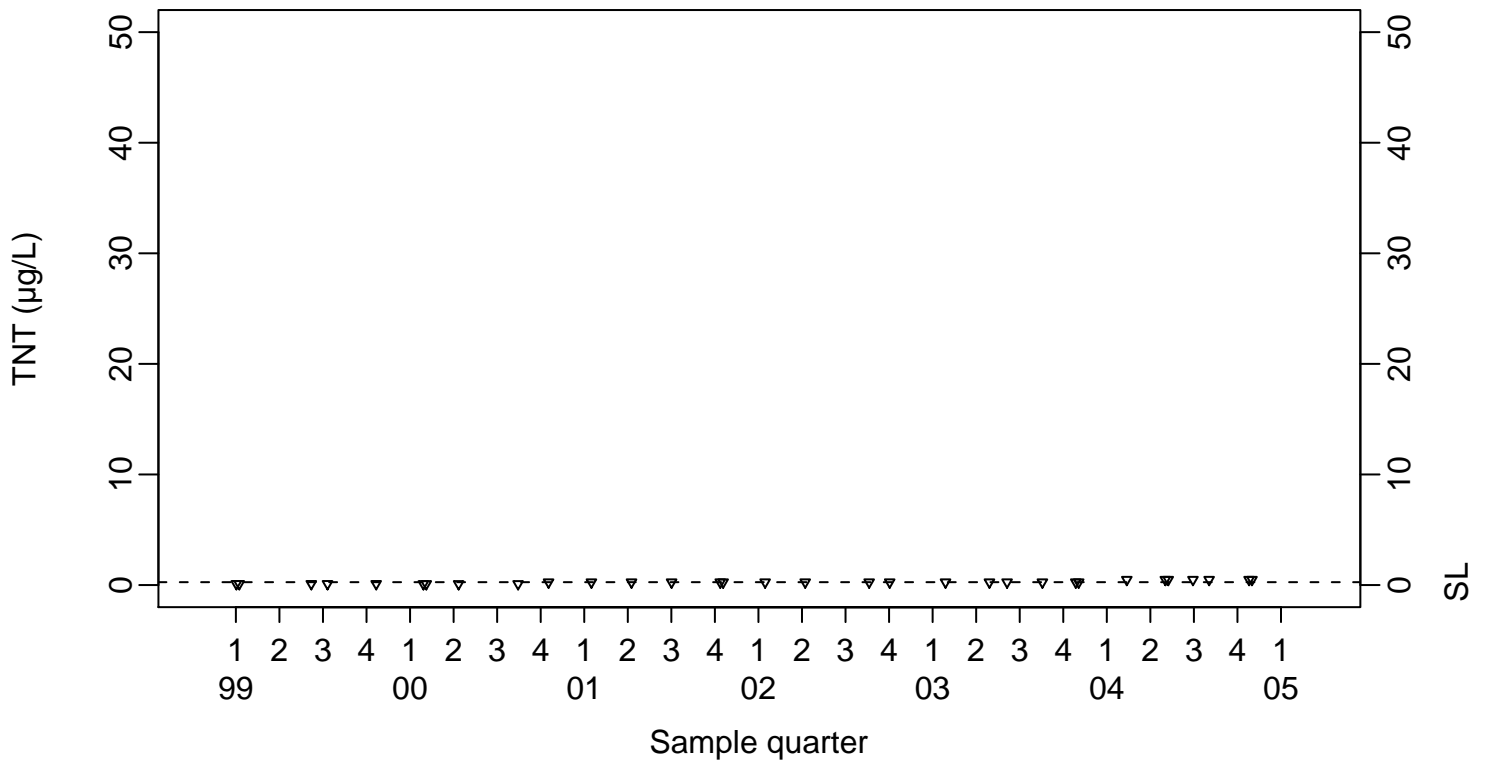
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=0.26

Compliance Monitoring Point W-817-02



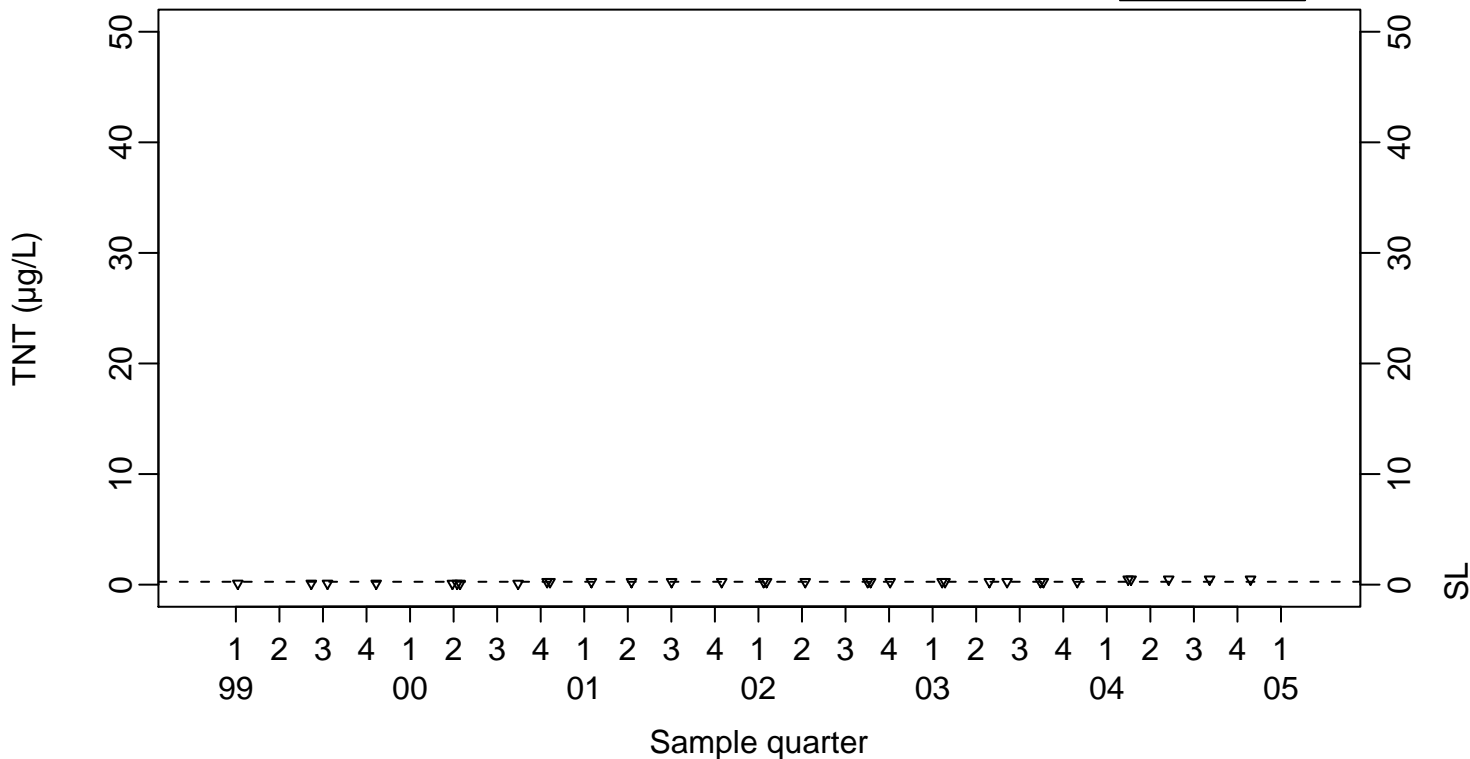
Surface Impoundments Ground Water

TNT ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

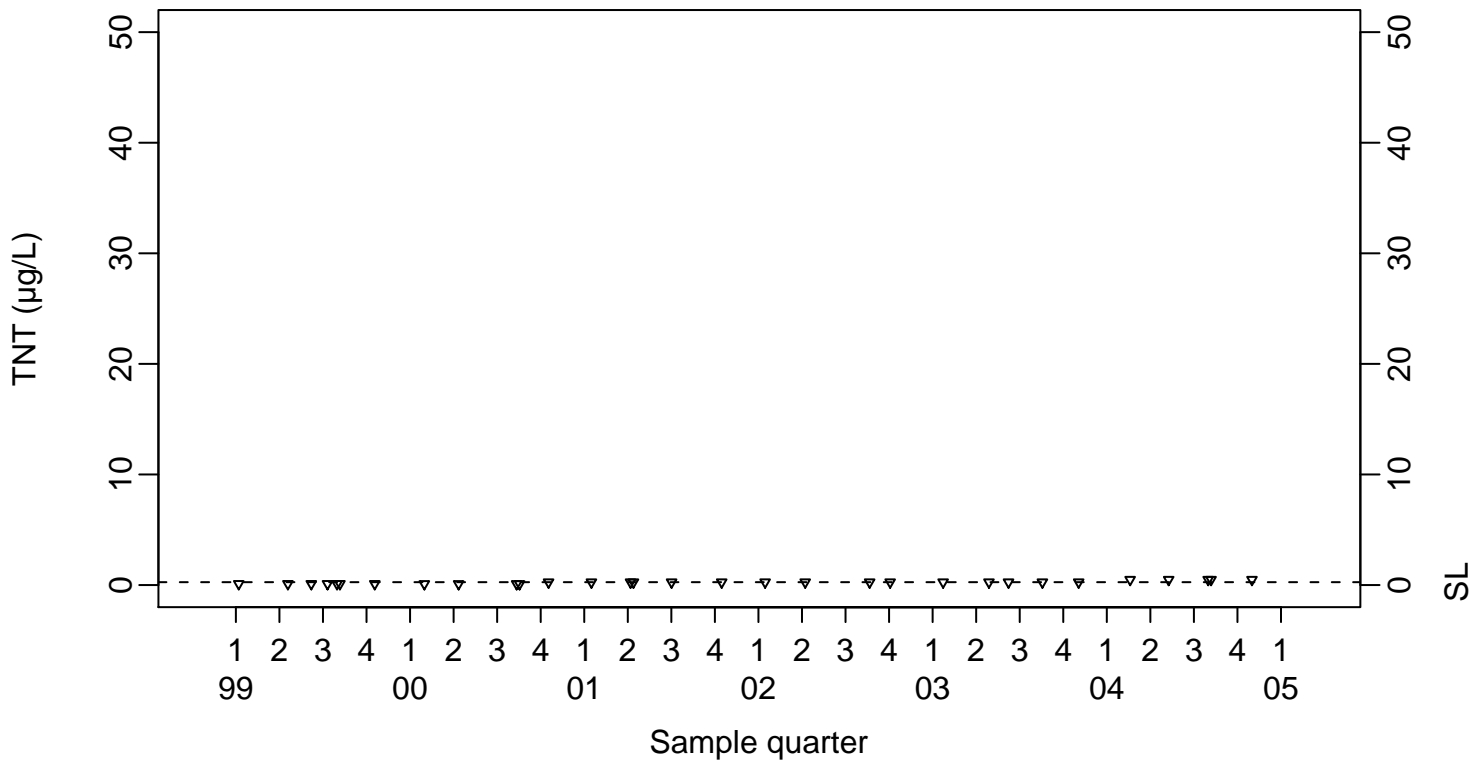
SL=0.26

◆ Above RL
▽ Below RL



SL=0.26

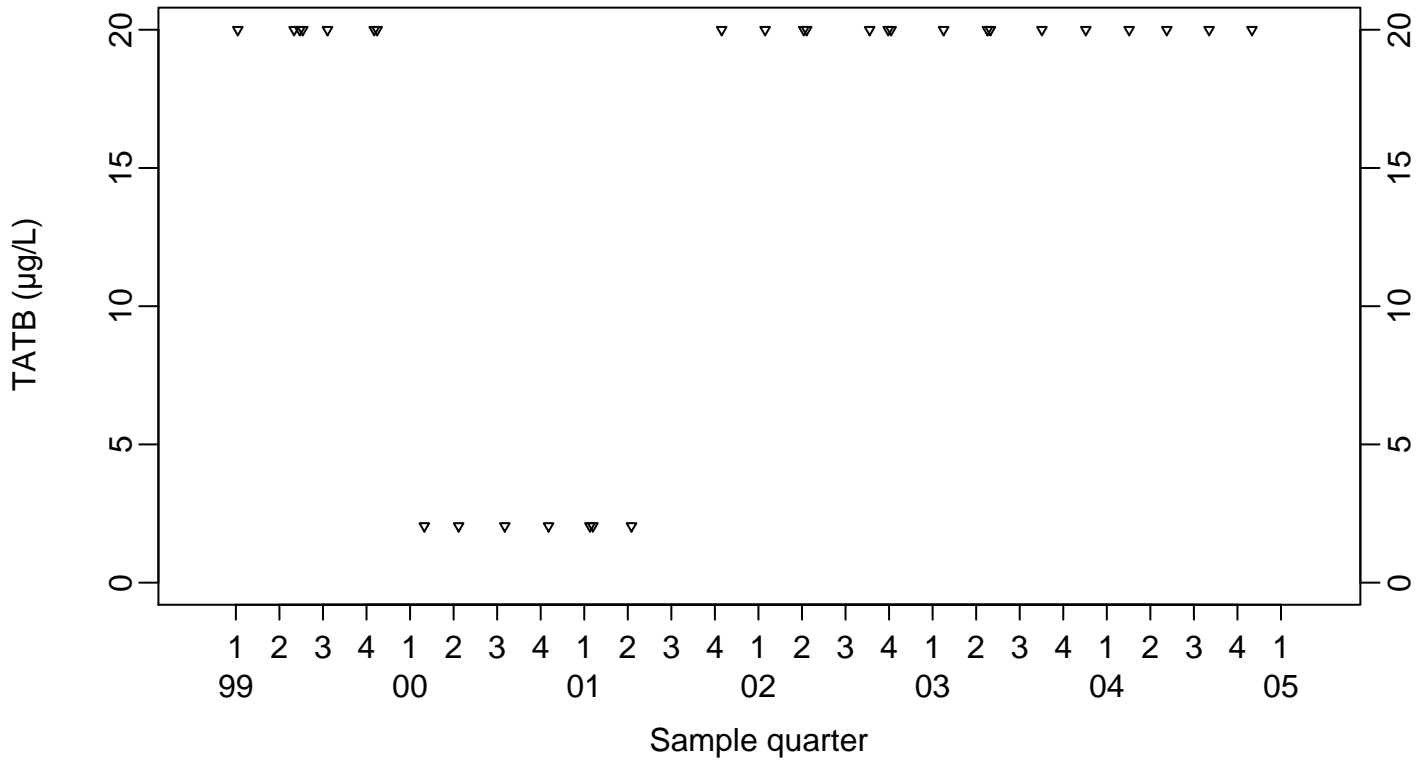
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water TATB ($\mu\text{g/L}$)

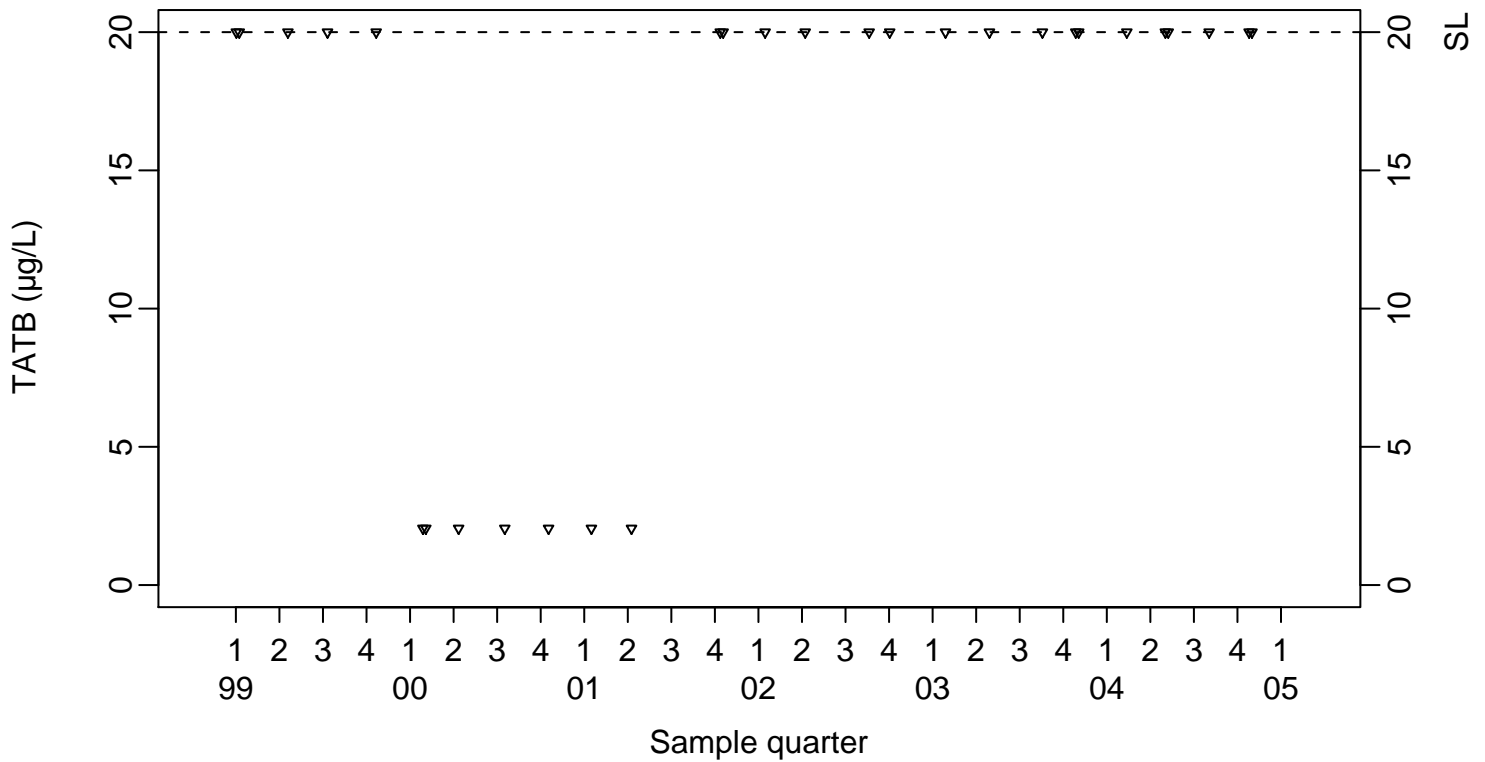
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



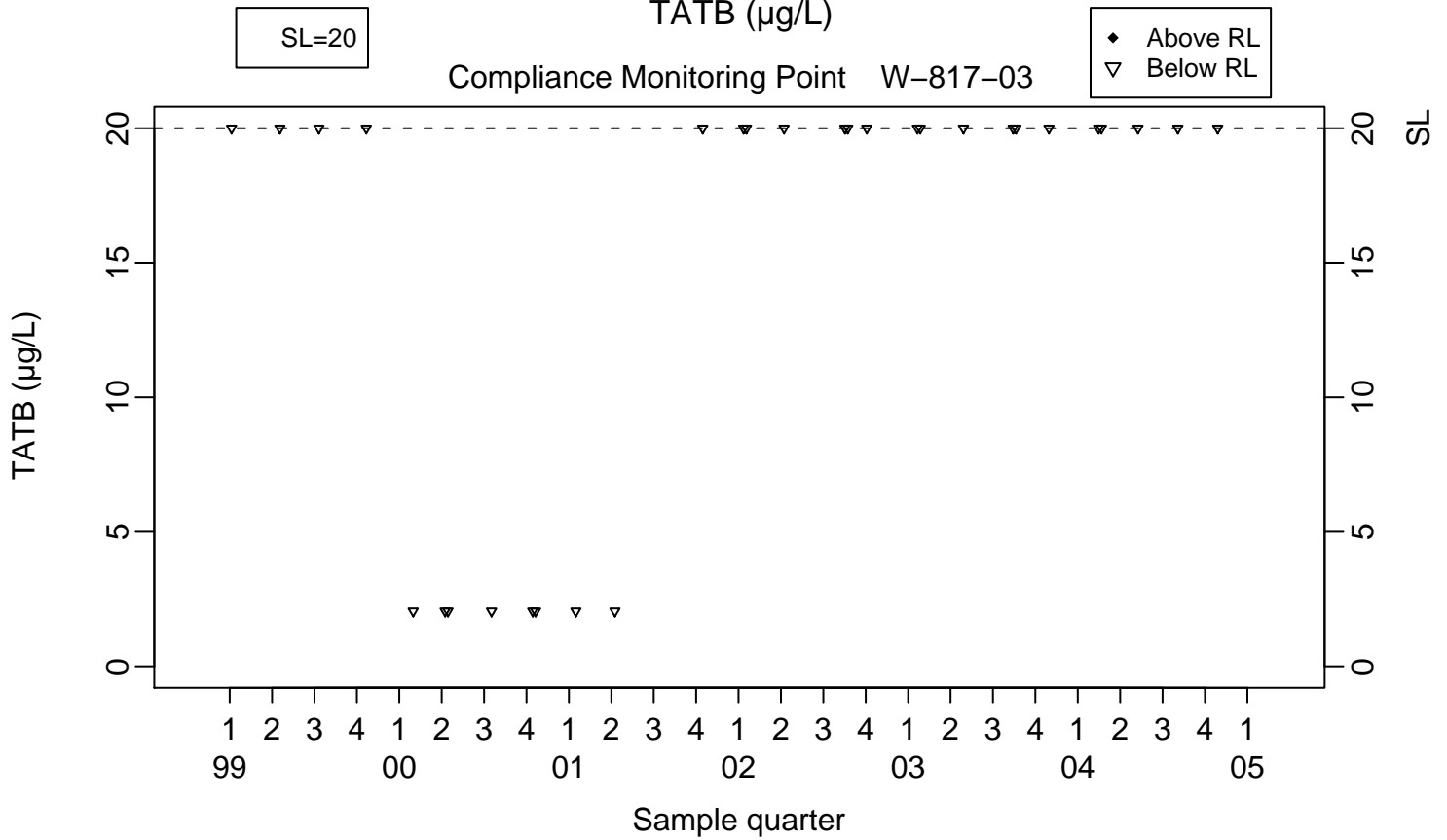
SL=20

Compliance Monitoring Point W-817-02

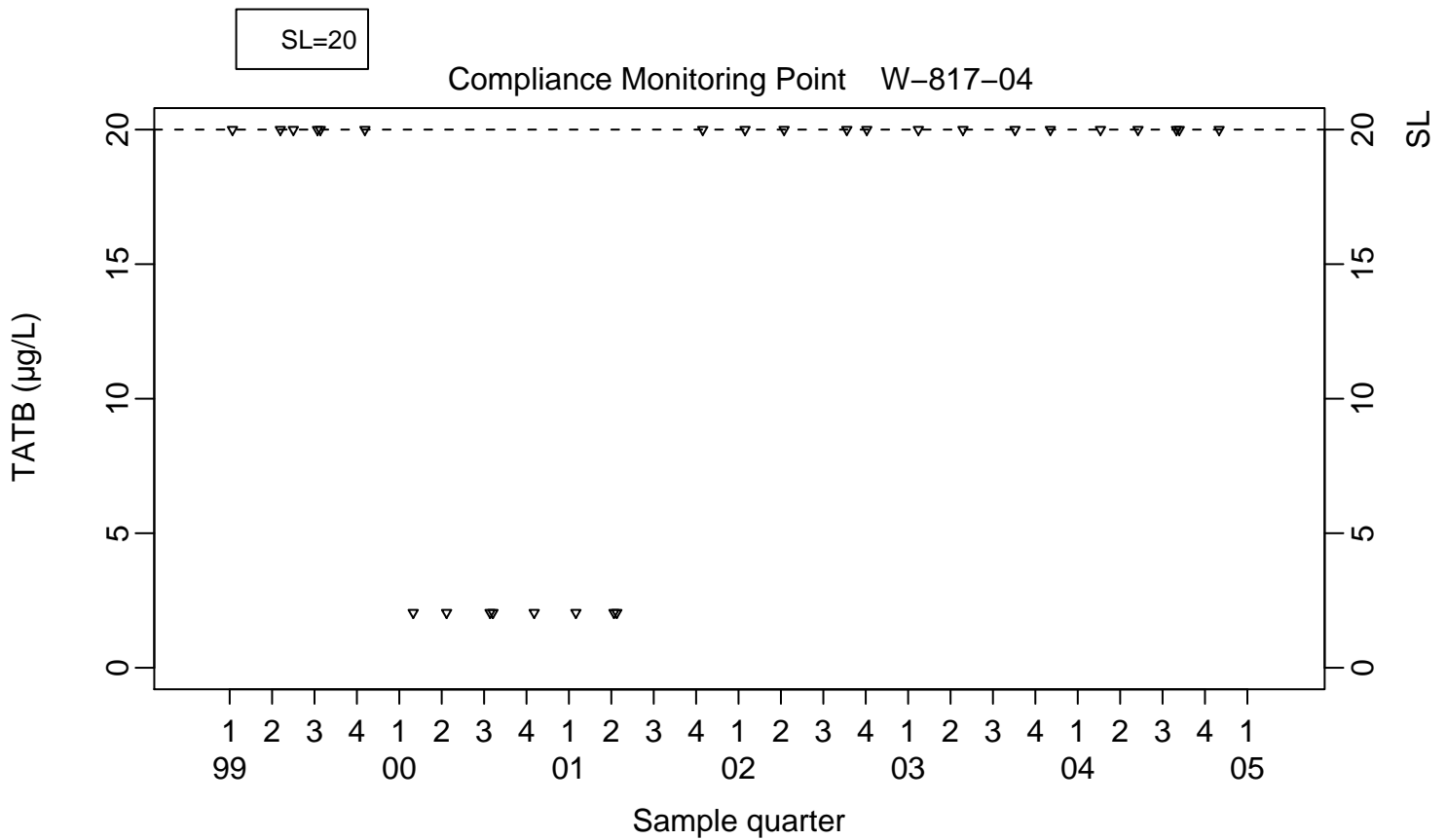


Surface Impoundments Ground Water TATB ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03



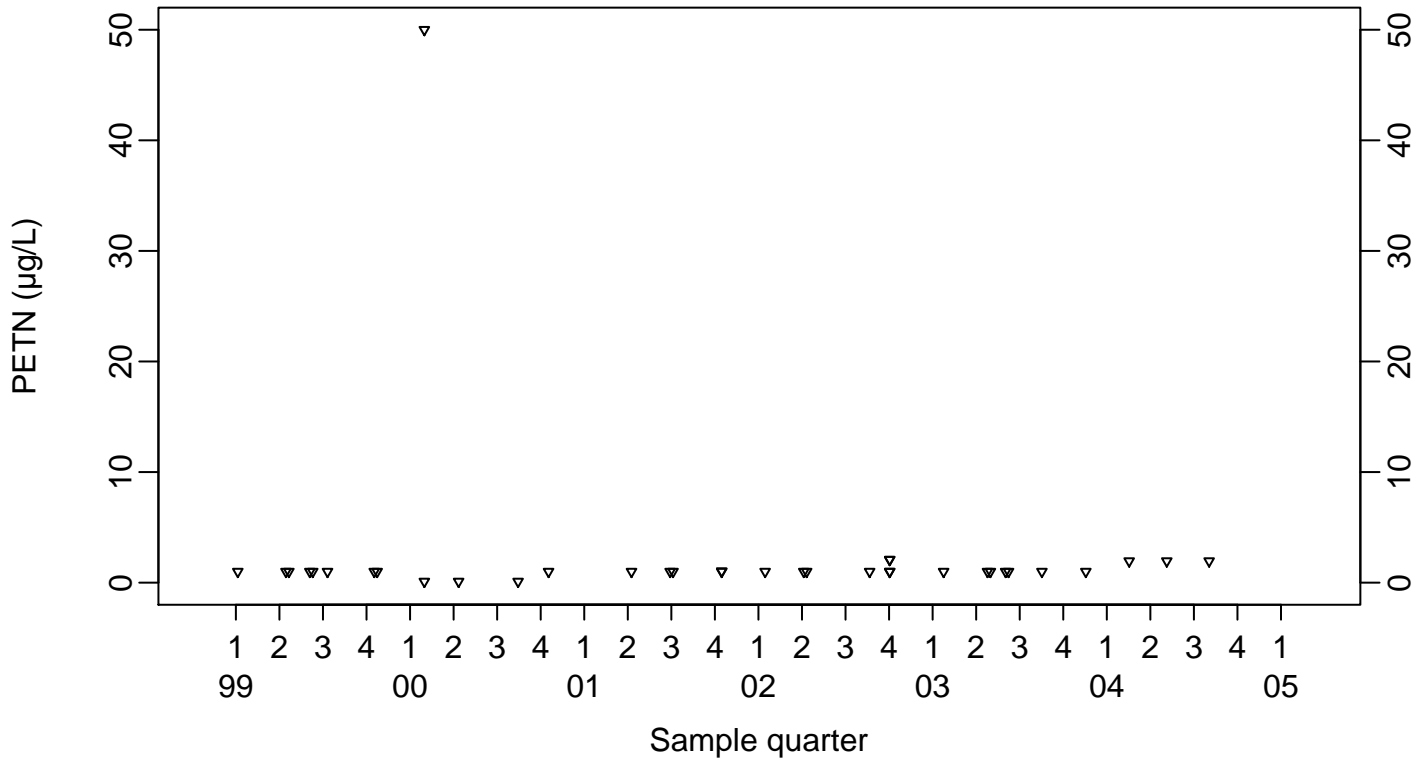
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water PETN ($\mu\text{g/L}$)

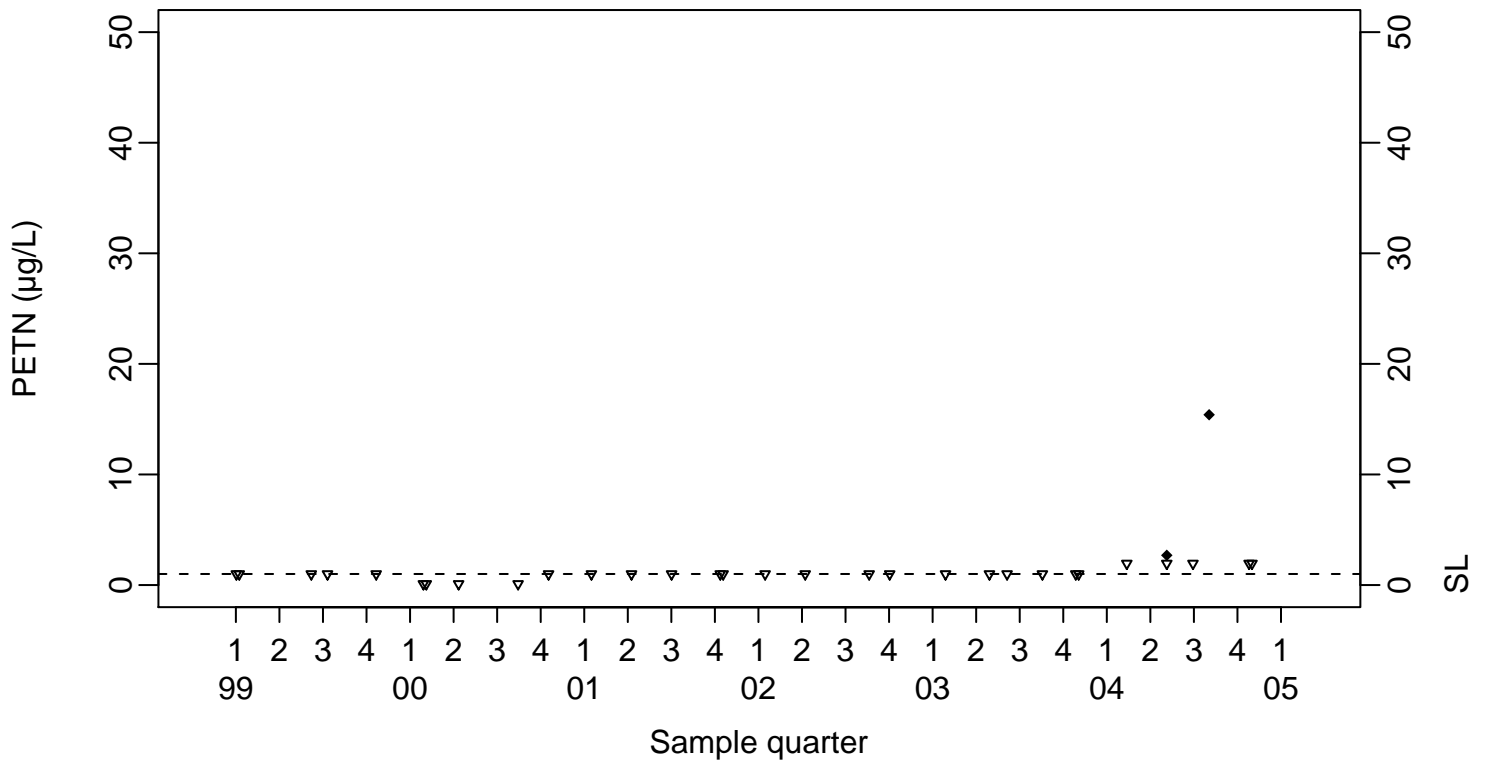
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=1

Compliance Monitoring Point W-817-02

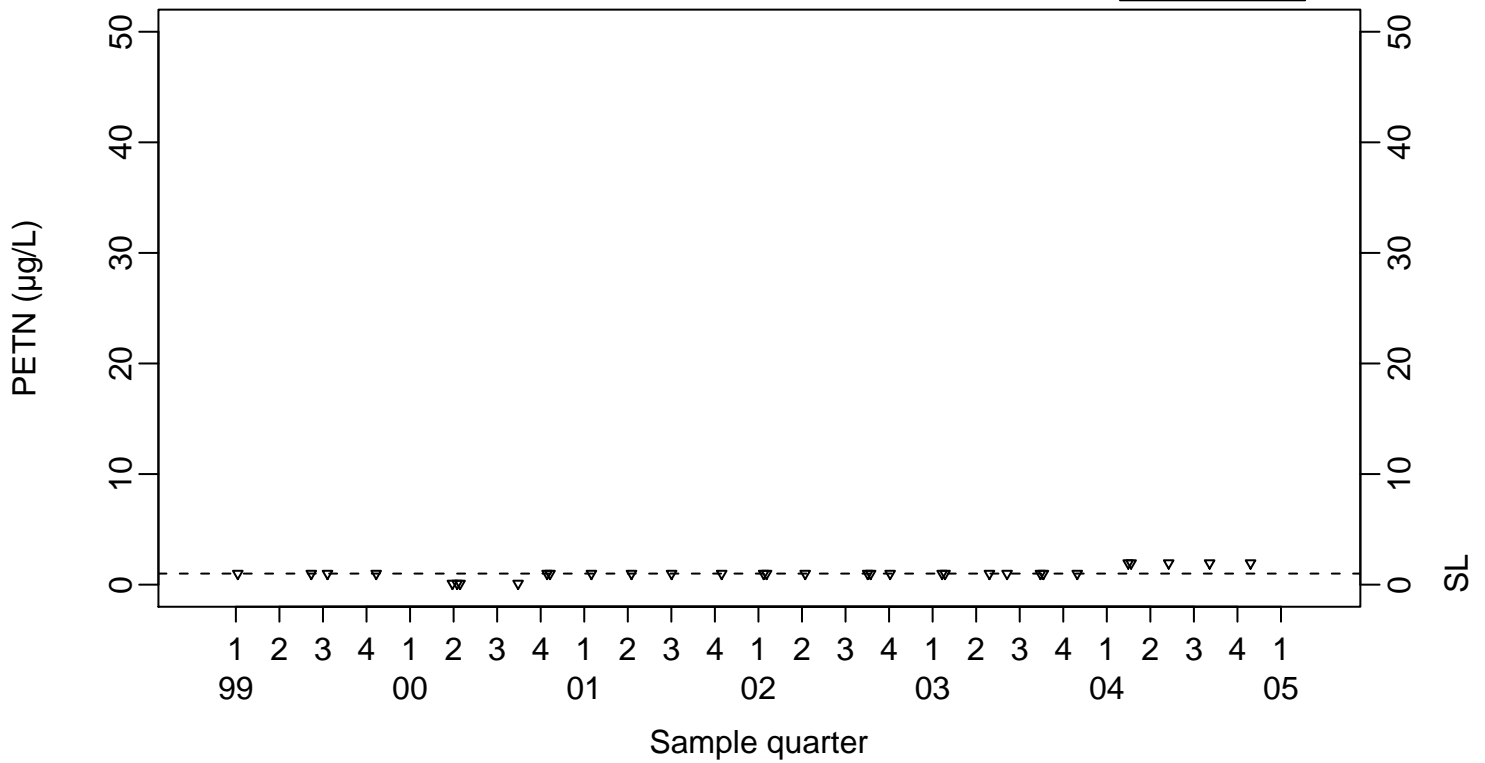


Surface Impoundments Ground Water PETN ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

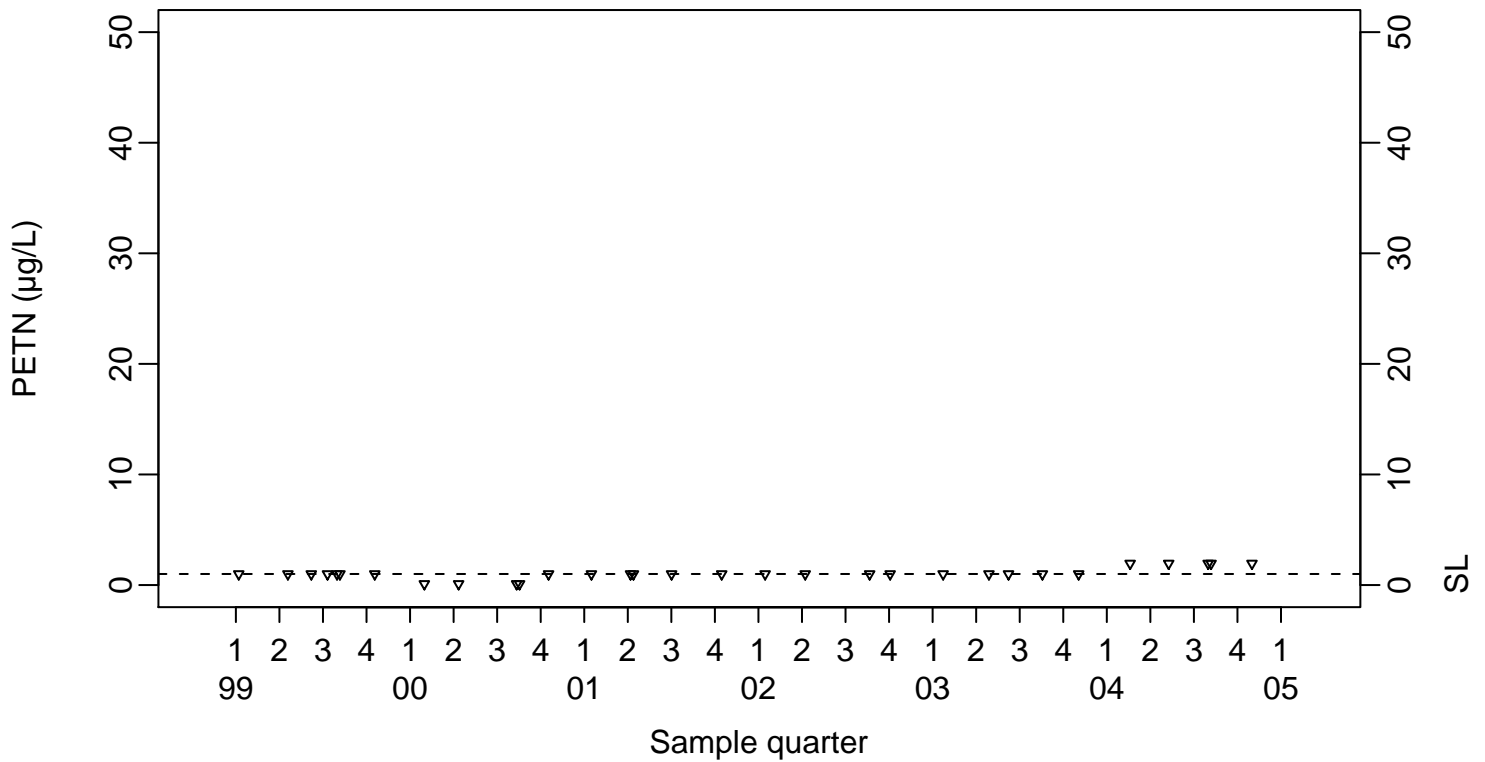
SL=1

◆ Above RL
▽ Below RL



SL=1

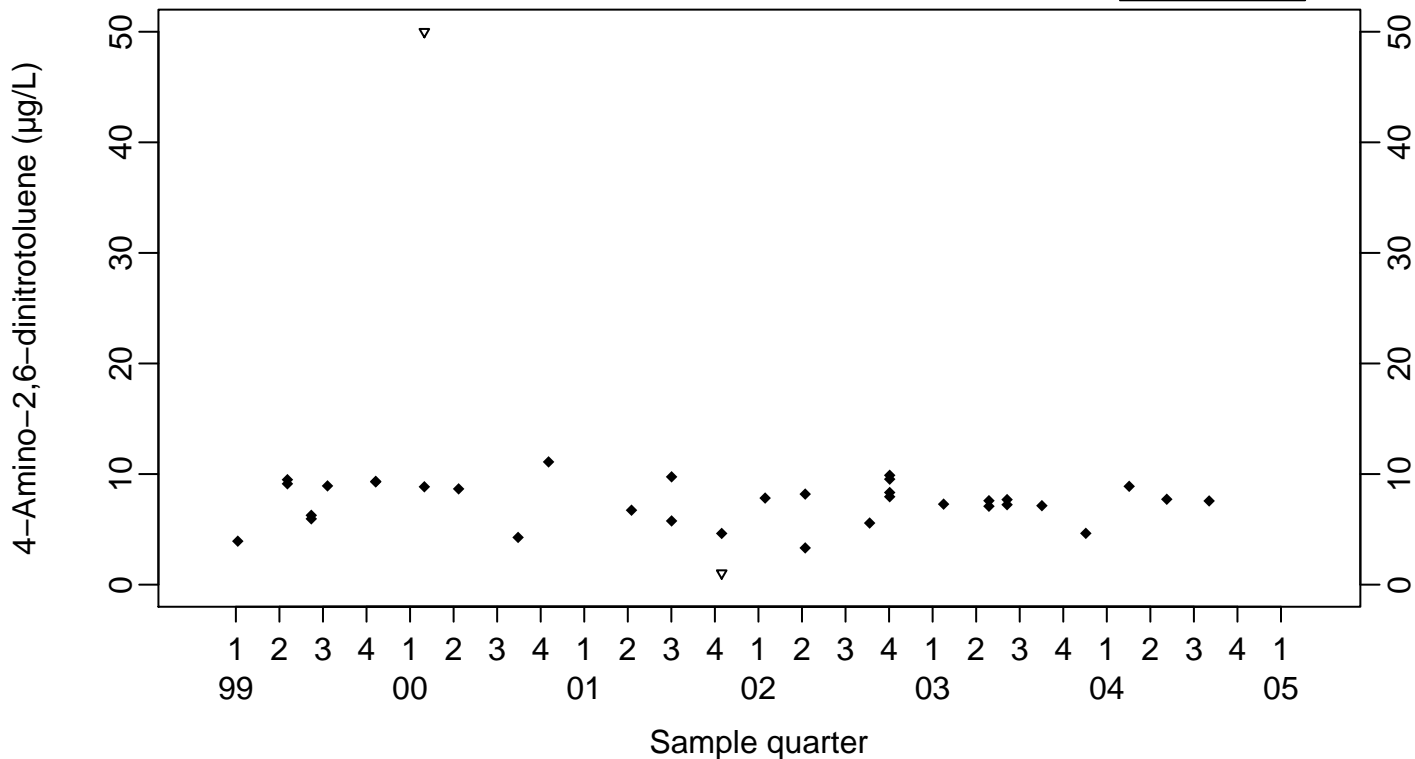
Compliance Monitoring Point W-817-04



Surface Impoundments Ground Water 4-Amino-2,6-dinitrotoluene ($\mu\text{g/L}$)

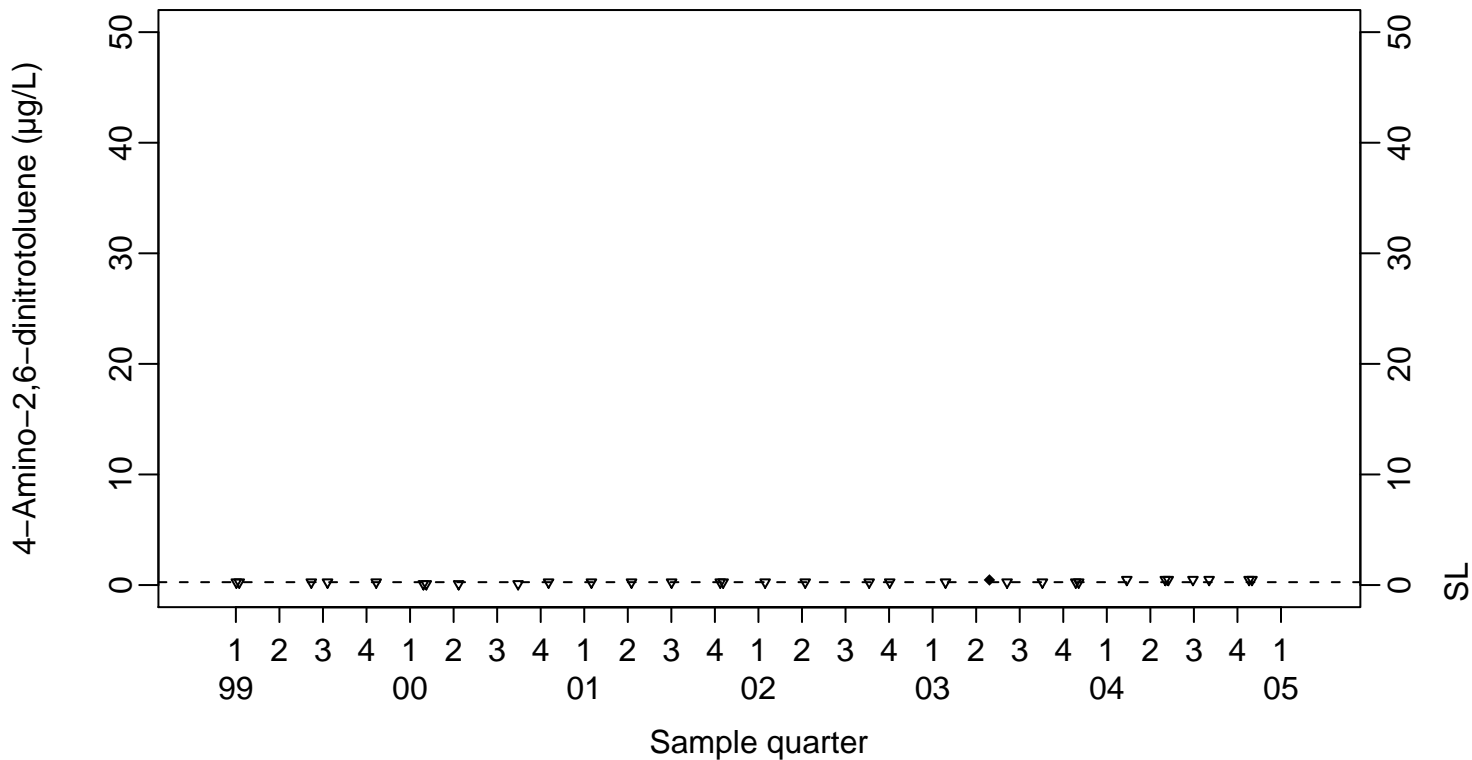
Background Monitoring Point W-817-01

◆ Above RL
▽ Below RL



SL=0.26

Compliance Monitoring Point W-817-02

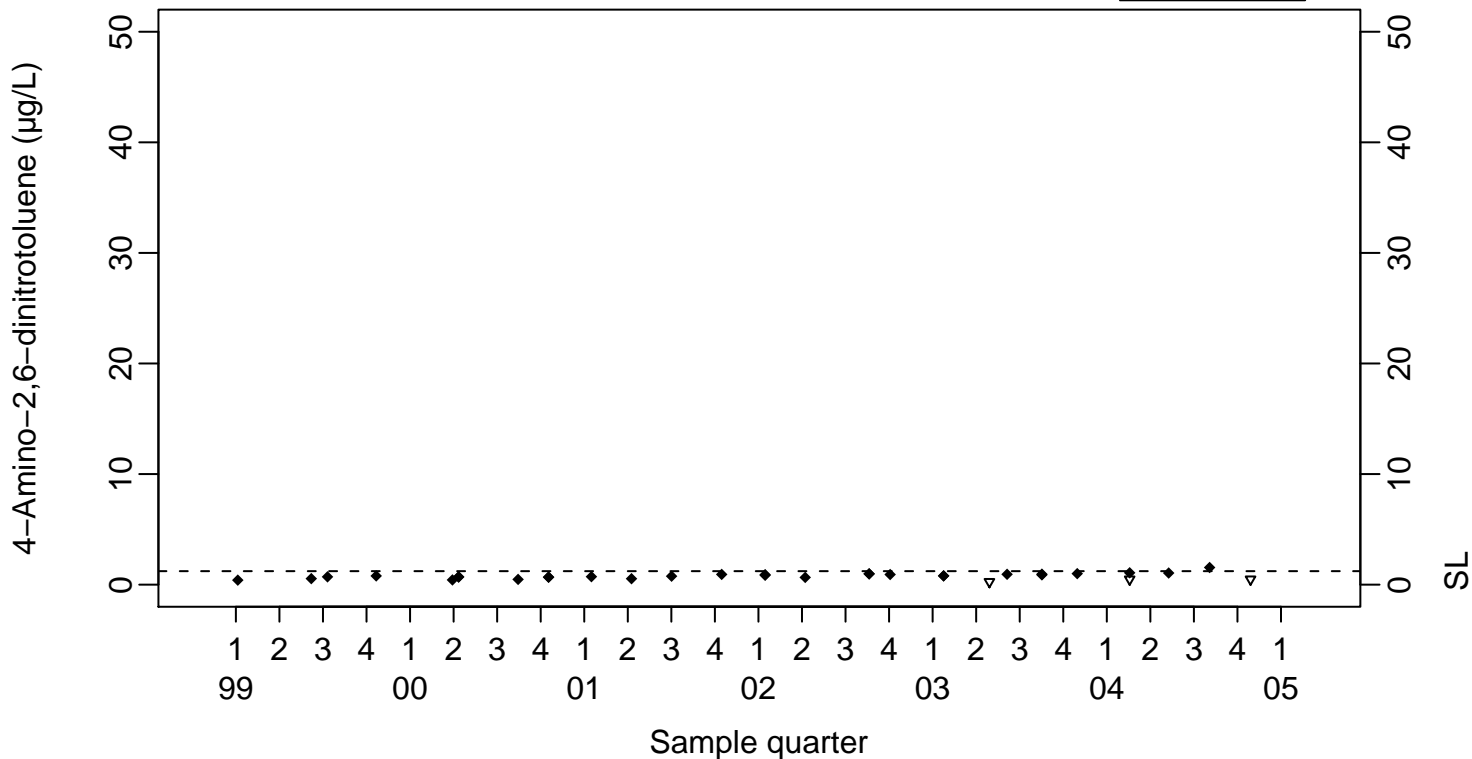


Surface Impoundments Ground Water 4-Amino-2,6-dinitrotoluene ($\mu\text{g/L}$)

Compliance Monitoring Point W-817-03

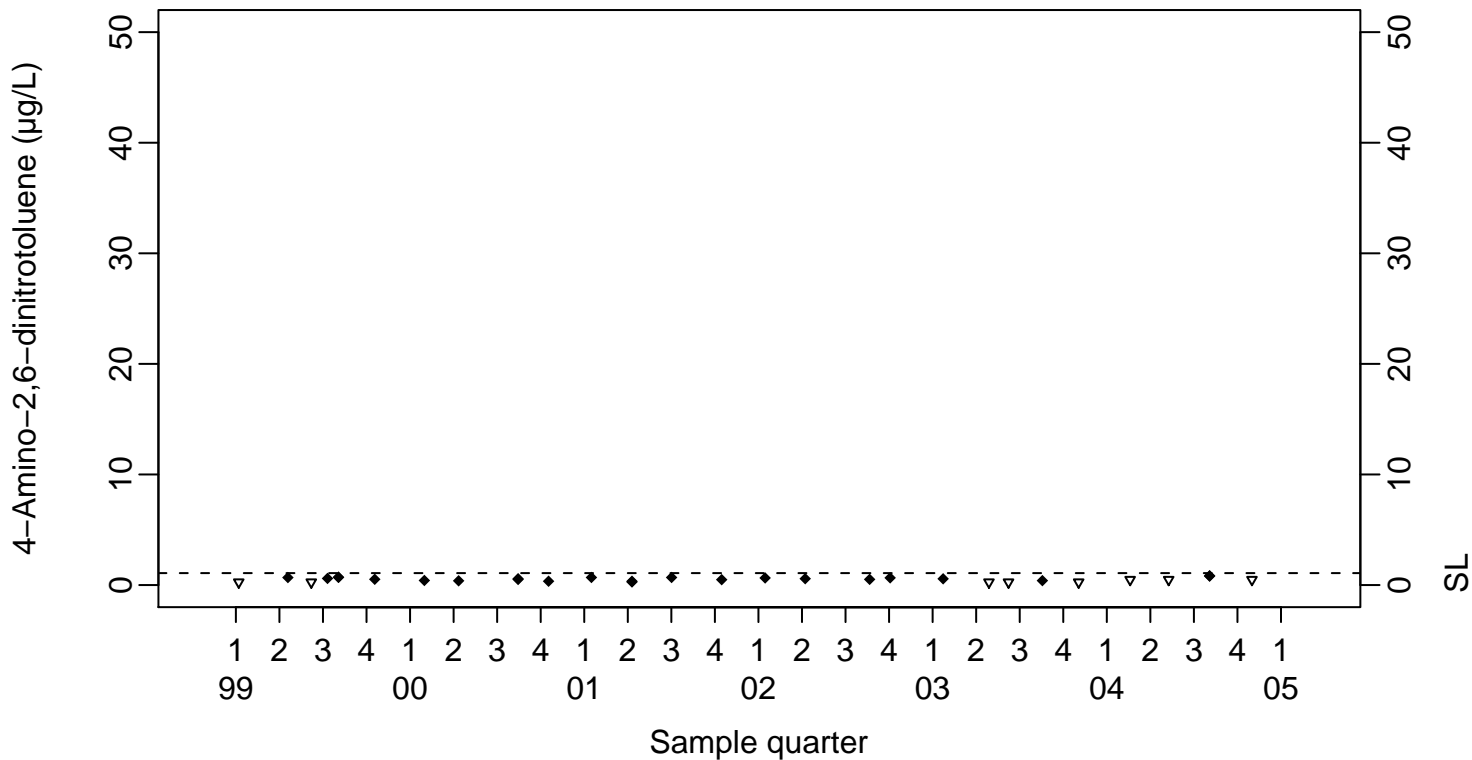
SL=1.22

◆ Above RL
▽ Below RL



SL=1.08

Compliance Monitoring Point W-817-04



Annual Summary Tables of Surface Impoundments Ground Water Monitoring Data

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit ^a	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
General						
pH (unitless)	W-817-01	None	8.45	8.46	8.50	8.31
	W-817-02	None	7.95	8.18	8.30	8.16
	W-817-03	None	8.20	8.06	8.38	8.24
	W-817-04	None	8.23	8.06	8.27	8.28
Halocarbons ($\mu\text{g/L}$)						
1,1,1-Trichloroethane	W-817-01	NA ^b	<0.5	<0.5	<0.5	<0.5
	W-817-02	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-03	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-04	1.0	<0.5	<0.5	<0.5	<0.5
Bromoform	W-817-01	NA	<0.5	<0.5	<0.5	<0.5
	W-817-02	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-03	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-04	1.0	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	W-817-01	NA	<0.5	<0.5	<0.5	<0.5
	W-817-02	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-03	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-04	1.0	<0.5	<0.5	<0.5	<0.5
Freon 113	W-817-01	NA	<0.5	<0.5	<0.5	<0.5
	W-817-02	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-03	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-04	1.0	<0.5	<0.5	<0.5	<0.5
Methylene chloride	W-817-01	NA	<1.0	<1.0	<1.0	<1.0
	W-817-02	1.0	<1.0	<1.0	<1.0	<1.0
	W-817-03	1.0	<1.0	<1.0	<1.0	<1.0
	W-817-04	1.0	<1.0	<1.0	<1.0	<1.0

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit ^a	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Halocarbons ($\mu\text{g/L}$) (continued)						
Tetrachloroethene	W-817-01	NA	<0.5	<0.5	<0.5	<0.5
	W-817-02	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-03	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-04	1.0	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	W-817-01	NA	<0.5	<0.5	<0.5	<0.5
	W-817-02	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-03	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-04	1.0	<0.5	<0.5	<0.5	<0.5
Hydrocarbons ($\mu\text{g/L}$)						
Toluene	W-817-01	NA	<0.5	<0.5	<0.5	<0.5
	W-817-02	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-03	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-04	1.0	<0.5	<0.5	<0.5	<0.5
Naphthalene	W-817-01	NA	<5	<5	<5	<5
	W-817-02	5	<5	<5	<5	<5
	W-817-03	5	<5	<5	<5	<5
	W-817-04	5	<5	<5	<5	<5
Photographic chemicals ($\mu\text{g/L}$)						
<i>meta</i> and <i>para</i> -Cresol	W-817-01	NA	<2	<2	<2	<2
	W-817-02	2	<2	<2	<2	<2
	W-817-03	2	<2	<2	<2	<2
	W-817-04	2	<2	<2	<2	<2
Benzyl alcohol	W-817-01	NA	<2	<2	<2	<2
	W-817-02	2	<2	<2	<2	<2
	W-817-03	2	<2	<2	<2	<2
	W-817-04	2	<2	<2	<2	<2

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit ^a	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Volatile/semivolatile organic compounds (µg/L)						
Acetone	W-817-01	NA	<10	<10	<10	<10
	W-817-02	10	<10	<10	<10	<10
	W-817-03	10	<10	<10	<10	<10
	W-817-04	10	<10	<10	<10	<10
2-Butanone (methyl ethyl ketone)	W-817-01	NA	<20	<20	<20	<20
	W-817-02	20	<20	<20	<20	<20
	W-817-03	20	<20	<20	<20	<20
	W-817-04	20	<20	<20	<20	<20
Dimethyl sulfoxide (DMSO)	W-817-01	NA	<10	<10	<10	<10
	W-817-02	10	<10	<10	<10	<10
	W-817-03	10	<10	<10	<10	<10
	W-817-04	10	<20	<10	<10	<10
Ethyl alcohol (ethanol)	W-817-01	NA	<1000	<1000	<1000	<1000
	W-817-02	1000	<1000	<1000	<1000	<1000
	W-817-03	1000	<1000	<1000	<1000	<1000
	W-817-04	1000	<1000	<1000	<1000	<1000
Methyl isobutyl ketone	W-817-01	NA	<20	<20	<20	<20
	W-817-02	20	<20	<20	<20	<20
	W-817-03	20	<20	<20	<20	<20
	W-817-04	20	<20	<20	<20	<20
Additives to energetic compounds (µg/L)						
Bis(2-ethylhexyl)phthalate	W-817-01	NA	<5	<5	3. 2 est ^c	<5
	W-817-02	5	1. 4 est	<5	7. 6 ^d	<5
	W-817-03	5	3. 8 est	1. 4 est	0. 97 est	<5
	W-817-04	5	<5	1. 5 est	<5	<5

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit ^a	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Unreactive polymers ($\mu\text{g/L}$)						
Styrene	W-817-01	NA	<0.5	<0.5	<0.5	<0.5
	W-817-02	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-03	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-04	1.0	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	W-817-01	NA	<0.5	<0.5	<0.5	<0.5
	W-817-02	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-03	1.0	<0.5	<0.5	<0.5	<0.5
	W-817-04	1.0	<0.5	<0.5	<0.5	<0.5
Metals (mg/L)						
Aluminum	W-817-01	NA	<0.05	<0.05	<0.05	<0.05
	W-817-02	0.20	<0.05	<0.05	<0.05	<0.05
	W-817-03	0.20	<0.05	<0.05	0.039 est	<0.05
	W-817-04	0.20	<0.05	<0.05	0.096	<0.05
Arsenic	W-817-01	NA	0.048	0.037	0.045	0.050
	W-817-02	0.073	0.061	0.049	0.064	0.054
	W-817-03	0.072	0.058	0.042	0.061	0.056
	W-817-04	0.077	0.051	0.038	0.045	0.054
Barium	W-817-01	NA	<0.025	0.011 est	0.012 est	0.012 est
	W-817-02	0.025	0.0077 est	0.0089 est	0.0091 est	0.013 est
	W-817-03	0.025	0.0086 est	0.0083 est	0.0095 est	0.0079 est
	W-817-04	0.025	0.008 est	0.0085 est	0.0097 est	0.0086 est
Cadmium	W-817-01	NA	<0.0005	<0.0005	<0.0005	<0.0005
	W-817-02	0.0016	0.0001 est	0.0002 est	0.0002 est	0.0001 est
	W-817-03	0.001	<0.0005	<0.0005	<0.0005	<0.0005
	W-817-04	0.001	<0.0005	<0.0005	<0.0005	<0.0005

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit ^a	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Metals (mg/L) (continued)						
Chromium	W-817-01	NA	0.001	0.001	0.0008 est	0.0009 est
	W-817-02	0.003	0.001	0.0008 est	0.001	0.0007 est
	W-817-03	0.0042	0.002	0.002	0.002	0.002
	W-817-04	0.0098	0.013 ^e	0.005	0.002	0.003
Cobalt	W-817-01	NA	<0.05	<0.05	<0.05	<0.05
	W-817-02	0.05	<0.05	<0.05	0.0009 est	0.001 est
	W-817-03	0.05	<0.05	<0.05	<0.05	<0.05
	W-817-04	0.05	<0.05	<0.05	<0.05	<0.05
Copper	W-817-01	NA	0.001	0.002	0.001	0.001
	W-817-02	0.02	0.002	0.001	0.0008 est	0.0008 est
	W-817-03	0.02	0.0004 est	0.001	0.0003 est	0.0003 est
	W-817-04	0.02	0.0004 est	0.002	0.0003 est	0.0004 est
Lead	W-817-01	NA	<0.005	<0.005	<0.02	<0.005
	W-817-02	0.0099	<0.005	<0.005	<0.02	<0.005
	W-817-03	0.0099	<0.02	<0.005	<0.02	<0.005
	W-817-04	0.0099	<0.02	0.0004 est	<0.02	<0.005
Manganese	W-817-01	NA	<0.01	0.0018 est	<0.01	<0.01
	W-817-02	0.01	<0.01	0.003 est	<0.01	<0.01
	W-817-03	0.01	<0.01	<0.01	<0.01	<0.01
	W-817-04	0.01	0.0047 est	0.0013 est	0.019 ^e	0.004 est
Molybdenum	W-817-01	NA	0.025	0.024 est	0.026	0.026
	W-817-02	0.073	0.077 ^e	0.046	0.051	0.045
	W-817-03	0.060	0.041	0.037	0.037	0.038
	W-817-04	0.054	0.042	0.039	0.040	0.042
Nickel	W-817-01	NA	<0.002	0.0006 est	<0.002	<0.002
	W-817-02	0.044	0.0009 est	0.0009 est	0.0006 est	<0.002
	W-817-03	0.044	0.0009 est	0.001 est	<0.002	<0.002
	W-817-04	0.044	0.038	0.030	0.082 ^e	0.032

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit ^a	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Metals (mg/L) (continued)						
Potassium	W-817-01	NA	9.4	9.9	9.7	9.5
	W-817-02	18.6	13	13	13	12
	W-817-03	14.6	9.9	10	10	10
	W-817-04	13.7	11	10	10	11
Silver	W-817-01	NA	<0.001	<0.001	<0.001	<0.001
	W-817-02	0.001	0.000039 est	<0.001	<0.001	<0.001
	W-817-03	0.001	<0.001	<0.001	<0.001	<0.001
	W-817-04	0.001	<0.001	<0.001	<0.001	<0.001
Zinc	W-817-01	NA	<0.01	0.012	0.0024 est	0.0081 est
	W-817-02	0.24	0.16	0.15	0.12	0.17
	W-817-03	0.0099	<0.01	<0.01	0.0008 est	0.009 est
	W-817-04	0.055	<0.01	0.0049 est	<0.01	0.0074 est
Salts (mg/L)						
Ammonia nitrogen (as N)	W-817-01	NA	0.04	0.04	0.01 est	0.02
	W-817-02	0.02	0.02	0.10 ^e	<0.02	0.05 ^e
	W-817-03	0.02	<0.02	0.02	0.01 est	0.06 ^d
	W-817-04	0.02	<0.02	0.02	<0.02	0.07 ^e
Bicarbonate alkalinity (as CaCO ₃)	W-817-01	NA	220	220	200	240
	W-817-02	277	260	260	240	260
	W-817-03	277	250	270	270	270
	W-817-04	277	280 ^d	280 ^d	290 ^e	260
Bromide	W-817-01	NA	0.7	0.2	0.8	0.7
	W-817-02	1.46	1.1	1.5 ^e	1.0	1.0
	W-817-03	1.18	1.0	1.4 ^e	0.8	0.8
	W-817-04	1.49	0.8	<0.2	0.9	1.0
Chloride	W-817-01	NA	189	193	191	180
	W-817-02	388	273	271	272	279
	W-817-03	302	208	203	204	207
	W-817-04	296	225	219	223	223

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit ^a	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Salts (mg/L) (continued)						
Nitrate (as NO ₃)	W-817-01	NA	89.3	87.8	86.3	83.1
	W-817-02	110	92.9	91.4	90.3	89.6
	W-817-03	110	93.0	89.4	89.6	87.4
	W-817-04	110	89.4	89.2	83.6	88.9
<i>Ortho</i> -phosphate	W-817-01	NA	0.089	0.073	0.069	0.087
	W-817-02	0.19	0.077	0.064	0.077	0.085
	W-817-03	0.19	0.071	<0.25	0.055	0.078
	W-817-04	0.19	0.05	0.036 est	<0.05	0.073
Perchlorate	W-817-01	NA	0.022	0.021	0.025	0.027
	W-817-02	0.044	0.027	0.025	0.032	0.028
	W-817-03	0.050	0.026	0.026	0.034	0.029
	W-817-04	0.049	0.023	0.024	0.031	0.030
Sulfate	W-817-01	NA	116	120	117	112
	W-817-02	512	306	304	301	296
	W-817-03	233	190	194	190	196
	W-817-04	284	208	210	211	212
Energetic materials (µg/L)						
HMX	W-817-01	NA	16.4	15.3	12.6	NS ^f
	W-817-02	1.0	<1.00	<1.00	<1.0	<1.00
	W-817-03	1.0	<1.00	<1.00	<1.0	<1.00
	W-817-04	1.0	<1.00	<1.00	<1.0	<1.00
RDX	W-817-01	NA	50.1	44.8	34.1	NS
	W-817-02	0.85	<0.85	<0.85	<0.85	<0.85
	W-817-03	9.30	8.66	7.46	12.7 ^e	8.95
	W-817-04	9.68	7.75	4.84	9.98 ^e	2.48
TNT	W-817-01	NA	<0.486	<0.486	<0.486	NS
	W-817-02	0.26	<0.486	<0.486	<0.486	<0.486
	W-817-03	0.26	<0.486	<0.486	<0.486	<0.486
	W-817-04	0.26	<0.486	<0.486	<0.486	<0.486

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248. (concluded)

Parameter	Well	Statistical limit ^a	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Energetic materials ($\mu\text{g/L}$) (concluded)						
TATB	W-817-01	NA	<20	<20	<20	<20
	W-817-02	20	<20	<20	<20	<20
	W-817-03	20	<20	<20	<20	<20
	W-817-04	20	<20	<20	<20	<20
PETN	W-817-01	NA	<1.95	<1.95	<1.95	NS ^f
	W-817-02	1.0	<1.95	2.69 ^e	15.4 ^e	<1.95
	W-817-03	1.0	<1.95	<1.95	<1.95	<1.95
	W-817-04	1.0	<1.95	<1.95	<1.95	<1.95
Tetryl	W-817-01	NA	<1.46	<1.46	<1.46	NS
	W-817-02	1.0	<1.46	<1.46	<1.46	<1.46
	W-817-03	1.0	<1.46	<1.46	<1.46	<1.46
	W-817-04	1.0	<1.46	<1.46	<1.46	<1.46
4-amino-2,6-dinitrotoluene	W-817-01	NA	8.89	7.72	7.57	NS
	W-817-02	0.26	<0.486	<0.486	<0.486	<0.486
	W-817-03	1.22	<0.486	1.05	1.55 ^e	<0.486
	W-817-04	1.08	<0.486	<0.486	0.805	<0.486

^a Statistical limit as listed in MRP 96-248, Table 5, modified by CVRWQCB letter (Cohen 1998) dated September 25, 1998.

^b NA = Not applicable.

^c Results followed by an "est" have estimated concentrations between the MDL and the reporting limit for that analyte.

^d The exceedance of the SL was confirmed by retest sample results.

^e The exceedance of the SL was not confirmed by retest sample results.

^f NS = Not sampled. Water from well W-817-01 was not analyzed for energetic materials, except for TATB.

Table B-1.2 Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL ^a	Reporting limit	Statistical limit ^b	Result	Retest 1 result 12/2/04	Retest 2 result 12/13/04
General								
pH (unitless)	W-817-01	1-Nov-04	0.05	None	None	8.31		
	W-817-02	29-Oct-04	0.05	None	None	8.16		
	W-817-03	29-Oct-04	0.05	None	None	8.24		
	W-817-04	1-Nov-04	0.05	None	None	8.28		
Halocarbons (µg/L)								
1,1,1-Trichloroethane	W-817-01	1-Nov-04	0.13	0.5	NA ^c	<0.5		
	W-817-02	29-Oct-04	0.13	0.5	1.0	<0.5		
	W-817-03	29-Oct-04	0.13	0.5	1.0	<0.5		
	W-817-04	1-Nov-04	0.13	0.5	1.0	<0.5		
Bromoform	W-817-01	1-Nov-04	0.063	0.5	NA	<0.5		
	W-817-02	29-Oct-04	0.063	0.5	1.0	<0.5		
	W-817-03	29-Oct-04	0.063	0.5	1.0	<0.5		
	W-817-04	1-Nov-04	0.063	0.5	1.0	<0.5		
1,2-Dichloroethane	W-817-01	1-Nov-04	0.18	0.5	NA	<0.5		
	W-817-02	29-Oct-04	0.18	0.5	1.0	<0.5		
	W-817-03	29-Oct-04	0.18	0.5	1.0	<0.5		
	W-817-04	1-Nov-04	0.18	0.5	1.0	<0.5		
Freon 113	W-817-01	1-Nov-04	0.078	0.5	NA	<0.5		
	W-817-02	29-Oct-04	0.078	0.5	1.0	<0.5		
	W-817-03	29-Oct-04	0.078	0.5	1.0	<0.5		
	W-817-04	1-Nov-04	0.078	0.5	1.0	<0.5		
Methylene chloride	W-817-01	1-Nov-04	0.15	1.0	NA	<1.0		
	W-817-02	29-Oct-04	0.15	1.0	1.0	<1.0		
	W-817-03	29-Oct-04	0.15	1.0	1.0	<1.0		
	W-817-04	1-Nov-04	0.15	1.0	1.0	<1.0		

(continued)

Table B-1.2 Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL ^a	Reporting limit	Statistical limit ^b	Result	Retest 1 result 12/2/04	Retest 2 result 12/13/04
Halocarbons ($\mu\text{g/L}$) (continued)								
Tetrachloroethene	W-817-01	1-Nov-04	0.069	0.5	NA ^c	<0.5		
	W-817-02	29-Oct-04	0.069	0.5	1.0	<0.5		
	W-817-03	29-Oct-04	0.069	0.5	1.0	<0.5		
	W-817-04	1-Nov-04	0.069	0.5	1.0	<0.5		
Chlorobenzene	W-817-01	1-Nov-04	0.093	0.5	NA	<0.5		
	W-817-02	29-Oct-04	0.093	0.5	1.0	<0.5		
	W-817-03	29-Oct-04	0.093	0.5	1.0	<0.5		
	W-817-04	1-Nov-04	0.093	0.5	1.0	<0.5		
Hydrocarbons ($\mu\text{g/L}$)								
Toluene	W-817-01	1-Nov-04	0.15	0.5	NA	<0.5		
	W-817-02	29-Oct-04	0.15	0.5	1.0	<0.5		
	W-817-03	29-Oct-04	0.15	0.5	1.0	<0.5		
	W-817-04	1-Nov-04	0.15	0.5	1.0	<0.5		
Naphthalene	W-817-01	1-Nov-04	0.35	5	NA	<5		
	W-817-02	29-Oct-04	0.35	5	5	<5		
	W-817-03	29-Oct-04	0.36	5	5	<5		
	W-817-04	1-Nov-04	0.36	5	5	<5		
Photographic chemicals ($\mu\text{g/L}$)								
<i>meta</i> and <i>para</i> -Cresol	W-817-01	1-Nov-04	0.62	2	NA	<2		
	W-817-02	29-Oct-04	0.64	2	2	<2		
	W-817-03	29-Oct-04	0.64	2	2	<2		
	W-817-04	1-Nov-04	0.64	2	2	<2		
Benzyl alcohol	W-817-01	1-Nov-04	0.31	2	NA	<2		
	W-817-02	29-Oct-04	0.32	2	2	<2		
	W-817-03	29-Oct-04	0.32	2	2	<2		
	W-817-04	1-Nov-04	0.32	2	2	<2		

(continued)

Table B-1.2 Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL ^a	Reporting limit	Statistical limit ^b	Result	Retest 1 result 12/2/04	Retest 2 result 12/13/04
Volatile/semivolatile organic compounds (µg/L)								
Acetone	W-817-01	1-Nov-04	4.7	10	NA ^c	<10		
	W-817-02	29-Oct-04	4.7	10	10	<10		
	W-817-03	29-Oct-04	4.7	10	10	<10		
	W-817-04	1-Nov-04	4.7	10	10	<10		
2-Butanone (methyl ethyl ketone)	W-817-01	1-Nov-04	1.3	20	NA	<20		
	W-817-02	29-Oct-04	1.3	20	20	<20		
	W-817-03	29-Oct-04	1.3	20	20	<20		
	W-817-04	1-Nov-04	1.3	20	20	<20		
Dimethyl sulfoxide (DMSO)	W-817-01	1-Nov-04	0.032	10	NA	<10		
	W-817-02	29-Oct-04	0.033	10	10	<10		
	W-817-03	29-Oct-04	0.033	10	10	<10		
	W-817-04	1-Nov-04	0.033	10	10	<10		
Ethyl alcohol (ethanol)	W-817-01	1-Nov-04	51	1000	NA	<1000		
	W-817-02	29-Oct-04	51	1000	1000	<1000		
	W-817-03	29-Oct-04	51	1000	1000	<1000		
	W-817-04	1-Nov-04	51	1000	1000	<1000		
Methyl isobutyl ketone	W-817-01	1-Nov-04	1.0	20	NA	<20		
	W-817-02	29-Oct-04	1.0	20	20	<20		
	W-817-03	29-Oct-04	1.0	20	20	<20		
	W-817-04	1-Nov-04	1.0	20	20	<20		
Additives to energetic compounds (µg/L)								
Bis(2-ethylhexyl)phthalate	W-817-01	1-Nov-04	1.4	5	NA	<5		
	W-817-02	29-Oct-04	1.4	5	5	<5		
	W-817-03	29-Oct-04	1.4	5	5	<5		
	W-817-04	1-Nov-04	1.4	5	5	<5		

(continued)

Table B-1.2 Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL ^a	Reporting limit	Statistical limit ^b	Result	Retest 1 result 12/2/04	Retest 2 result 12/13/04
Unreactive polymers ($\mu\text{g/L}$)								
Styrene	W-817-01	1-Nov-04	0.076	0.5	NA ^c	<0.5		
	W-817-02	29-Oct-04	0.076	0.5	1.0	<0.5		
	W-817-03	29-Oct-04	0.076	0.5	1.0	<0.5		
	W-817-04	1-Nov-04	0.076	0.5	1.0	<0.5		
Vinyl chloride	W-817-01	1-Nov-04	0.17	0.5	NA	<0.5		
	W-817-02	29-Oct-04	0.17	0.5	1.0	<0.5		
	W-817-03	29-Oct-04	0.17	0.5	1.0	<0.5		
	W-817-04	1-Nov-04	0.17	0.5	1.0	<0.5		
Metals (mg/L)								
Aluminum	W-817-01	1-Nov-04	0.022	0.05	NA	<0.05		
	W-817-02	29-Oct-04	0.022	0.05	0.20	<0.05		
	W-817-03	29-Oct-04	0.022	0.05	0.20	<0.05		
	W-817-04	1-Nov-04	0.022	0.05	0.20	<0.05		
Arsenic	W-817-01	1-Nov-04	0.002	0.004	NA	0.050		
	W-817-02	29-Oct-04	0.002	0.004	0.073	0.054		
	W-817-03	29-Oct-04	0.002	0.004	0.072	0.056		
	W-817-04	1-Nov-04	0.002	0.004	0.077	0.054		
Barium	W-817-01	1-Nov-04	0.00083	0.025	NA	0.012 est ^d		
	W-817-02	29-Oct-04	0.00083	0.025	0.025	0.013 est		
	W-817-03	29-Oct-04	0.00083	0.025	0.025	0.0079 est		
	W-817-04	1-Nov-04	0.00083	0.025	0.025	0.0086 est		
Cadmium	W-817-01	1-Nov-04	0.000045	0.0005	NA	<0.0005		
	W-817-02	29-Oct-04	0.000045	0.0005	0.0016	0.0001 est		
	W-817-03	29-Oct-04	0.000045	0.0005	0.001	<0.0005		
	W-817-04	1-Nov-04	0.000045	0.0005	0.001	<0.0005		

(continued)

Table B-1.2 Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL ^a	Reporting limit	Statistical limit ^b	Result	Retest 1 result 12/2/04	Retest 2 result 12/13/04
Metals (mg/L) (continued)								
Chromium	W-817-01	1-Nov-04	0.00006	0.001	NA ^c	0.0009 est		
	W-817-02	29-Oct-04	0.00006	0.001	0.003	0.0007 est		
	W-817-03	29-Oct-04	0.00006	0.001	0.0042	0.002		
	W-817-04	1-Nov-04	0.00006	0.001	0.0098	0.003		
Cobalt	W-817-01	1-Nov-04	0.00075	0.05	NA	<0.05		
	W-817-02	29-Oct-04	0.00075	0.05	0.05	0.001 est		
	W-817-03	29-Oct-04	0.00075	0.05	0.05	<0.05		
	W-817-04	1-Nov-04	0.00075	0.05	0.05	<0.05		
Copper	W-817-01	1-Nov-04	0.0002	0.001	NA	0.001		
	W-817-02	29-Oct-04	0.0002	0.001	0.02	0.0008 est		
	W-817-03	29-Oct-04	0.0002	0.001	0.02	0.0003 est		
	W-817-04	1-Nov-04	0.0002	0.001	0.02	0.0004 est		
Lead	W-817-01	1-Nov-04	0.0003	0.005	NA	<0.005		
	W-817-02	29-Oct-04	0.0003	0.005	0.0099	<0.005		
	W-817-03	29-Oct-04	0.0003	0.005	0.0099	<0.005		
	W-817-04	1-Nov-04	0.0003	0.005	0.0099	<0.005		
Manganese	W-817-01	1-Nov-04	0.0021	0.01	NA	<0.01		
	W-817-02	29-Oct-04	0.0021	0.01	0.01	<0.01		
	W-817-03	29-Oct-04	0.0021	0.01	0.01	<0.01		
	W-817-04	1-Nov-04	0.0021	0.01	0.01	0.004 est		
Molybdenum	W-817-01	1-Nov-04	0.0011	0.025	NA	0.026		
	W-817-02	29-Oct-04	0.0011	0.025	0.073	0.045		
	W-817-03	29-Oct-04	0.0011	0.025	0.060	0.038		
	W-817-04	1-Nov-04	0.0011	0.025	0.054	0.042		
Nickel	W-817-01	1-Nov-04	0.00067	0.002	NA	<0.002		
	W-817-02	29-Oct-04	0.00067	0.002	0.044	<0.002		
	W-817-03	29-Oct-04	0.00067	0.002	0.044	<0.002		
	W-817-04	1-Nov-04	0.00067	0.002	0.044	0.032		

(continued)

Table B-1.2 Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL ^a	Reporting limit	Statistical limit ^b	Result	Retest 1 result 12/2/04	Retest 2 result 12/13/04
Metals (mg/L) (continued)								
Potassium	16-Oct-01	1-Nov-04	0.058	1.0	NA ^c	9.5		
	16-Oct-01	29-Oct-04	0.058	1.0	18.6	12		
	16-Oct-01	29-Oct-04	0.058	1.0	14.6	10		
	W-817-04	1-Nov-04	0.058	1.0	13.7	11		
Silver	W-817-01	1-Nov-04	0.000034	0.001	NA	<0.001		
	W-817-02	29-Oct-04	0.000034	0.001	0.001	<0.001		
	W-817-03	29-Oct-04	0.000034	0.001	0.001	<0.001		
	W-817-04	1-Nov-04	0.000034	0.001	0.001	<0.001		
Zinc	W-817-01	1-Nov-04	0.0024	0.01	NA	0.0081 est		
	W-817-02	29-Oct-04	0.0024	0.01	0.24	0.17		
	W-817-03	29-Oct-04	0.0024	0.01	0.0099	0.009 est		
	W-817-04	1-Nov-04	0.0024	0.01	0.055	0.0074 est		
Salts (mg/L)								
Ammonia nitrogen (as N)	16-Oct-01	1-Nov-04	0.01	0.02	NA	0.02		
	16-Oct-01	29-Oct-04	0.01	0.02	0.02	0.05 ^e	<0.02 ^f	<0.02 ^f
	16-Oct-01	29-Oct-04	0.02	0.04	0.02	0.06 ^e	0.03 ^g	<0.02
	W-817-04	1-Nov-04	0.01	0.02	0.02	0.07 ^e	<0.02 ^f	<0.02 ^f
Bicarbonate alkalinity (as CaCO ₃)	W-817-01	1-Nov-04	10	10	NA	240		
	W-817-02	29-Oct-04	10	10	277	260		
	W-817-03	29-Oct-04	10	10	277	270		
	W-817-04	1-Nov-04	10	10	277	260		
Bromide	W-817-01	1-Nov-04	0.03	0.1	NA	0.7		
	W-817-02	29-Oct-04	0.05	0.2	1.46	1.0		
	W-817-03	29-Oct-04	0.03	0.1	1.18	0.8		
	W-817-04	1-Nov-04	0.05	0.2	1.49	1.0		
Chloride	W-817-01	1-Nov-04	0.026	0.5	NA	180		
	W-817-02	29-Oct-04	0.052	1.0	388	279		
	W-817-03	29-Oct-04	0.026	0.5	302	207		
	W-817-04	1-Nov-04	0.052	1.0	296	223		

(continued)

Table B-1.2 Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL ^a	Reporting limit	Statistical limit ^b	Result	Retest 1 result 12/2/04	Retest 2 result 12/13/04
Salts (mg/L) (continued)								
Nitrate (as NO ₃)	W-817-01	1-Nov-04	0.077	0.5	NA ^c	83.1		
	W-817-02	29-Oct-04	0.16	1.0	110	89.6		
	W-817-03	29-Oct-04	0.077	0.5	110	87.4		
	W-817-04	1-Nov-04	0.16	1.0	110	88.9		
<i>Ortho</i> -phosphate	W-817-01	1-Nov-04	0.03	0.05	NA	0.087		
	W-817-02	29-Oct-04	0.03	0.05	0.19	0.085		
	W-817-03	29-Oct-04	0.03	0.05	0.19	0.078		
	W-817-04	1-Nov-04	0.03	0.05	0.19	0.073		
Perchlorate	W-817-01	1-Nov-04	0.00011	0.004	NA	0.027		
	W-817-02	29-Oct-04	0.00011	0.004	0.044	0.028		
	W-817-03	29-Oct-04	0.00011	0.004	0.050	0.029		
	W-817-04	1-Nov-04	0.00011	0.004	0.049	0.030		
Sulfate	W-817-01	1-Nov-04	0.096	1.0	NA	112		
	W-817-02	29-Oct-04	0.20	2.0	512	296		
	W-817-03	29-Oct-04	0.096	1.0	233	196		
	W-817-04	1-Nov-04	0.20	1.0	284	212		
Energetic materials (µg/L)								
HMX	W-817-01	1-Nov-04	NS ^h	NS	NA	NS		
	W-817-02	29-Oct-04	0.162	1.0	1.0	<1.00		
	W-817-03	29-Oct-04	0.162	1.0	1.0	<1.00		
	W-817-04	1-Nov-04	0.162	1.0	1.0	<1.00		
RDX	W-817-01	1-Nov-04	NS	NS	NA	NS		
	W-817-02	29-Oct-04	0.162	0.85	0.85	<0.85		
	W-817-03	29-Oct-04	0.162	0.85	9.30	8.95		
	W-817-04	1-Nov-04	0.162	0.85	9.68	2.48		
TNT	W-817-01	1-Nov-04	NS	NS	NA	NS		
	W-817-02	29-Oct-04	0.162	0.486	0.26	<0.486		
	W-817-03	29-Oct-04	0.162	0.486	0.26	<0.486		
	W-817-04	1-Nov-04	0.162	0.486	0.26	<0.486		

(continued)

Table B-1.2 Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248. (concluded)

Parameter	Well	Sample date	MDL ^a	Reporting limit	Statistical limit ^b	Result	Retest 1 result 11/25/04	Retest 2 result 12/3/04
Energetic materials ($\mu\text{g/L}$) (concluded)								
TATB	W-817-01	1-Nov-04	5.00	20	NA ^c	<20		
	W-817-02	29-Oct-04	5.00	20	20	<20		
	W-817-03	29-Oct-04	5.00	20	20	<20		
	W-817-04	1-Nov-04	5.00	20	20	<20		
PETN	W-817-01	1-Nov-04	NS ^h	NS	NA	NS		
	W-817-02	29-Oct-04	0.649	1.95	1.0	<1.95		
	W-817-03	29-Oct-04	0.649	1.95	1.0	<1.95		
	W-817-04	1-Nov-04	0.649	1.95	1.0	<1.95		
Tetryl	W-817-01	1-Nov-04	NS	NS	NA	NS		
	W-817-02	29-Oct-04	0.487	1.46	1.0	<1.46		
	W-817-03	29-Oct-04	0.487	1.46	1.0	<1.46		
	W-817-04	1-Nov-04	0.487	1.46	1.0	<1.46		
4-amino-2,6-dinitrotoluene	W-817-01	1-Nov-04	NS	NS	NA	NS		
	W-817-02	29-Oct-04	0.162	0.486	0.26	<0.486		
	W-817-03	29-Oct-04	0.162	0.486	1.22	<0.486		
	W-817-04	1-Nov-04	0.162	0.486	1.08	<0.486		

^a MDL = Method detection limit.

^b Statistical limit as listed in MRP 96-248, Table 5, modified by CVRWQCB letter (Cohen 1998) dated September 25, 1998.

^c NA = Not applicable.

^d Results followed by an "est" have estimated concentrations between the MDL and the reporting limit for that analyte.

^e These concentrations of ammonia may be biased high because ammonia was detected in the field blank sample at a concentration of 0.03 mg/L. See also **Appendix F** and **Table F-2.1**.

^f None of the retest samples collected and analyzed for ammonia from wells W-817-02 and W-817-04 exceeded the SL of 0.02 mg/L.

^g The retest sample collected from well W-817-03 on Dec. 2, 2004, and analyzed for ammonia exceeded the SL.

^h NS = Not sampled and analyzed for this COC.

Table B-2 Fourth quarter ground water analytical results, surface impoundments, other constituents.

Parameter	Well	Sample date	MDL ^a	Reporting limit	Result
General					
Ground water elevation (meters above mean sea level)	W-817-01	13-Dec-04	NA ^b	NA	NS ^c
	W-817-02	13-Dec-04	NA	NA	178. 85
	W-817-03	13-Dec-04	NA	NA	174. 49
	W-817-04	13-Dec-04	NA	NA	184. 83
Field pH (unitless)	W-817-01	01-Nov-04	NA	NA	7. 95
	W-817-02	13-Dec-04	NA	NA	7. 86
	W-817-03	13-Dec-04	NA	NA	7. 88
	W-817-04	13-Dec-04	NA	NA	8. 01
Specific conductance (μ mhos/cm)	W-817-01	01-Nov-04	NA	NA	1377
	W-817-02	13-Dec-04	NA	NA	2023
	W-817-03	13-Dec-04	NA	NA	1658
	W-817-04	13-Dec-04	NA	NA	1760
Water temperature ($^{\circ}$ Celsius)	W-817-01	01-Nov-04	NA	NA	20. 7
	W-817-02	13-Dec-04	NA	NA	19. 4
	W-817-03	13-Dec-04	NA	NA	20. 6
	W-817-04	13-Dec-04	NA	NA	19. 6

(continued)

Table B-2 Fourth quarter ground water analytical results, surface impoundments, other constituents.

Parameter	Well	Sample date	MDL ^a	Reporting limit	Result
Volatile/semi-volatile organic compounds ($\mu\text{g/L}$) ^c					
1,1-Dichloroethene	W-817-01	1-Nov-04	0.12	0.5	<0.5
	W-817-02	29-Oct-04	0.12	0.5	<0.5
	W-817-03	29-Oct-04	0.12	0.5	0.30 est ^e
	W-817-04	1-Nov-04	0.12	0.5	<0.5
Benzoic Acid	W-817-01	1-Nov-04	1.4	50	<50
	W-817-02	29-Oct-04	1.4	50	<50
	W-817-03	29-Oct-04	1.4	50	<50
	W-817-04	1-Nov-04	1.4	50	<50
Chloroform	W-817-01	1-Nov-04	0.095	0.5	<0.5
	W-817-02	29-Oct-04	0.095	0.5	<0.5
	W-817-03	29-Oct-04	0.095	0.5	0.26 est
	W-817-04	1-Nov-04	0.095	0.5	<0.5
Trichloroethene (TCE)	W-817-01	1-Nov-04	0.15	0.5	0.17 est
	W-817-02	29-Oct-04	0.15	0.5	0.54
	W-817-03	29-Oct-04	0.15	0.5	13
	W-817-04	1-Nov-04	0.15	0.5	3.1
Metal (mg/L)					
Lithium	W-817-01	1-Nov-04	0.0027	0.02	0.019 est
	W-817-02	29-Oct-04	0.0027	0.02	0.024
	W-817-03	29-Oct-04	0.0027	0.02	0.021
	W-817-04	1-Nov-04	0.0027	0.02	0.017 est

(continued)

Table B-2 Fourth quarter ground water analytical results, surface impoundments, other constituents (concluded).

Energetic materials ($\mu\text{g/L}$)^f					
2,6-dinitrotoluene	W-817-01	1-Nov-04	0.182	1.00	NS ^c
	W-817-02	29-Oct-04	0.182	1.00	<1.00
	W-817-03	29-Oct-04	0.182	1.00	<1.00
	W-817-04	1-Nov-04	0.182	1.00	<1.00
2-amino-4,6-dinitrotoluene	W-817-01	1-Nov-04	0.325	1.00	NS
	W-817-02	29-Oct-04	0.325	1.00	0.882 est
	W-817-03	29-Oct-04	0.325	1.00	<1.00
	W-817-04	1-Nov-04	0.325	1.00	<1.00
Tentatively identified compounds ($\mu\text{g/L}$)^g					
1H-Benzotriazole	W-817-01	1-Nov-04	NA	NA	ND ^h
	W-817-02	29-Oct-04	NA	NA	ND
	W-817-03	29-Oct-04	NA	NA	ND
	W-817-04	1-Nov-04	NA	NA	ND

^a MDL = Method detection limit.

^b NA = Not applicable.

^c NS = Not sampled and analyzed for this parameter.

^d No other volatile or semi-volatile organic compounds (other than those listed in **Table B-1.2**) were detected by EPA Methods 624 and 625.

^e Results followed by an "est" have estimated concentrations between the MDL and the reporting limit for that analyte.

^f No other energetic materials (other than those listed in **Table B-1.2**) were detected by EPA Method 8330 in the fourth quarter.

^g Tentatively identified compounds (TICs) identified in ground water analyses using EPA Method 625 for semi-volatile organics.

^h ND = Not detected.

Appendix C

Annual Summary Plots and Tables of Sewage Evaporation and Percolation Ponds Wastewater Monitoring Data

Appendix C

This appendix contains graphical and tabular summaries of the 2004 sewage evaporation and percolation ponds wastewater monitoring data. The monitoring requirements of WDR 96-248 began in the fourth quarter of 1996.

Wastewater influent monitoring at location ISWP consists of pH, electrical conductivity (EC), and biochemical oxygen demand (BOD). Routine wastewater monitoring at location ESWP consists of pH, EC, and dissolved oxygen (DO); BOD was also analyzed only during the first quarter of 2004. A continuous discharge from the sewage evaporation pond into the percolation pond at location DSWP began in December 2003 and continued into the first quarter of 2004. Samples of the continuous discharge were collected on January 27 and February 25, 2004, and analyzed for pH, EC, BOD, nitrate, and fecal and total coliform bacteria.

Each two-dimensional graph plots concentration on the vertical axis versus time (years divided into four quarterly sampling periods) on the horizontal axis. Units of measure are given on the vertical axis label and in the header at the top of each page. Values above the analytical reporting limit for each analyte are plotted as solid diamonds, and values below the analytical reporting limit are plotted as open inverted triangles. Data determined not to be valid are not plotted.

Tabular summaries of the observations are contained in **Tables C-1 to C-4**, starting on page C-18.

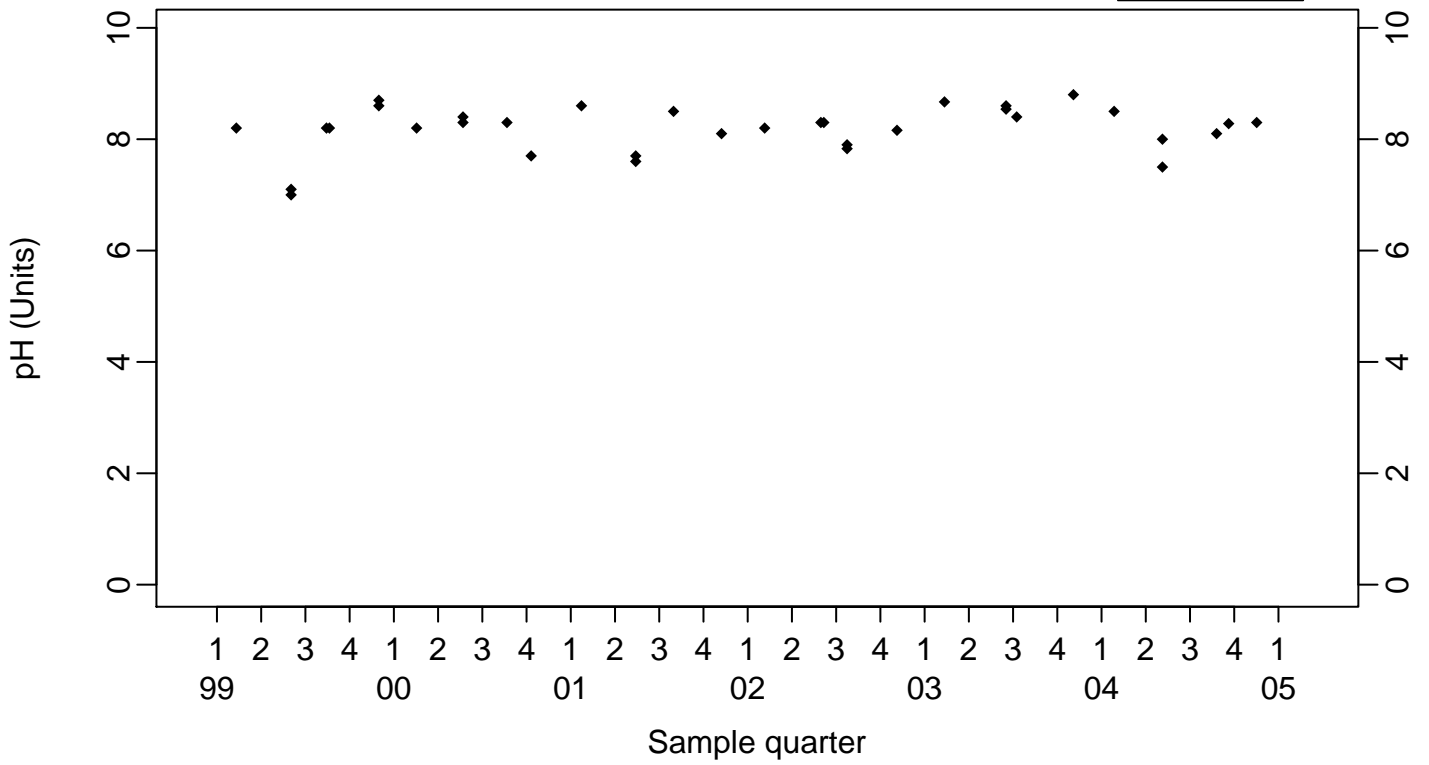
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Annual Plots of Sewage Evaporation and Percolation Ponds Wastewater Monitoring Data

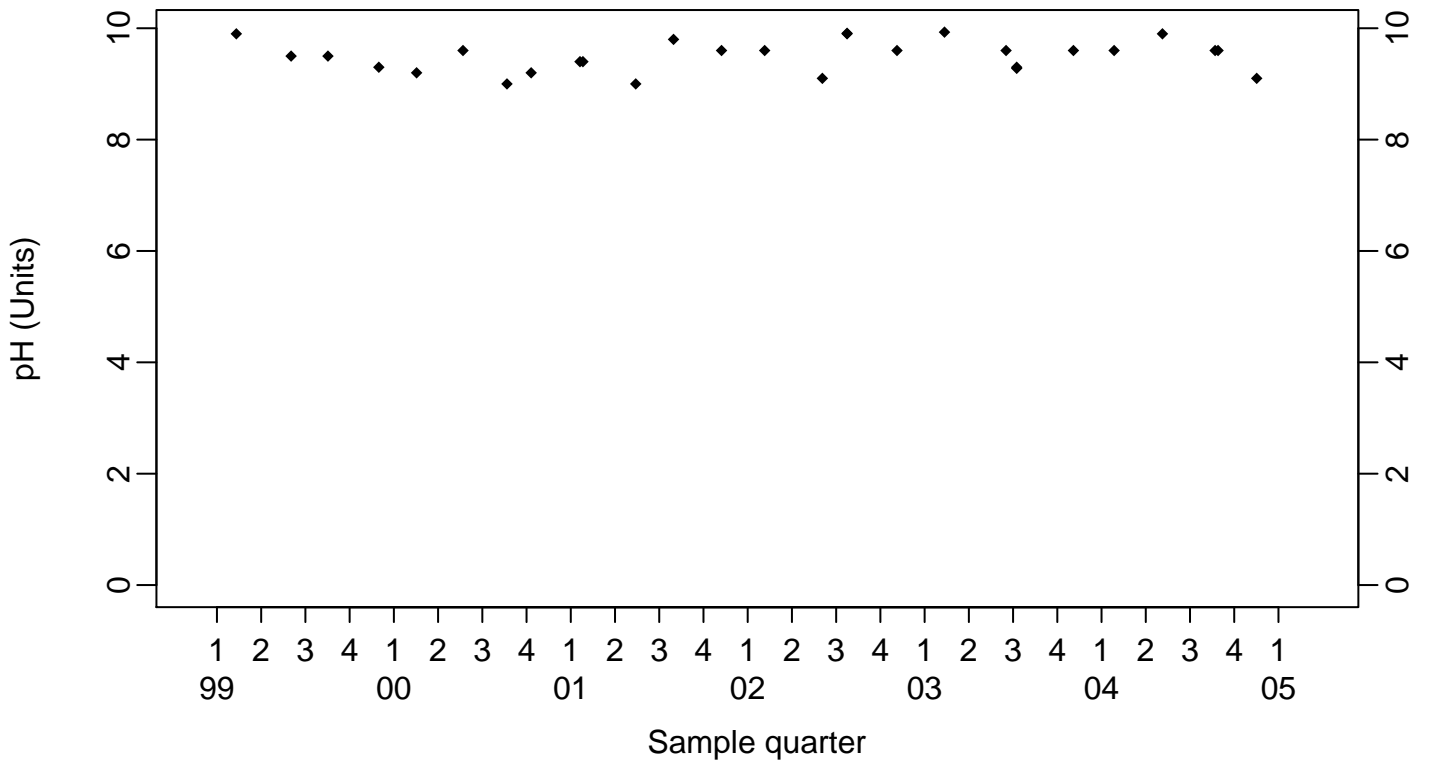
Sewage Ponds Wastewater pH (Units)

Influent 3-ISWP-OW

◆ Above RL
▽ Below RL



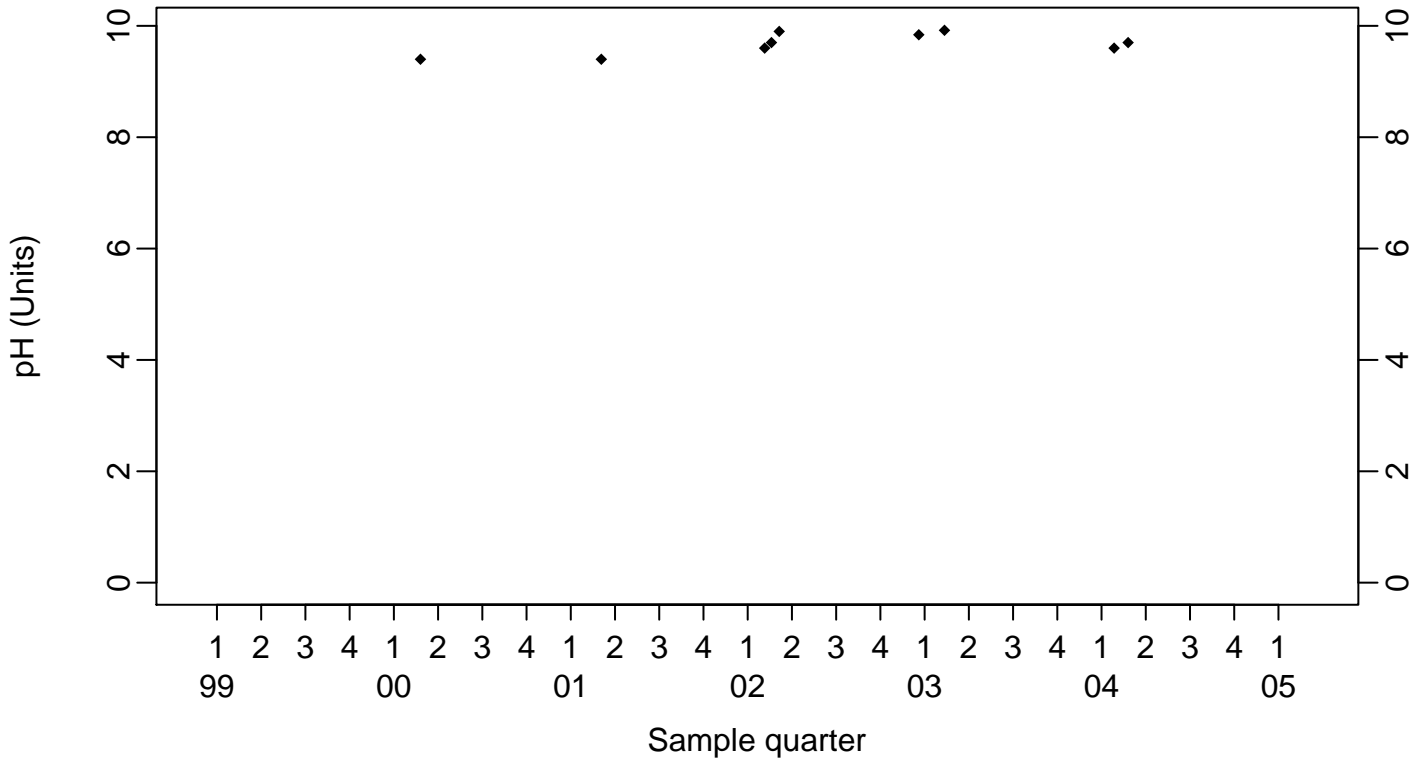
In-pond 3-ESWP-OW



Sewage Ponds Wastewater pH (Units)

Effluent 3-DSWP-OW

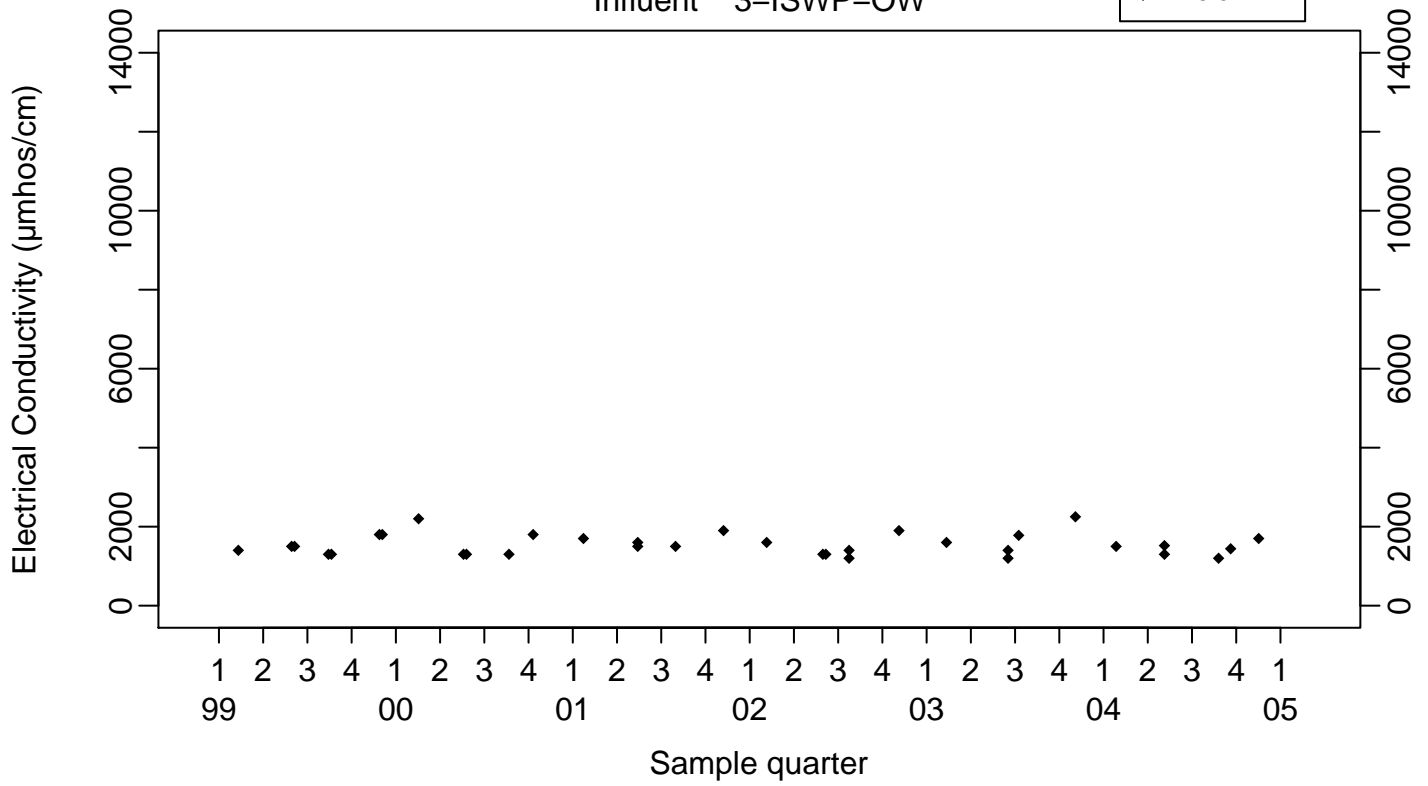
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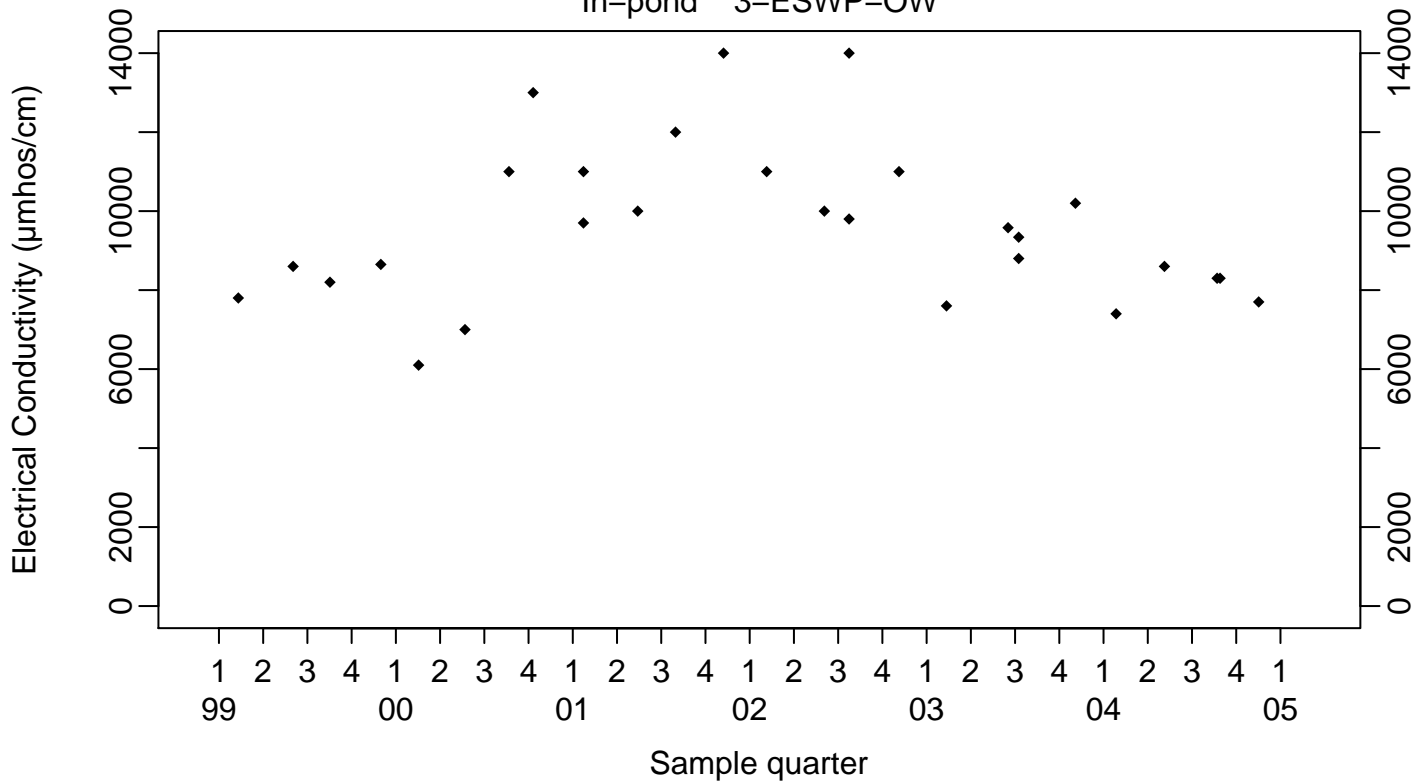
Sewage Ponds Wastewater Electrical Conductivity ($\mu\text{mhos/cm}$)

Influent 3-ISWP-OW

◆ Above RL
▽ Below RL



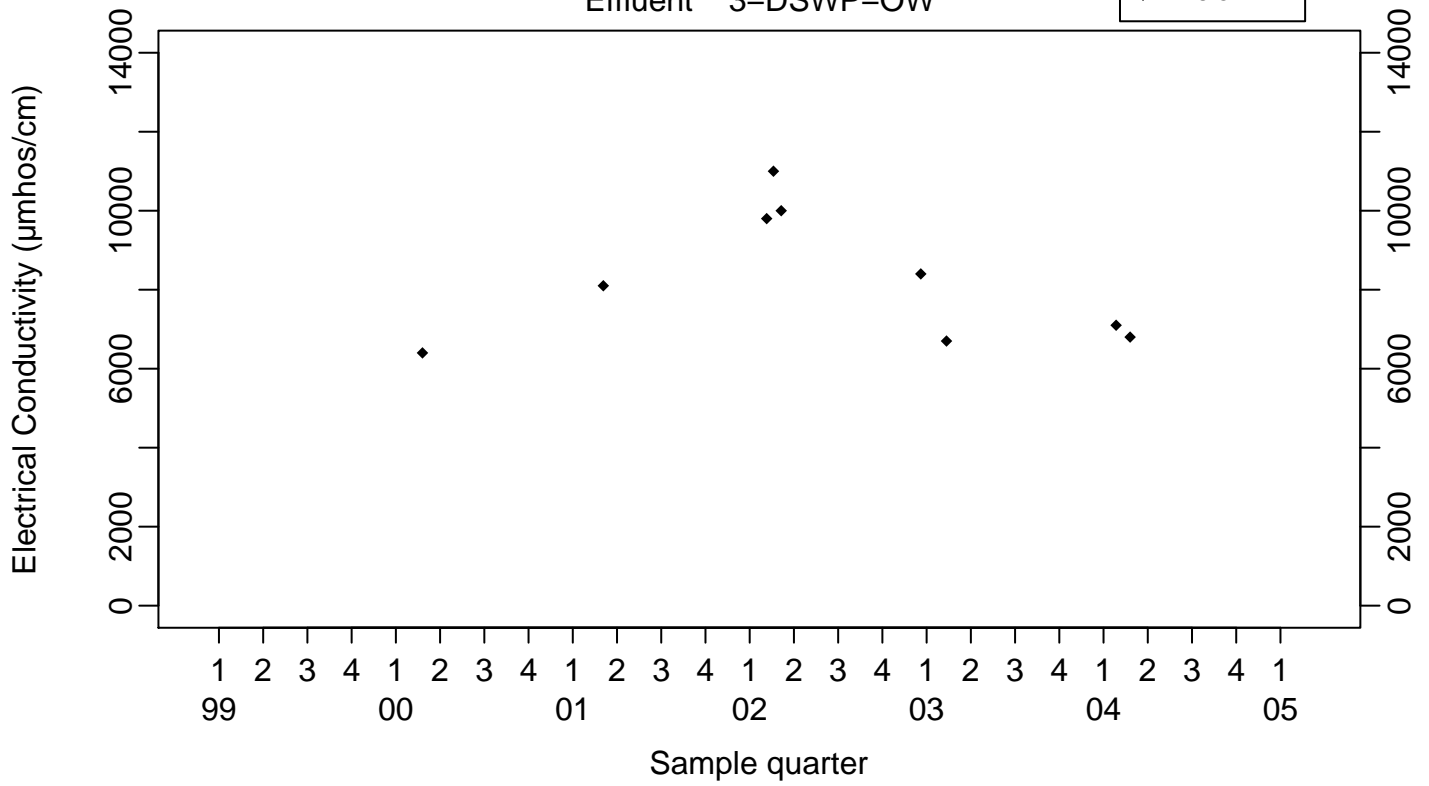
In-pond 3-ESWP-OW



Sewage Ponds Wastewater Electrical Conductivity ($\mu\text{mhos/cm}$)

Effluent 3-DSWP-OW

◆ Above RL
▽ Below RL

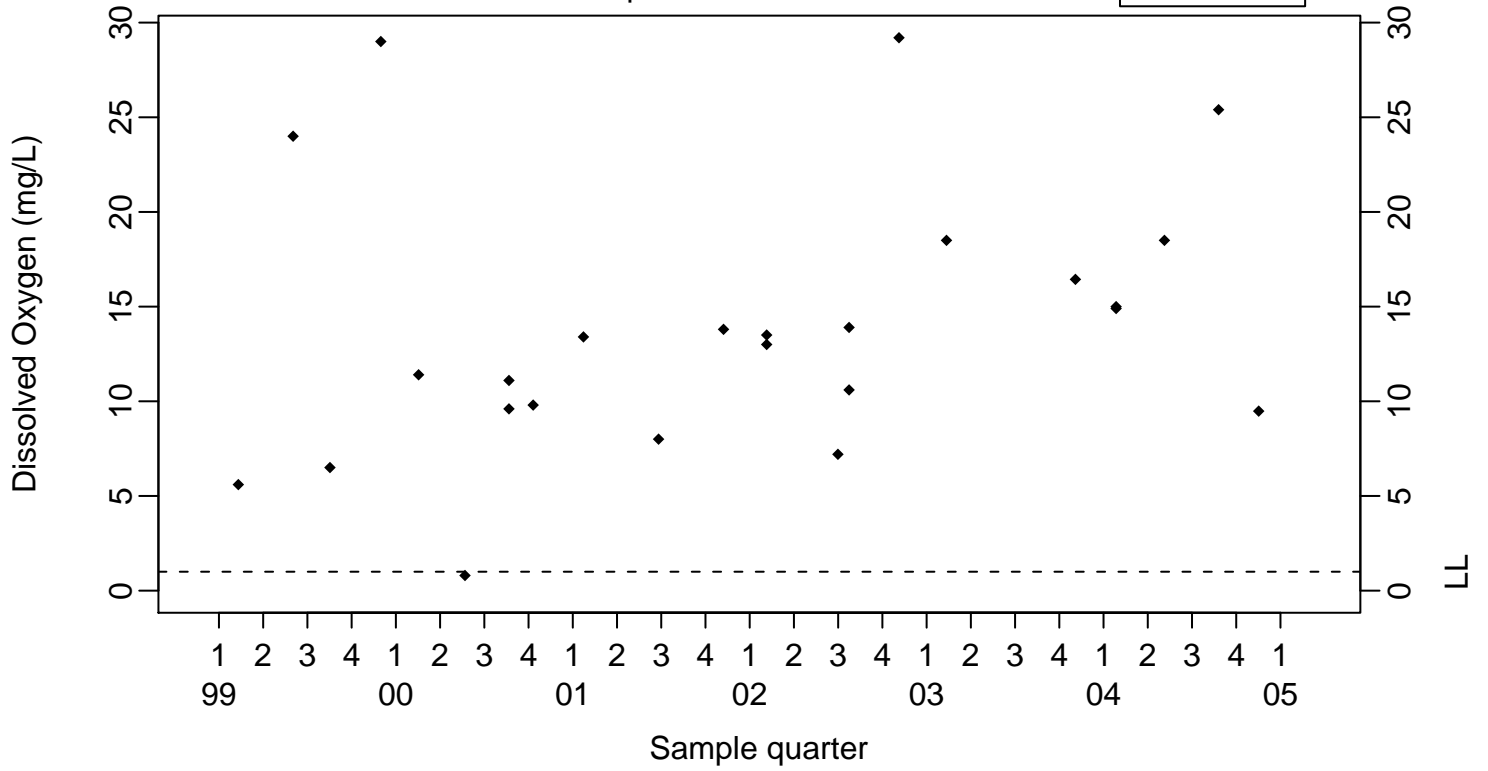


Sewage Ponds Wastewater Dissolved Oxygen (mg/L)

In-pond 3-ESWP-OW

LL=1

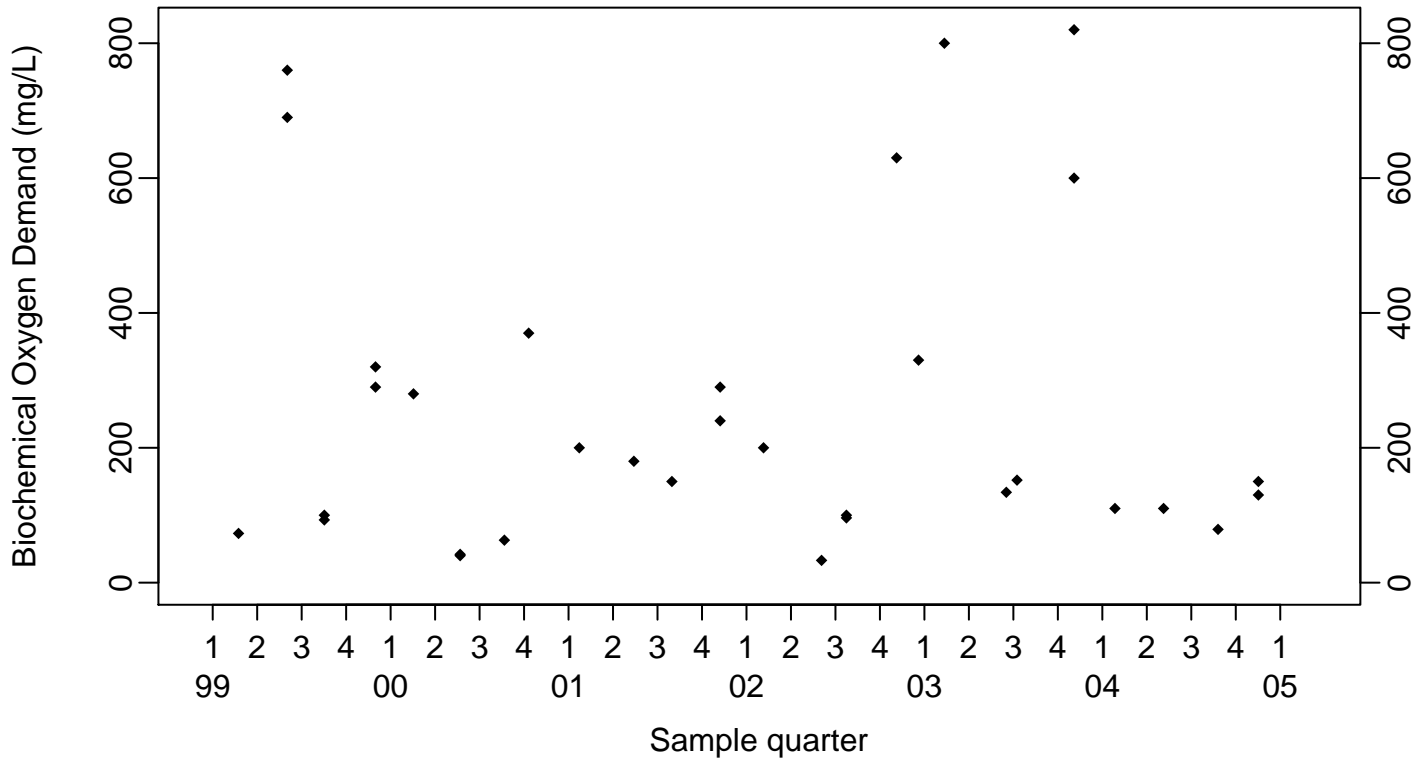
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▽ Below RL



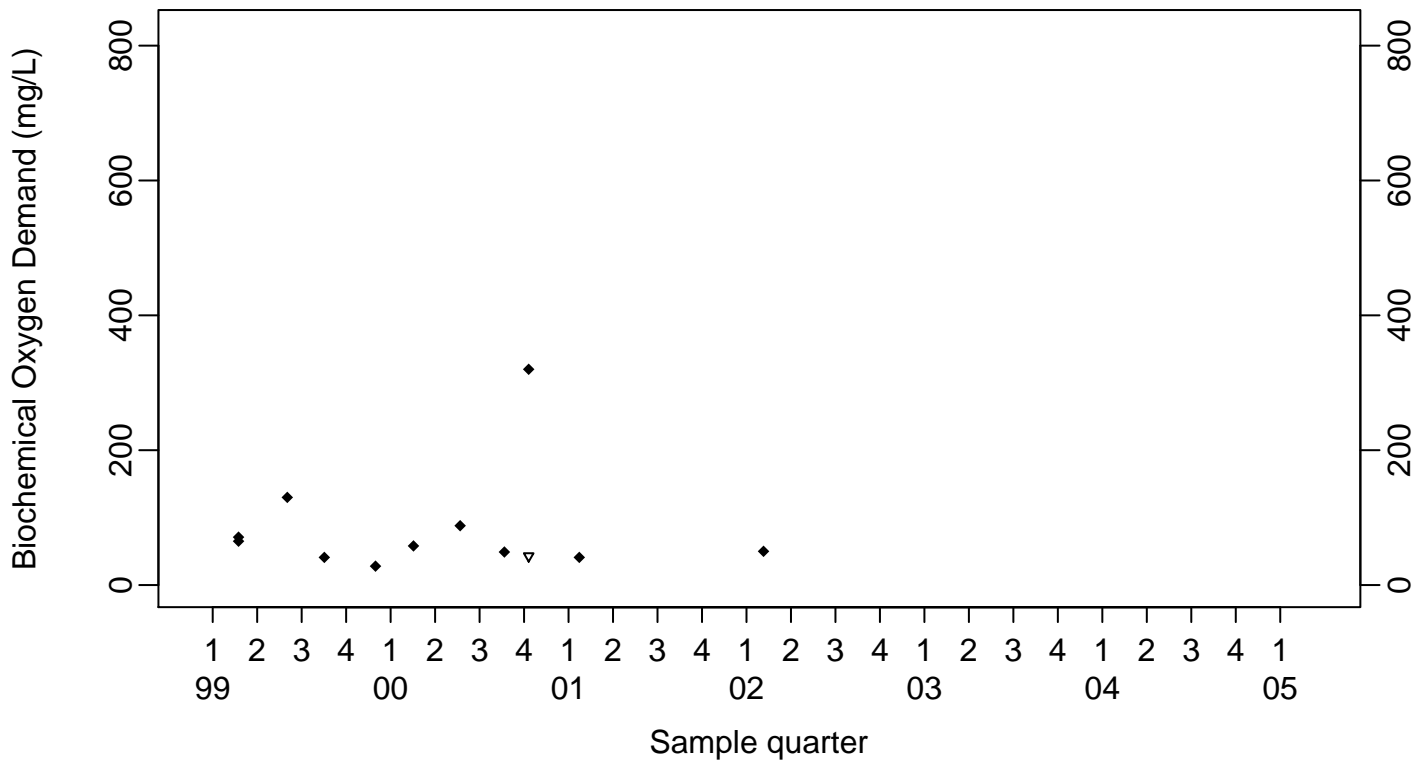
Sewage Ponds Wastewater Biochemical Oxygen Demand (mg/L)

Influent 3-ISWP-OW

◆ Above RL
▽ Below RL



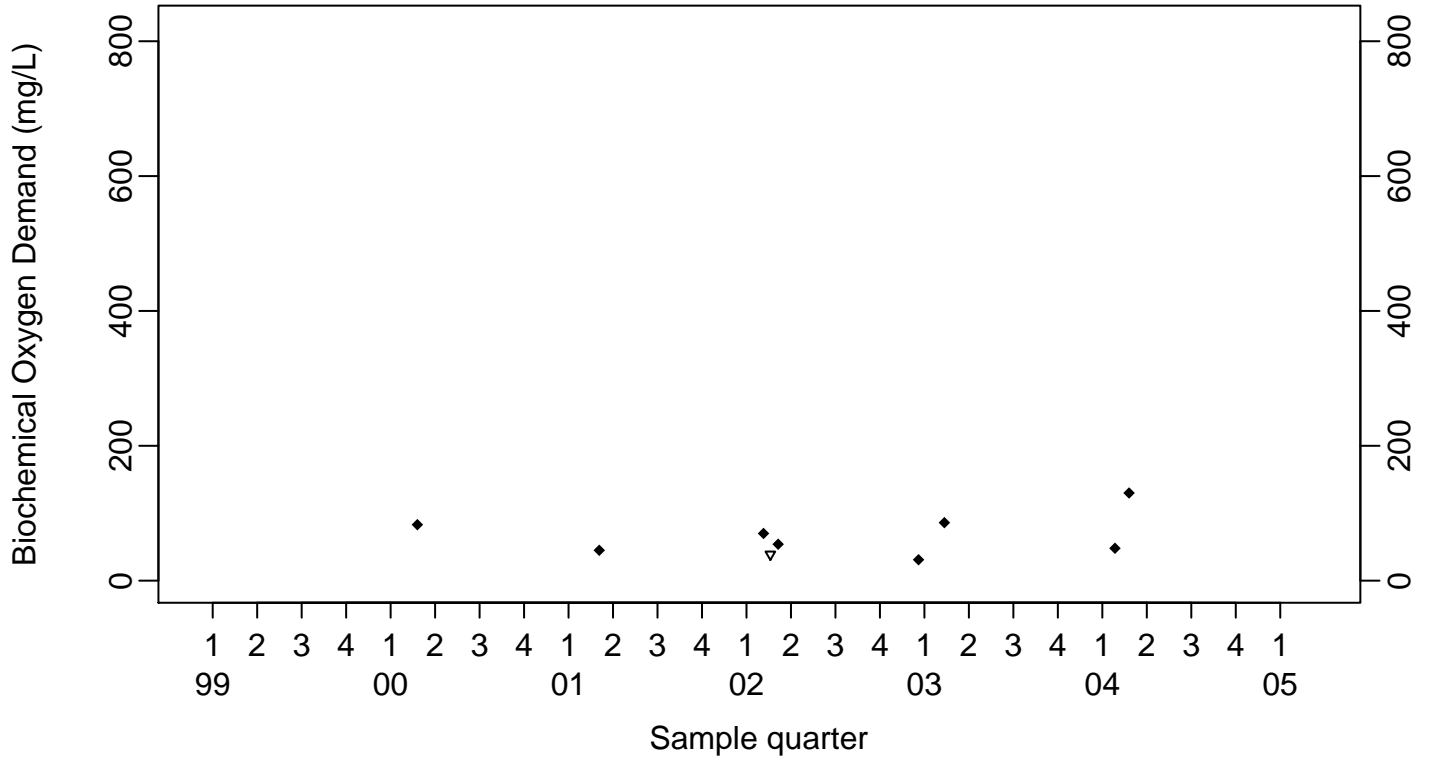
In-pond 3-ESWP-OW



Sewage Ponds Wastewater Biochemical Oxygen Demand (mg/L)

Effluent 3-DSWP-OW

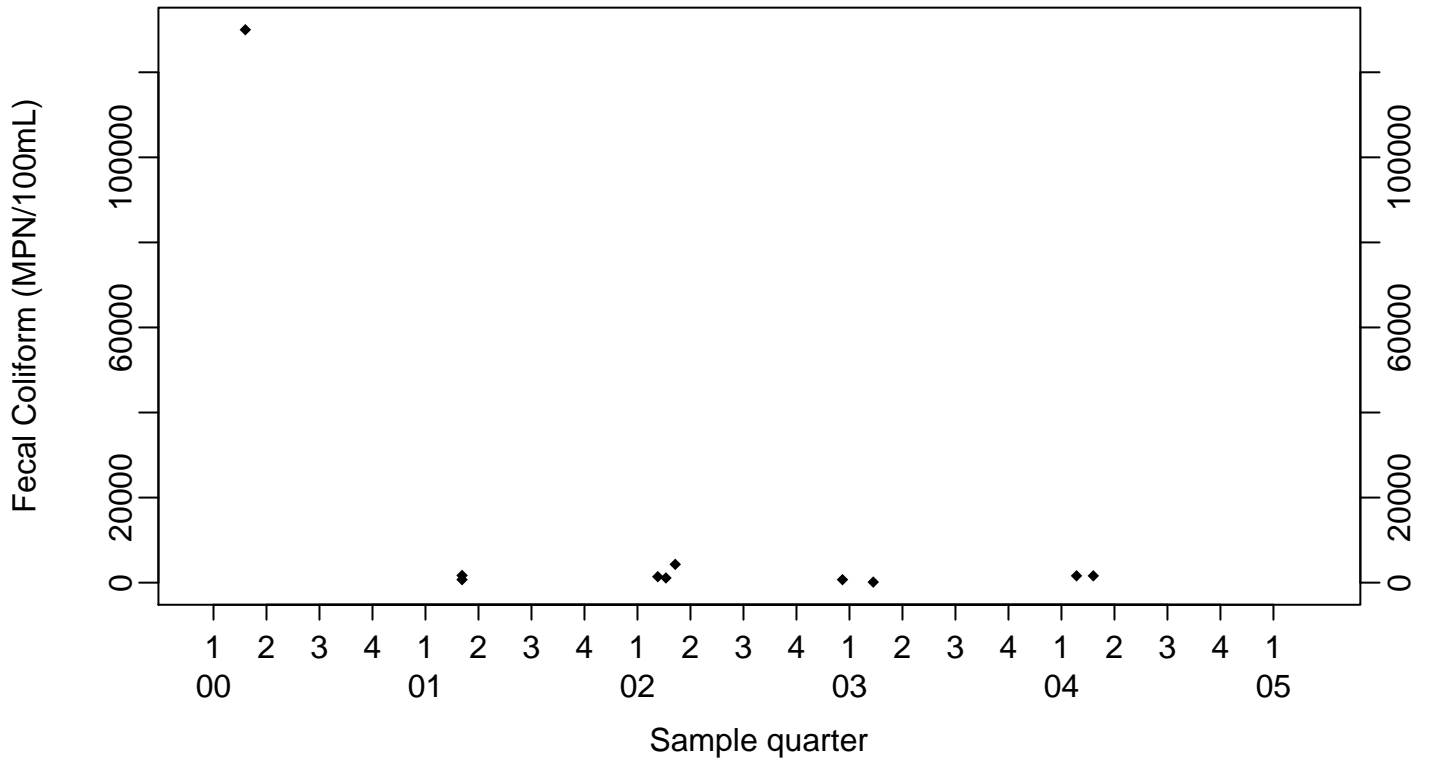
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Sewage Ponds Wastewater Fecal Coliform (MPN/100mL)

Effluent 3-DSWP-OW

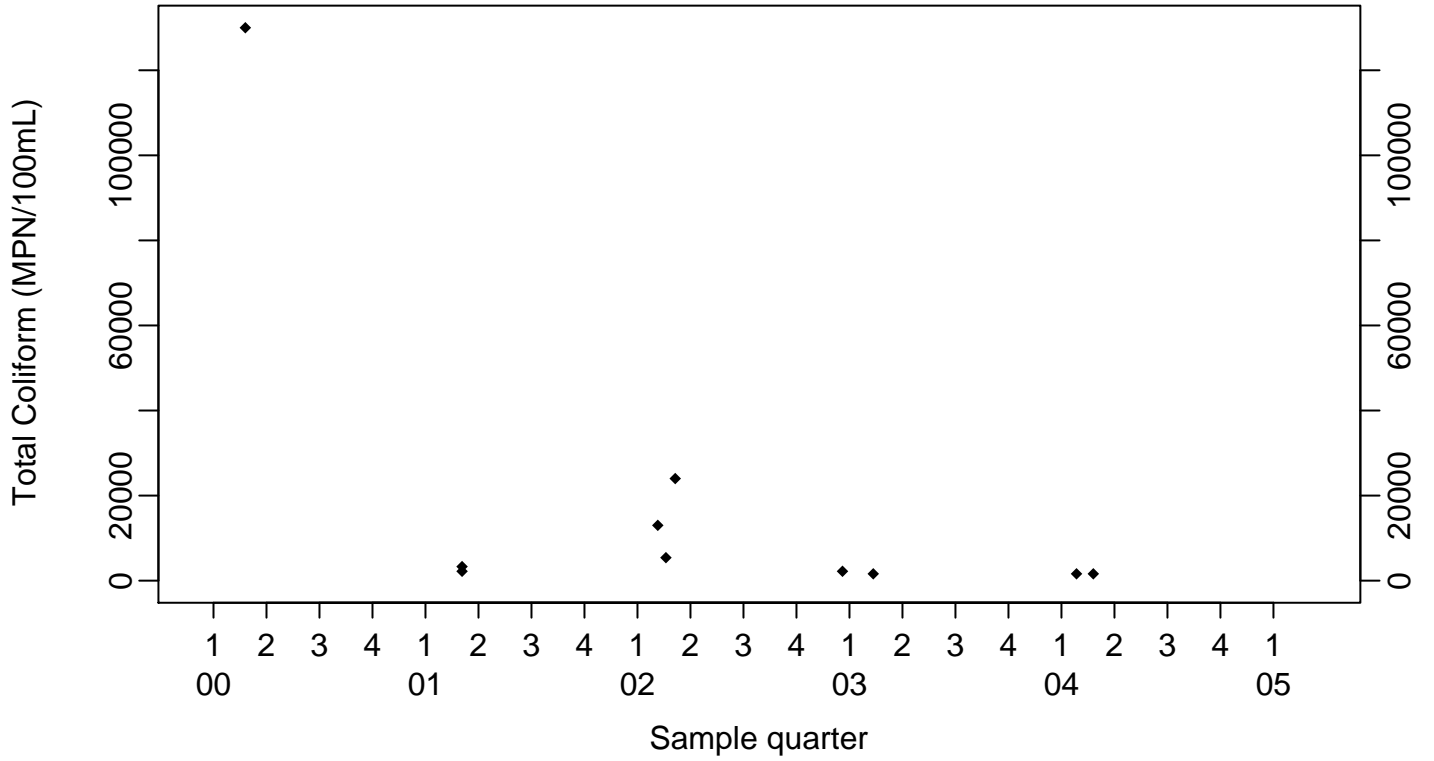
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Sewage Ponds Wastewater Total Coliform (MPN/100mL)

Effluent 3-DSWP-OW

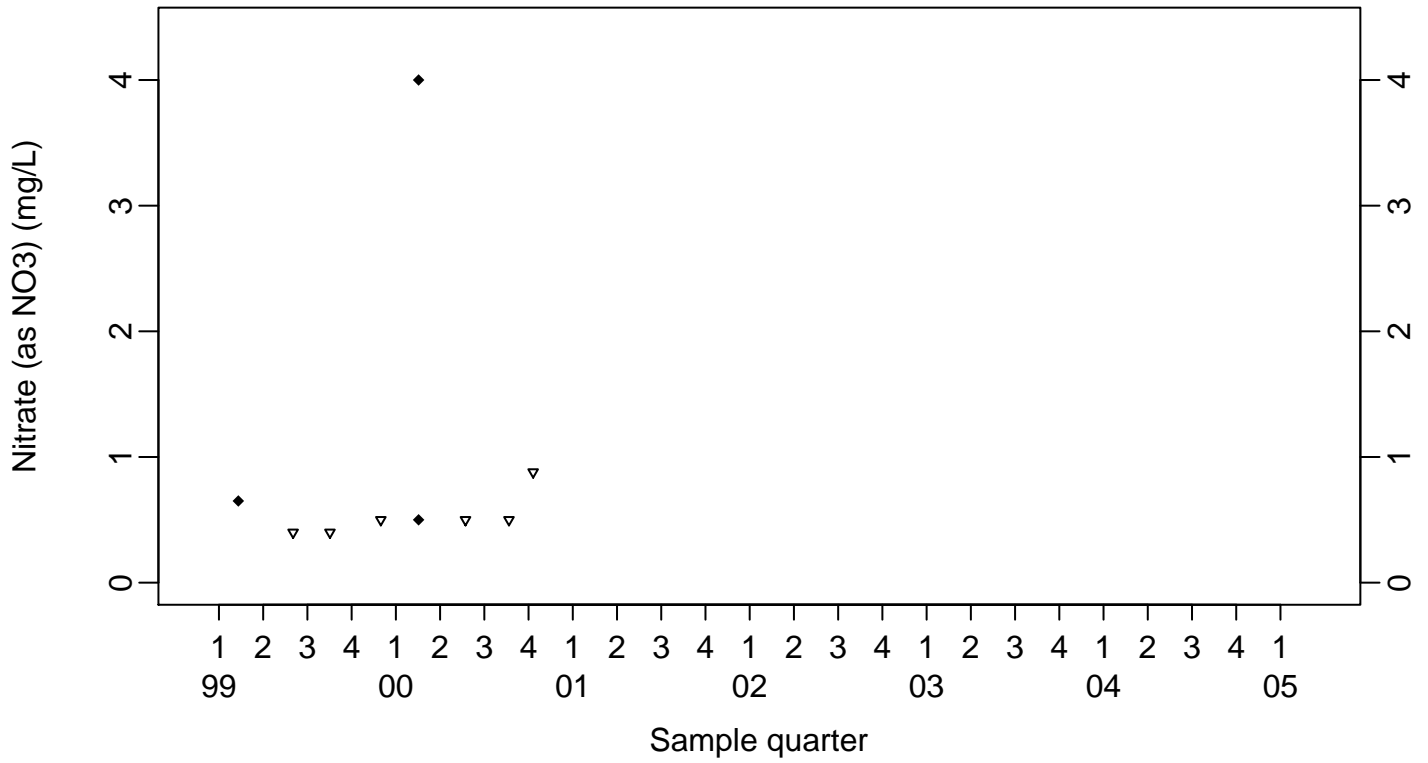
◆ Above RL
▽ Below RL



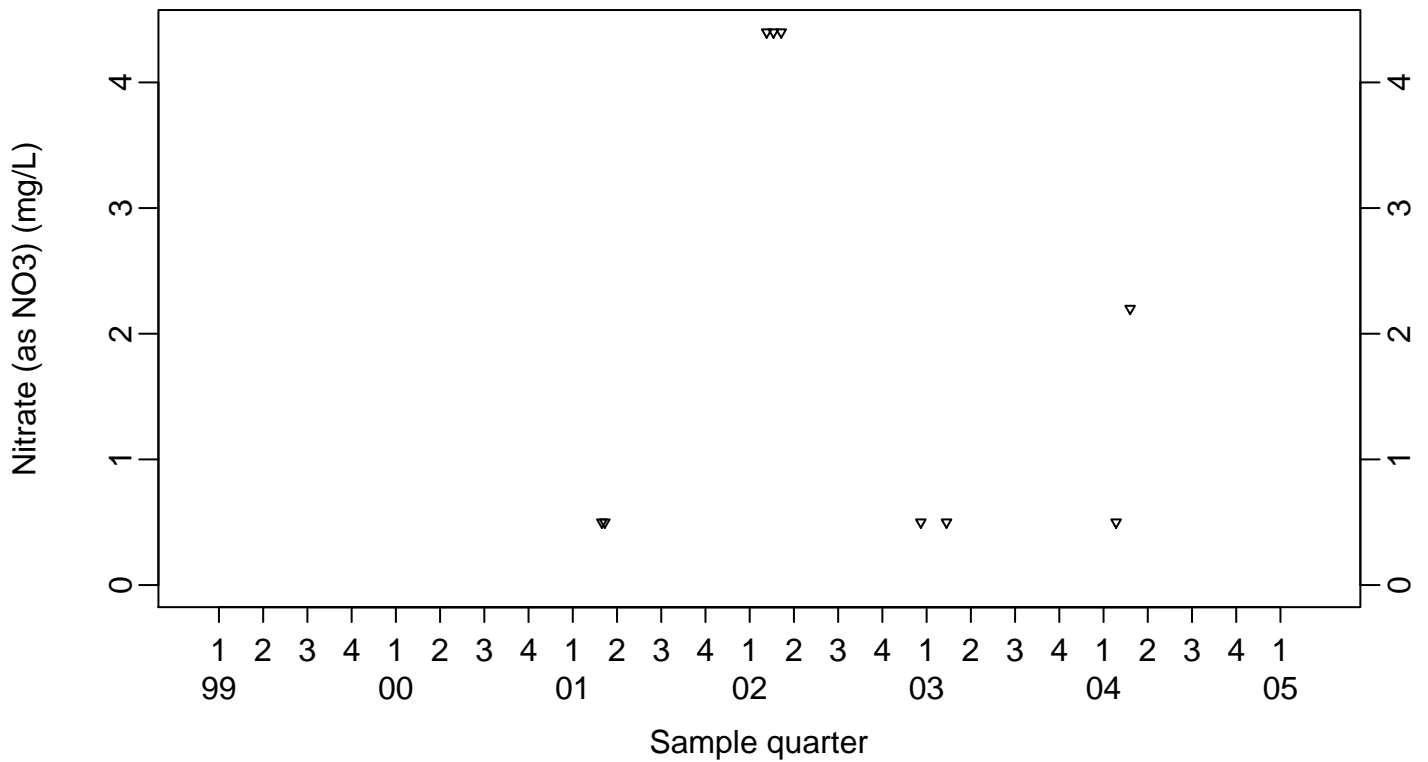
Sewage Ponds Wastewater
 Nitrate (as NO₃) (mg/L)

In-pond 3-ESWP-OW

◆ Above RL
 ▼ Below RL



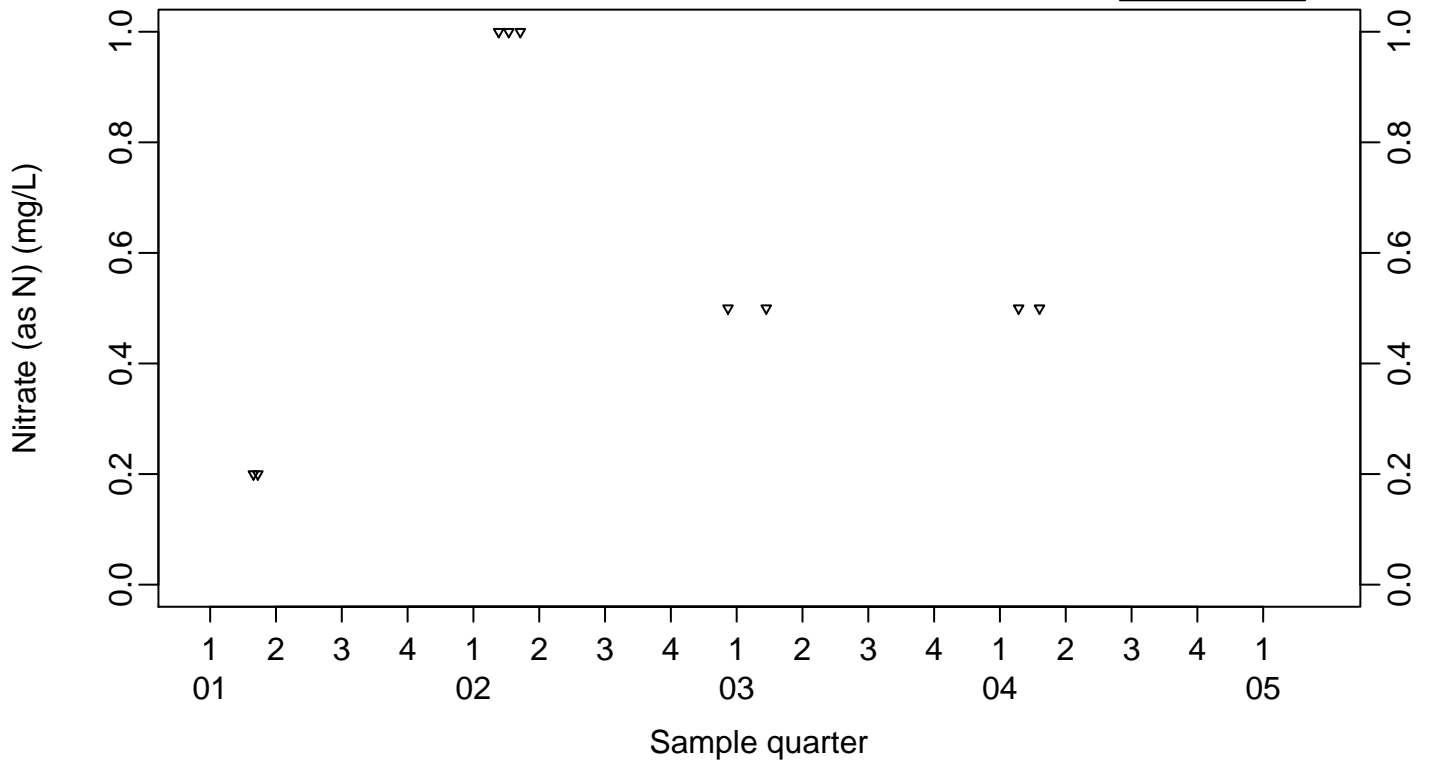
Effluent 3-DSWP-OW



Sewage Ponds Wastewater Nitrate (as N) (mg/L)

Effluent 3-DSWP-OW

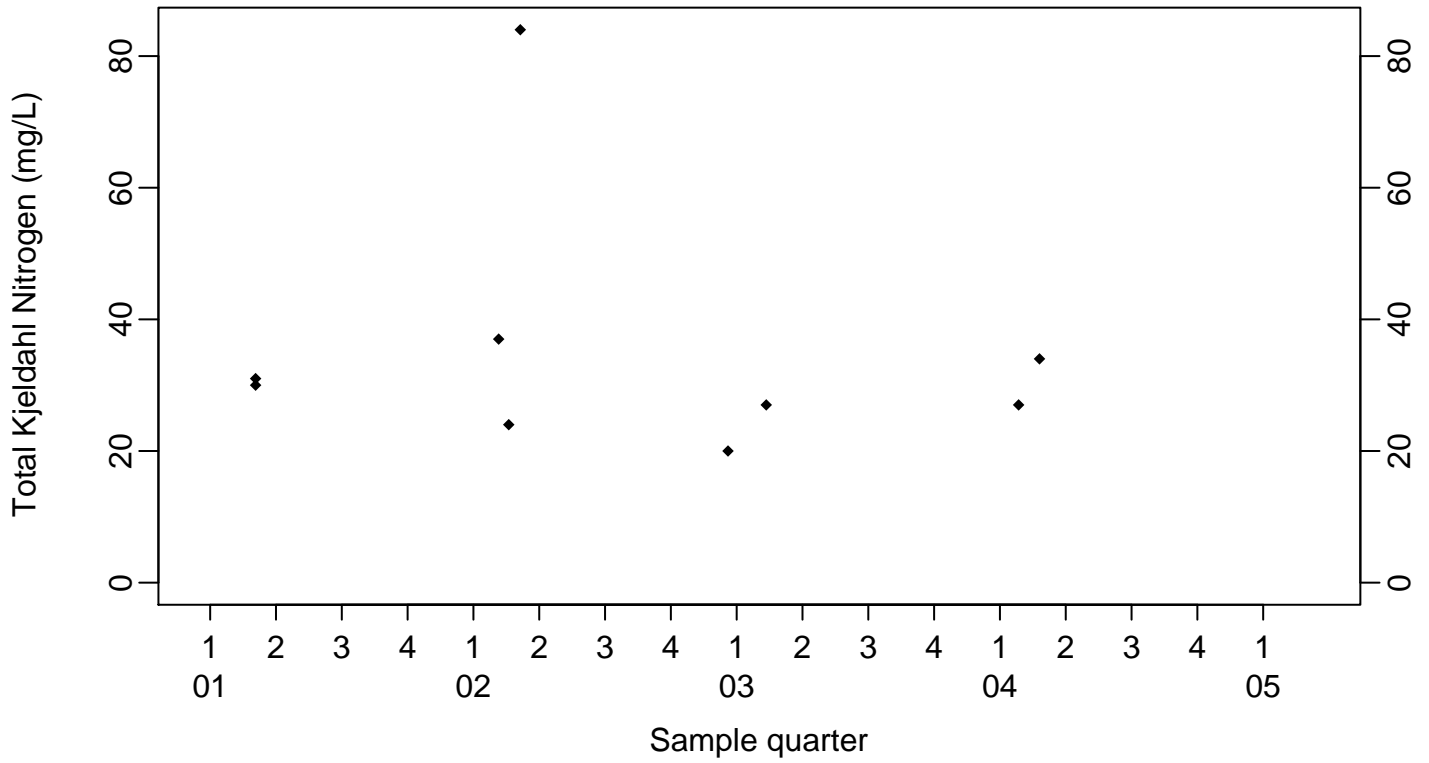
◆ Above RL
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Sewage Ponds Wastewater Total Kjeldahl Nitrogen (mg/L)

Effluent 3-DSWP-OW

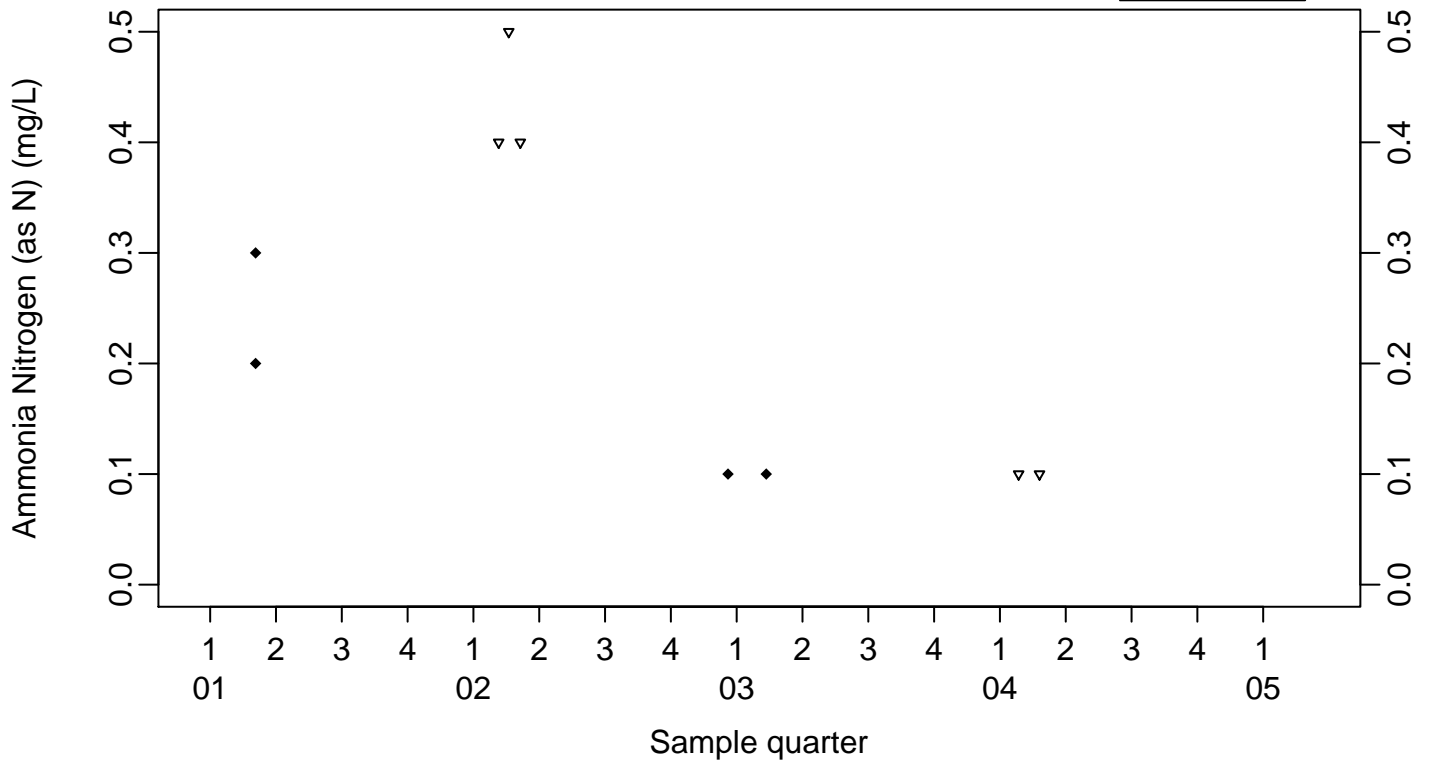
◆ Above RL
▽ Below RL



Sewage Ponds Wastewater Ammonia Nitrogen (as N) (mg/L)

Effluent 3-DSWP-OW

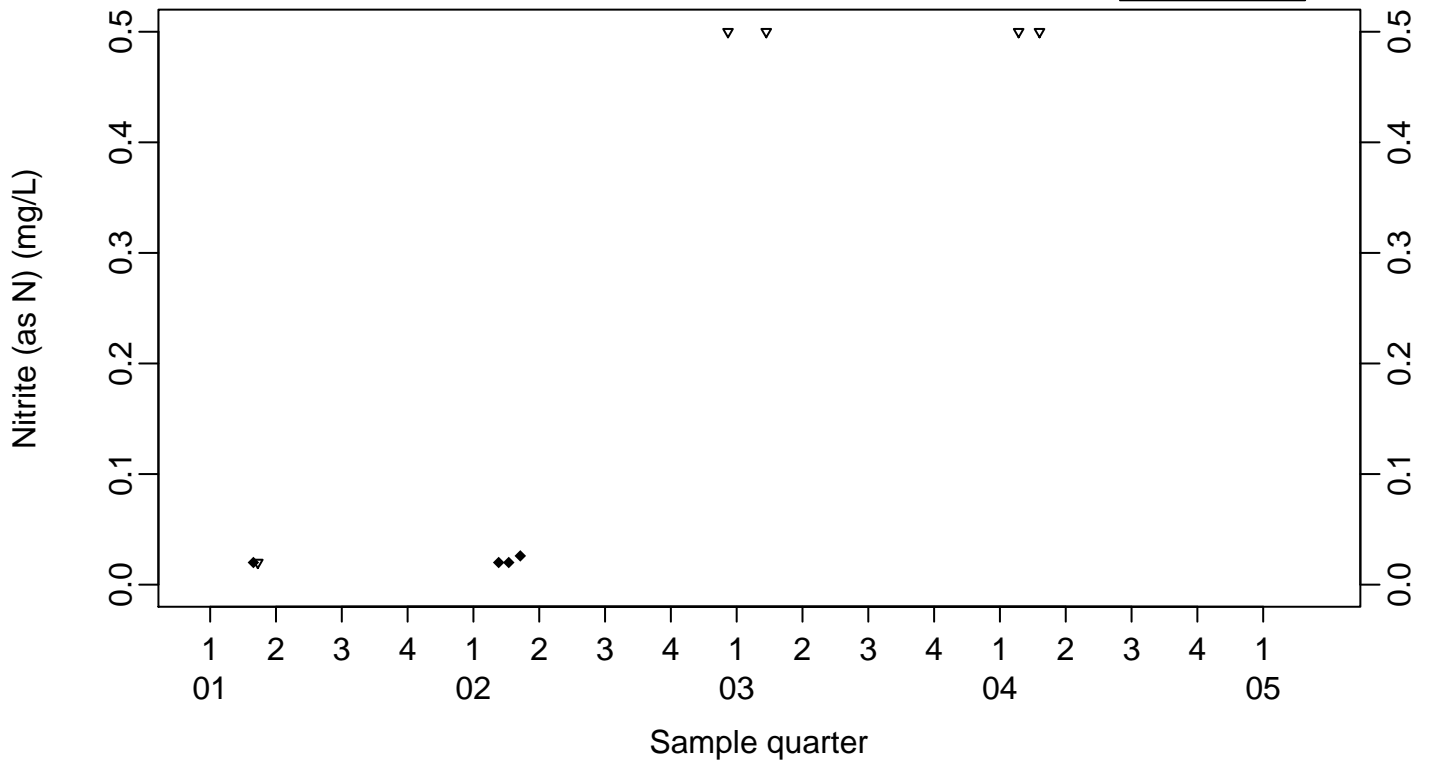
◆ Above RL
▽ Below RL



Sewage Ponds Wastewater Nitrite (as N) (mg/L)

Effluent 3-DSWP-OW

◆ Above RL
▽ Below RL



Sewage Ponds Wastewater Nitrite (as NO₂) (mg/L)

Effluent 3-DSWP-OW

◆ Above RL
▽ Below RL

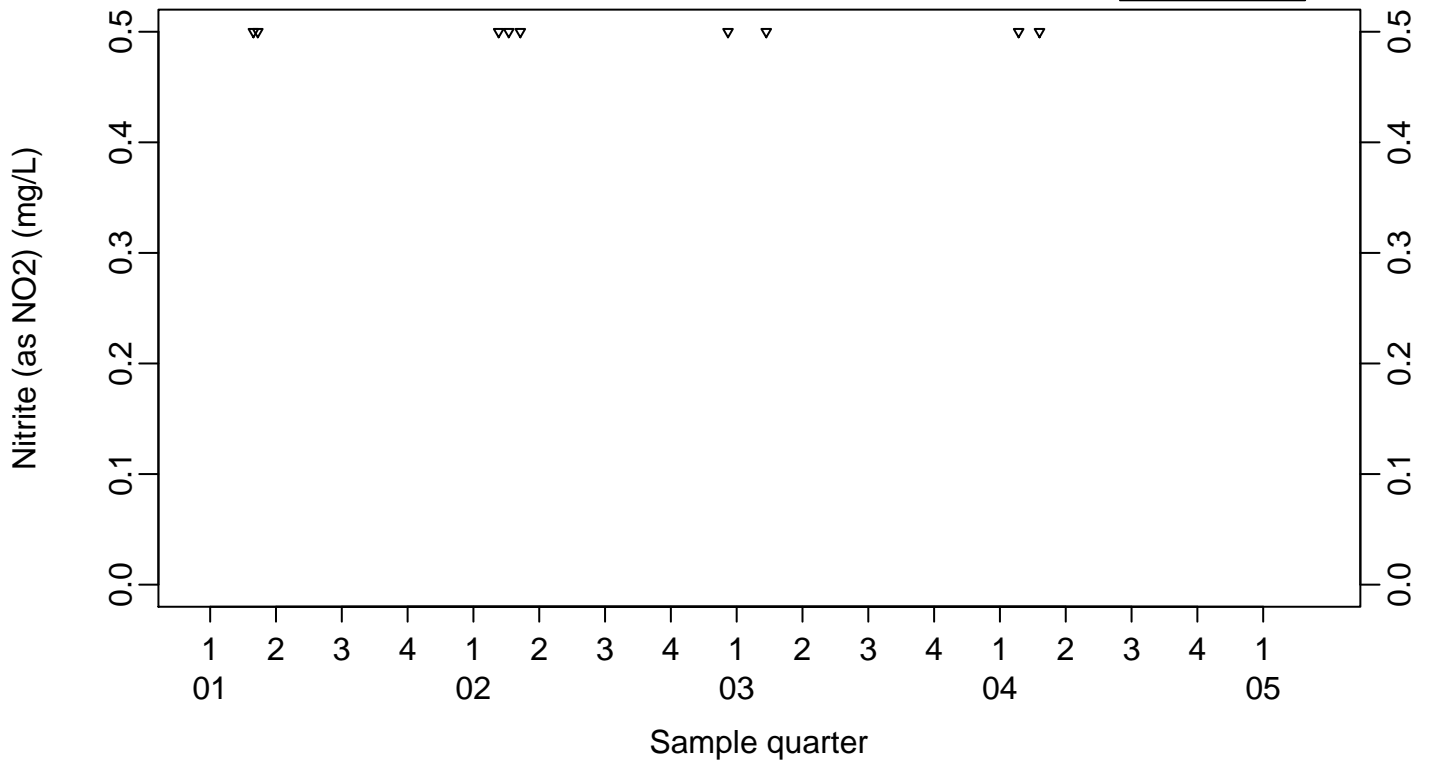


Table C-1 2004 summary of sewage pond observations.

Month	Freeboard ^a	Color	Odor	Levee condition
January	0.57 ^b –0.59 ^b	Green – brown-green	Slight	Animal burrows and erosion are okay, weed control is okay
February	0.55 ^b –0.58 ^b	Green – green-brown	Slight	Animal burrows and erosion are okay, weed control is okay
March	0.55 ^b –0.63	Green – brown-green	Slight	Animal burrows and erosion are okay, weed control is okay
April	0.69–0.71	Green	Slight	Animal burrows and erosion are okay, weed control is okay
May	0.69–0.74	Green	Slight	Animal burrows and erosion are okay, weed control is okay
June	0.64–0.72	Green	Slight	Animal burrows and erosion are okay, weed control is okay
July	0.67–0.72	Green	Slight	Animal burrows and erosion are okay, weed control is okay
August	0.68–0.69	Green	Slight	Animal burrows and erosion are okay, weed control is okay
September	0.69–0.71	Green	Slight	Animal burrows and erosion are okay, weed control is okay
October	0.65–0.70	Green	Slight	Animal burrows and erosion are okay, weed control is okay
November	0.62–0.65	Green	Slight	Animal burrows and erosion are okay, weed control is okay
December	0.59 ^b –0.62	Green	Slight	Animal burrows and erosion are okay, weed control is okay

^a Minimum freeboard is 0.61 m = 2 ft.

^b Freeboard in the evaporation pond was slightly less than 0.61 m (2 ft), as the evaporation pond overfilled and then continuously discharged to the percolation pond.

Table C-2 2004 sewage wastewater influent monitoring results (Location ISWP).

Parameter	Permit limits	First quarter	Second quarter	Third quarter	Fourth quarter
pH (units)	6.5 < pH < 10	8.5	8.0	8.1	8.3
EC (μ mhos/cm)	None	1,500	1,300	1,200	1,700
BOD (mg/L)	None	110	110	79	150/130 ^a

^a Sample and duplicate sample results for interlaboratory comparison.

Table C-3 2004 sewage evaporation pond monitoring results (Location ESWP).

Parameter	Permit limits	First quarter	Second quarter	Third quarter	Fourth quarter
pH (units)	None	9.6	9.9	9.6	9.1
EC ($\mu\text{mhos/cm}$)	None	7,400	8,600	8,300	7,700
Laboratory DO (mg/L)	1.0 (min.)	15	18.5 ^a	25.4 ^a	9.48

^a Sample was saturated with dissolved oxygen (DO), according to analytical laboratory.

Table C-4 2004 sewage percolation pond discharge location (Location DSWP).

Parameter	Permit limits	January 27	February 25
pH (units)	6.5 < pH < 10	9.6	9.7
EC ($\mu\text{mhos/cm}$)	None	7,100	6,800
BOD (mg/L)	None	48	130
Fecal coliform (MPN ^a /100 mL)	None	1,600	1,600
Total coliform (MPN ^a /100 mL)	None	1,600	1,600
Nitrate as NO ₃	None	< 0.5	< 2.2

^a MPN = Most probable number (of organisms).

Appendix D

**Annual Summary Plots and Tables of Sewage
Evaporation and Percolation Ponds
Ground Water Monitoring Data**

Appendix D

This appendix contains graphical and tabular summaries of ground water monitoring data from the sewage ponds ground water network. These plots contain all monitoring data available since LLNL began sampling from upgradient ground water monitoring wells W-7E, W-7ES, and W-7PS; from cross-gradient ground water monitoring well W-35A-04; and from downgradient ground water monitoring wells W-26R-01, W-26R-11, W-26R-05, W-25N-20, and W-7DS in 1987.

The plots display field parameters of ground water elevation, pH, electrical conductivity (EC), total coliform bacteria, fecal coliform bacteria, and finally nitrate (as NO_3). The upgradient (background) monitoring wells W-7E, W-7ES, and W-7PS are always plotted first for each analyte.

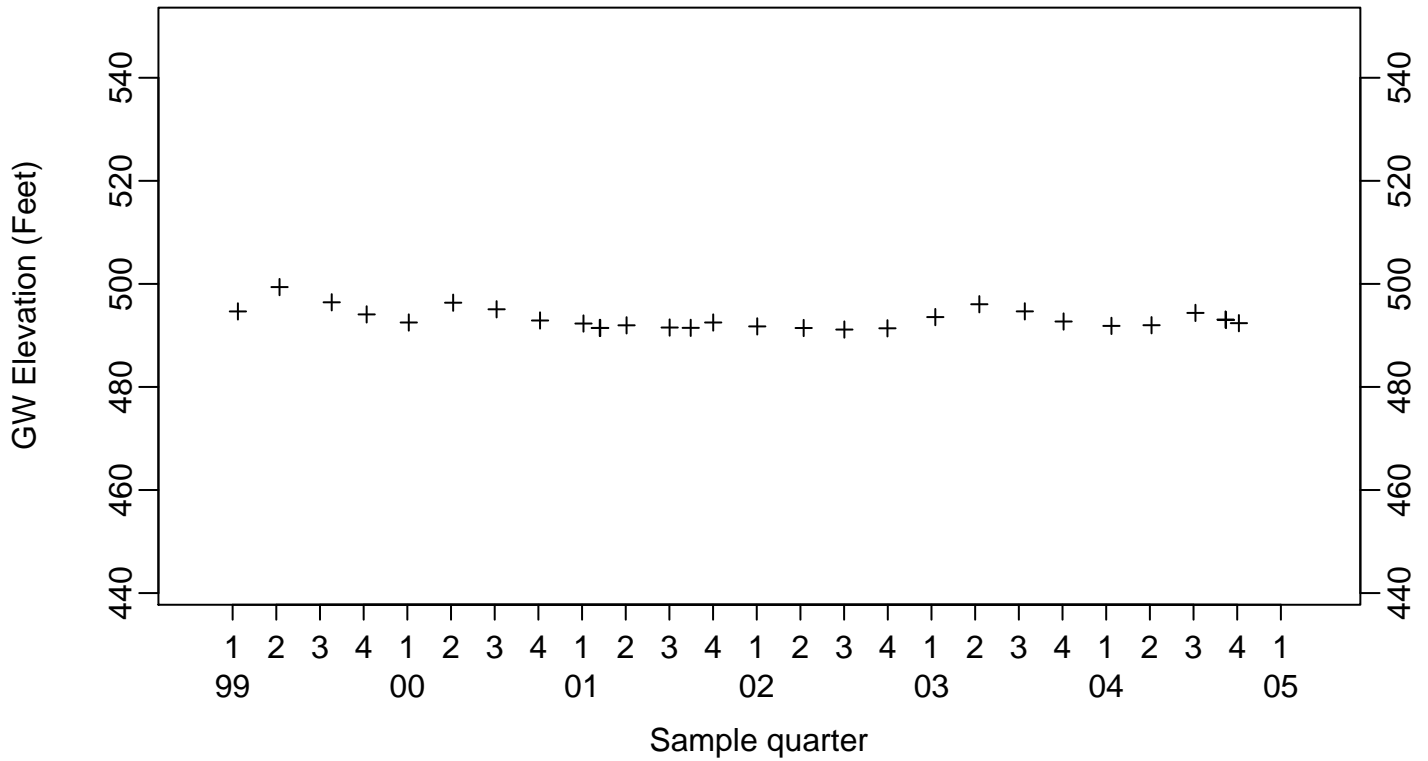
Each two-dimensional graph shows concentration plotted on the vertical axis versus time (years divided into four quarterly sampling periods) on the horizontal axis. Units of measure are given on the vertical axis label and in the header at the top of each page. Values above the analytical reporting limit for each analyte are plotted as solid diamonds, and values below the reporting limit are plotted as open inverted triangles.

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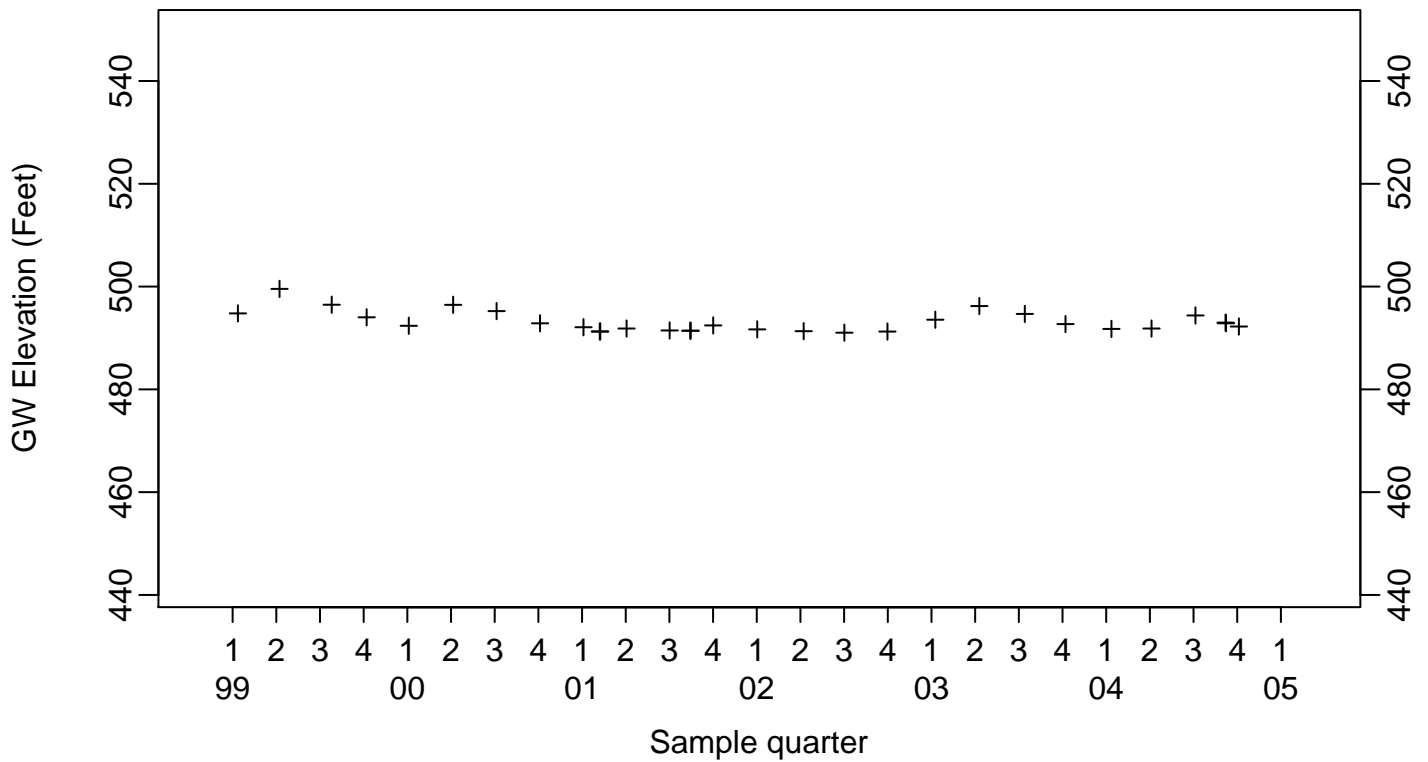
Annual Plots of Sewage Evaporation and Percolation Ponds Ground Water Monitoring Data

Sewage Ponds Ground Water GW Elevation (Feet)

Upgradient Monitor Well W-7E

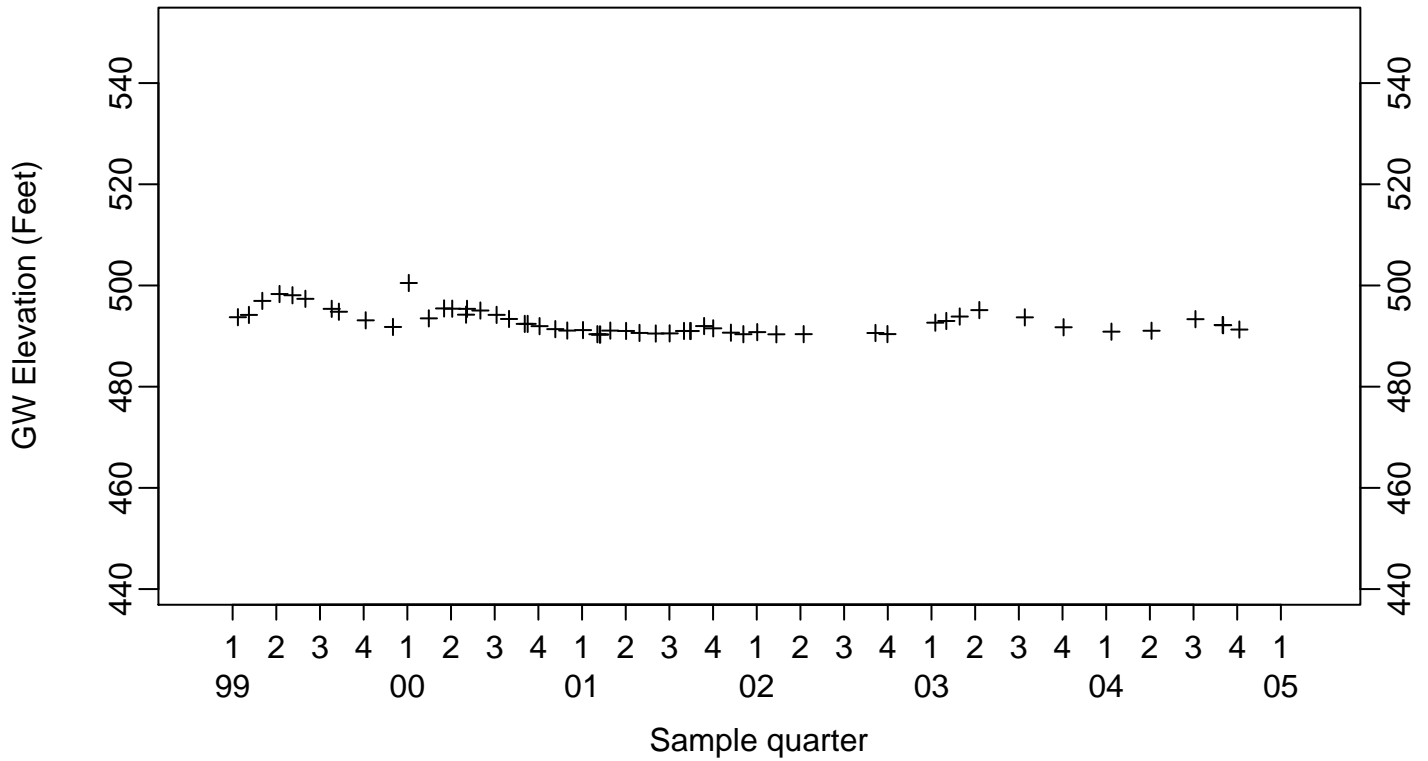


Upgradient Monitor Well W-7ES

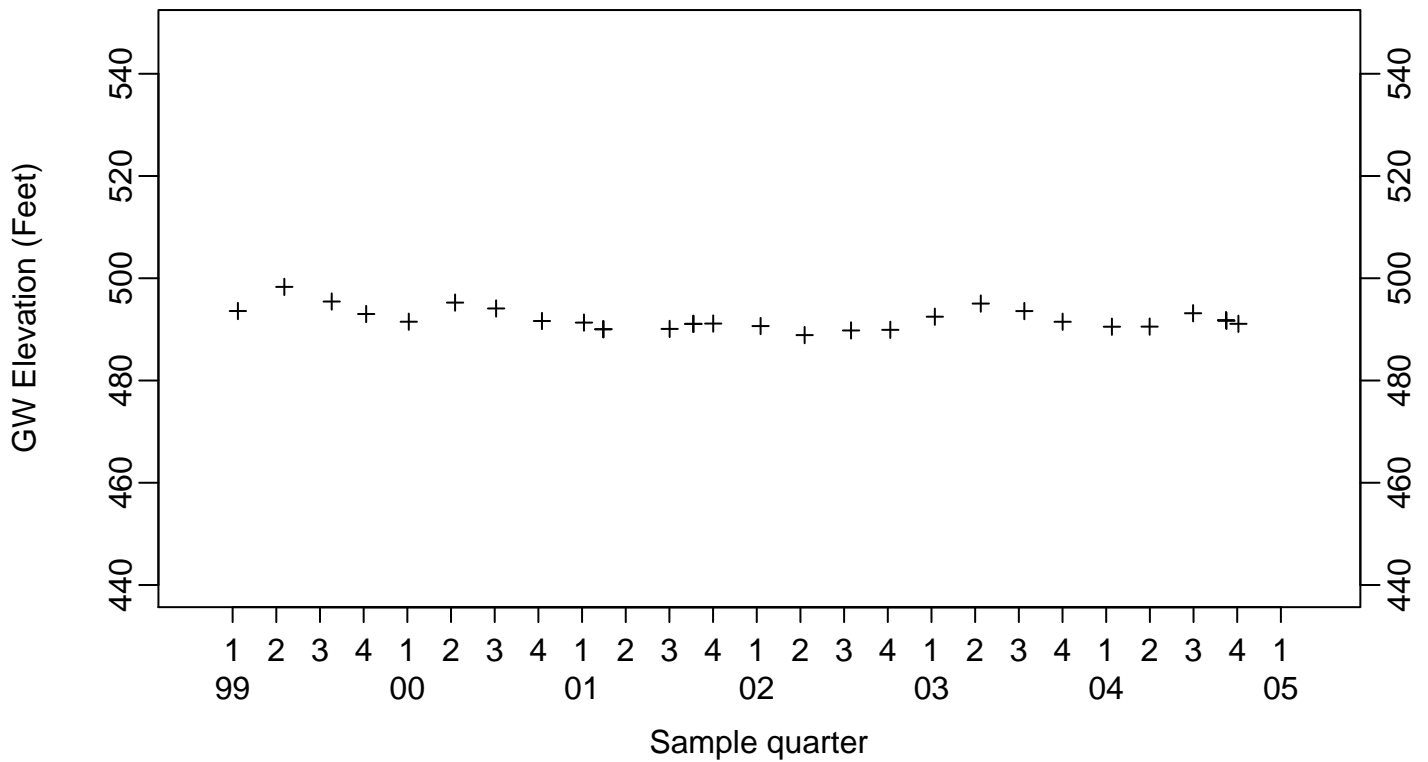


Sewage Ponds Ground Water GW Elevation (Feet)

Upgradient Monitor Well W-7PS

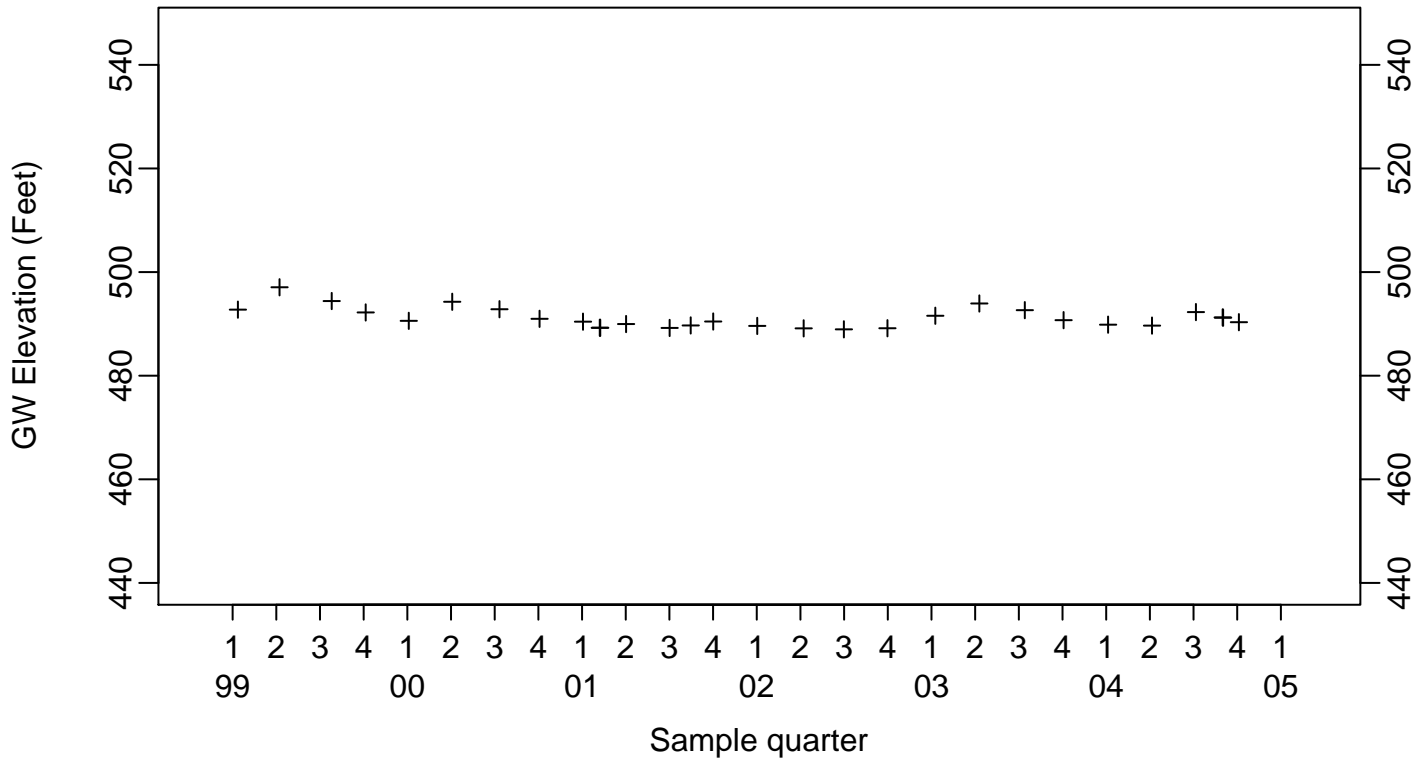


Crossgradient Monitor Well W-35A-04

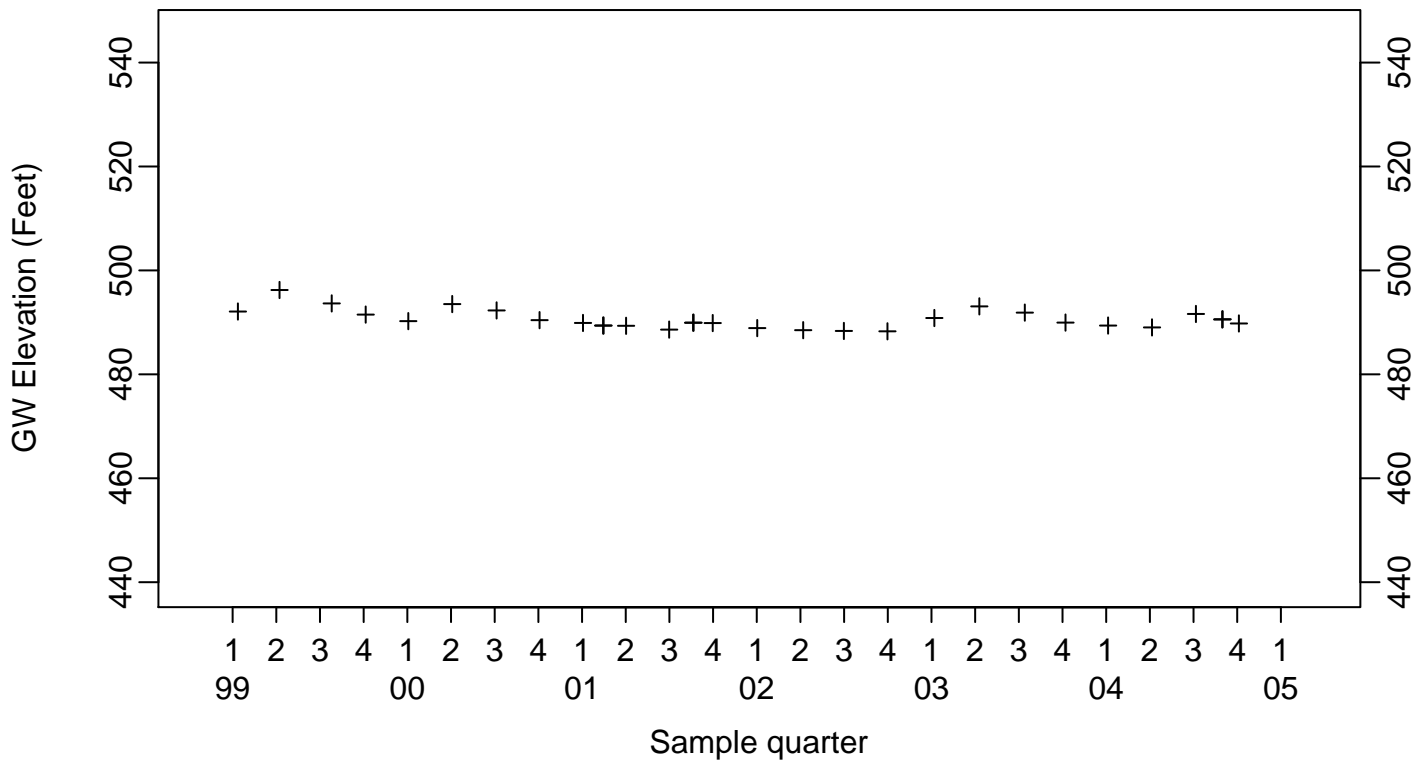


Sewage Ponds Ground Water GW Elevation (Feet)

Downgradient Monitor Well W-7DS

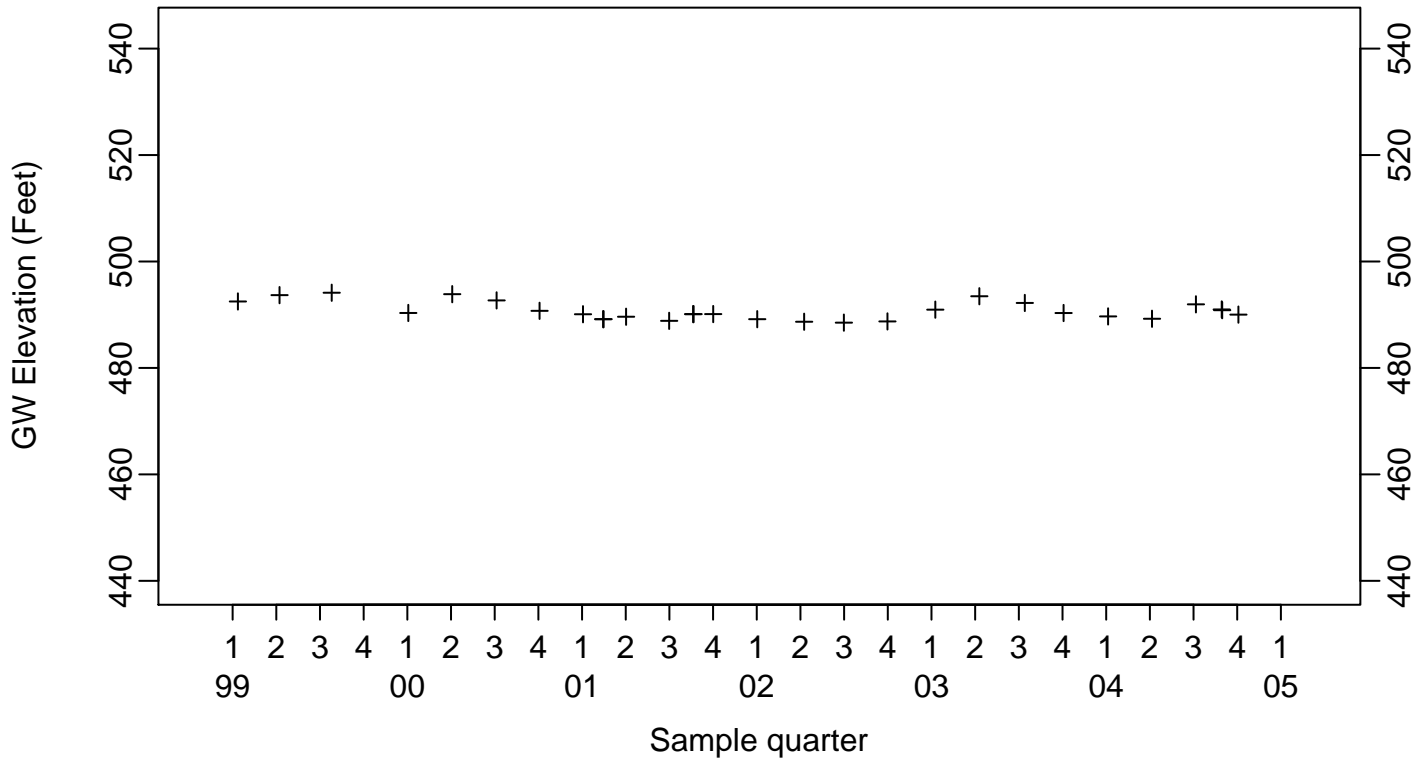


Downgradient Monitor Well W-25N-20

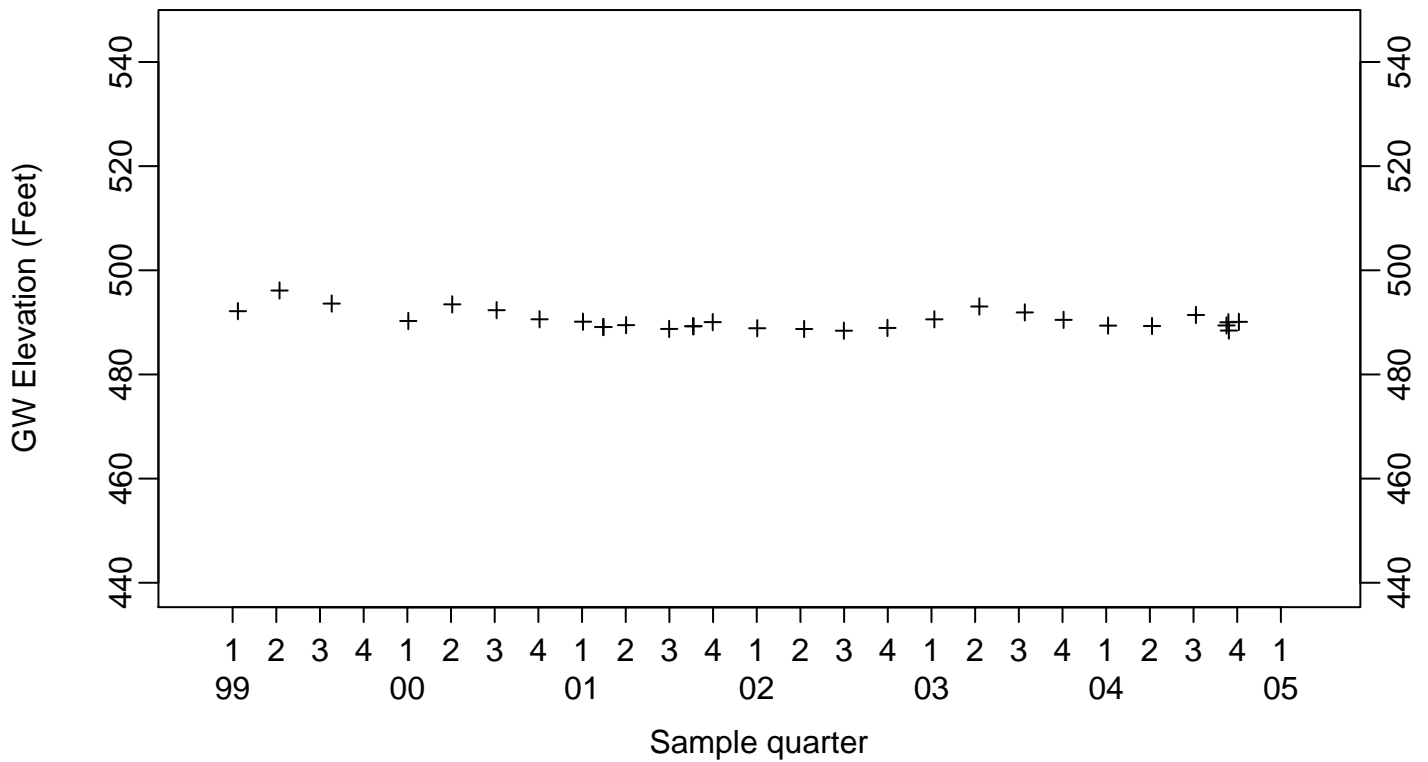


Sewage Ponds Ground Water GW Elevation (Feet)

Downgradient Monitor Well W-26R-01

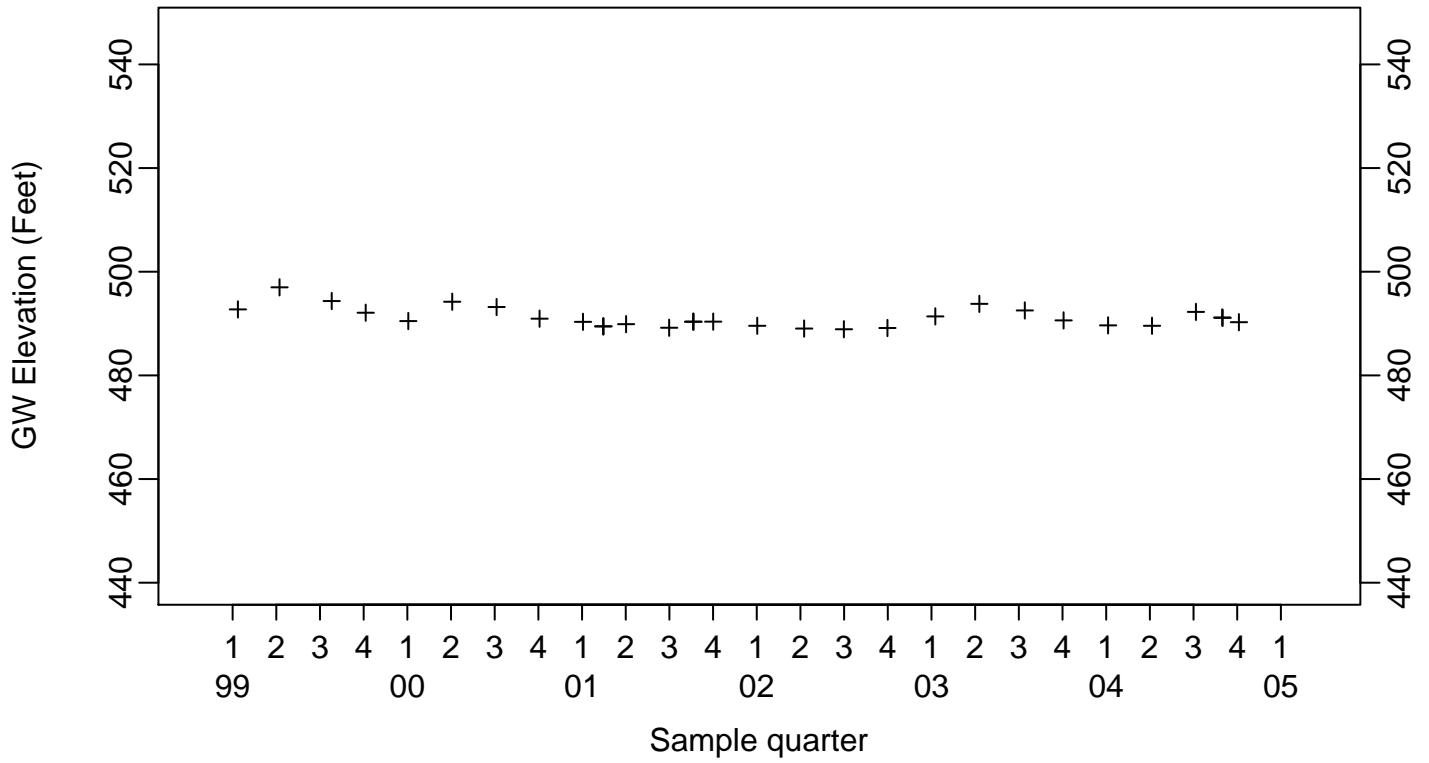


Downgradient Monitor Well W-26R-05



Sewage Ponds Ground Water GW Elevation (Feet)

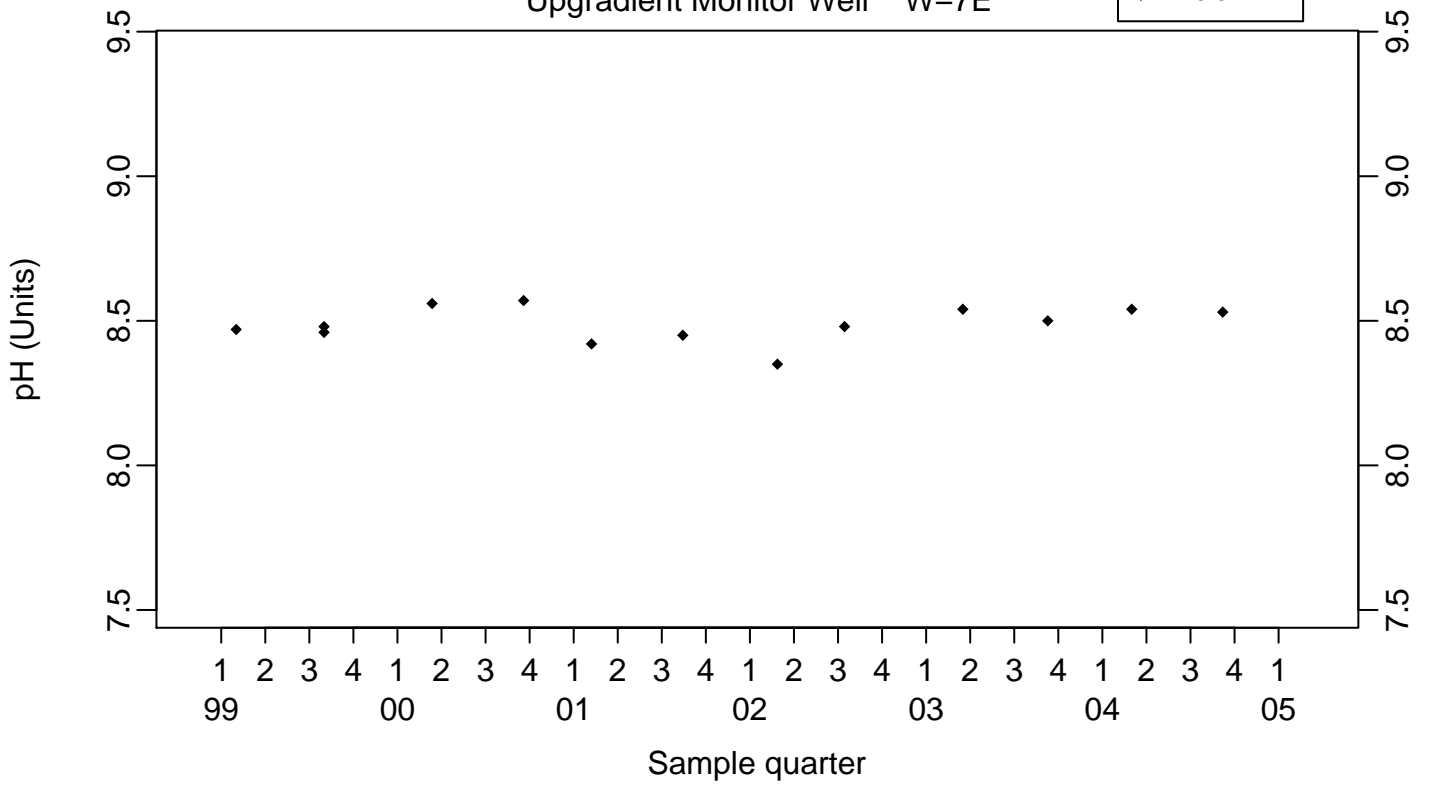
Downgradient Monitor Well W-26R-11



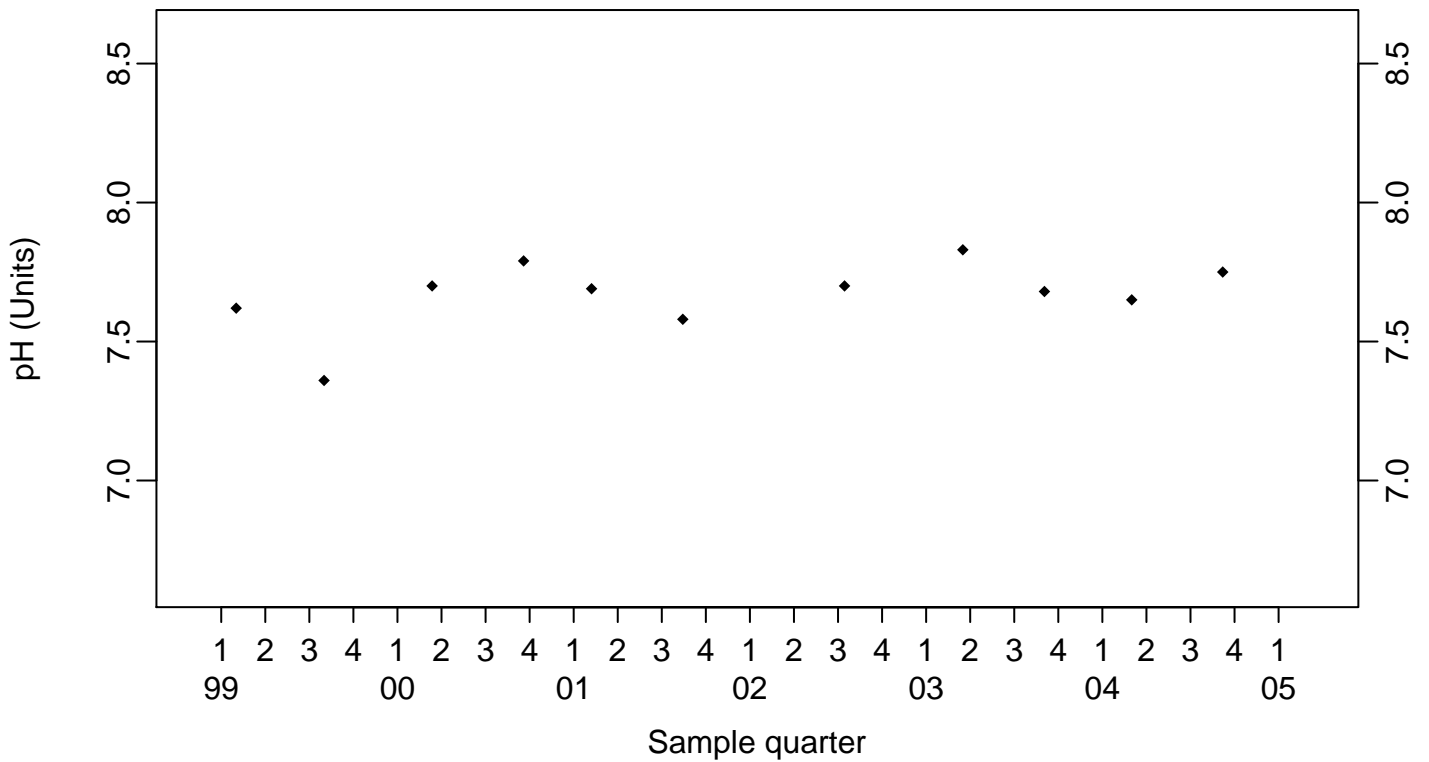
Sewage Ponds Ground Water pH (Units)

Upgradient Monitor Well W-7E

◆ Above RL
▽ Below RL



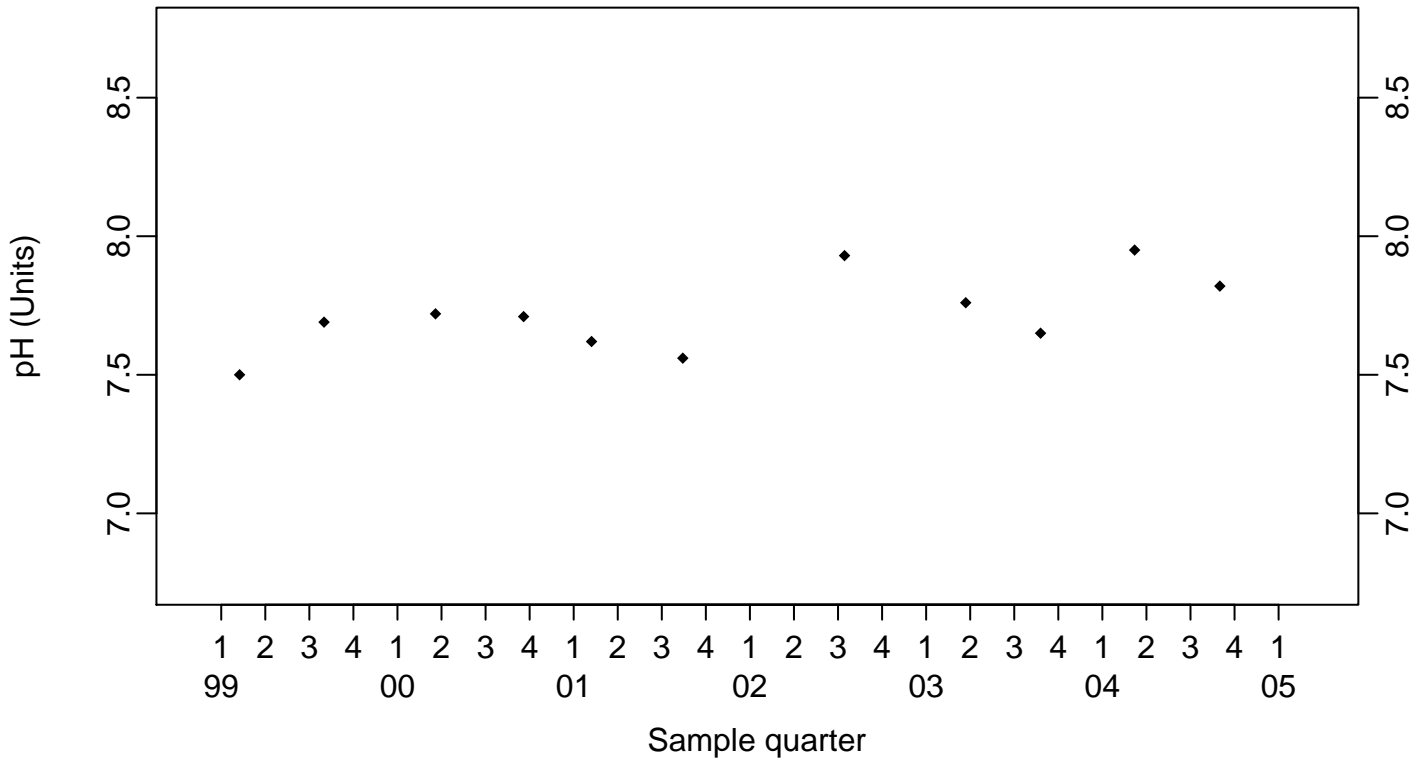
Upgradient Monitor Well W-7ES



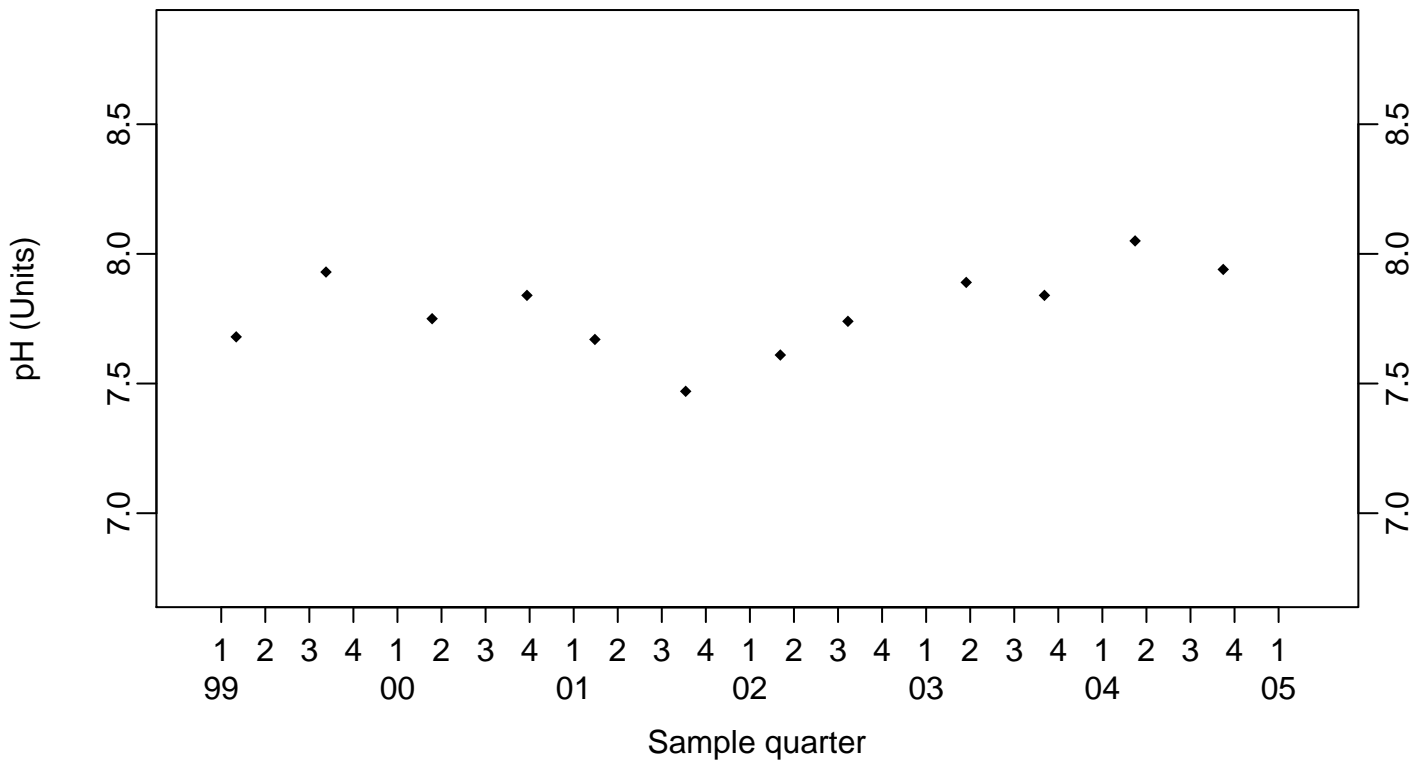
Sewage Ponds Ground Water pH (Units)

Upgradient Monitor Well W-7PS

◆ Above RL
▽ Below RL



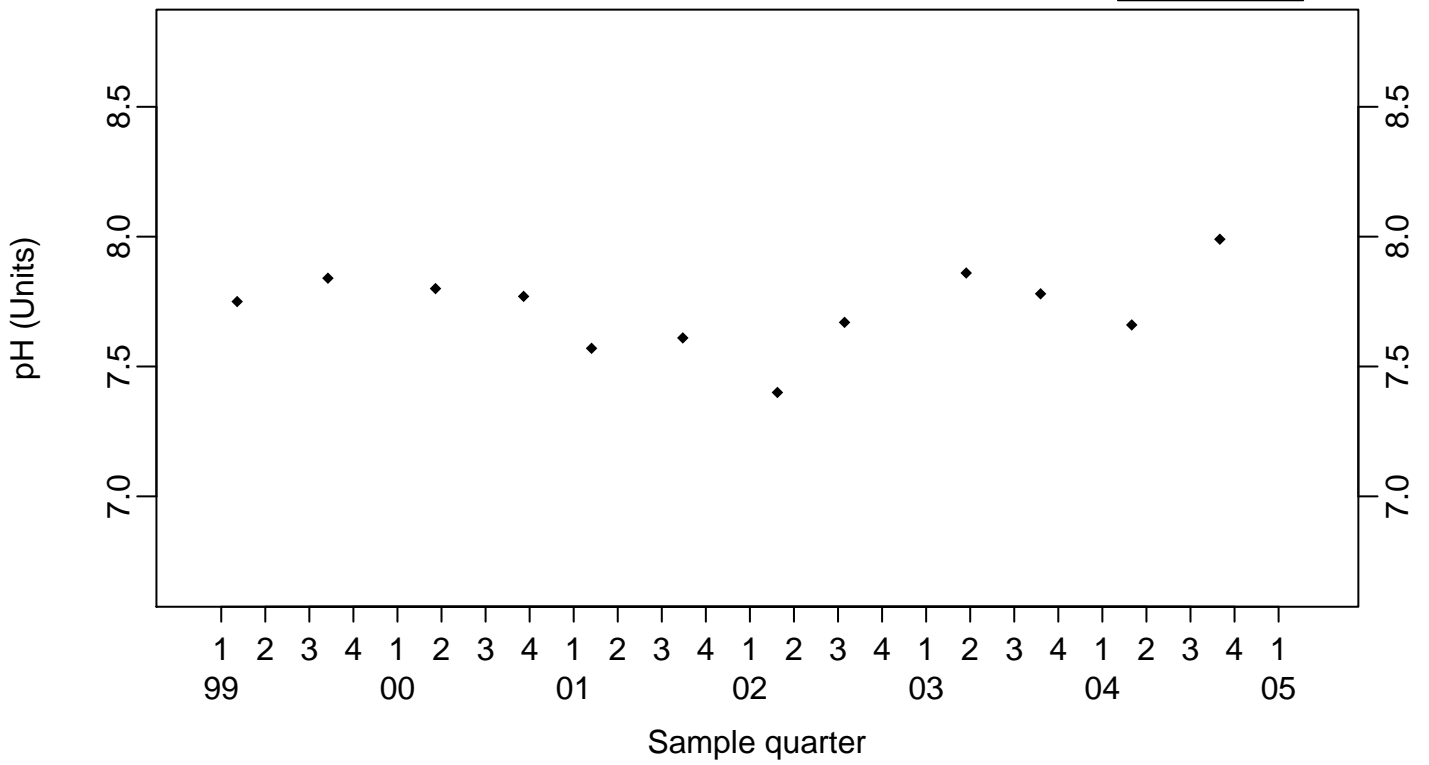
Crossgradient Monitor Well W-35A-04



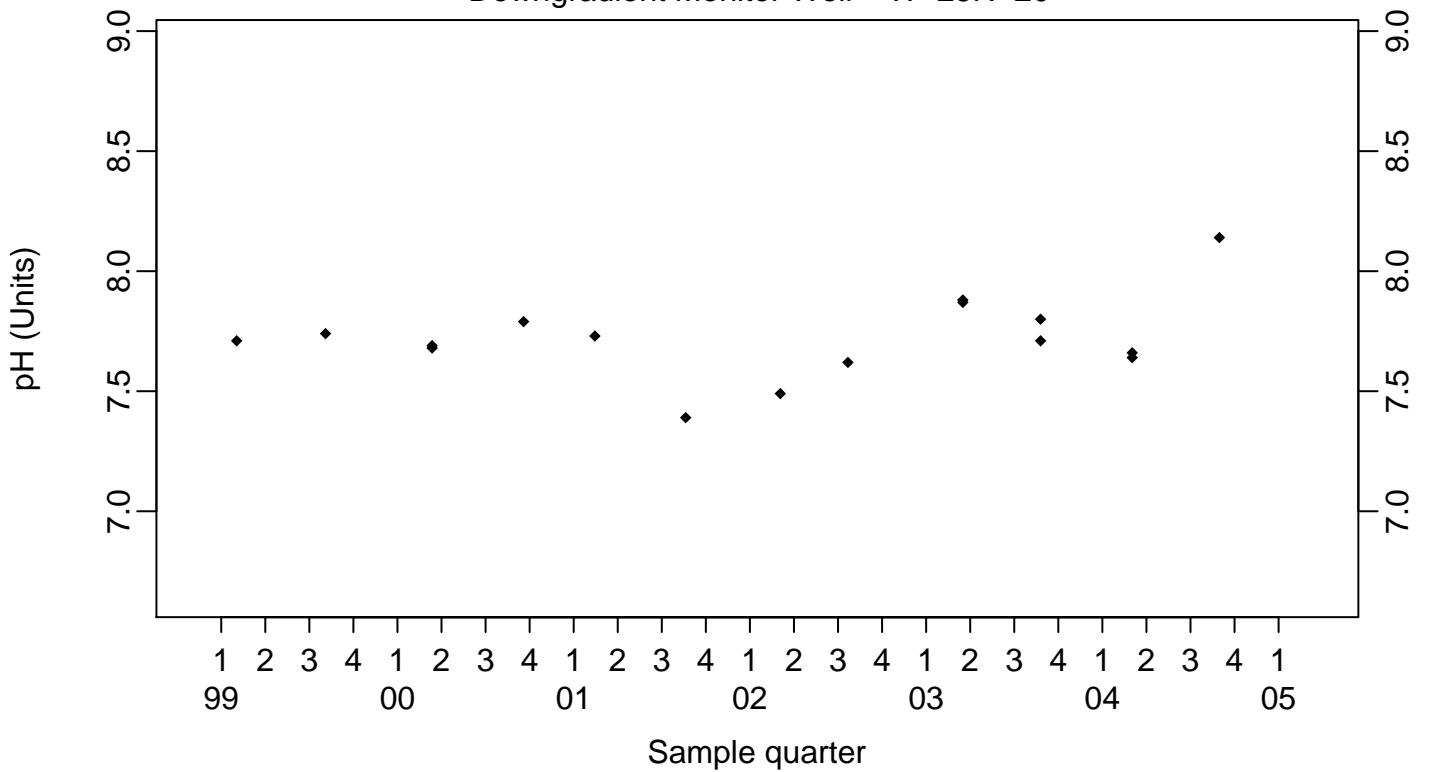
Sewage Ponds Ground Water pH (Units)

Downgradient Monitor Well W-7DS

◆ Above RL
▽ Below RL



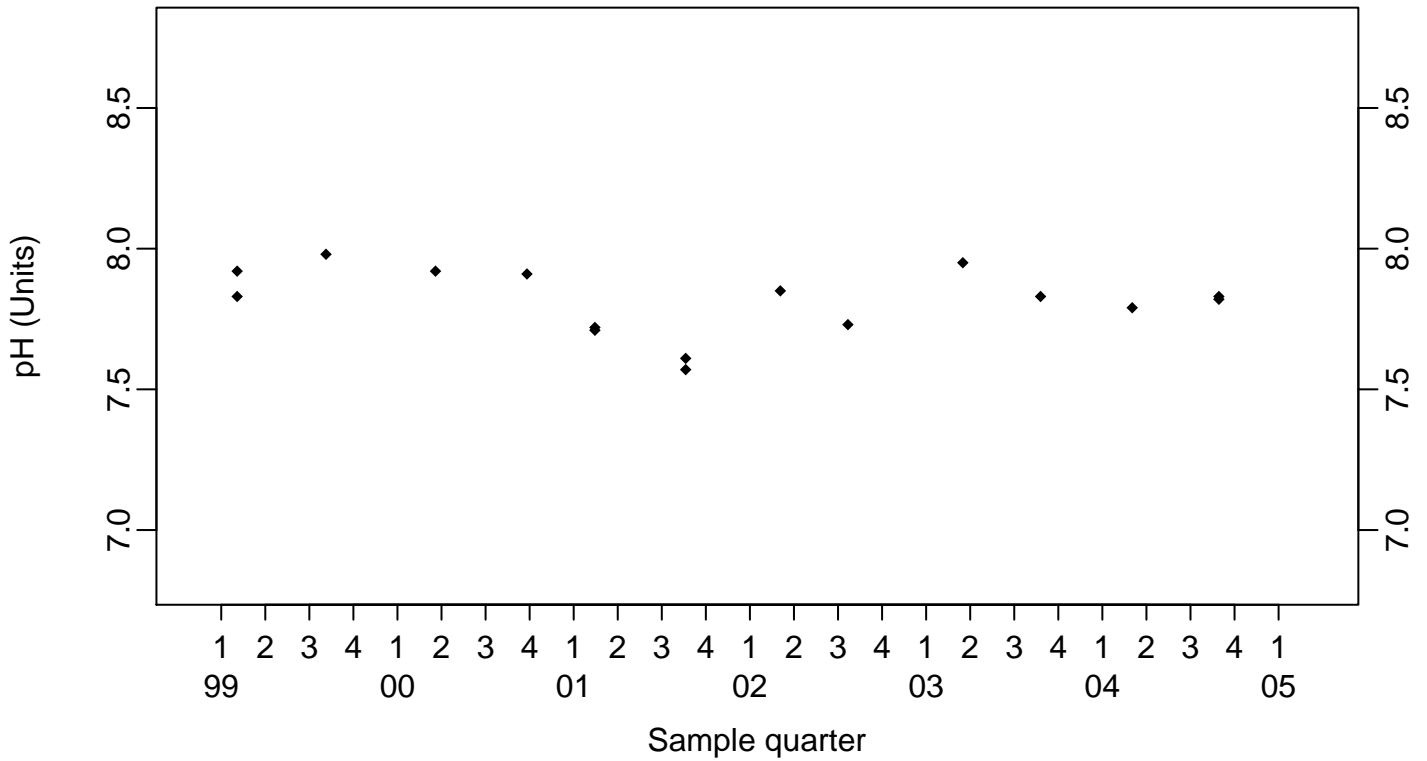
Downgradient Monitor Well W-25N-20



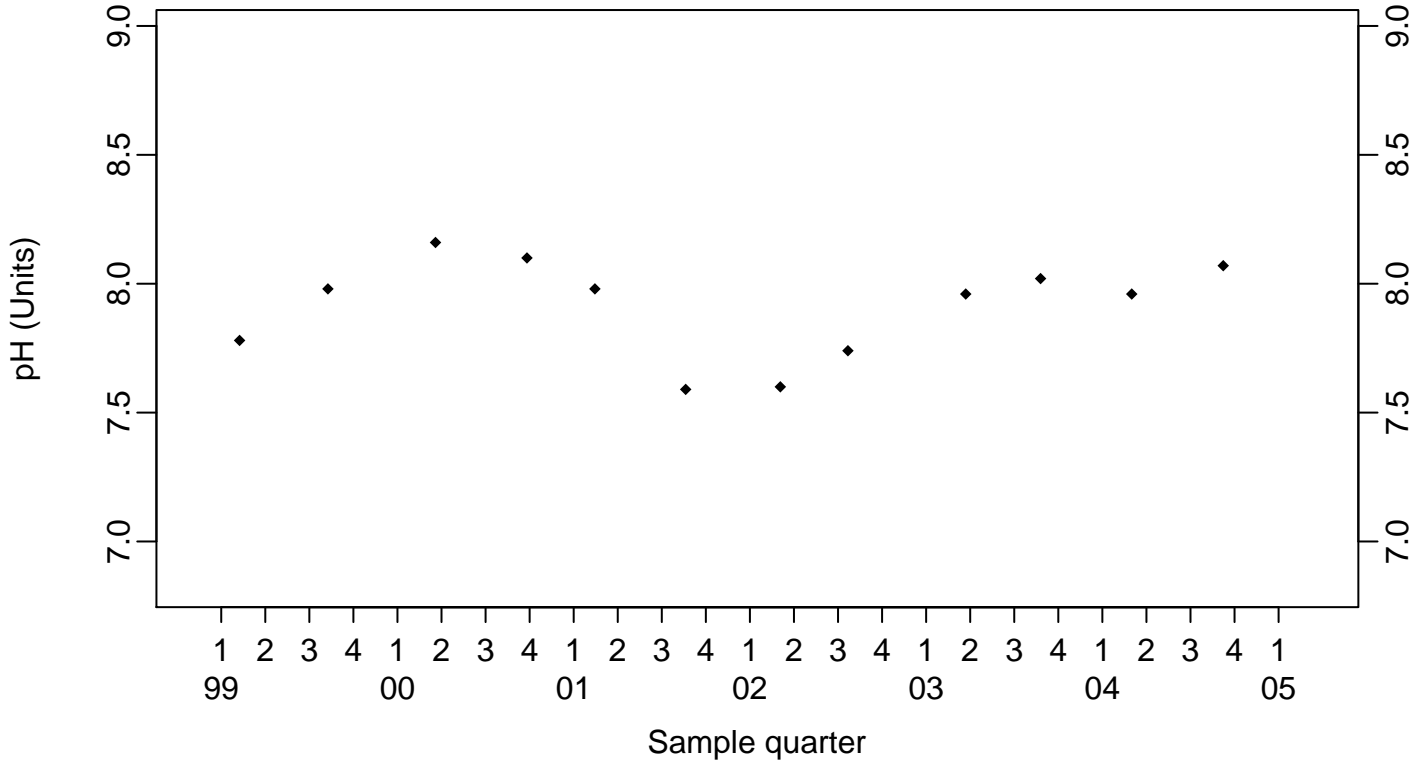
Sewage Ponds Ground Water pH (Units)

Downgradient Monitor Well W-26R-01

◆ Above RL
▽ Below RL



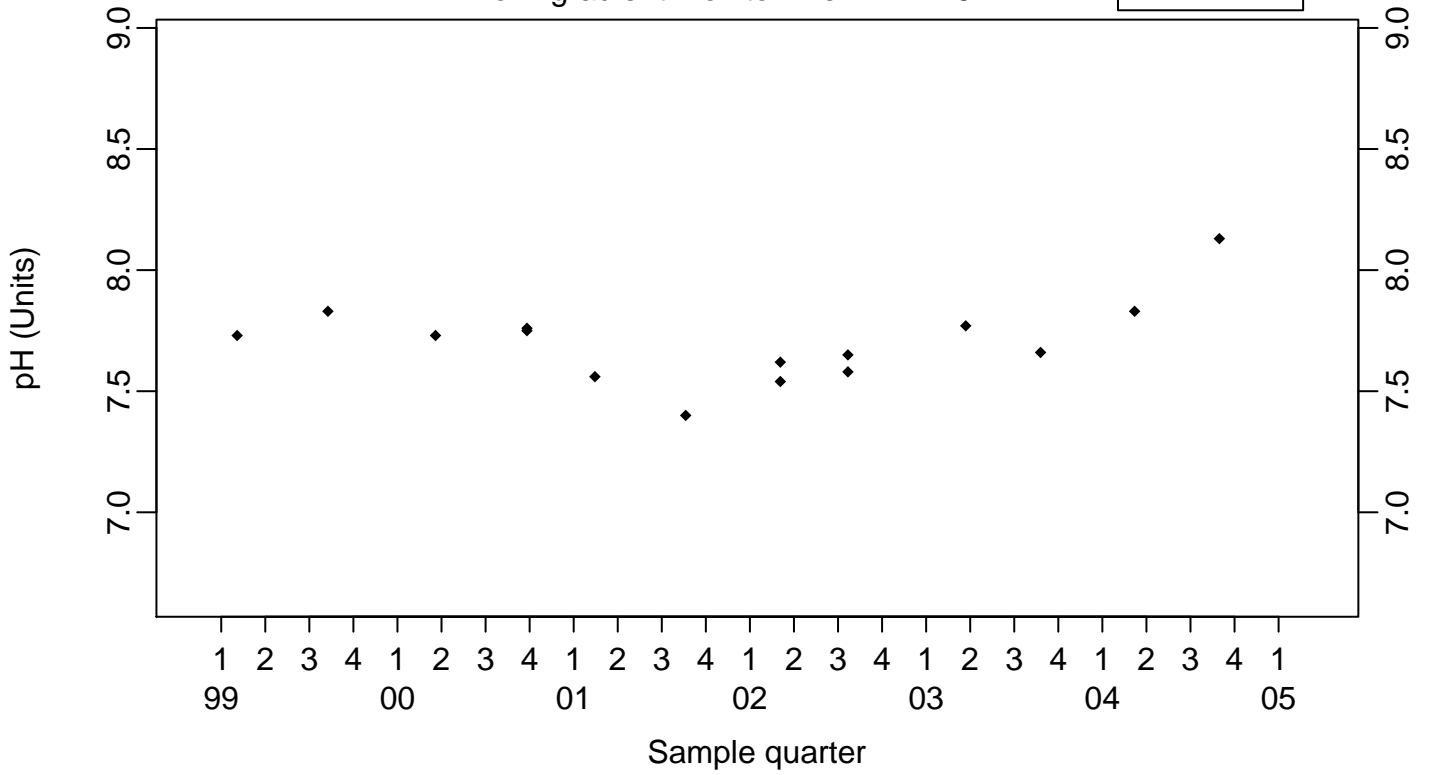
Downgradient Monitor Well W-26R-05



Sewage Ponds Ground Water pH (Units)

Downgradient Monitor Well W-26R-11

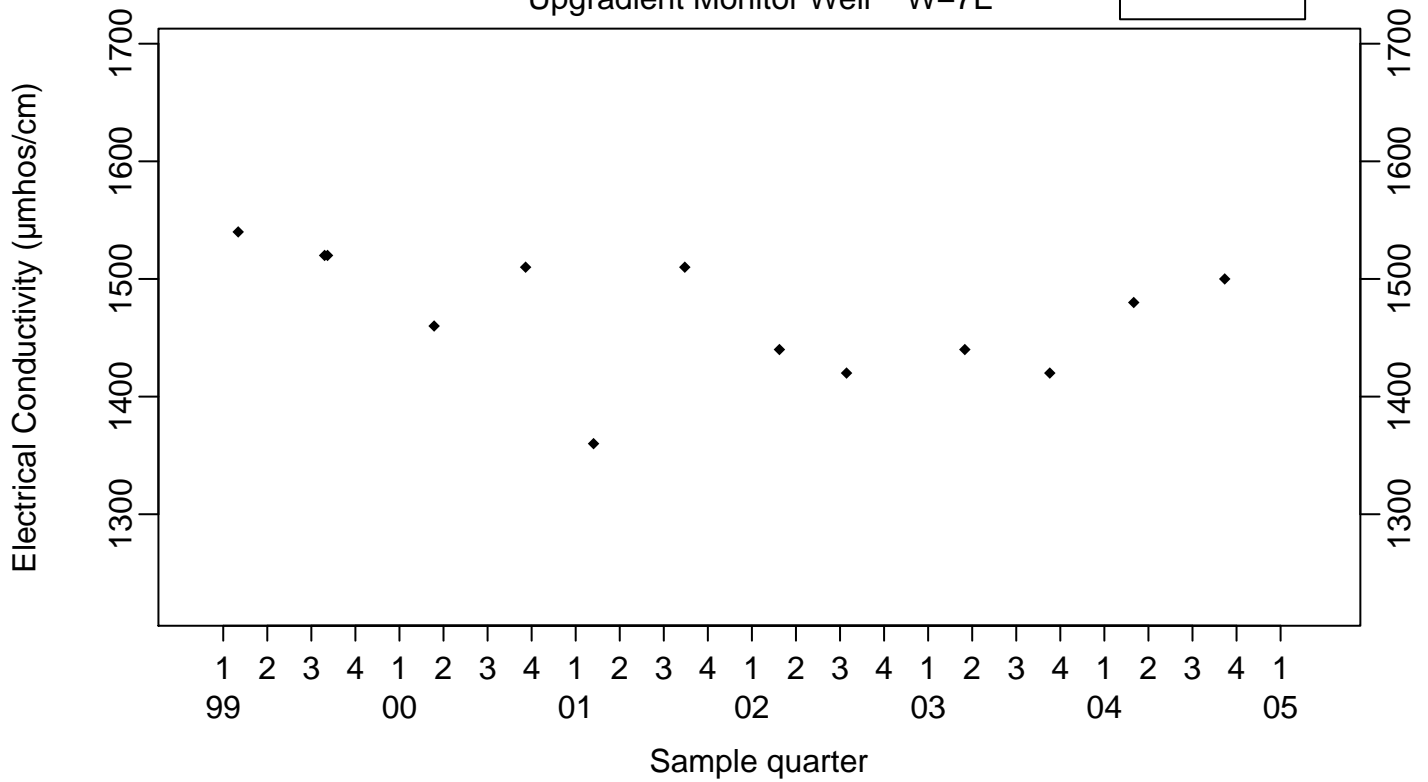
◆ Above RL
▽ Below RL



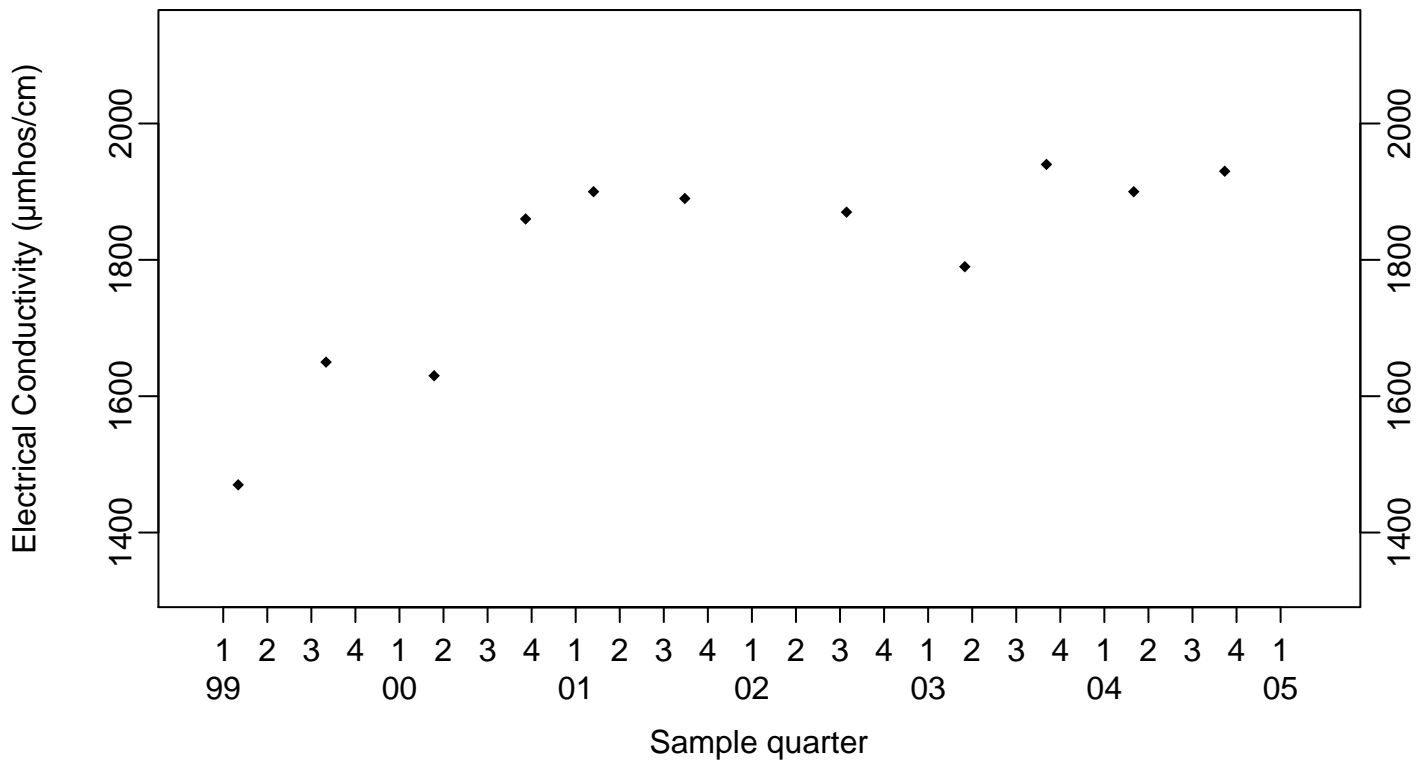
Sewage Ponds Ground Water Electrical Conductivity ($\mu\text{mhos/cm}$)

Upgradient Monitor Well W-7E

◆ Above RL
▽ Below RL



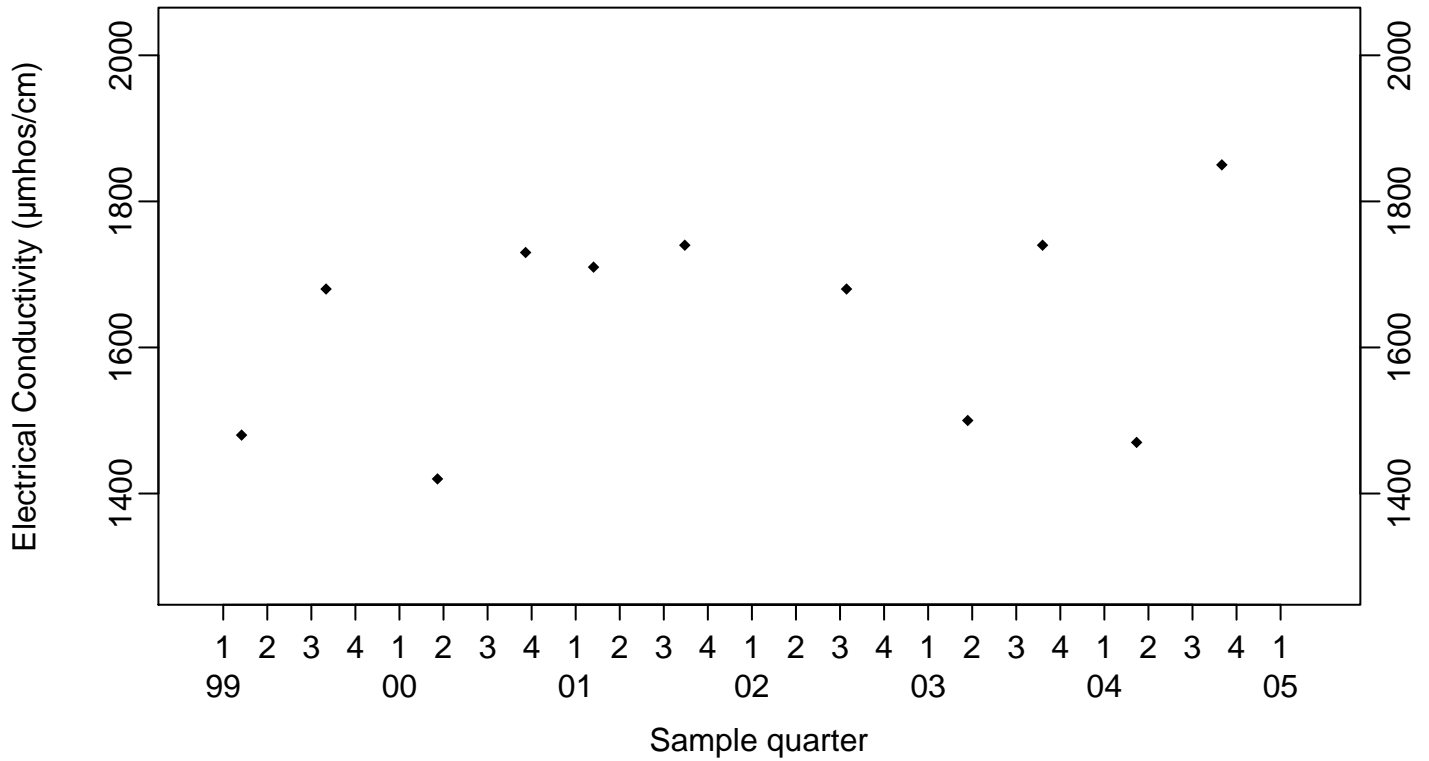
Upgradient Monitor Well W-7ES



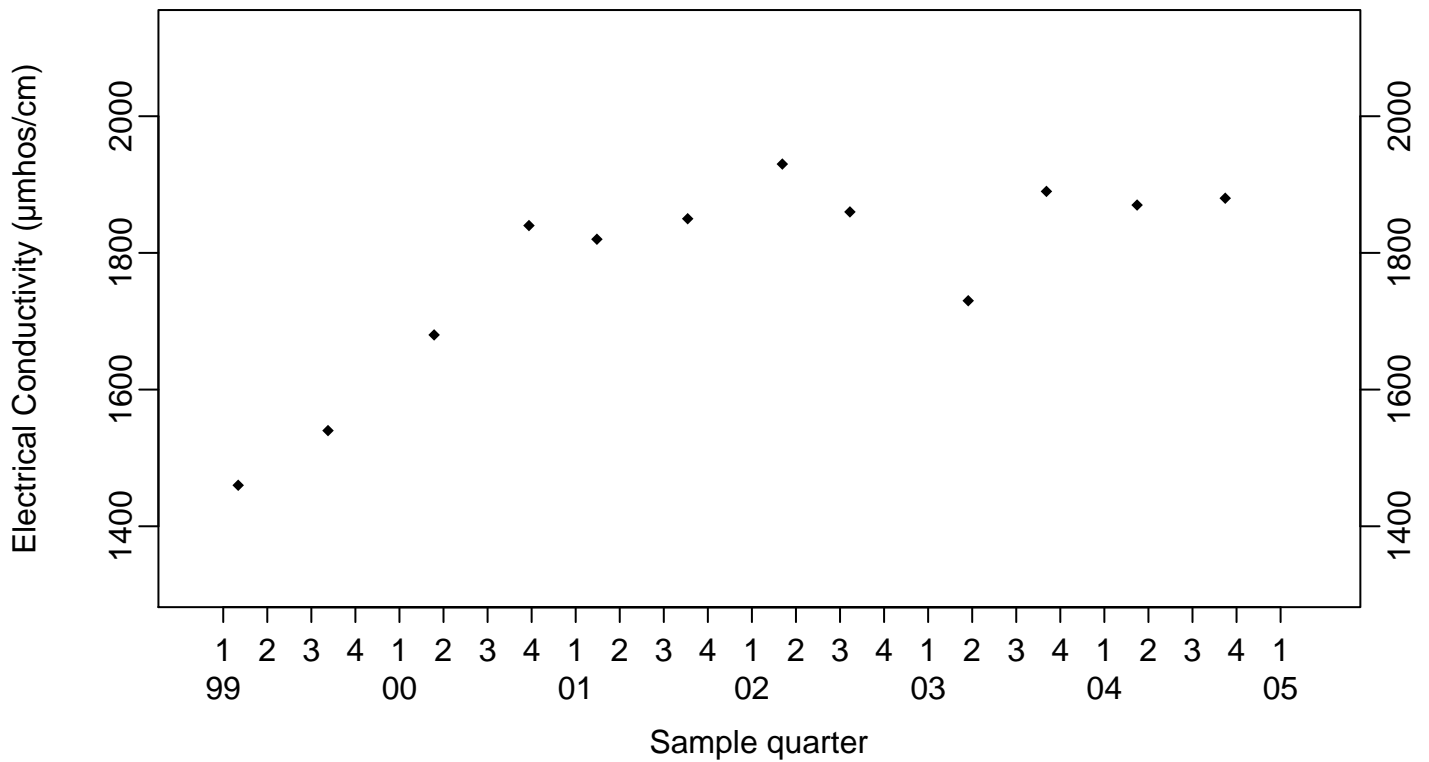
Sewage Ponds Ground Water Electrical Conductivity ($\mu\text{mhos/cm}$)

Upgradient Monitor Well W-7PS

◆ Above RL
▽ Below RL



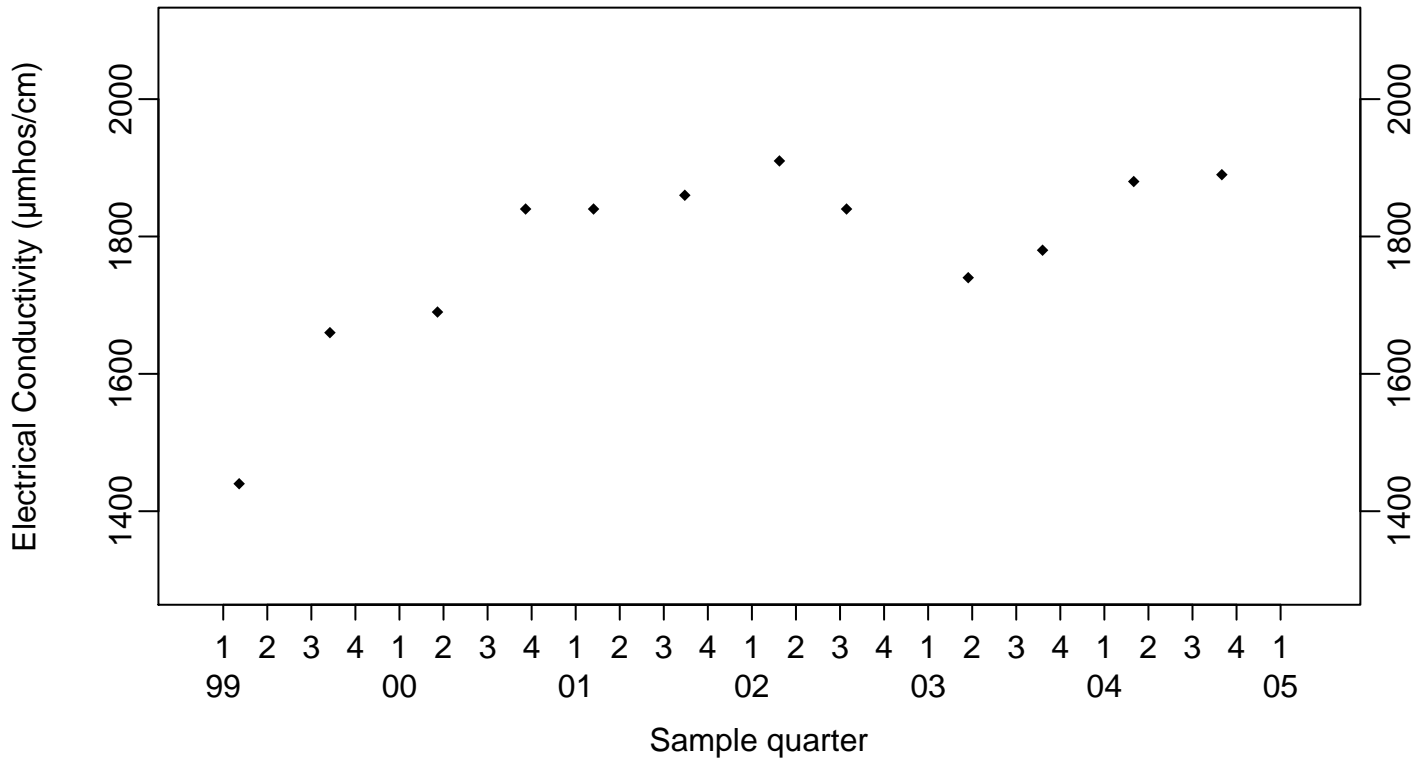
Crossgradient Monitor Well W-35A-04



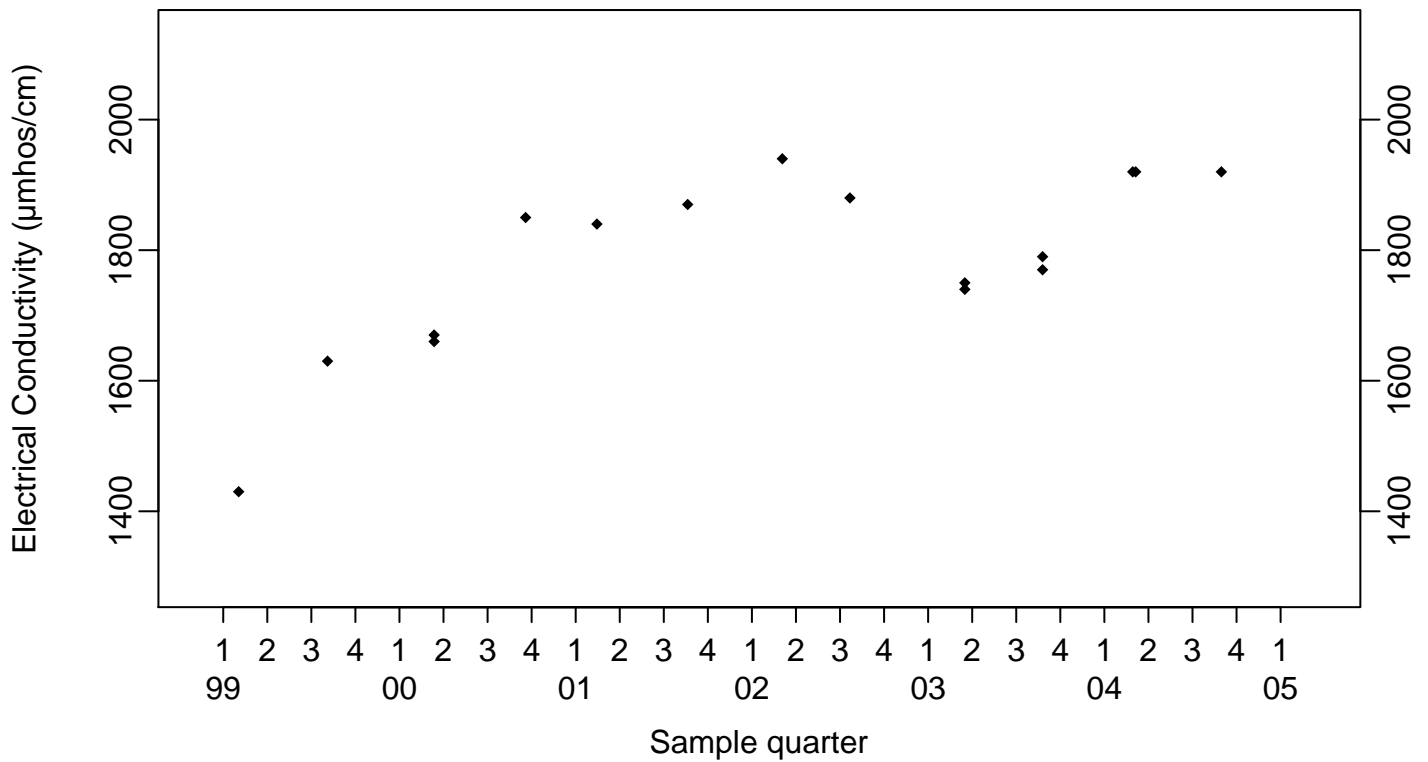
Sewage Ponds Ground Water Electrical Conductivity ($\mu\text{mhos/cm}$)

Downgradient Monitor Well W-7DS

- ◆ Above RL
- ▽ Below RL



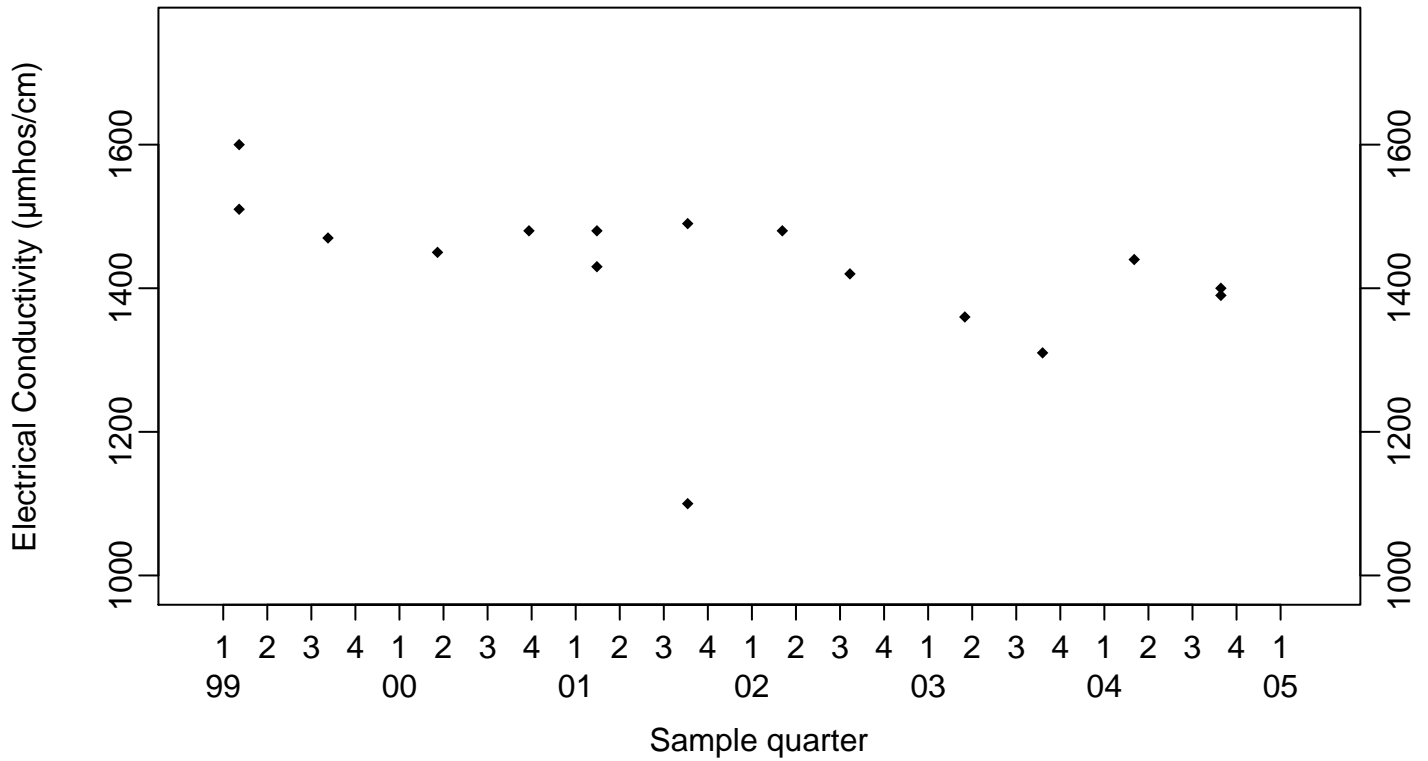
Downgradient Monitor Well W-25N-20



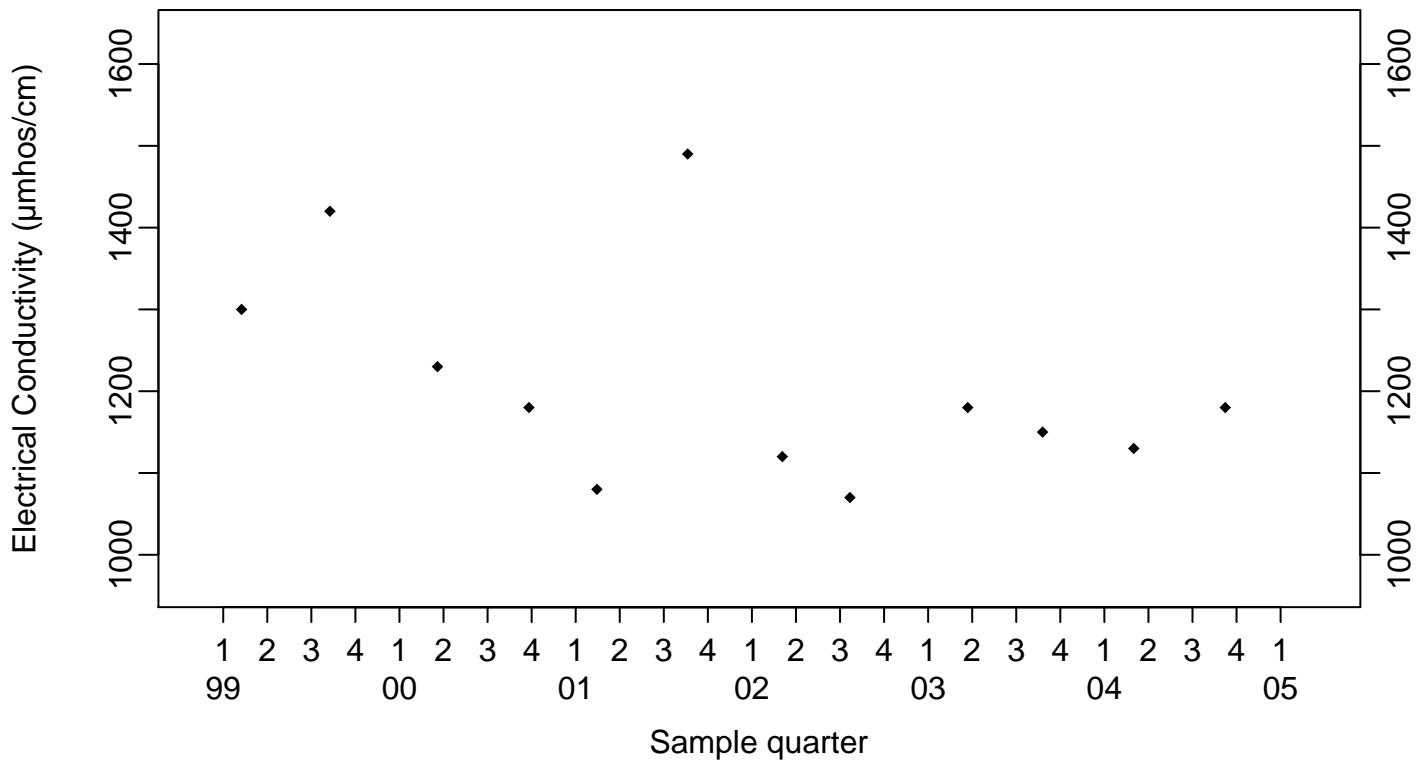
Sewage Ponds Ground Water Electrical Conductivity ($\mu\text{mhos/cm}$)

Downgradient Monitor Well W-26R-01

- ◆ Above RL
- ▽ Below RL



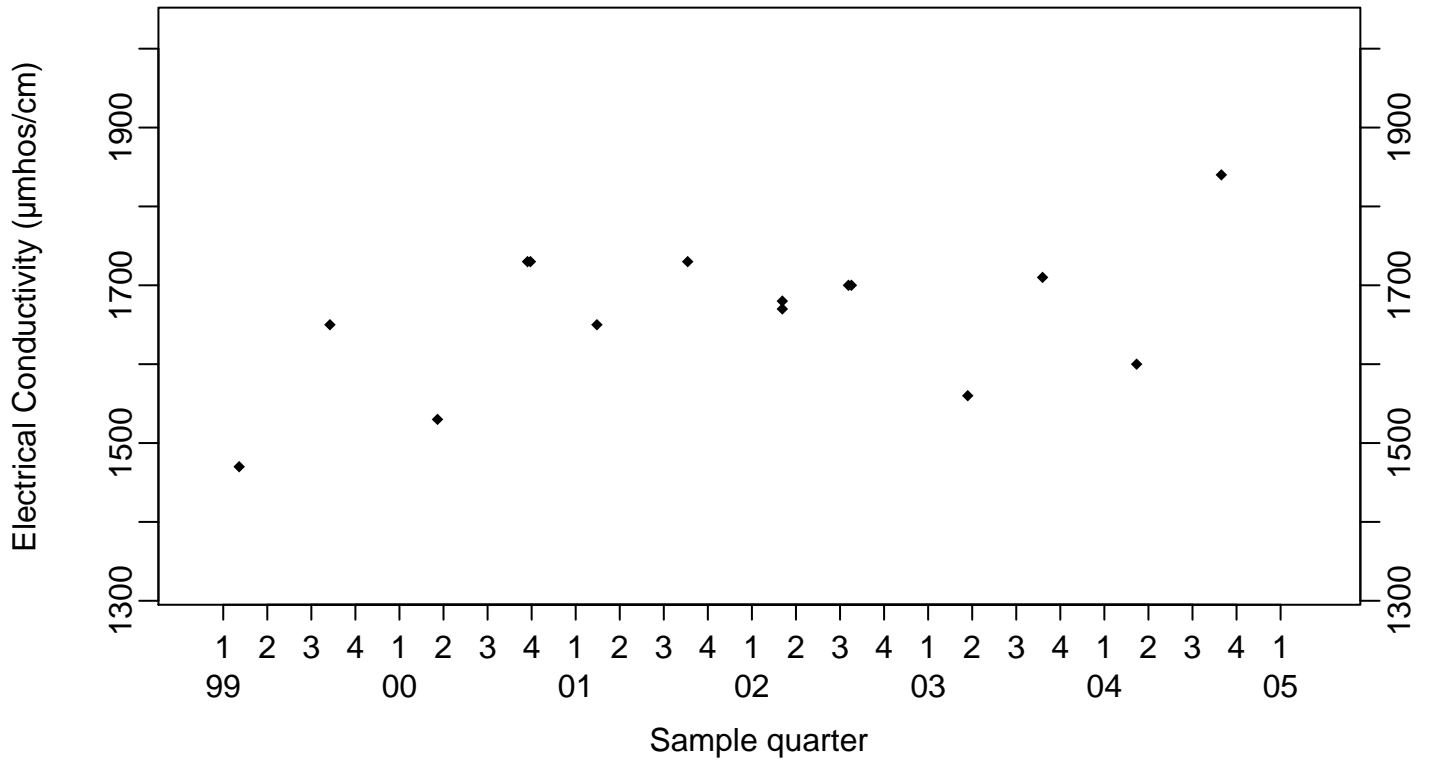
Downgradient Monitor Well W-26R-05



Sewage Ponds Ground Water Electrical Conductivity ($\mu\text{mhos/cm}$)

Downgradient Monitor Well W-26R-11

◆ Above RL
▽ Below RL

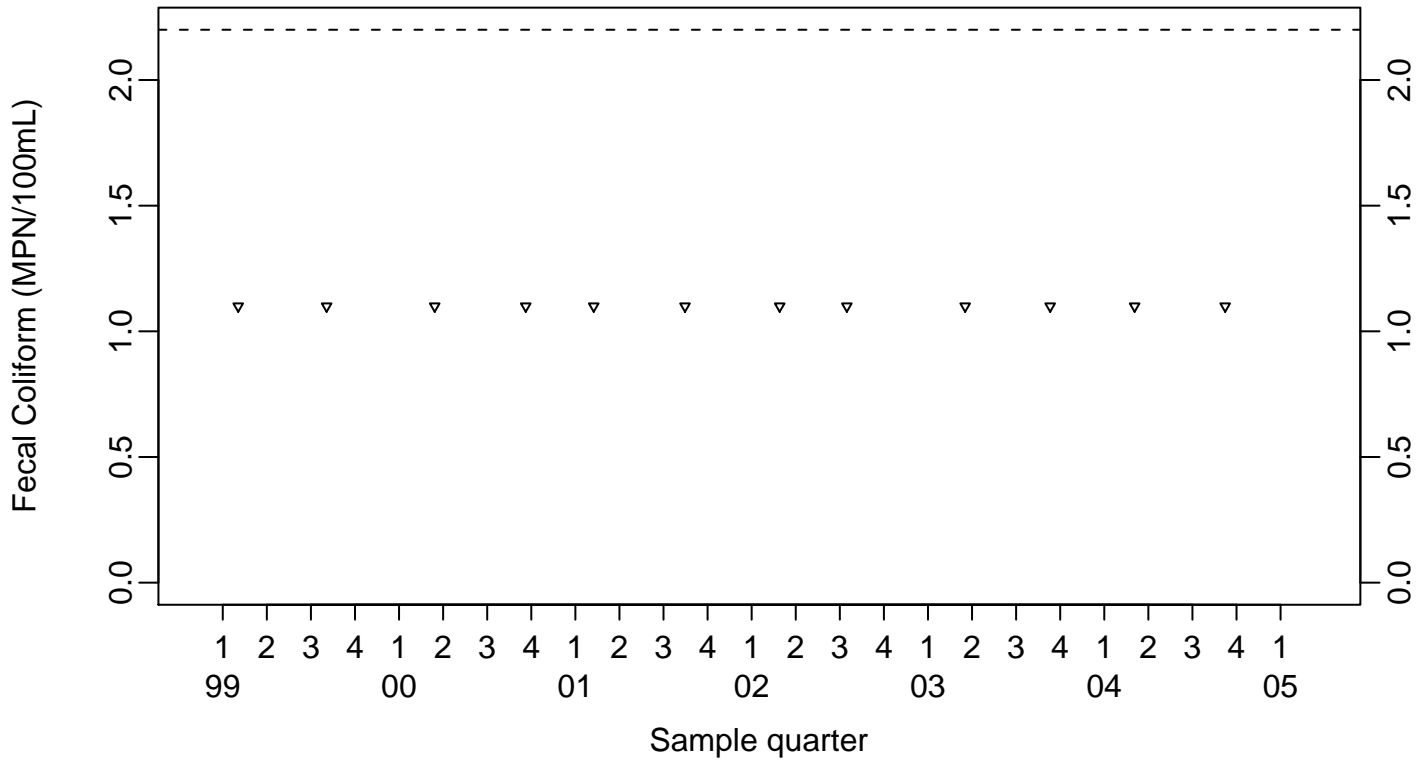


Sewage Ponds Ground Water Fecal Coliform (MPN/100mL)

Upgradient Monitor Well W-7E

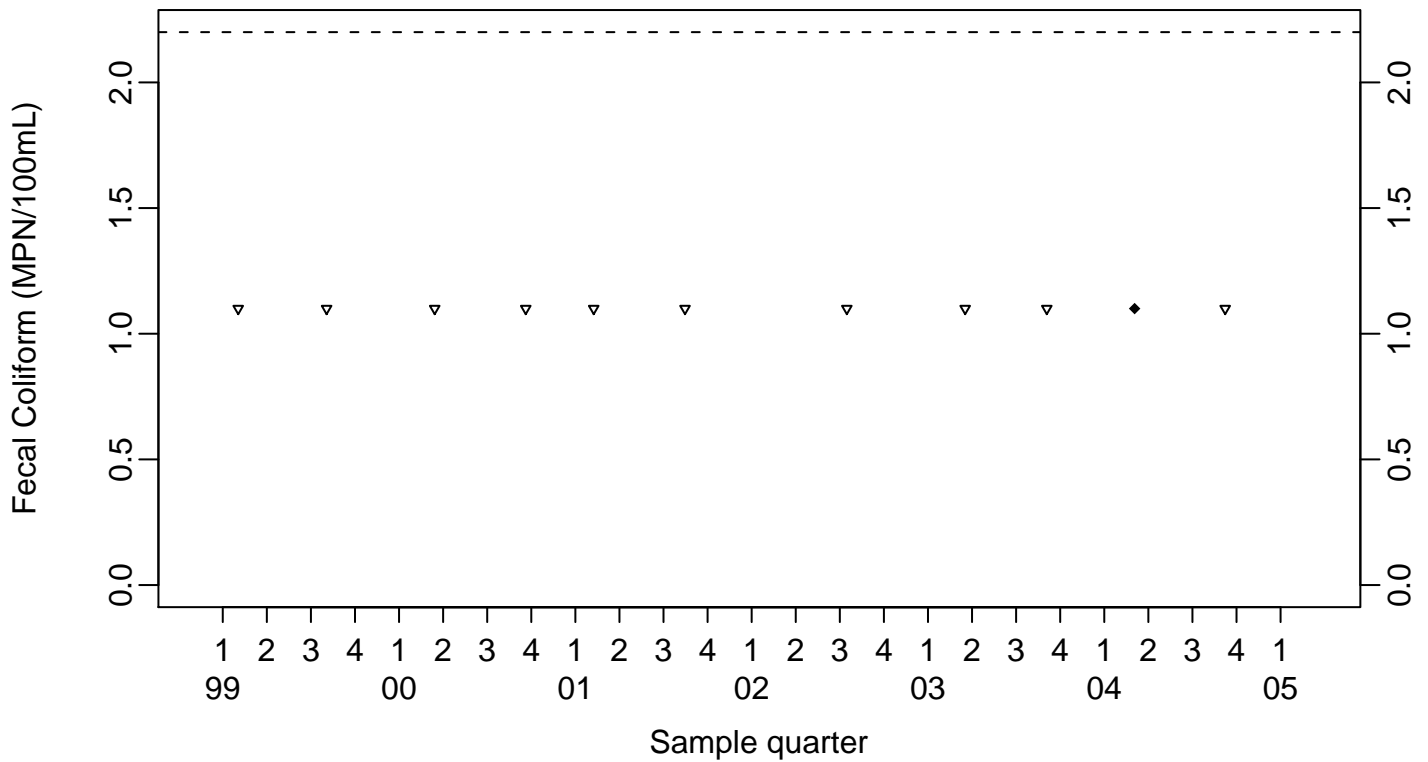
PL=2.2

◆ Above RL
▽ Below RL



PL=2.2

Upgradient Monitor Well W-7ES

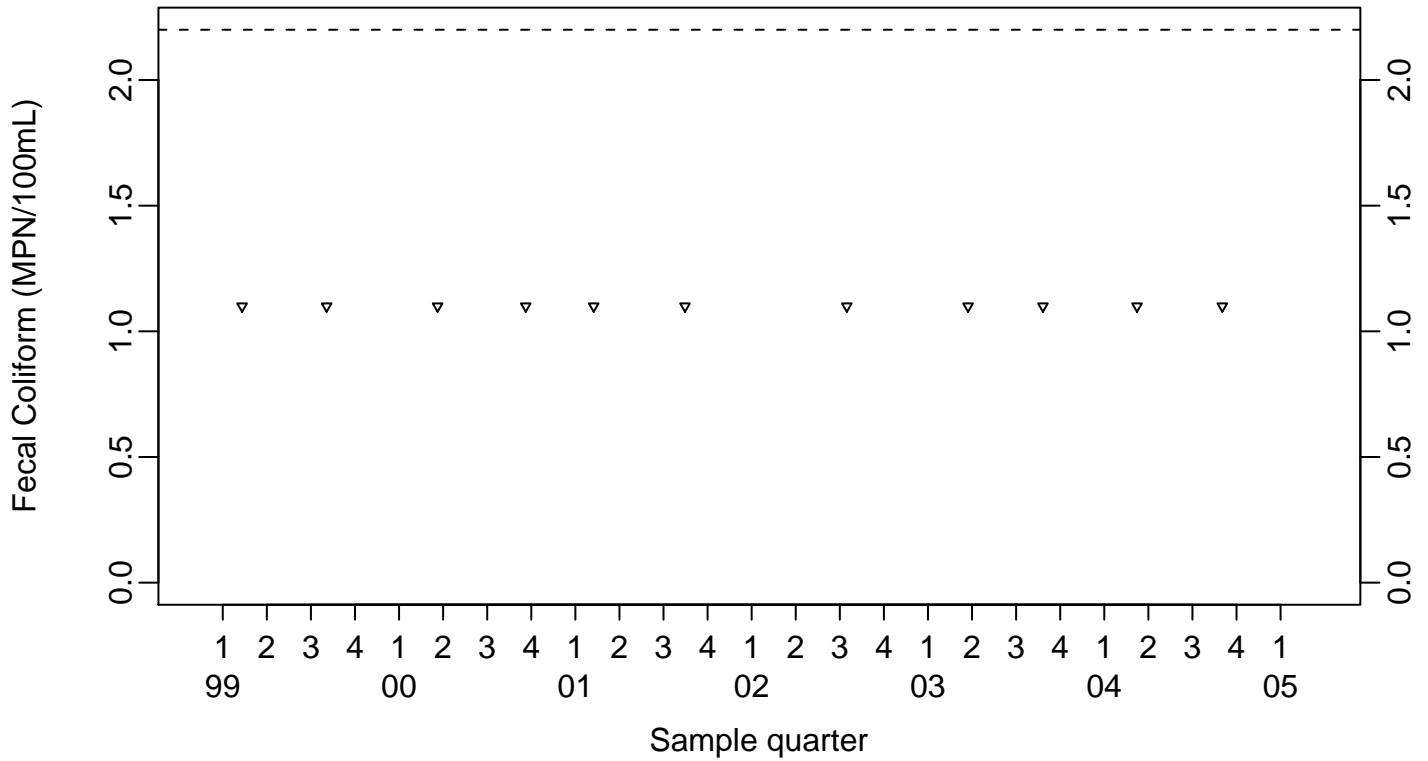


Sewage Ponds Ground Water Fecal Coliform (MPN/100mL)

Upgradient Monitor Well W-7PS

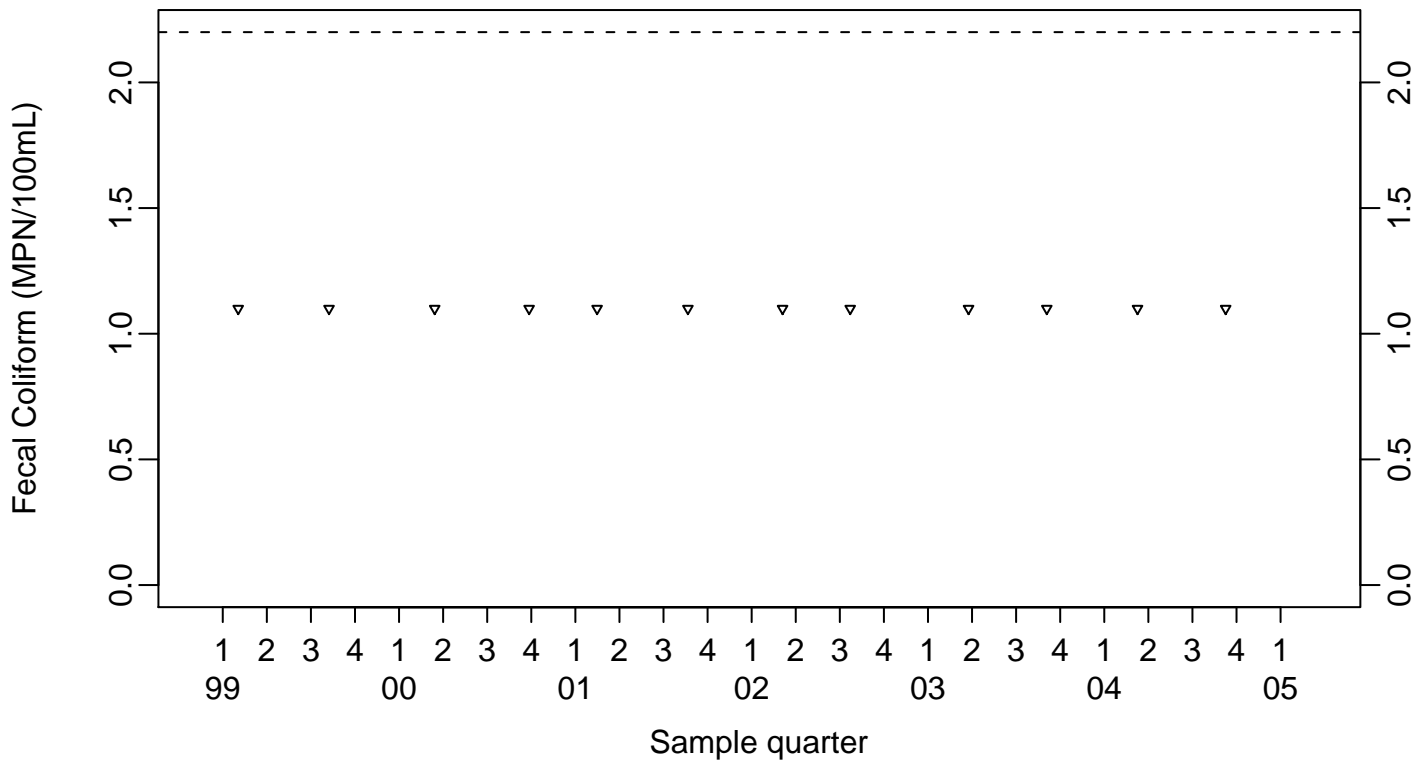
PL=2.2

◆ Above RL
▽ Below RL



PL=2.2

Crossgradient Monitor Well W-35A-04

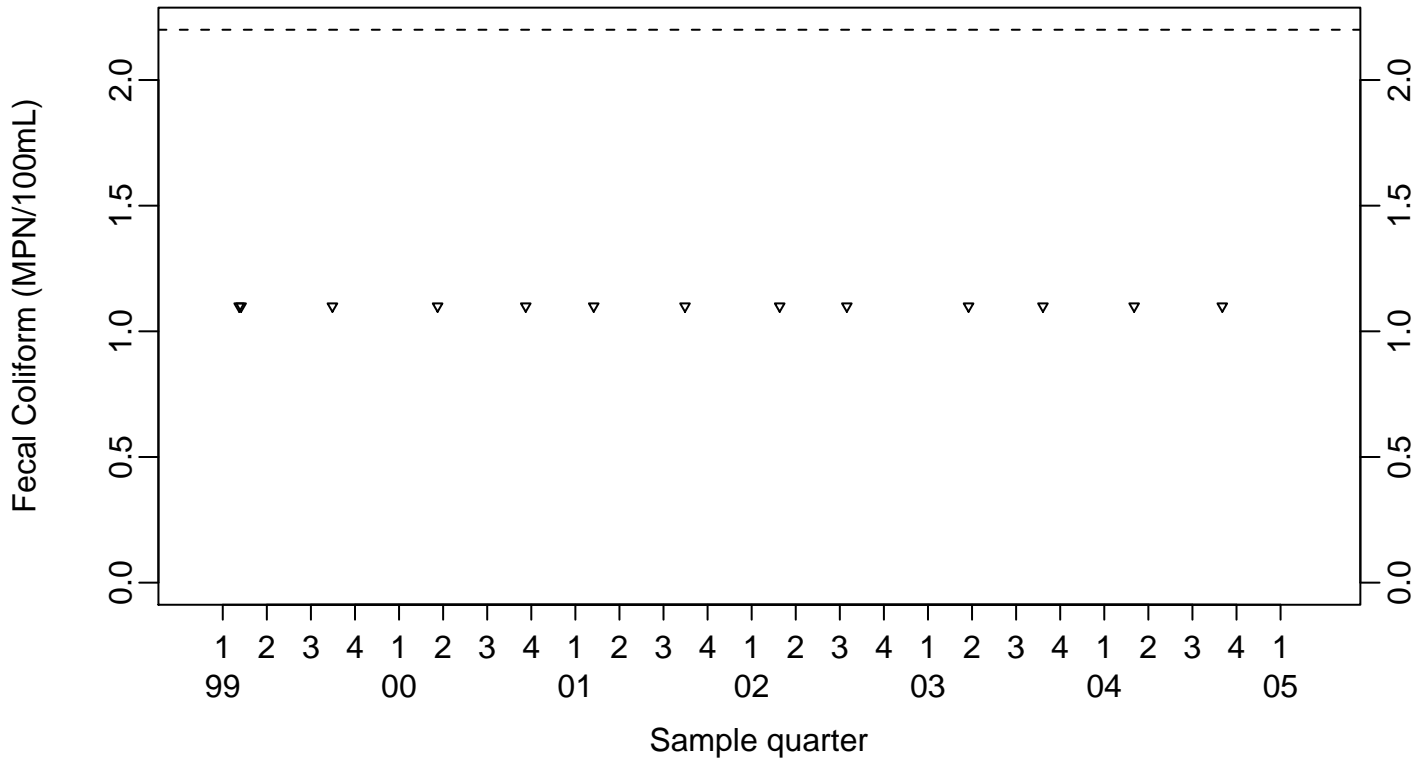


Sewage Ponds Ground Water Fecal Coliform (MPN/100mL)

Downgradient Monitor Well W-7DS

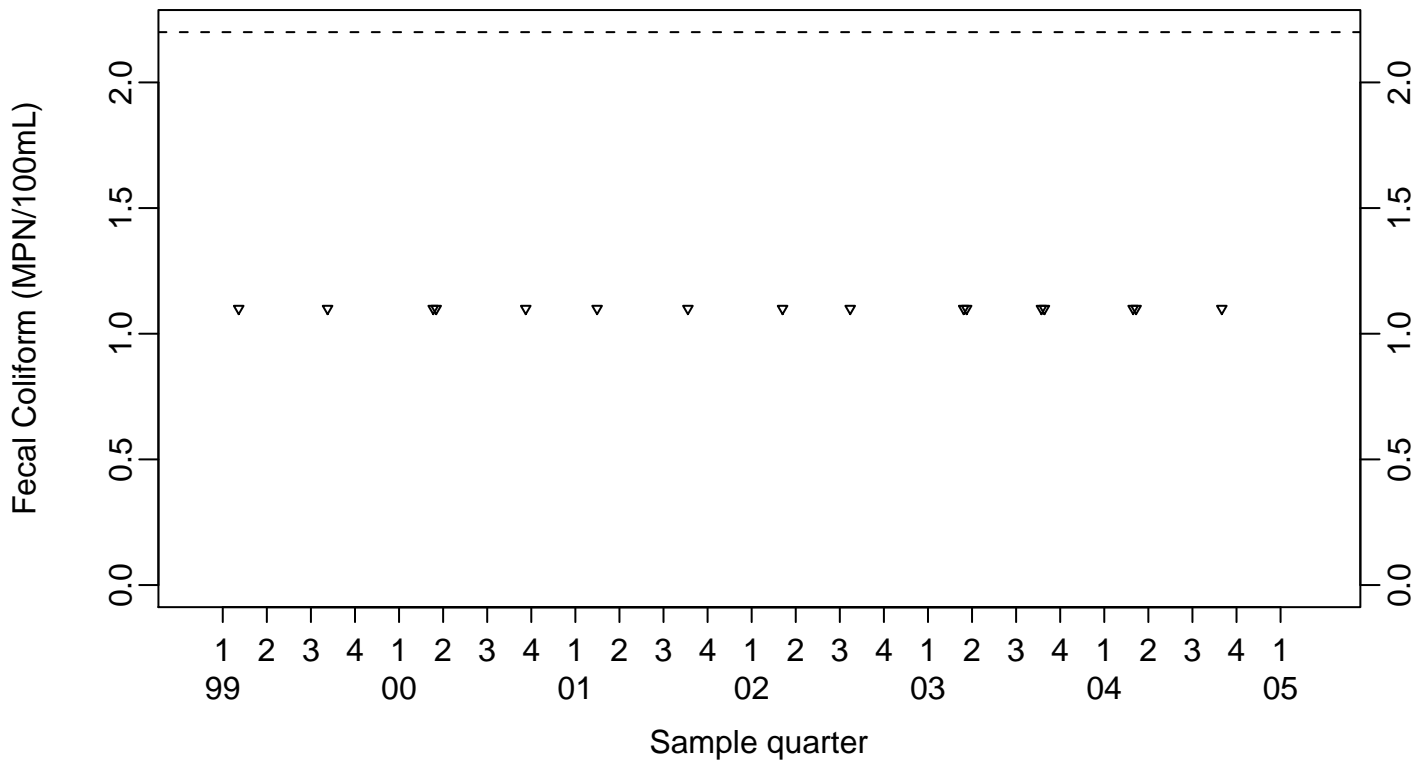
PL=2.2

◆ Above RL
▽ Below RL



PL=2.2

Downgradient Monitor Well W-25N-20

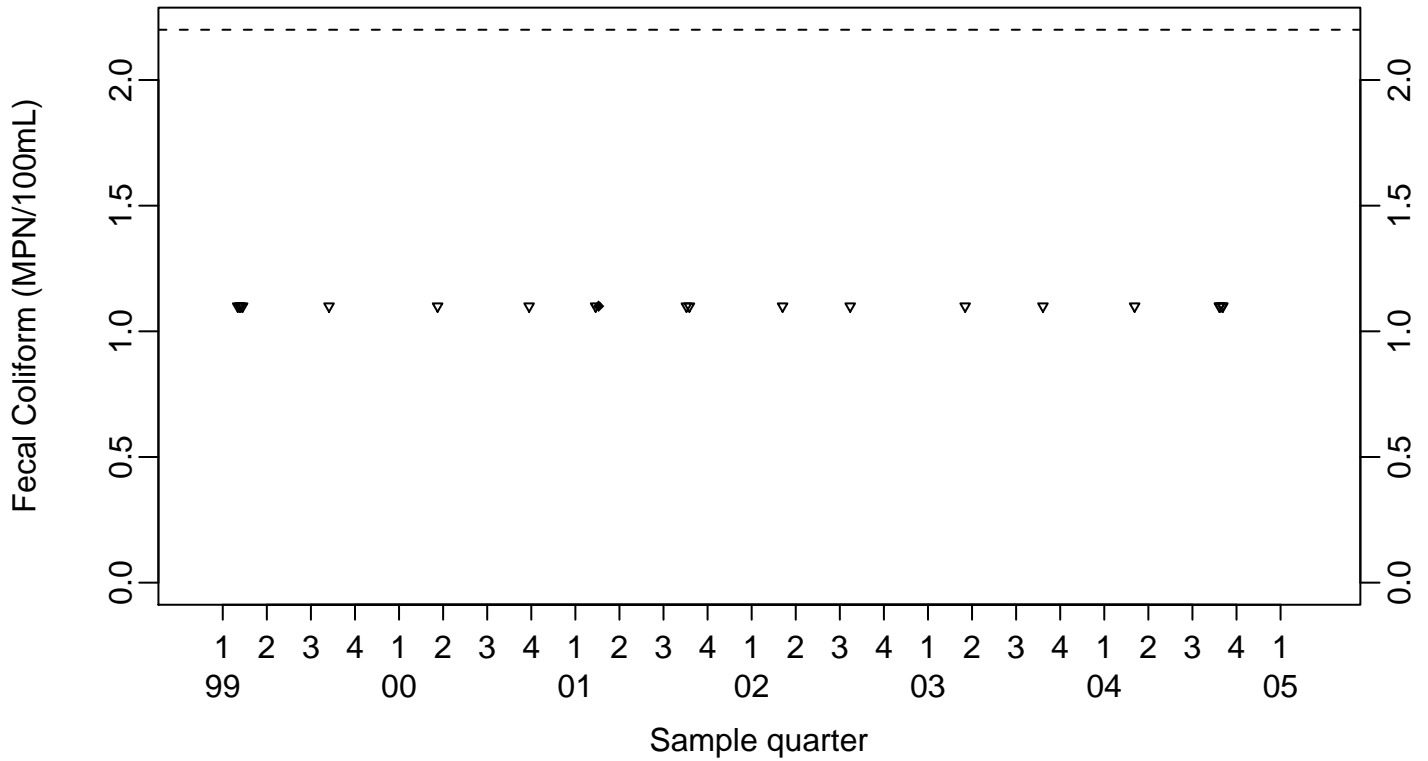


Sewage Ponds Ground Water Fecal Coliform (MPN/100mL)

Downgradient Monitor Well W-26R-01

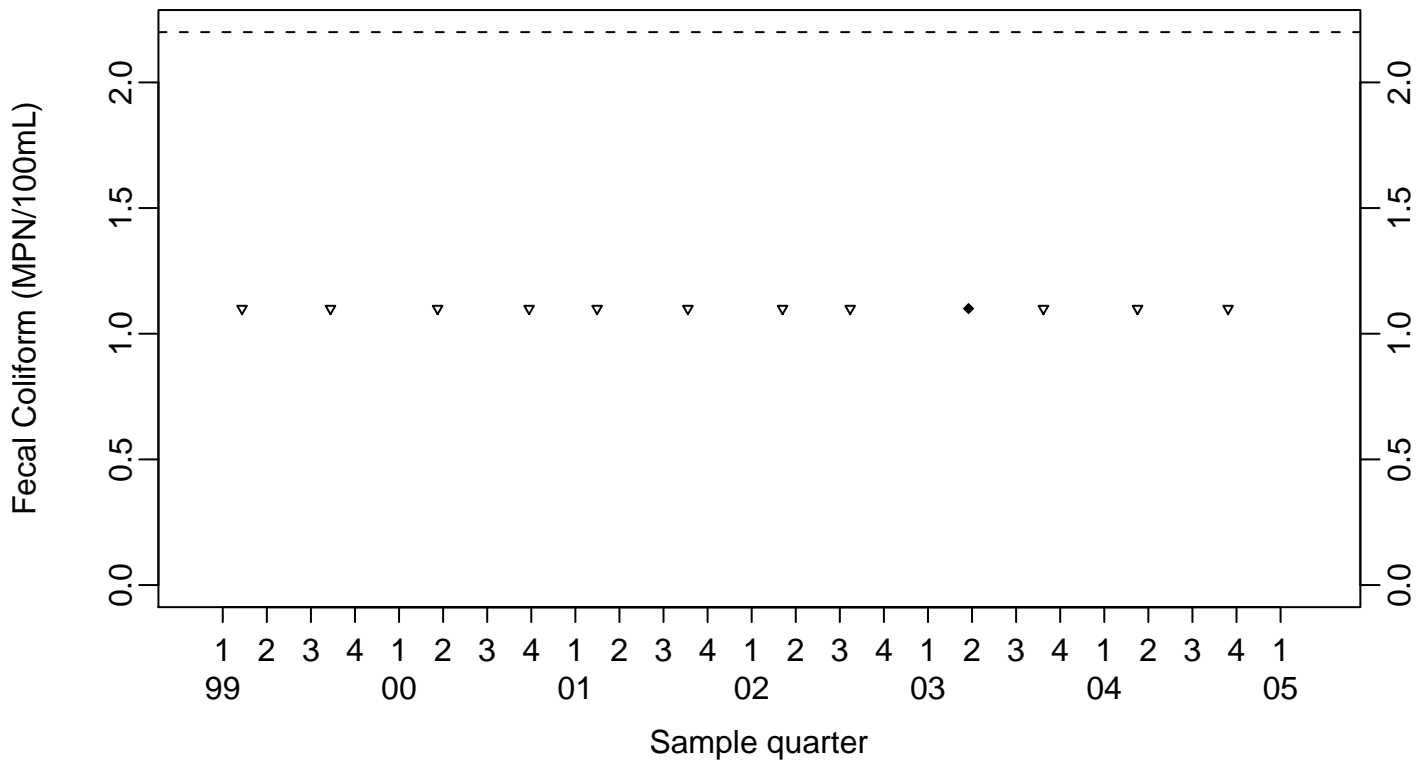
PL=2.2

◆ Above RL
▽ Below RL



Downgradient Monitor Well W-26R-05

PL=2.2

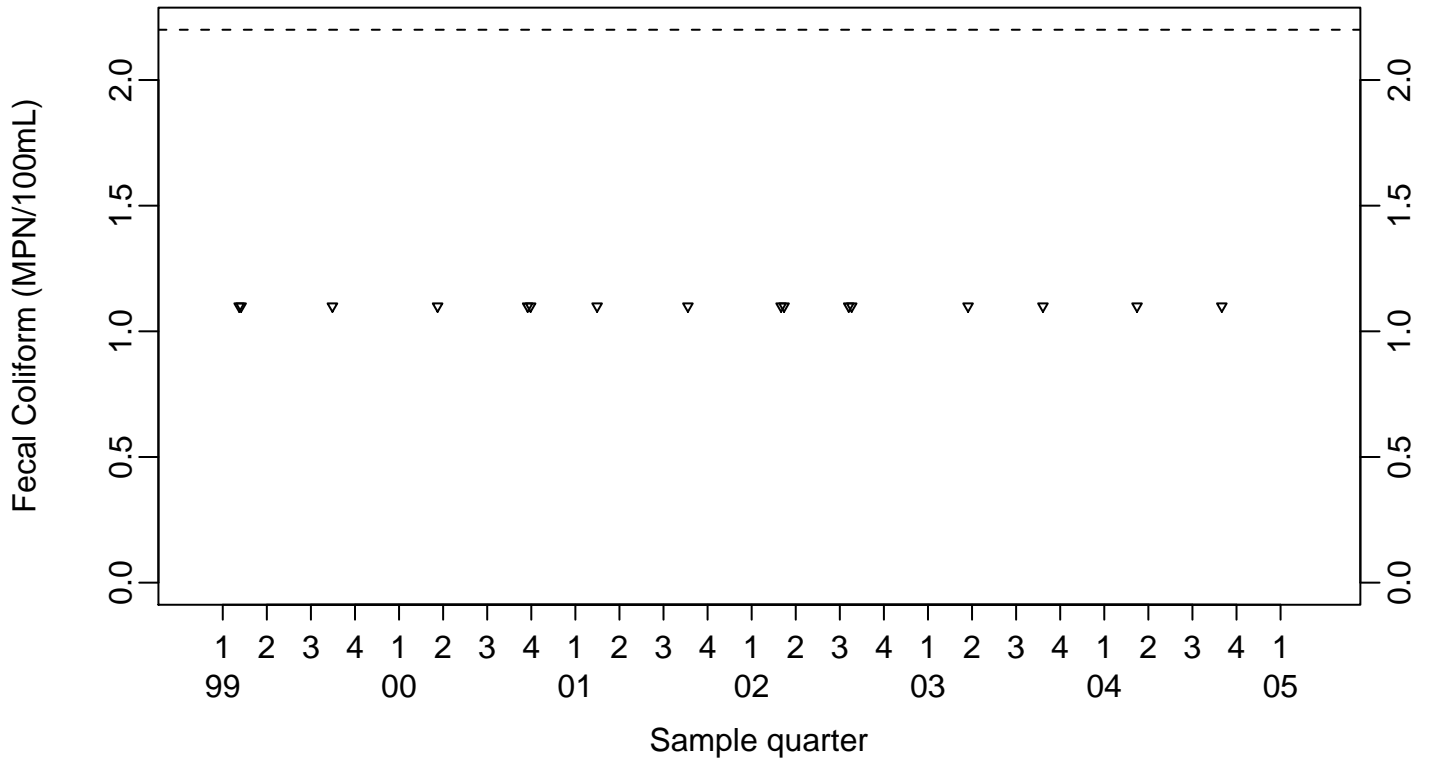


Sewage Ponds Ground Water Fecal Coliform (MPN/100mL)

Downgradient Monitor Well W-26R-11

PL=2.2

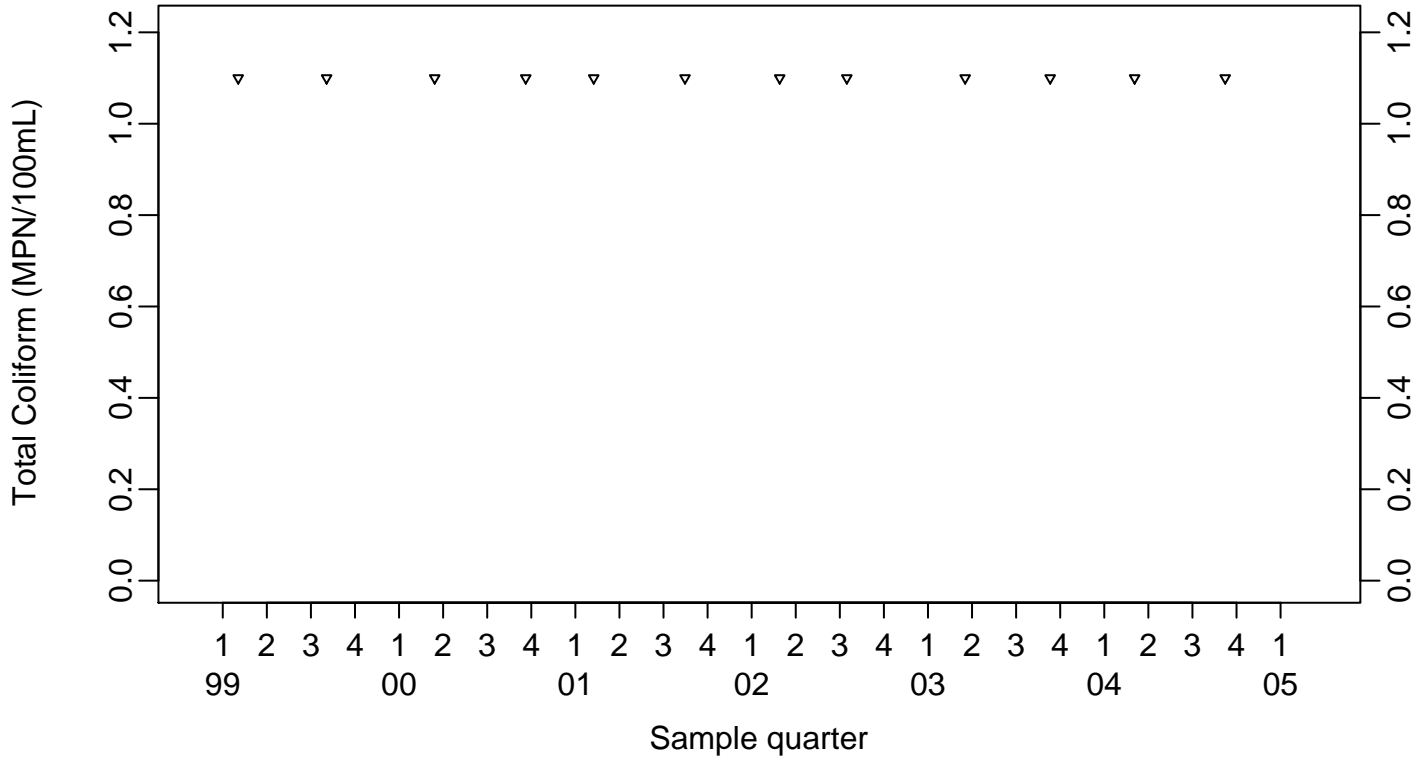
◆ Above RL
▽ Below RL



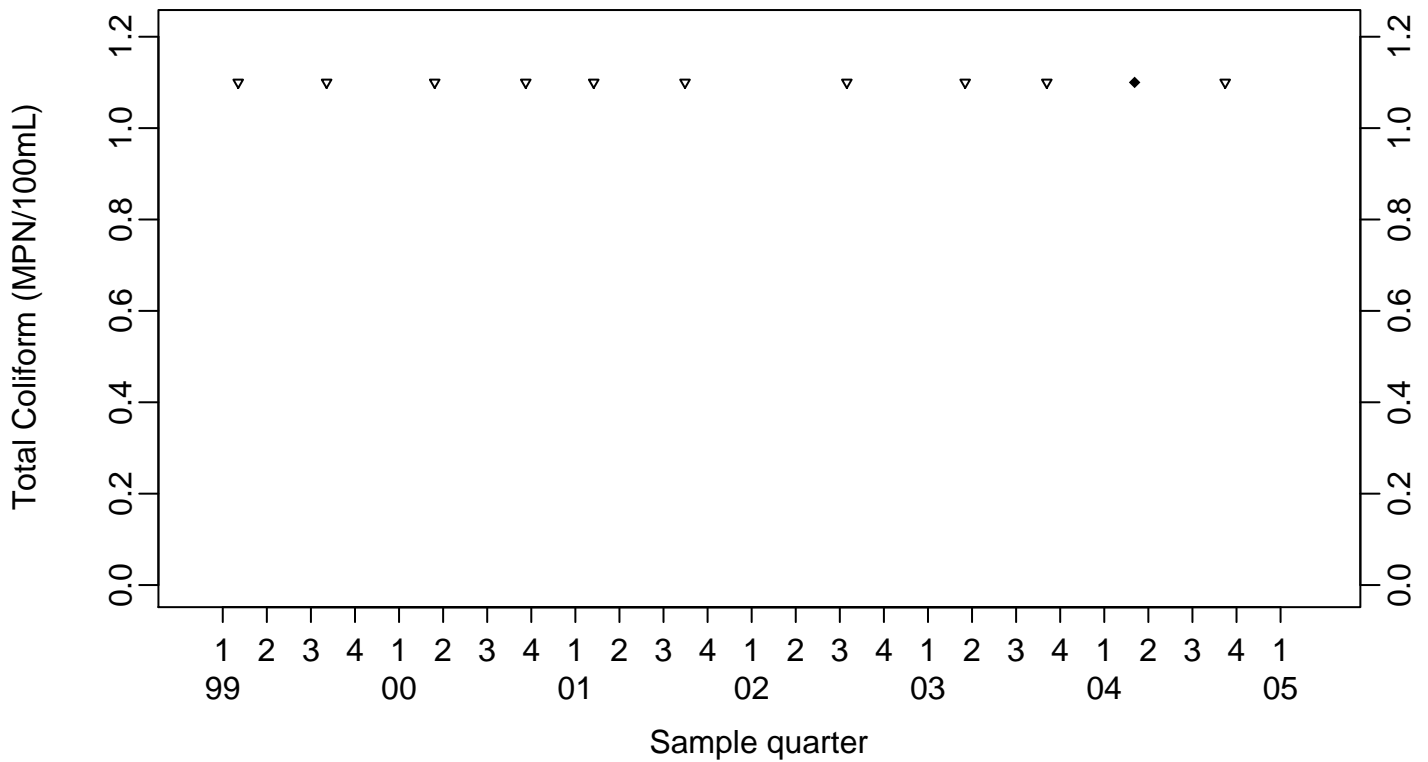
Sewage Ponds Ground Water Total Coliform (MPN/100mL)

Upgradient Monitor Well W-7E

◆ Above RL
▽ Below RL



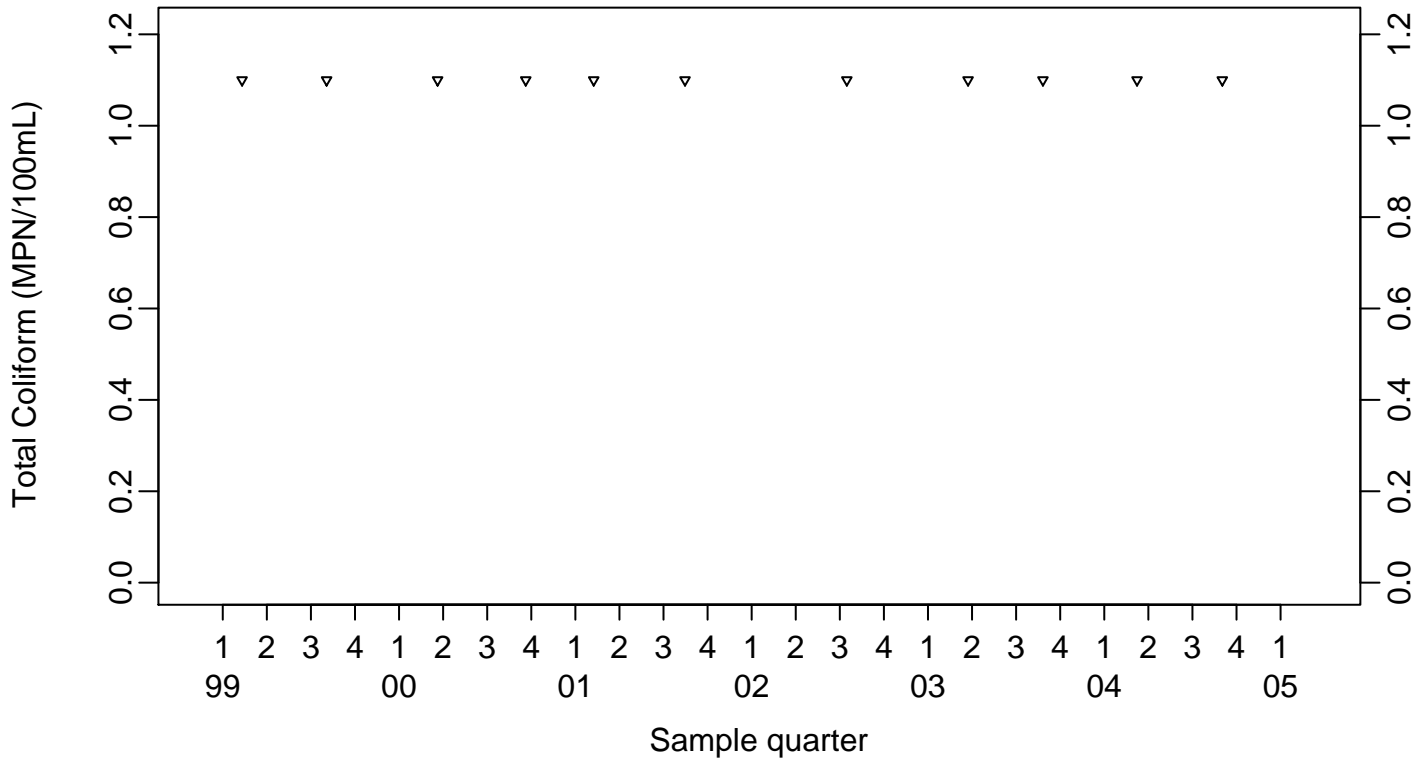
Upgradient Monitor Well W-7ES



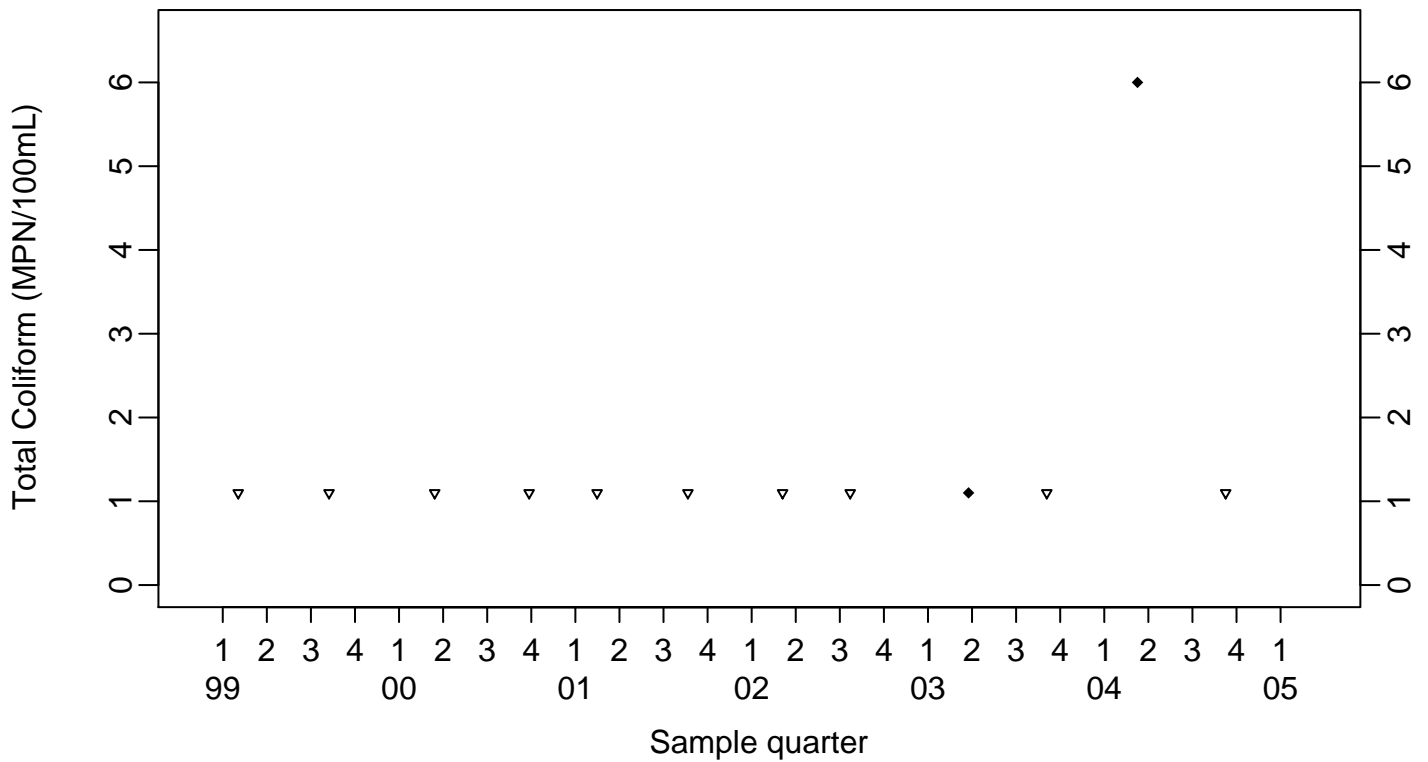
Sewage Ponds Ground Water Total Coliform (MPN/100mL)

Upgradient Monitor Well W-7PS

◆ Above RL
▽ Below RL



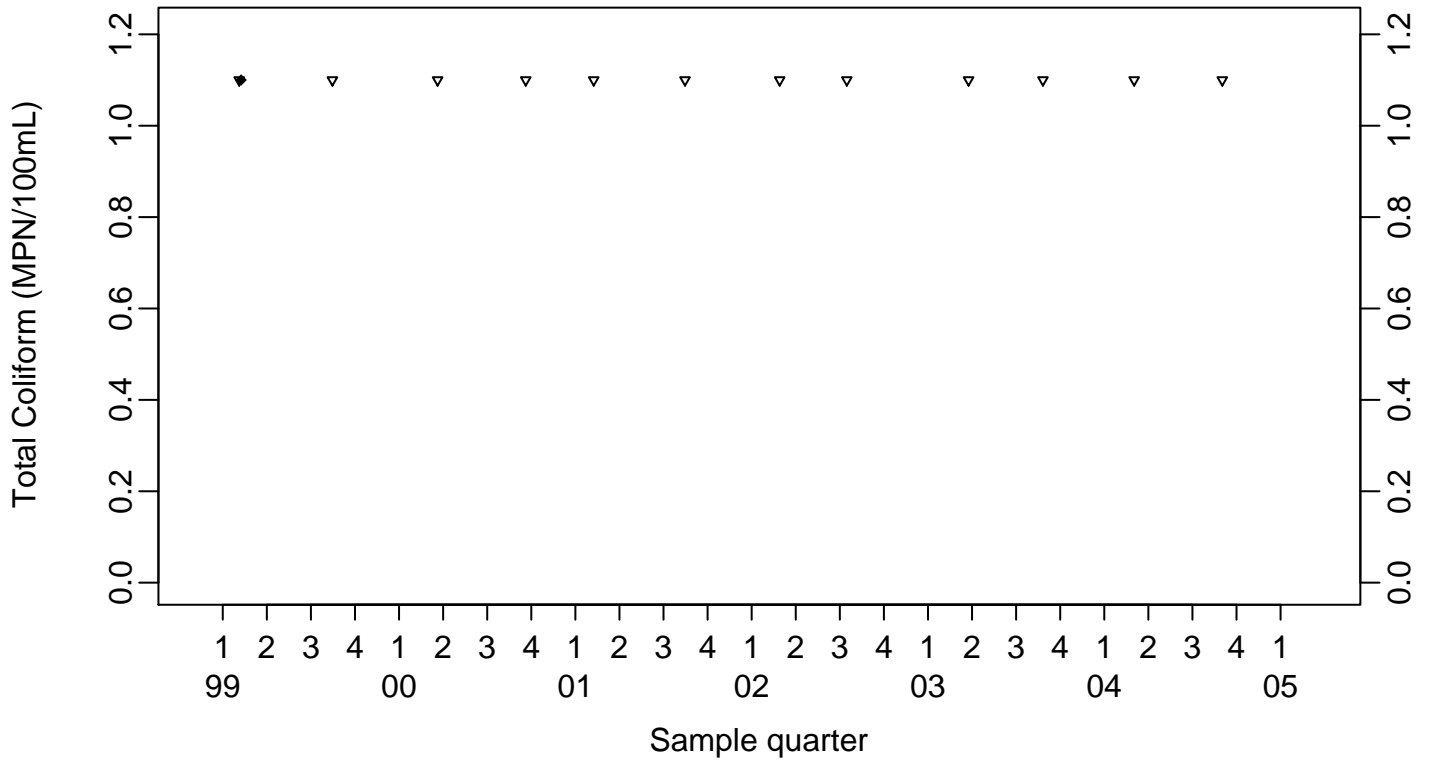
Crossgradient Monitor Well W-35A-04



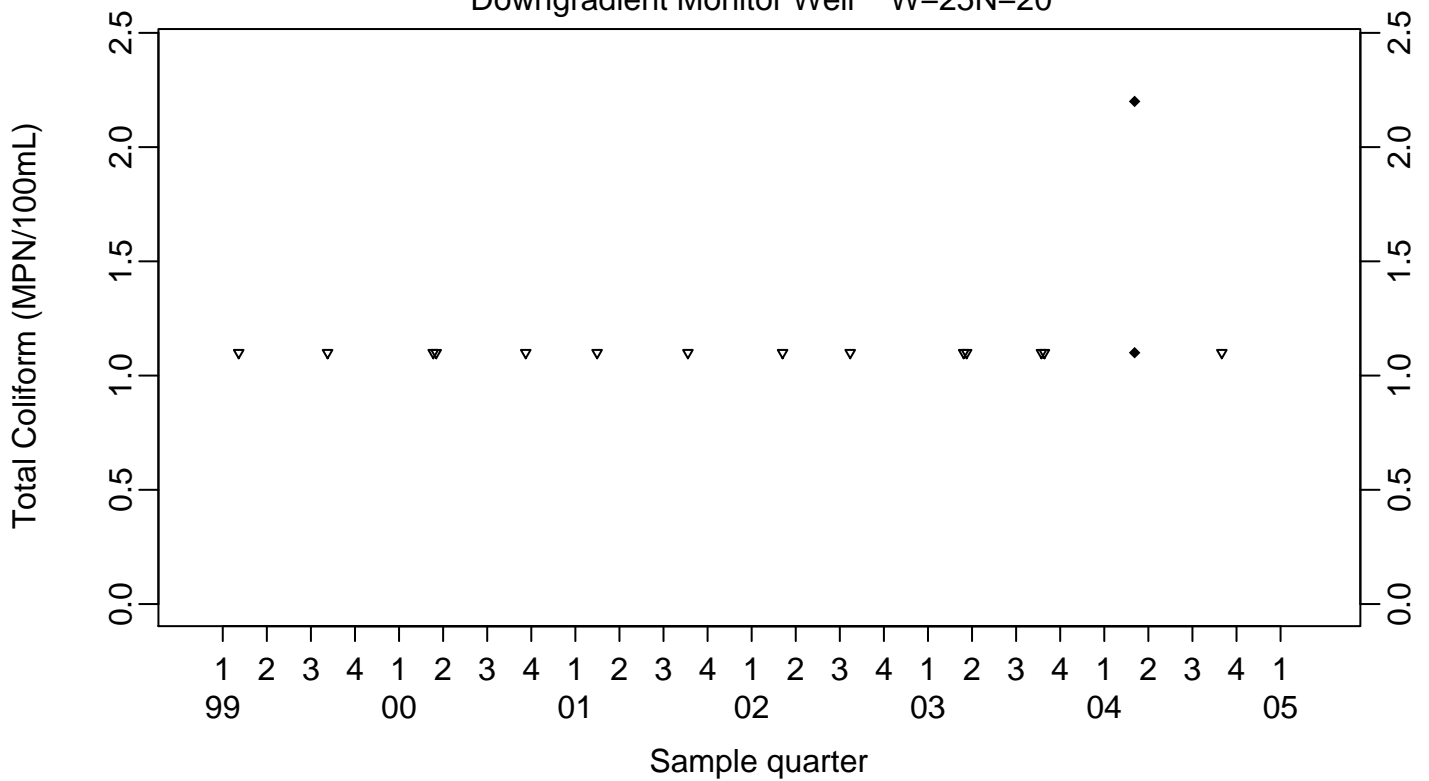
Sewage Ponds Ground Water Total Coliform (MPN/100mL)

Downgradient Monitor Well W-7DS

◆ Above RL
▽ Below RL



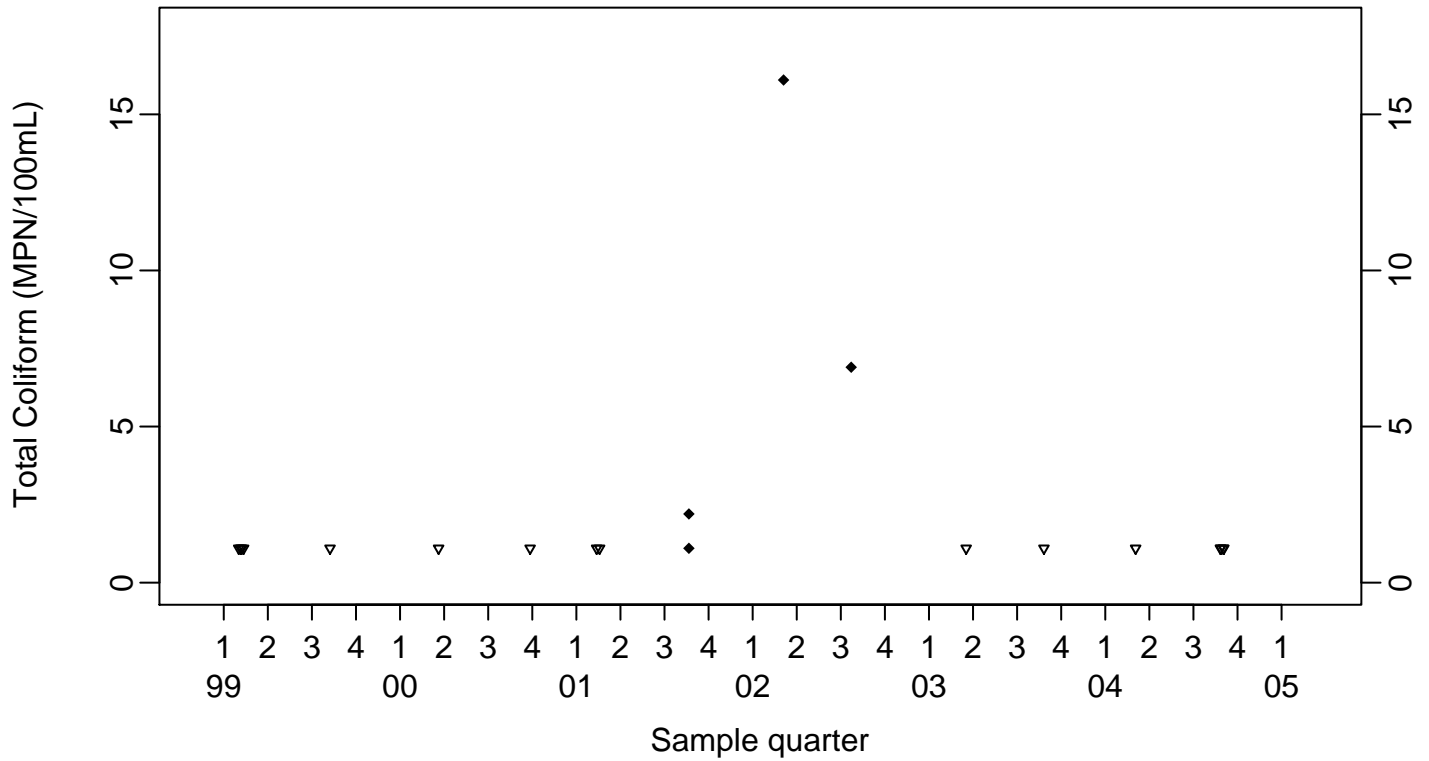
Downgradient Monitor Well W-25N-20



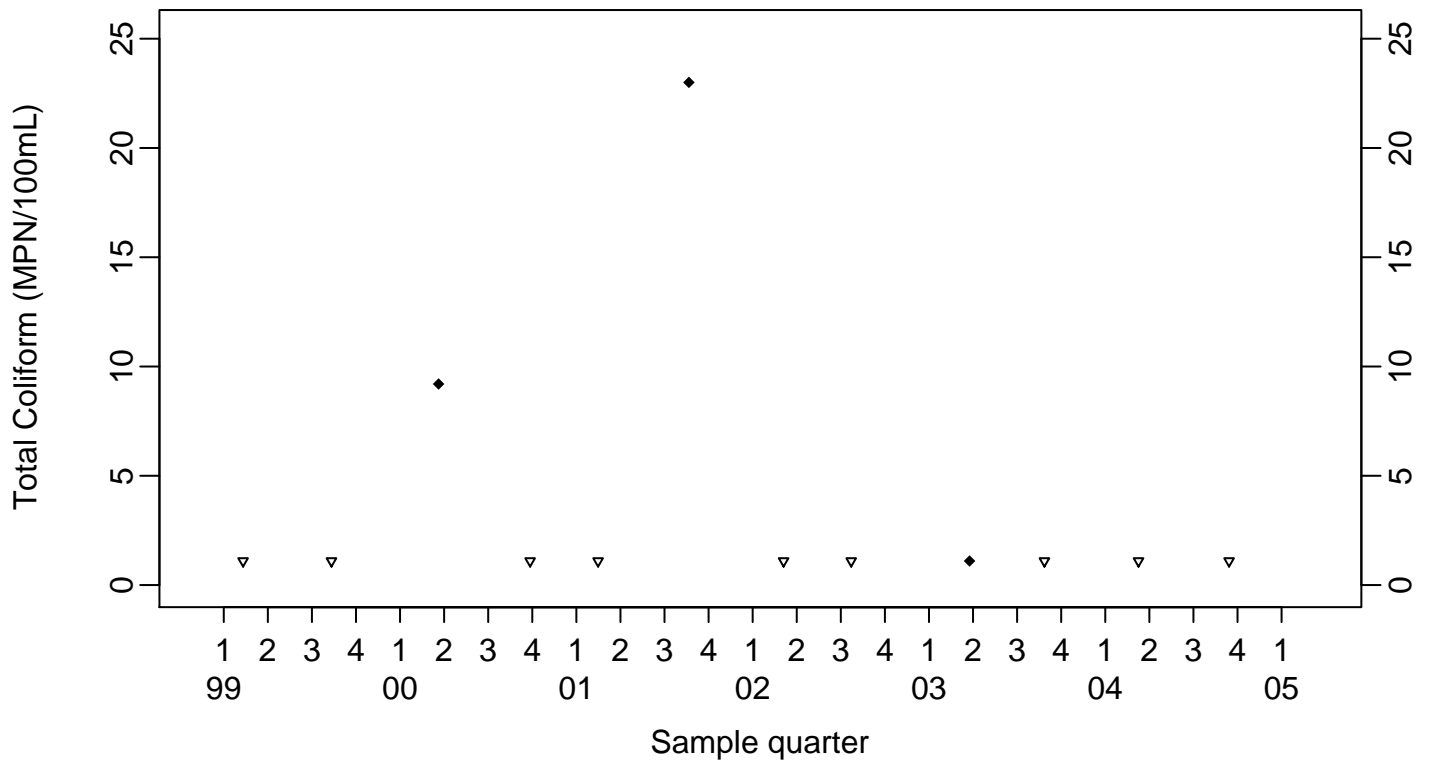
Sewage Ponds Ground Water
 Total Coliform (MPN/100mL)

Downgradient Monitor Well W-26R-01

◆ Above RL
 ▼ Below RL



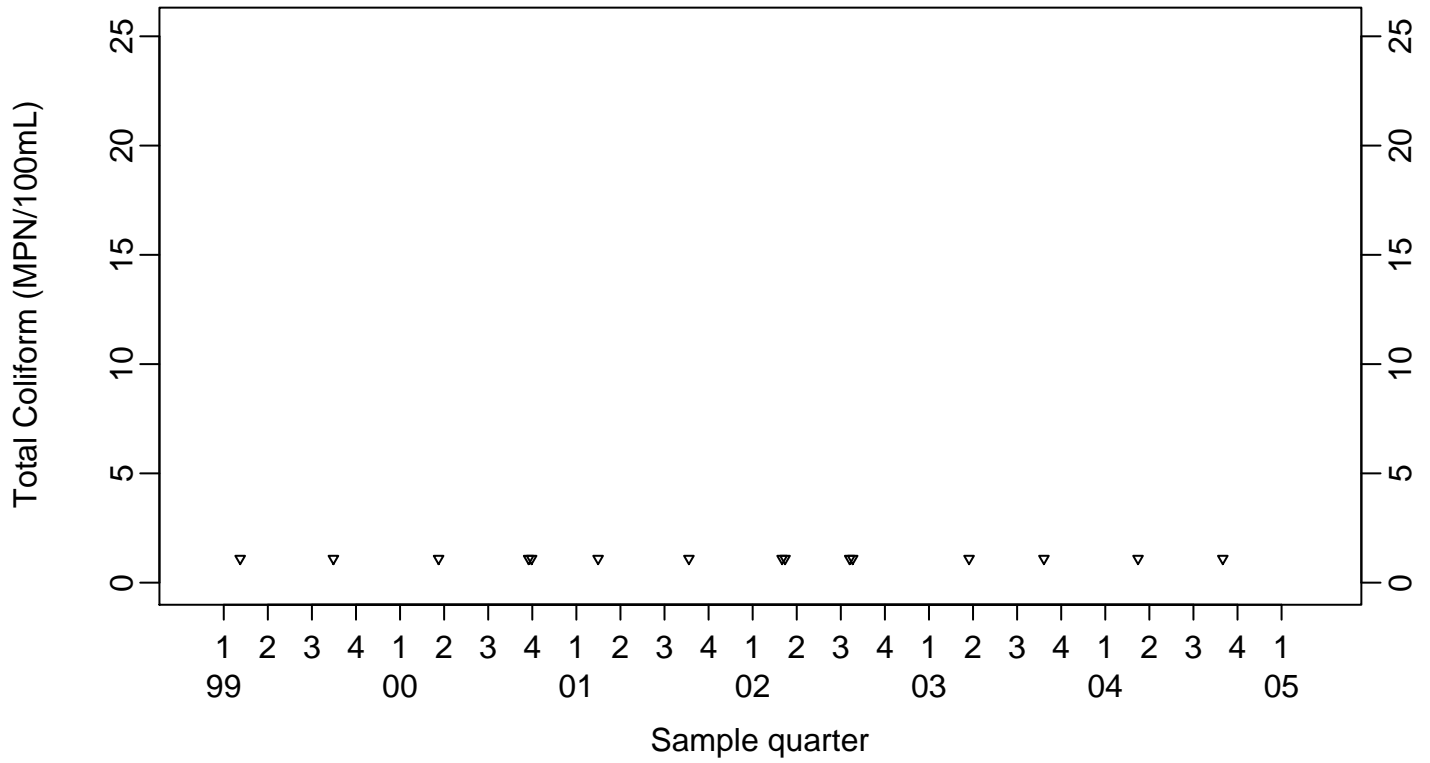
Downgradient Monitor Well W-26R-05



Sewage Ponds Ground Water Total Coliform (MPN/100mL)

Downgradient Monitor Well W-26R-11

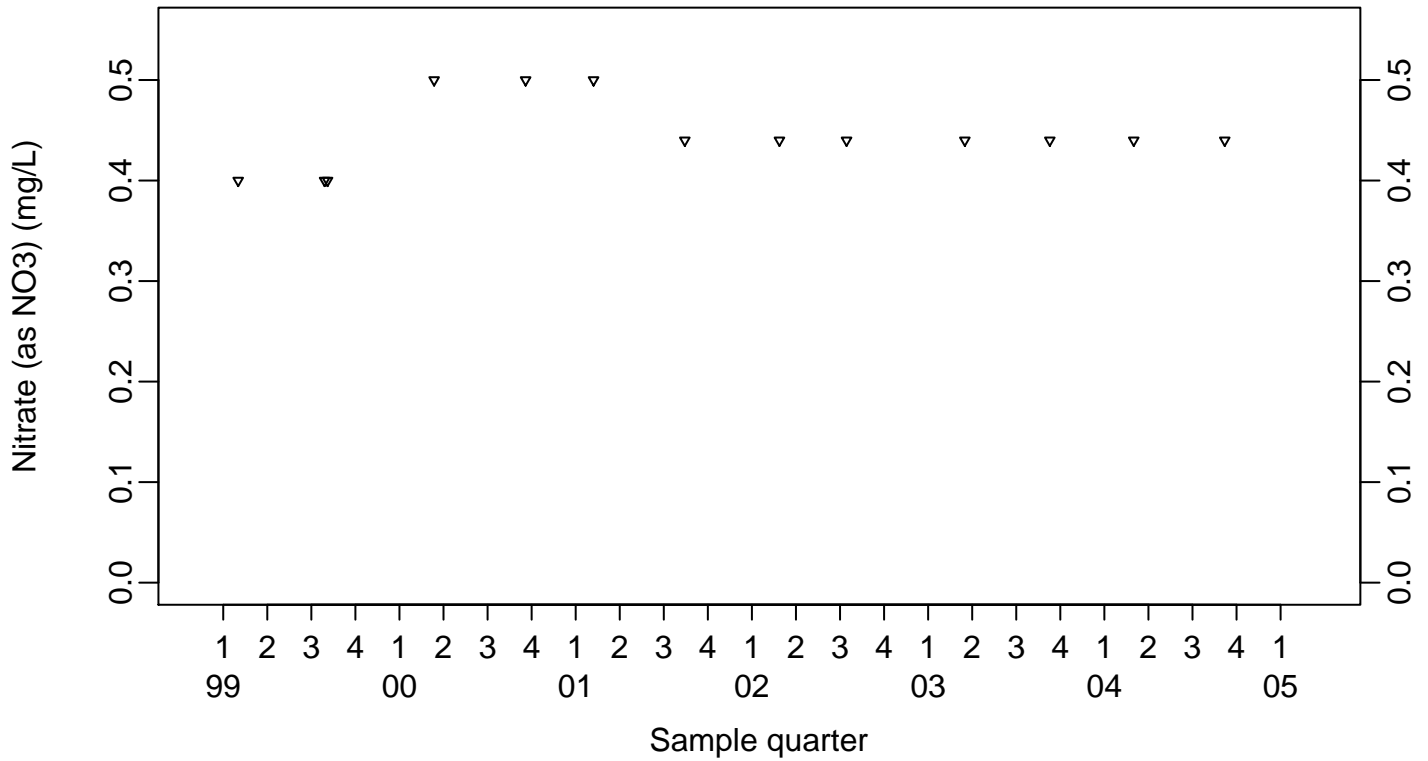
◆ Above RL
▽ Below RL



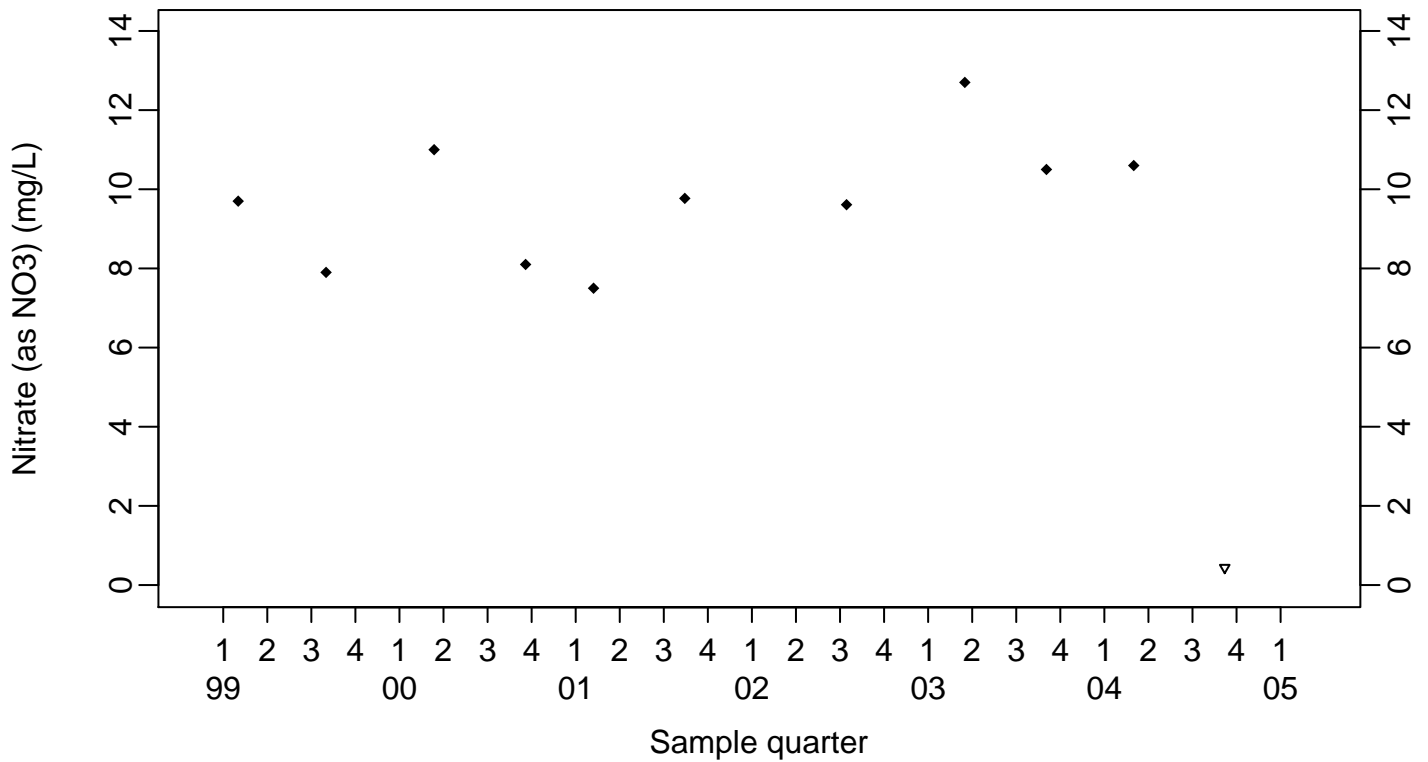
Sewage Ponds Ground Water Nitrate (as NO3) (mg/L)

Upgradient Monitor Well W-7E

◆ Above RL
▽ Below RL



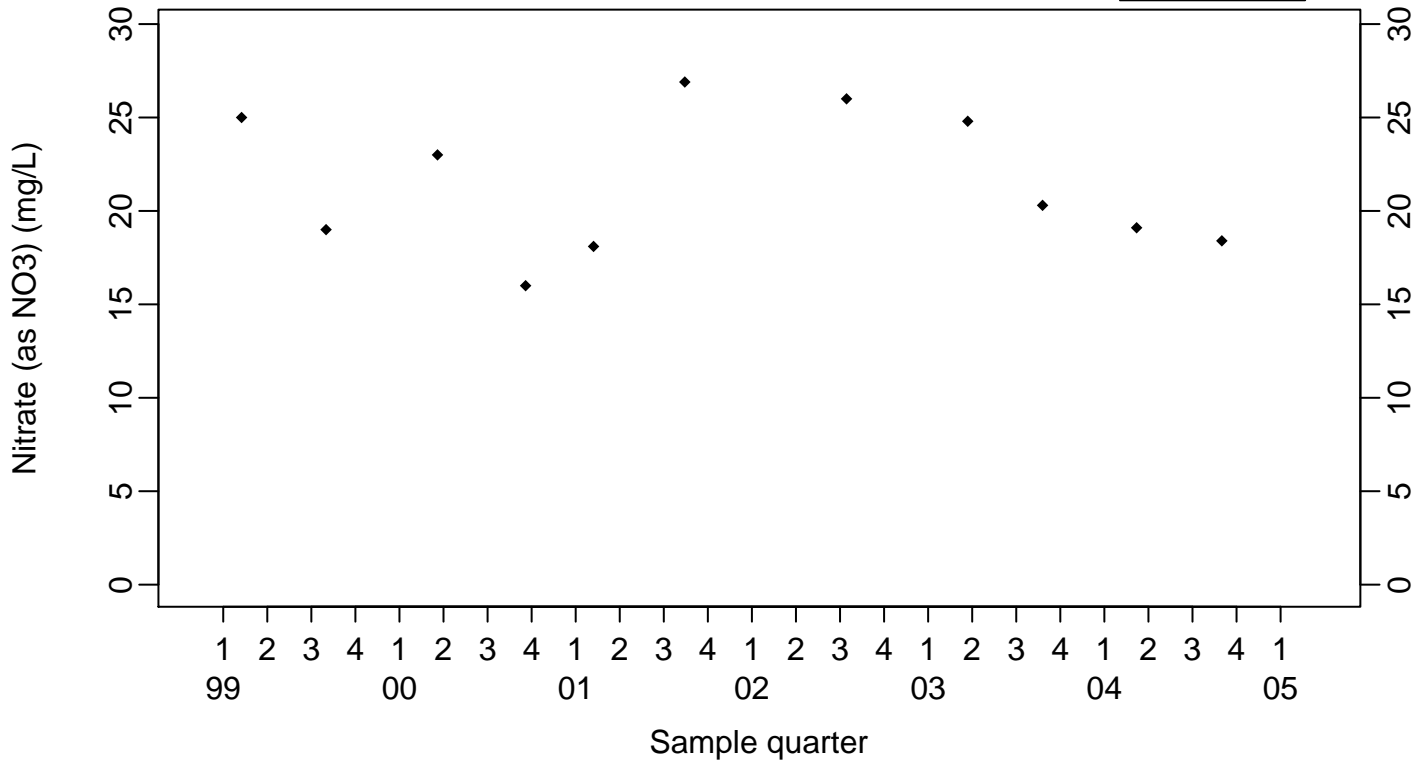
Upgradient Monitor Well W-7ES



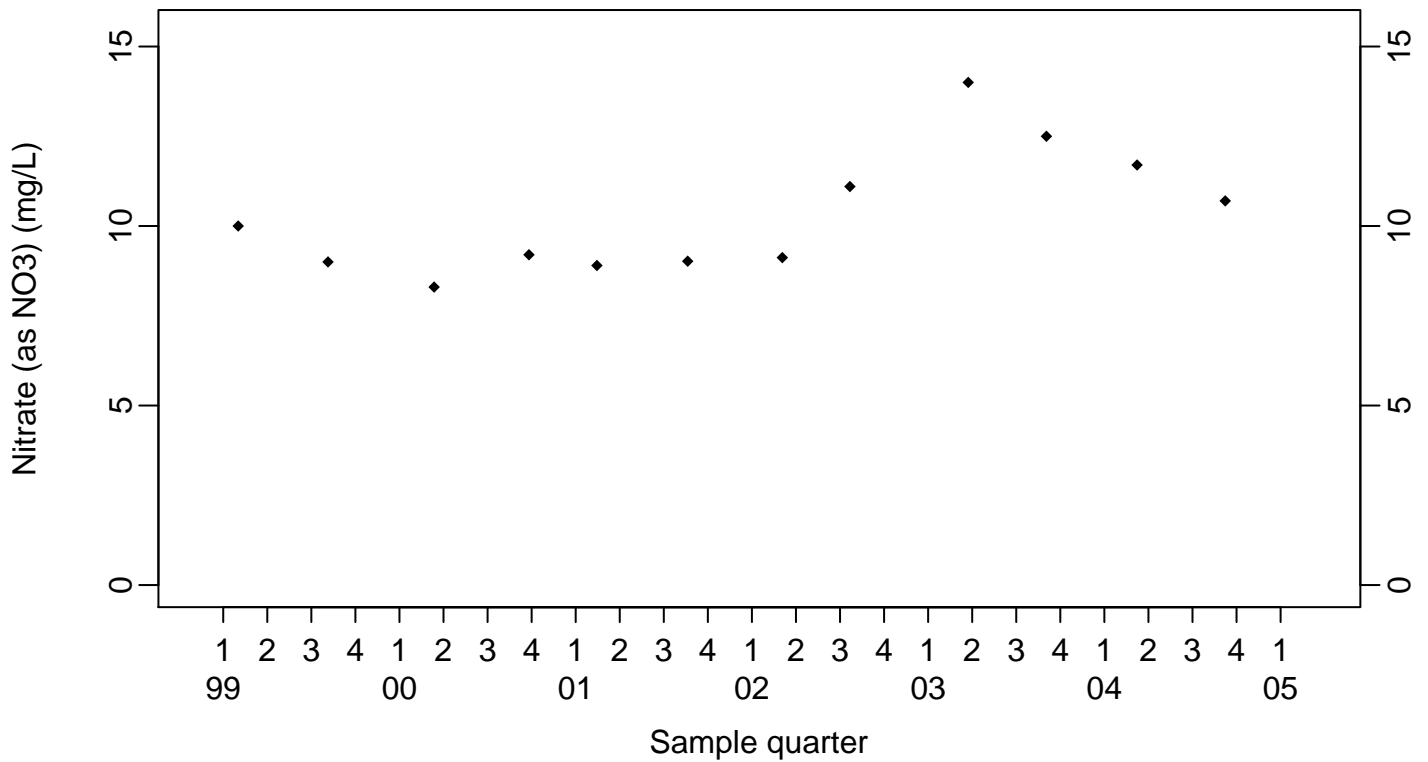
Sewage Ponds Ground Water Nitrate (as NO3) (mg/L)

Upgradient Monitor Well W-7PS

◆ Above RL
▽ Below RL



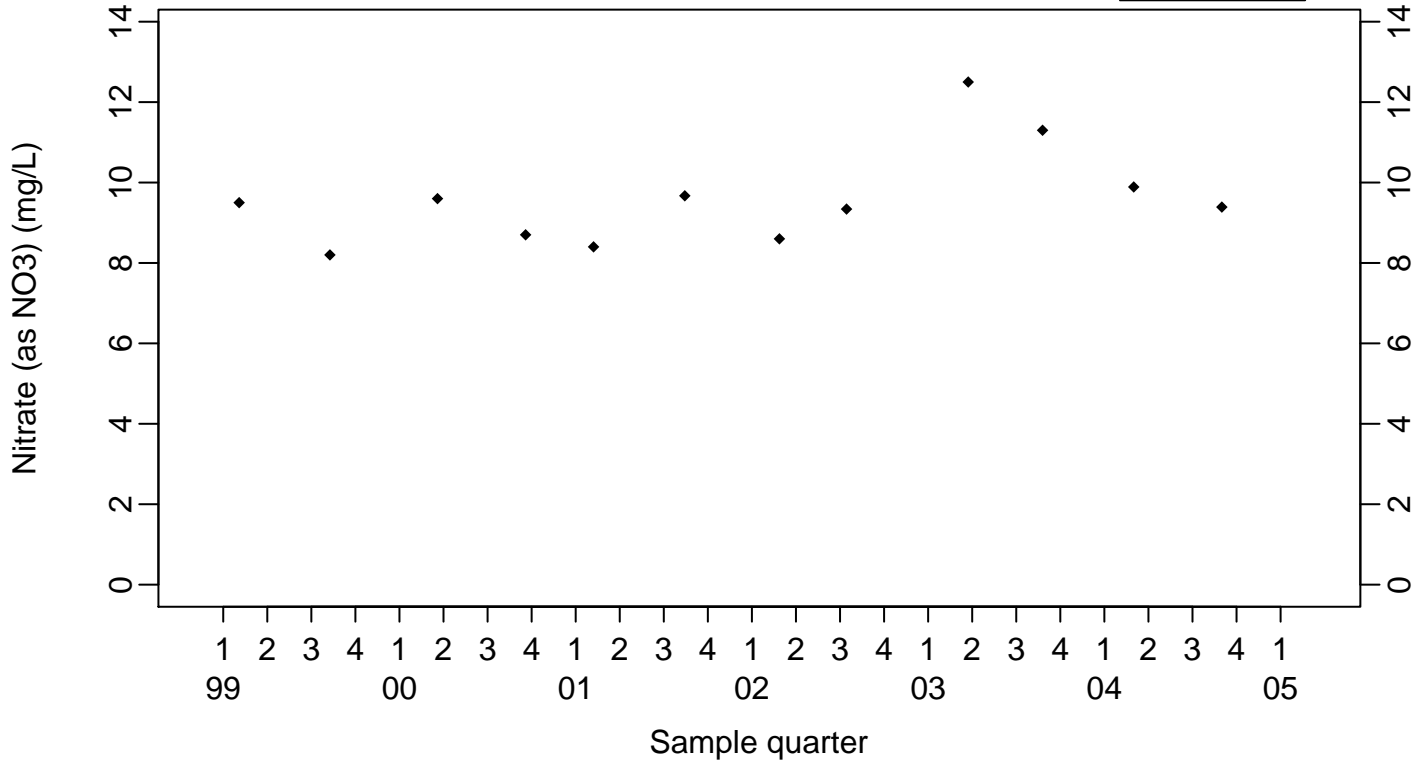
Crossgradient Monitor Well W-35A-04



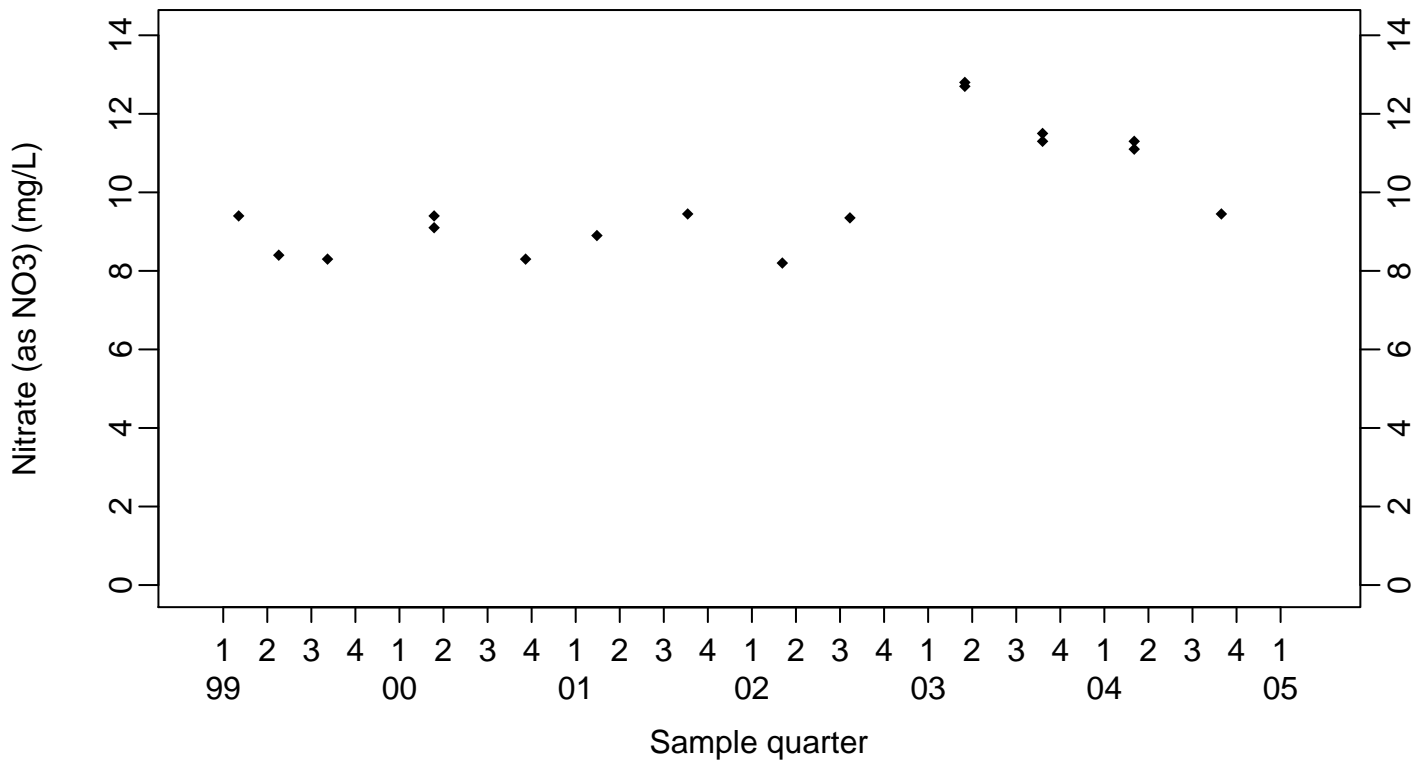
Sewage Ponds Ground Water Nitrate (as NO3) (mg/L)

Downgradient Monitor Well W-7DS

◆ Above RL
▽ Below RL



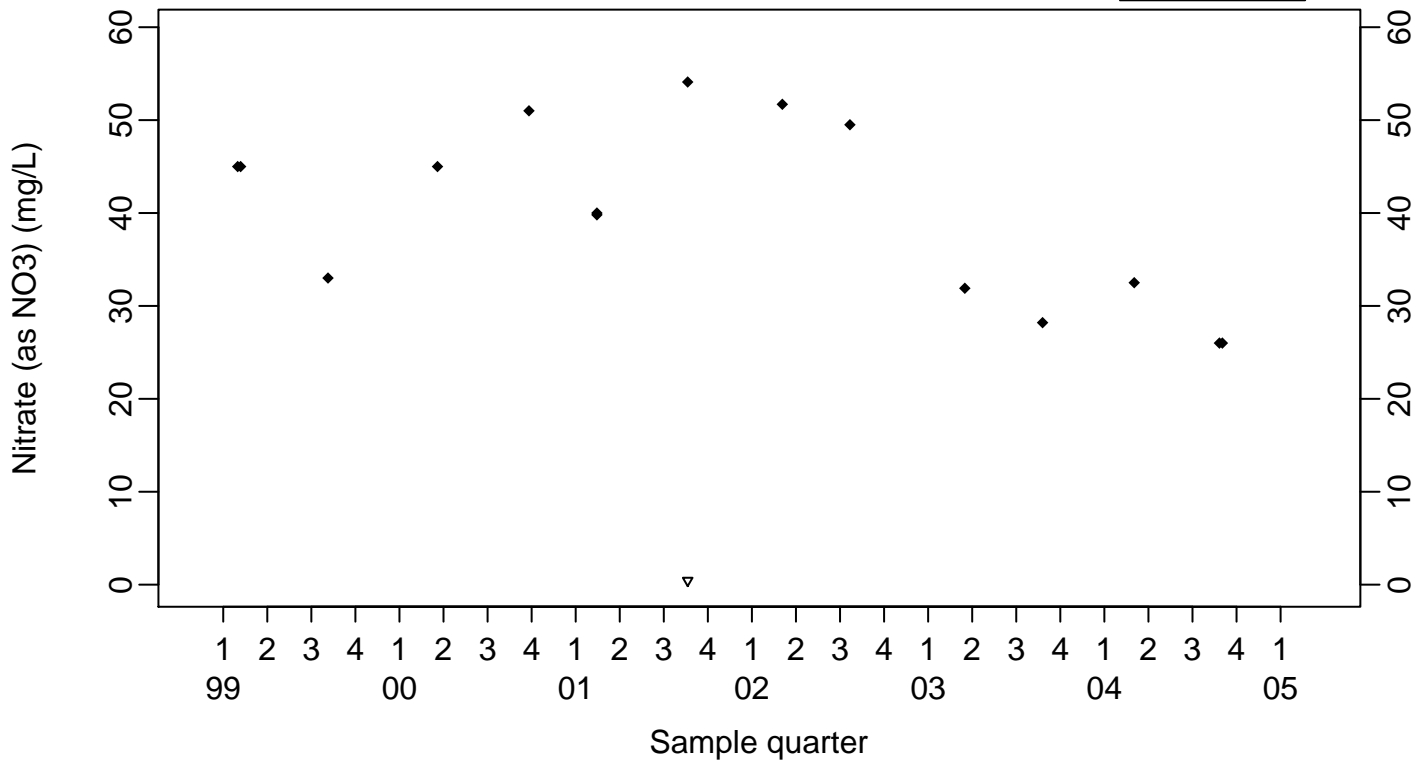
Downgradient Monitor Well W-25N-20



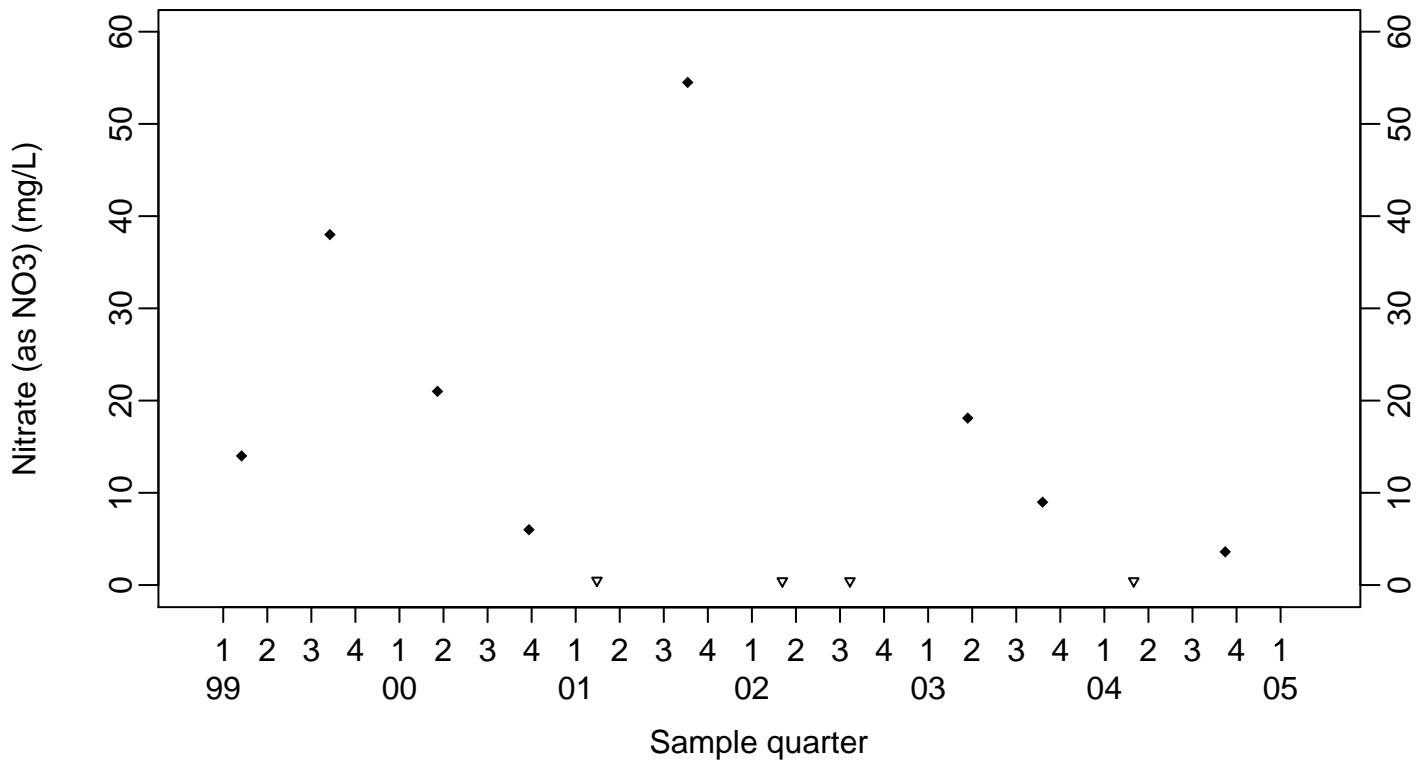
Sewage Ponds Ground Water Nitrate (as NO3) (mg/L)

Downgradient Monitor Well W-26R-01

◆ Above RL
▽ Below RL



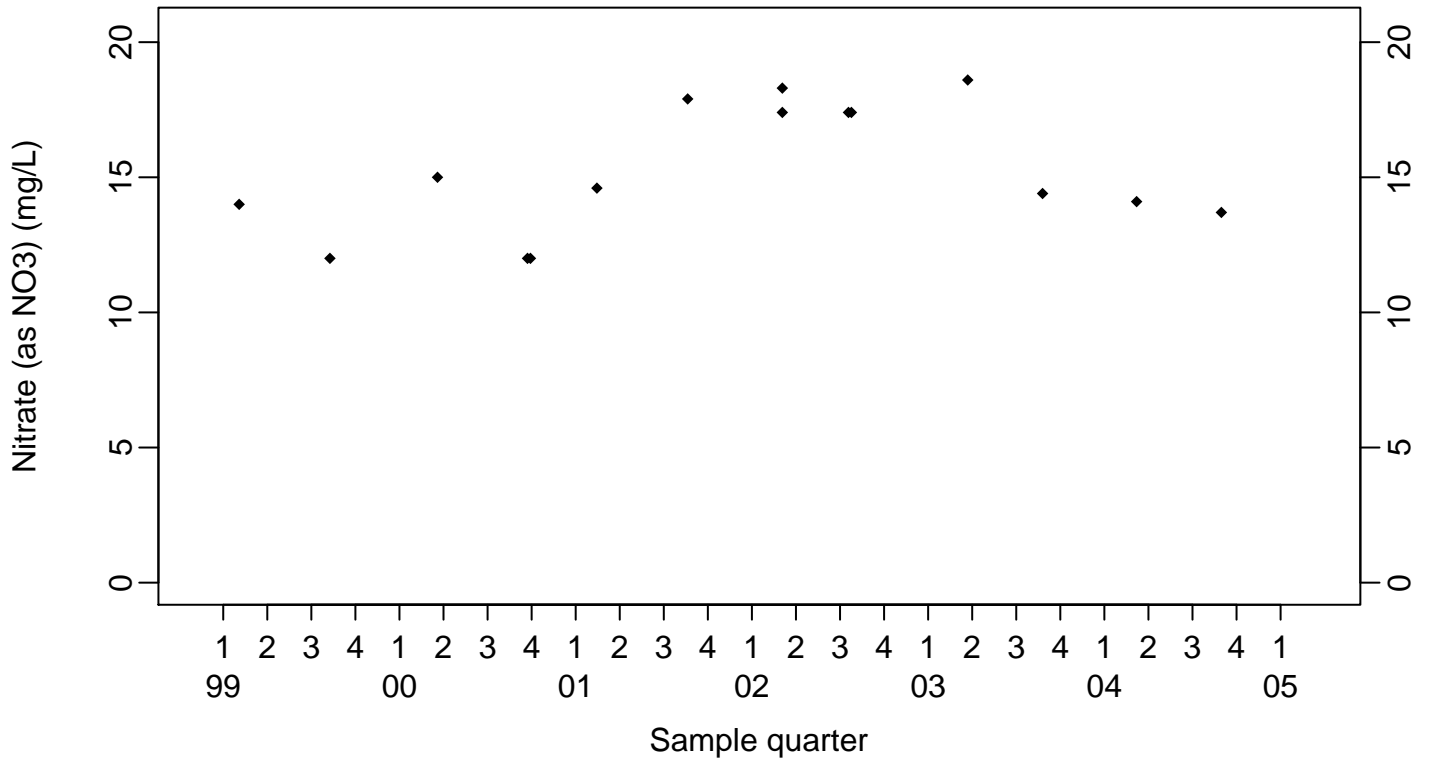
Downgradient Monitor Well W-26R-05



Sewage Ponds Ground Water Nitrate (as NO₃) (mg/L)

Downgradient Monitor Well W-26R-11

◆ Above RL
▽ Below RL



Annual Summary Tables of Sewage Evaporation and Percolation Ponds Ground Water Monitoring Data

Table D. Ground water analytical results, sewage ponds, constituents of concern required by WDR 96-248.

Parameter	Well	Reporting limit	WDR 96-248 limit	(Mar. 2 - Mar. 10) First quarter result	(Aug. 30 - Sep. 14) Third quarter result
General					
pH (unitless)	W-7E	NA ^a	None	8. 54	8. 53
	W-7ES	NA	None	7. 65	7. 75
	W-7PS	NA	None	7. 95	7. 82
	W-35A-04	NA	None	8. 05	7. 94
	W-25N-20	NA	None	7. 66	8. 14
	W-26R-01	NA	None	7. 79	7. 83
	W-26R-05	NA	None	7. 96	8. 07
	W-26R-11	NA	None	7. 83	8. 13
	W-7DS	NA	None	7. 66	7. 99
Specific conductance (μ mhos/cm)	W-7E	1	None	1480	1500
	W-7ES	1	None	1900	1930
	W-7PS	1	None	1470	1850
	W-35A-04	1	None	1870	1880
	W-25N-20	1	None	1920	1920
	W-26R-01	1	None	1440	1390
	W-26R-05	1	None	1130	1180
	W-26R-11	1	None	1600	1840
	W-7DS	1	None	1880	1890
Nutrients (mg/L)					
Nitrate (as NO ₃)	W-7E	0. 5	None	<0. 44	<0. 5
	W-7ES	0. 44	None	10. 6	<0. 44
	W-7PS	0. 5	None	19. 1	18. 4
	W-35A-04	0. 5	None	11. 7	10. 7
	W-25N-20	0. 5	None	11. 3	9. 45
	W-26R-01	2. 2	None	32. 5	26. 0
	W-26R-05	0. 5	None	<0. 44	3. 6
	W-26R-11	0. 88	None	14. 1	13. 7
	W-7DS	0. 5	None	9. 89	9. 39

(continued)

Table D. Ground water analytical results, sewage ponds, constituents of concern required by WDR 96-248 (concluded).

Parameter	Well	Reporting limit	WDR 96-248 limit	(Mar. 2 - Mar. 10) First quarter result	(Aug. 30 - Sep. 14) Third quarter result
Bacteria					
Fecal coliform (MPN ^b /100 mL)	W-7E	1. 1	2. 2	<1. 1	<1. 1
	W-7ES	1. 1	2. 2	1. 1	<1. 1
	W-7PS	1. 1	2. 2	<1. 1	<1. 1
	W-35A-04	1. 1	2. 2	<1. 1	<1. 1
	W-25N-20	1. 1	2. 2	<1. 1	<1. 1
	W-26R-01	1. 1	2. 2	<1. 1	<1. 1
	W-26R-05	1. 1	2. 2	<1. 1	<1. 1
	W-26R-11	1. 1	2. 2	<1. 1	<1. 1
	W-7DS	1. 1	2. 2	<1. 1	<1. 1
Total coliform (MPN/100 mL)	W-7E	1. 1	None	<1. 1	<1. 1
	W-7ES	1. 1	None	1. 1	<1. 1
	W-7PS	1. 1	None	<1. 1	<1. 1
	W-35A-04	1. 1	None	6	<1. 1
	W-25N-20	1. 1	None	1. 1	<1. 1
	W-26R-01	1. 1	None	<1. 1	<1. 1
	W-26R-05	1. 1	None	<1. 1	<1. 1
	W-26R-11	1. 1	None	<1. 1	<1. 1
	W-7DS	1. 1	None	<1. 1	<1. 1

^a NA = Not applicable.

^b MPN = Most probable number (of organisms).

Appendix E

Statistical Analyses for Ground Water Data

Appendix E

Statistical Analyses

Statistical Methods

Statistical methods are used to detect increases in concentrations of COCs that may indicate releases of COCs to ground water. The CVRWQCB *Standard Provisions* (1993) accompanying WDR 96-248 require the use of statistical methods from the *California Code of Regulations* (CCR), Title 23, Chapter 3, Subchapter 15.

Two statistical methods, prediction intervals and control charts, are used to generate concentration limits and statistical test limits (SLs) for COCs in ground water samples from the surface impoundments monitoring network. Both methods are sensitive in indicating COC concentration increases, and both methods require only one sample per monitoring well for each COC per quarter. Prediction intervals are used when COC concentrations are statistically similar in each of the three down gradient wells to those in the upgradient well, W-817-01. The method of control charts is used when COC concentrations in the downgradient wells are statistically different from those in the upgradient well. A COC is considered to have exceeded its concentration limit when a single ground water analytical result exceeds its SL and either of two subsequent re-tests also exceeds the SL (**Table B-1.2**). **Table E-1** provides a summary and status of the reported COCs that have shown statistically significant evidence of release.

Table E-1. Reported COCs showing statistically significant evidence of release.

Constituent	Date first reported	Monitor wells	Status of investigation
Zinc	1/9/97	W-817-02, W-817-03	In progress, CERCLA
Chloride	2/7/97	W-817-03	Complete
Arsenic	4/14/97	W-817-02, W-817-03, W-817-04	In progress, under CERCLA
Chromium	7/14/99	W-817-04	Transferred to CERCLA
Bicarbonate alkalinity	7/2/2001	W-817-04	Complete
Manganese	7/2/2001	W-817-04	Complete
Ammonia, as nitrogen	1/24/2002 1/27/05	W-817-04 W-817-02	Complete In progress
Bromide	10/23/02	W-817-03, W-817-02	Transferred to CERCLA
Nickel	1/24/2002	W-817-04	Complete
Ortho-phosphate	10/13/2003	W-817-02, W-817-03, W-817-04	Complete
Bis(2-ethylhexyl)phthalate	10/24/2004	W-817-02	Complete

RDX	10/24/2004	W-817-03, W-817-04	Complete, no confirmation by retest samples
PETN	10/24/2004	W-817-02	Complete, no confirmation by retest samples
4-Amino-2,6-dinitrotoluene	10/24/2004	W-817-03	Complete, no confirmation by retest samples

Appendix F

Fourth Quarter
Quality Assurance/Quality Control
Monitoring Data Discussion,
Surface Impoundments Monitoring Networks

Appendix F

Quality Assurance/Quality Control

1.0 Quality Assurance (QA) Program

To ensure data quality, LLNL utilizes an extensive written set of protocols and procedures that covers all aspects of ground water and surface water sampling, sample tracking, and environmental data management. The *LLNL Livermore Site and Site 300 Environmental Restoration Project Standard Operating Procedures* (Goodrich and Depue, 2004), and the *Environmental Monitoring Plan* (Althouse *et al.*, 2002) form the set of written instructions to be followed. Observing these protocols prevents inadvertent sample contamination and maintains sample integrity from the sampling location to the analytical laboratories. Data management procedures ensure that all laboratory measurements are received, accurately recorded, and properly stored in a computer database for easy and fast retrieval. Hard copies of the data are also archived. All sample analyses for the surface water impoundments meet the reporting criteria delineated in the Permit as modified by Wendy Cohen of CVRWQCB on September 25, 1998 (Cohen, 1998) (**Tables F-1.1** through **F-2.2**).

1.1 Field Procedures

As a part of the QA program, data quality for the sampling activities during each quarter is assessed by the following method: field blanks use analyte-free water for the analyses of organic compounds and high-performance liquid chromatography (HPLC)-grade water for all other required analyses. Field blanks, which are prepared at monitor wells and wastewater sample locations chosen at random, are analyzed for parameters identical to those for the routine samples. Field blank data are reviewed by analysts to determine whether contamination has been introduced into the samples as a result of field conditions or sample handling procedures.

1.1.1 Process Wastewater Influent

Field QA procedures include adherence to the *Environmental Monitoring Plan* (Althouse *et al.*, 2002). These include approved procedures for: sample preparation, handling, preservation, custody, and equipment decontamination procedures. Field activities are recorded on field tracking forms and/or in logbooks, and sample tracking is maintained through the chain-of-custody process. Field QA protocols include the preparation of at least 10 percent duplicate or collocated samples. The purpose of field duplicates is to verify the precision and comparability of the sampling activity. Additionally, temperature blanks are included in each shipping container of samples to verify that the temperature is maintained at $4^{\circ} \pm 2^{\circ}$ Celsius until receipt at the analytical laboratories.

1.1.2 Ground Water Monitoring

Field QA procedures include adherence to the sampling and analysis protocols of the *LLNL Livermore Site and Site 300 Environmental Restoration Project Standard Operating Procedures* (Goodrich and Depue, 2004). These include approved procedures for: sample collection, preparation, handling, preservation, custody, and equipment decontamination procedures. Field activities are recorded on field sampling sheets and/or in logbooks, and sample tracking is maintained through the chain-of-custody process. Field QA protocols include the preparation of at least 10 percent duplicate or collocated samples. The purpose of field collocated samples is to verify the precision of the sampling and analysis activities. Significant differences between duplicate samples (which should have identical results within the margin of sampling and analytical errors) are investigated by the responsible analysts, in collaboration with an LLNL quality control chemist. Field blanks are prepared at random locations to assess sample hygiene and handling practices.

1.2 Analytical Laboratories

LLNL contracts with several outside analytical laboratories. They provide routine analytical services that meet the requirements of LLNL's QA documents, as well as the requirements cited in the Permit. Analytical laboratories used by LLNL and each laboratory's responsible person are:

- BC Laboratories, Inc.
4100 Atlas Court
Bakersfield, CA 93308
Laboratory Responsible Person: Chrissy Herndon
- General Engineering Laboratories
P.O. Box 30712
2040 Savage Road
Charleston, SC 29414
Laboratory Responsible Person: Cheryl Jones
- Sequoia
885 Jarvis Drive
Morgan Hill, CA 95037
Laboratory Responsible Person: Lisa Race

These laboratories perform extensive quality control analyses including: method blank analyses, analyses of laboratory control samples (LCS), matrix spike (MS), and matrix spike duplicates (MSD), and analyses of surrogate samples for organic compounds. Additionally, these laboratories provide data reports of tentatively identified compounds (TICs) for volatile and semivolatile organic compounds (VOCs and SVOCs), analyzed by gas chromatography/mass spectroscopy, and provide estimated concentrations. (TICs are currently reported in the data tables of this report.) Each of these laboratories is accredited by the California Department of Health Services for the analyses

performed. Résumés of the analysts' education and qualifications are available through each laboratory.

2.0 Quality Assurance and Quality Control Results

2.1 Process Wastewater Influent

Field QA/QC data discussed in this section are contained in **Table F-1.1**.

Routine fourth quarter photographic process rinsewater samples were submitted to Sequoia and duplicate samples were submitted to BC Laboratories, Inc. for interlaboratory comparison. Metals and pH laboratory QA/QC (i.e., MS/MSD and LCS) data associated with the samples, verified per EPA Functional Guidelines for data review (U.S. Environmental Protection Agency, 1994a and 1994b), showed that all data are usable.

Representative samples were collected from the retention tank at Building 823 on November 23, 2004. Metal concentrations show the variations experienced for certain metals (such as copper, silver and zinc) between the routine and duplicate samples collected from the Building 823 retention tank. No metals were detected in the method blank above laboratory reporting limits (**Table F-1.1**).

2.2 Ground Water Monitoring

Analyte concentrations of routine and duplicate samples collected from down gradient monitor well W-817-02 are in very good agreement for the COCs detected above their respective reporting limits (**Table F-2.1**).

No COC or non-COC compounds were detected in method blank samples above laboratory reporting limits during the fourth quarter (**Tables F-2.1** and **F-2.2**). Of the COCs, only ammonia as N (0.03 mg/L) and dissolved zinc (0.0059 mg/L est.) were detected in field blank samples at concentrations that could potentially be of regulatory significance (**Table F-2.1**). Concentrations of ammonia as N in the routine fourth quarter ground water samples collected from all three down gradient wells – W-817-02, W-817-03, and W-817-04 – exceeded the current SL of 0.02 mg/L (**Tables B-1.1** and **B-1.2**). Those analytical results are likely biased high due to the detectable presence of ammonia in the field blank sample (**Table F-2.1**). Ammonia was detected in only one of the six retest samples collected from those three wells (**Table B-1.2**). The estimated concentration of 0.0059 mg/L of dissolved zinc detected in the field blank sample indicates that the concentrations detected in the ground water samples collected from all four wells might be biased high due to field contamination. However, this is not a significant issue for zinc because concentrations in the down gradient wells did not exceed any SL for zinc. Recoveries for all LCS samples and for all MS and MSD samples are within laboratory acceptance limits, so that these data meet all requirements for data accuracy as well as precision.

Laboratory QA/QC (i.e., MS/MSD and LCS) data associated with all ground water samples and evaluated per EPA Functional Guidelines for data review (U.S. Environmental Protection Agency, 1994a and 1994b), showed all parameters within acceptable ranges for data usability.

Table F-1.1 Photographic process rinsewater QA/QC results, Building 823, constituents of concern required by WDR 96-248.

Parameter	Building 823 Sampled 11/23/04				
	MDL ^a	Reporting limit	Routine sample ^b	Duplicate sample ^b	Method blank ^b
General parameters					
pH (unitless)	2.0	2.0	8.2	NA ^c	NA
Metals (mg/L)					
Antimony	0.0002	0.0005	0.00028 est ^d	0.0007 est	0.00021 est
Arsenic	0.0002	0.001	0.0012	< 0.002	< 0.001
Barium	0.000037	0.001	0.008	0.0094 est	< 0.001
Beryllium	0.000012	0.0005	< 0.0005	< 0.0002	< 0.0005
Cadmium	0.000014	0.00025	0.00012 est	0.0004 est	< 0.00025
Chromium	0.00013	0.002	0.0025	0.002	0.00067 est
Cobalt	0.000009	0.001	0.000074 est	< 0.05	< 0.001
Copper	0.00006	0.0005	0.038	0.05	0.000073 est
Lead	0.000012	0.0005	0.0015	0.002 est	0.000025 est
Manganese	0.00015	0.01	0.009 est	0.0098 est	< 0.01
Molybdenum	0.000015	0.001	0.019	0.022 est	0.000039 est
Nickel	0.000035	0.001	0.0034	0.004	0.000043 est
Potassium	0.3	1.0	12.0	9.2	< 1.0
Silver	0.0006	0.005	0.18	0.051	< 0.00025
Thallium	0.000002	0.001	< 0.001	< 0.001	< 0.001
Vanadium	0.00068	0.001	< 0.001	< 0.01	< 0.001
Zinc	0.0013	0.005	0.089	0.11	0.00141 est

a MDL = Method detection limit

b Routine sample and blank analyzed by Sequoia Analytical; duplicate sample by BC Laboratories

c NA = Not applicable

d Results followed by "est" have estimated values between the MDL and the reporting limit for that compound

Table F-2.1 Ground water field QA/QC results, constituents of concern required by WDR 96-248.

Monitoring well W-817-02	MDL ^a	Reporting limit	Routine sample	Duplicate sample	Field blank sample	Method blank sample
General						
pH (unitless)	0. 05	NA ^b	8. 16	8. 17	7. 20	NA
Halocarbons (µg/L)						
1,1,1-Trichloroethane	0. 13	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Bromoform	0. 063	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
1,2-Dichloroethane	0. 18	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Freon 113	0. 078	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Methylene chloride	0. 15	1. 0	<1. 0	<1. 0	<1. 0	<1. 0
Tetrachloroethene	0. 069	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Chlorobenzene	0. 093	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Hydrocarbons (µg/L)						
Toluene	0. 15	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Naphthalene	0. 35	5	<5	<5	<5	<2
Photographic chemicals (µg/L)						
<i>meta</i> and <i>para</i> -Cresol	0. 63	2	<2	<2	<2	<2
Benzyl alcohol	0. 32	2	<2	<2	<2	<2
Volatile/semivolatile organic compounds (µg/L)						
Acetone	4. 7	10	<10	<10	<10	<10
2-Butanone	1. 3	20	<20	<20	<20	<20
Dimethyl sulfoxide (DMSO)	0. 033	10	<10	<10	<10	<10
Ethyl alcohol (ethanol)	51	1000	<1000	<1000	<1000	<1000
Methyl isobutyl ketone	1. 0	20	<20	<20	<20	<20
Additives to energetic compounds (µg/L)						
Bis(2-ethylhexyl)phthalate	1. 4	5	<5	<5	<5	<5
Unreactive polymers (µg/L)						
Styrene	0. 076	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Vinyl chloride	0. 17	0. 5	<0. 5	<0. 5	<0. 5	<0. 5

(continued)

Table F-2.1 Ground water field QA/QC results, constituents of concern required by WDR 96-248.

Monitoring well W-817-02	MDL ^a	Reporting limit	Routine sample	Duplicate sample	Field blank sample	Method blank sample
Metals (mg/L)						
Aluminum	0.022	0.05	<0.05	<0.05	0.031 est ^c	<0.05
Arsenic	0.002	0.004	0.054	0.052	<0.002	<0.002
Barium	0.00083	0.025	0.013 est	0.0008 est	0.001 est	<0.025
Cadmium	0.000045	0.0005	0.0001 est	0.0001 est	<0.0005	<0.0005
Chromium	0.00006	0.001	0.0007 est	0.0007 est	<0.001	<0.001
Cobalt	0.00075	0.05	0.001 est	0.0009 est	<0.05	<0.05
Copper	0.0002	0.001	0.0008 est	0.0006 est	<0.001	<0.001
Lead	0.0003	0.005	<0.005	<0.005	<0.005	<0.005
Manganese	0.0021	0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum	0.0011	0.025	0.045	0.047	<0.025	<0.025
Nickel	0.00067	0.002	<0.002	<0.002	<0.002	<0.002
Potassium	0.058	1.0	12	13	<1.0	<1.0
Silver	0.000034	0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.0024	0.01	0.17	0.17	0.0059 est	<0.01
Salts (mg/L)						
Ammonia nitrogen (as N)	0.01	0.02	0.05	0.1	0.03	<0.02
Bicarbonate alkalinity (as CaCO ₃)	2.5	10	260	260	<2.5	<2.5
Bromide	0.03	0.2	1.0	1.0	<0.1	<0.1
Chloride	0.026	1.0	279	279	0.16 est	<0.5
Nitrate (as NO ₃)	0.16	1.0	89.6	89.3	<0.5	<0.5
Orthophosphate	0.03	0.05	0.085	0.084	<0.05	<0.05
Perchlorate	0.00011	0.004	0.028	0.028	0.0022 est	<0.004
Sulfate	0.096	2.0	296	296	<1.0	<1.0

(continued)

Table F-2.1 Ground water field QA/QC results, constituents of concern required by WDR 96-248 (concluded).

Monitoring well W-817-02	MDL ^a	Reporting limit	Routine sample	Duplicate sample	Field blank sample	Method blank sample
Energetic materials ($\mu\text{g/L}$)						
HMX	0.162	1.00	<1.0	<1.0	<1.0	<1.0
RDX	0.162	0.85	<0.85	<0.85	<0.85	<0.85
TNT	0.162	0.486	<0.486	<0.486	<0.486	<0.486
TATB	5.0	20	<20	<20	<20	<20
PETN	0.649	1.95	<1.95	<1.95	<1.95	<1.95
Tetryl	0.487	1.46	<1.46	<1.46	<1.46	<1.46
4-amino-2,6-dinitrotoluene	0.162	0.486	<0.486	<0.486	<0.486	<0.486

^a MDL = Method detection limit.

^b NA = Not applicable.

^c Results followed by an "est" have estimated concentrations between the MDL and the reporting limit for that analyte.

Table F-2.2 Ground water field QA/QC results, other constituents.

Monitoring well W-817-02	MDL ^a	Reporting limit	Routine sample	Duplicate sample	Field blank sample	Method blank sample
Metal (mg/L)						
Lithium	0.0027	0.020	0.024	0.026	<0.020	<0.010
Volatile/semivolatile organic compounds (µg/L)^b						
1,1-Dichloroethene	0.12	0.5	<0.5	<0.5	<0.5	<0.5
Benzoic acid	1.4	50	<50	<50	<50	<10
Chloroform	0.095	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene (TCE)	0.15	0.5	0.54	0.58	<0.5	<0.5
Energetic materials (µg/L)^c						
2-amino-4,6-dinitrotoluene	0.325	1.00	0.882 est ^d	1.01	<1.00	<1.00
2,6-dinitrotoluene	0.182	1.00	<1.00	<1.00	<1.00	<1.00

^a MDL = Method detection limit.

^b Other than those listed in this subheading, no other compounds were detected using EPA Methods 624 or 625.

^c Other than those listed in this subheading, no other compounds were detected using EPA Method 8330.

^d Results followed by an "est" have estimated concentrations between the MDL and the reporting limit for that analyte.

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