Environmental Functional Area

Water, Air, Monitoring & Analysis

UCRL-AR-10191-12-4

Lawrence Livermore National Laboratory (LLNL) Experimental Test Site (Site 300)

Compliance Monitoring Program for Closed Pit 1 Landfill

Fourth Quarter/Annual Report for 2012

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Summary

This fourth quarter/annual report for 2012 summarizes compliance activities performed at the Lawrence Livermore National Laboratory (LLNL) Experimental Test Site (Site 300) landfill known as Pit 1. Compliance activities at the pit consist of ground water sampling and analysis, pit cap inspections, and reporting of analytical results. Ground water measurements for the fourth quarter of 2012 are contained in **Appendix A, Tables A-1** to **A-4**.

No evidence of a new release of constituents of concern from Pit 1 was indicated by the fourth quarter ground water measurements and only one constituent of concern were detected above SL at Pit 1.

The visual inspection of the Pit 1 cap was performed on December 4, 2012 by LLNL staff and with the exception of a few small animal burrows, no deficiencies were noted. These minor borrows were backfilled by LLNL staff and the pit cap and drainage structures continue to function properly.

Introduction

This fourth quarter/annual report for 2012 summarizes compliance monitoring results for a closed landfill known as Pit 1 at LLNL's Site 300. Site 300 is a 28.3 square kilometer (km^2) (10.9 square miles [mi^2]) site located in the Altamont Hills approximately 10.5 km (6.5 mi) southwest of downtown Tracy, California (**Figure 1**). The landfill is located in the northern portion of the site (**Figure 2**). Closure of this unlined Class I waste management unit was completed with waste in place in December 1992 following a California Department of Health Services (now Department of Toxic Substances Control, or DTSC) approved RCRA Closure and Post-Closure Plan (PCP) using the LLNL Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Federal Facilities Agreement (FFA) process. Site 300 is owned by the U.S. Department of Energy (U.S. DOE) and is operated by Lawrence Livermore National Security, LLC.

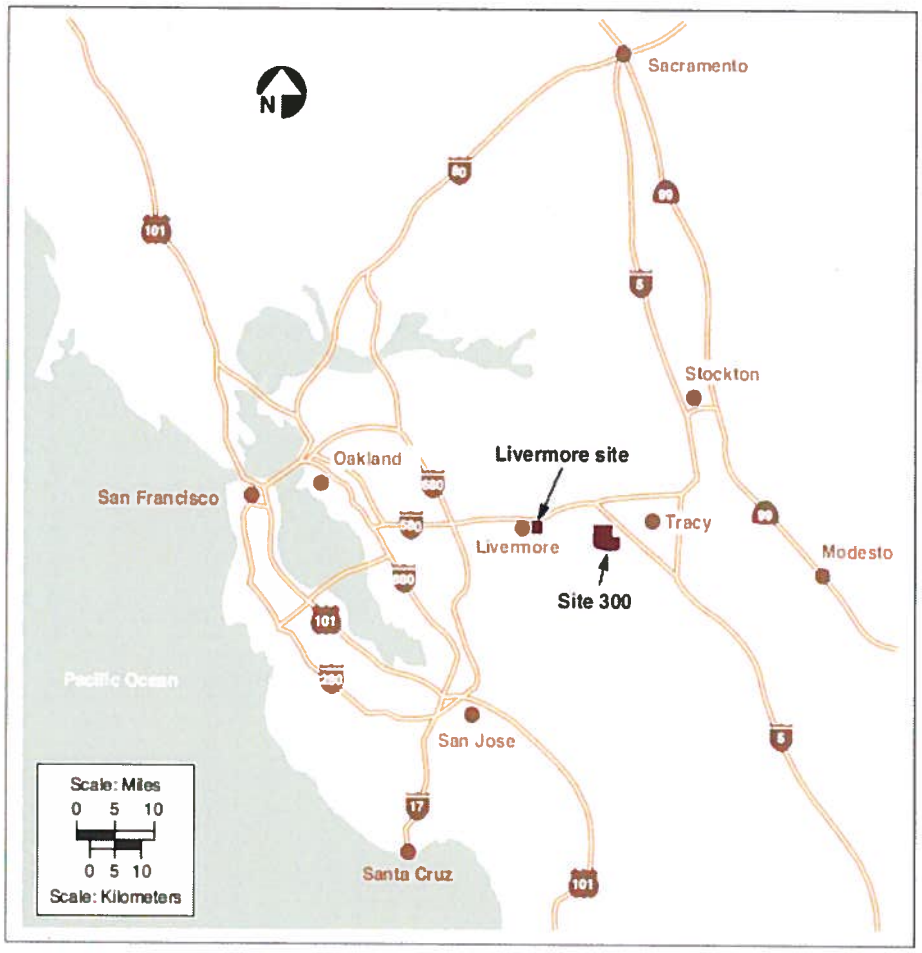

Figure 1. Location of LLNL Site 300.

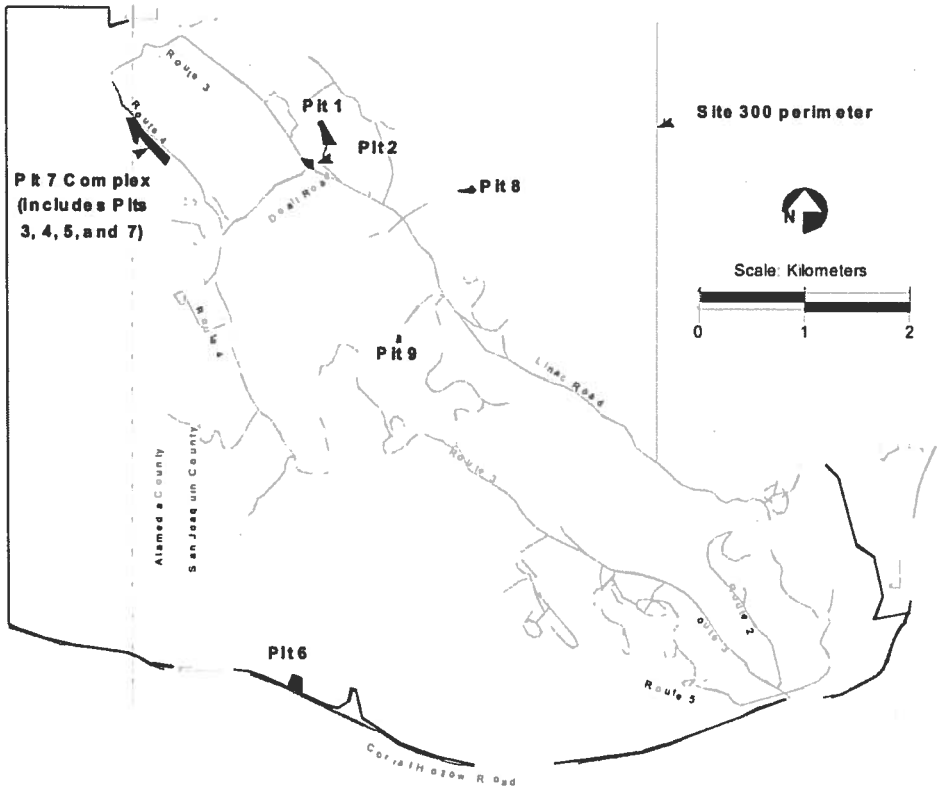

Figure 2. Location of closed landfill Pit 1 at LLNL Site 300.

Pit 1 is located in the Elk Ravine drainage area, about 300 meters (m) or 984 feet (ft) above mean sea level (MSL). Ground water generally flows in an east-northeast direction beneath Pit 1 (**Figure 3**), following the inclination (dip) of underlying Miocene-age sedimentary rocks (Webster-Scholten, 1994).

The current monitoring network at Pit 1 consists of twelve monitoring wells. These include eight detection monitoring wells and four evaluation monitoring wells (**Figure 3**). The detection monitoring wells that are used to sample the ground water in the vicinity of Pit 1 include: wells K1-01C and K1-07 located hydrologically upgradient from Pit 1; downgradient wells K1-02B, K1-04, K1-05, and W-PIT1-2326; and cross-gradient wells K1-08 and K1-09. The primary objective of the detection monitoring wells is to detect any new release of constituents of concern to ground water. Constituents of concern, as defined by Title 23 of the California Code of Regulations (CCR), Chapter 15, are waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste buried in the Pit 1 Landfill. LLNL collects, analyzes, and statistically evaluates one sample quarterly from each detection monitoring well.

The evaluation monitoring wells are all downgradient of Pit 1 wells and include K1-06, W-PIT1-2620, W-PIT1-2209, and W-865-2005 as required by the Monitoring Reporting Program (MRP). Well W-PIT1-02 is no longer sampled because it was abandoned and replaced by well W-PIT1-2620. These evaluation monitoring wells were added to Pit 1 monitoring and

reporting requirements to track existing plumes of perchlorate and tritium from an upgradient source. LLNL collects and analyzes one sample quarterly from each evaluation monitoring well and annually conducts trend analyses for tritium and perchlorate.

All of these wells are screened in the uppermost water-bearing zone in the Neroly Formation lower blue sandstone unit ($Tnbs_1/Tnbs_0$). The Neroly Formation contains the main aquifer beneath Site 300. Pit 2, which was closed before RCRA was enacted, is hydrologically upgradient from Pit 1. In 1992, a 2.4 m (8 ft) thick RCRA cap containing an impermeable layer of clay that is 0.6 m (2 ft) thick was constructed over Pit 1. The cap prevents rainwater from percolating through the waste buried in the pit. A water diversion channel was constructed around the pit cap to remove storm water runoff. The diversion channel empties into the adjacent arroyo, the headwater of Elk Ravine.

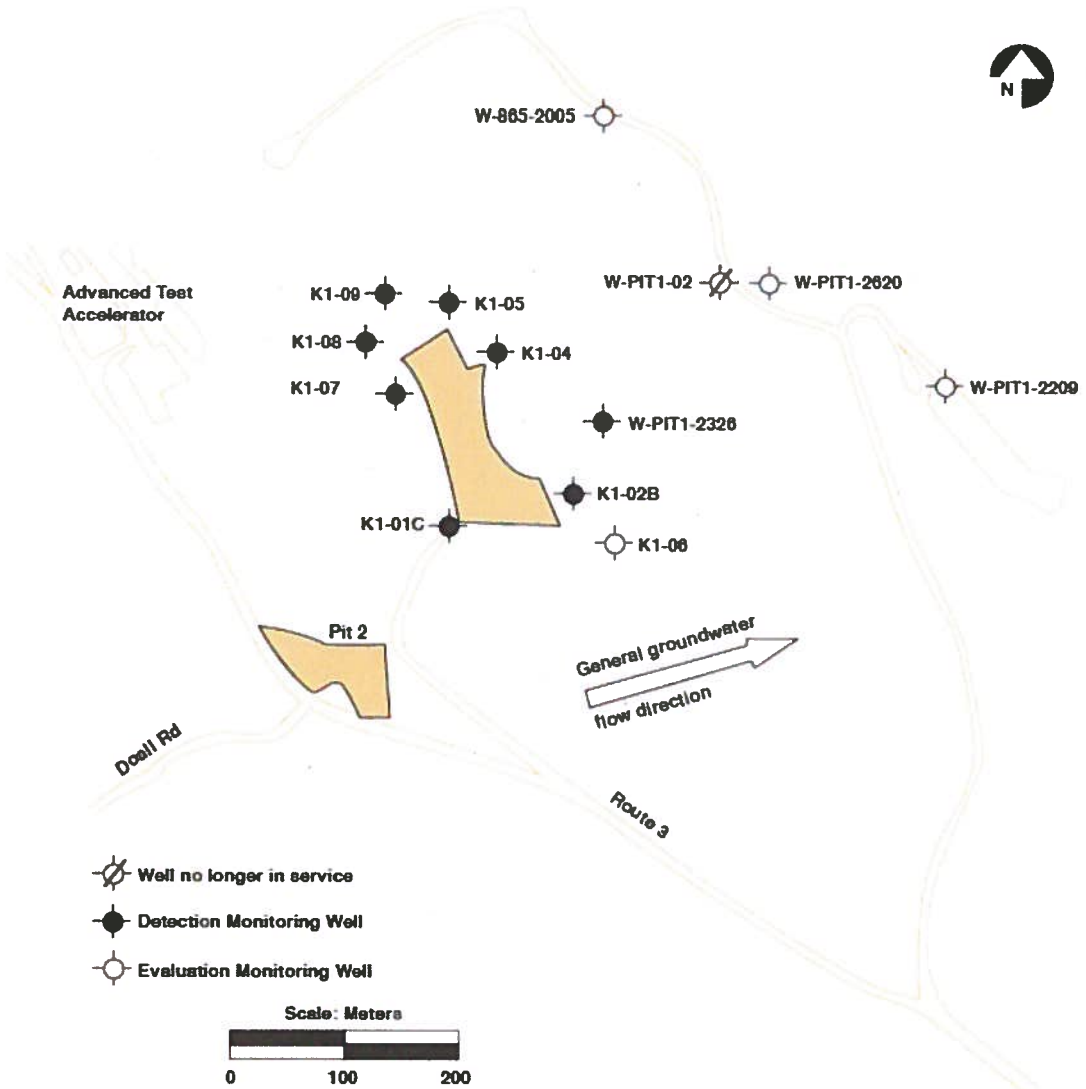

Figure 3. Locations of Pit 1 compliance monitoring wells.

Compliance Monitoring Program Overview

This report fulfills quarterly requirements set forth in the following two documents: (1) Waste Discharge Requirements (WDR) Order 93-100 and the February 18, 2010, MRP No. 93-100, administered by the California CVRWQCB (CVRWQCB 1993 and 2010) and (2) LLNL Site 300 RCRA Closure and Post-Closure Plans, Landfill Pits 1 and 7 (Rogers/Pacific Corporation 1990). The PCP was approved by the California Department of Health Services (currently the California Department of Toxic Substances Control). The combined requirements include quarterly ground water sampling and analyses to detect potential releases of constituents of concern from the landfill, quarterly and post-rain visual inspections of pit cap integrity, repairs as necessary to maintain the integrity of the landfill and its water-diversion system, annual measurements of cap survey markers to detect subsidence, an annual inspection of the cap by an independent engineer, and quarterly written monitoring reports.

Quality Assurance

To ensure quality data, LLNL works within the established Quality Assurance (QA) program of the LLNL Environmental Functional Area (EFA). LLNL uses protocols and procedures that cover all aspects of ground water sampling, sample tracking, and data management. These written protocols and procedures are contained in the *LLNL Livermore Site and Site 300 Environmental Restoration Project Standard Operating Procedures (SOPs)* (Goodrich and Lorega, 2009), and the *Environmental Monitoring Plan* (Gallegos, 2012). SOPs are used to minimize inadvertent sample contamination and maintain sample integrity from the well to the analytical laboratory. Data management SOPs ensure that all laboratory measurements are received, accurately recorded, and properly stored both in a computer database and in hardcopy format.

Each quarter, a duplicate (collocated) set of ground water samples is collected from each monitoring network and a set of blank samples is prepared from a randomly chosen well. In addition, equipment blanks are prepared and analyzed to ensure that sampling equipment is properly cleaned before use. Each day, when samples are collected for volatile organic compound (VOC) analysis, a trip blank (prepared at the analytical laboratory) is carried into the field. It is returned unopened to the analytical laboratory for VOC analysis. If VOCs are detected in a trip blank and in any of the routine samples obtained that day, sample results may be discounted and new sampling may be performed.

As required by Executive Order 12770, measurements are reported in *Système Internationale* (SI) units. The SI unit for radioactivity is the becquerel (Bq), equal to 1 nuclear disintegration per second. The more commonly used unit, picocurie (pCi), is equal to 1 nuclear disintegration per 27 seconds. As a convenience, maximum contaminant levels (MCLs) for radioactivity in drinking water are given in both becquerels per liter (Bq/L) and picocuries per liter (pCi/L) in **Table 1** below. Note that MCLs are provided for reference only, because this report does not involve wells used for potable domestic, livestock, or industrial water supply.

Table 1. MCLs for radioactivity in drinking water.

Radiological parameter	MCL (Bq/L)	MCL (pCi/L)
Gross alpha	0.555	15
Gross beta	1.85	50
Tritium	740	20,000
Radium (total)	0.185	5
Uranium (total)	0.74	20

Description of Report Contents

The "Summary of Analytical Results" section reviews any constituents of concern detected in ground water during the fourth quarter of 2012 from detection monitoring and perchlorate and tritium in evaluation monitoring wells. Constituents of concern measurements that exceeded SLs or MCLs in drinking water are discussed in this report.

Appendix A contains the ground water analytical measurements for the fourth quarter of 2012. Pit 1 data are in **Tables A-1**, **A-2**, and **A-3**. **Table A-4** shows the sample dates for Pit 1, and **A-5** shows the reporting limits for the Pit 1 VOC constituents of concern. Note that the **Appendix A** tables may include some small negative values for radioactivity measurements. These are below the method RLs and are calculated values. They simply indicate that the radioactivity for that ground water sample is less than a low reference standard. **Appendix A** also contains a ground water contour map of water levels from the $Tnbs_1/Tnbs_0$ Hydrostratigraphic Unit (HSU) at Pit 1.

Appendix B explains the methods used to determine the SL of concentration for a constituent of concern. Requirements for statistical treatment of ground water data are established in the CCR, Title 23, Division 3, Chapter 15, Section 2550.7. LLNL uses a statistical prediction limit method to implement intrawell comparisons. The method uses the average and standard deviation of historical measurements to calculate a SL value. If a routine quarterly constituent of concern measurement exceeds its SL and is confirmed by retesting, it is reported to the CVRWQCB as statistically significant evidence of a release.

Appendix C contains the results for QA sample analyses performed during the fourth quarter of 2012 at Pit 1 (**Table C-1**).

Appendix D consists of **Table D-1** summarizing constituents of concern and the sampling frequencies in the monitoring network for the pit. The regulatory drivers for each constituent of concern are also included in **Table D-1**.

Appendix E consists of **Table E-1** and presents well specification and construction details for detection monitoring and evaluation monitoring wells.

Appendix F consists of **Table F-1** that displays hydrographs for all compliance monitoring wells.

Appendix G consists of **Table G-1** and includes field logs for all compliance monitoring wells.

Appendix H consists of the statistical limits and graphs of ground water measurement at Pit 1.

Summary of Analytical Results

This section summarizes the analytical results for Pit 1 for the fourth quarter/annual report of 2012 and reports on the requirements of the CVRWQCB Pit 1 MRP and post closure plan requirements. During the fourth quarter monitoring period, no new releases of constituents of concern to ground water from the pit are evident in the data. As part of the MRP, statistical limits (SLs) used to monitor ground water constituents of concern are shown on **Table A-1**. The MRP requires that two confirmation samples be collected from wells with constituents of concern exceeding SLs. If either of the two confirmation samples exceeds the statistical limit, a finding of statistically significant evidence of a release is confirmed and a seven-day notification letter must be submitted to the CVRWQCB. The statistical tests used to evaluate this data are those identified in **Appendix B**.

Detection Monitoring Wells

During the fourth quarter, analytical results indicate that only one constituent of concern was detected above statistical limit (SL) from the Pit 1 detection monitoring wells. This included the total uranium activity from a routine sample from well K1-02B (0.146 Bq/L, [SL=0.145 Bq/L]). The activity of total uranium in this well has been discussed in past Pit 1 reports (Third Quarter Report, 2011) where it was shown that the total uranium in this well is natural in origin. The presence of total uranium in well K1-02B was also discussed in a seven-day letter was submitted to the CVRWQCB on July 29, 2011 indicating that the SL exceedance of total uranium from well W-K1-02B also does not indicate a significant evidence of a release of total uranium from Pit 1. Our analysis indicated that the total uranium activities in this well have a natural uranium signature, are within background ranges, and are lower than activities in the upgradient detection monitoring wells. LLNL conducted additional analyses (Third Quarter Report, 2011) for uranium isotopes on various Pit 1 monitoring wells to further investigate total uranium at Pit 1. LLNL concluded in all cases, that the uranium 235/238 isotopic ratios were very close to a ratio of 0.0072 indicating that the uranium in the Pit 1 wells is of natural origin.

The concentrations of selected volatile organic compounds (VOCs) detected in ground water samples from detection monitoring wells are summarized and presented as total VOCs (**Table A-2**). VOCs were detected in the ground water samples from downgradient well K1-05 (24 µg/L) and cross-gradient wells K1-08 (24 µg/L) and K1-09 (41 µg/L). The only VOC observed in these samples was Freon-113. Freon-113 arises from a source at Building 865, about 300 m (984 ft) west of Pit 1 (Ferry and Holtzapple, 2006). While Freon-113 is not a constituent of concern for Pit 1, concentrations have generally decreased from historic maxima, and in the past few years the concentrations appear to be relatively stable.

In addition to the normal reporting on constituents of concern with statistical limits, this report evaluates additional constituents that historically have elevated concentrations and are monitored under the post closure plan or under LLNL's surveillance monitoring program under DOE Order 458.1. For this annual report, Freon-113 results for ground waste samples collected from monitoring wells K1-05, K1-08, and K1-09 are plotted on **Figure 4**.

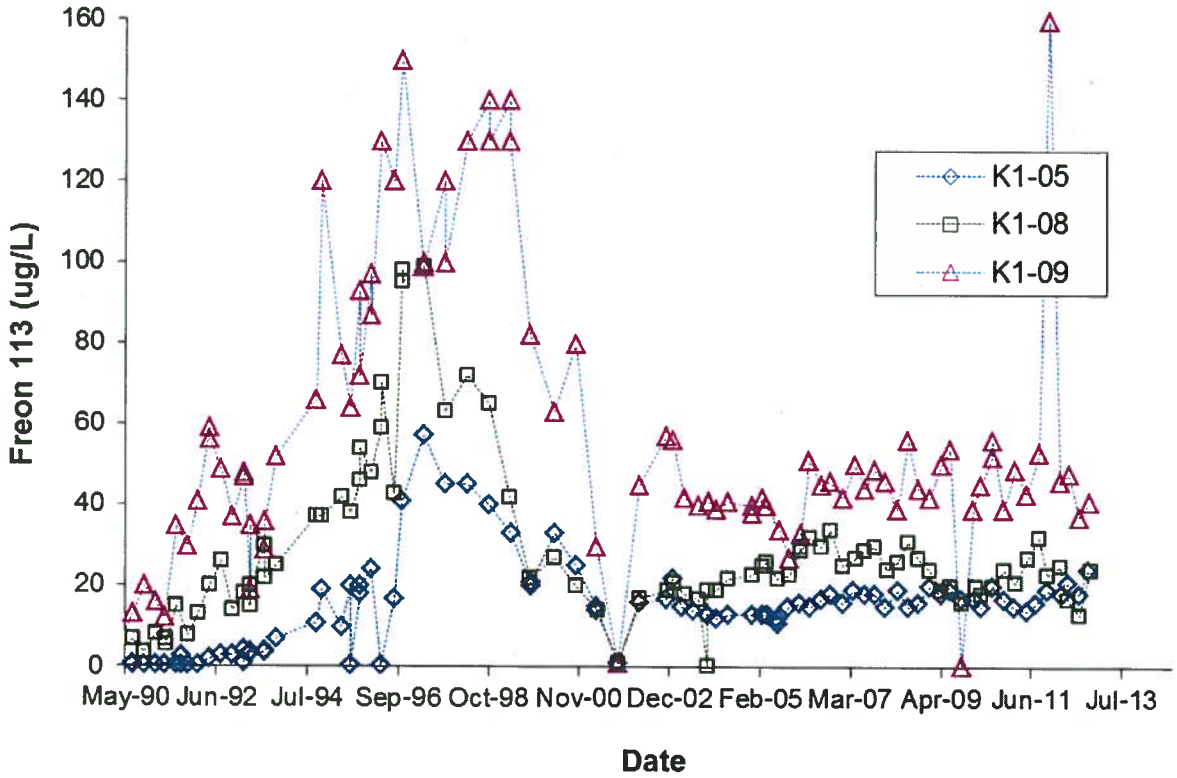

Figure 4. Freon-113 concentrations in water samples collected from detection ground water monitoring wells around Pit 1.

Evaluation Monitoring Wells

Evaluation monitoring wells are required by the MRP and sample analytical results from these wells are shown on **Table A-3**. The table lists physical parameters as well as the results of perchlorate and tritium analyses. These wells are used to track existing plumes of perchlorate and tritium from an upgradient source. As required by the MRP, annual trend analyses graphs for both percholorate and tritium evaluation monitoring wells are presented in each fourth quarter/annual report. During this quarter, evaluation monitoring well K1-06 was not sampled due to insufficient water. Attempts to sample the well occurred on October 8 and November 16, 2012.

The fourth quarter 2012 analytical results indicate that the perchlorate concentration in one of the four evaluation monitoring wells [W-PIT1-2620 (5.5 µg/L)], exceeded the reporting limit of 4.0 µg/L but did not exceed the 6.0 µg/L MCL for perchlorate. The perchlorate concentration in this well is similar to the concentrations reported in previous quarterly reports.

Tritium activity in a sample from one of the four evaluation monitoring wells [W-PIT1-2326] (71.8 Bq/L [1942 pCi/L]) exceeded the detection limit of 3.7 Bq/L [100 pCi/L]. The tritium activity in this well is slightly higher than the activities reported in previous quarterly reports.

For this annual report, perchlorate results for ground waste samples collected from evaluation monitoring wells W-PIT1-02, W-PIT1-2209, W-865-2005, K1-06, and W-PIT1-2620 are plotted on **Figure 5**.

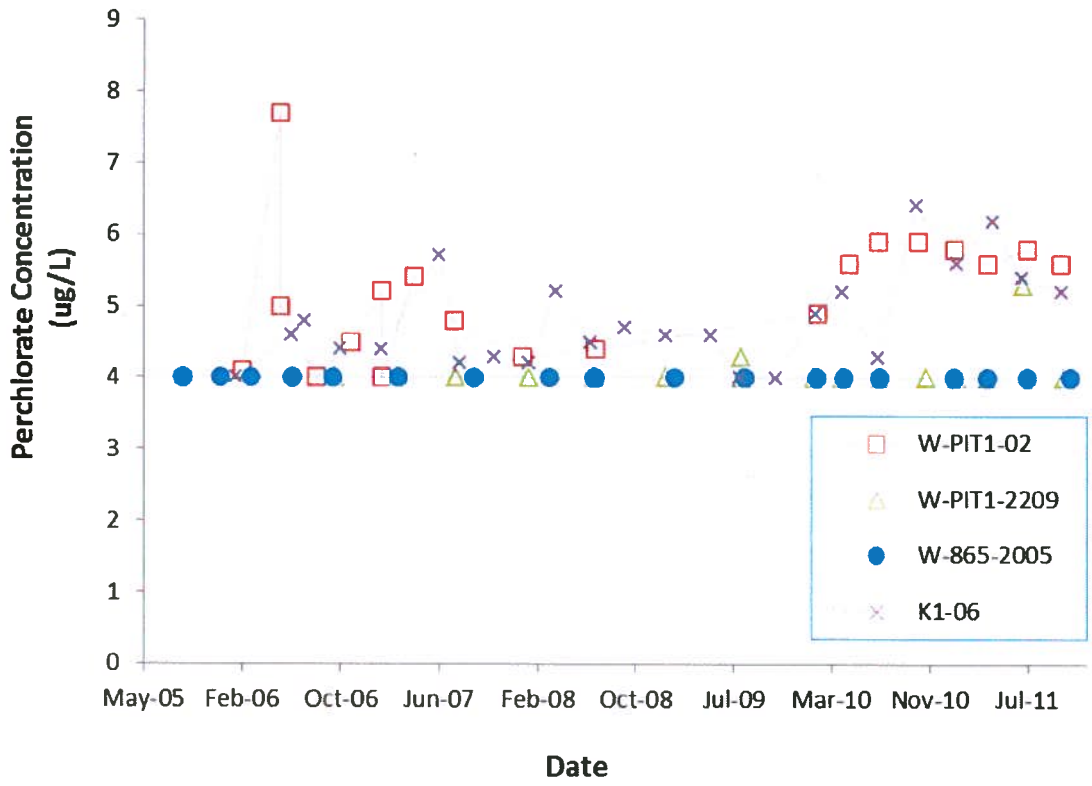

Figure 5. Perchlorate concentrations in water samples collected from detection ground water monitoring wells around Pit 1.

For this annual report, tritium results for ground waste samples collected from evaluation monitoring wells W-PIT1-02, W-PIT1-2209, W-865-2005, K1-06, and W-PIT1-2620 are plotted on **Figure 6**.

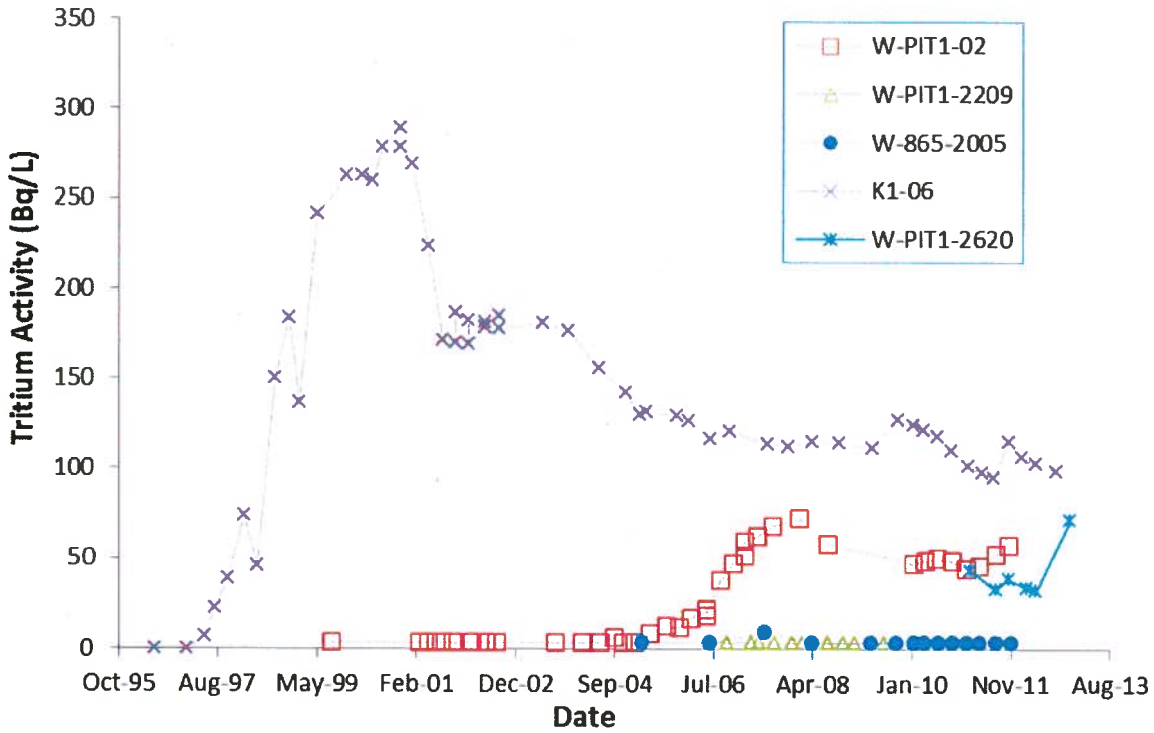

Figure 6. Tritium activities in water samples collected from detection ground water monitoring wells around Pit 1.

Inspection and Maintenance Summary

Visual inspection of the Pit 1 cap was performed on December 4, 2012 by LLNL staff and with the exception of a few small animal burrows, no deficiencies were noted. These minor borrows were backfilled by LLNL staff and the pit cap and drainage structures continue to function properly.

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Acknowledgments

The compliance monitoring program for Pit 1 could not be conducted without the dedicated efforts of many people. Rosanne Depue provided essential administrative and editorial assistance. Don MacQueen provided detailed analytical information. Suzie Chamberlain provided detailed analytical information and performed quality reviews and data table preparation. Eric Walter coordinated the sampling activities. Mario Silva sampled the monitoring wells and packaged the samples for shipment. Della Burruss, Connie Wells, Beth Schad, Lisa Graves, and Becky Goodrich provided excellent data management support and ensured data quality. Off-site analytical support was provided by BC Laboratories, Inc., Eberline Lab, and Gel Laboratory. We thank John Scott, Karen Folks, and Dawn Chase at Site 300 for their cooperation in this effort. Hydrogeologic and graphic assistance was provided by John Radyk and John Valett. A draft of this report was reviewed by LLNL peers, including Suzie Chamberlain, Dawn Chase, and Leslie Ferry whose suggestions and improvements were incorporated.

Abbreviations and Acronyms

Bq	becquerel (international unit of radioactivity equal to 27 pCi)
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CVRWQCB	Central Valley Regional Water Quality Control Board
DOE	U.S. Department of Energy
DTSC	Department of Toxic Substances Control (California)
EFA	Environmental Functional Area (LLNL)
ERD	Environmental Restoration Department
FFA	Federal Facility Agreement
ft	foot (used as a measure of elevation above MSL)
HSU	Hydrostratigraphic Unit
km	kilometer
km^2	square kilometer
L	liter
LLNL	Lawrence Livermore National Laboratory
m	meter
m^2	square meter
MCL	maximum contaminant level (for drinking water)
mg	milligram
MRP	Monitoring and Reporting Plan
MSL	mean sea level (datum for elevation measurements)
µg	microgram
pCi	picocurie (unit of radioactivity equal to 0.037 Bq)
PCP	post-closure plan
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
RL	reporting limit (contractual concentration near zero)
SI	*Système Internationale* (units of measurement)
Site 300	Experimental Test Site, LLNL
SL	statistically determined concentration limit
SOP	standard operating procedure
$Tnbs_0$	Neroly Formation basal sandstone
$Tnbs_1$	Neroly Formation lower blue sandstone
VOC	volatile organic compound
WDR	Waste Discharge Requirements (permit)

Appendix A

Tables and Figures of Ground Water Measurements

Table A-1. Pit 1 detection monitoring wells, constituents of concern, SLs, and quarterly analytical results for 2012.

Quarter			1	2	3	4
COC (units)	**Well**	**SL**	**Result**	**Result**	**Result**	**Result**
Arsenic (µg/L)	K1-01C	—[a]	13	14	12	–
	K1-07	—[a]	13	14	14	13
	K1-02B	15	13	–	13	12
	K1-04	16	11	12	11	10
	K1-05	18	14	16	14	13
	K1-08	17	14	15	14	15
	K1-09	16	13	13	13	14
	W-PIT1-2326	14	13	12	13	12
Barium (µg/L)	K1-01C	–	<25	<25	<25	–
	K1-07	–	29	29	30	28
	K1-02B	26	25	–	25	<25
	K1-04	32	28	26	29	27
	K1-05	43	38	41	40	39
	K1-08	49	43	47	44	39
	K1-09	51	42	45	44	44
	W-PIT1-2326	46	36	34	35	33
Beryllium (µg/L)	K1-01C	–	<0.5	<0.5	<0.5	–
	K1-07	–	<0.5	<0.5	<0.5	<0.5
	K1-02B	0.5	<0.5	–	<0.5	<0.5
	K1-04	0.5	<0.5	<0.5	<0.5	<0.5
	K1-05	0.5	<0.5	<0.5	<0.5	<0.5
	K1-08	0.5	<0.5	<0.5	<0.5	<0.5
	K1-09	0.5	<0.5	<0.5	<0.5	<0.5
	W-PIT1-2326	0.5	<0.5	<0.5	<0.5	<0.5
Cadmium (µg/L)	K1-01C	–	<0.5	<0.5	<0.5	–
	K1-07	–	<0.5	<0.5	<0.5	<0.5
	K1-02B	0.52	<0.5	–	<0.5	<0.5
	K1-04	0.5	<0.5	<0.5	<0.5	<0.5
	K1-05	0.5	<0.5	<0.5	<0.5	<0.5
	K1-08	0.5	<0.5	<0.5	<0.5	<0.5
	K1-09	0.5	<0.5	<0.5	<0.5	<0.5
	W-PIT1-2326	0.5	<0.5	<0.5	<0.5	<0.5
Cobalt (µg/L)	K1-01C	–	<25	<25	<25	–
	K1-07	–	<25	<25	<25	<25
	K1-02B	25	<25	–	<25	<25
	K1-04	25	<25	<25	<25	<25
	K1-05	25	<25	<25	<25	<25
	K1-08	25	<25	<25	<25	<25
	K1-09	25	<25	<25	<25	<25
	W-PIT1-2326	25	<25	<25	<25	<25

Table A-1. Pit 1 detection monitoring wells, constituents of concern, SLs, and quarterly analytical results for 2012.

Quarter			1	2	3	4
COC (units)	**Well**	**SL**	**Result**	**Result**	**Result**	**Result**
Copper (µg/L)	K1-01C	–	<10	<10	<10	–
	K1-07	–	<10	<10	<10	<10
	K1-02B	60	<10	–	<10	32
	K1-04	10	<10	<10	<10	<10
	K1-05	30	<10	<10	<10	18
	K1-08	10	<10	<10	<10	<10
	K1-09	10	<10	<10	<10	<10
	W-PIT1-2326	10	<10	<10	<10	<10
Lead (µg/L)	K1-01C	–	<2	<2	<2	–
	K1-07	–	<2	<2	<2	<2
	K1-02B	2	<2	–	<2	<2
	K1-04	2	<2	<2	<2	<2
	K1-05	2	<2	<2	<2	<2
	K1-08	2	<2	<2	<2	<2
	K1-09	2	<2	<2	<2	<2
	W-PIT1-2326	2	<2	<2	<2	<2
Nickel (µg/L)	K1-01C	–	<5	<5	<5	–
	K1-07	–	<5	<5	<5	<5
	K1-02B	9	<5	–	<5	<5
	K1-04	5	<5	<5	<5	<5
	K1-05	13	<5	<5	<5	<5
	K1-08	5	<5	<5	<5	<5
	K1-09	5	<5	<5	<5	<5
	W-PIT1-2326	5	<5	<5	<5	<5
Vanadium (µg/L)	K1-01C	–	66	68	67	–
	K1-07	–	65	64	68	68
	K1-02B	59	48	–	47	49
	K1-04	46	31	32	37	33
	K1-05	79	64	65	60	69
	K1-08	78	61	63	62	66
	K1-09	69	58	53	58	60
	W-PIT1-2326	63	48	48	49	50
Zinc (µg/L)	K1-01C	–	<20	<20	<20	–
	K1-07	–	<20	<20	<20	<20
	K1-02B	98	<20	–	<20	27
	K1-04	51	<20	<20	<20	28
	K1-05	24	<20	<20	<20	22
	K1-08	20	<20	<20	<20	<20
	K1-09	20	<20	<20	<20	<20
	W-PIT1-2326	48	<20	<20	<20	<20

Table A-1. Pit 1 detection monitoring wells, constituents of concern, SLs, and quarterly analytical results for 2012.

Quarter			1	2	3	4
COC (units)	**Well**	**SL**	**Result**	**Result**	**Result**	**Result**
Radium 226 (Bq/L)[b]	K1-01C	–	0.007	0.014	0.004	–
	K1-07	–	0.002	0.002	0.006	0.002
	K1-02B	0.012	0.002	–	0.000	0.001
	K1-04	0.012	0.004	0.009	0.001	0.003
	K1-05	0.012	0.001	0.003	0.003	0.002
	K1-08	0.009	0.002	.016, 0.005, 0.00	0.004	0.006
	K1-09	0.012	0.003	0.000	0.008	0.001
	W-PIT1-2326	0.019	0.004	0.001	0.007	0.01
Tritium (Bq/L)	K1-01C	–	33.2	35.0	33.6	–
	K1-07	–	-1.00	2.11	3.88	1.9
	K1-02B	158	141	–	132	120
	K1-04	19.2	13.6	17.9	18.9	17.4
	K1-05	11.4	7.99	6.25	5.59	9.47
	K1-08	10.7	3.31	9.25	9.69	7.81
	K1-09	8.66	2.19	5.36	8.55	7.44
	W-PIT1-2326	133	103	99.5	98.4	98.8
Uranium (total, Bq/L)	K1-01C	–	0.165	0.122	0.132	–
	K1-07	–	0.104	0.103	0.111	0.105
	K1-02B	0.145	0.135	–	0.136	0.146
	K1-04	0.085	0.072	0.069	0.067	0.065
	K1-05	0.115	0.126	0.113	0.113	0.105
	K1-08	0.149	0.100	0.111	0.111	0.115
	K1-09	0.137	0.126	0.119	0.118	0.11
	W-PIT1-2326	0.139	0.119	0.131	0.123	0.132
Thorium 228 (Bq/L)	K1-01C	–	0.000	0.000	0.000	–
	K1-07	–	0.000	0.000	0.000	0
	K1-02B	0.003	0.000	–	0.000	0.001
	K1-04	0.005	0.000	0.000	-0.001	0
	K1-05	0.003	0.000	0.001	0.000	0.001
	K1-08	0.004	0.000	-0.001	0.000	0
	K1-09	0.008	0.000	0.000	0.000	0.001
	W-PIT1-2326	0.005	0.000	0.000	0.000	0
Thorium 232 (Bq/L)	K1-01C	–	0.000	0.000	0.000	–
	K1-07	–	0.000	0.000	0.000	0
	K1-02B	0.004	0.000	–	0.000	0
	K1-04	0.001	0.000	0.000	0.000	0
	K1-05	0.004	0.000	0.000	0.000	0
	K1-08	0.004	0.000	0.000	0.000	0
	K1-09	0.002	0.000	0.000	0.000	0.001
	W-PIT1-2326	0.001	0.000	0.000	0.000	0

Table A-1. Pit 1 detection monitoring wells, constituents of concern, SLs, and quarterly analytical results for 2012.

Quarter			1	2	3	4
COC (units)	**Well**	**SL**	**Result**	**Result**	**Result**	**Result**
HMX (µg/L)	K1-01C	–	<1.3	<1	<1	–
	K1-07	–	<1	<1	<1	<0.79
	K1-02B	1	<1.3	–	<1	<0.83
	K1-04	1	<1	<1	<1	<0.71
	K1-05	1	<1.3	<1	<1	<0.8
	K1-08	1	<1	<1	<1	<0.7
	K1-09	1	<0.89	<1	<1	<1
	W-PIT1-2326	1	<1	<1	<0.9	<0.71
RDX (µg/L)	K1-01C	–	<1.3	<1	<1	–
	K1-07	–	<1	<1	<1	<0.79
	K1-02B	1	<1.3	–	<1	<0.83
	K1-04	1	<1	<1	<1	<0.71
	K1-05	1	<1.3	<1	<1	<0.8
	K1-08	1	<1	<1	<1	<0.7
	K1-09	1	<0.89	<1	<1	<1
	W-PIT1-2326	1	<1	<1	<0.9	<0.71

[a] Wells K1-01C and K1-07 have no release detection SLs for COCs, because they are upgradient of Pit 1.

[b] Radioactivity measurements are corrected for the background radioactivity inside the measurement chamber.

A negative result for radioactivity indicates that the sample measured lower than the background by the amount shown. Radioactivity values shown as 0.000 measured less than 0.0005 Bq/L.

(-) No sample taken during the second quarter at well K1-01C due to an inoperable pump.

Table A-2. Pit 1 additional PCP constituents for the fourth quarter 2012 analytical results for detection monitoring wells.

	Monitoring Well						
	K1-07	K1-02B	K1-04	K1-05	K1-08	K1-09	W-PIT1-2326
Date Sampled	10-Oct	10-Oct	9-Oct	8-Oct	29-Oct	9-Oct	29-Oct
Depth to water (ft)	142.85	137.09	158.14	172.81	157.25	163.64	181.08
Ground water elevation (ft)	966.78	970.14	964.53	958.05	965.49	963.04	966.71
Field pH (Units)	7.44	7.42	7.44	7.58	7.64	7.48	7.47
Field Specific Conductance (µmhos/cm)	605	734	603	629	630	648	713
Field Temperature (Degrees C)	21.2	21.1	22.1	22.8	22.3	22.1	21.3
Gross alpha (Bq/L)	0.101	0.205	0.107	0.103	0.101	0.217	0.099
Gross beta (Bq/L)	0.1	0.162	0.097	0.101	0.148	0.119	0.135
Nitrate (as NO3) (mg/L)	32	31	29	34	34	35	31
Perchlorate (µg/L)	<4	4.6	<4	<4	<4	<4	<4
Total VOCs (calculated) (µg/L)	ND	ND	ND	24	24	41	ND
Freon 113 (µg/L)	<0.5	<0.5	<0.5	24	24	41	<0.5

Note:

ND = Not detected above reporting limit. Reporting limits vary with individual VOCs.

Table A-3. Pit 1 evaluation monitoring wells, constituents of concern, physical parameters, and analytical results for fourth quarter 2012.

	Monitoring Well			
	K1-06	**W-PIT1-2620**	**W-PIT1-2209**	**W-865-2005**
Date Sampled	–	29-Nov	4-Oct	4-Oct
Depth to water (ft)	–	231.62	216.7	327.43
Ground water elevation (ft)	–	948.25	949.35	947.44
Tritium (Bq/L)	–	71.8	0.503	2.51
Field pH (Units)	–	7.62	7.64	7.53
Field Specific Conductance (µmhos/cm)	–	781	625	600
Field Temperature (Degrees C)	–	20.5	22.1	21.9
Perchlorate (µg/L)	–	5.5	<4	<4

Note:
– Well not sampled due to insufficient water column for sample method.

Table A-4. Pit 1 ground water well routine sampling dates.

Location	Quarter	Sample Date
K1-01C	1	14-Feb-2012
	2	14-May-2012
	3	18-Jul-2012
	4	12-Nov-2012
K1-02B	1	14-Feb-2012
	2	19-May-2012
	3	23-Jul-2012
	4	10-Oct-2012
K1-04	1	7-Feb-2012
	2	10-May-2012
	3	17-Jul-2012
	4	9-Oct-2012
K1-05	1	14-Feb-2012
	2	17-Apr-2012
	3	16-Jul-2012
	4	8-Oct-2012
K1-07	1	7-Feb-2012
	2	17-Apr-2012
	3	2-Aug-2012
	4	10-Oct-2012
K1-08	1	7-Feb-2012
	2	17-May-2012
	3	17-Jul-2012
	4	29-Oct-2-12
K1-09	1	6-Feb-2012
	2	19-Apr-2012
	3	17-Jul-2012
	4	9-Oct-2012
W-PIT1-2326	1	15-Feb-2012
	2	10-May-2012
	3	23-Jul-2012
	4	29-Oct-2012
K1-06	1	10-Jan-2012
	2	18-Apr-2012
	3	11-Jul-2012
	4	8-Oct-2012
W-PIT1-2209	1	10-Jan-2012
	2	15-May-2012
	3	11-Jul-2012
	4	4-Oct-2012
W-PIT1-2620	1	15-Feb-2012
	2	18-Apr-2012
	3	16-Aug-2012
	4	29-Nov-2012
W-865-2005	1	8-Feb-2012
	2	15-May-2012
	3	10-Jul-2012
	4	4-Oct-2012

Table A-5. Pit 1 VOC Reporting Limits (µg/L).

VOC/Location	K1-04	K1-05	K1-07	K1-02B	K1-09	K1-08	K1-01C	W-PIT1-2326
Acetonitrile	100	100	100	100	100	100	100	100
Acetone	10	10	10	10	10	10	10	10
Acrolein	50	50	50	50	50	50	50	50
Acrylonitrile	50	50	50	50	50	50	50	50
Benzene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Bromodichloromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Bromoform	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Bromomethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2-Butanone	10	10	10	10	10	10	10	10
Carbon disulfide	5	5	5	5	5	5	5	5
Carbon tetrachloride	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Chlorobenzene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2-Chloro-1,3-butadiene	5	5	5	5	5	5	5	5
Chloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2-Chloroethylvinylether	10	10	10	10	10	10	10	10
Chloroform	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Chloromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,2-Dibromo-3-chloropropane	1	1	1	1	1	1	1	1
Dibromochloromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,4-Dichloro-2-butene	5	5	5	5	5	5	5	5
Dichlorodifluoromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1-Dichloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,2-Dichloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1-Dichloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
cis-1,2-Dichloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
trans-1,2-Dichloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,2-Dichloroethene (total)	1	1	1	1	1	1	1	1
1,2-Dichloropropane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
cis-1,3-Dichloropropene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
trans-1,3-Dichloropropene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,4-Dioxane	100	100	100	100	100	100	100	100
Ethanol	1000	1000	1000	1000	1000	1000	1000	1000
Ethylbenzene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Freon 113	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2-Hexanone	10	10	10	10	10	10	10	10
4-Methyl-2-pentanone	10	10	10	10	10	10	10	10
Methylene chloride	1	1	1	1	1	1	1	1
Styrene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1,1,2-Tetrachloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1,2,2-Tetrachloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Tetrachloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Trichloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Toluene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1,1-Trichloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1,2-Trichloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Trichlorofluoromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Vinyl acetate	20	20	20	20	20	20	20	20
Vinyl chloride	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total xylene isomers	1	1	1	1	1	1	1	1

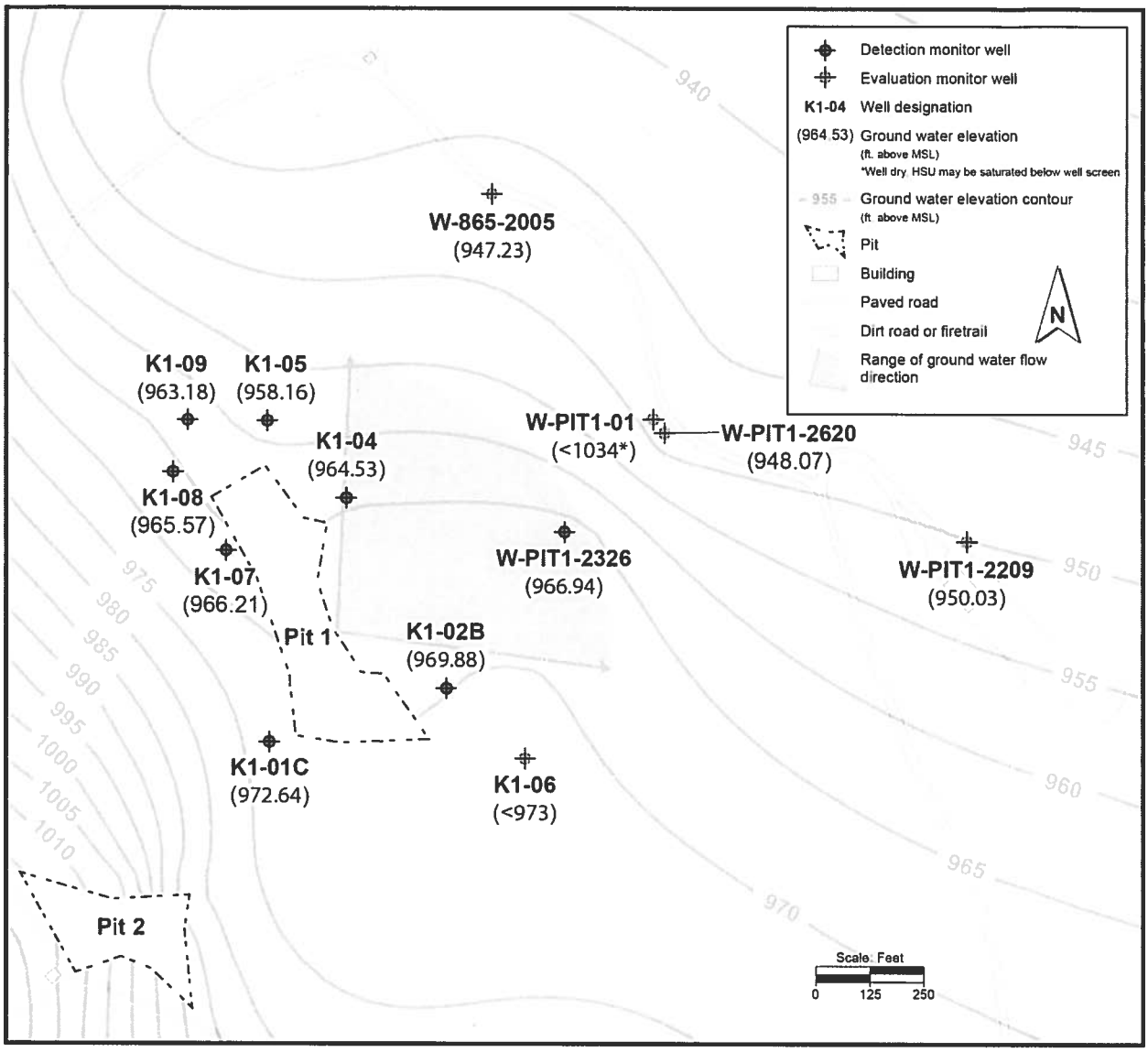

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Figure A-1. Ground water elevation contour map for the $Tnbs_1/Tnbs_0$ HSU at Pit 1.

Appendix B

Statistical Methods for Release Detection

Appendix B

Statistical Methods for Release Detection

Statistical monitoring of the RCRA closure and PCP for the Pit 1 landfill is described in the Revised MRP No. 93-100 (February 18, 2010) to satisfy the provisions of CCR Title 23, Chapter 15, Section 2550.7.

LLNL uses an intrawell comparison for each analyte at each down-gradient and cross-gradient well to detect potential releases of constituents of concern to ground water. Intrawell tests compare each measurement at a well to past measurements at that well in order to detect increases in concentration that statistically exceed the variation historically seen at that well.

Where sufficient detections are available, LLNL uses a statistical prediction limit method to implement intrawell comparisons. The method uses the average and standard deviation of historical measurements to calculate a SL value. The SL is calculated so that it will be exceeded by approximately one percent of individual measurements when there has not been a release. When too few detections are available, either the analytical reporting limit or maximum recent detection is used as an SL. The SLs currently in use are documented in the MRP.

Each quarter, each measurement is compared with its associated SL. The SL comparison is augmented by a verification procedure containing two discreet retests, in accordance with CCR Title 23, Chapter 15, Section 2550.7. This protects against false positives due to other causes, such as analytical error in the laboratory. Retests are used when the original measurement exceeds the SL. If either or both of the retests also exceed the SL, the result is considered to be a "statistically significant evidence of a release." Based on the MRP, monitoring is conducted to evaluate SL detections for all constituents of concern in **Table A-1** detection monitoring wells. In addition, sampling is performed to evaluate whether tritium and perchlorate results for ground water samples collected from evaluation monitoring wells near Pit 1 indicate a release from Pit 1 or another source.

A change of the SL for total uranium at well W-PIT1-2326 was sent to the CVRWQCB in a letter request on June 13, 2011 because the total uranium values at the well had been elevated for several quarters. However, the value was below the closed upgradient well. The SL for this well continued to be slightly elevated during the remainder of 2011 and during the first quarter of 2012. LLNL communicated with the CVRWQCB in past letters and quarterly reports that we did not believe that the total uranium activities in this monitoring well represent statistical evidence of a release from Pit 1. LLNL's conclusion is based on samples collected from upgradient wells, as well as the natural uranium-235/238 ratio at the well. In the June 13, 2011 letter, LLNL proposed to update the total uranium SL from 3.12 pCi/L to 3.75 pCi/L for this well. LLNL received a letter response from the CVRWQCB on July 16, 2012 indicating that the CVRWQCB agreed to the SL changes proposed by LLNL, and changes were incorporated into this report commencing during the third quarter of 2012.

Appendix C

Quality Assurance Samples

Table C-1. Pit 1 quality assurance for routine, duplicate, and field blank samples for fourth quarter 2012.

	PIT1FB	Routine [b]	
Constituent [a]	Field blank (Oct 10)	K1-01C	**Units**
Arsenic	<2	–	µg/L
Barium	<25	–	µg/L
Beryllium	<0.5	–	µg/L
Cadmium	<0.5	–	µg/L
Cobalt	<25	–	µg/L
Copper	<10	–	µg/L
Lead	<2	–	µg/L
Nickel	<5	–	µg/L
Vanadium	<25	–	µg/L
Zinc	<20	–	µg/L
Nitrate (as NO3)	<0.5	–	mg/L
Perchlorate	<4	–	µg/L
He compounds			
HMX	<1	–	µg/L
RDX	<1	–	µg/L
Radioactivity			
Radium 226 [c]	0.001 ± 0.004	–	Bq/L
Tritium	-0.437 ± 1.83	–	Bq/L
Uranium (total)	-0.001 ± 0.001	–	Bq/L
Thorium 228	0.000 ± 0.001	–	Bq/L
Thorium 232	0.000 ± 0.001	–	Bq/L
Gross alpha	0.012 ± 0.033	–	Bq/L
Gross beta	-0.020 ± 0.051	–	Bq/L

[a] As standard QA protocol, trip blanks were submitted with all samples in Table C-1. This quarter, all trip blank analyses were non-detects.

[b] (–) Routine sample not taken due to an inoperable pump.

[c] Radioactivity is corrected for the background radioactivity inside the measurement apparatus. Negative activity indicates that the sample contained less than the background activity by the amount shown. Radioactivity equal to or less than the 2-sigma uncertainty shown is considered to be a nondetection.

Appendix D

Constituents of Concern and Monitoring Frequencies

Table D-1. Pit 1 constituents of concern and monitoring frequencies. [a]

Constituent	WDR [b]	PCP [c]	Pit 1
Arsenic	X		Q
Barium	X		Q
Beryllium	X		Q
Cadmium	X		Q
Chloride		X	A
Chromium		X	SA
Cobalt	X		Q
Copper	X		Q
Iron		X	SA
Lead	X		Q
Manganese		X	SA
Mercury		X	SA
Nickel	X		Q
Nitrate		X	SA
Selenium		X	SA
Silver		X	SA
Sodium		X	SA
Sulfate		X	A
Vanadium	X		Q
Zinc	X		Q
Total organic carbon (TOC)		X	A
Total organic halides (TOX)		X	A
EPA Method 601		X	
EPA Method 624		X	A
EPA Method 625		X	A
EPA Method 608		X	A
Gross alpha and gross beta		X	SA
Radium 226	X		Q
Thorium 228	X		Q
Thorium 232	X		Q
Tritium	X		Q
Perchlorate	X		Q
Uranium (total)	X		Q
HMX	X		Q
RDX	X		Q
Ground water elevation		X	SA
Ground water temperature		X	SA
pH		X	SA
Specific conductance		X	SA

[a] Monitoring frequencies are: Q (quarterly); SA (semiannually); A (annually).

[b] Constituents of concern required to be monitored by WDR 93-100 (CVRWQCB, 2010).

[c] Additional constituents of concern required to be monitored by the post-closure plan (Rogers/Pacific Corporation, 1990).

Appendix E

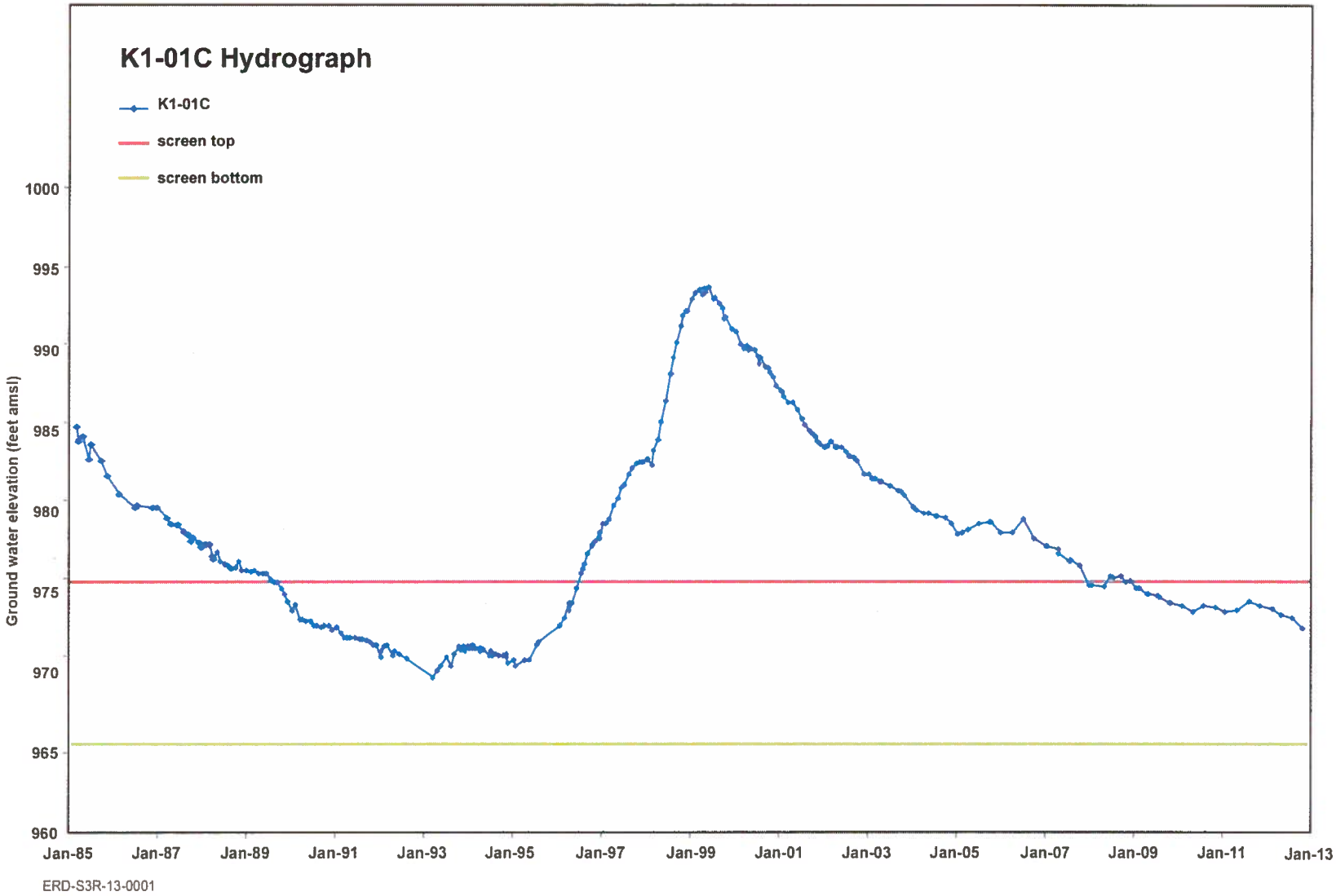
Well Specification and Construction Details for Detection Monitoring and Evaluation Monitoring Wells

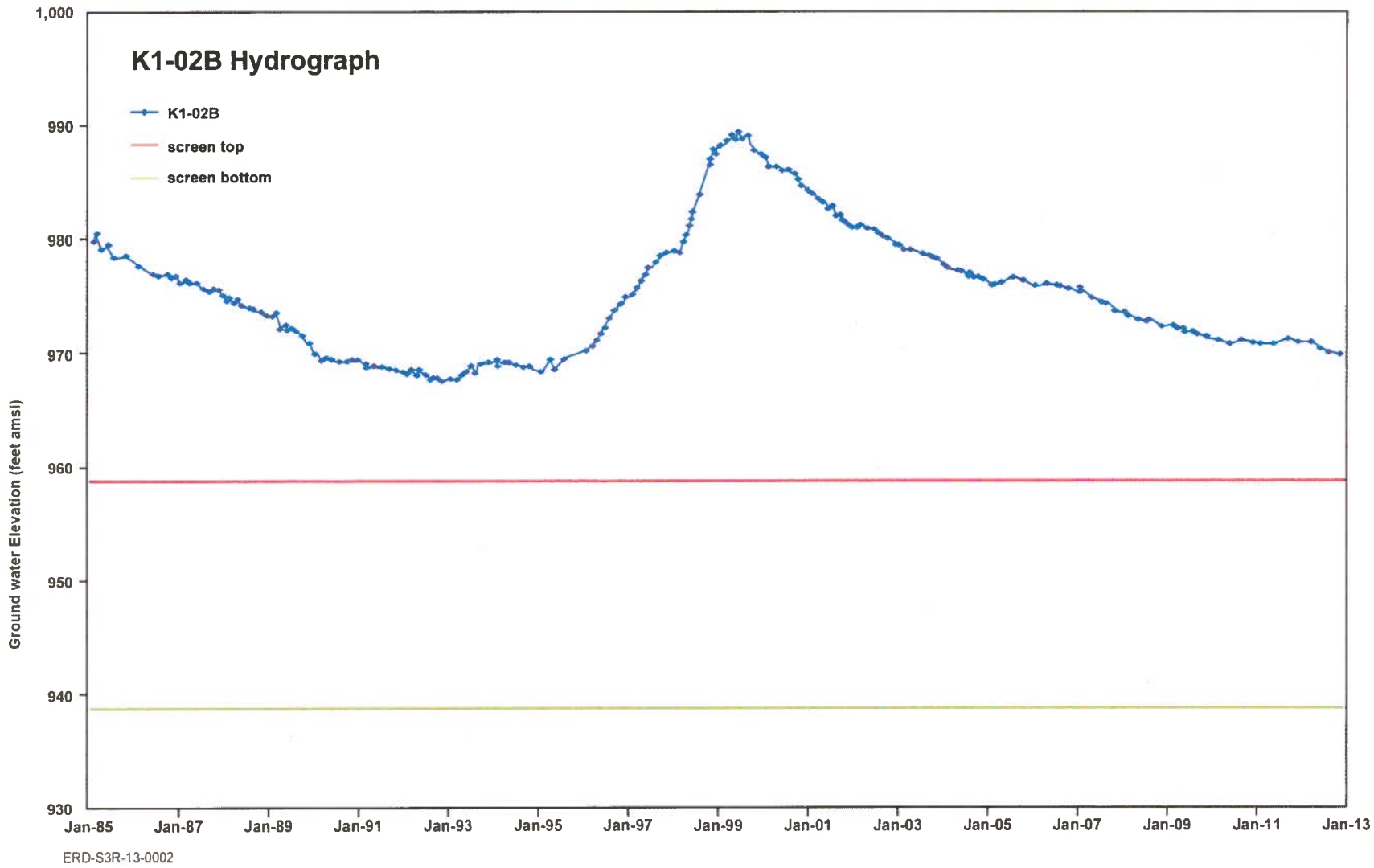
Table E-1. Well specification and construction details of the Pit 1 monitoring network.

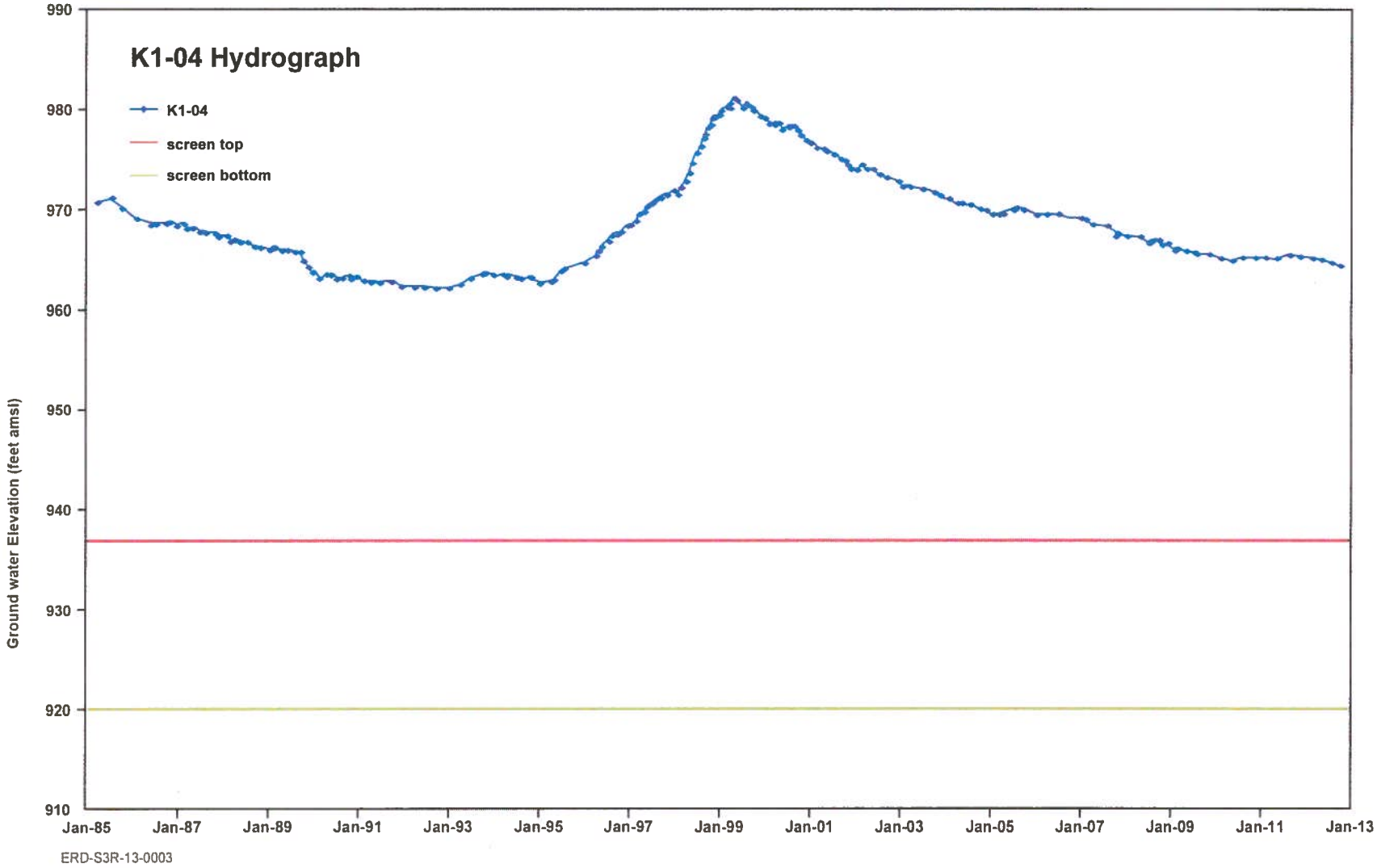
Well	HSU	Northing	Easting	Ground Surface Evaluation	Reference Evaluation	Elevation of Screen Top	Elevation of Screen Bottom	Elevation of Bentonite Top	Elevation of Bentonite Bottom	Elevation of Filter Pack Top	Elevation of Filter Pack Bottom	Elevation of Casing Bottom
K1-01C	$Tnbs_1/Tnbs_0$	427774.28	1699062.3	1078.92	1081.94	975.42	965.42	998.92	986.92	986.92	955.92	965.42
K1-02B	$Tnbs_1/Tnbs_0$	427893.78	1699452.58	1105.23	1107.23	958.73	938.73	985.23	982.13	982.13	932.73	938.73
K1-04	$Tnbs_1/Tnbs_0$	428315.51	1699231.7	1120.00	1122.67	937.00	920.00	978.00	968.00	968.00	919.00	919.00
K1-05	$Tnbs_1/Tnbs_0$	428485.47	1699057.58	1128.86	1130.86	965.86	944.86	None	None	972.86	941.86	944.86
K1-06	$Tnbs_1/Tnbs_0$	427736.68	1699627.38	1087.54	1089.54	982.54	972.54	None	None	995.54	971.54	972.54
K1-07	$Tnbs_1/Tnbs_0$	428199.97	1698965.54	1106.63	1109.63	978.63	958.63	985.63	983.93	983.93	956.63	956.63
K1-08	$Tnbs_1/Tnbs_0$	428373.1	1698848.94	1120.72	1122.74	979.72	954.72	991.22	985.72	985.72	952.72	952.72
K1-09	$Tnbs_1/Tnbs_0$	428488.09	1698880.26	1124.68	1126.68	969.68	934.68	978.18	975.68	975.68	932.68	932.68
W-865-2005	$Tnbs_1/Tnbs_0$	428990.64	1699555.36	1272.87	1274.87	942.87	922.87	954.87	950.87	950.87	919.87	921.87
W-PIT1-02	$Tnbs_1/Tnbs_0$	428494.39	1699912.16	1179.30	1181.30	929.30	919.30	942.30	934.30	934.30	911.30	918.30
W-PIT1-2209	$Tnbs_1/Tnbs_0$	428221.94	1700615.69	1164.05	1166.05	919.05	899.05	939.05	929.05	929.05	896.05	898.05
W-PIT1-2326	$Tnbs_1/Tnbs_0$	428240.21	1699717.26	1145.79	1147.79	930.79	911.09	960.79	949.79	949.79	905.79	910.67
W-PIT1-2620	$Tnbs_1/Tnbs_0$	428473.29	1699935.03	1177.87	1179.87	932.87	917.97	947.87	942.57	942.57	914.87	917.55

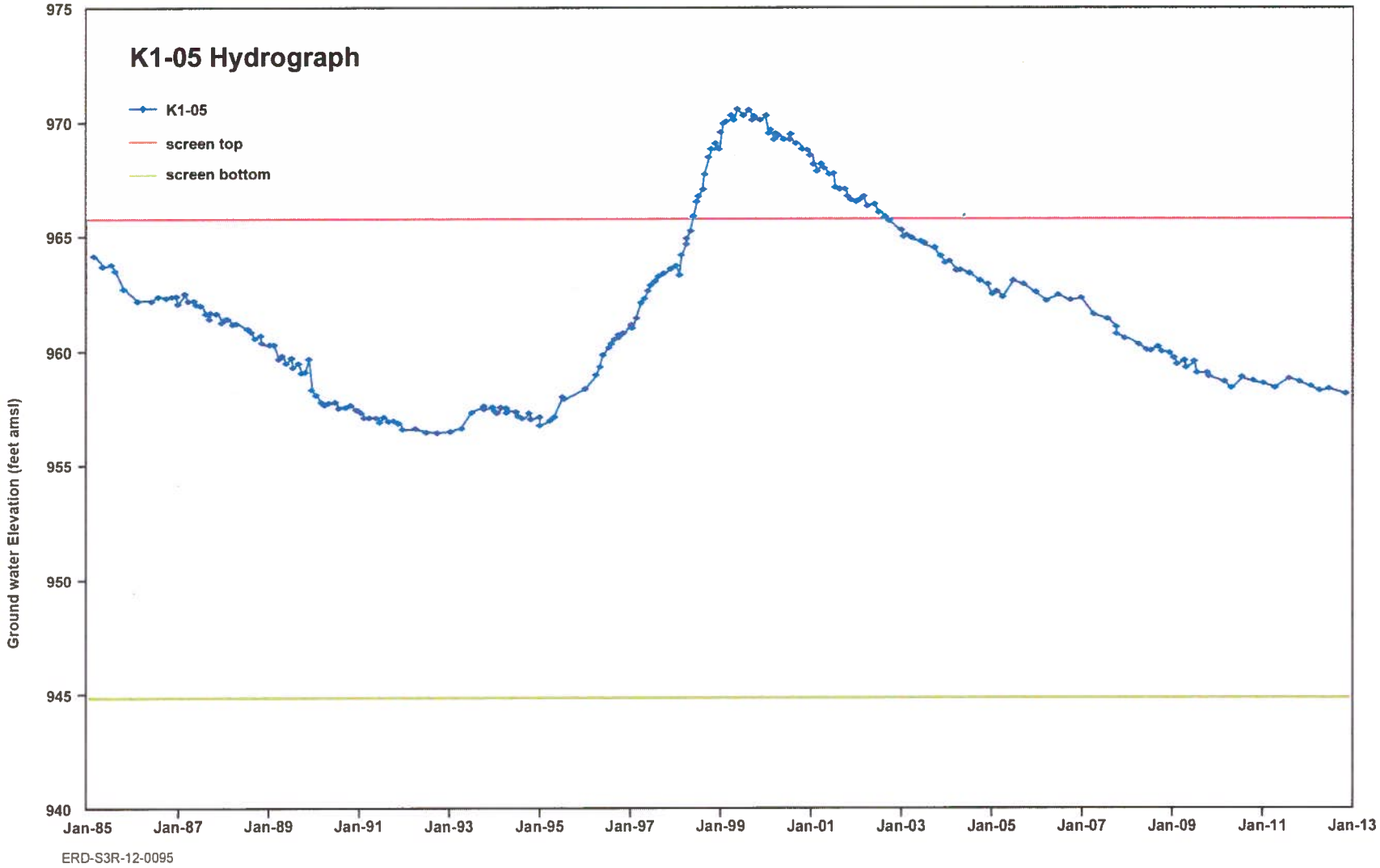
Appendix F

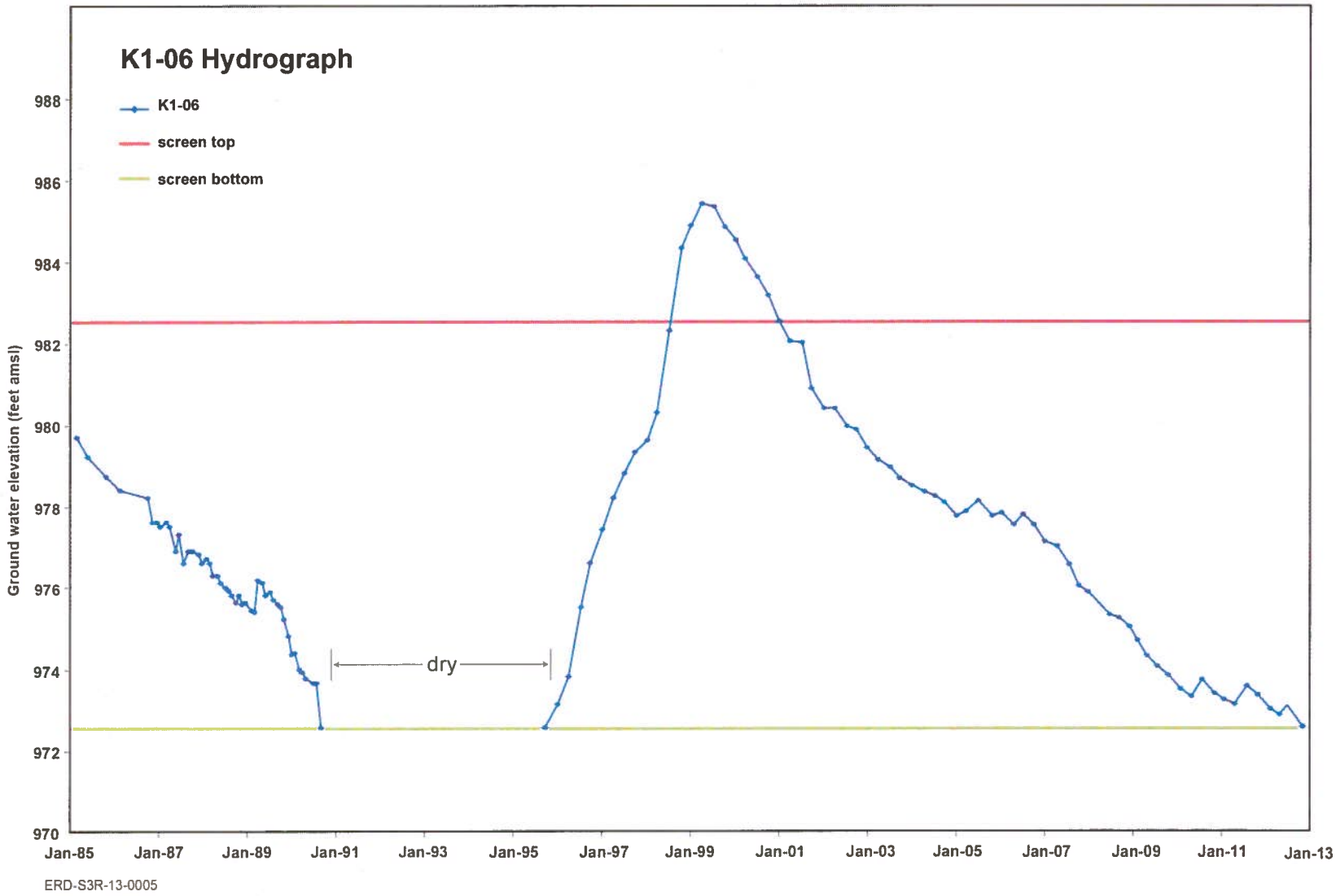
Hydrographs for All Compliance Monitoring Wells

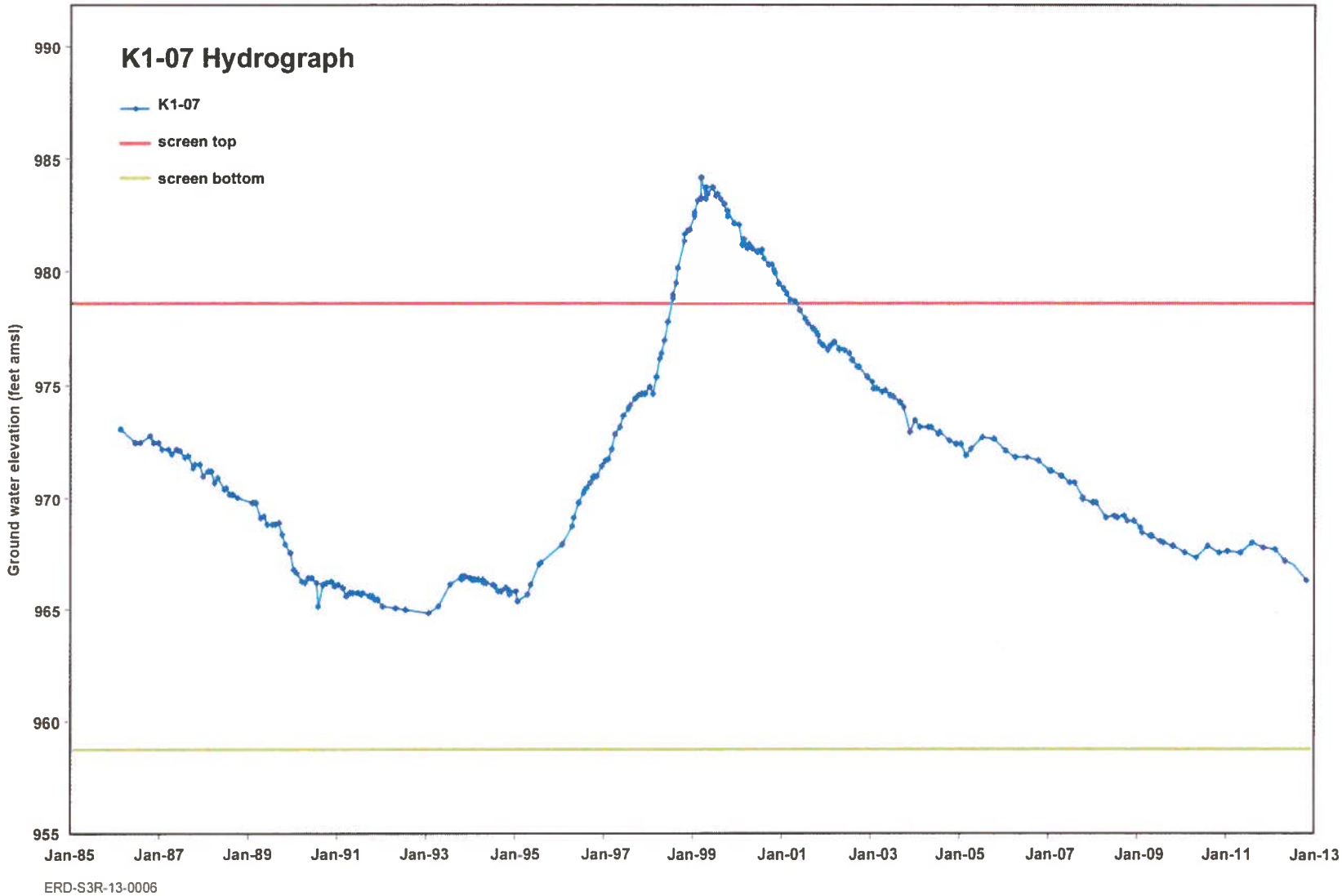

K1-01C Hydrograph
K1-01C
screen top
screen bottom
Ground water elevation (feet amsl)
1000
995
990
985
980
975
970
965
960
Jan-85
Jan-87
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Jan-09
Jan-11
Jan-13
ERD-S3R-13-0001

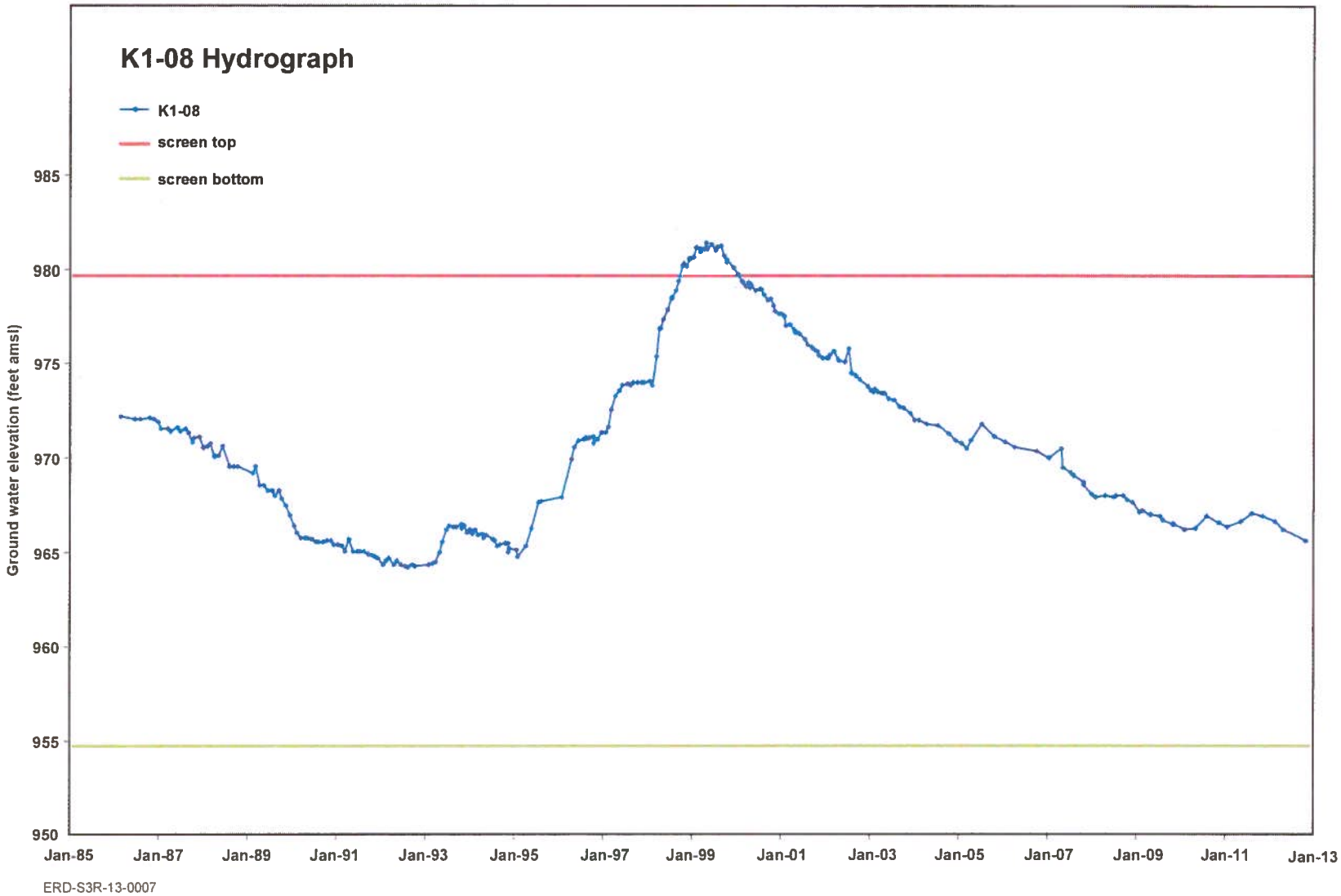

K1-02B Hydrograph
K1-02B
screen top
screen bottom
Ground water Elevation (feet amsl)
1,000
990
980
970
960
950
940
930
Jan-85
Jan-87
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Jan-09
Jan-11
Jan-13
ERD-S3R-13-0002

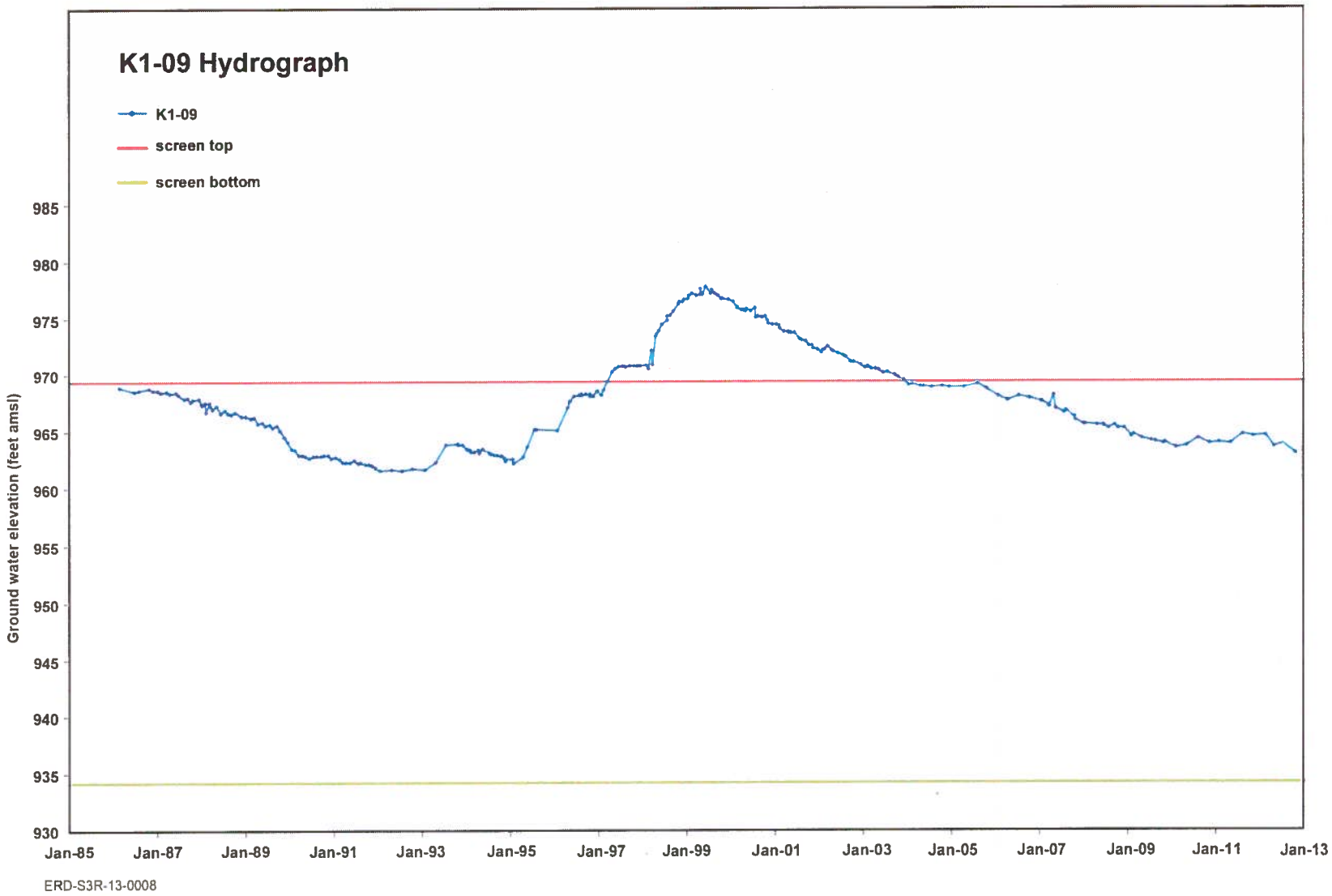

K1-04 Hydrograph
K1-04
screen top
screen bottom
Ground water Elevation (feet amsl)
990
980
970
960
950
940
930
920
910
Jan-85
Jan-87
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Jan-09
Jan-11
Jan-13
ERD-S3R-13-0003

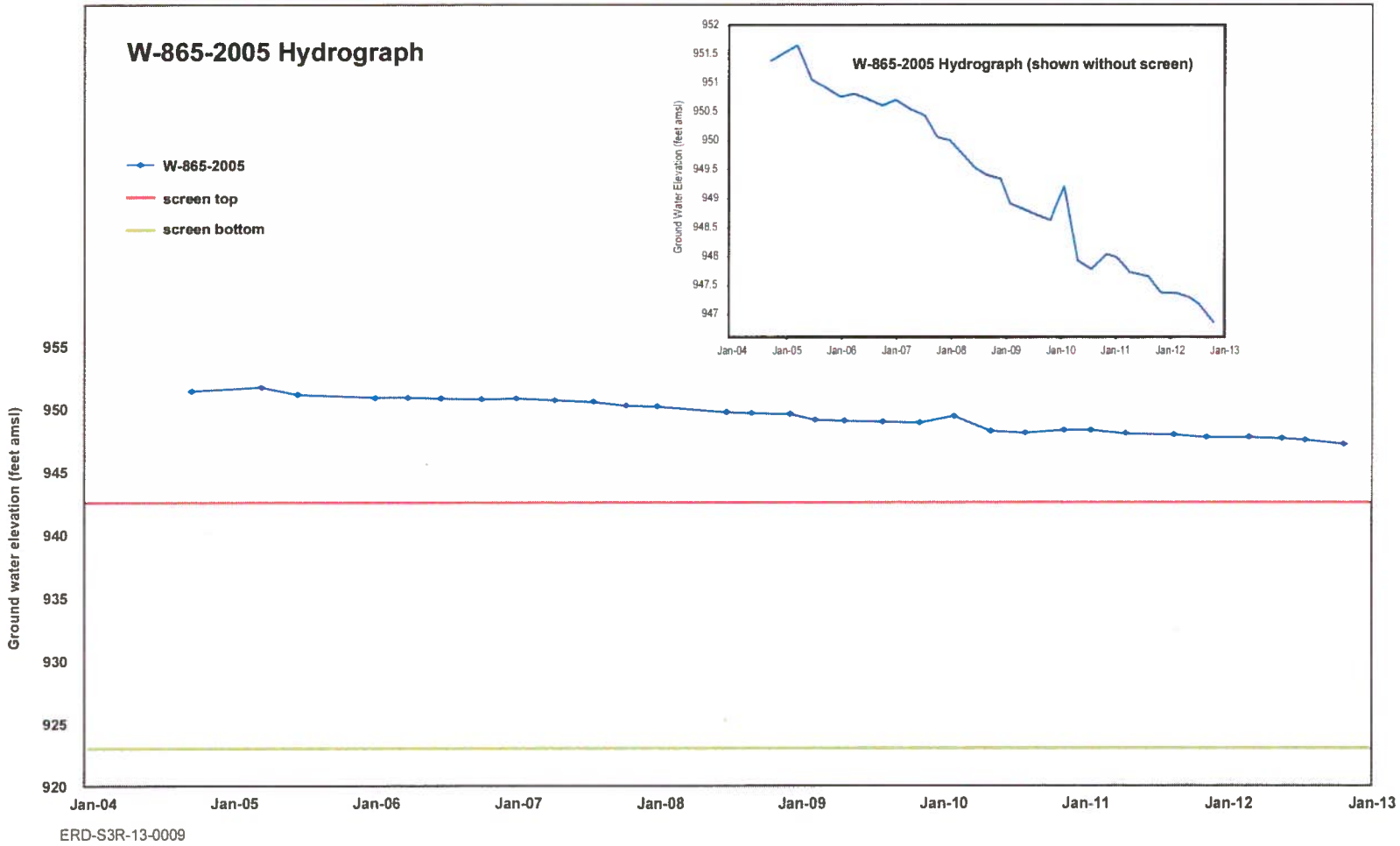

K1-05 Hydrograph
K1-05
screen top
screen bottom
Ground water Elevation (feet amsl)
975
970
965
960
955
950
945
940
Jan-85
Jan-87
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Jan-09
Jan-11
Jan-13
ERD-S3R-12-0095

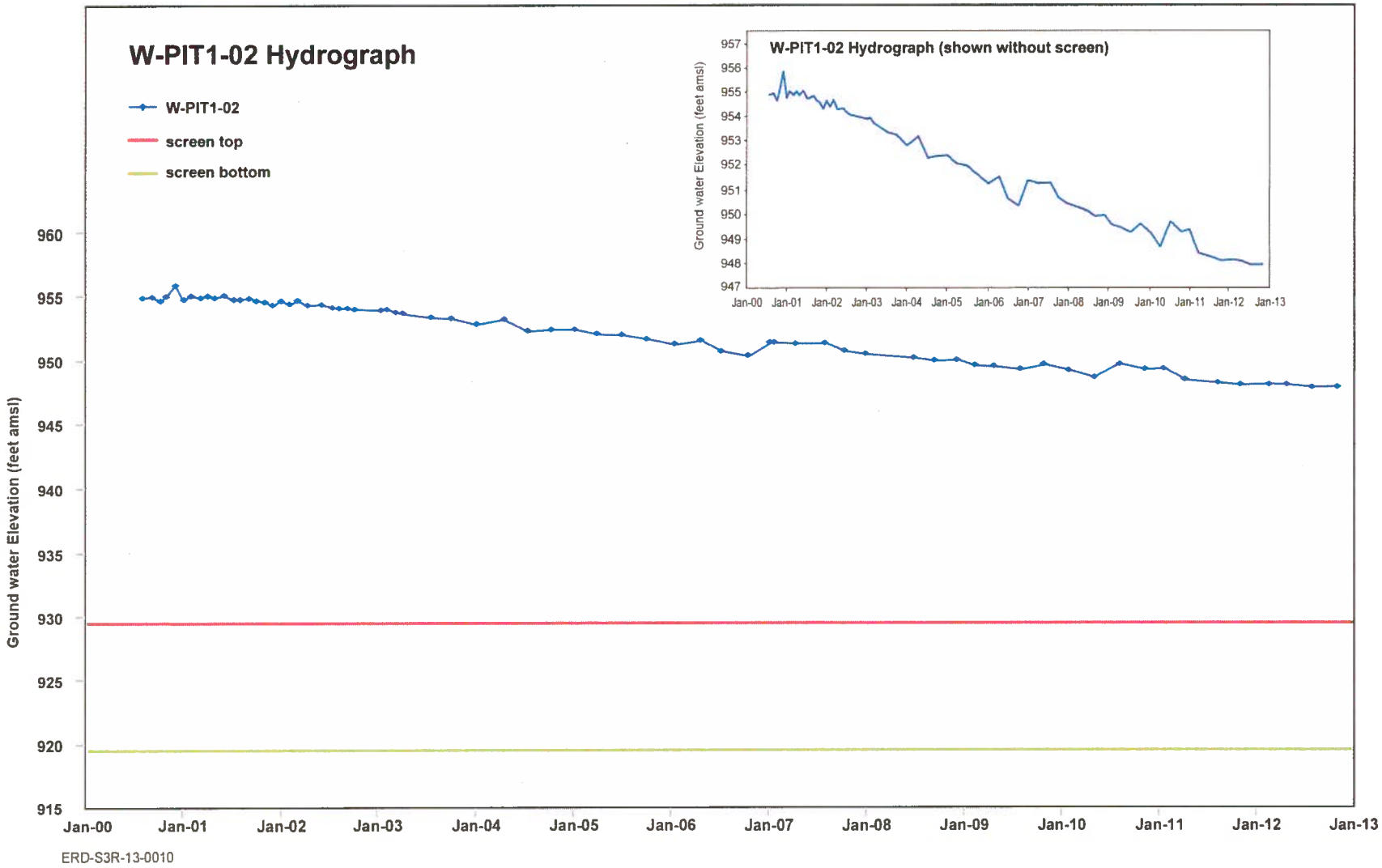

K1-06 Hydrograph
K1-06
screen top
screen bottom
Ground water elevation (feet amsl)
988
986
984
982
980
978
976
974
972
970
dry
Jan-85
Jan-87
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Jan-09
Jan-11
Jan-13
ERD-S3R-13-0005

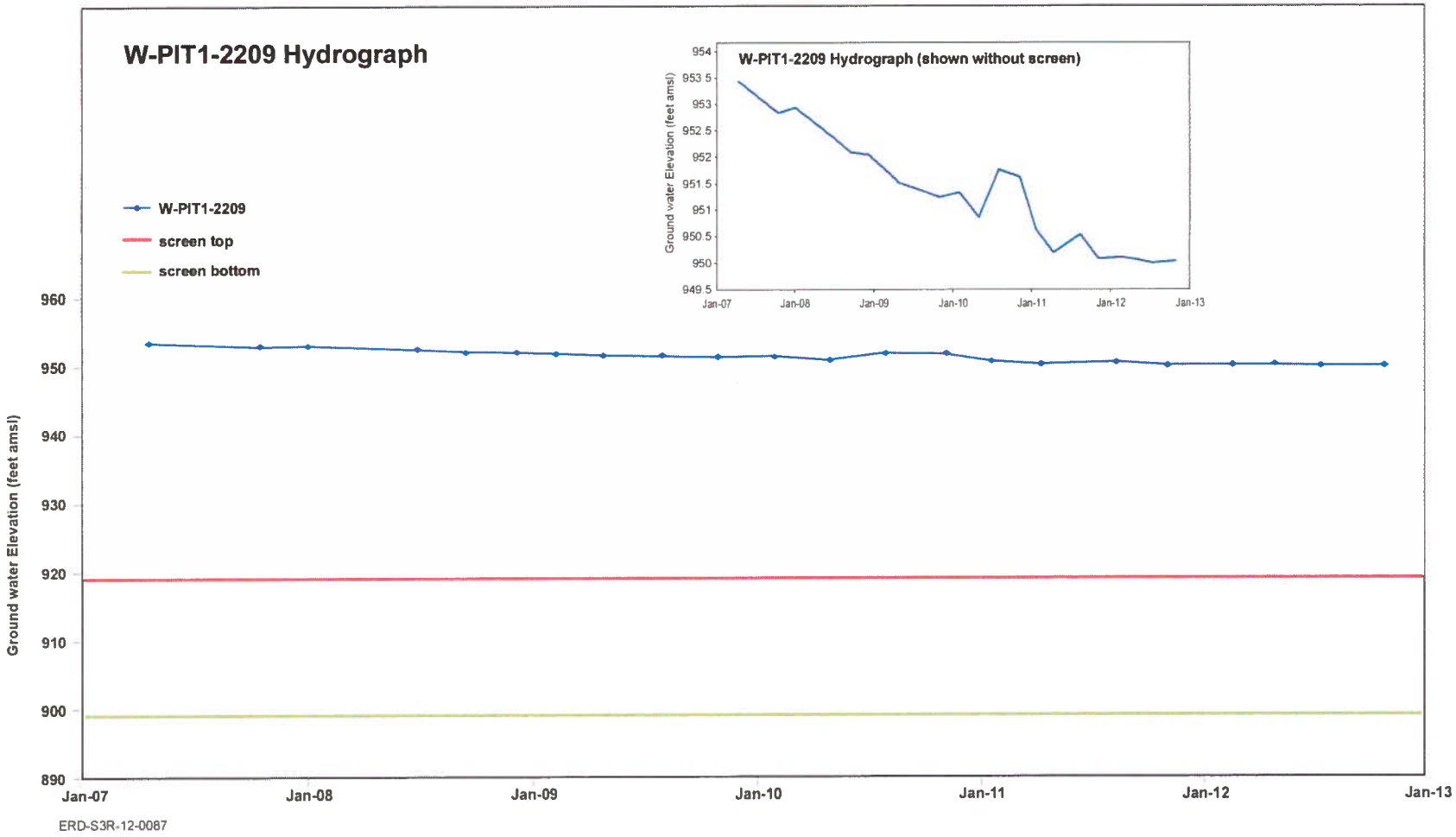

K1-07 Hydrograph
K1-07
screen top
screen bottom
Ground water elevation (feet amsl)
990
985
980
975
970
965
960
955
Jan-85
Jan-87
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Jan-09
Jan-11
Jan-13
ERD-S3R-13-0006

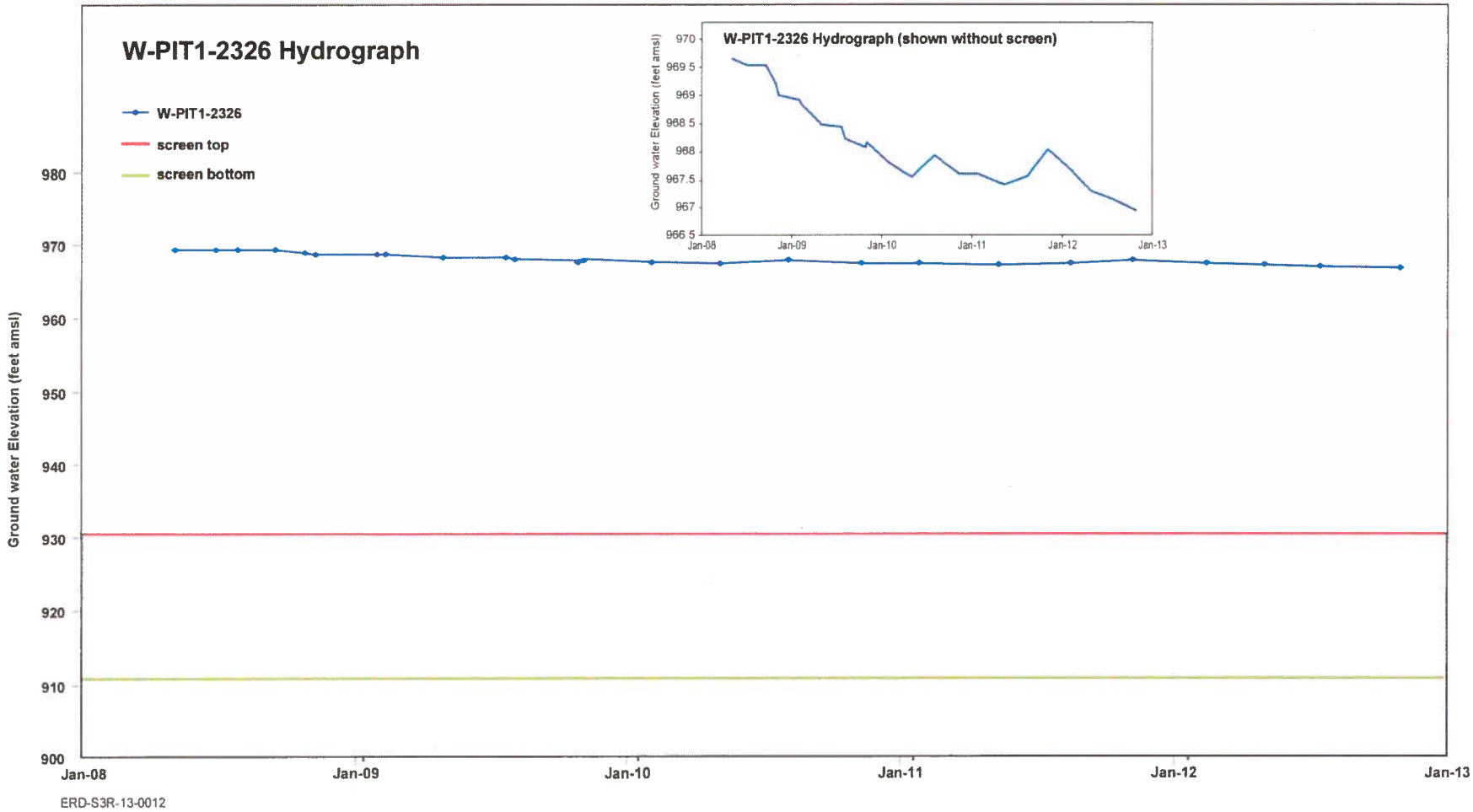

K1-08 Hydrograph
K1-08
screen top
screen bottom
Ground water elevation (feet amsl)
985
980
975
970
965
960
955
950
Jan-85
Jan-87
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Jan-09
Jan-11
Jan-13
ERD-S3R-13-0007


K1-09 Hydrograph
K1-09
screen top
screen bottom
Ground water elevation (feet amsl)
985
980
975
970
965
960
955
950
945
940
935
930
Jan-85
Jan-87
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Jan-09
Jan-11
Jan-13
ERD-S3R-13-0008


W-865-2005 Hydrograph
W-865-2005
screen top
screen bottom
Ground water elevation (feet amsl)
955
950
945
940
935
930
925
920
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
W-865-2005 Hydrograph (shown without screen)
Ground Water Elevation (feet amsl)
952
951.5
951
950.5
950
949.5
949
948.5
948
947.5
947
ERD-S3R-13-0009


W-PIT1-02 Hydrograph
W-PIT1-02
screen top
screen bottom
Ground water Elevation (feet amsl)
960
955
950
945
940
935
930
925
920
915
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
W-PIT1-02 Hydrograph (shown without screen)
Ground water Elevation (feet amsl)
957
956
955
954
953
952
951
950
949
948
947
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
ERD-S3R-13-0010


W-PIT1-2209 Hydrograph
W-PIT1-2209
screen top
screen bottom
Ground water Elevation (feet amsl)
960
950
940
930
920
910
900
890
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
ERD-S3R-12-0087
W-PIT1-2209 Hydrograph (shown without screen)
Ground water Elevation (feet amsl)
954
953.5
953
952.5
952
951.5
951
950.5
950
949.5
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13


W-PIT1-2326 Hydrograph
W-PIT1-2326
screen top
screen bottom
Ground water Elevation (feet amsl)
980
970
960
950
940
930
920
910
900
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
W-PIT1-2326 Hydrograph (shown without screen)
Ground water Elevation (feet amsl)
970
969.5
969
968.5
968
967.5
967
966.5
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
ERD-S3R-13-0012

Appendix G

Field Logs for Compliance Monitoring and Evaluation Monitoring Wells

Target Sample Date: 15-Nov-2012 Month: Norm Qtr: 4 Norm Year: 2012

WELL ID: K1-01C AREA INFO: S300/EWFA/PIT1

DATE: 15-Nov-2012 LOG BOOK (DOCUMENT CONTROL) #: AA23158

PURGE METHOD/SAMPLE METHOD: RF / GRVS CONTAMINANT PRESENT: NO3-37/3H<1000 pCi/L

SCREENED INTERVAL: 106.82 - 116.82 PUMP INTAKE DEPTH: 112.30

CASING DEPTH(calc)/(fbgs): 116.82 / 113.5 CASING DIAMETER/TCASING HT(in): 3.5 / 3.02

DEPTH TO WATER(fbmp): 108.72 on 08-AUG-12 VOLUME FACTOR: 0.500

WATER IN CASING (ft): 7.80 CASING VOL (Gal/Time): 3.90

TIME PUMP ON: INITIAL FLOW RATE (Q=GPM):

TIME PUMP OFF: MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW

METER	SERIAL #	CALIBRATED
pH :	6205310	YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: N/A

PURGE VOL/EXCESS H2O DEST: 0.00 / None

TF LOCATION: Ground

QC SAMPLE ID: K1-78Y QC LAB(S): EBERLINE, BCLABS-BAK, GEL QC SAMPLE TIME:

SAMPLE ID (VERIFY): K1-01C / GRVS TIME COLLECTED:

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS	/ QUANTITY	/ TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

Pump is inoperable
Confirmed the control box is functioning properly.

All Ground Water Sampling Data

Target Sample Date: 10-Oct-2012 Month: Norm Qtr: 4 Norm Year: 2012

WELL ID: K1-02B AREA INFO: S300/EWFA/PIT1

DATE: 10-Oct-2012 LOG BOOK (DOCUMENT CONTROL) #: AA23147

PURGE METHOD/SAMPLE METHOD: ST / 3VES CONTAMINANT PRESENT: NO3-33/PERC-6.4/H3>1000 PCi/L

SCREENED INTERVAL: 148.80 - 168.80 PUMP INTAKE DEPTH: 147.30

CASING DEPTH(calc)/(fbgs): 168.80 / 166.5 CASING DIAMETER/TCASING HT(in): 3.5 / 2.00

DEPTH TO WATER(fbmp): 137.09 on 23-JUL-12 137.09 VOLUME FACTOR: 0.500

WATER IN CASING (ft): 31.41 31.71 CASING VOL (Gal/Time): 15.70 15.8 x 3cu = 47.4

TIME PUMP ON: 0940 INITIAL FLOW RATE (Q=GPM): 1.5 Q

TIME PUMP OFF: 1024 MEASURED BY: FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
0951		15.8	1	7.59	21.2	722.6	157	1	141.31
1001		31.6	2	7.48	21.0	728.7	141	1	144.43
1011		47.4	3	7.48	21.2	737.2	140	1	144.82
1013				7.44	21.2	734.8	137	1	
1015				7.42	21.1	734.3	133	1	

METER	SERIAL #	CALIBRATED
pH :	6205114	YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: silva90
PROJECT: 3EMG
SAMPLE PRESERVATION/AMT of REAGENT: NA
PURGE VOL/EXCESS H2O DEST: 47.10 / PIT7-SRC
TF LOCATION: PIT7-SRC

QC SAMPLE ID: PIT1FB QC LAB(S): EBERLINE, BCLABS-BAK, GEL QC SAMPLE TIME: 1024

SAMPLE ID (VERIFY): K1-02B / 3VES TIME COLLECTED: 1024

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS	/ QUANTITY	/ TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

All Ground Water Sampling Data

Target Sample Date: 09-Oct-2012 Month: Norm Qtr: 4 Norm Year: 2012

WELL ID: K1-04 AREA INFO: S300/EWFA/PIT1

DATE: 09-Oct-2012 LOG BOOK (DOCUMENT CONTROL) #: AA23146

PURGE METHOD/SAMPLE METHOD: ST / 3VES CONTAMINANT PRESENT: NO3-28

SCREENED INTERVAL: 185.97 - 202.97 PUMP INTAKE DEPTH: 186.00

CASING DEPTH(calc)/(fbgs): 203.97 / 201 CASING DIAMETER/TCASING HT(in): 3.5 / 2.67

DEPTH TO WATER(fbmp): 158.00 on 17-JUL-12 158.14 VOLUME FACTOR: 0.500

WATER IN CASING (ft): 45.67 45.83 CASING VOL (Gal/Time): 22.83 23 x 3cv = 69 Gal

TIME PUMP ON: 1017 INITIAL FLOW RATE (Q=GPM): 1.3 Q

TIME PUMP OFF: MEASURED BY: FLOW METER / GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1034		23	1	7.51	21.9	587.8	28	1	177.78
1052		46	2	7.48	22.0	594.1	38	1	178.88
1110		69	3	7.44	22.5	600.3	58	1	180.62
1112				7.44	22.3	603.2	54	1	
1114				7.44	22.1	602.8	53	1	

METER	SERIAL #	CALIBRATED		
pH :	610514	YES/NO	SAMPLER/EMPLOYER:	silva90
SC :		YES/NO	PROJECT:	3EMG
mV :		YES/NO	SAMPLE PRESERVATION/AMT of REAGENT:	NA
H2O:		YES/NO	PURGE VOL/EXCESS H2O DEST:	68.48 / S300-DRUM
			TF LOCATION:	S300

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): K1-04 / 3VES TIME COLLECTED: 1122

PROJECT	ANALYTICAL LAB	REQUESTED ANALYSIS	QUANTITY	TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

All Ground Water Sampling Data

Target Sample Date: 08-Oct-2012 Month: Norm Qtr: 4 Norm Year: 2012

WELL ID: K1-05 AREA INFO: S300/EWFA/PIT1

DATE: 08-Oct-2012 LOG BOOK (DOCUMENT CONTROL) #: AA23145

PURGE METHOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT: FREON 113-19.0/NO3-37

SCREENED INTERVAL: 165.30 - 186.30 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 186.30 / 184 CASING DIAMETER/TCASING HT(in): 5 / 2.00

DEPTH TO WATER(fbmp): 172.44 on 16-JUL-12 172.81 VOLUME FACTOR: 1.020

WATER IN CASING (ft): 13.56 13.44 CASING VOL (Gal/Time): 13.83 13.75 x 3 = 41.25

TIME PUMP ON: 0939 INITIAL FLOW RATE (Q=GPM): .10 Q

TIME PUMP OFF: 1040 MEASURED BY: FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
0959	.9			7.63	22.8	630.8	170	1	* NM
1009	.9			7.61	22.9	633.2	158	1	* NM
1024	.9			7.60	22.9	629.8	157	1	* NM
1026				7.61	22.7	628.2	161	1	
1028				7.58	22.8	629.2	158	1	

METER	SERIAL #	CALIBRATED
pH :	020514	YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: silva90
PROJECT: 3EMG
SAMPLE PRESERVATION/AMT of REAGENT: N/A
PURGE VOL/EXCESS H2O DEST: 41.49 / S300-DRUM
TF LOCATION: S300

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): K1-05 / 3045 TIME COLLECTED: 1040

PROJECT	ANALYTICAL LAB	REQUESTED ANALYSIS	QUANTITY	TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

* probe sticking

Purge water needs to be shut off at time of sample to allow enough H2O to flow from sample port

All Ground Water Sampling Data

Target Sample Date: 08-Oct-2012 Month: Norm Qtr: 4 Norm Year: 2012

WELL ID: K1-06 AREA INFO: S300/EWFA/PIT1

DATE: 08-Oct-2012 LOG BOOK (DOCUMENT CONTROL) #: AA23145

PURGE METHOD/SAMPLE METHOD: PB / GRBA CONTAMINANT PRESENT: 3H>1000pCi/L

SCREENED INTERVAL: 107.30 - 117.30 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 117.30 / 115 CASING DIAMETER/TCASING HT(in): 5 / 2.00

DEPTH TO WATER(fbmp): 116.47 on 13-JUL-12 116.83 VOLUME FACTOR: 1.020

WATER IN CASING (ft): 0.53 .47 CASING VOL (Gal/Time): 0.54

TIME PUMP ON: INITIAL FLOW RATE (Q=GPM):

TIME PUMP OFF: MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
		–	–	7.73	23.1	627.8	115	1	–

METER	SERIAL #	CALIBRATED
pH :	610514	YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 0.00 / None

TF LOCATION: Ground

QC SAMPLE ID: – QC LAB(S): – QC SAMPLE TIME: –

SAMPLE ID (VERIFY): K1-06 / GRBA TIME COLLECTED:

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS	/ QUANTITY	/ TYPE OF CONTAINERS
3EMG	CALTEST	E300.0:PERC	1	250 ml Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER

INSuff H2O to collect Sample

Will return End of October to attempt Sample if rain occurs.

NOTE:
Purge rate/time: N/A since est_sus_flow = 0
Purge Volume: 0 gal.
Revision: 07/08/2011

Target Sample Date: 15-Nov-2012 Month: Norm Qtr: 4 Norm Year: 2012

WELL ID: K1-06 AREA INFO: S300/EWFA/PIT1

DATE: 15-Nov-2012 LOG BOOK (DOCUMENT CONTROL) #: AA23158

PURGE METHOD/SAMPLE METHOD: PB / GRBA CONTAMINANT PRESENT: 3H>1000pCi/L

SCREENED INTERVAL: 107.30 - 117.30 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 117.30 / 115 CASING DIAMETER/TCASING HT(in): 5 / 2.00

DEPTH TO WATER(fbmp): 116.47 on 13-JUL-12 Dry VOLUME FACTOR: 1.020

WATER IN CASING (ft): 0.53 CASING VOL (Gal/Time): 0.54

TIME PUMP ON: INITIAL FLOW RATE (Q=GPM):

TIME PUMP OFF: MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW

METER	SERIAL #	CALIBRATED
pH :	670540	YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: N/A

PURGE VOL/EXCESS H2O DEST: 0.00 / None

TF LOCATION: Ground

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): K1-06 TIME COLLECTED:

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS	/ QUANTITY	/ TYPE OF CONTAINERS
3EMG	CALTEST	E300.0:PERC	1	250 ml Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER

Insufficient H2O to collect Samples

NOTE:
Purge rate/time: N/A since est_sus_flow = 0
Purge Volume: 0 gal.
Revision: 07/08/2011

Target Sample Date: 10-Oct-2012 Month: Norm Qtr: 4 Norm Year: 2012

WELL ID: K1-07 AREA INFO: S300/EWFA/PIT1

DATE: 10-Oct-2012 LOG BOOK (DOCUMENT CONTROL) #: AA23147

PURGE METHOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT: NO3-34

SCREENED INTERVAL: 131.30 - 151.30 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 153.30 / 150 CASING DIAMETER/TCASING HT(in): 4.5 / 3.00

DEPTH TO WATER(fbmp): 142.76 on 02-AUG-12 142.85 VOLUME FACTOR: 0.826

WATER IN CASING (ft): 10.24 10.45 CASING VOL (Gal/Time): 8.46 8.6 x 3.0 = 25.8

TIME PUMP ON: 1124 INITIAL FLOW RATE (Q=GPM): 1.1 Q

TIME PUMP OFF: MEASURED BY: FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1133		8.6	1	7.40	21.3	606.5	-20	1	145.41
1141		17.2	2	7.43	21.4	607.9	34	1	145.70
1149		25.8	3	7.45	21.3	605.3	31	1	145.92
1151				7.42	21.3	605.8	30	1	
1153				7.44	21.2	605.2	27	1	

METER	SERIAL #	CALIBRATED
pH :	6205114	YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: silva90
PROJECT: 3EMG
SAMPLE PRESERVATION/AMT of REAGENT: NA
PURGE VOL/EXCESS H2O DEST: 25.38 / S300-DRUM
TF LOCATION: S300

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): K1-07 / 3VES TIME COLLECTED: 1202

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS	/ QUANTITY	/ TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:U1SO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINF	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

All Ground Water Sampling Data

Target Sample Date: 29-Oct-2012 Month: Norm Qtr: 4 Norm Year: 2012

WELL ID: K1-08 AREA INFO: S300/EWFA/PIT1

DATE: 29-Oct-2012 LOG BOOK (DOCUMENT CONTROL) #: AA23149

PURGE METHOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT: FREON 113-37/NO3-36

SCREENED INTERVAL: 143.32 - 168.32 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 170.32 / 168 CASING DIAMETER/TCASING HT(in): 4.5 / 2.02

DEPTH TO WATER(fbmp): 156.98 on 17-JUL-12 157.25 VOLUME FACTOR: 0.826

WATER IN CASING (ft): 13.04 13.07 CASING VOL (Gal/Time): 10.77 10.8 x 3CV = 32.4

TIME PUMP ON: 1240 INITIAL FLOW RATE (Q=GPM): 1.6

TIME PUMP OFF: 1324 MEASURED BY: FLOW METER / GRAD CYL. / BUCKET / OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1251	1.6	10.8	1	7.69	21.2	633.6 TC	12	1	162.50 Top of Pump
1302	1.0	21.6	2	7.66	22.6	630.1	60	1	160.73
1313		32.4	3	7.67	22.3	630.6	49	1	160.68
1315				7.64	22.3	630.3	47	1	
1317				7.64	22.3	630.1	46	1	

METER	SERIAL #	CALIBRATED
pH :		YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 32.32 / S300-DRUM

TF LOCATION: S300

QC SAMPLE ID: – QC LAB(S): – QC SAMPLE TIME: –

SAMPLE ID (VERIFY): K1-08 | 3VES TIME COLLECTED: 1324

PROJECT	ANALYTICAL LAB	REQUESTED ANALYSIS	QUANTITY	TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

All Ground Water Sampling Data

Target Sample Date: 09-Oct-2012 Month: Norm Qtr: 4 Norm Year: 2012

WELL ID: K1-09 AREA INFO: S300/EWFA/PIT1

DATE: 09-Oct-2012 LOG BOOK (DOCUMENT CONTROL) #: AA23146

PURGE METHOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT: FREON 113-120.0

SCREENED INTERVAL: 157.30 - 192.30 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 194.30 / 192 CASING DIAMETER/TCASING HT(in): 4.5 / 2.00

DEPTH TO WATER(fbmp): 163.19 on 17-JUL-12 163.64 VOLUME FACTOR: 0.826

WATER IN CASING (ft): 30.81 30.66 CASING VOL (Gal/Time): 25.46 25.3 x 3cv = 75.9

TIME PUMP ON: 1149 INITIAL FLOW RATE (Q=GPM): 1.2

TIME PUMP OFF: 1309 MEASURED BY: FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1211		25.3	1	7.55	22.3	648.9	86	1	* NM
1253		50.6	2	7.49	22.1	649.9	49	1	* NM
1254		75.9	3	7.52	22.1	648.8	47	1	* NM
1256				7.49	22.0	648.7	44	1	* NM
1258				7.48	22.1	648.3	44	1	

METER	SERIAL #	CALIBRATED
pH :	6705114	YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: 76.37 / S300-DRUM

TF LOCATION: S300

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): K1-09 3VES TIME COLLECTED: 1309

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS	/ QUANTITY	/ TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

* Water is cascading down sounding tube. unable to get a WL

Target Sample Date: 29-Oct-2012 Month: Norm Qtr: 4 Norm Year: 2012

WELL ID: W-PIT1-2326 AREA INFO: S300/EWFA/PIT1

DATE: 29-Oct-2012 LOG BOOK (DOCUMENT CONTROL) #: AA23149

PURGE METHOD/SAMPLE METHOD: / 3VES CONTAMINANT PRESENT:

SCREENED INTERVAL: 217.30 - 237.02 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 237.42 / 235.12 CASING DIAMETER/TCASING HT(in): 5 / 2.00

DEPTH TO WATER(fbmp): 180.35 on 23-JUL-12 181.08 VOLUME FACTOR: 1.020

WATER IN CASING (ft): 56.77 56.34 CASING VOL (Gal/Time): 57.91 57.4 x 3 = 172.2

TIME PUMP ON: 1050 INITIAL FLOW RATE (Q=GPM): 3.0 Q

TIME PUMP OFF: 1203 MEASURED BY: FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1110		57.4	1	7.56	22.1	712.4	142	1	192.08
1130		114.80	2	7.51	21.4	717.3	119	1	192.55
1149		172.20	3	7.50	21.7	713.2	114	1	193.15
1151				7.48	21.3	712.8	110	1	
1153				7.47	21.3	713.2	107	1	

METER	SERIAL #	CALIBRATED
pH :		YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: ~~173.72~~ / PIT7-SRC

TF LOCATION: PIT7-SRC

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): W-PIT1-2326 / 3VES TIME COLLECTED: 1203

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS /	QUANTITY	/ TYPE OF CONTAINERS
3EMG	GEL	AS:FILTER	0	1L Polyethylene
3EMG	GEL	AS:THISO	2	1L Polyethylene
3EMG	GEL	AS:UISO	2	1L Polyethylene
3EMG	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E8260	3	40 mL Glass VOA vial
3EMG	BCLABS-BAK	E8330:R+H	3	1L Amber Glass
3EMG	GEL	E900	1	1L Polyethylene
3EMG	GEL	E900:FILTER	0	1L Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER
3EMG	EBERLINE	RA226	1	1L PLASTIC
3EMG	EBERLINE	RA226:FILTER	0	1L PLASTIC
3EMG	BCLABS-BAK	WGMGMET1	1	1L Polyethylene
3EMG	BCLABS-BAK	WGMGMET1:FILTER	0	1L Polyethylene

Target Sample Date: 04-Oct-2012 Month: Norm Qtr: 4 Norm Year: 2012

WELL ID: W-PIT1-2209 AREA INFO: S300/EWFA/PIT1

DATE: 04-Oct-2012 LOG BOOK (DOCUMENT CONTROL) #: AA23144

PURGE METHOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT:

SCREENED INTERVAL: 247.30 - 267.30 PUMP INTAKE DEPTH: 265.20

CASING DEPTH(calc)/(fbgs): 268.20 / 266 CASING DIAMETER/TCASING HT(in): 5 / 2.00

DEPTH TO WATER(fbmp): 216.04 on 16-JUL-12 216.20 VOLUME FACTOR: 1.020

WATER IN CASING (ft): 51.96 52.6 CASING VOL (Gal/Time): 53.00 53.04 x 3.00 = 160

TIME PUMP ON: 1119 INITIAL FLOW RATE (Q=GPM): 2.0 Q

TIME PUMP OFF: 1250 MEASURED BY: FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1146		53	1	7.70	21.9	620.1	135	1	233.62
1212		106	2	7.68	22.1	625.3	99	1	234.44
1238		160	3	7.63	22.1	624.8	96	1	234.62
1240				7.63	22.2	624.9	97	1	
1242				7.64	22.1	625.1	93	1	

METER	SERIAL #	CALIBRATED
pH :	6205114	YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG 3CMP 3GIV

SAMPLE PRESERVATION/AMT of REAGENT: N/A

PURGE VOL/EXCESS H2O DEST: 159.00 / None

TF LOCATION: Ground

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): W-PIT1-2209 | 3VES TIME COLLECTED: 1250

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS	/ QUANTITY	/ TYPE OF CONTAINERS
3CMP	GEL	AS:FILTER	0	1L Polyethylene
3CMP	GEL	AS:UISO	2	1L Polyethylene
3CMP	BCLABS-BAK	E300.0:NO3	1	250 ml Polyethylene
3EMG	BCLABS-BAK	E300.0:PERC	1	250 ml Polyethylene
3GIV	BCLABS-BAK	E601	3	40 mL Glass VOA vial
3EMG	GEL	E906	1	250 ml GLASS-AMBER

All Ground Water Sampling Data

Target Sample Date: 29-Nov-2012 Month: Norm Qtr: 4 Norm Year: 2012

WELL ID: W-PIT1-2620 AREA INFO: S300/EWFA/PIT1

DATE: 29-Nov-2012 LOG BOOK (DOCUMENT CONTROL) #: AA25002

PURGE METHOD/SAMPLE METHOD: Grundfos / 3VES CONTAMINANT PRESENT:

SCREENED INTERVAL: 247.30 - 262.20 PUMP INTAKE DEPTH: 254.97

CASING DEPTH(calc)/(fbgs): 262.50 / 260.32 CASING DIAMETER/TCASING HT(in): 5 / 2.00

DEPTH TO WATER(fbmp): 232.15 on 30-JUL-12 231.62 VOLUME FACTOR: 1.020

WATER IN CASING (ft): 30.17 30.88 CASING VOL (Gal/Time): 30.77 31.5 x 3cu = 94.5 Gal

TIME PUMP ON: 1228 INITIAL FLOW RATE (Q=GPM): ~~3.0~~ 1.5

TIME PUMP OFF: 1324 MEASURED BY: FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1249	1.5	31.5	1	7.59	20.6	783.5	127	1	233.63
1303	2.3	63	2	7.61	20.6	778.9	125	1	233.68
1317	2.3	94.5	3	7.64	20.5	780.7	120	1	233.73
1318				7.64	20.4	780.3	118	1	
1320				7.62	20.5	781.2	119	1	

METER SERIAL # CALIBRATED

pH : 620540 YES/NO

SC : YES/NO

mV : YES/NO

H2O: YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG 3GIV

SAMPLE PRESERVATION/AMT of REAGENT: NA

PURGE VOL/EXCESS H2O DEST: ~~92.32 /~~ PIT7-SRC

TF LOCATION: PIT7-SRC

QC SAMPLE ID: — QC LAB(S): — QC SAMPLE TIME: —

SAMPLE ID (VERIFY): W-PIT1-2620 / 3U45 TIME COLLECTED: 1324

PROJECT	ANALYTICAL LAB	REQUESTED ANALYSIS	QUANTITY	TYPE OF CONTAINERS
3EMG	CALTEST	E300.0:PERC	1	250 ml Polyethylene
3GIV	CALTEST	E601	3	40 mL Glass VOA vial
3EMG	GEL	E906	1	250 ml GLASS-AMBER

Target Sample Date: 04-Oct-2012 Month: Norm Qtr: 4 Norm Year: 2012

WELL ID: W-865-2005 AREA INFO: S300/EWFA/865

DATE: 04-Oct-2012 LOG BOOK (DOCUMENT CONTROL) #: AA23144

PURGE METHOD/SAMPLE METHOD: PB / GRBA CONTAMINANT PRESENT:

SCREENED INTERVAL: 332.30 - 352.30 INTAKE DEPTH: 0.00

CASING DEPTH(calc)/(fbgs): 353.20 / 351 CASING DIAMETER/TCASING HT(in): 5 / 2.00

DEPTH TO WATER(fbmp): 327.34 on 16-JUL-12 327.43 VOLUME FACTOR: 1.020

WATER IN CASING (ft): 25.66 CASING VOL (Gal/Time): 26.17

TIME PUMP ON: — INITIAL FLOW RATE (Q=GPM): —

TIME PUMP OFF: — MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1047		—	—	~~21.9~~	21.9	599.5	201	1	—
				7.53					

METER	SERIAL #	CALIBRATED
pH :	G205114	YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: silva90

PROJECT: 3EMG

SAMPLE PRESERVATION/AMT of ~~REAGENT~~: NA

PURGE VOL/EXCESS H2O DEST: 0.00 / S300-DRUM

TF LOCATION: S300

QC SAMPLE ID: W-865-64Y 865FB QC LAB(S): GEL, CALTEST QC SAMPLE TIME: 1024

SAMPLE ID (VERIFY): W-865-2005 / GRBA TIME COLLECTED: 1058

PROJECT	/ ANALYTICAL LAB	/ REQUESTED ANALYSIS	/ QUANTITY	/ TYPE OF CONTAINERS
3EMG	CALTEST	E300.0:PERC	1	250 ml Polyethylene
3EMG	GEL	E906	1	250 ml GLASS-AMBER

Appendix H

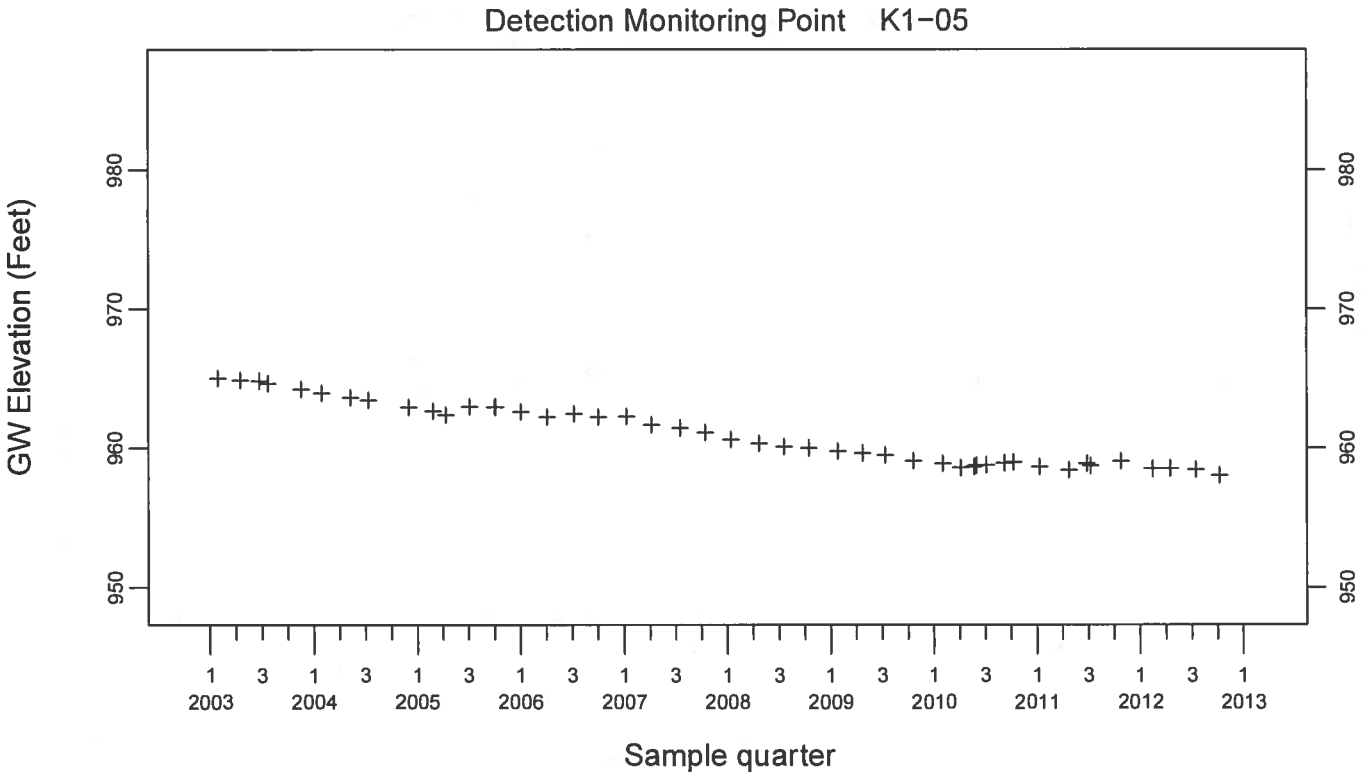
Statistical Limits and Graphs of Ground Water Measurements

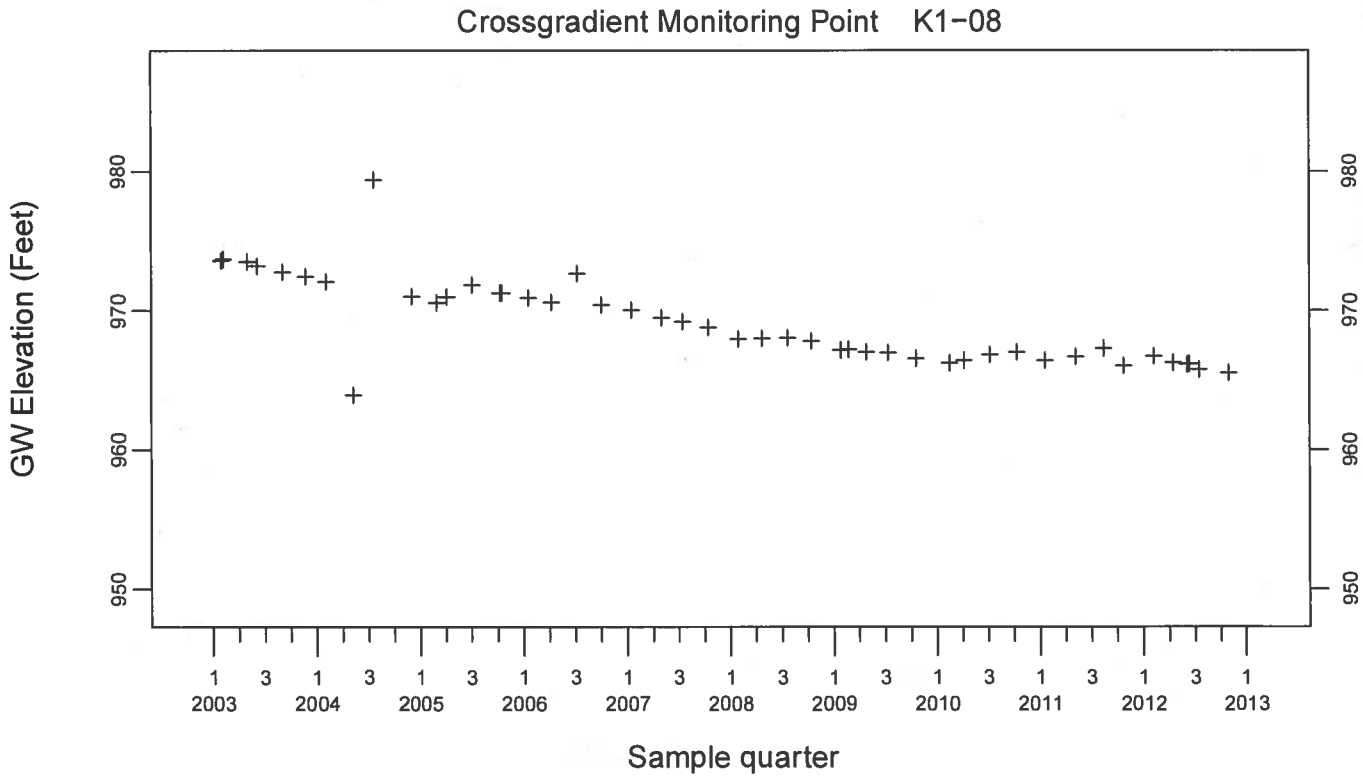
Table H-1. Analytical results from 2011 that were omitted from the Appendix H plots due to the use of specially reduced Y-axis plot limits.

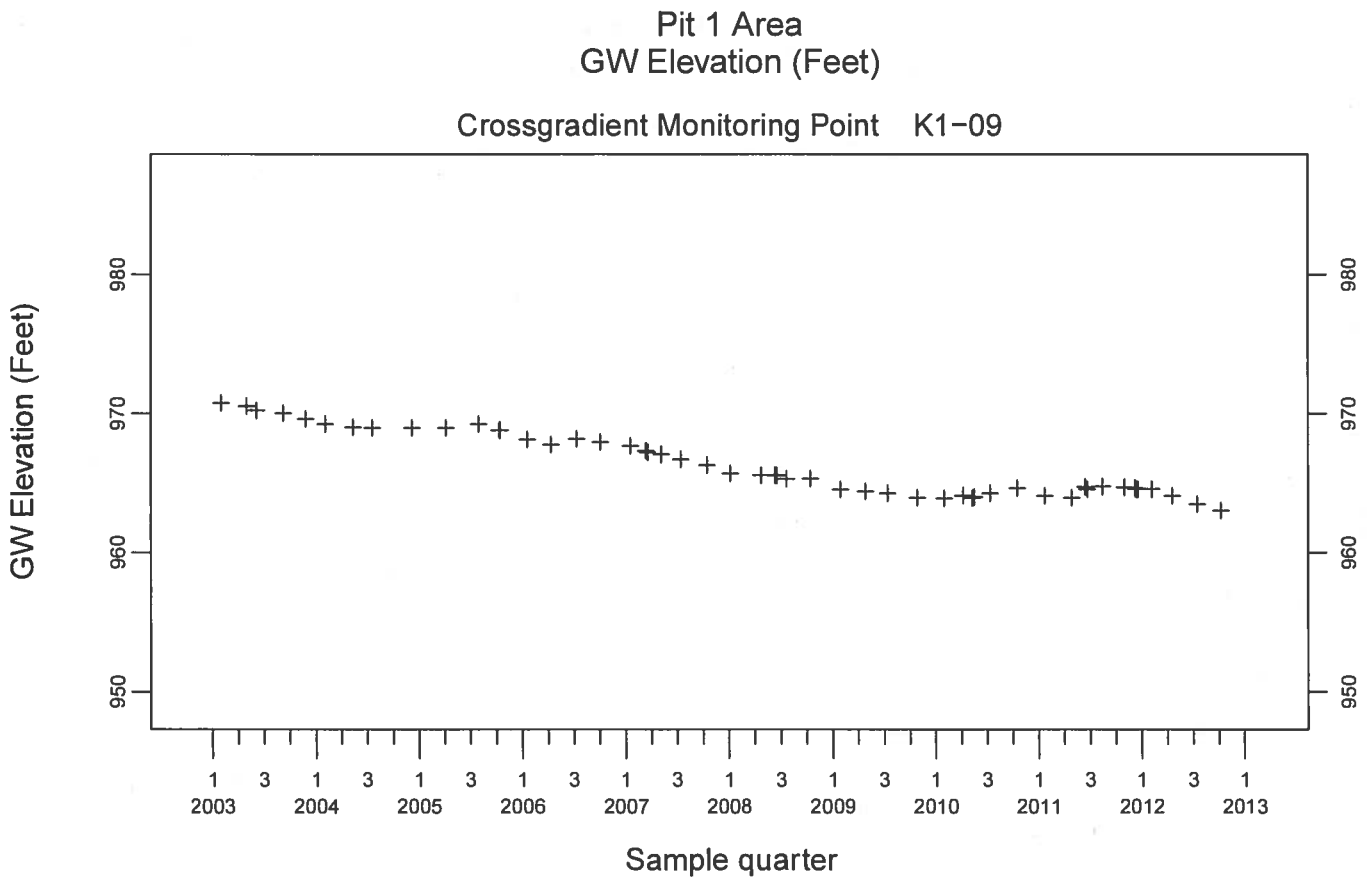
Pit Area	Constituent	Monitoring Well	Date Sampled	Result	Units [a]
Pit 1	Arsenic	W-PIT1-2326	07/29/2008	<50	µg/L
Pit 1	Barium	K1-04	04/18/2003	<100	µg/L
Pit 1	Barium	K1-05	04/18/2003	<100	µg/L
Pit 1	Cobalt	K1-04	04/18/2003	<50	µg/L
Pit 1	Cobalt	K1-05	04/18/2003	<50	µg/L
Pit 1	Nickel	W-PIT1-2326	07/29/2008	<100	µg/L
Pit 1	Lead	K1-04	04/18/2003	<5	µg/L
Pit 1	Lead	K1-05	04/18/2003	<5	µg/L
Pit 1	Lead	W-PIT1-2326	07/29/2008	<5	µg/L

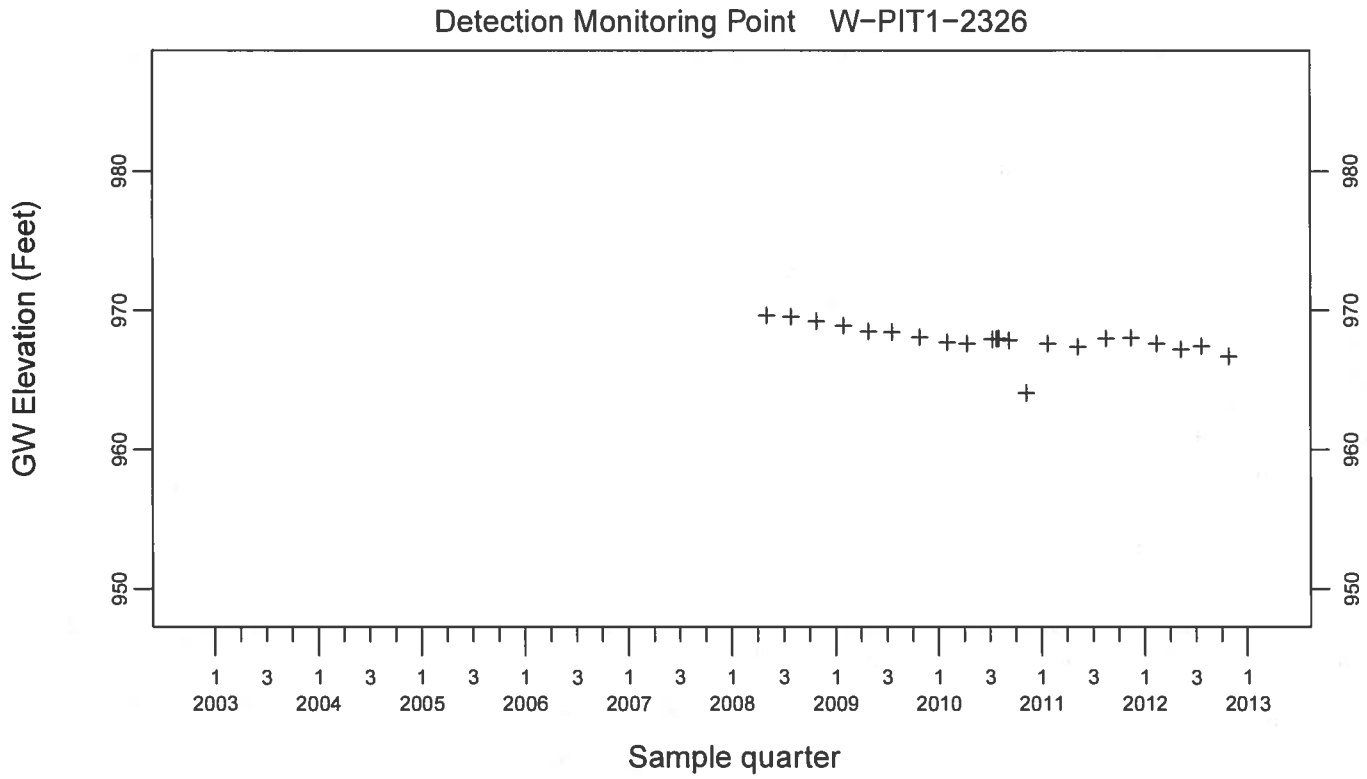
[a] Results labeled as "<" had high reporting limits (RLs) for that particular analytical result. These values were not included in the plots. These results if plotted would have significantly altered the y-axis scale.

Pit 1 Area
GW Elevation (Feet)

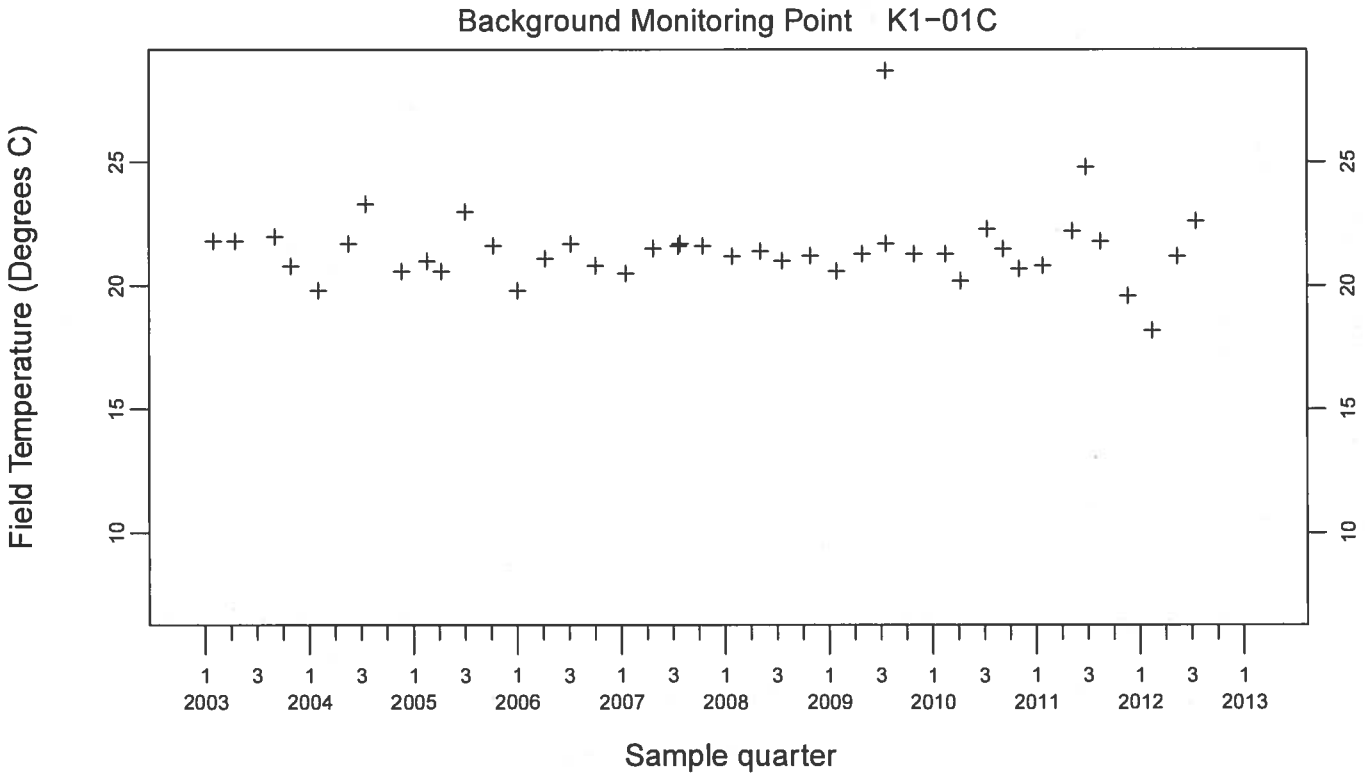


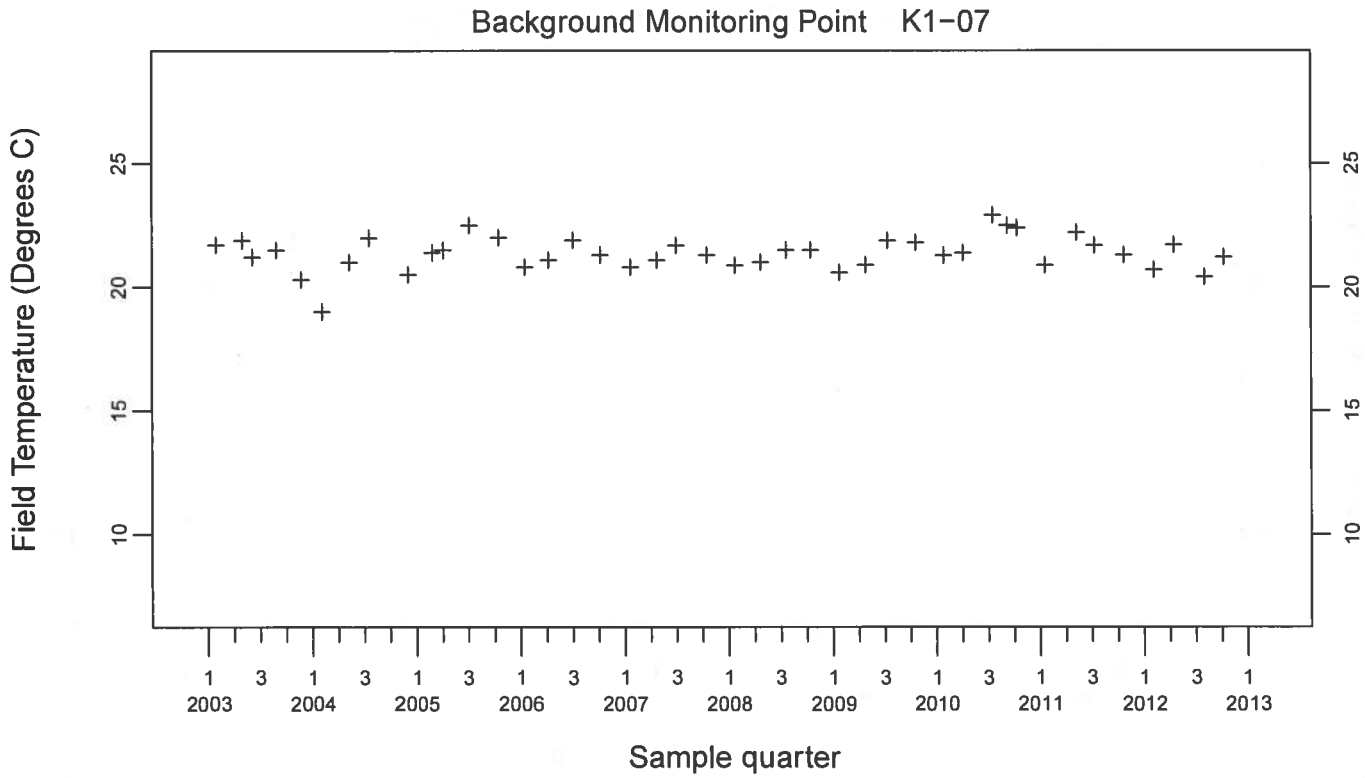



Pit 1 Area
GW Elevation (Feet)
Crossgradient Monitoring Point K1-09
GW Elevation (Feet)
980
970
960
950
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

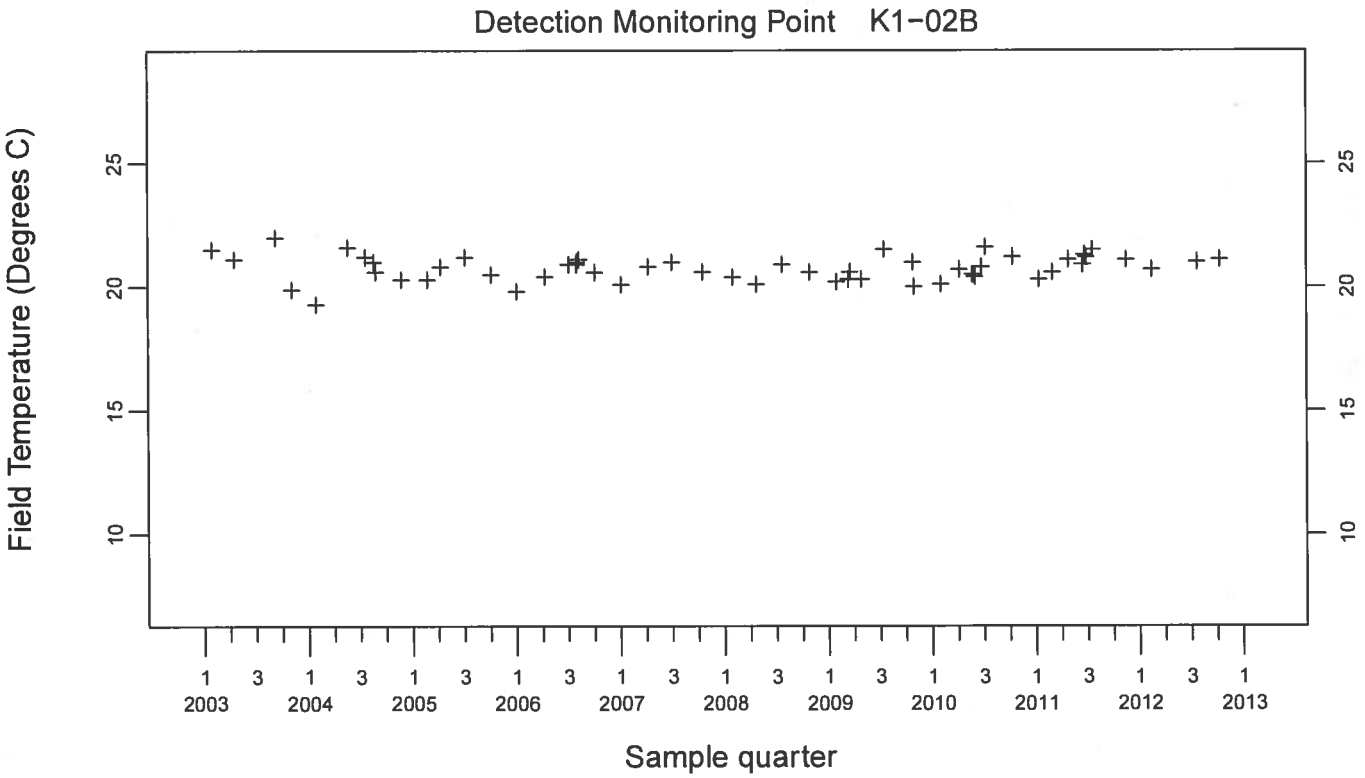

Detection Monitoring Point W-PIT1-2326
GW Elevation (Feet)
980
970
960
950
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

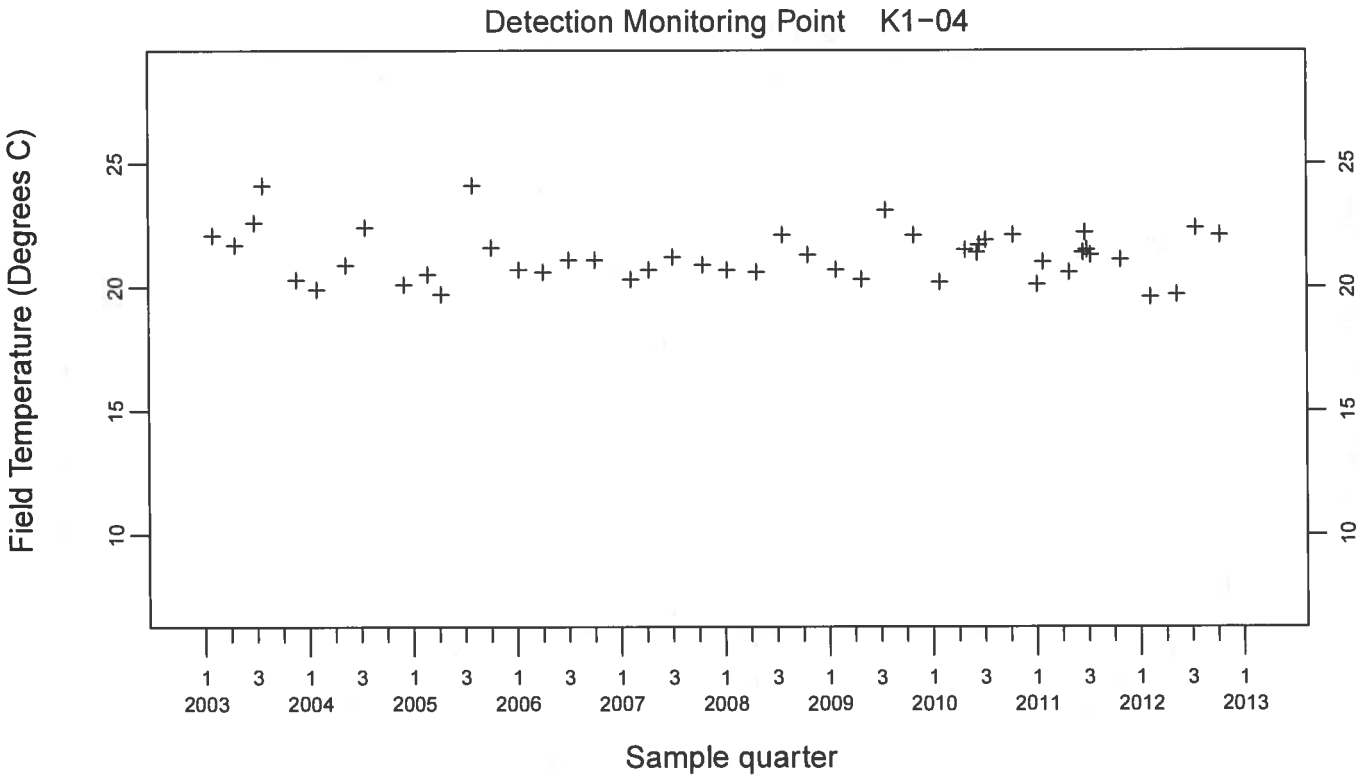
Pit 1 Area
Field Temperature (Degrees C)



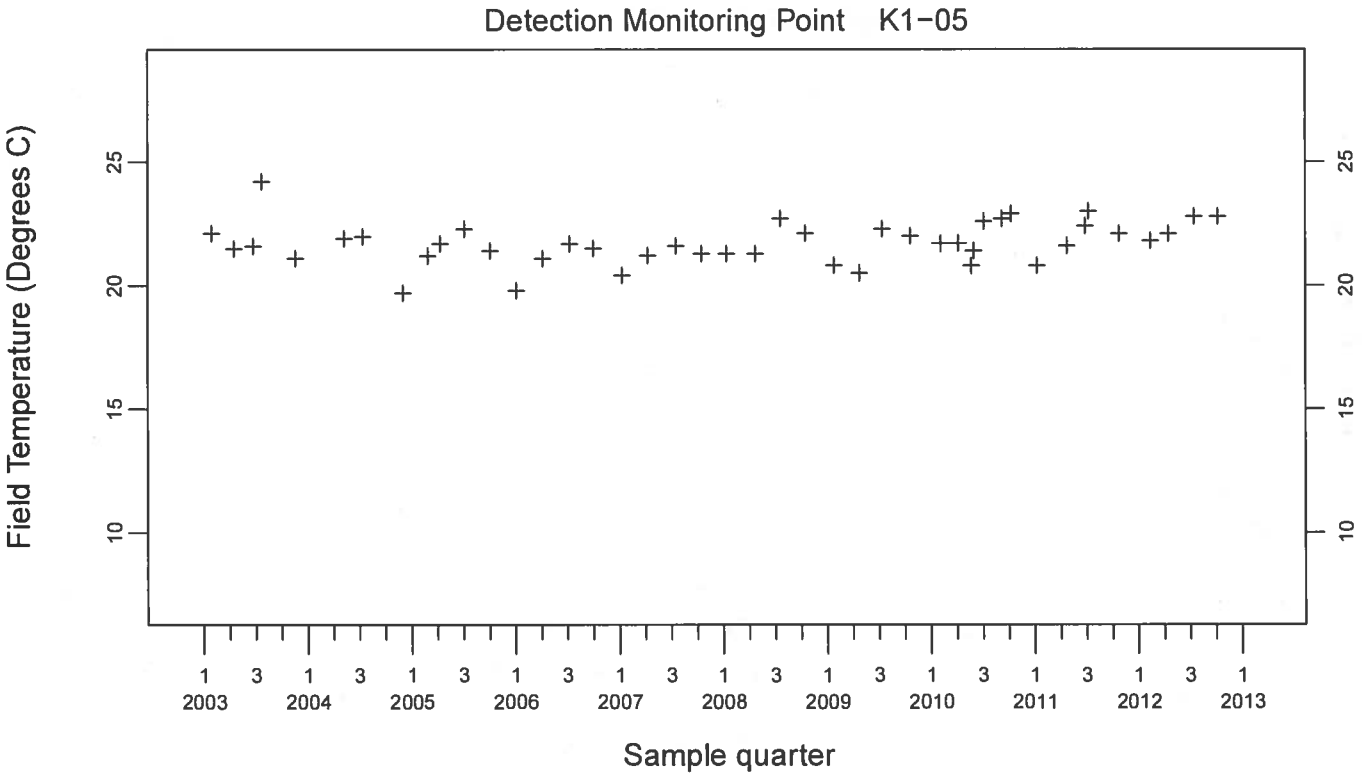


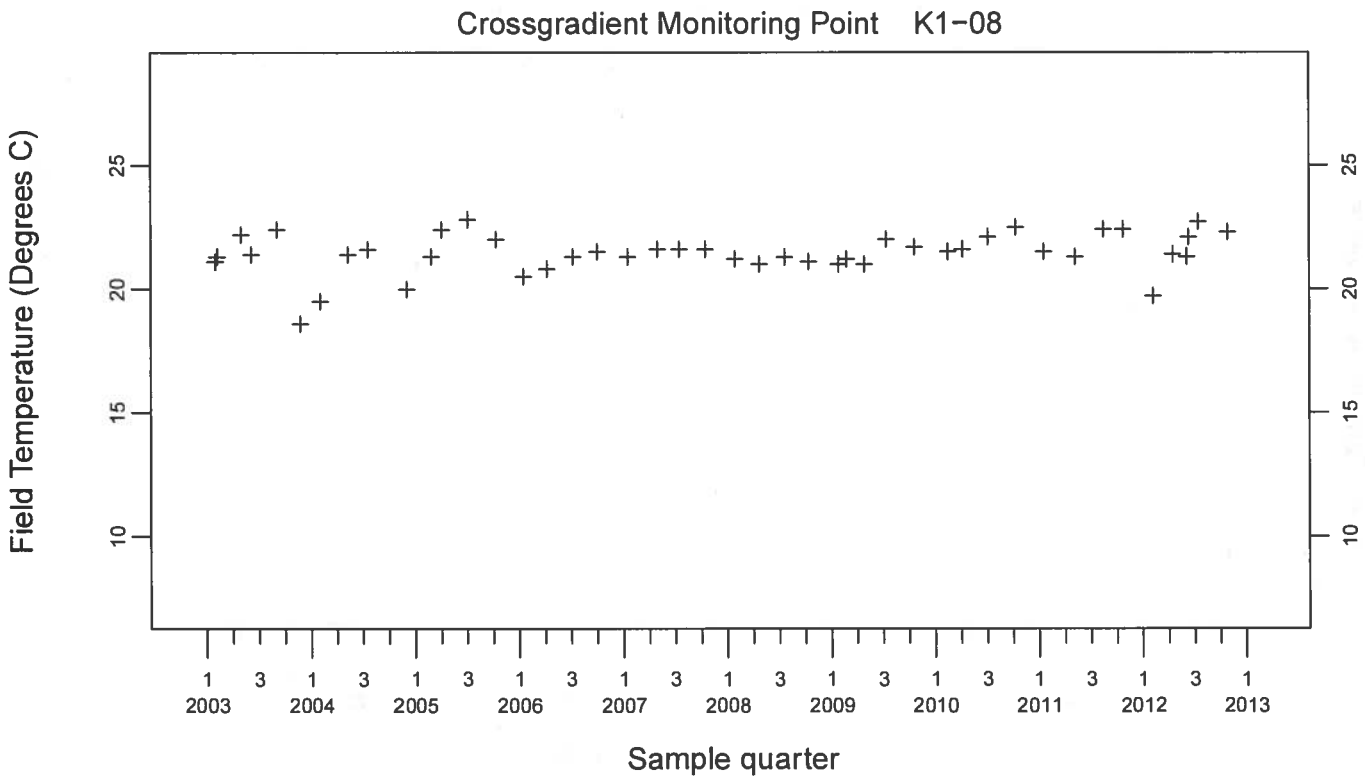
Pit 1 Area
Field Temperature (Degrees C)



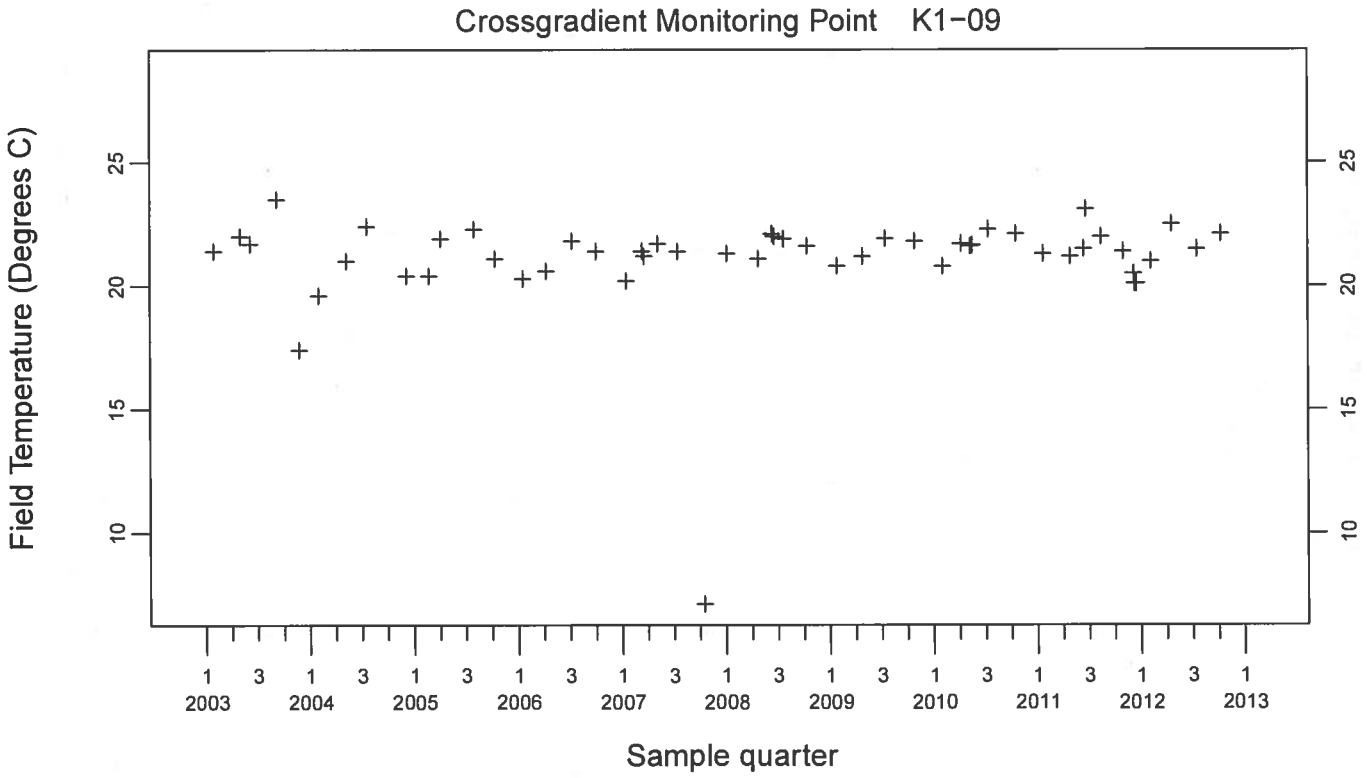


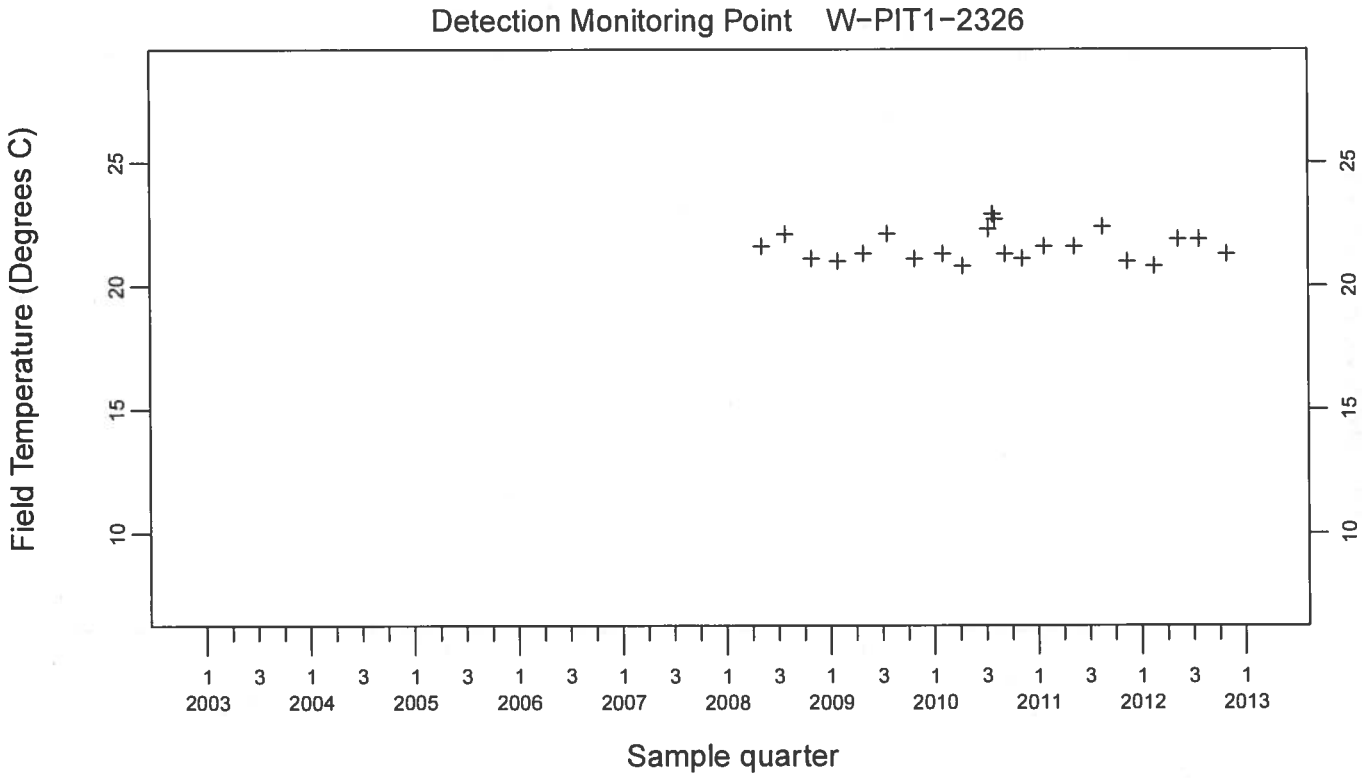
Pit 1 Area
Field Temperature (Degrees C)

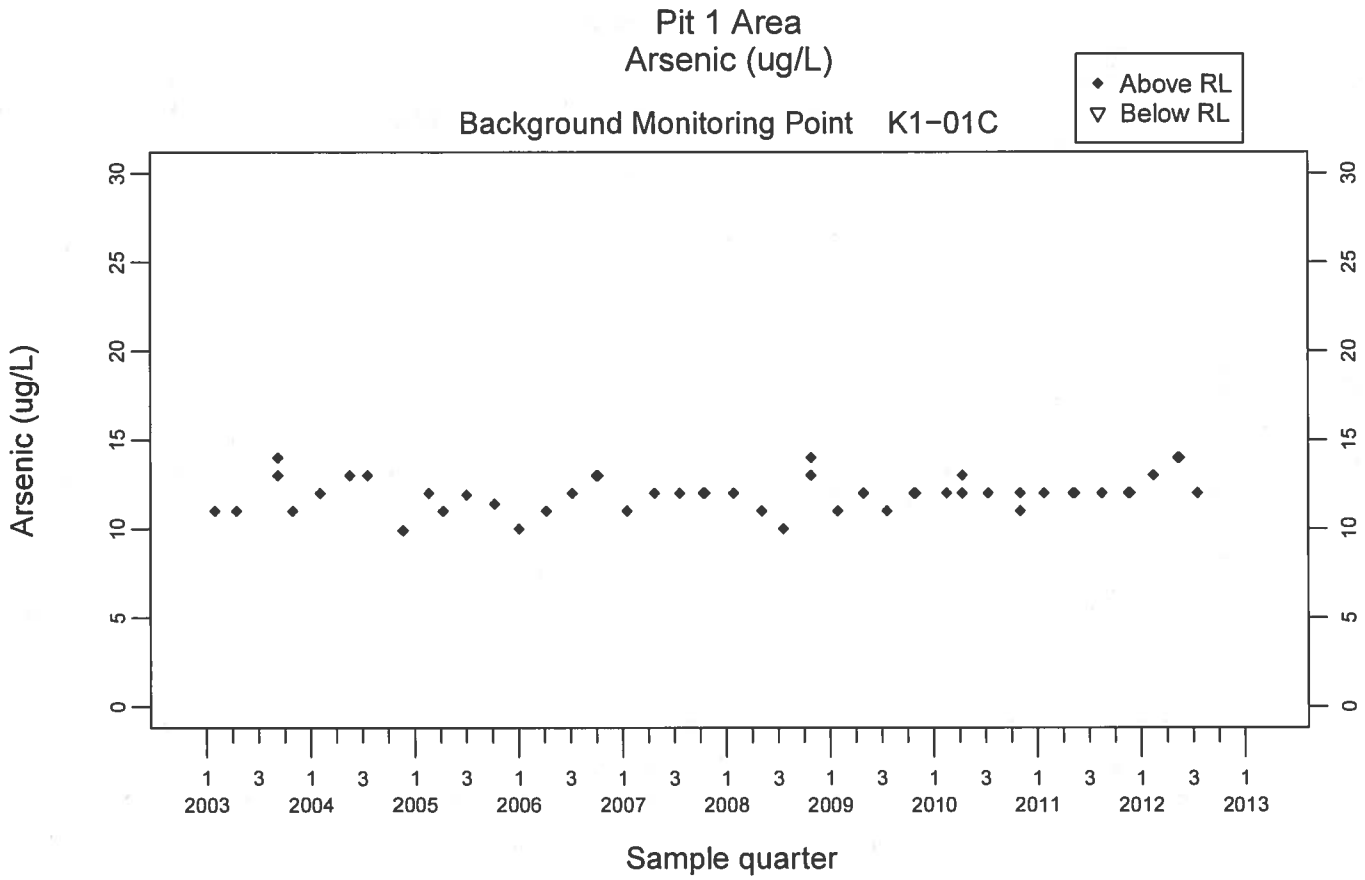


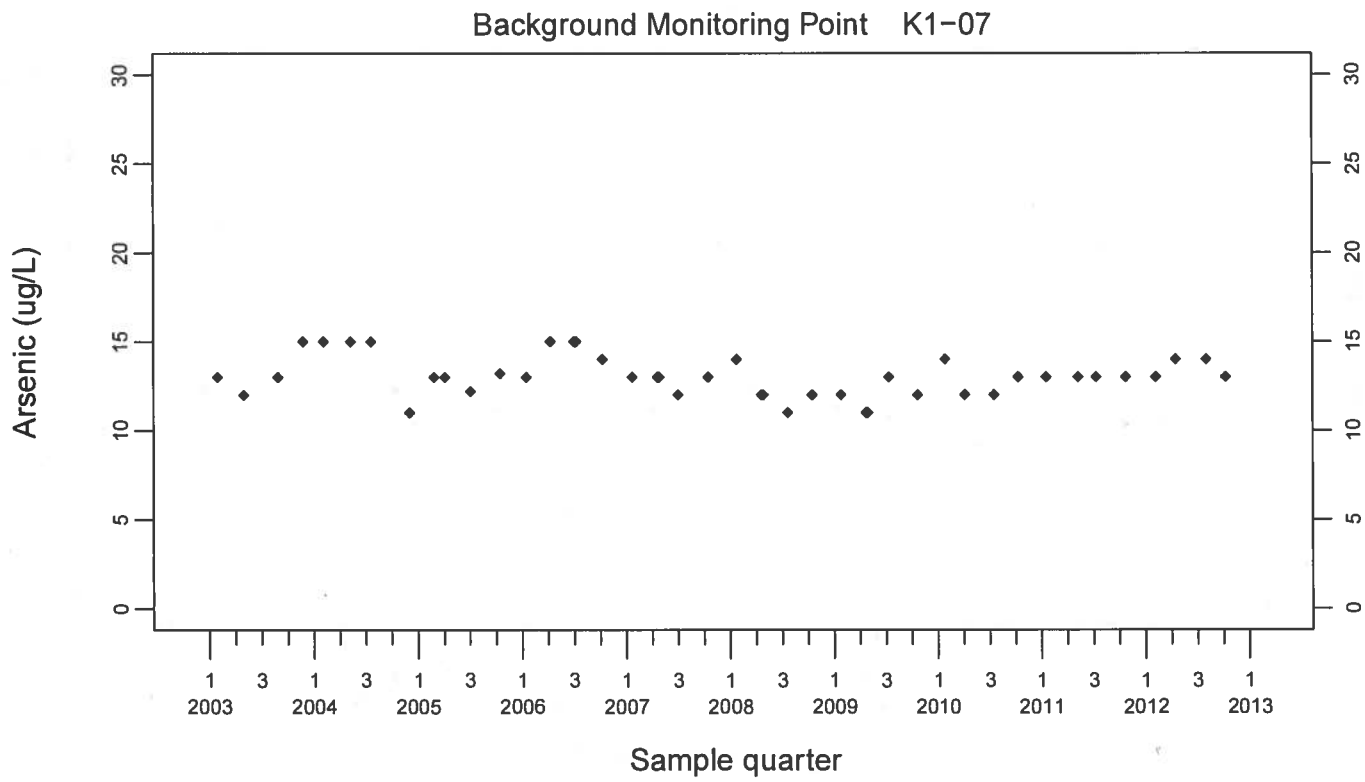


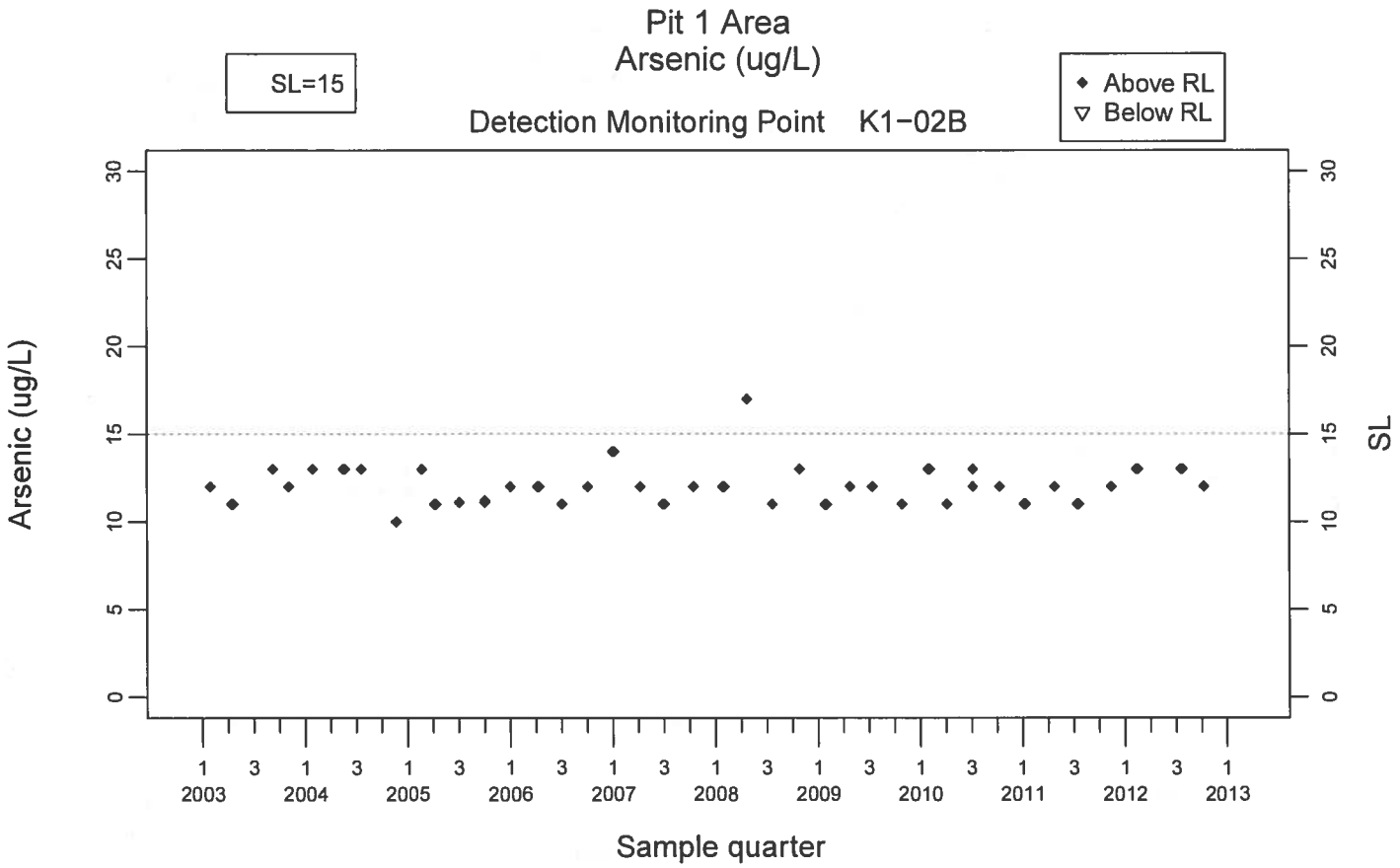
Pit 1 Area
Field Temperature (Degrees C)

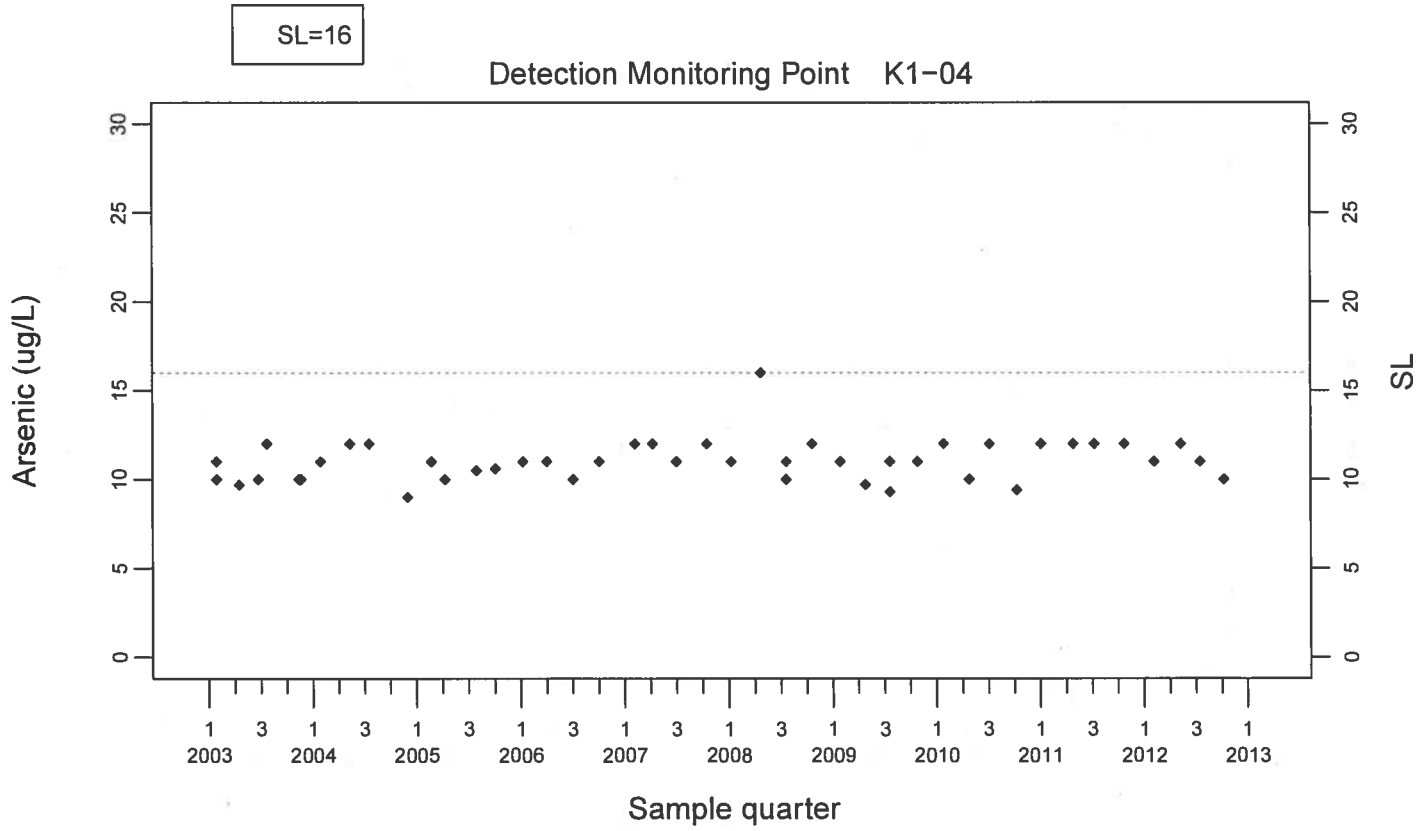


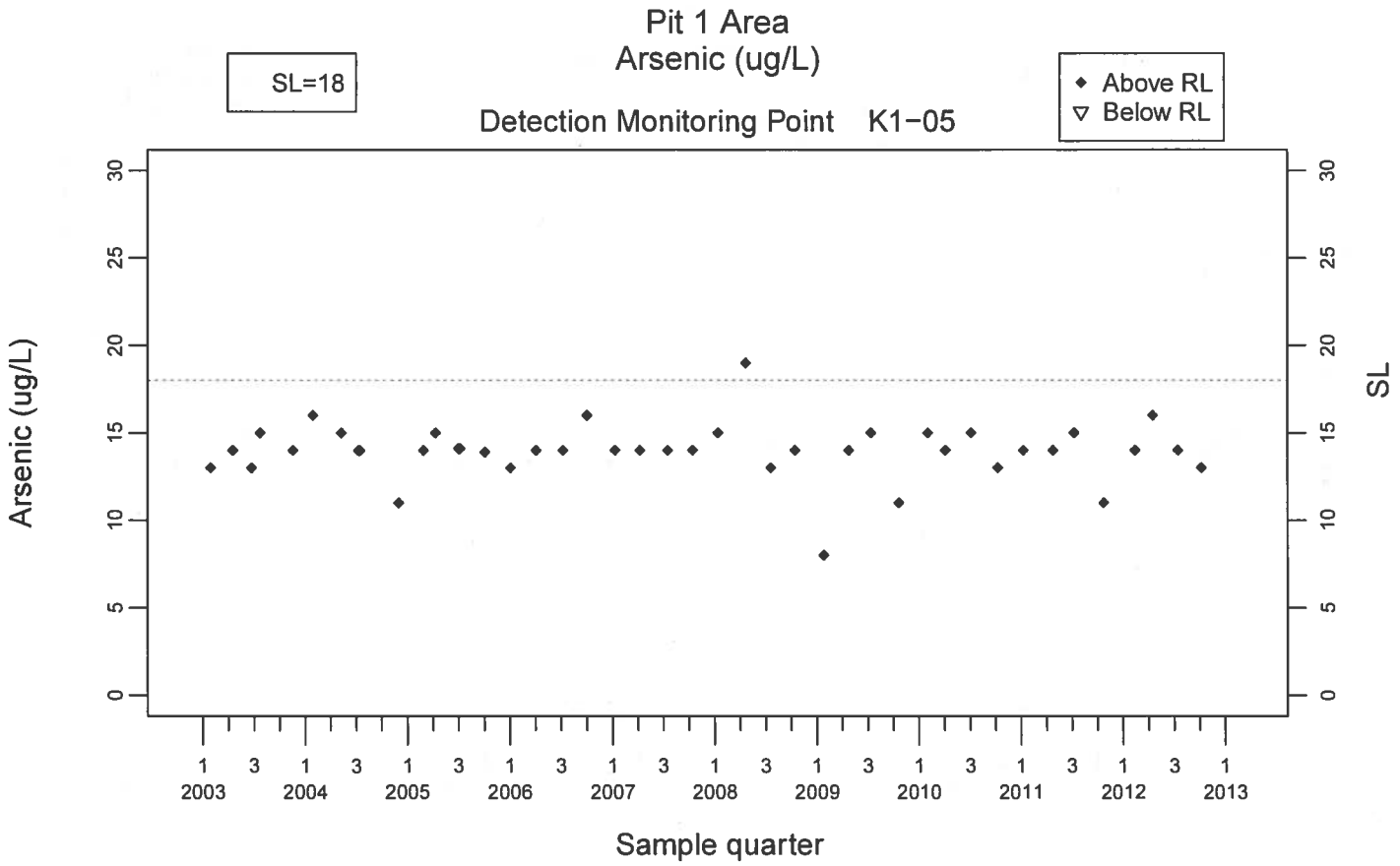


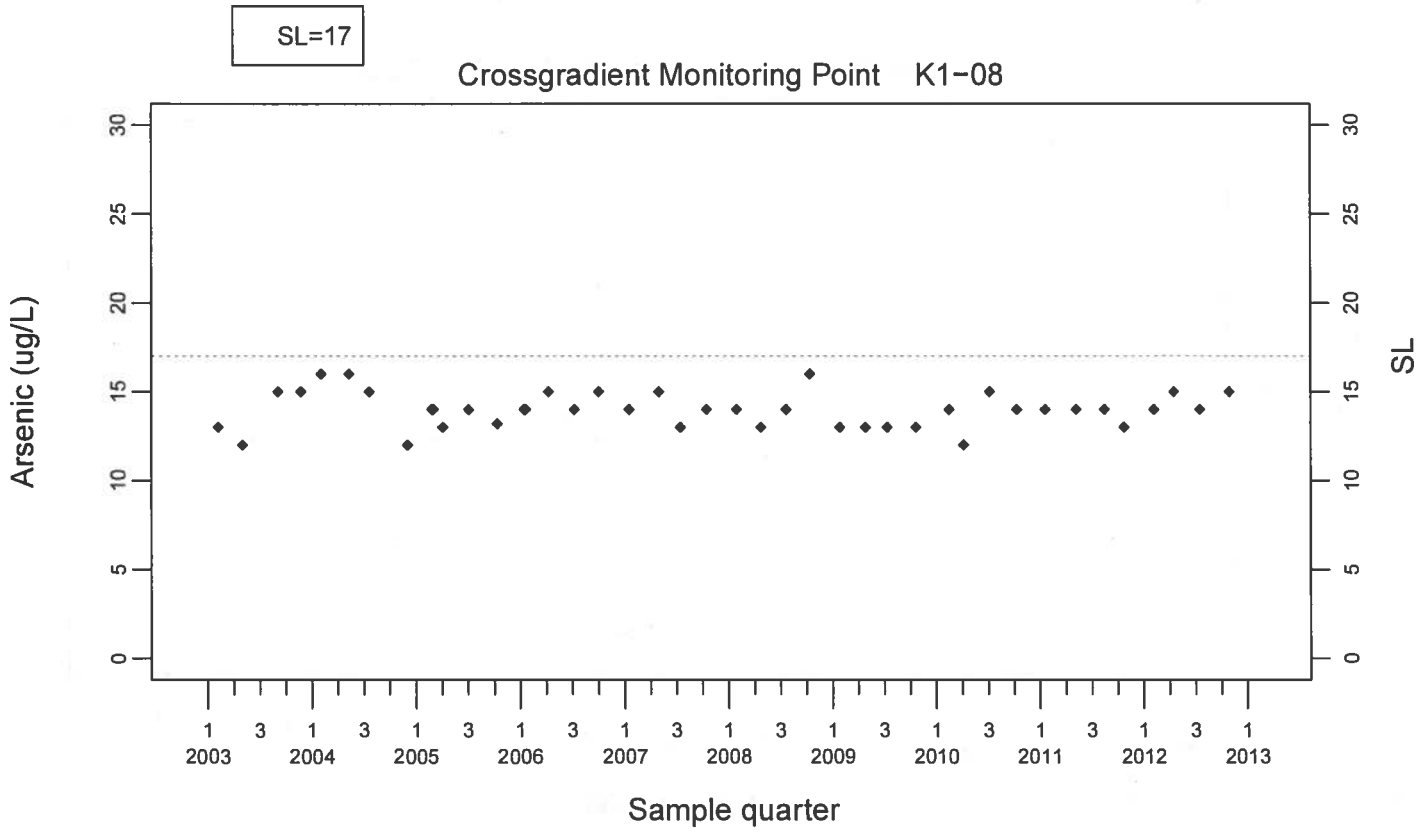

Pit 1 Area
Arsenic (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Arsenic (ug/L)
0
5
10
15
20
25
30
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

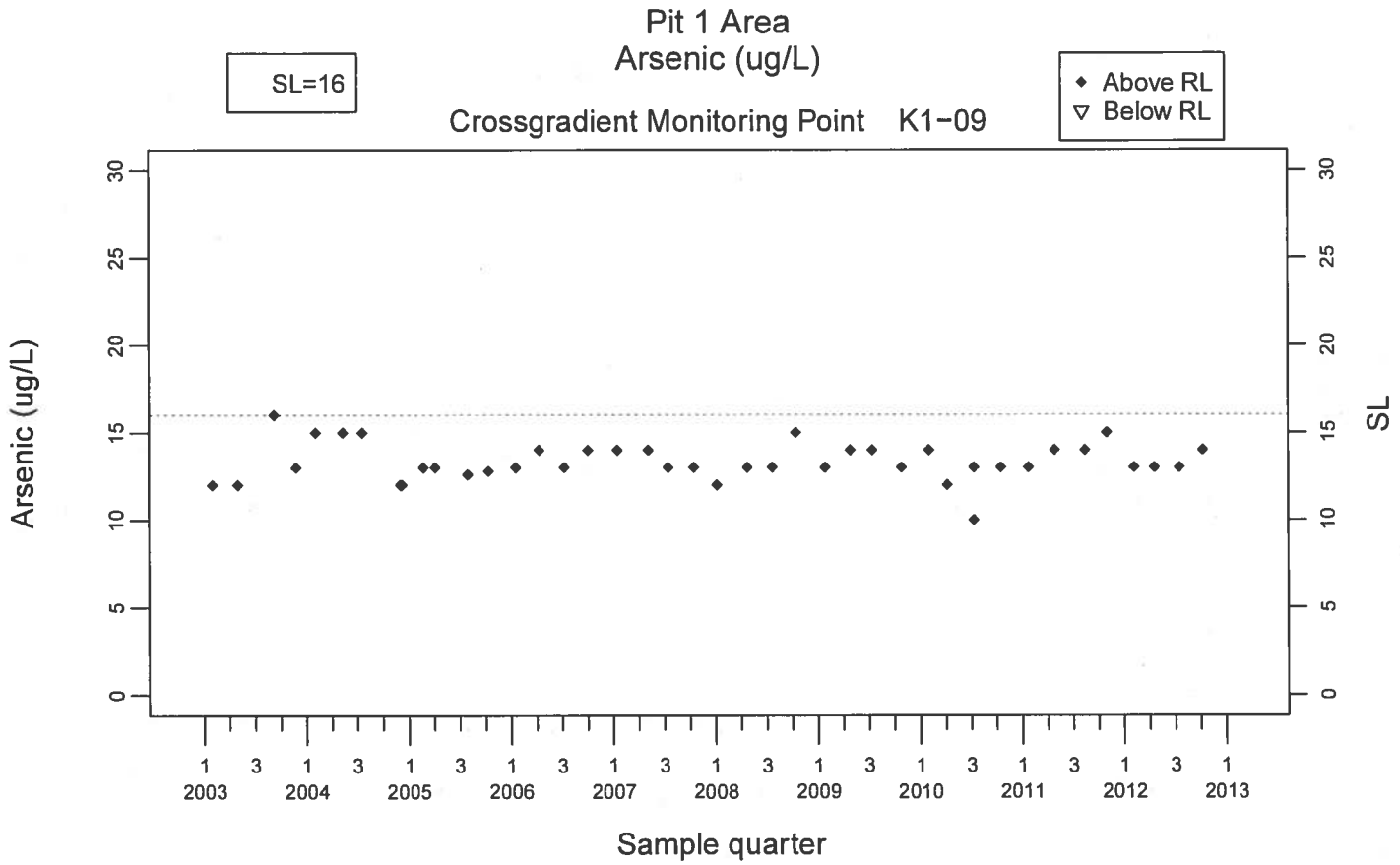

Background Monitoring Point K1-07
Arsenic (ug/L)
0
5
10
15
20
25
30
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

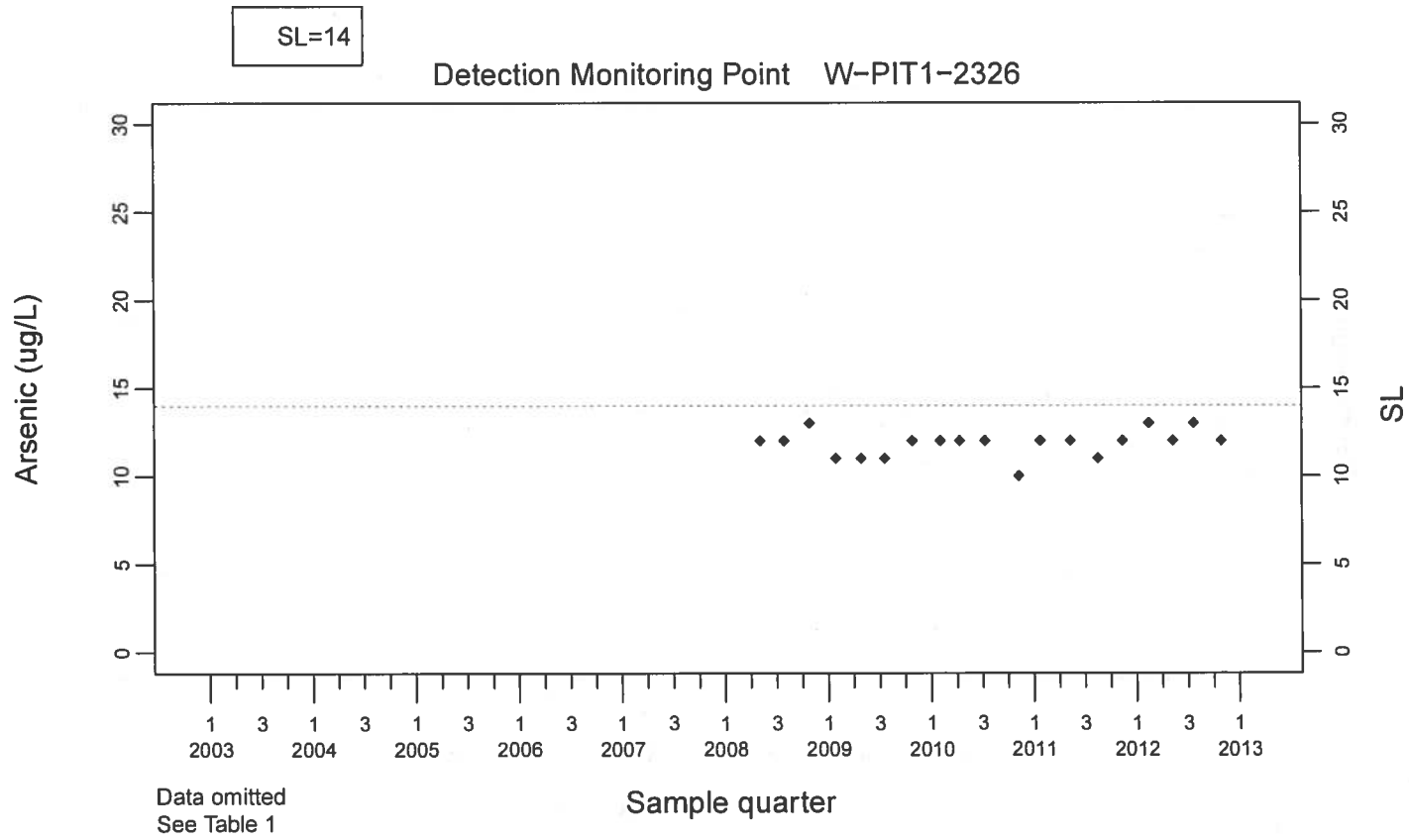

Pit 1 Area
Arsenic (ug/L)
SL=15
Above RL
Below RL
Detection Monitoring Point K1-02B
Arsenic (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

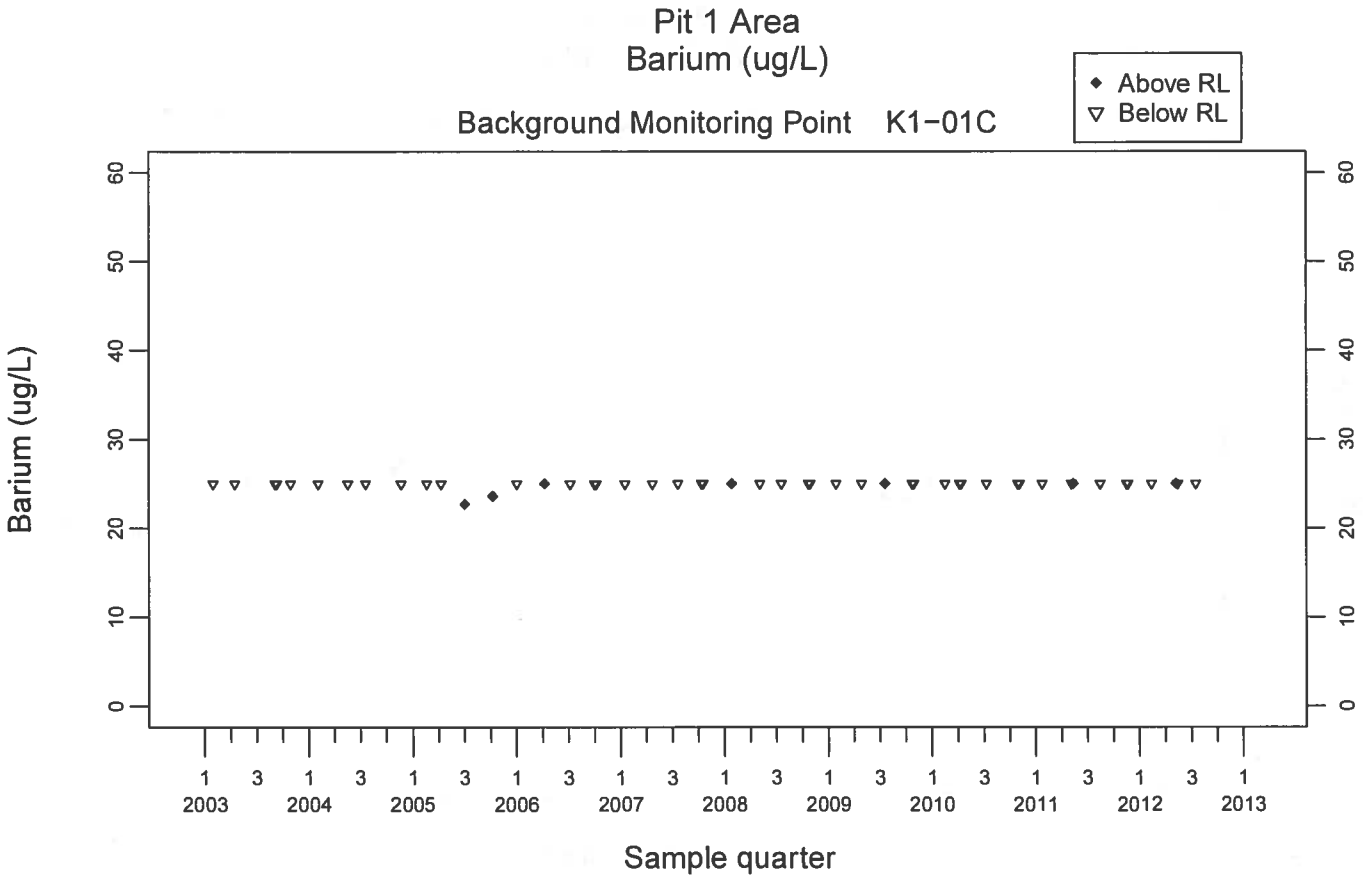

SL=16
Detection Monitoring Point K1-04
Arsenic (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

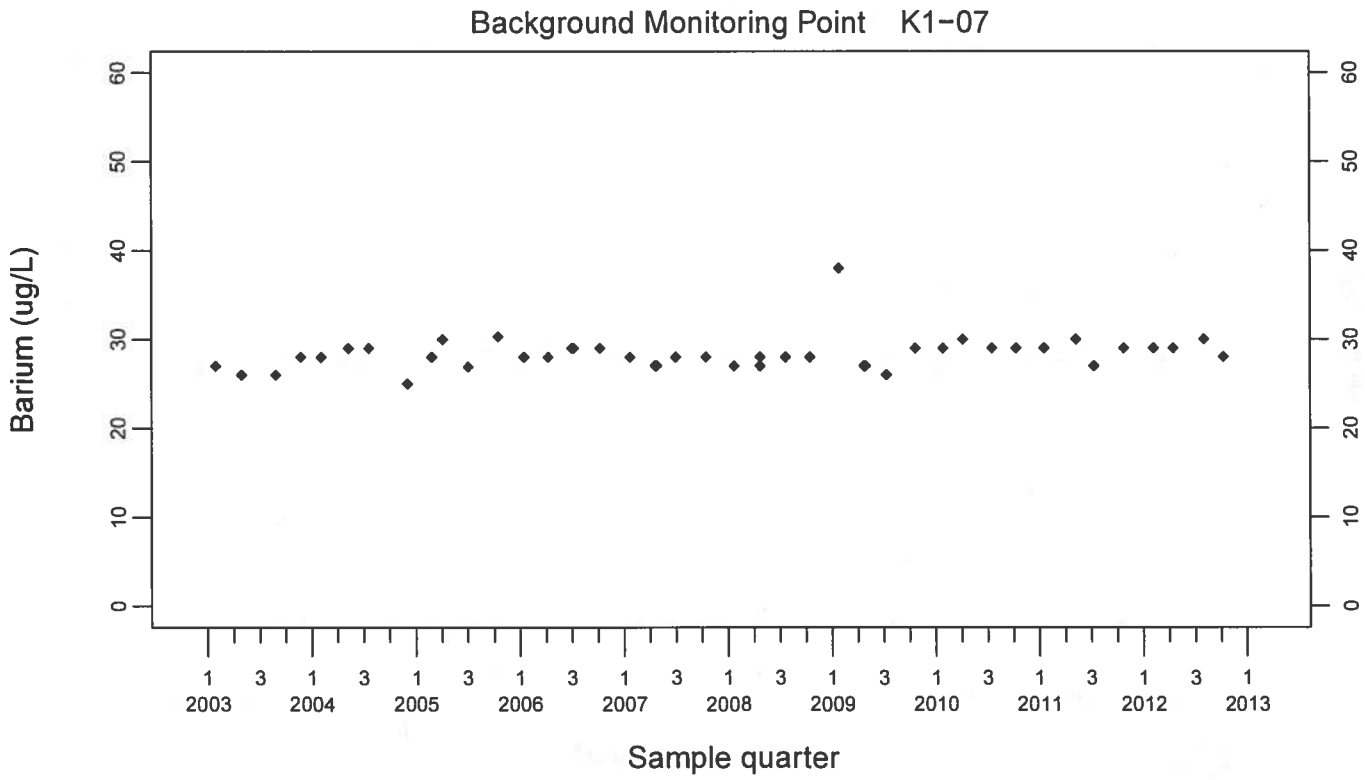

Pit 1 Area
Arsenic (ug/L)
SL=18
Detection Monitoring Point K1-05
Above RL
Below RL
Arsenic (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

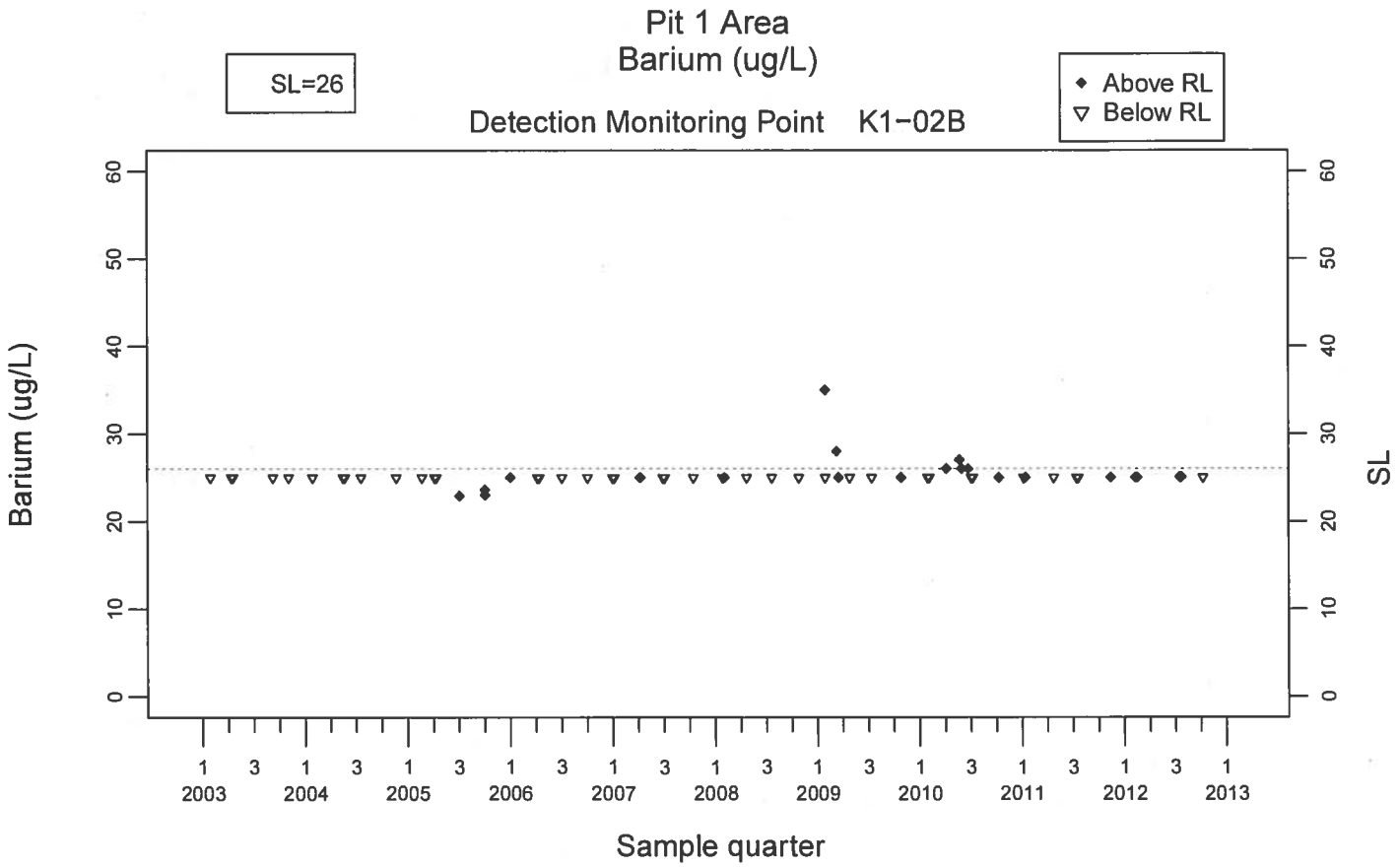

SL=17
Crossgradient Monitoring Point K1-08
Arsenic (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

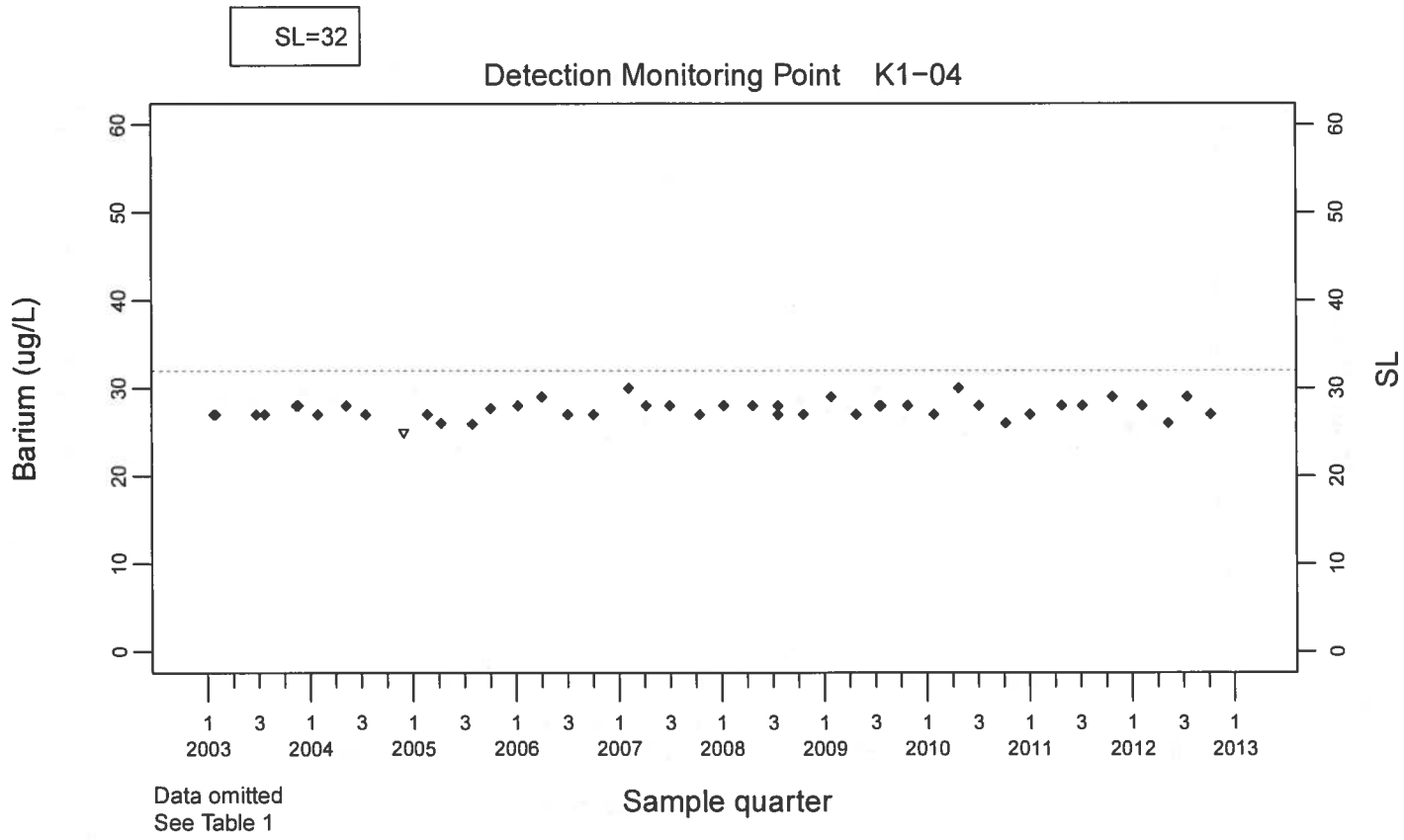

Pit 1 Area
Arsenic (ug/L)
SL=16
Crossgradient Monitoring Point K1-09
Above RL
Below RL
Arsenic (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

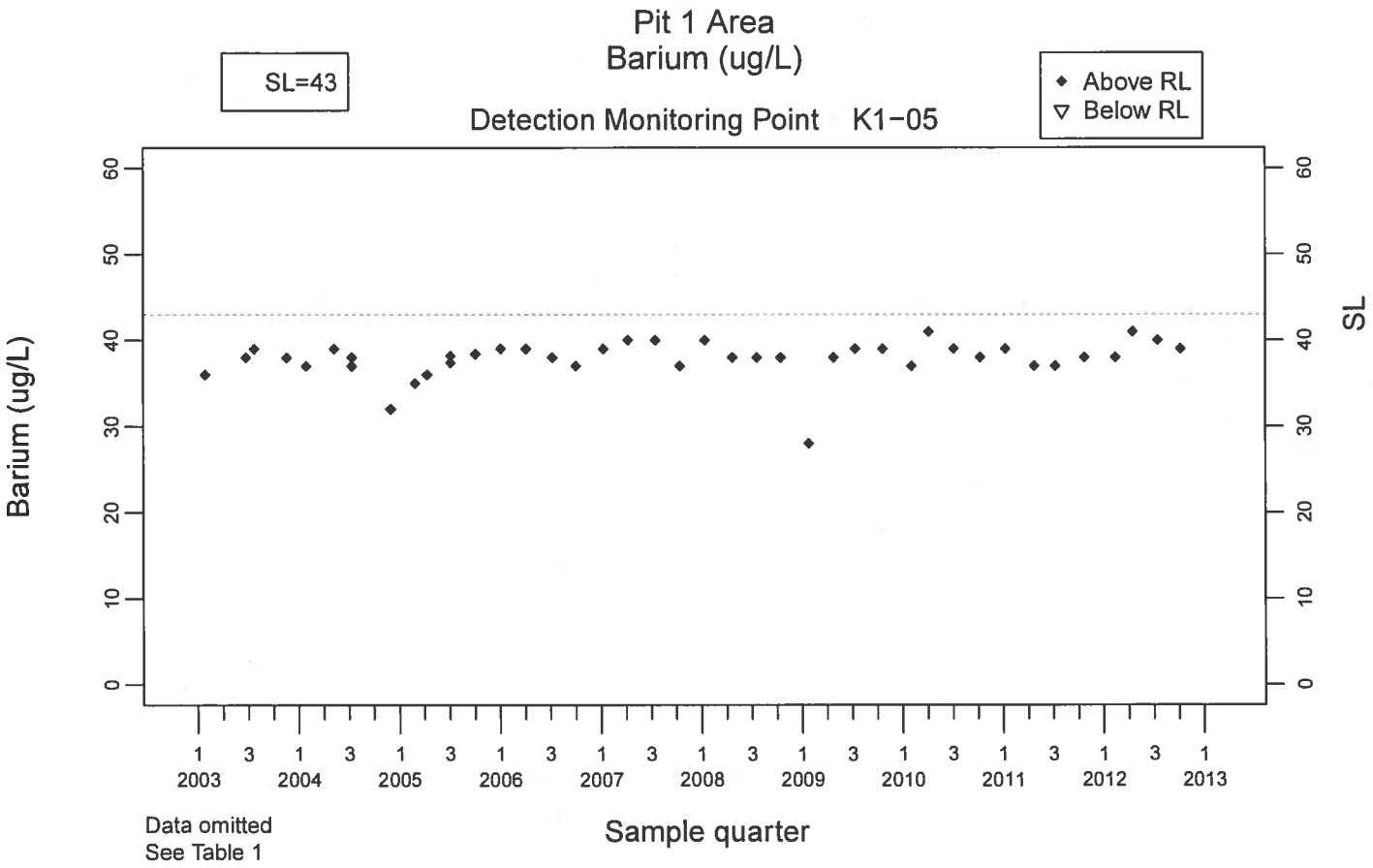

SL=14
Detection Monitoring Point W-PIT1-2326
Arsenic (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Data omitted
See Table 1

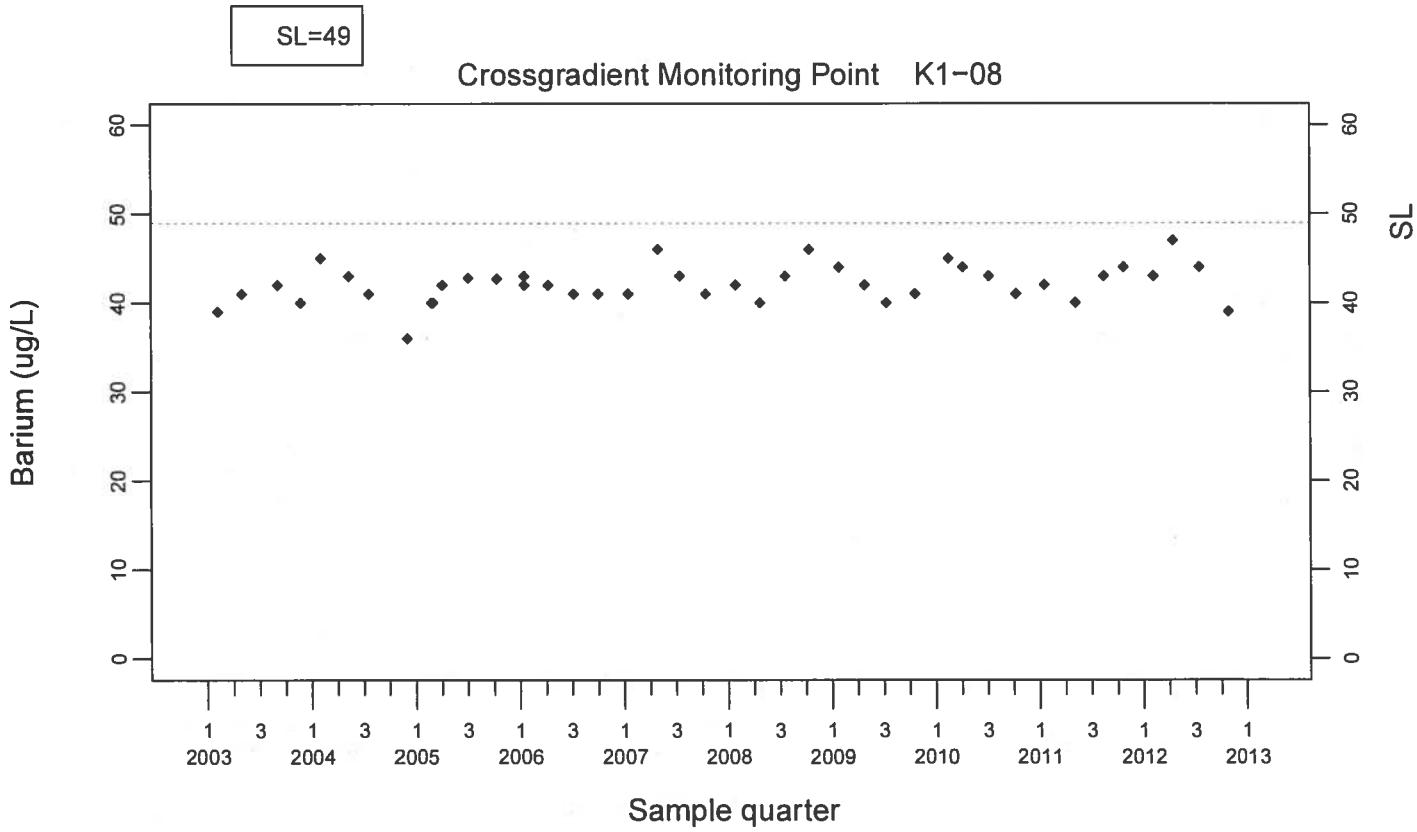

Pit 1 Area
Barium (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Barium (ug/L)
0
10
20
30
40
50
60
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

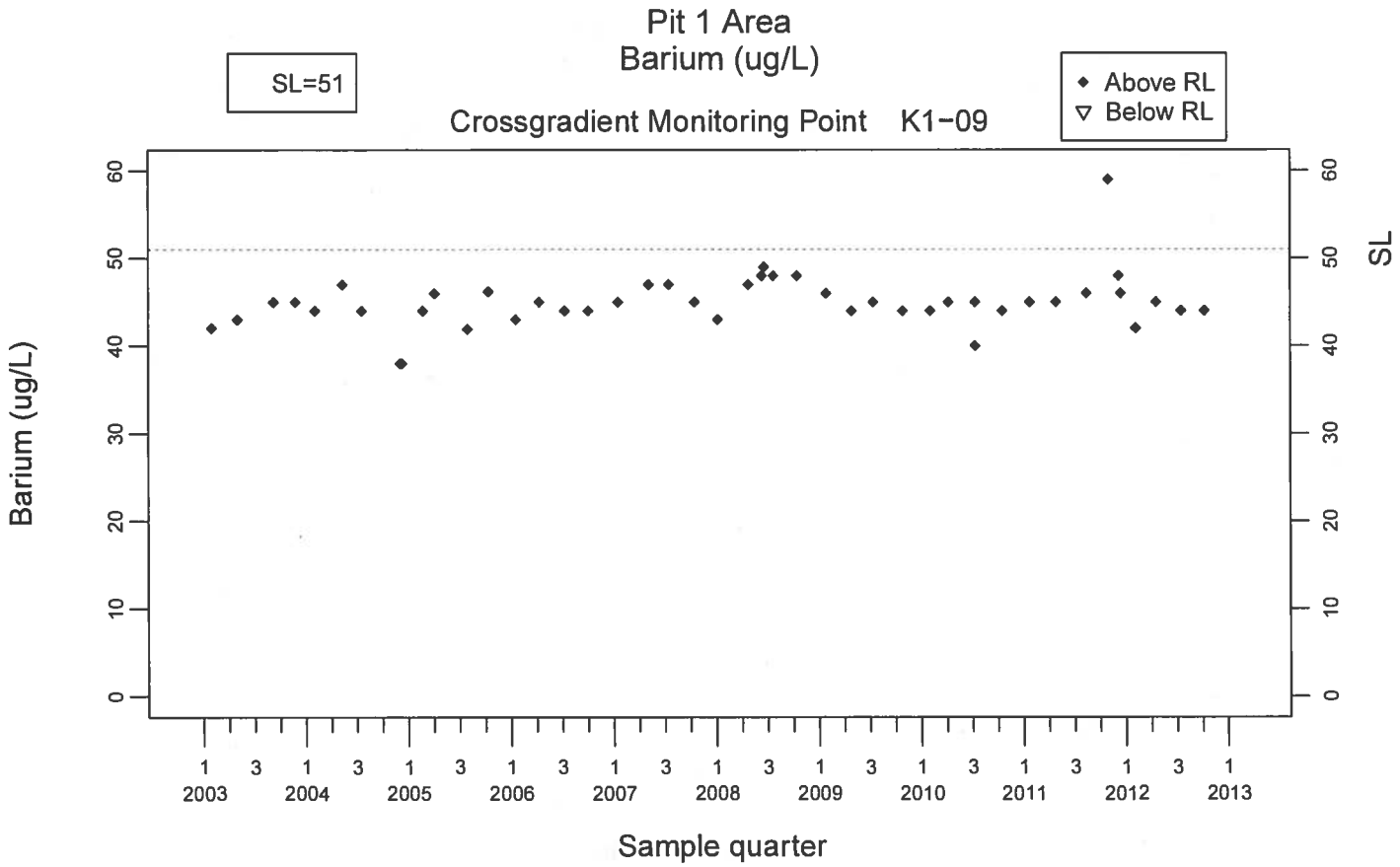

Background Monitoring Point K1-07
Barium (ug/L)
0
10
20
30
40
50
60
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

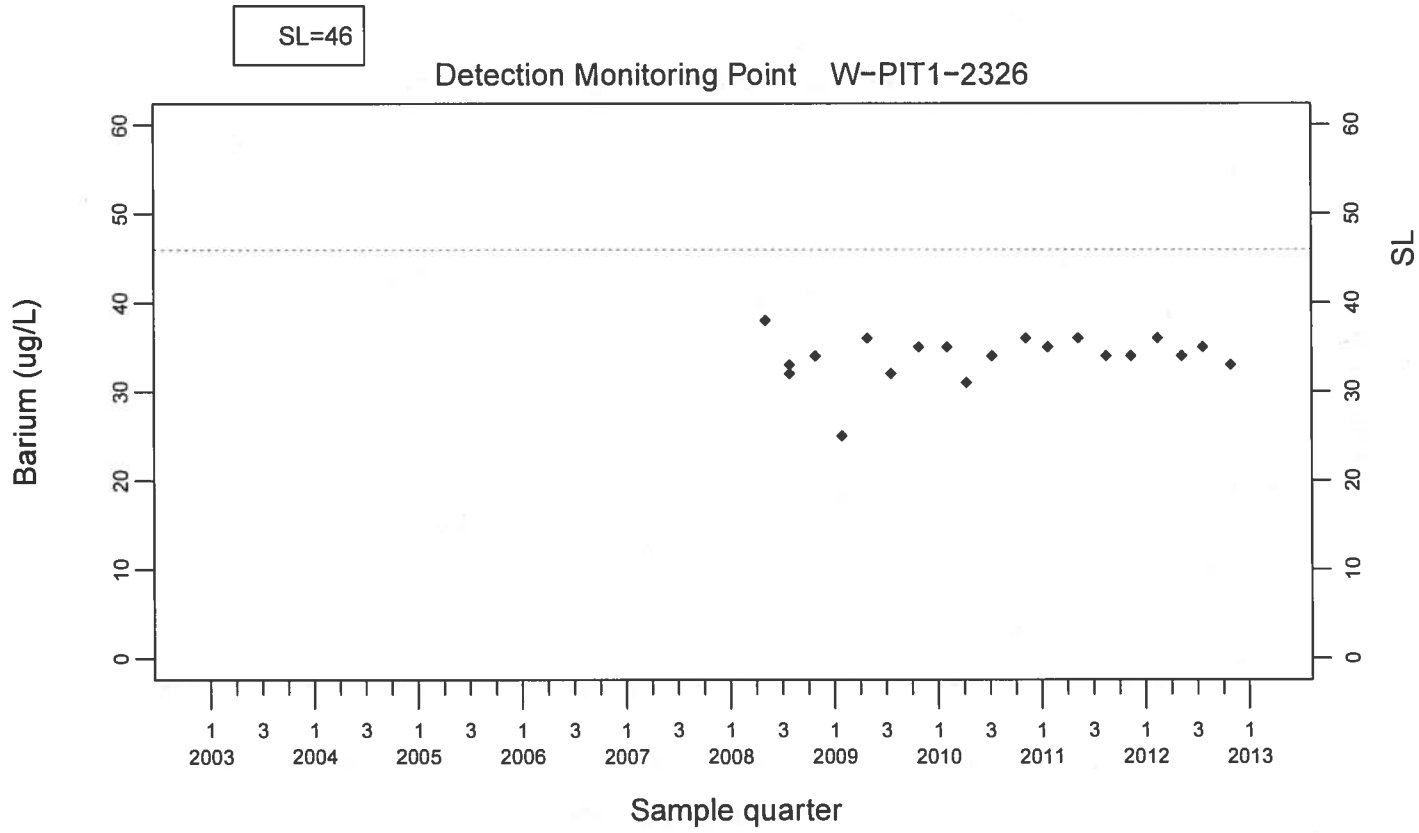

Pit 1 Area
Barium (ug/L)
SL=26
Above RL
Below RL
Detection Monitoring Point K1-02B
Barium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

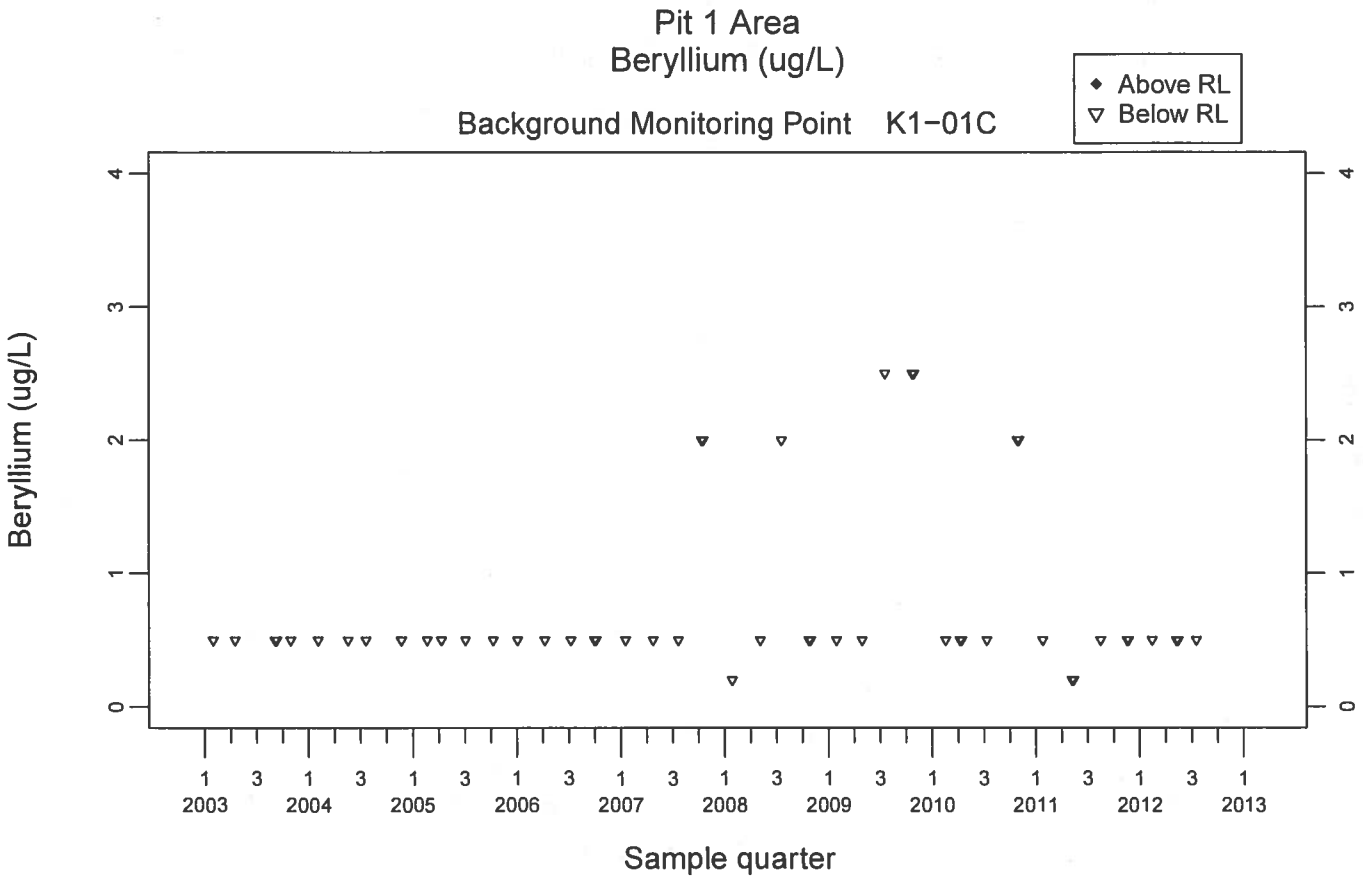

SL=32
Detection Monitoring Point K1-04
Barium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Data omitted
See Table 1

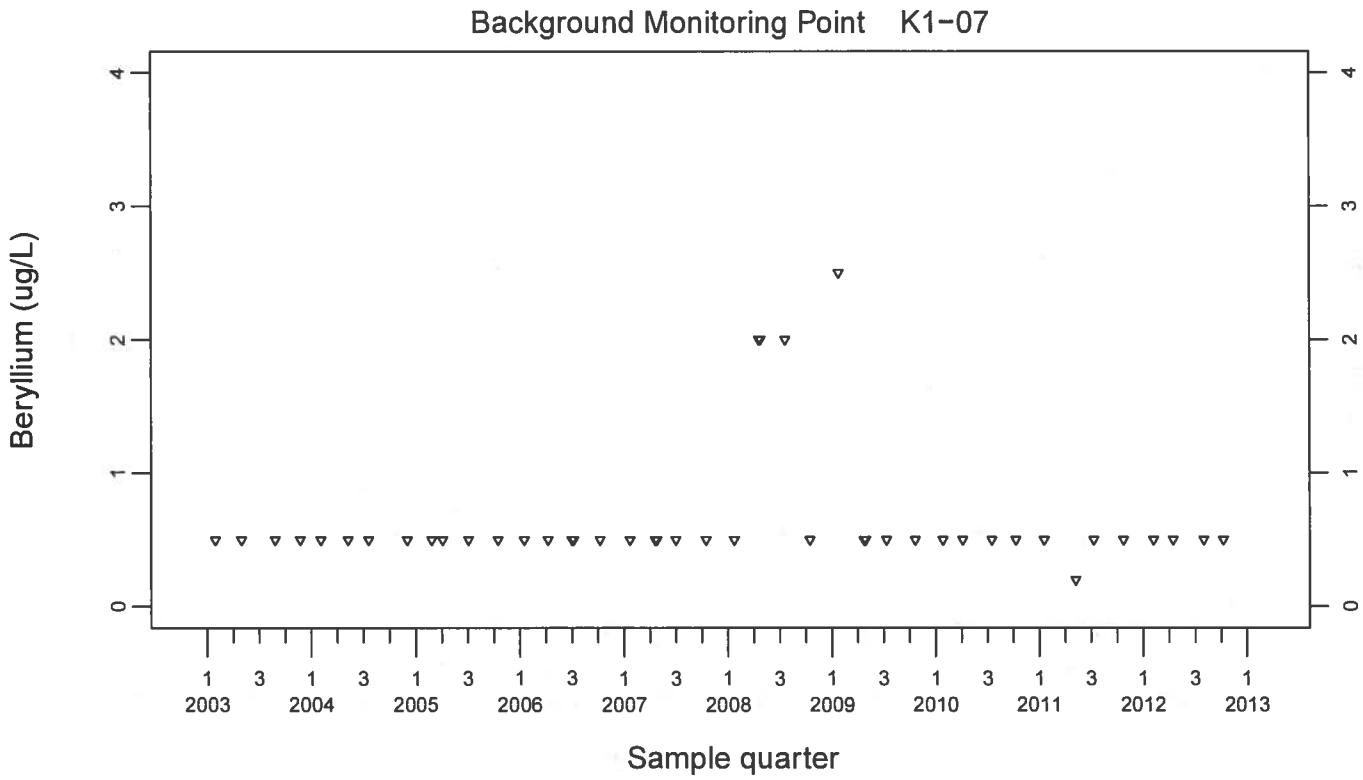

Pit 1 Area
Barium (ug/L)
SL=43
Detection Monitoring Point K1-05
Above RL
Below RL
Barium (ug/L)
SL
Sample quarter
Data omitted
See Table 1

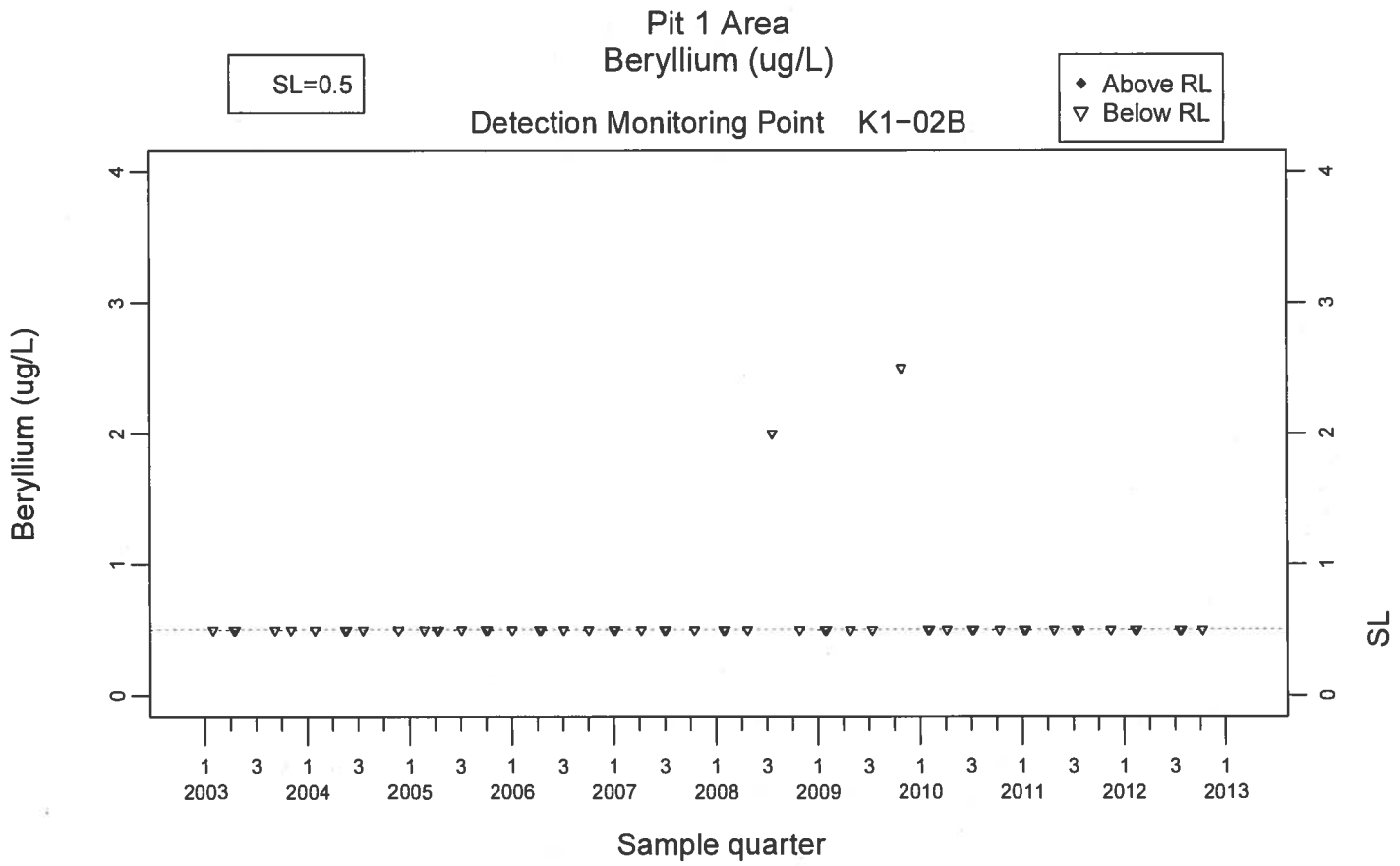

SL=49
Crossgradient Monitoring Point K1-08
Barium (ug/L)
SL
Sample quarter

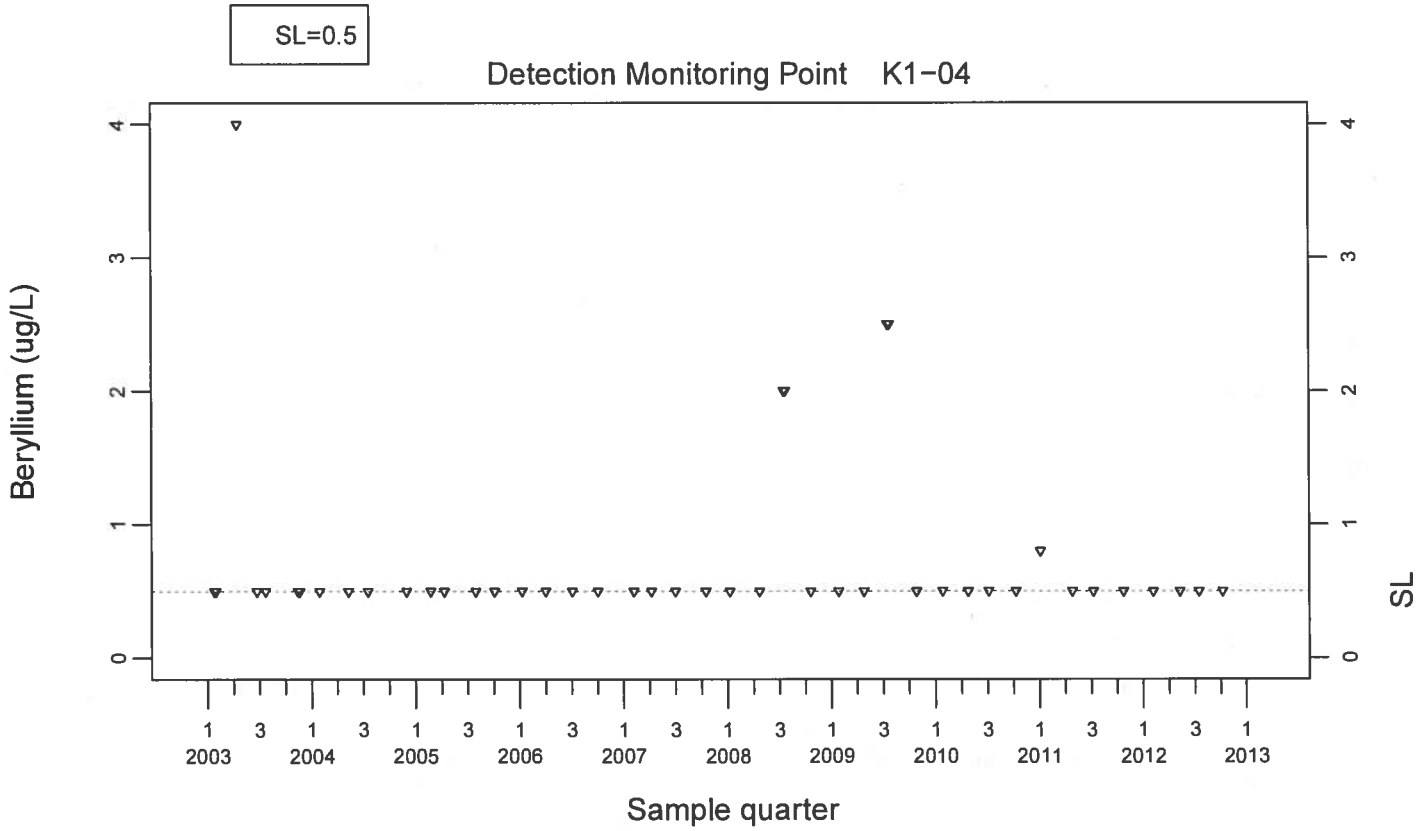

Pit 1 Area
Barium (ug/L)
SL=51
Crossgradient Monitoring Point K1-09
Above RL
Below RL
Barium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

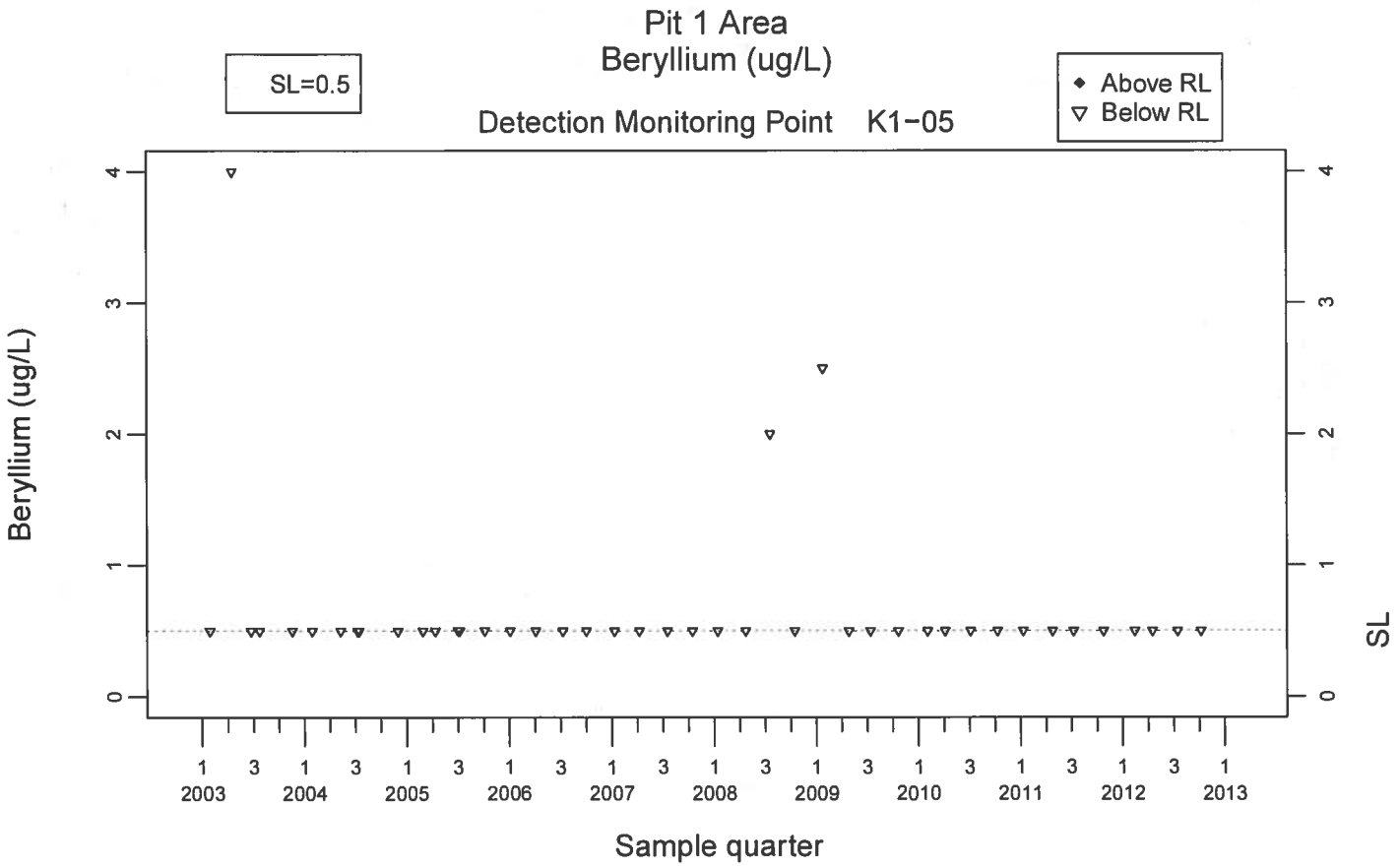

SL=46
Detection Monitoring Point W-PIT1-2326
Barium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

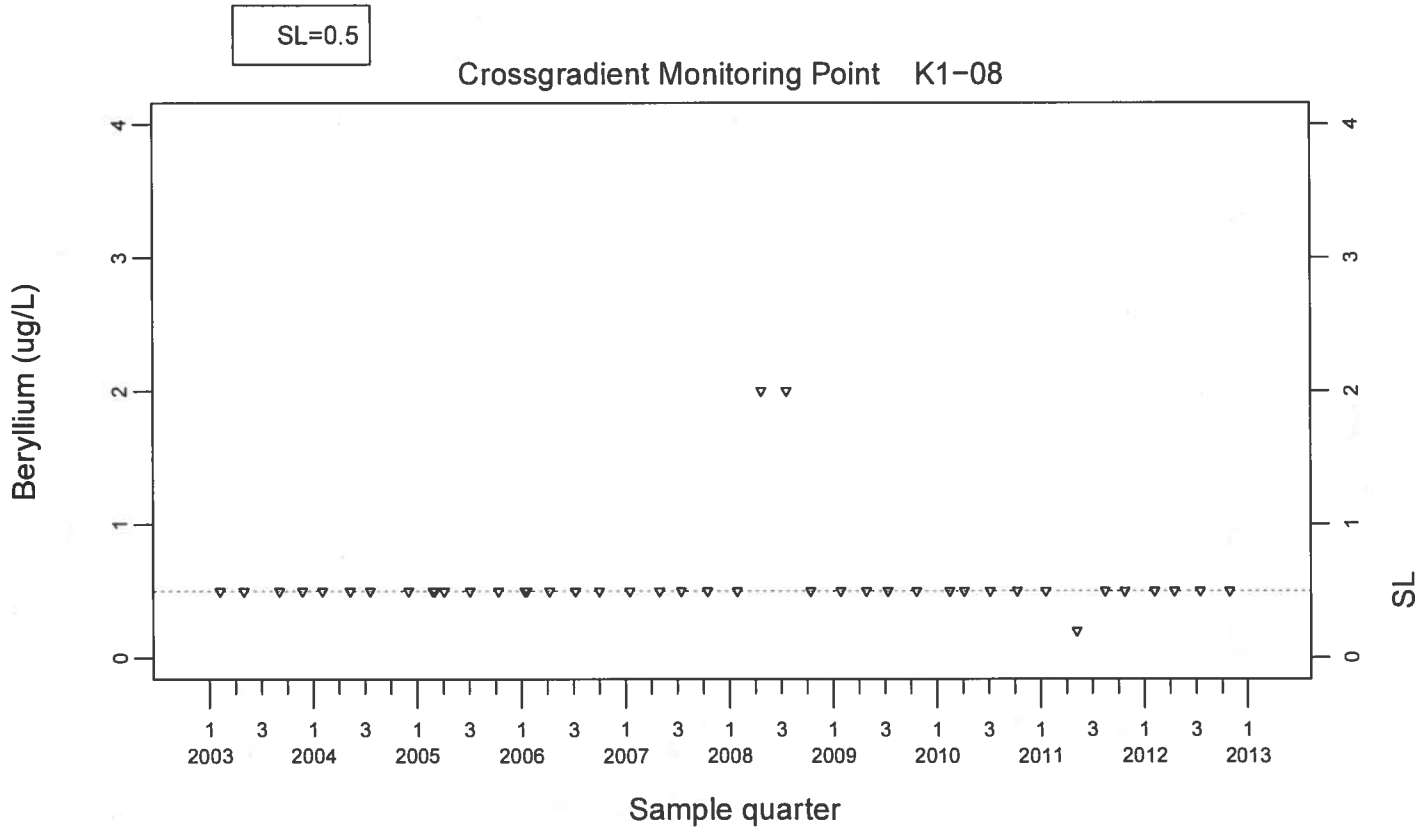

Pit 1 Area
Beryllium (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Beryllium (ug/L)
0
1
2
3
4
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

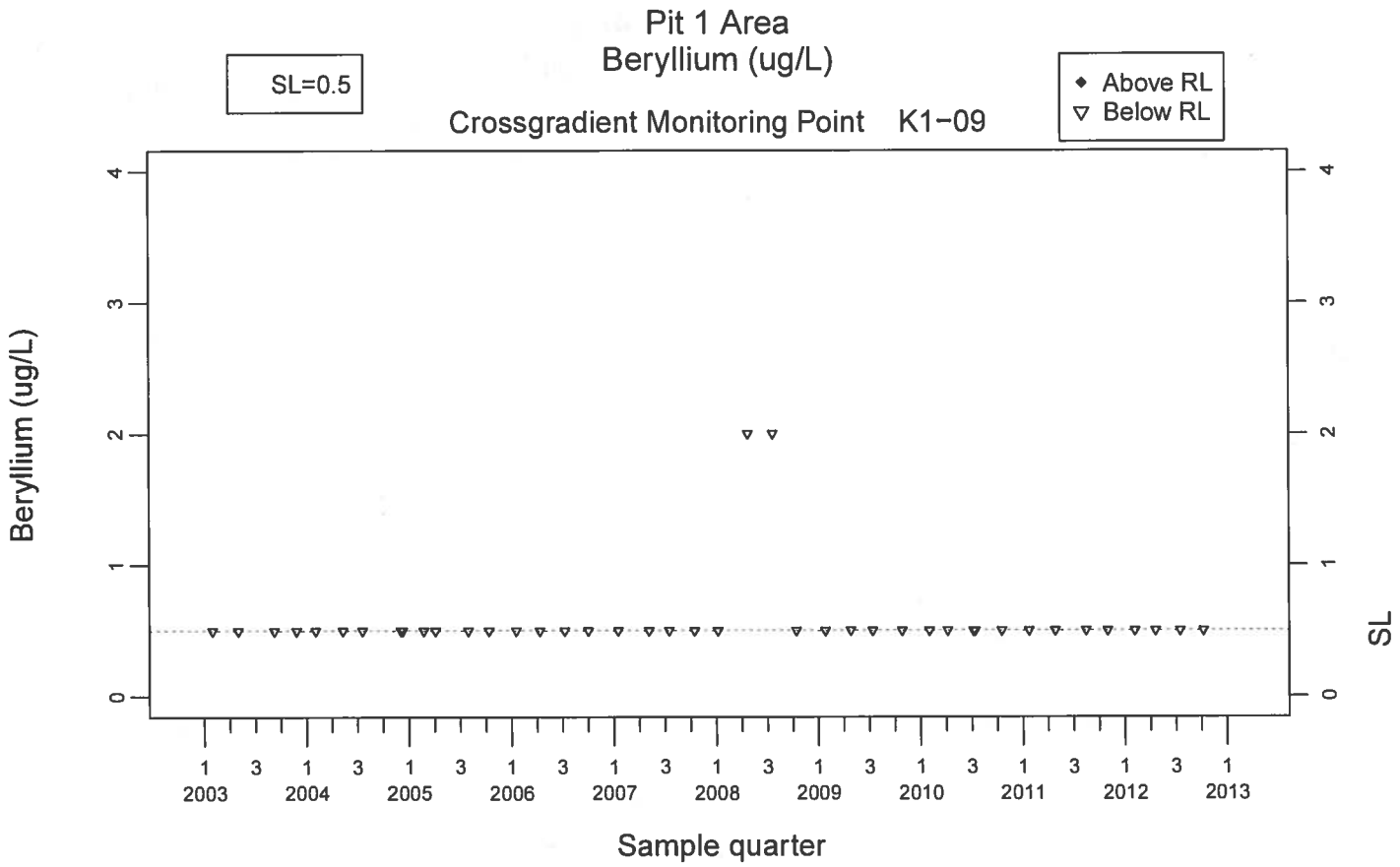

Background Monitoring Point K1-07
Beryllium (ug/L)
0
1
2
3
4
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

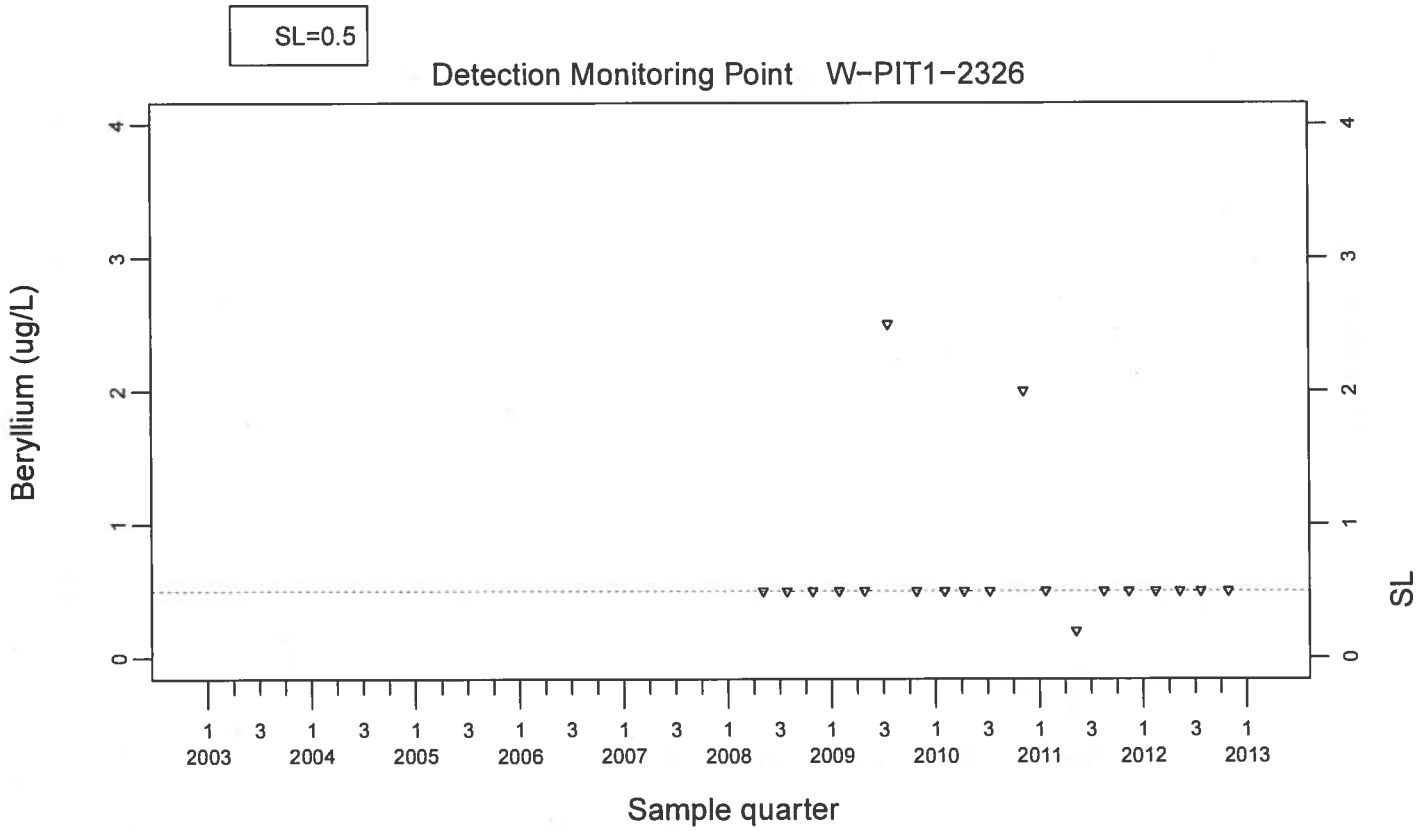

Pit 1 Area
Beryllium (ug/L)
SL=0.5
Above RL
Below RL
Detection Monitoring Point K1-02B
Beryllium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

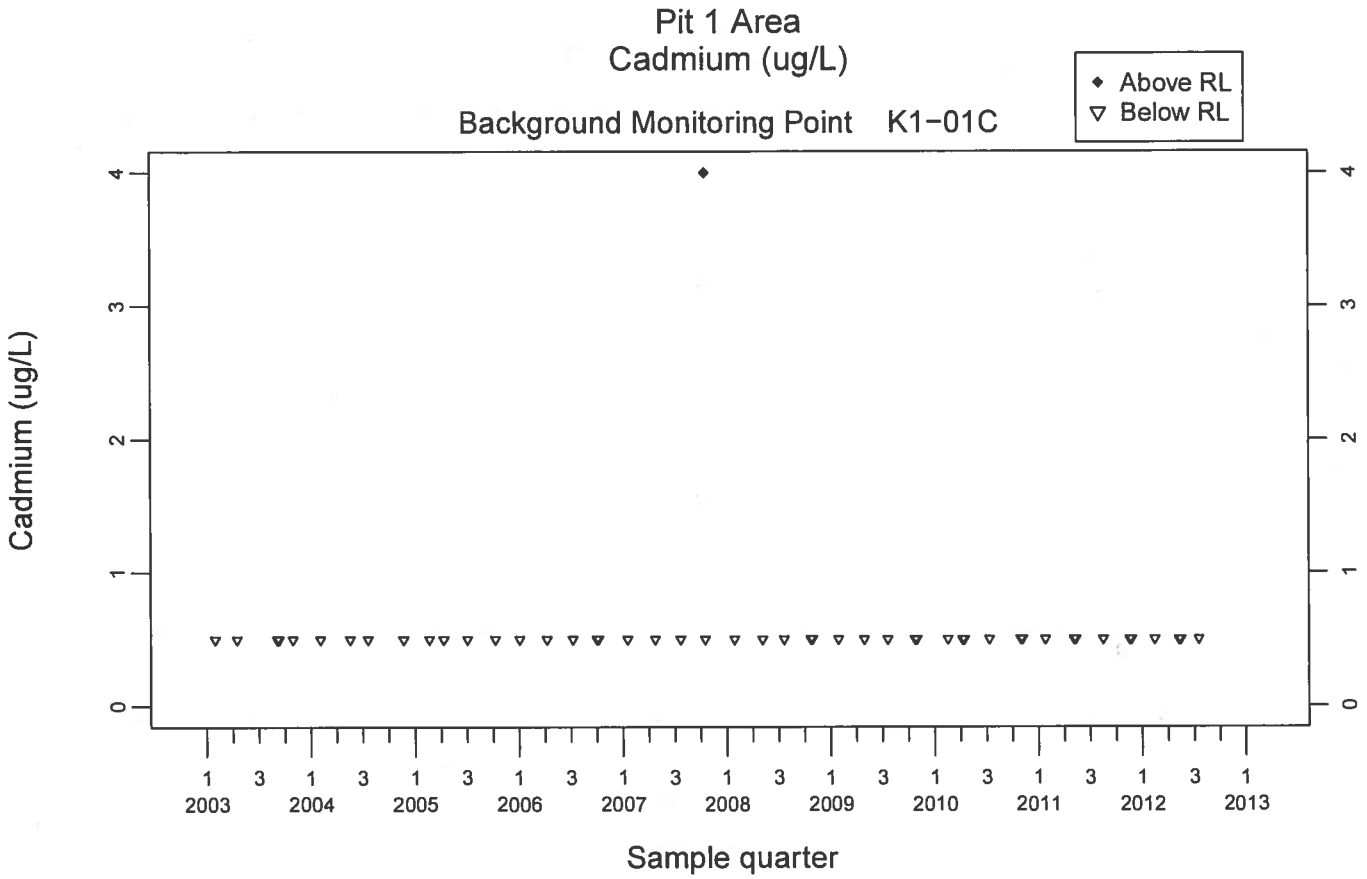

SL=0.5
Detection Monitoring Point K1-04
Beryllium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

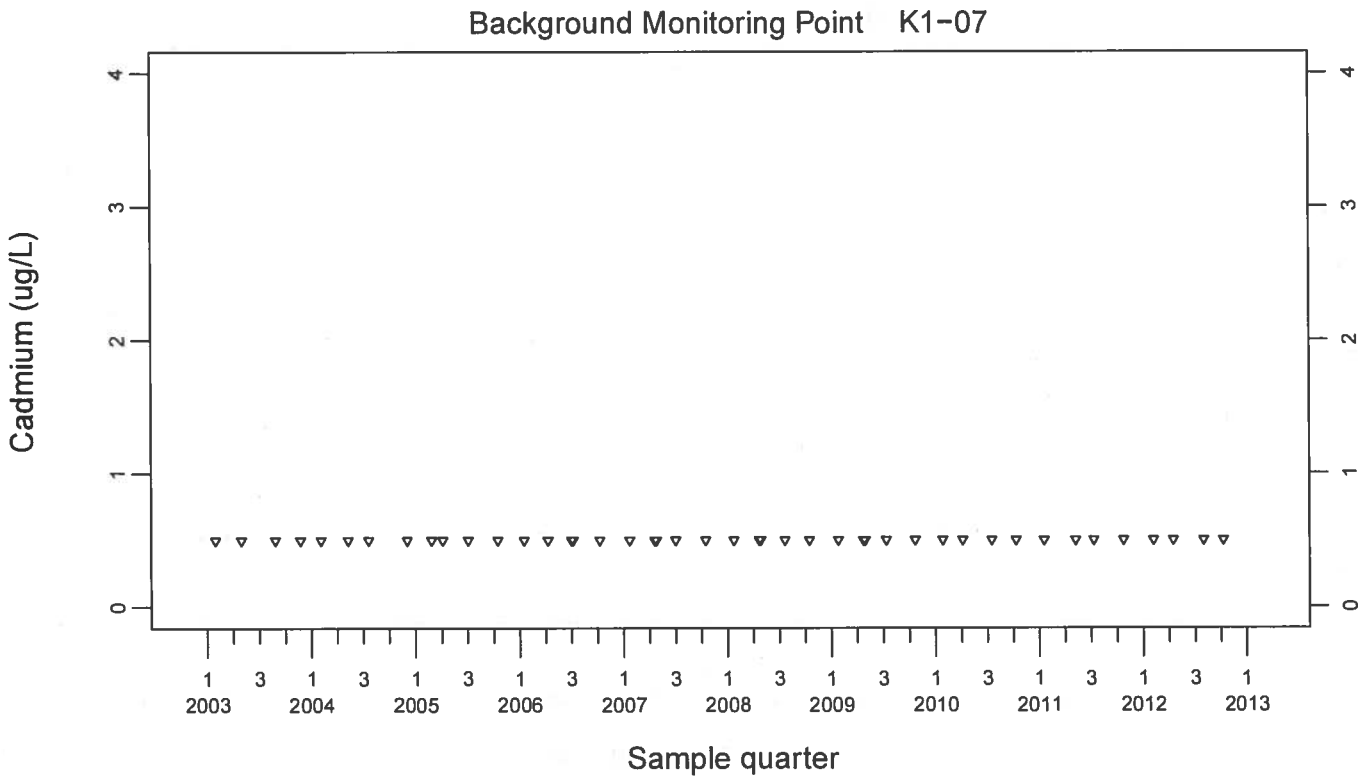

Pit 1 Area
Beryllium (ug/L)
Detection Monitoring Point K1-05
SL=0.5
Above RL
Below RL
Beryllium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

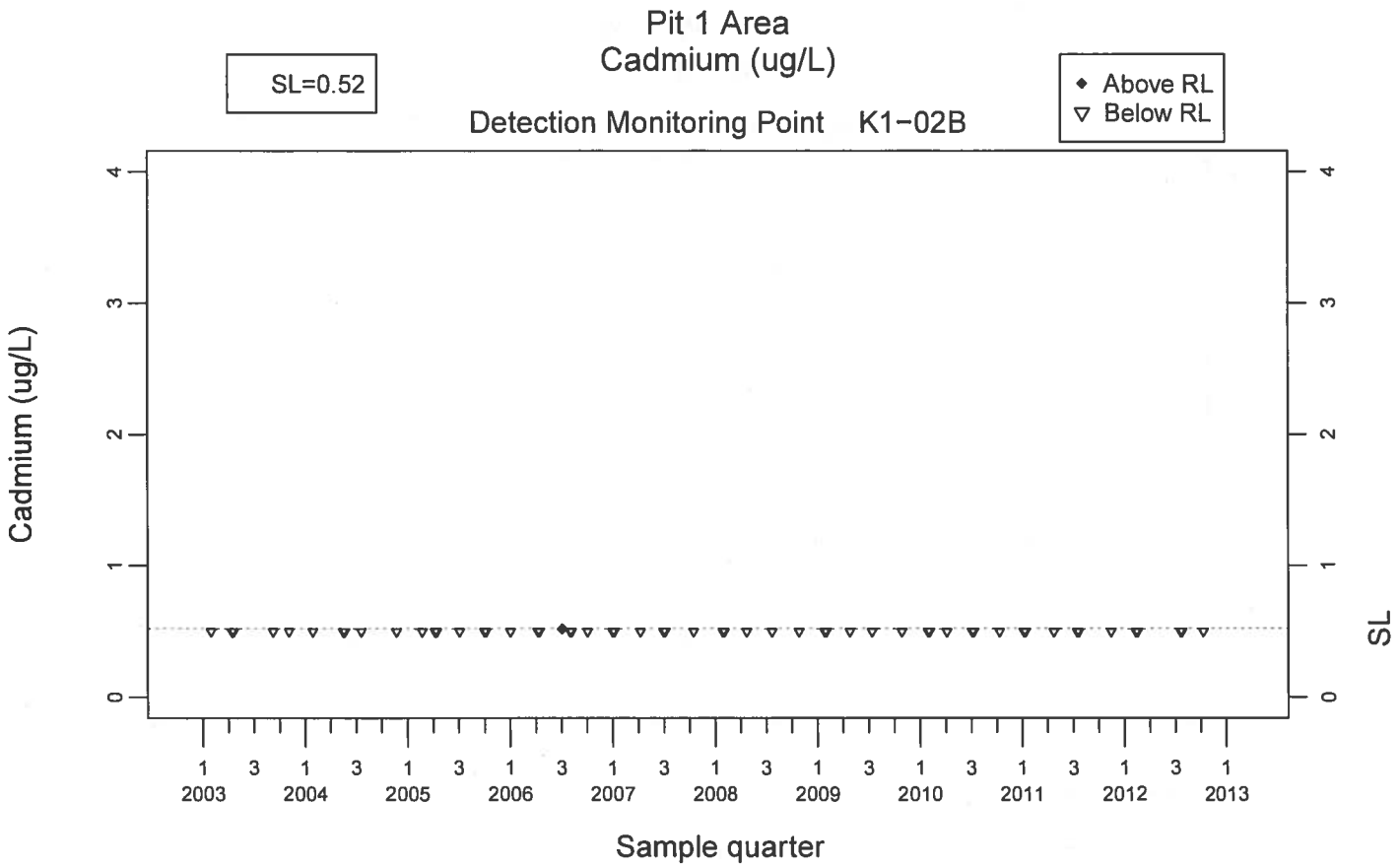

Crossgradient Monitoring Point K1-08
SL=0.5
Beryllium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

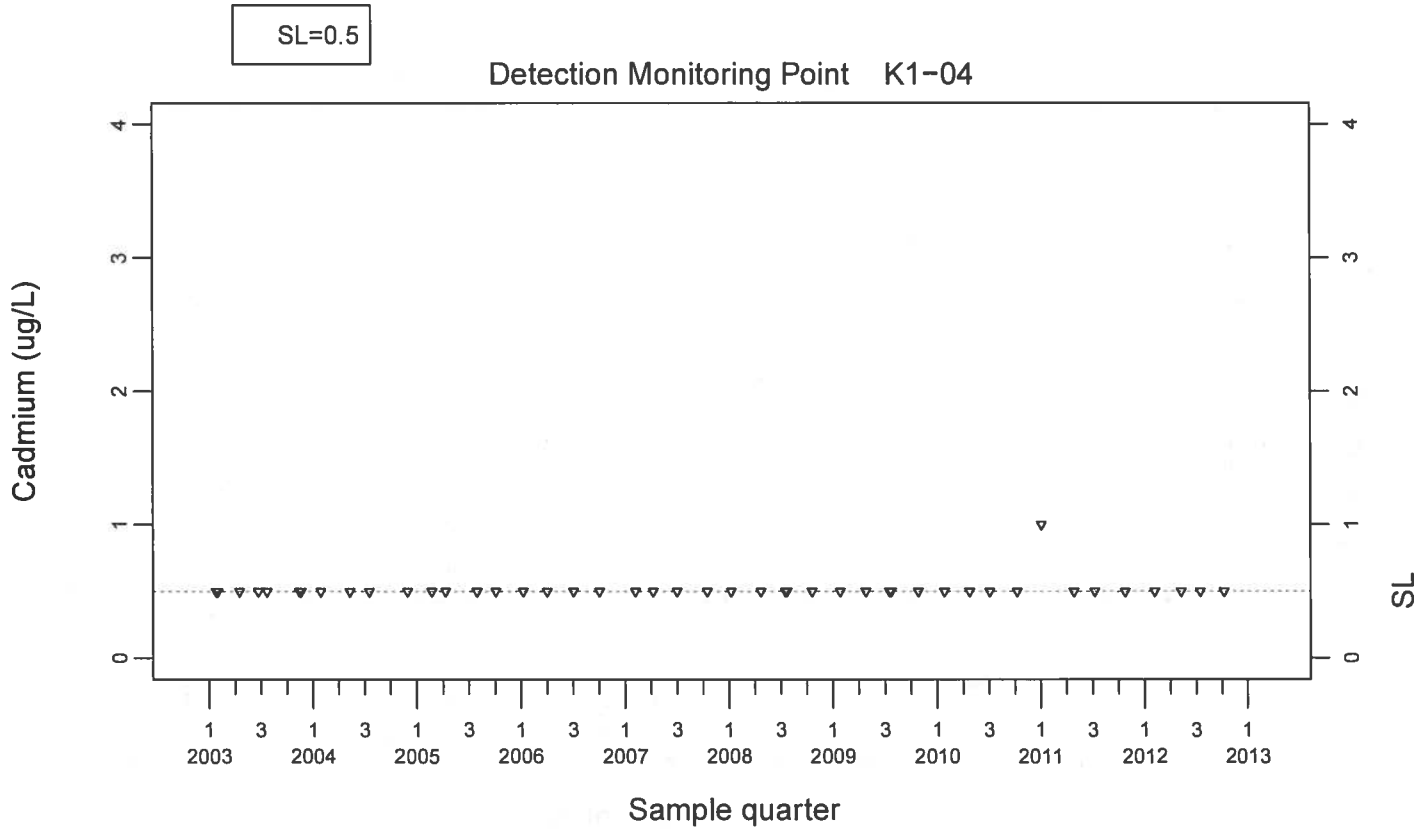

Pit 1 Area
Beryllium (ug/L)
SL=0.5
Above RL
Below RL
Crossgradient Monitoring Point K1-09
Beryllium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

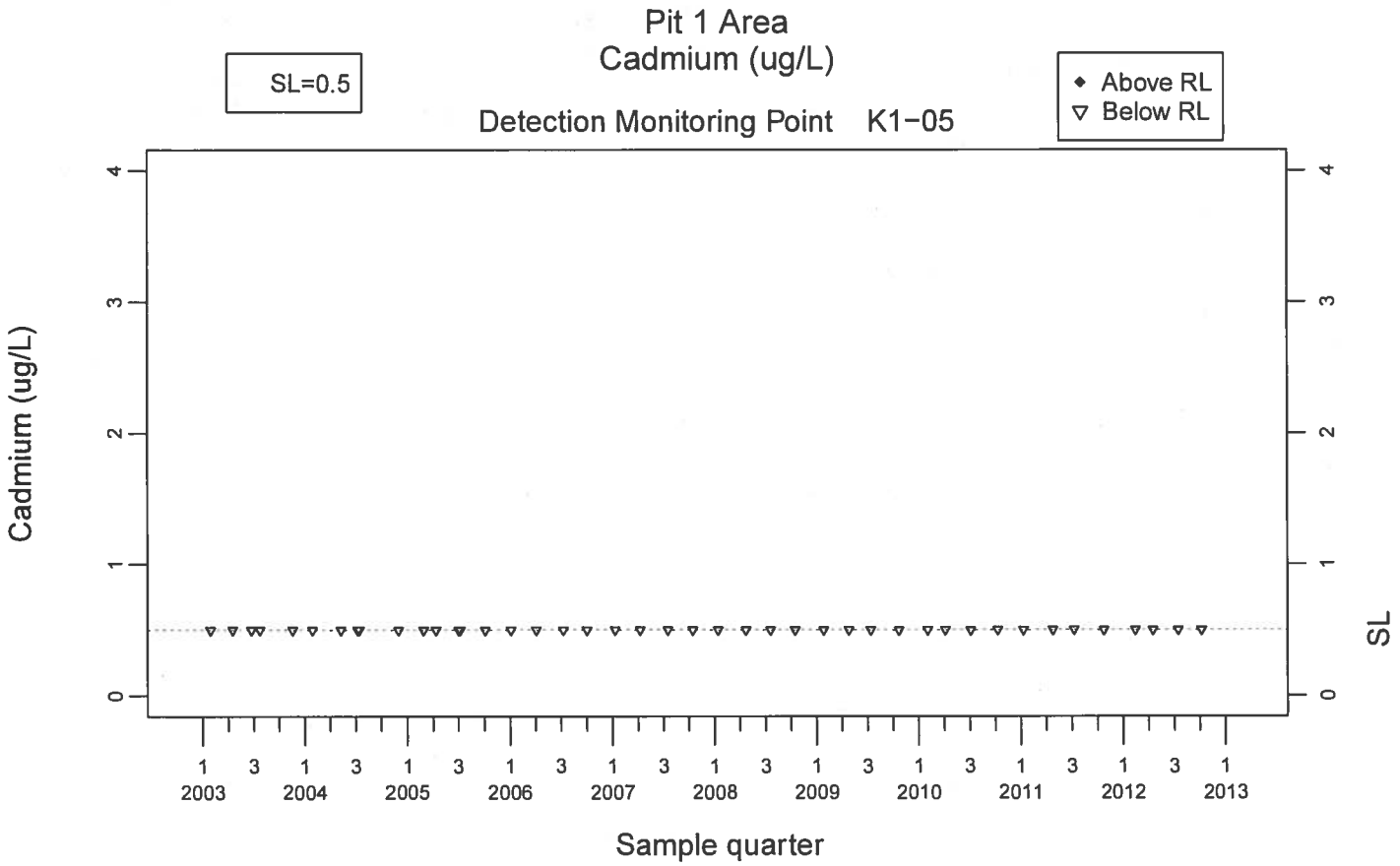

SL=0.5
Detection Monitoring Point W-PIT1-2326
Beryllium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

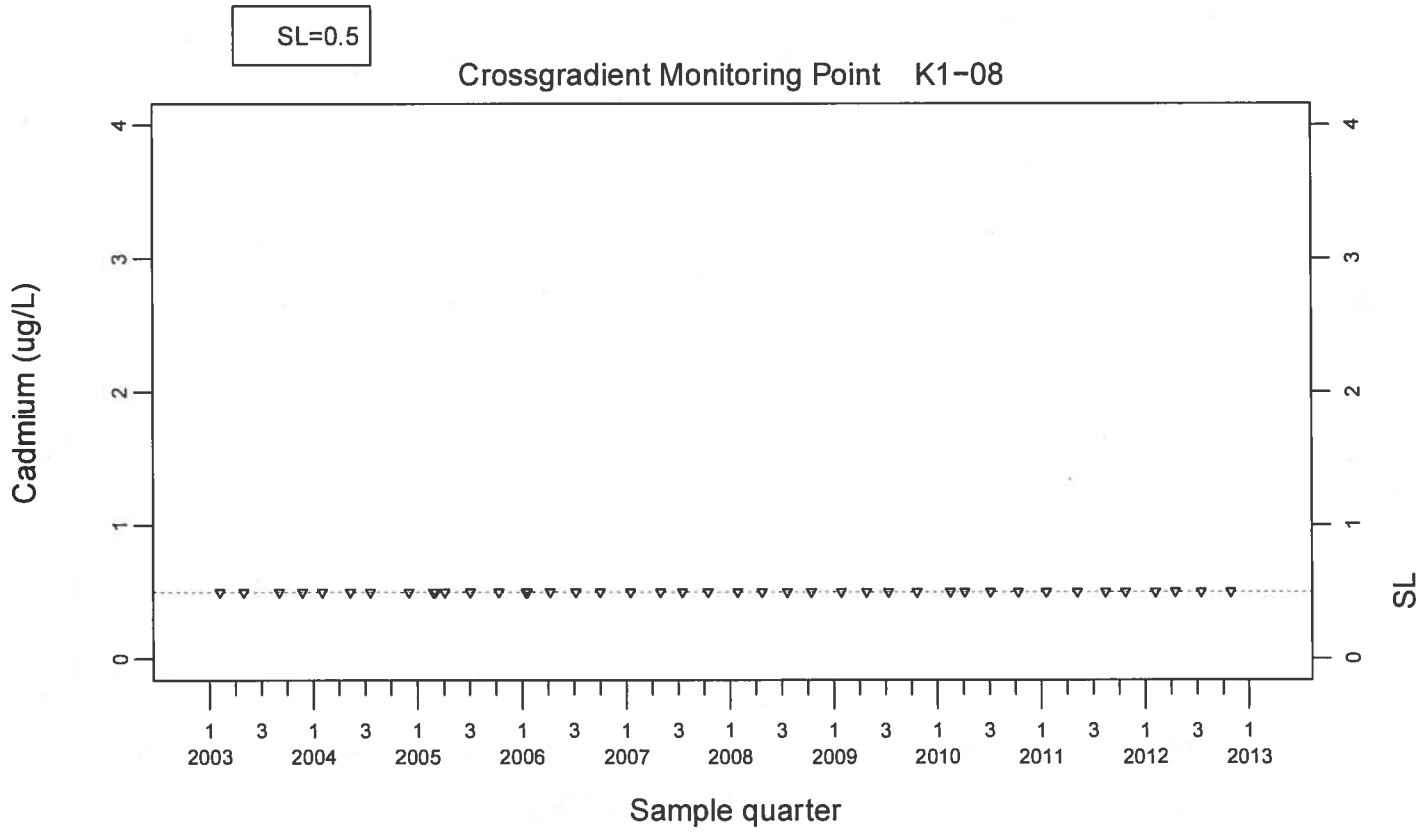

Pit 1 Area
Cadmium (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Cadmium (ug/L)
0
1
2
3
4
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

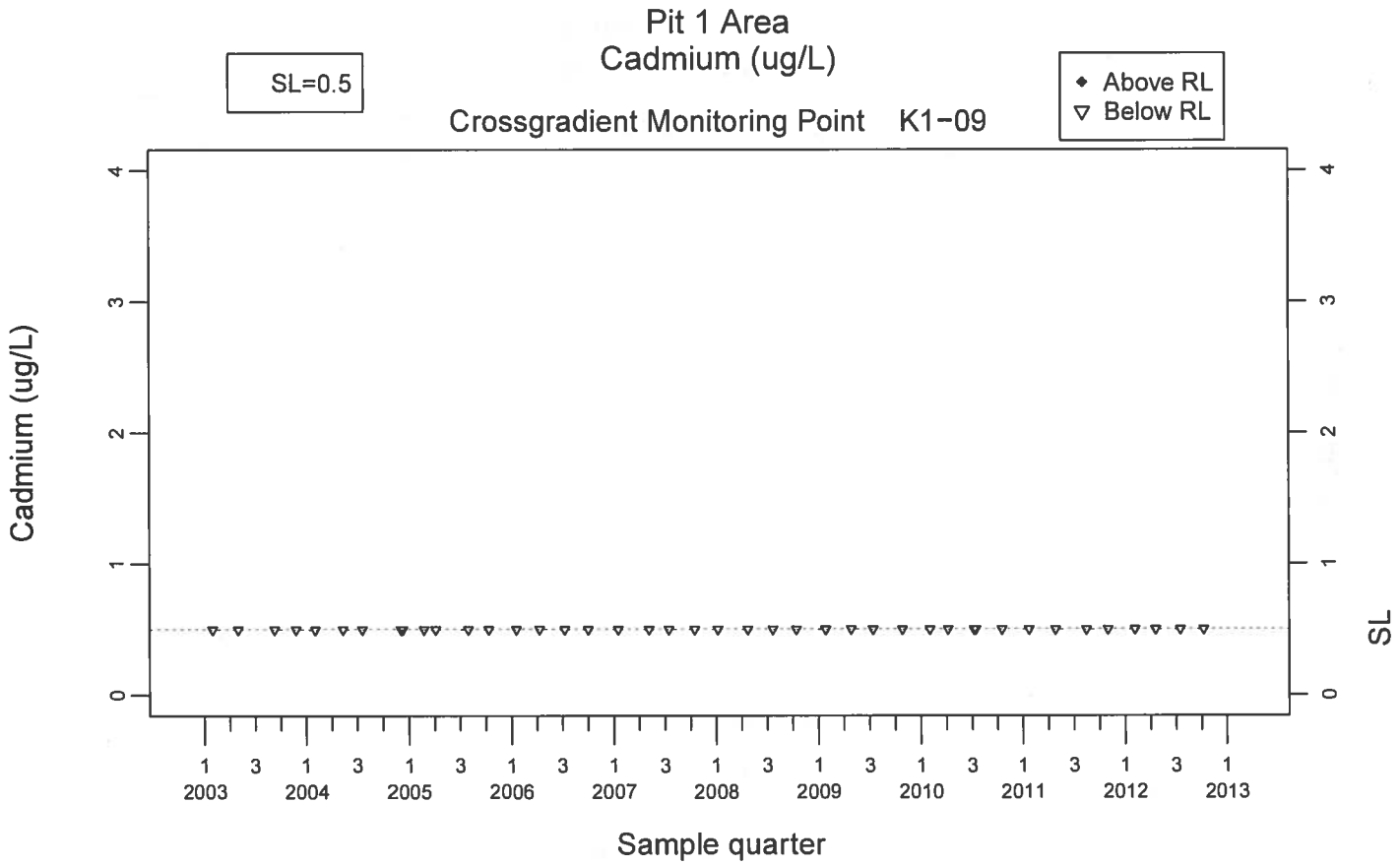

Background Monitoring Point K1-07
Cadmium (ug/L)
0
1
2
3
4
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

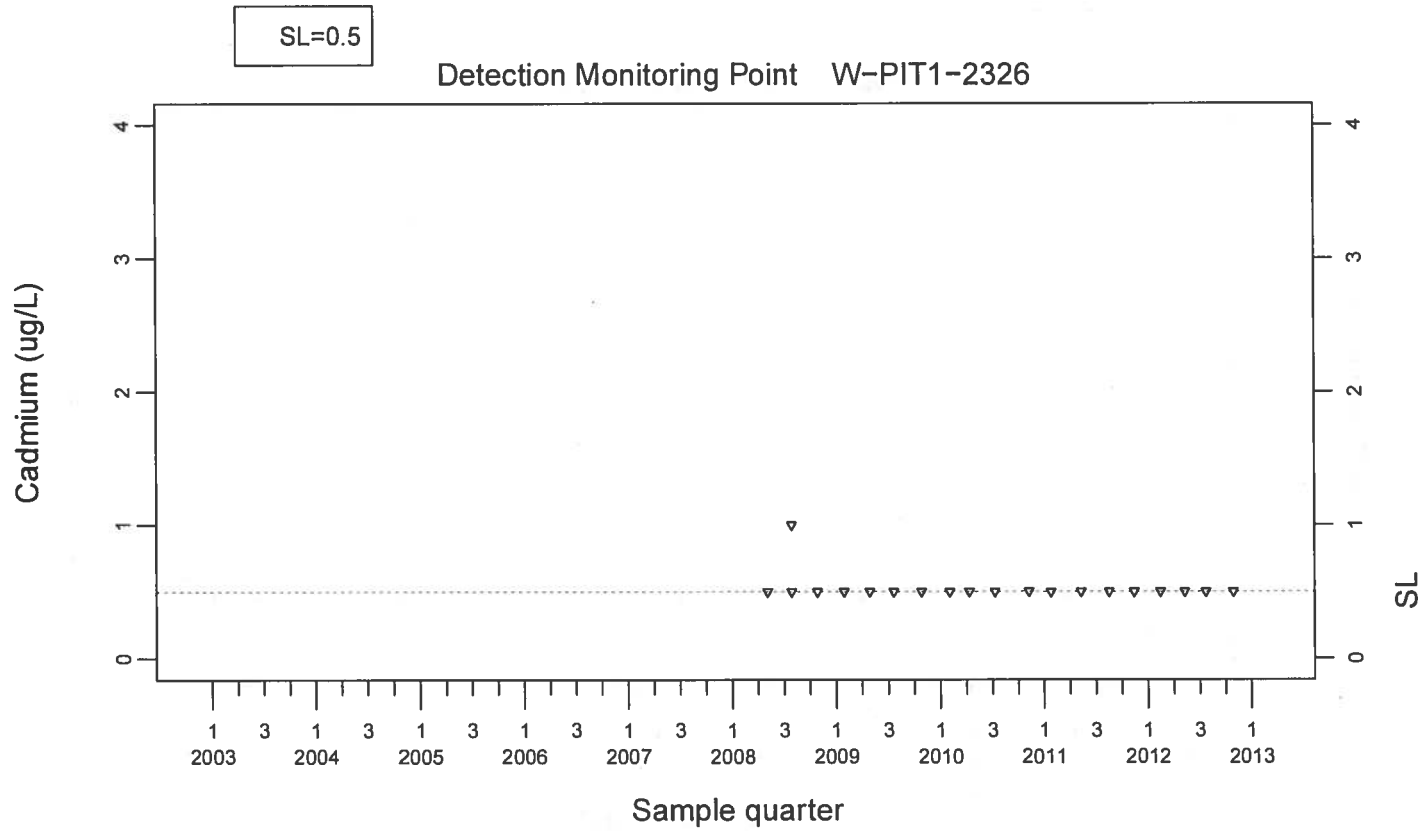

Pit 1 Area
Cadmium (ug/L)
SL=0.52
Above RL
Below RL
Detection Monitoring Point K1-02B
Cadmium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

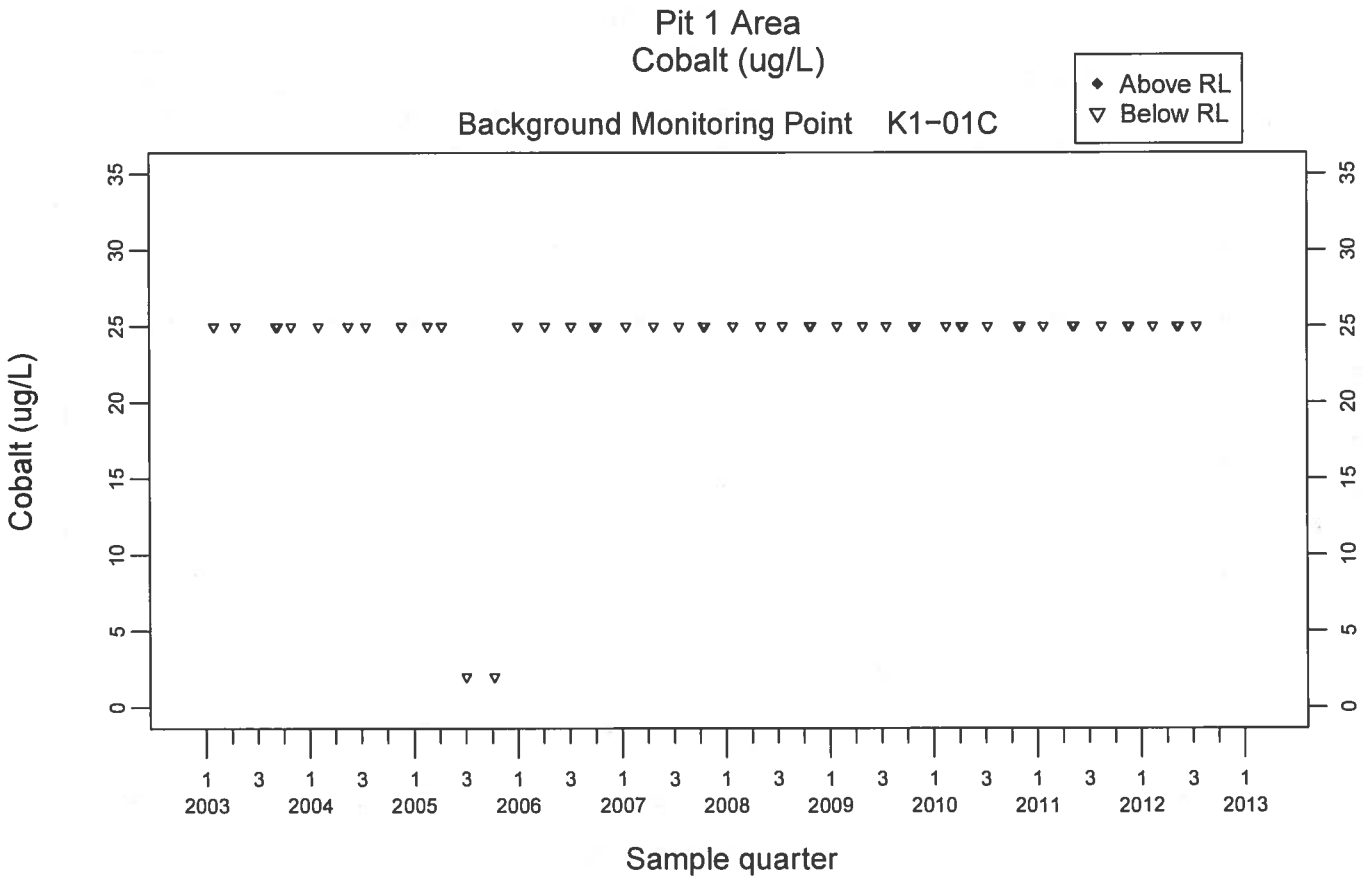

SL=0.5
Detection Monitoring Point K1-04
Cadmium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

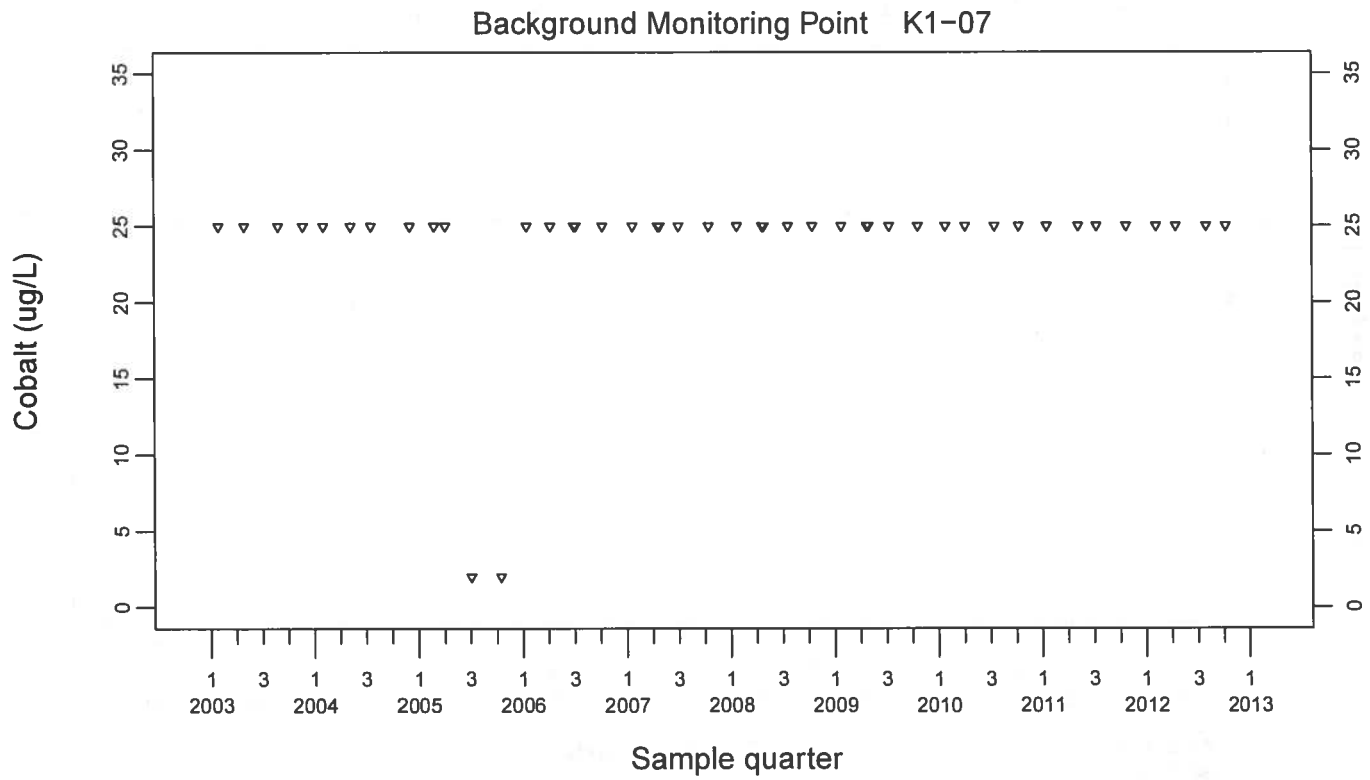

Pit 1 Area
Cadmium (ug/L)
SL=0.5
Above RL
Below RL
Detection Monitoring Point K1-05
Cadmium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

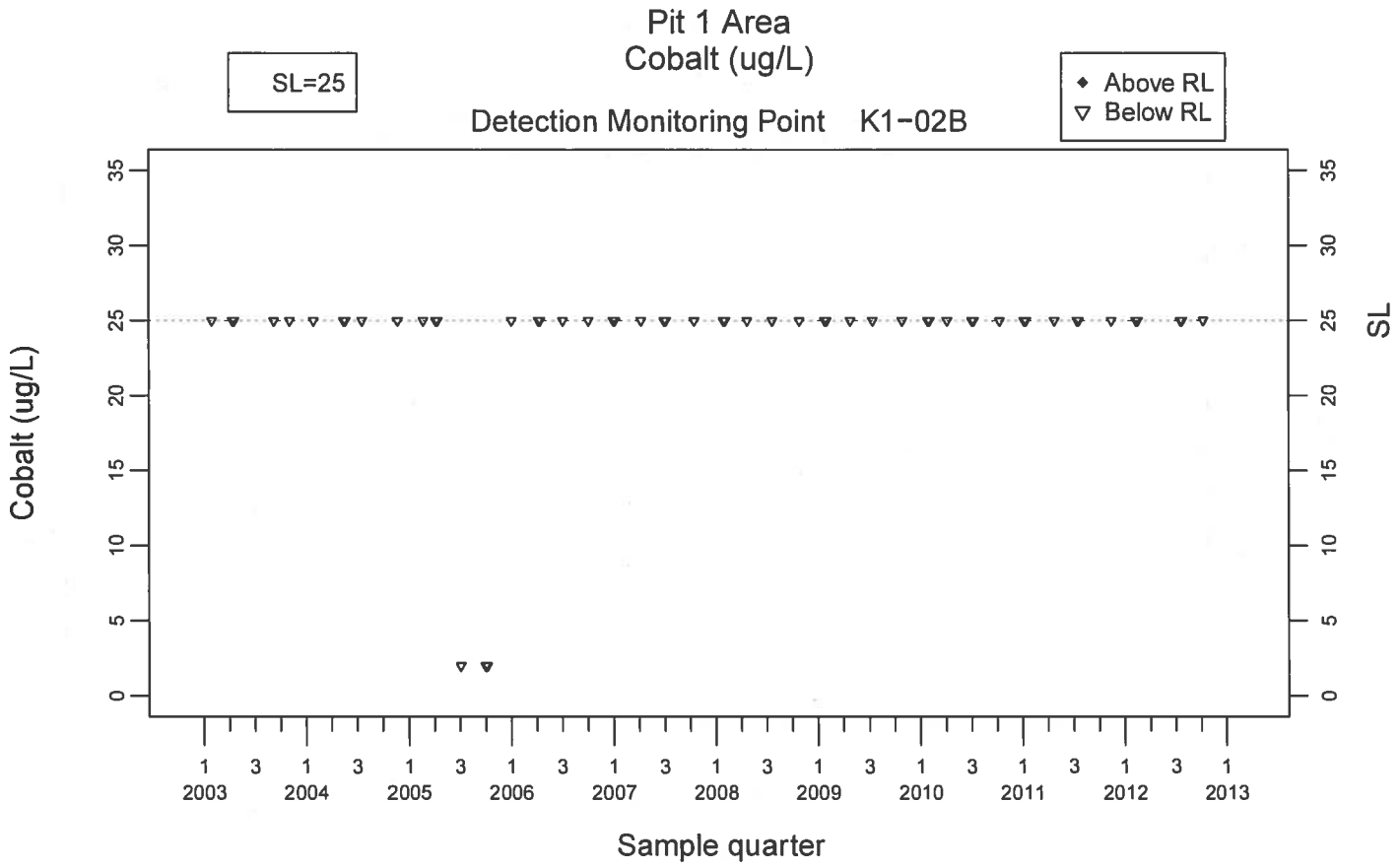

SL=0.5
Crossgradient Monitoring Point K1-08
Cadmium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

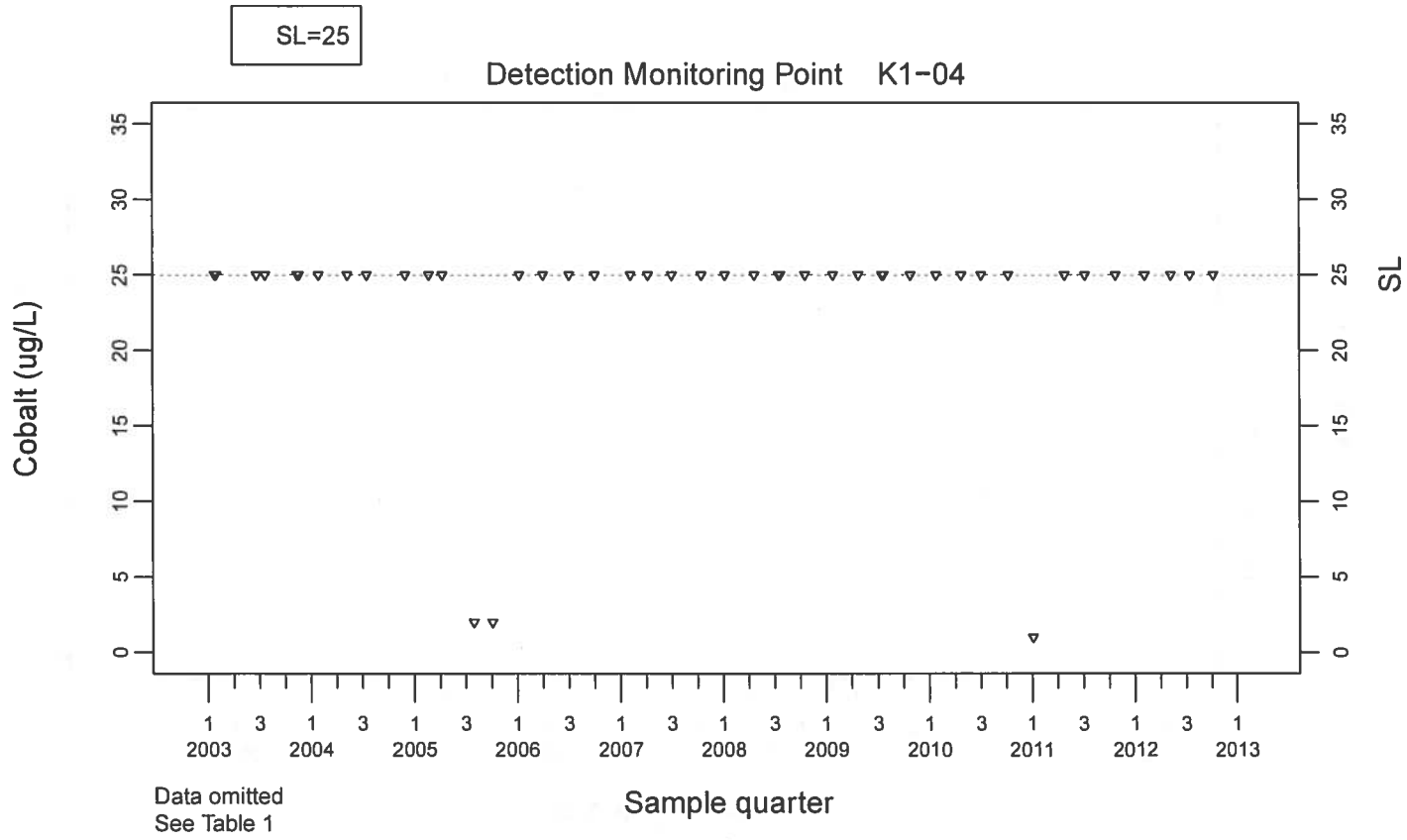

Pit 1 Area
Cadmium (ug/L)
SL=0.5
Crossgradient Monitoring Point K1-09
Above RL
Below RL
Cadmium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

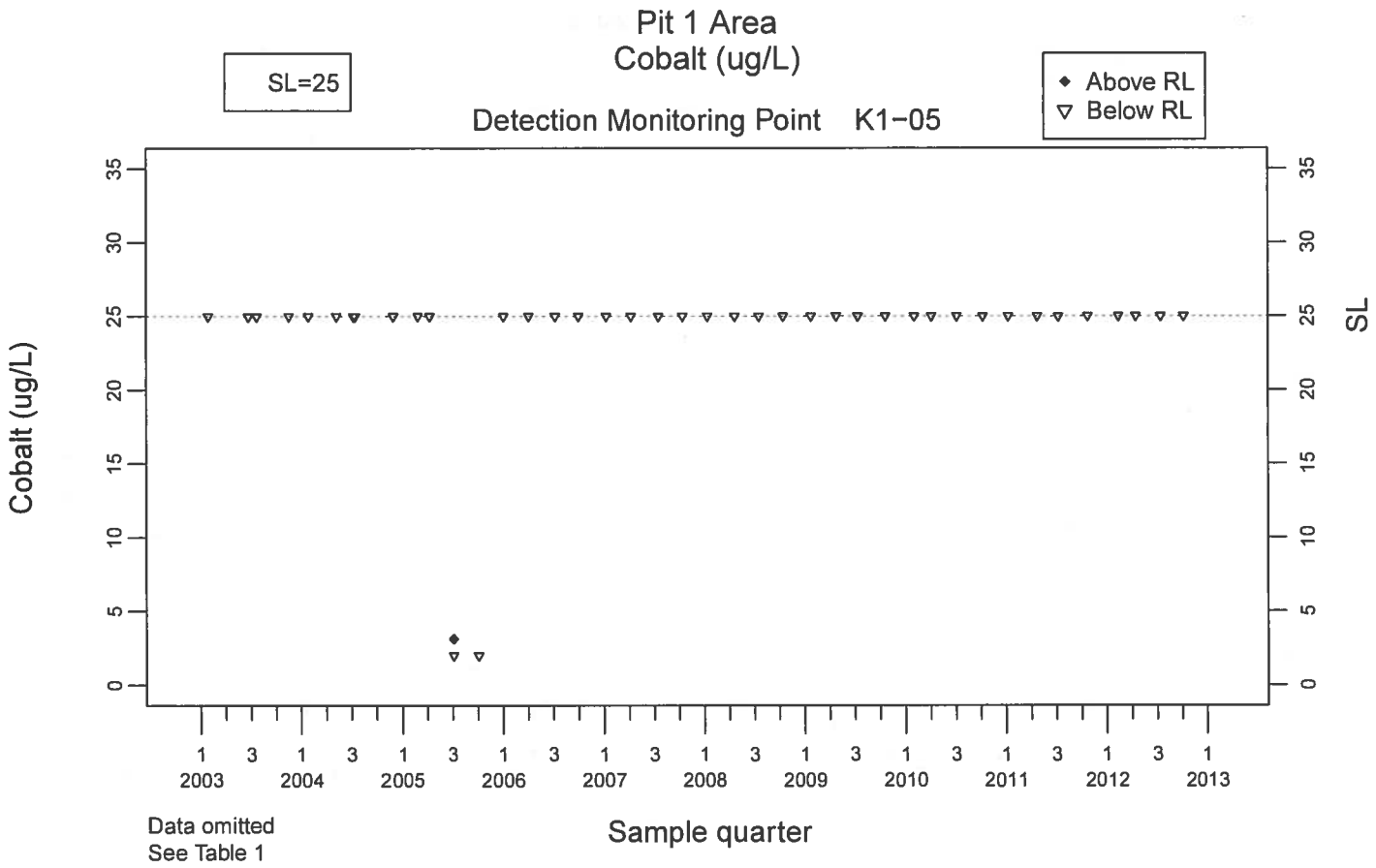

SL=0.5
Detection Monitoring Point W-PIT1-2326
Cadmium (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

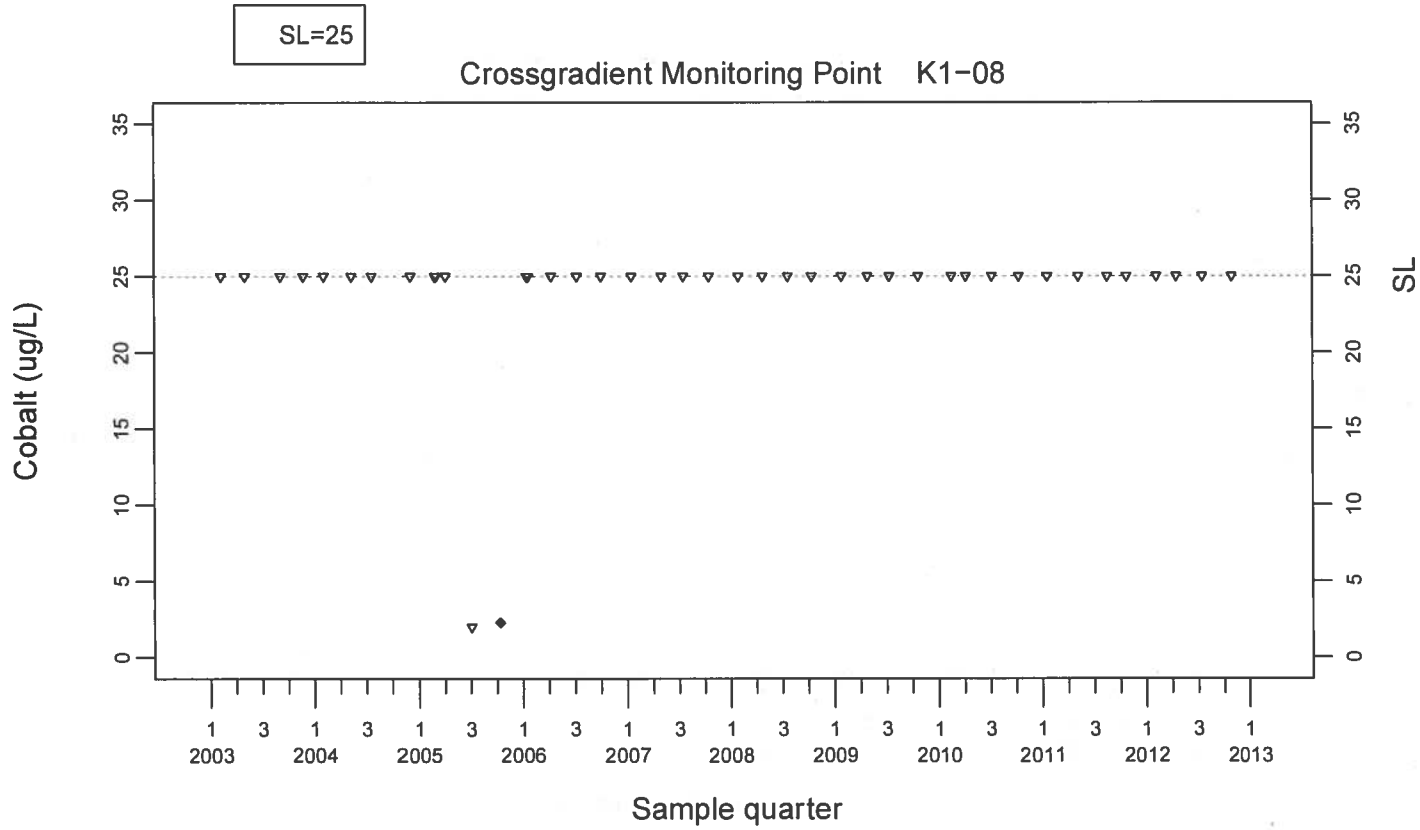

Pit 1 Area
Cobalt (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Cobalt (ug/L)
0
5
10
15
20
25
30
35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

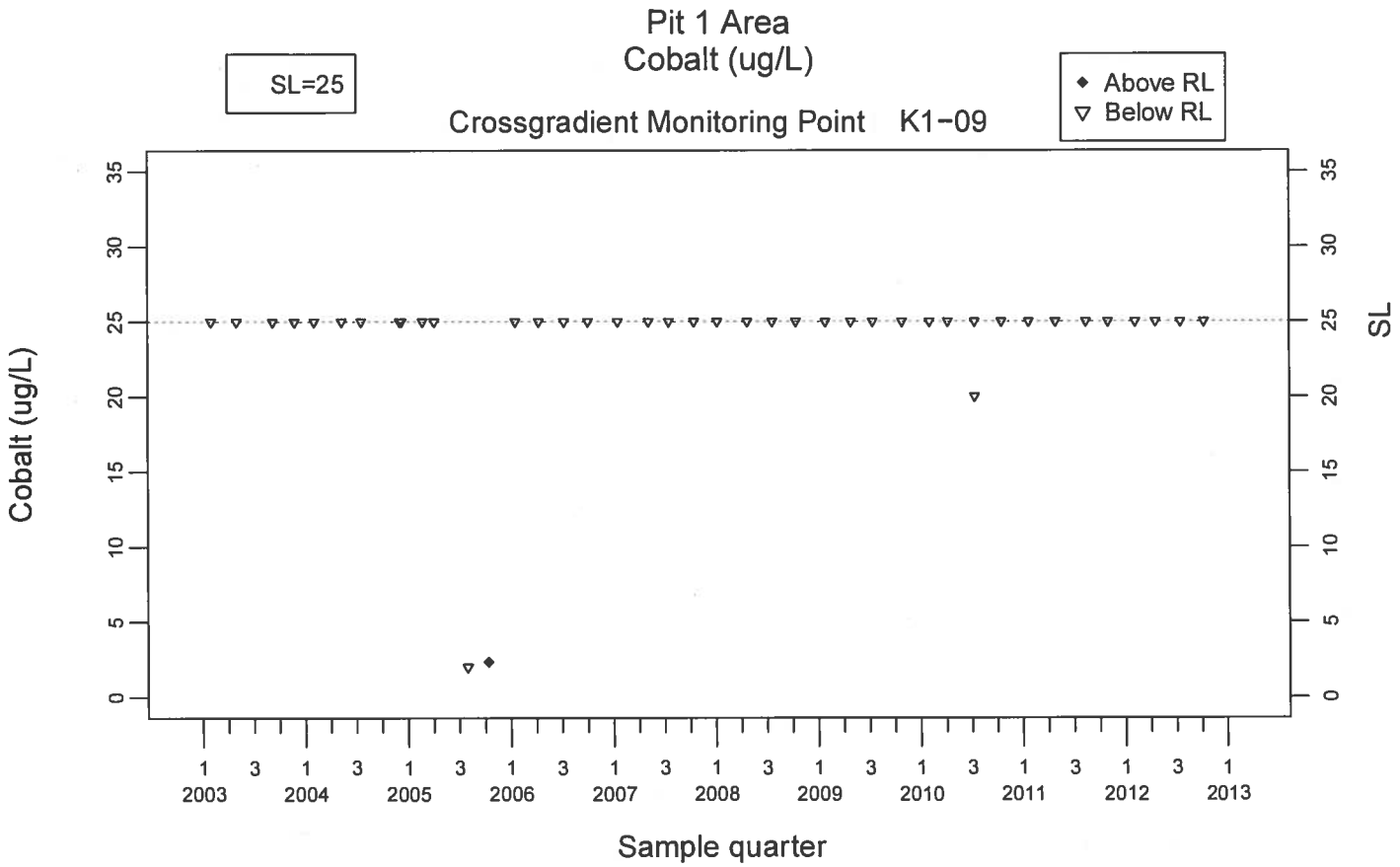

Background Monitoring Point K1-07
Cobalt (ug/L)
0
5
10
15
20
25
30
35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

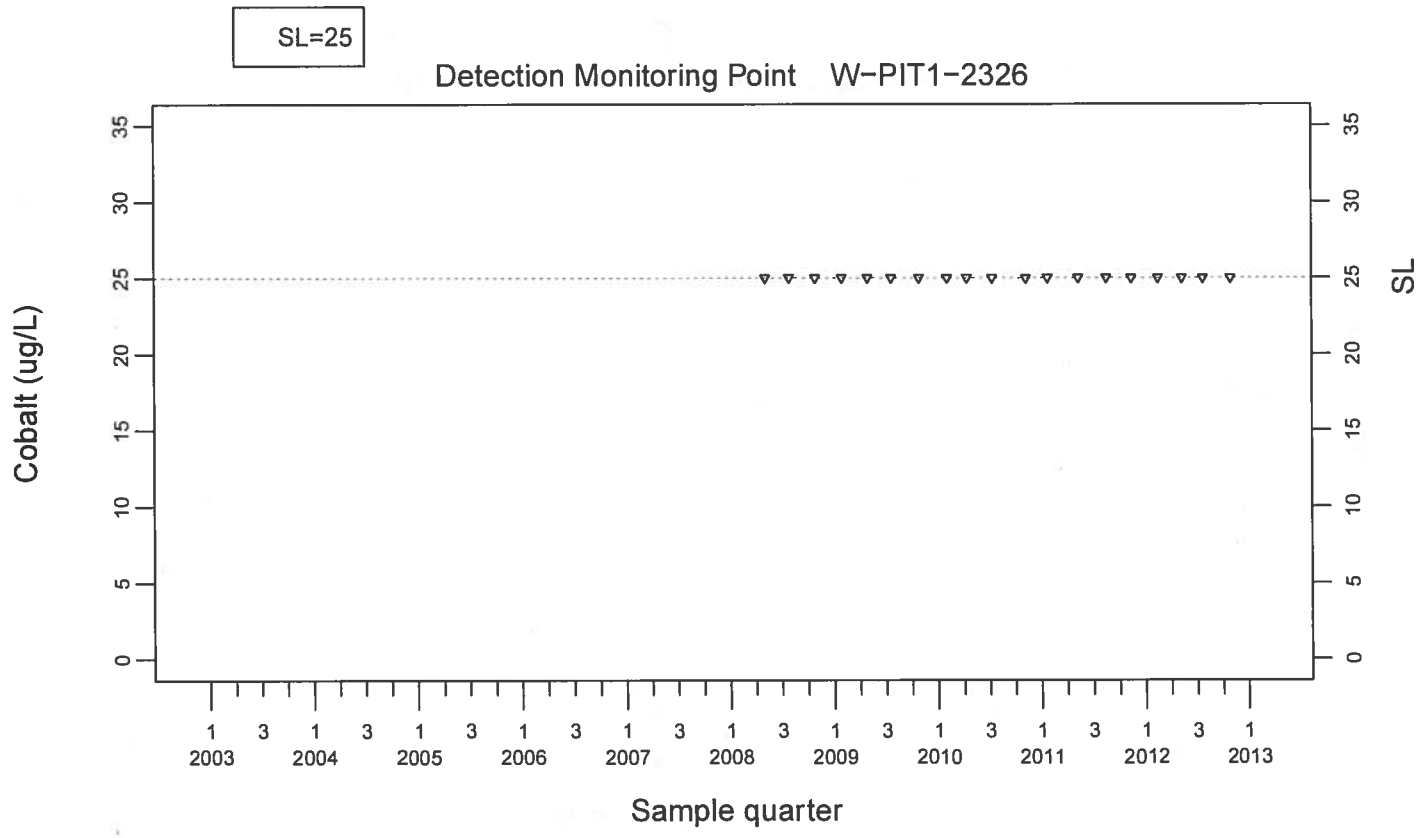

Pit 1 Area
Cobalt (ug/L)
SL=25
Above RL
Below RL
Detection Monitoring Point K1-02B
Cobalt (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

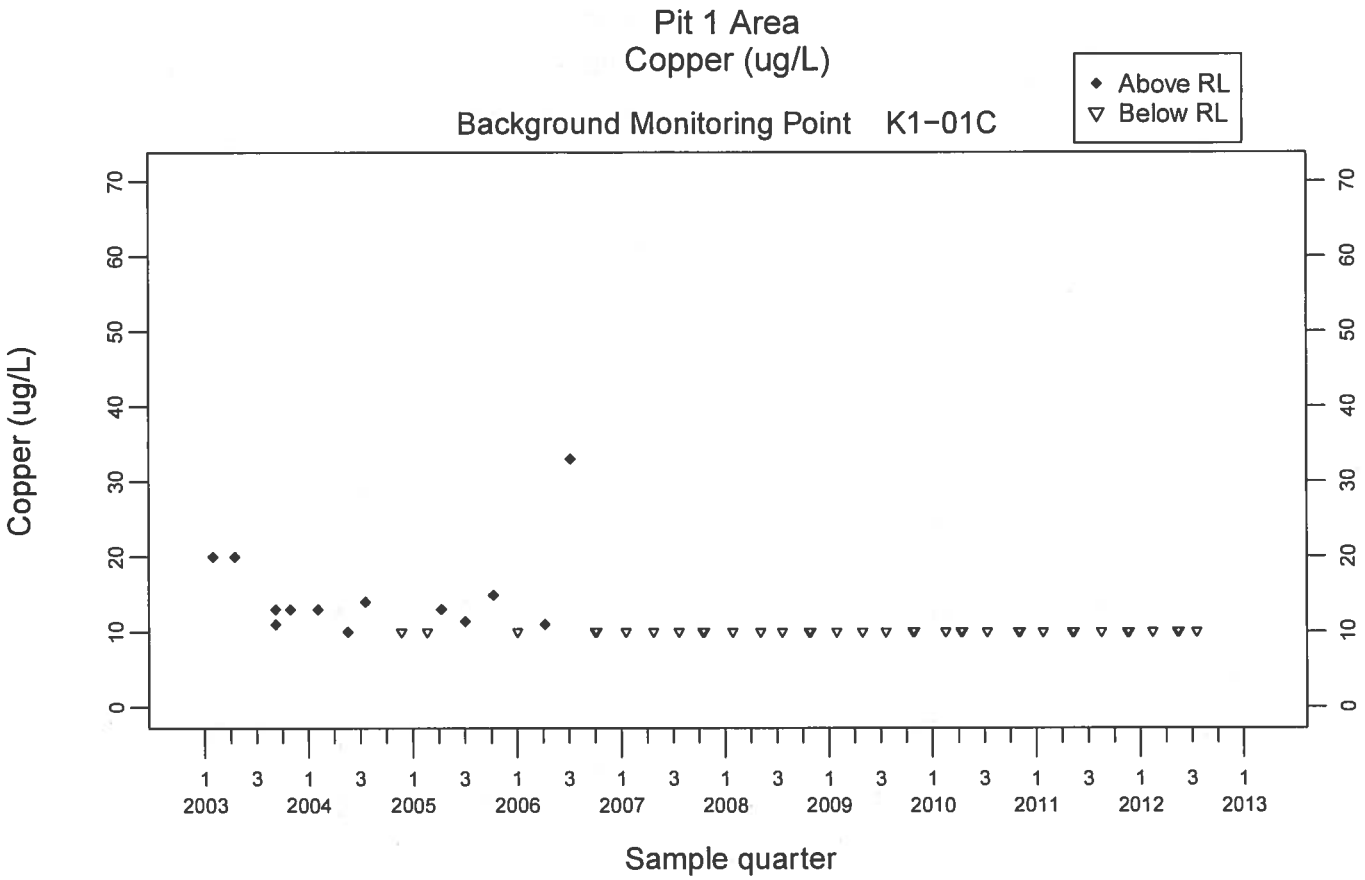

SL=25
Detection Monitoring Point K1-04
Cobalt (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Data omitted
See Table 1

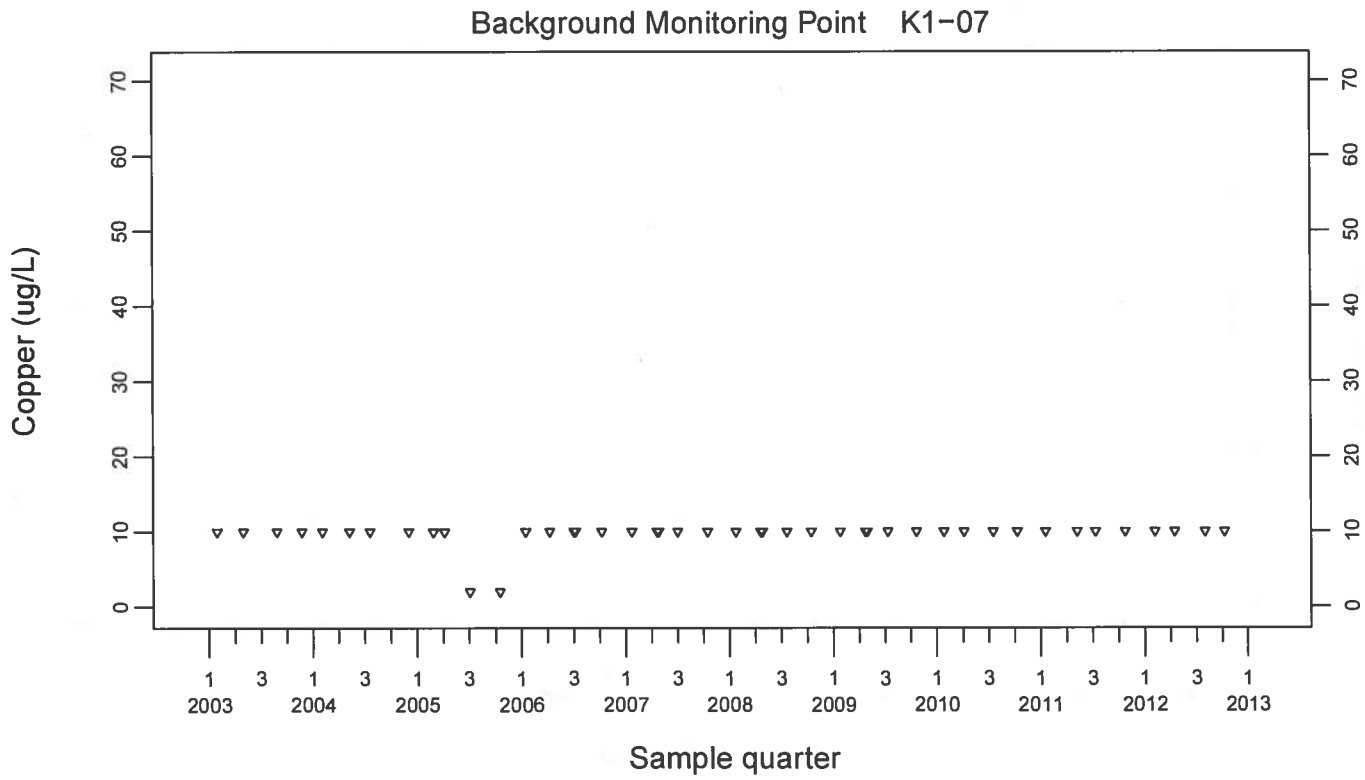

Pit 1 Area
Cobalt (ug/L)
SL=25
Above RL
Below RL
Detection Monitoring Point K1-05
Cobalt (ug/L)
SL
Sample quarter
Data omitted
See Table 1

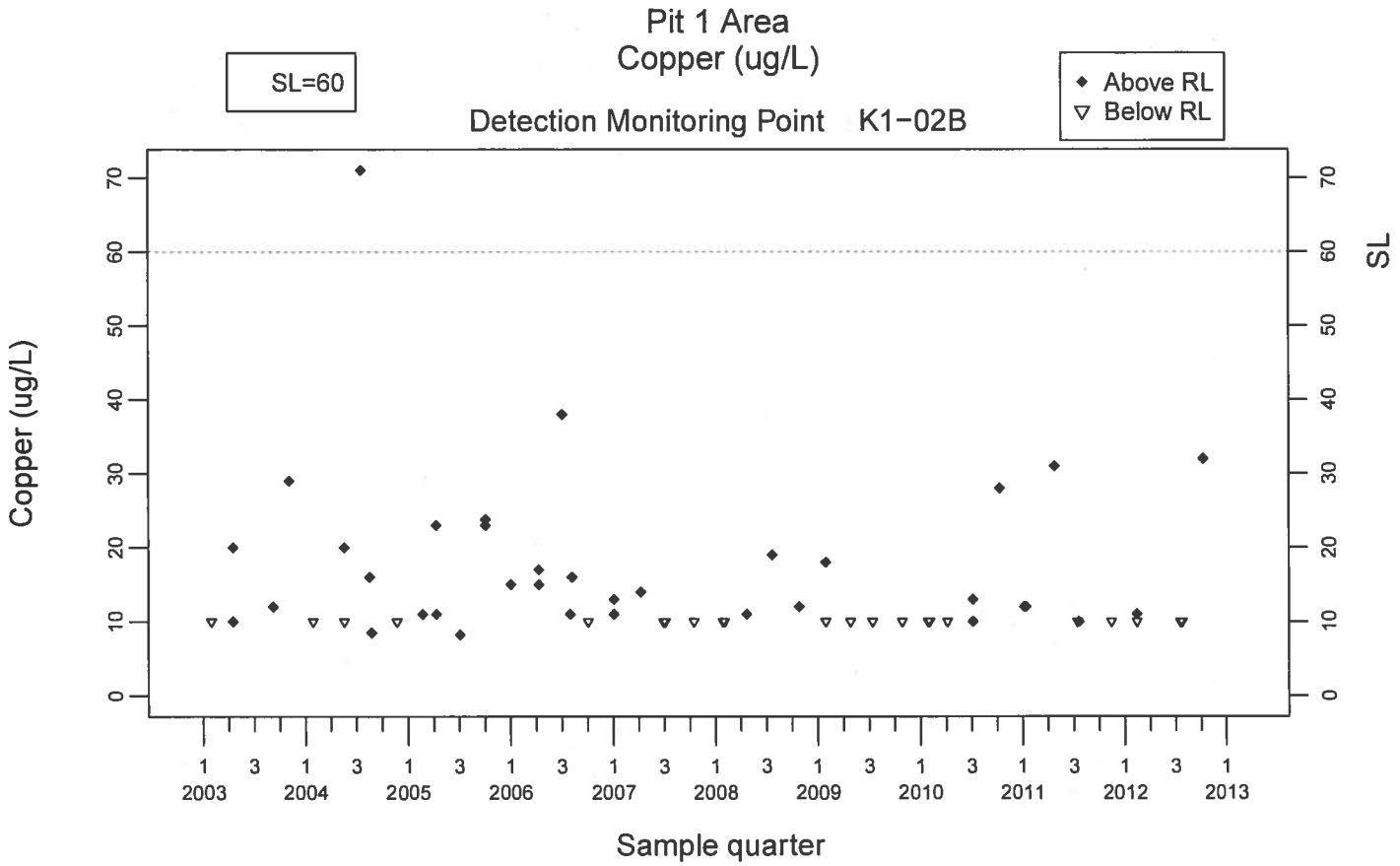

SL=25
Crossgradient Monitoring Point K1-08
Cobalt (ug/L)
SL
Sample quarter

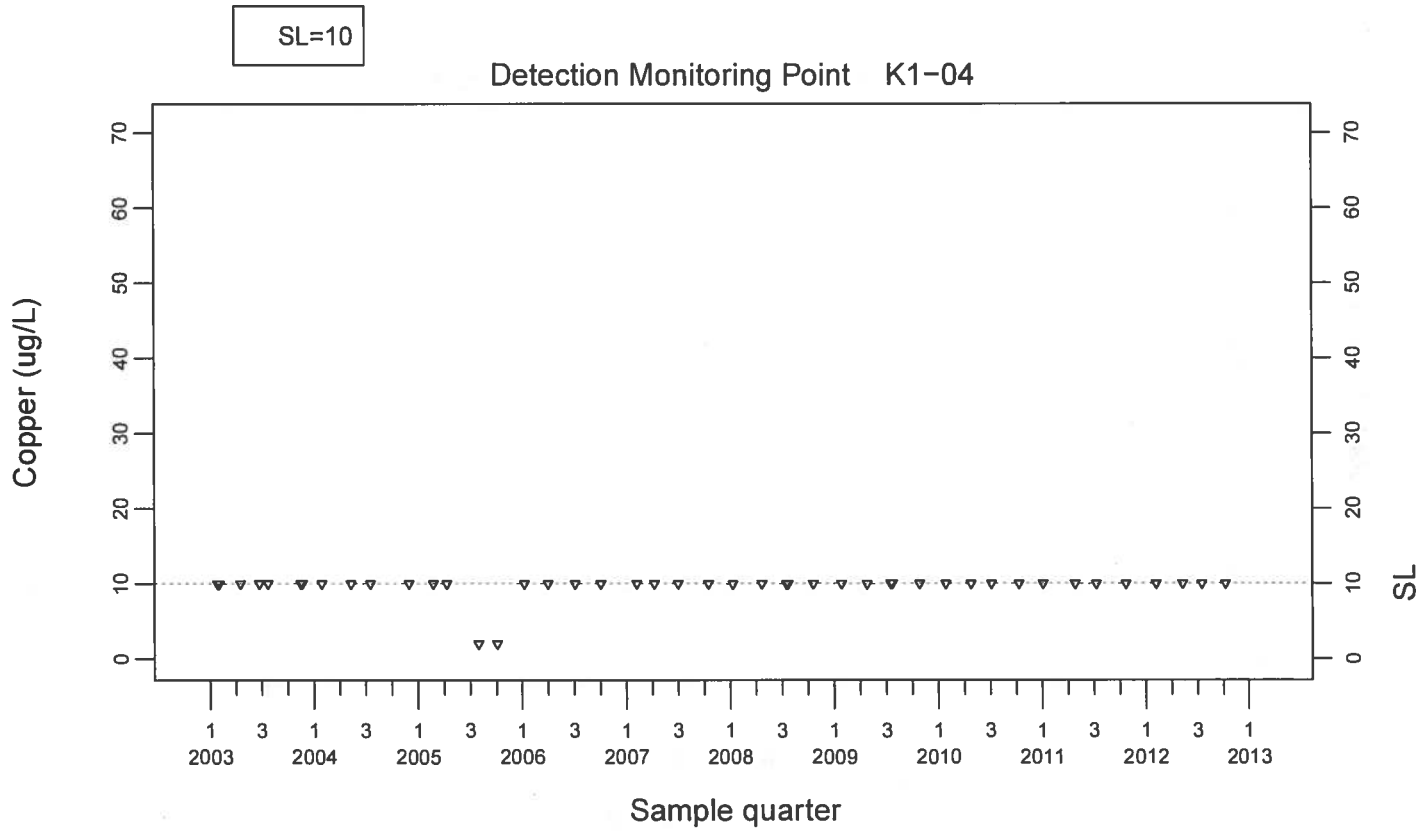

Pit 1 Area
Cobalt (ug/L)
SL=25
Above RL
Below RL
Crossgradient Monitoring Point K1-09
Cobalt (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

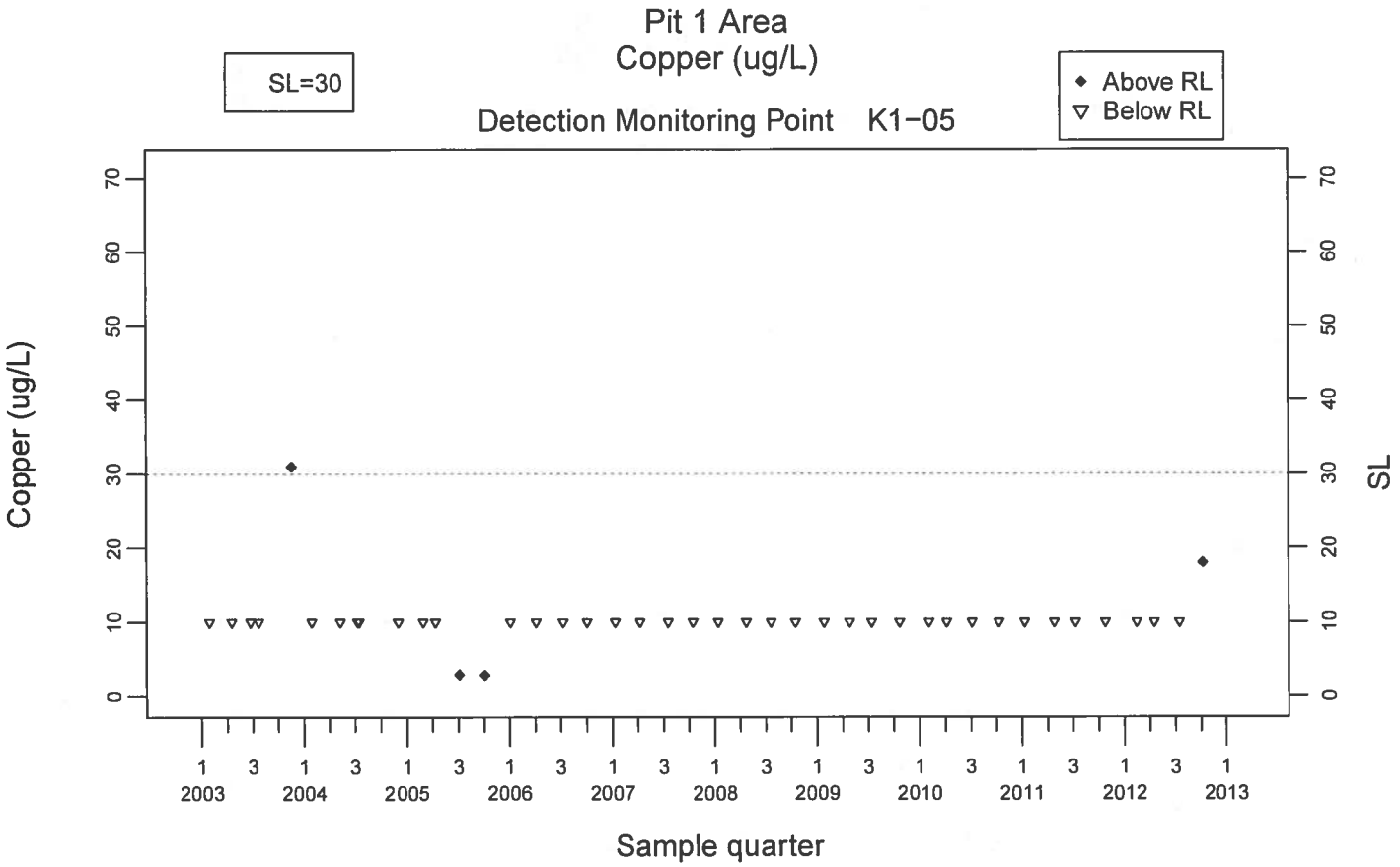

SL=25
Detection Monitoring Point W-PIT1-2326
Cobalt (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

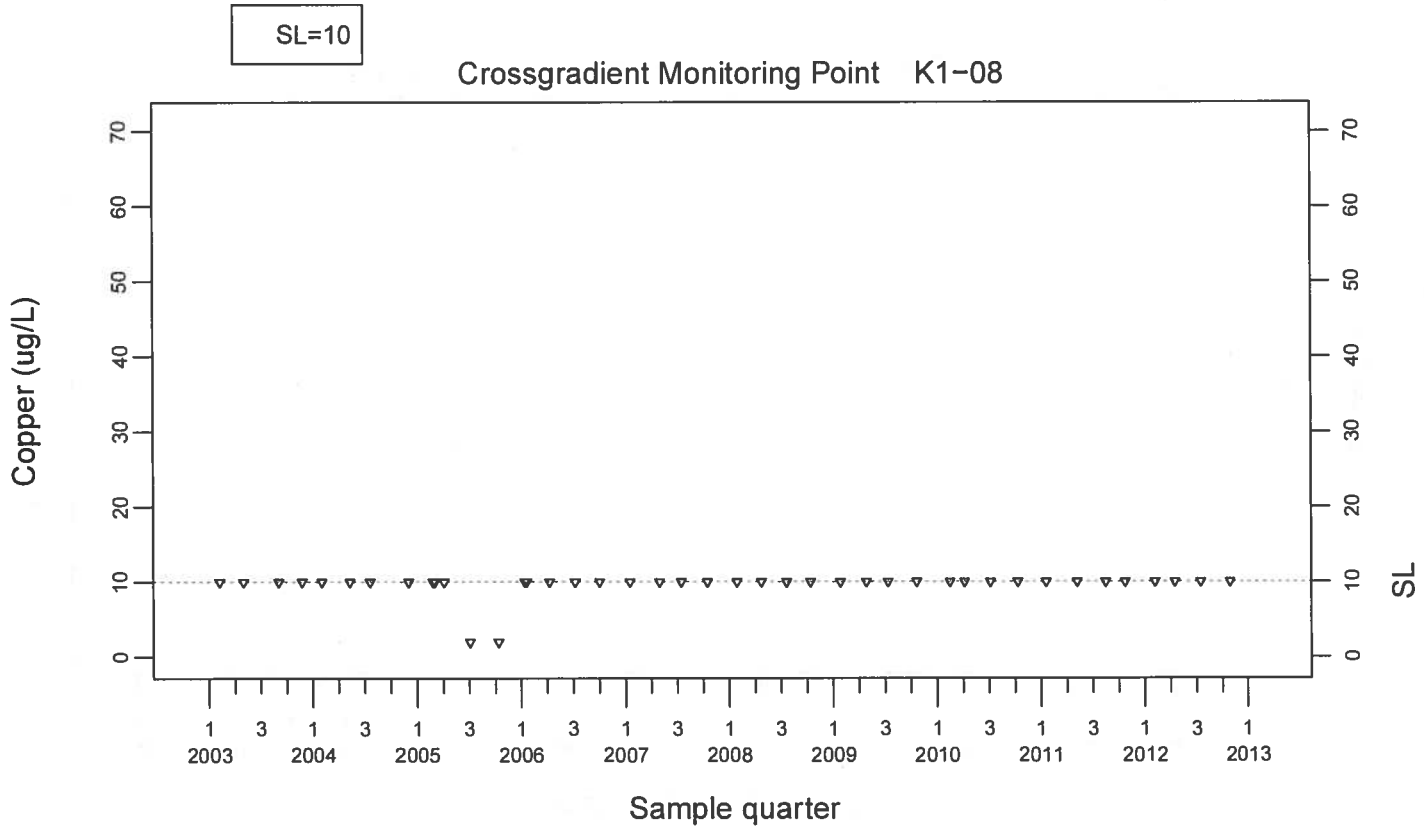

Pit 1 Area
Copper (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Copper (ug/L)
0
10
20
30
40
50
60
70
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

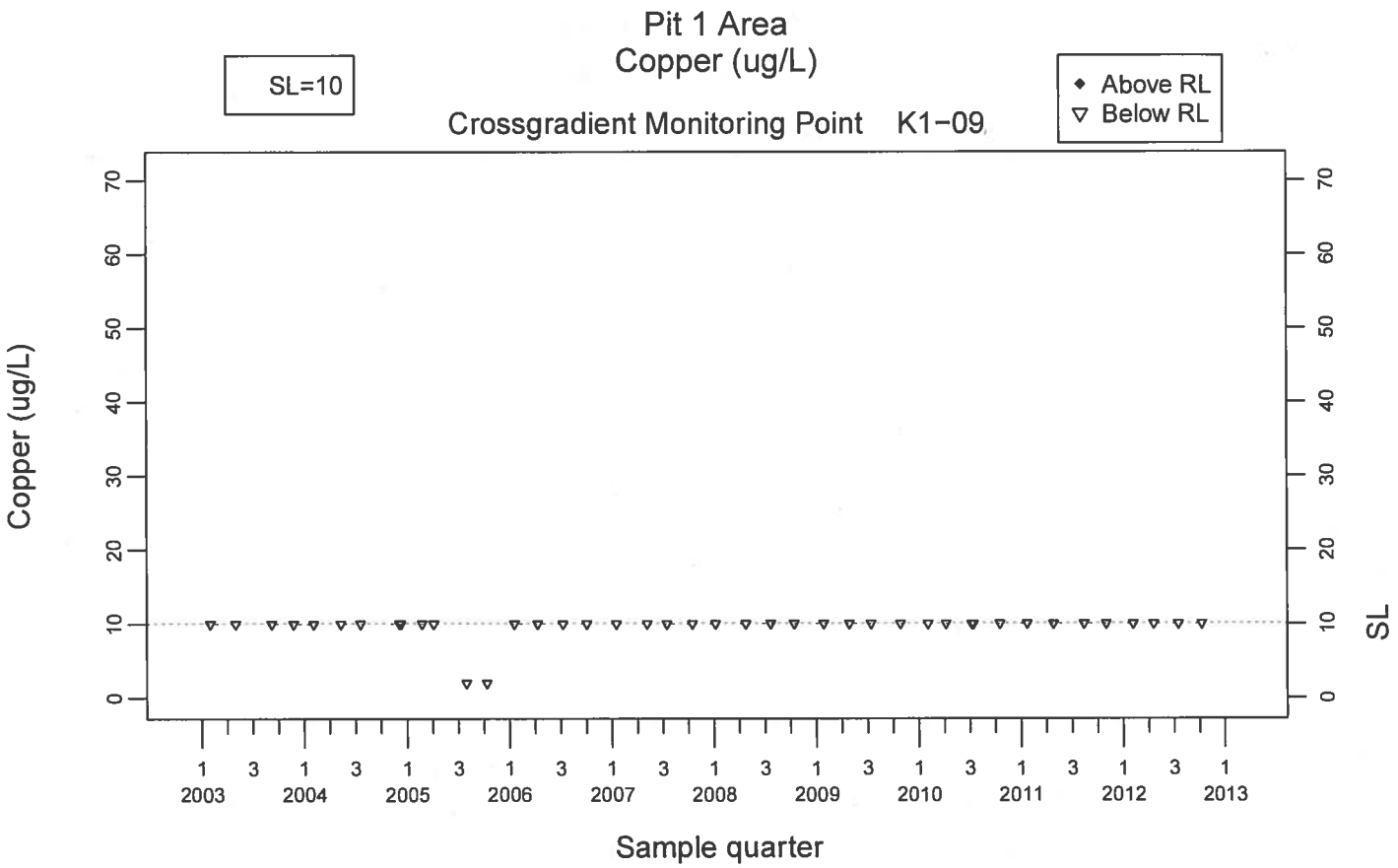

Background Monitoring Point K1-07
Copper (ug/L)
0
10
20
30
40
50
60
70
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

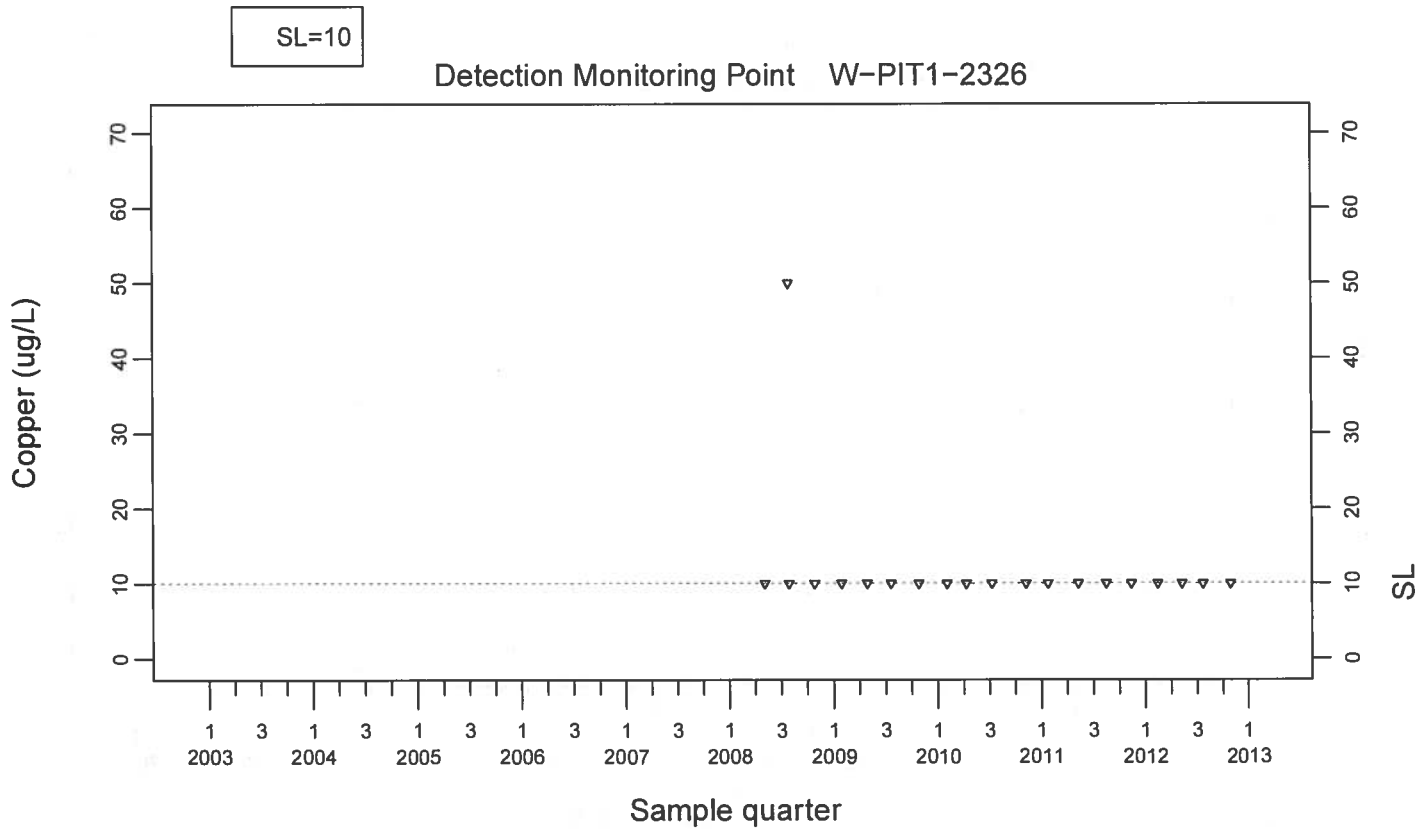

Pit 1 Area
Copper (ug/L)
SL=60
Above RL
Below RL
Detection Monitoring Point K1-02B
Copper (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

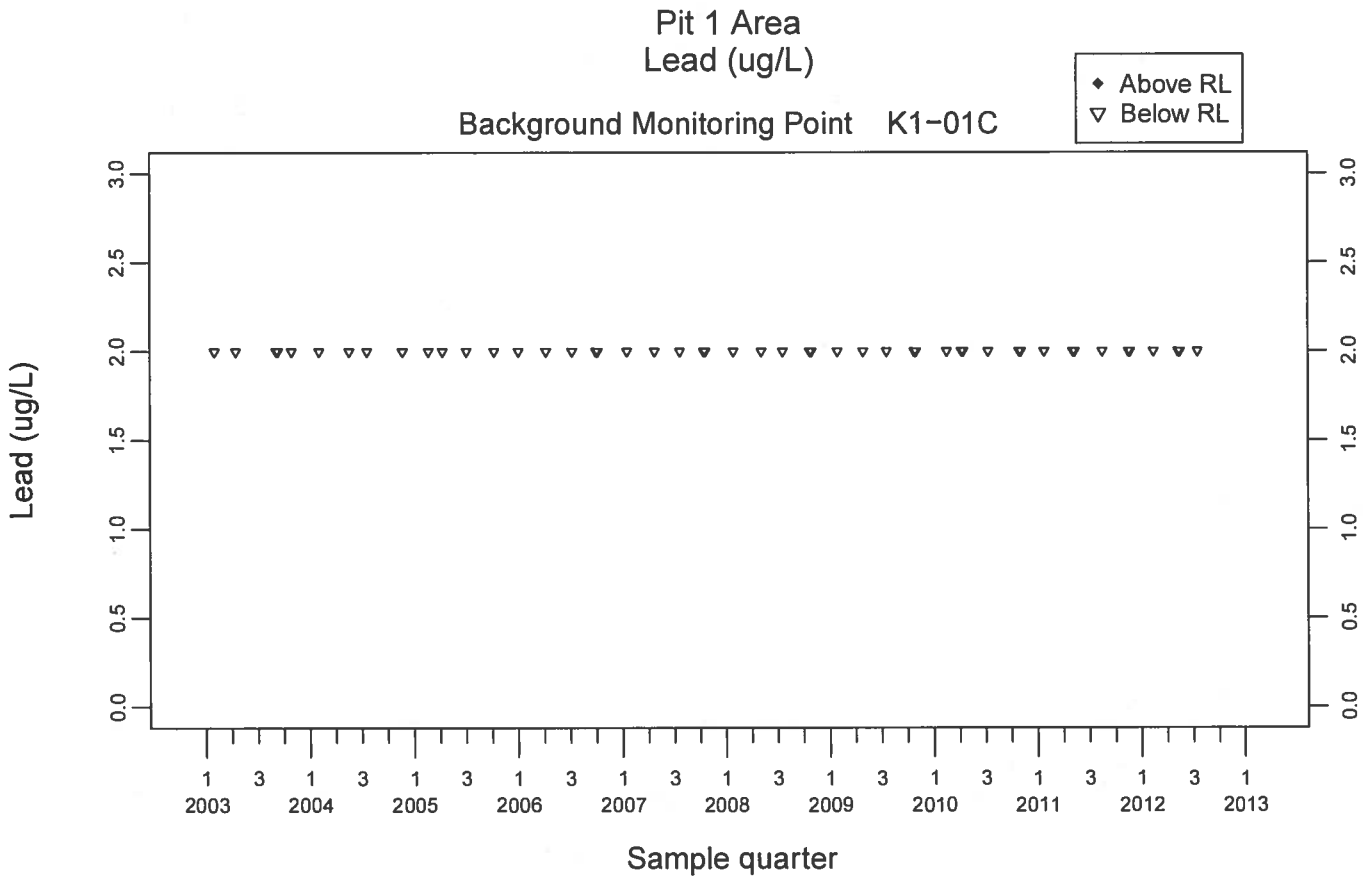

SL=10
Detection Monitoring Point K1-04
Copper (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

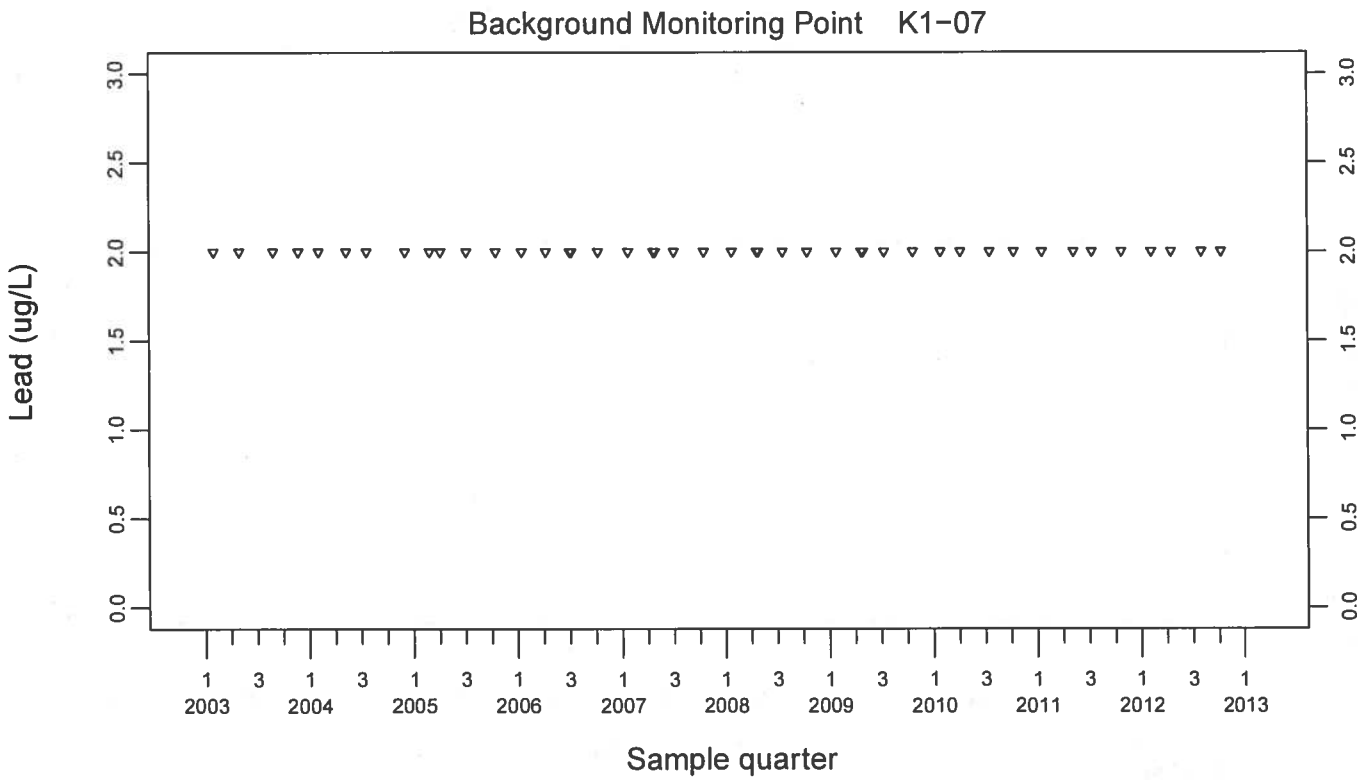

Pit 1 Area
Copper (ug/L)
SL=30
Above RL
Below RL
Detection Monitoring Point K1-05
Copper (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

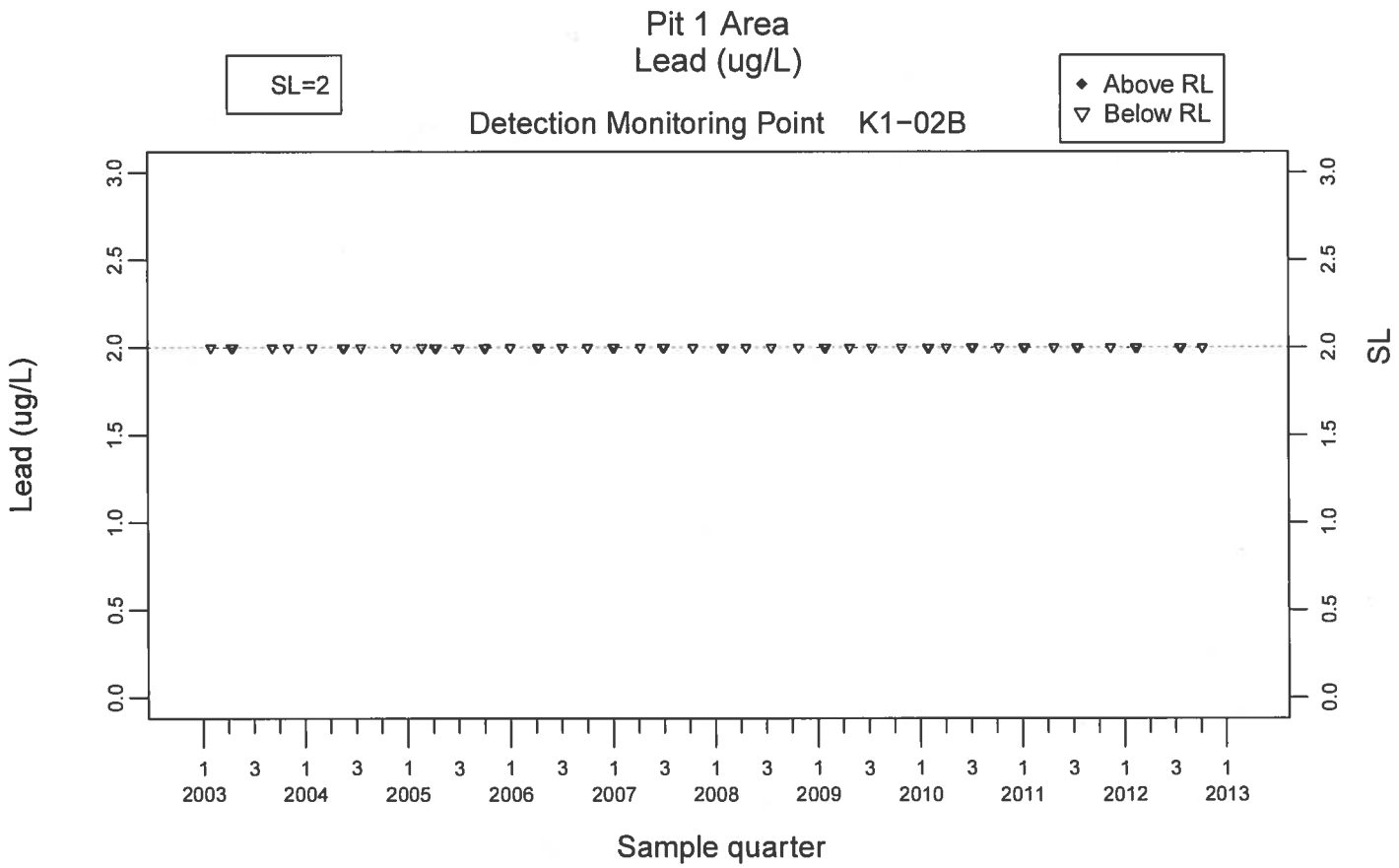

SL=10
Crossgradient Monitoring Point K1-08
Copper (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

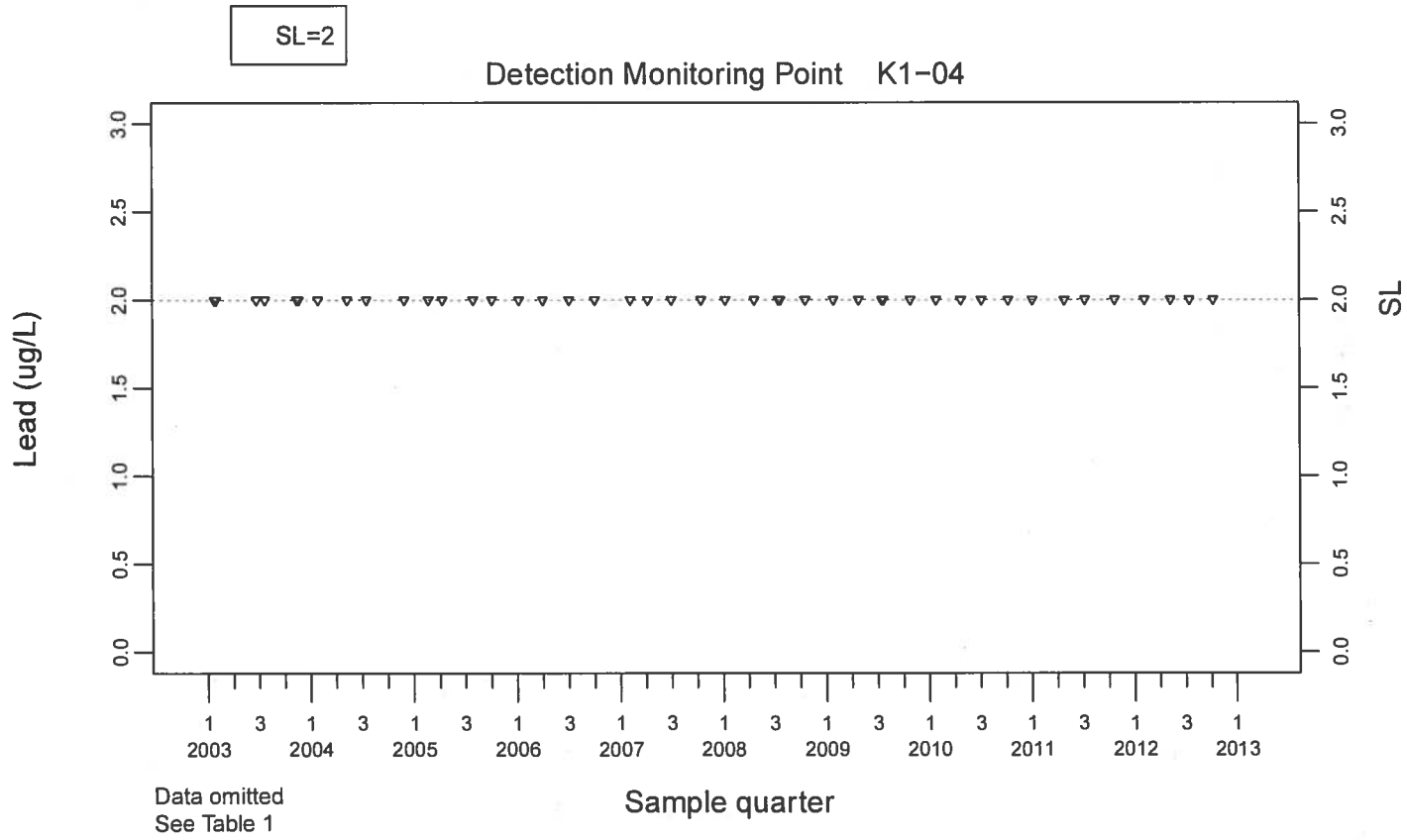

Pit 1 Area
Copper (ug/L)
SL=10
Above RL
Below RL
Crossgradient Monitoring Point K1-09
Copper (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

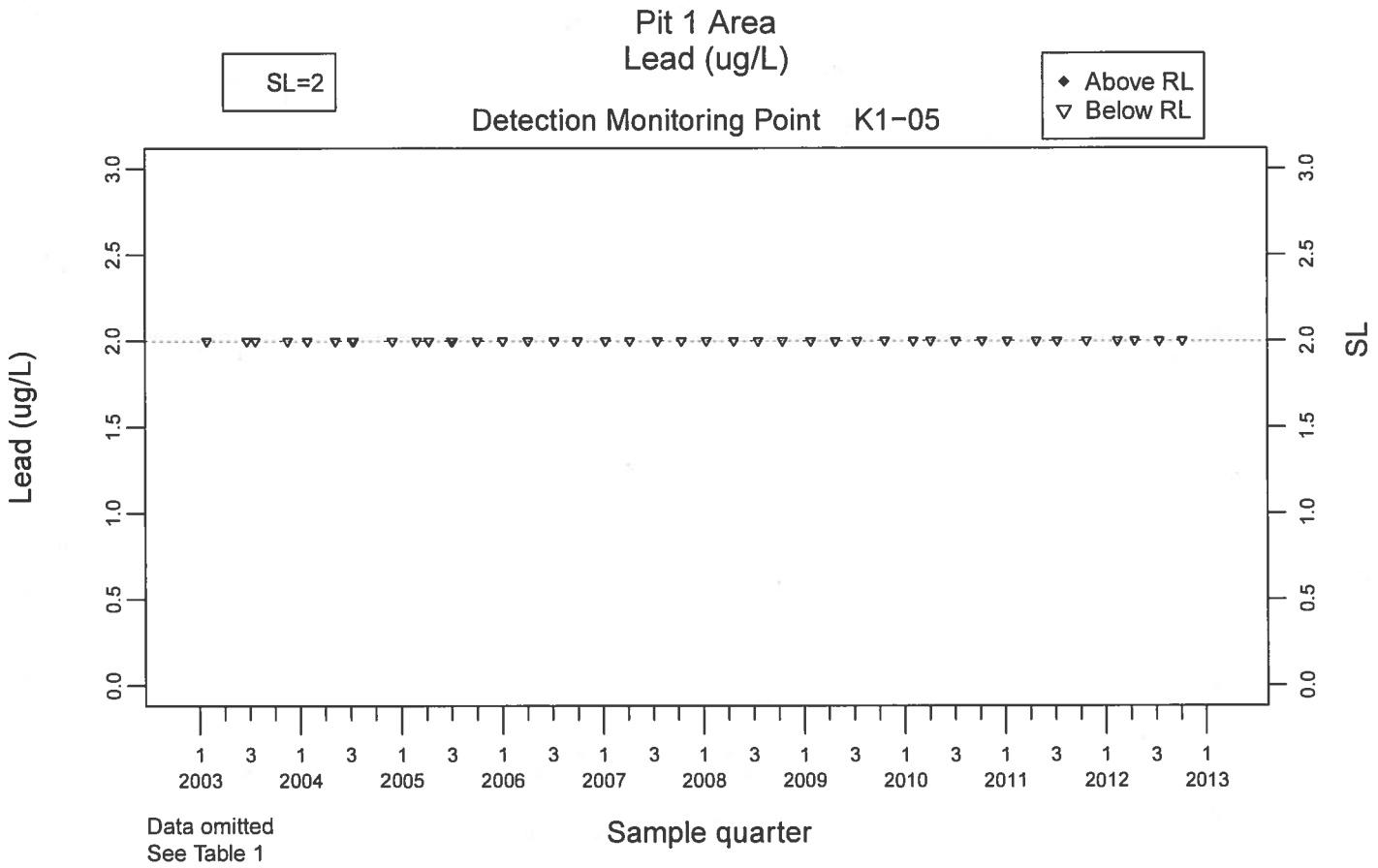

SL=10
Detection Monitoring Point W-PIT1-2326
Copper (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

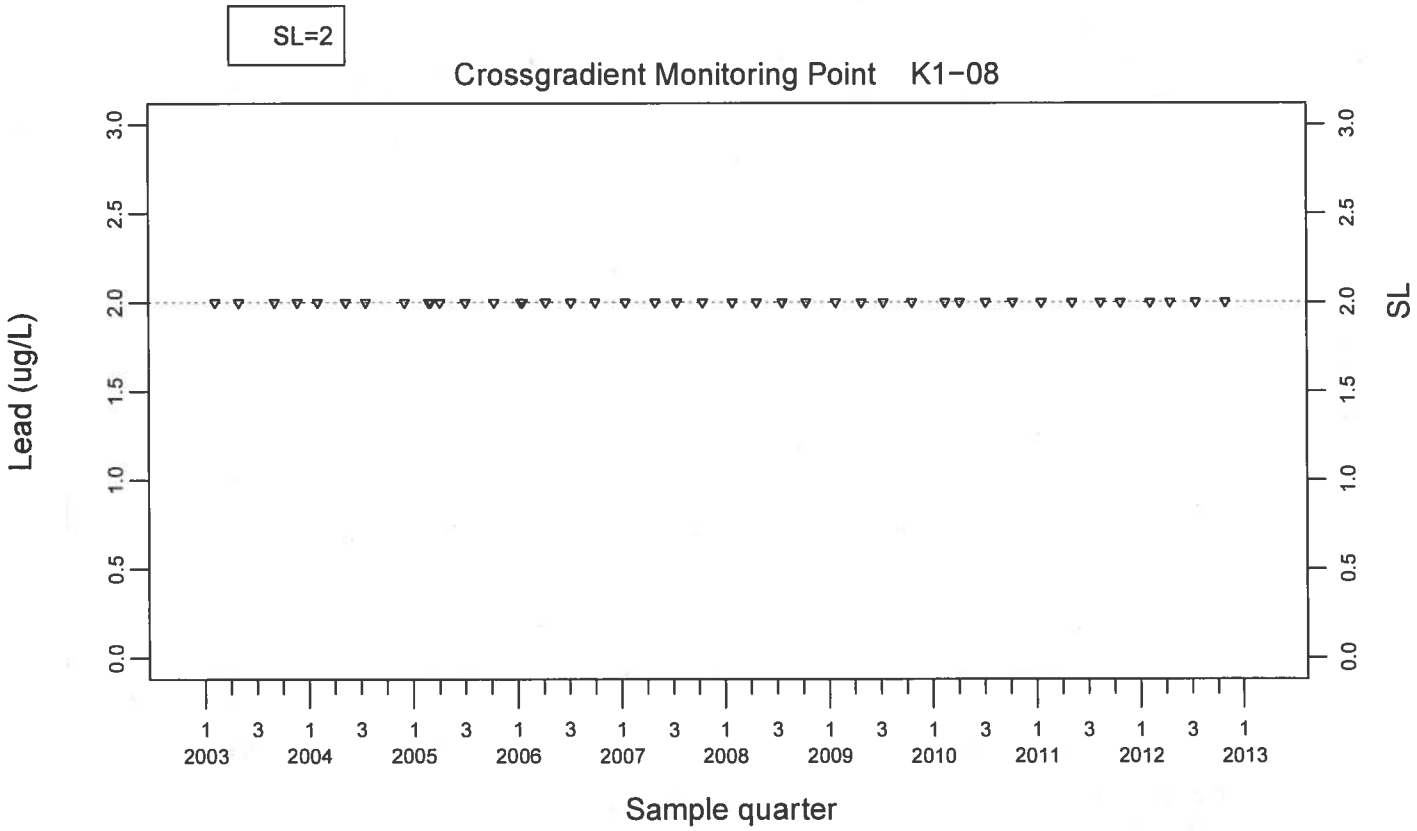

Pit 1 Area
Lead (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Lead (ug/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

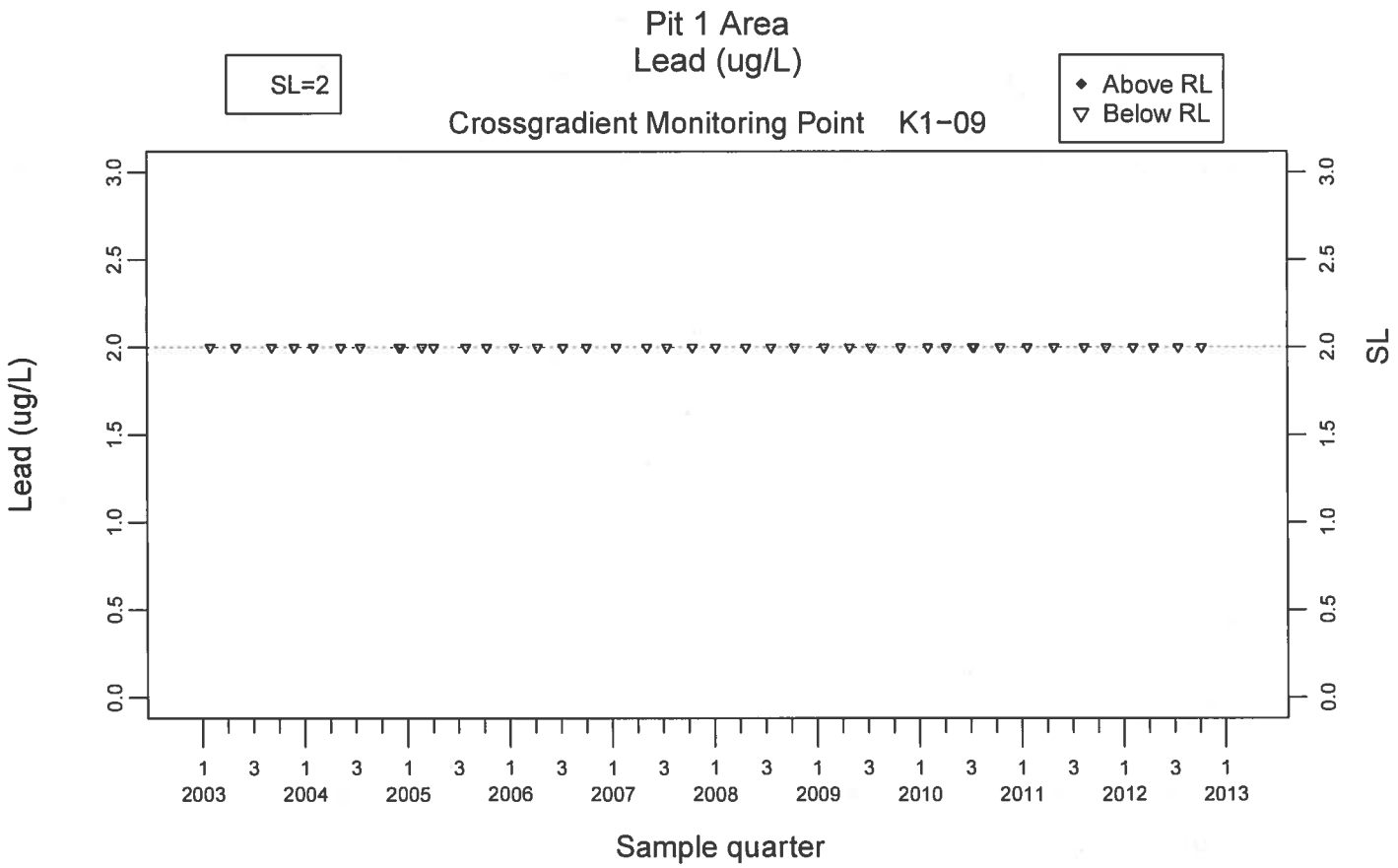

Background Monitoring Point K1-07
Lead (ug/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

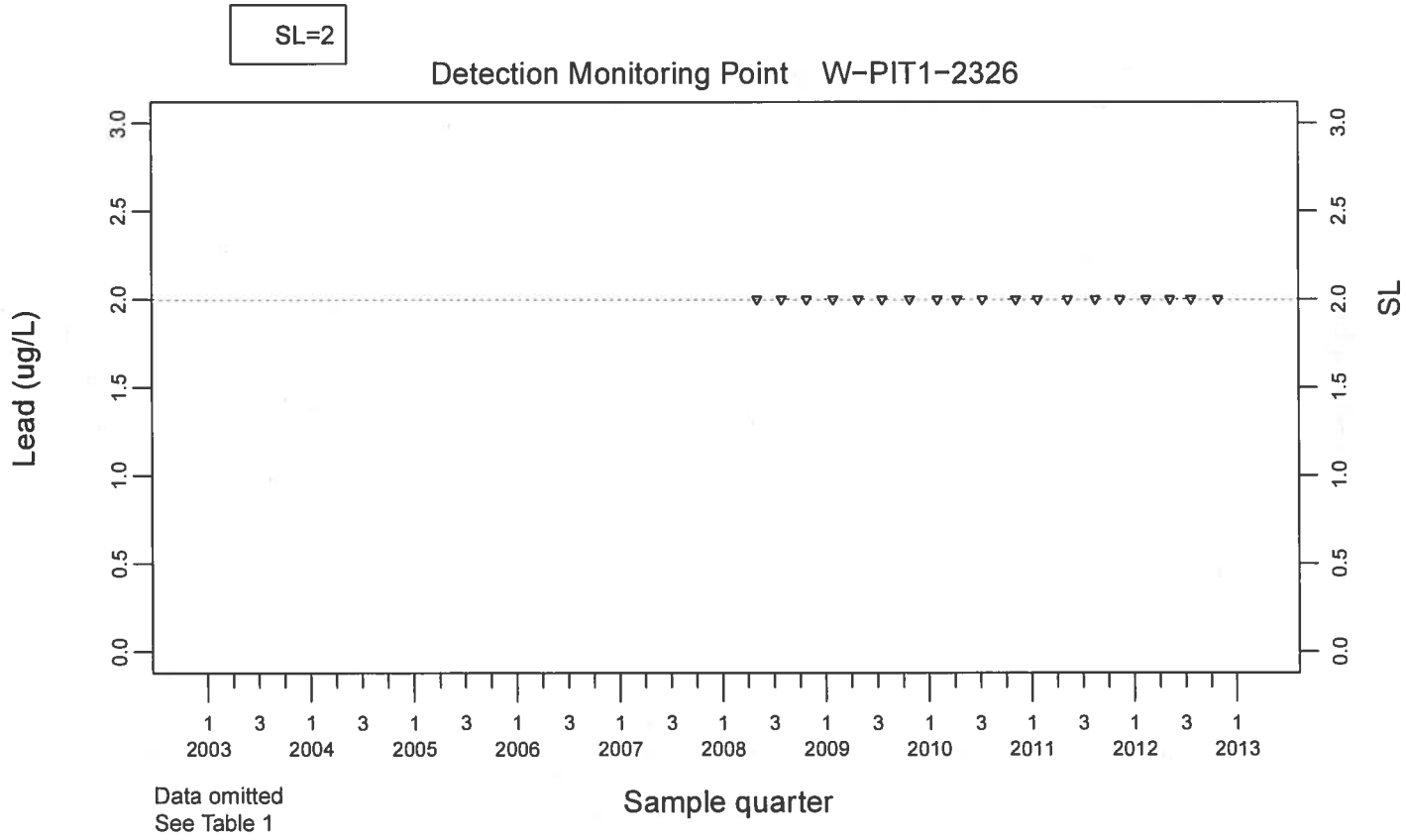

Pit 1 Area
Lead (ug/L)
SL=2
Above RL
Below RL
Detection Monitoring Point K1-02B
Lead (ug/L)
SL
Sample quarter

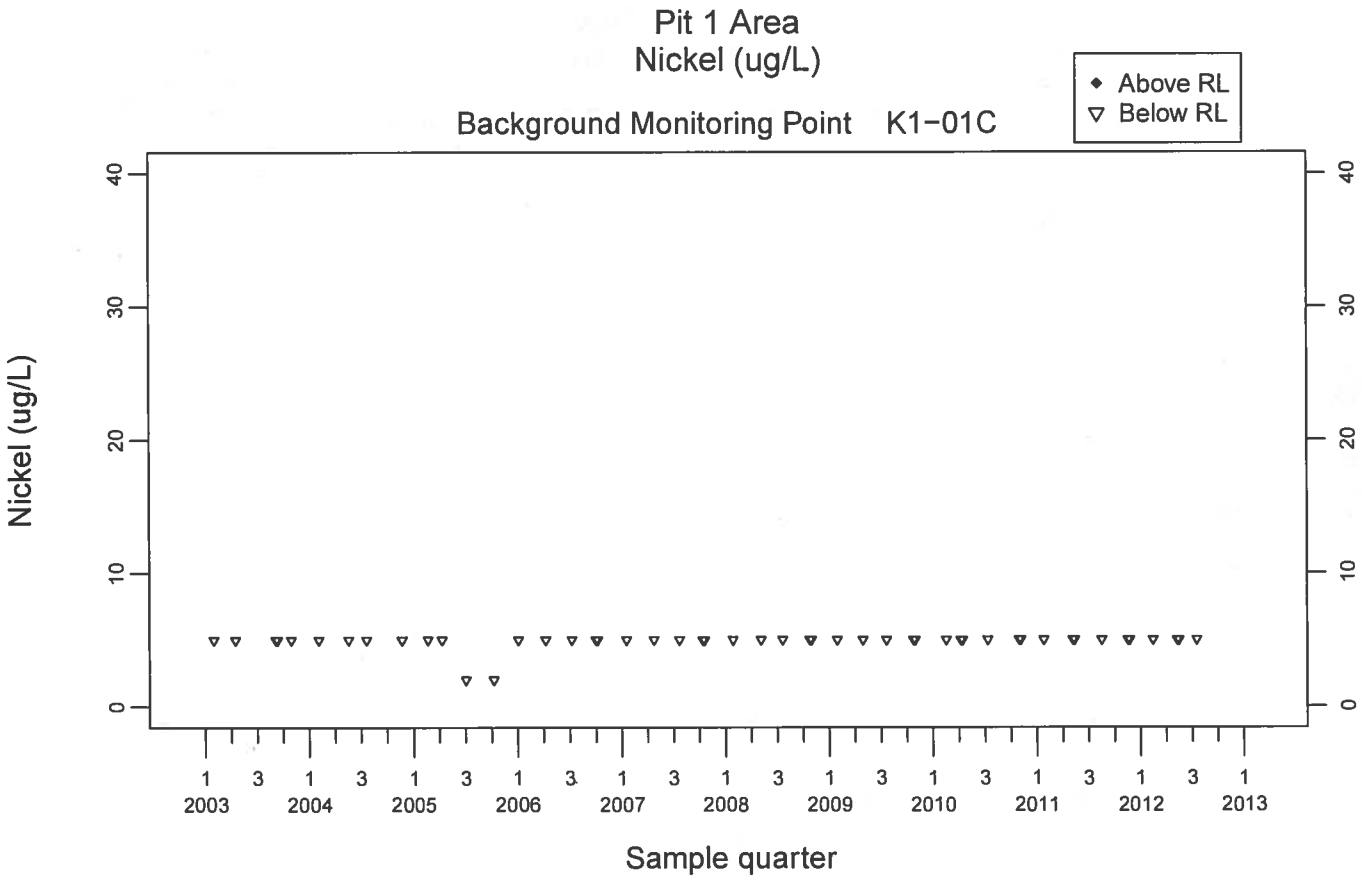

SL=2
Detection Monitoring Point K1-04
Lead (ug/L)
SL
Sample quarter
Data omitted
See Table 1

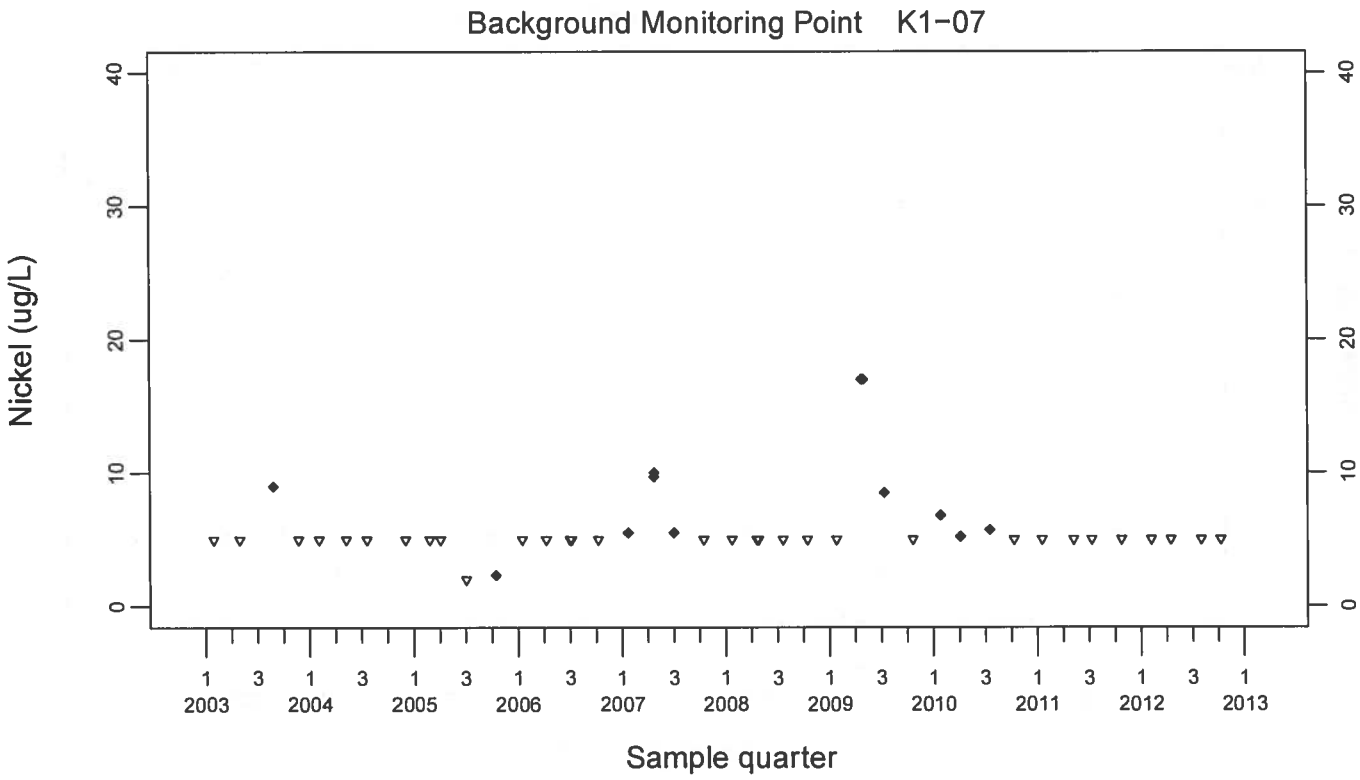

Pit 1 Area
Lead (ug/L)
SL=2
Above RL
Below RL
Detection Monitoring Point K1-05
Lead (ug/L)
SL
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Data omitted
See Table 1
Sample quarter

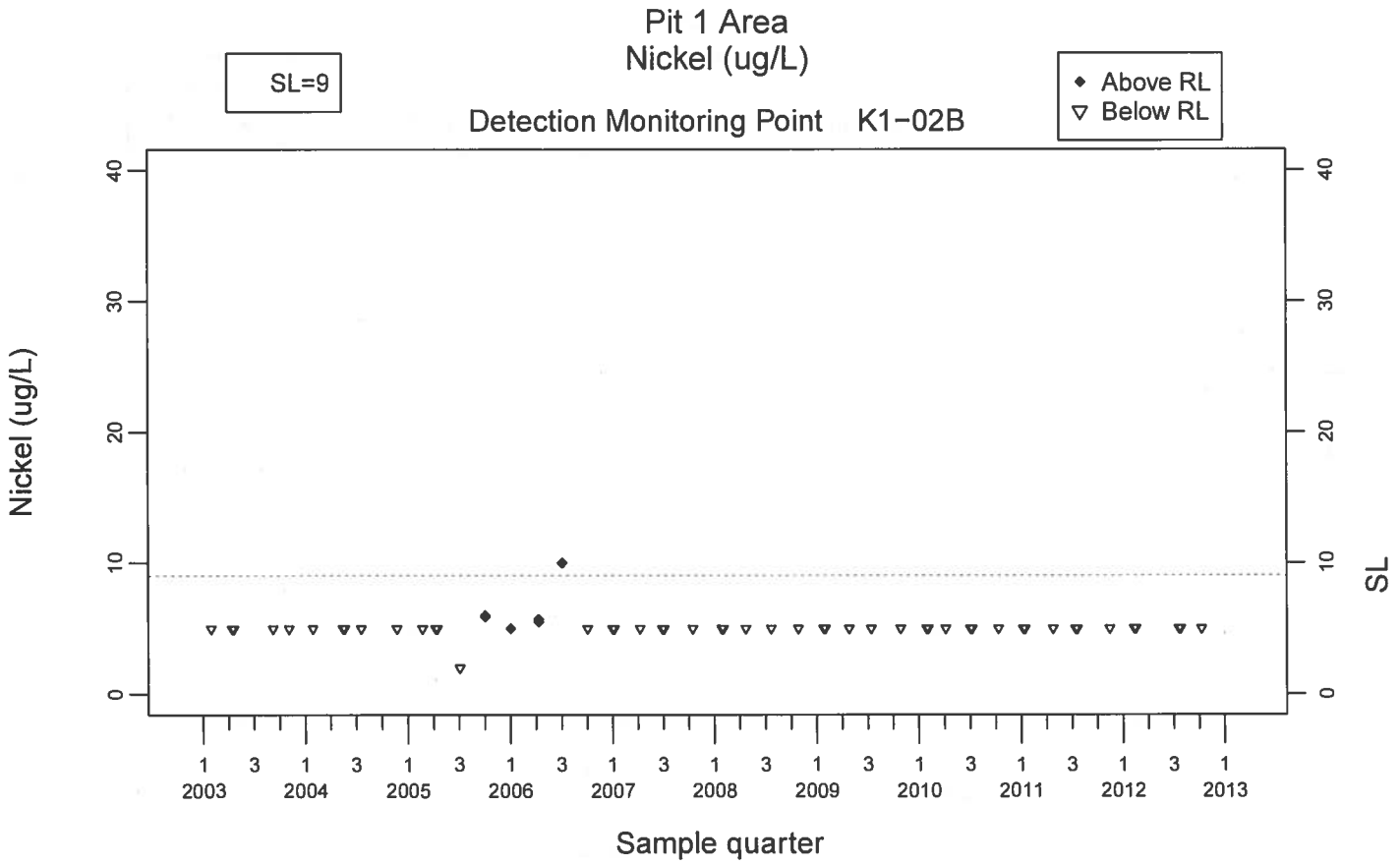

SL=2
Crossgradient Monitoring Point K1-08
Lead (ug/L)
SL
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

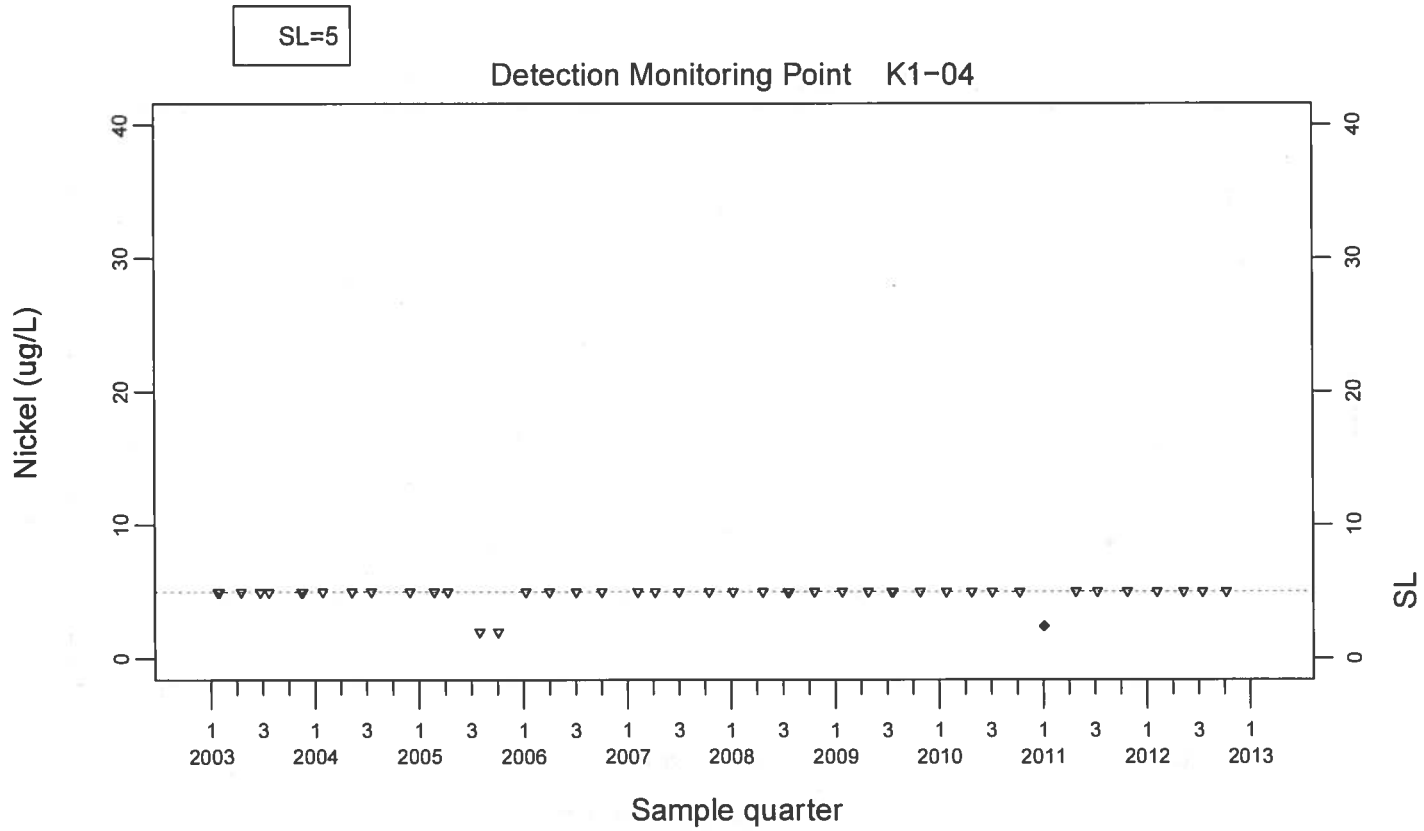

Pit 1 Area
Lead (ug/L)
SL=2
Above RL
Below RL
Crossgradient Monitoring Point K1-09
Lead (ug/L)
SL
Sample quarter

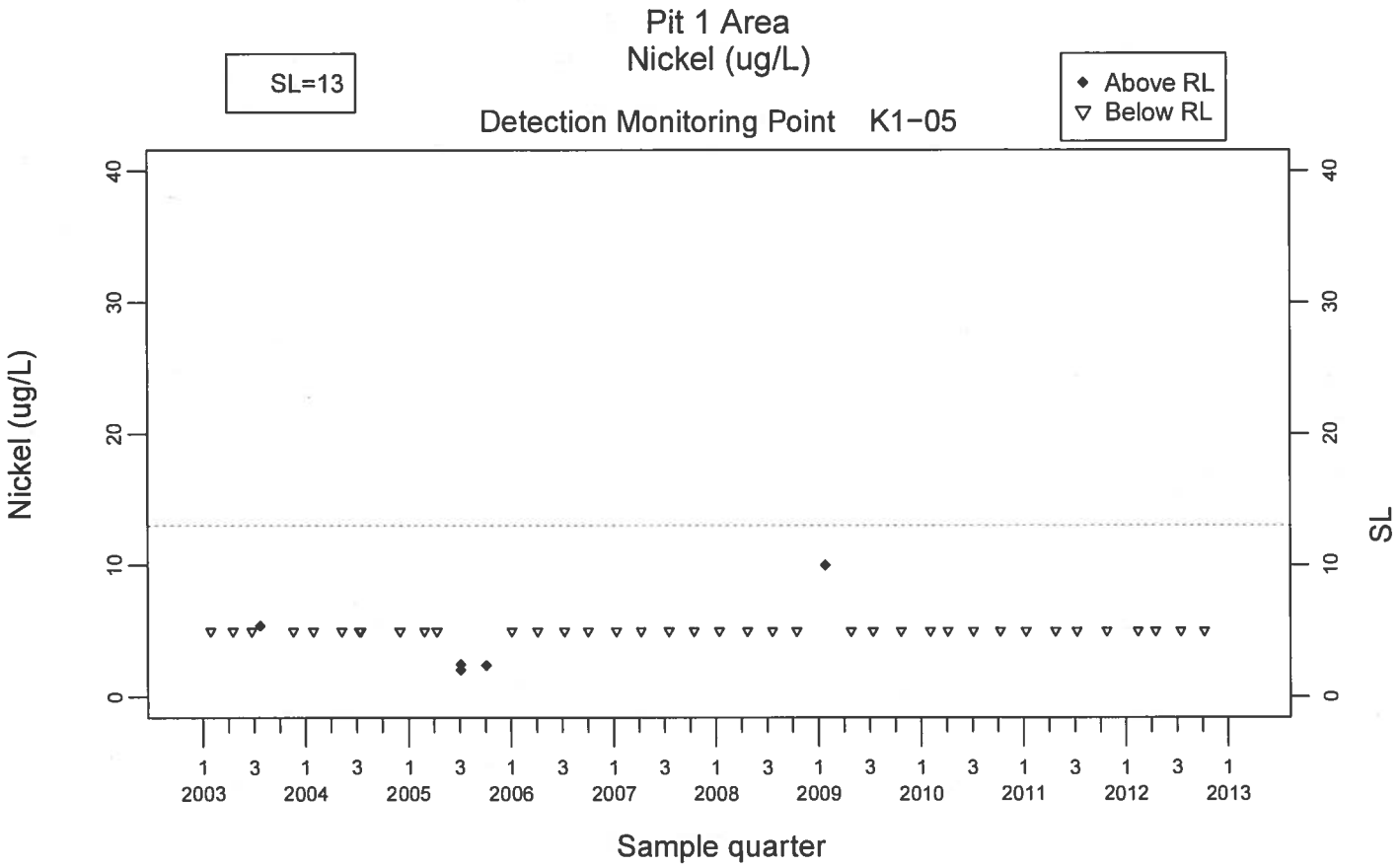

SL=2
Detection Monitoring Point W-PIT1-2326
Lead (ug/L)
SL
Sample quarter
Data omitted
See Table 1

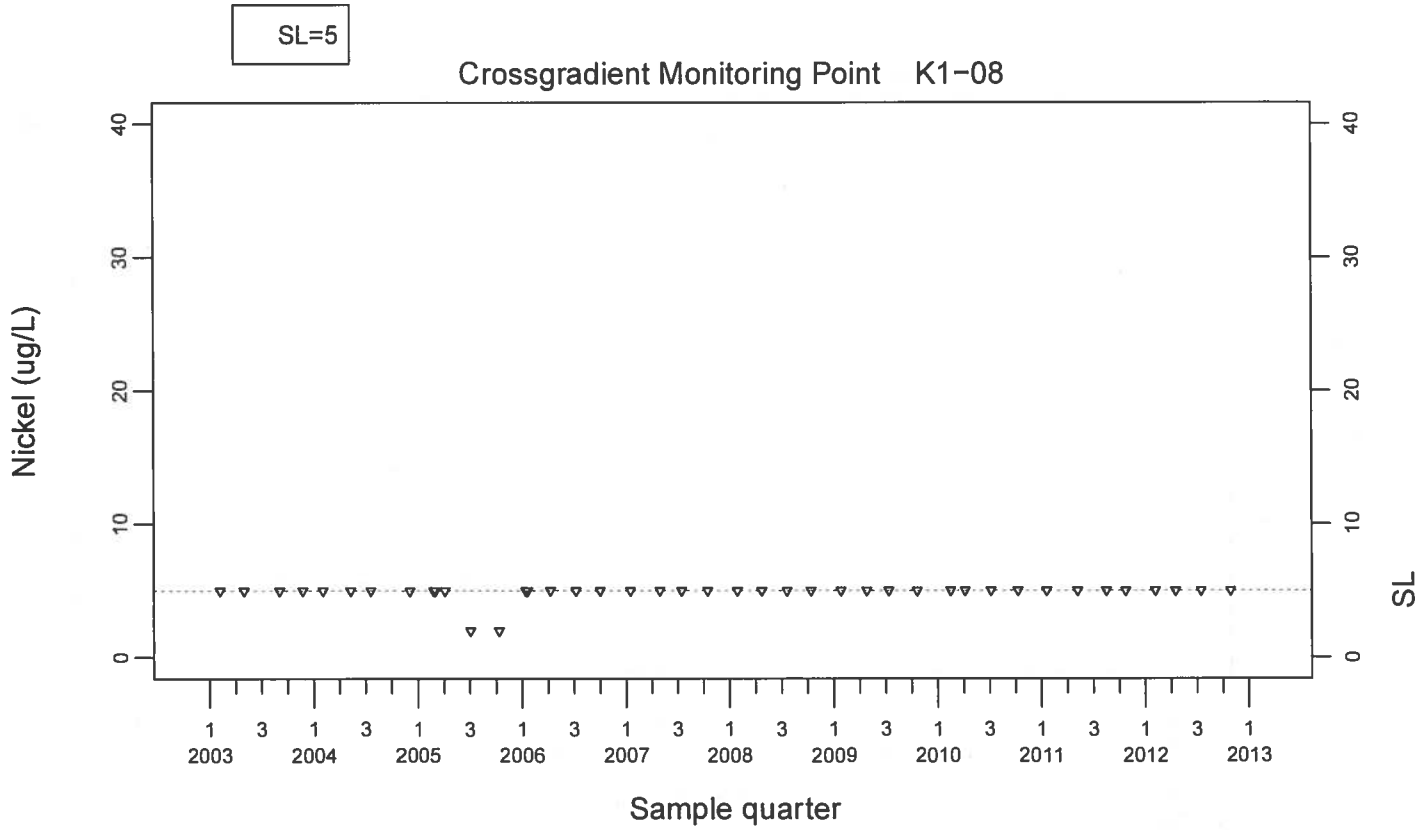

Pit 1 Area
Nickel (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Nickel (ug/L)
0
10
20
30
40
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

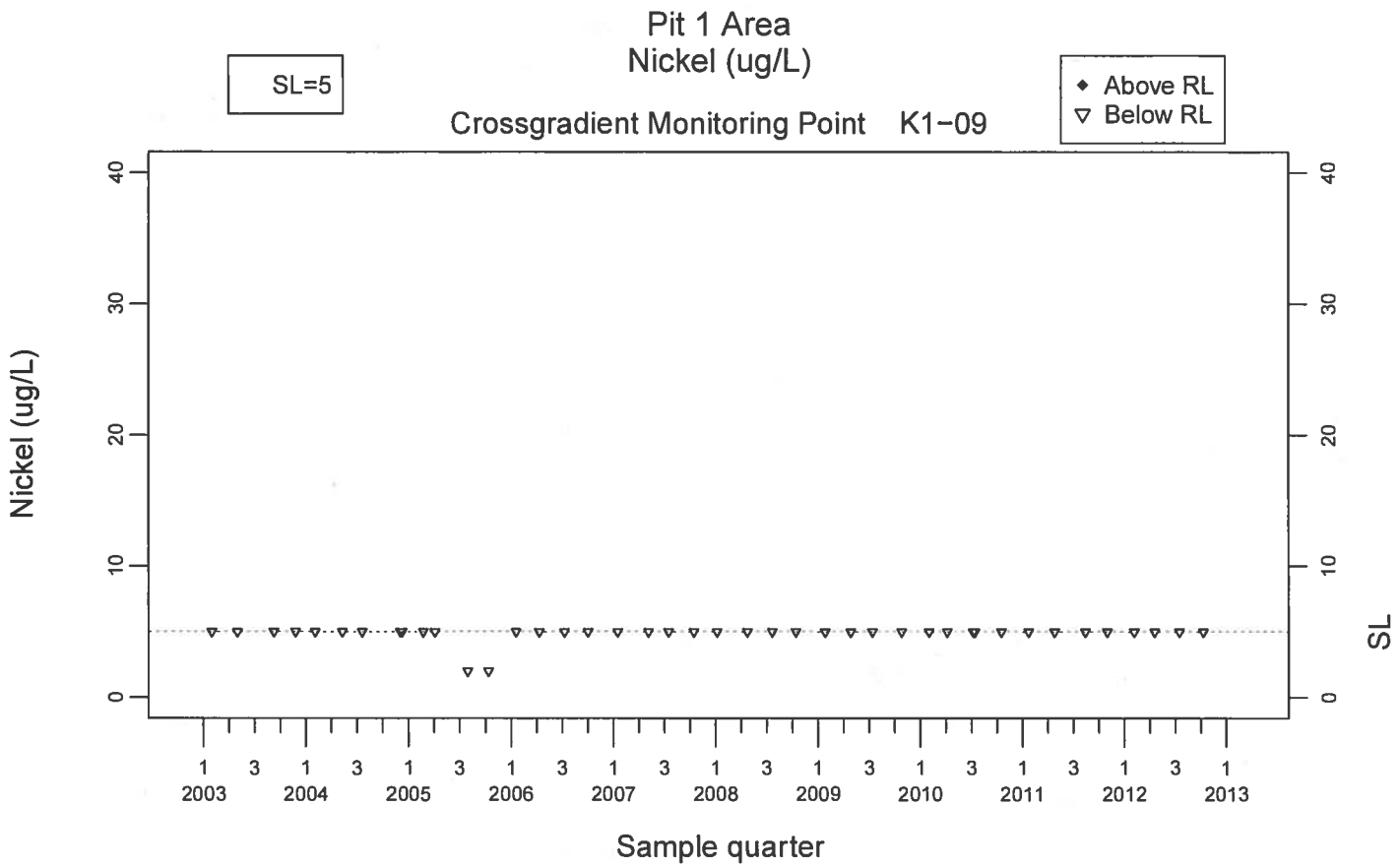

Background Monitoring Point K1-07
Nickel (ug/L)
0
10
20
30
40
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

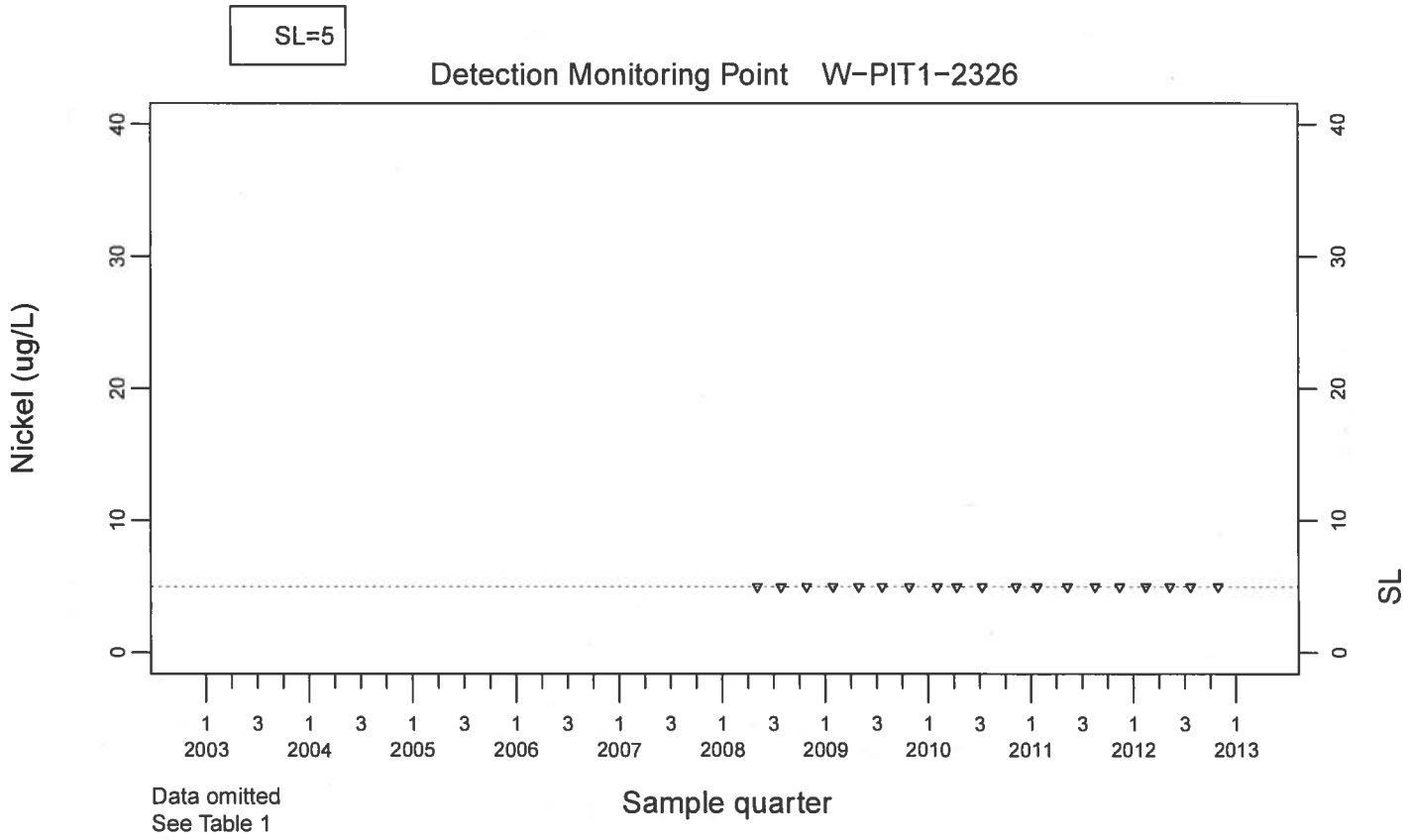

Pit 1 Area
Nickel (ug/L)
SL=9
Above RL
Below RL
Detection Monitoring Point K1-02B
Nickel (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

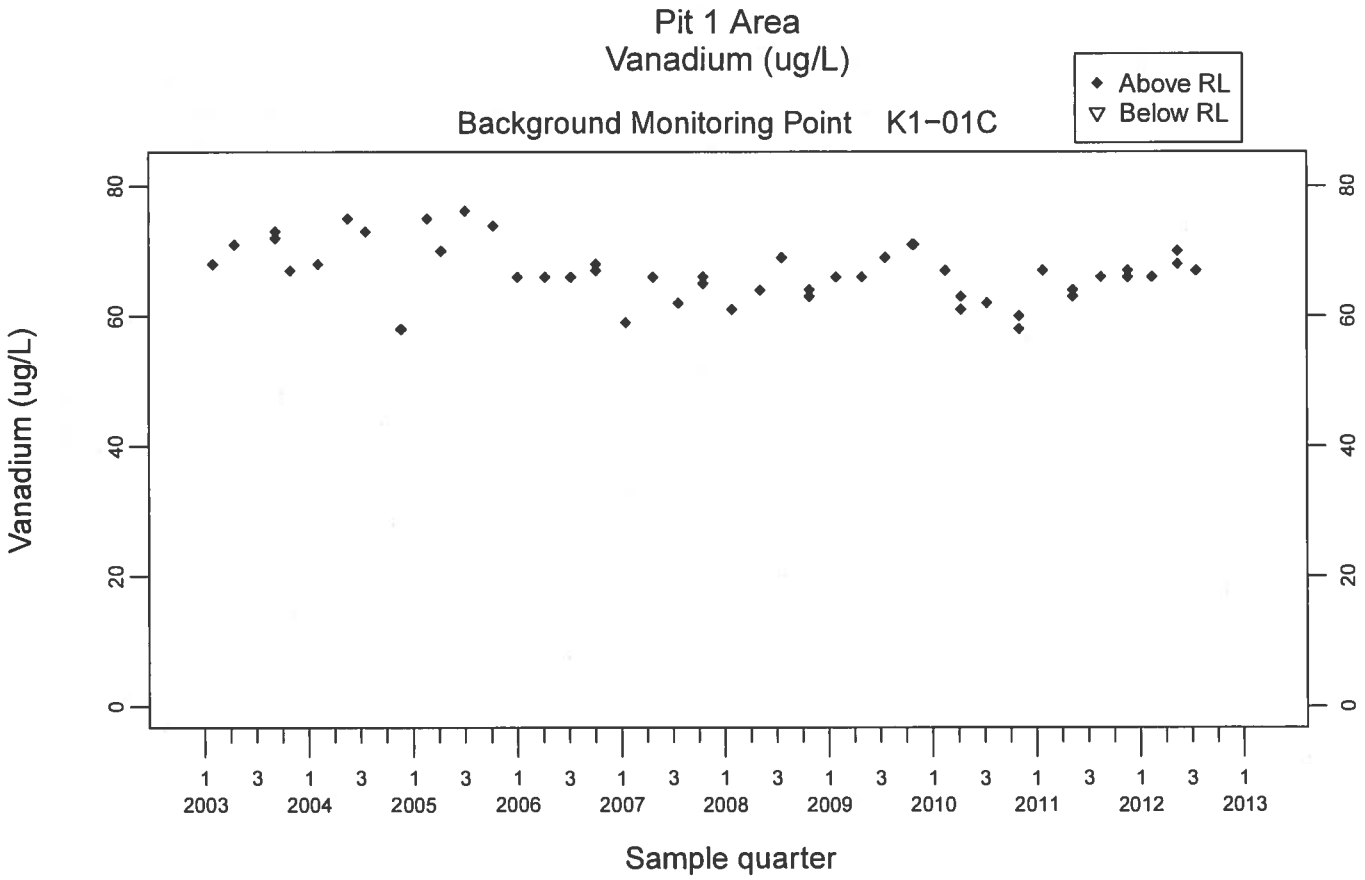

SL=5
Detection Monitoring Point K1-04
Nickel (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

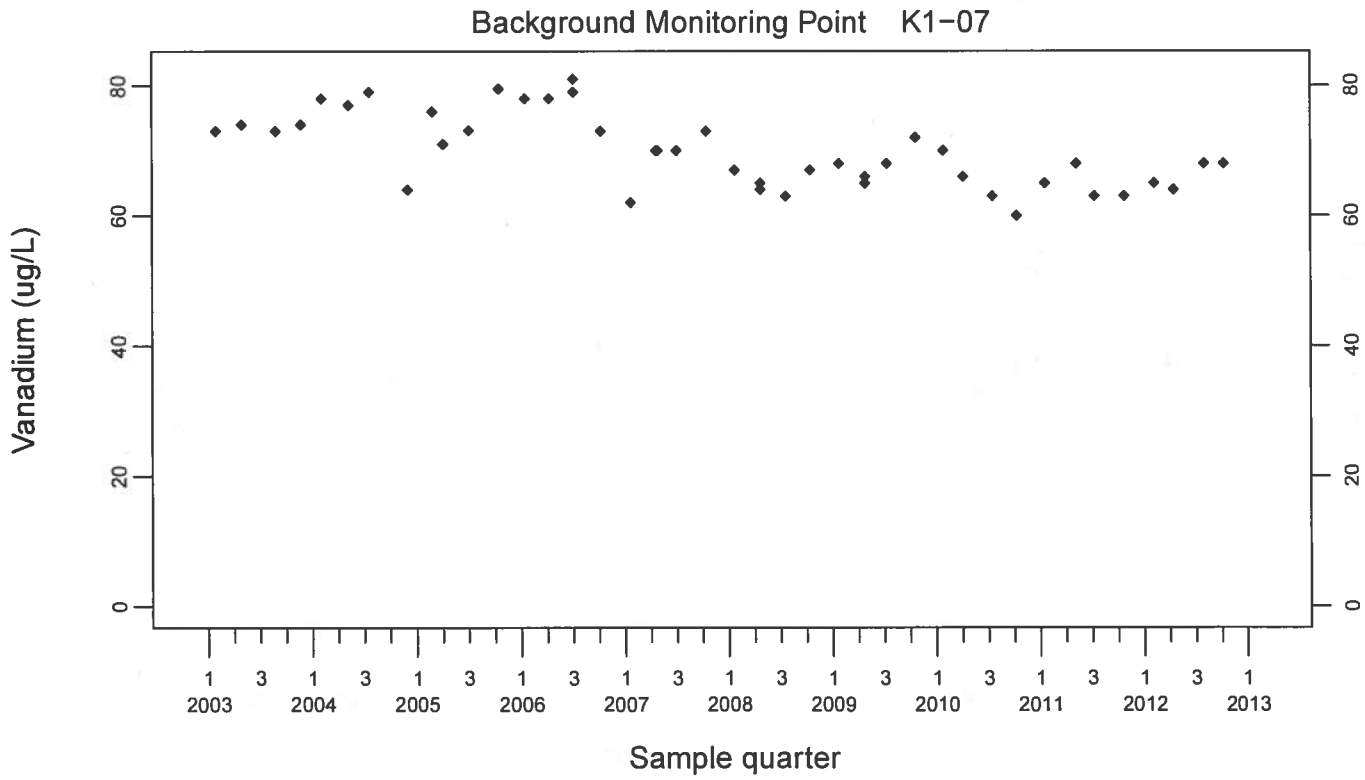

Pit 1 Area
Nickel (ug/L)
SL=13
Above RL
Below RL
Detection Monitoring Point K1-05
Nickel (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

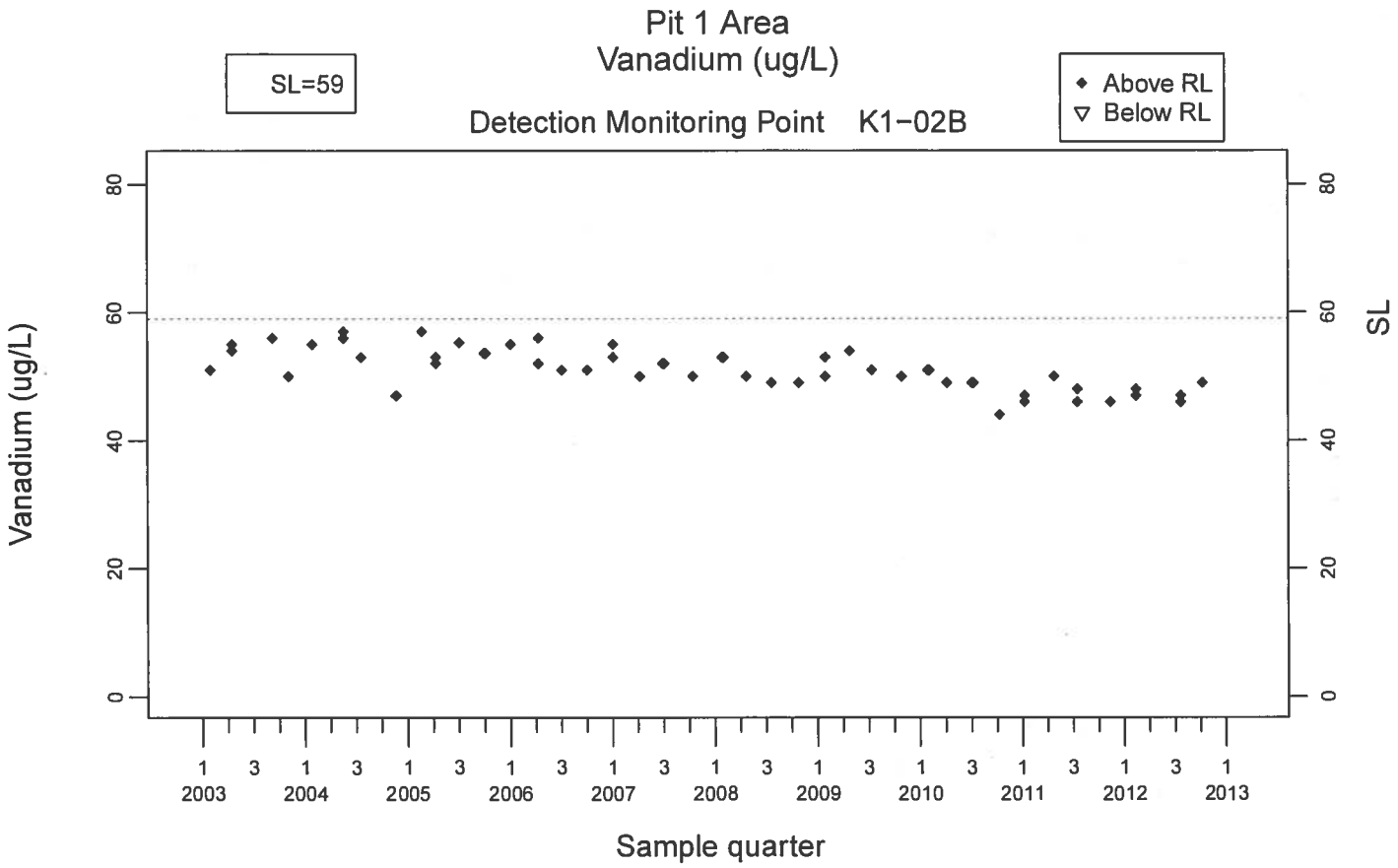

SL=5
Crossgradient Monitoring Point K1-08
Nickel (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

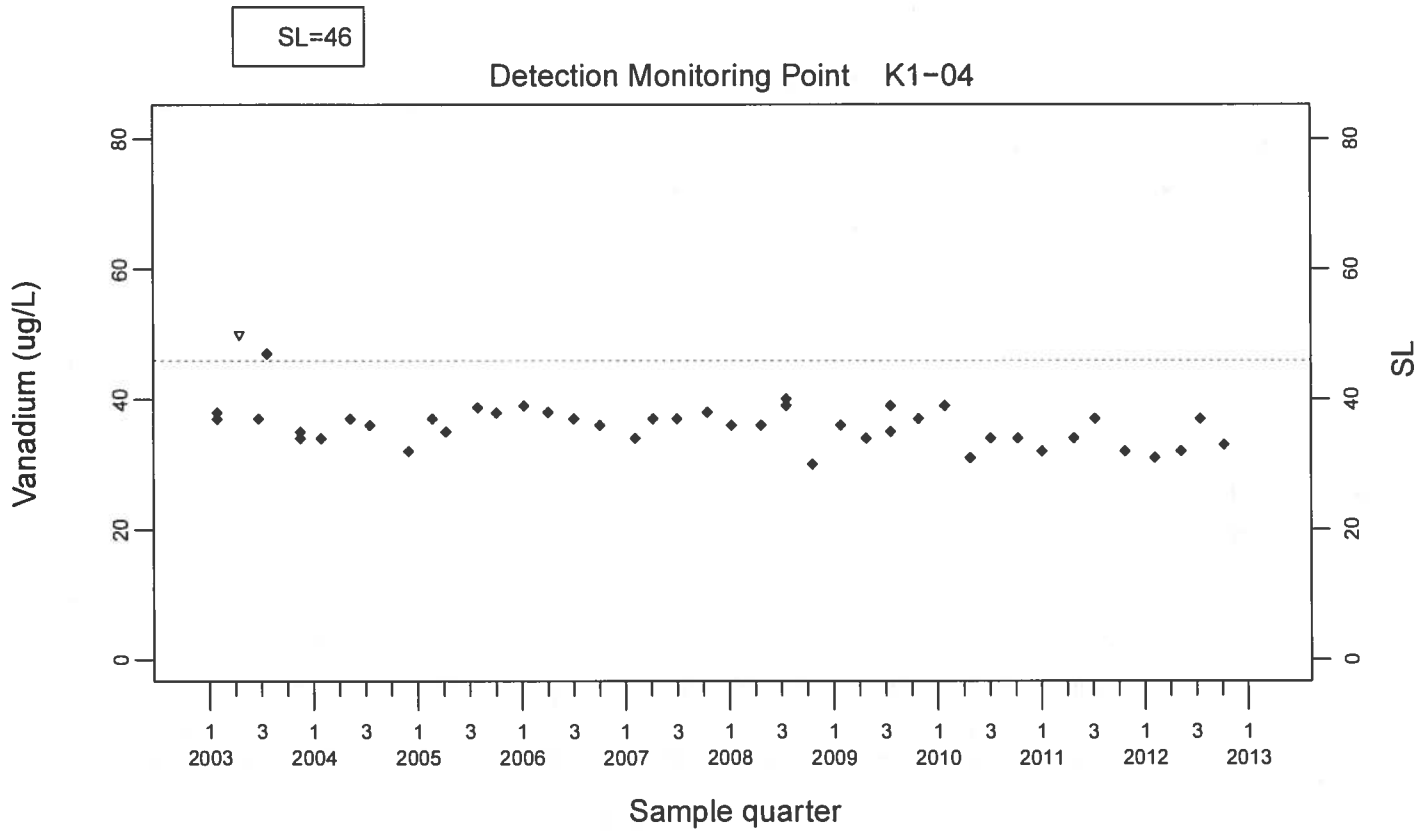

Pit 1 Area
Nickel (ug/L)
SL=5
Crossgradient Monitoring Point K1-09
Above RL
Below RL
Nickel (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

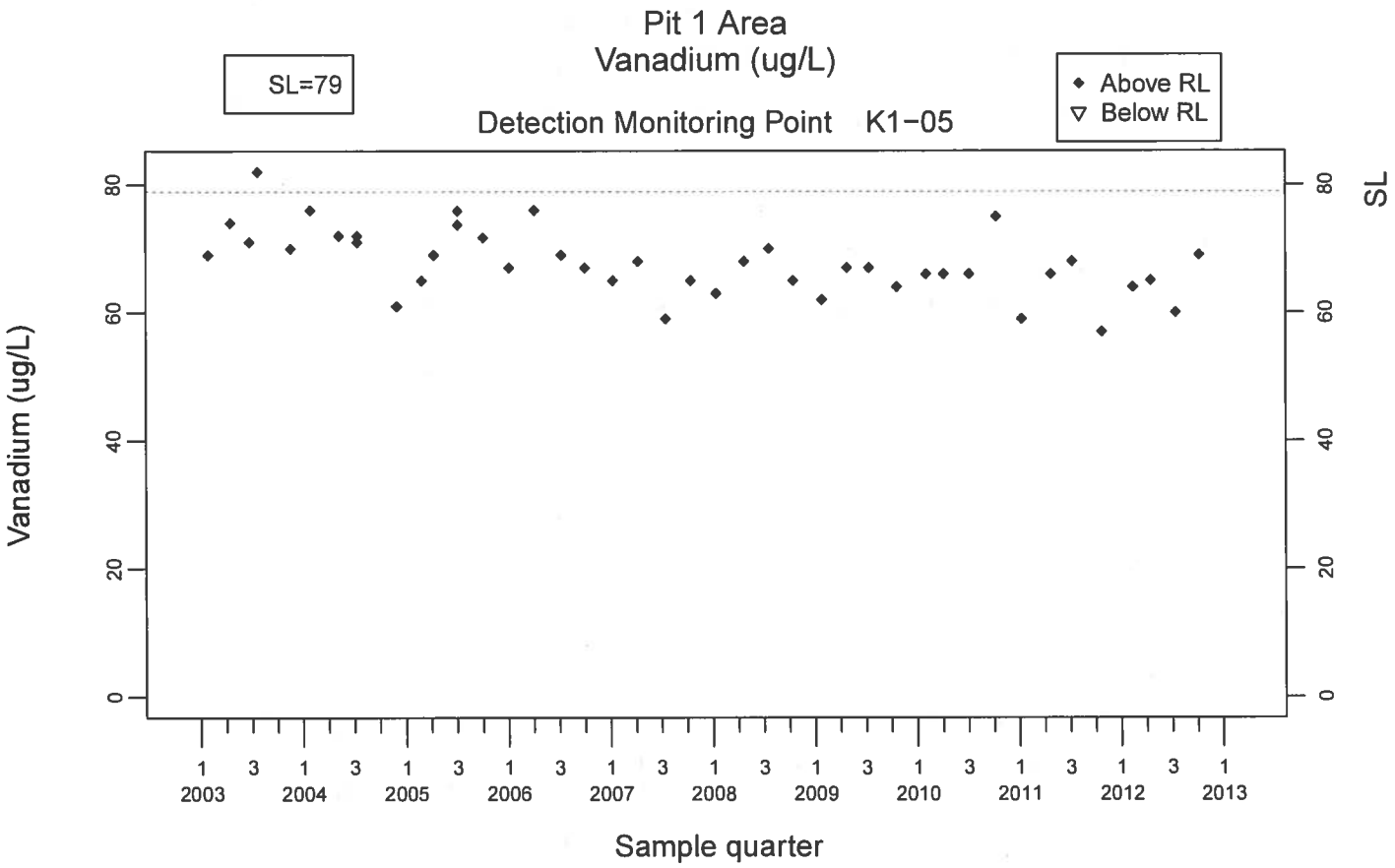

SL=5
Detection Monitoring Point W-PIT1-2326
Nickel (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Data omitted
See Table 1

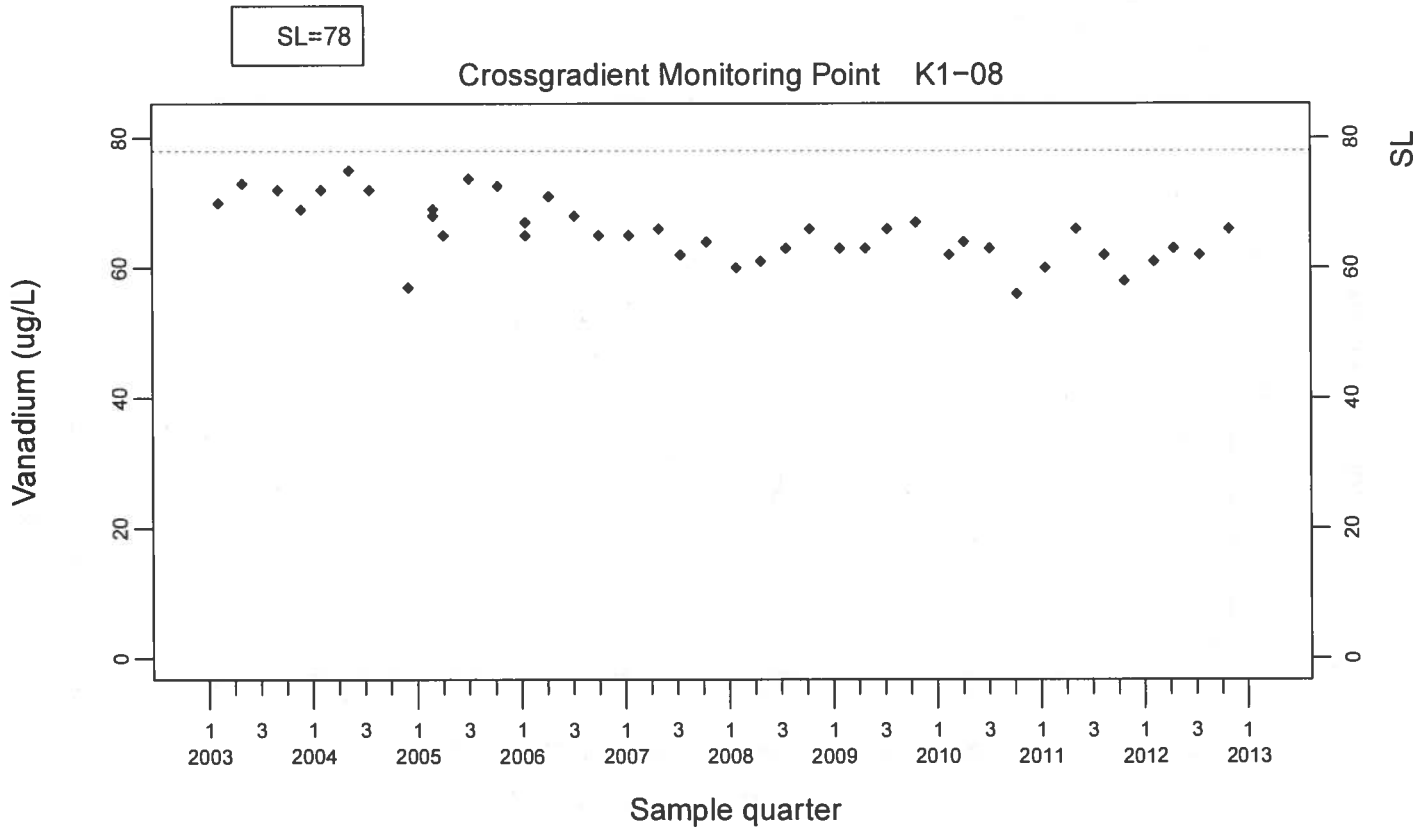

Pit 1 Area
Vanadium (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Vanadium (ug/L)
0
20
40
60
80
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

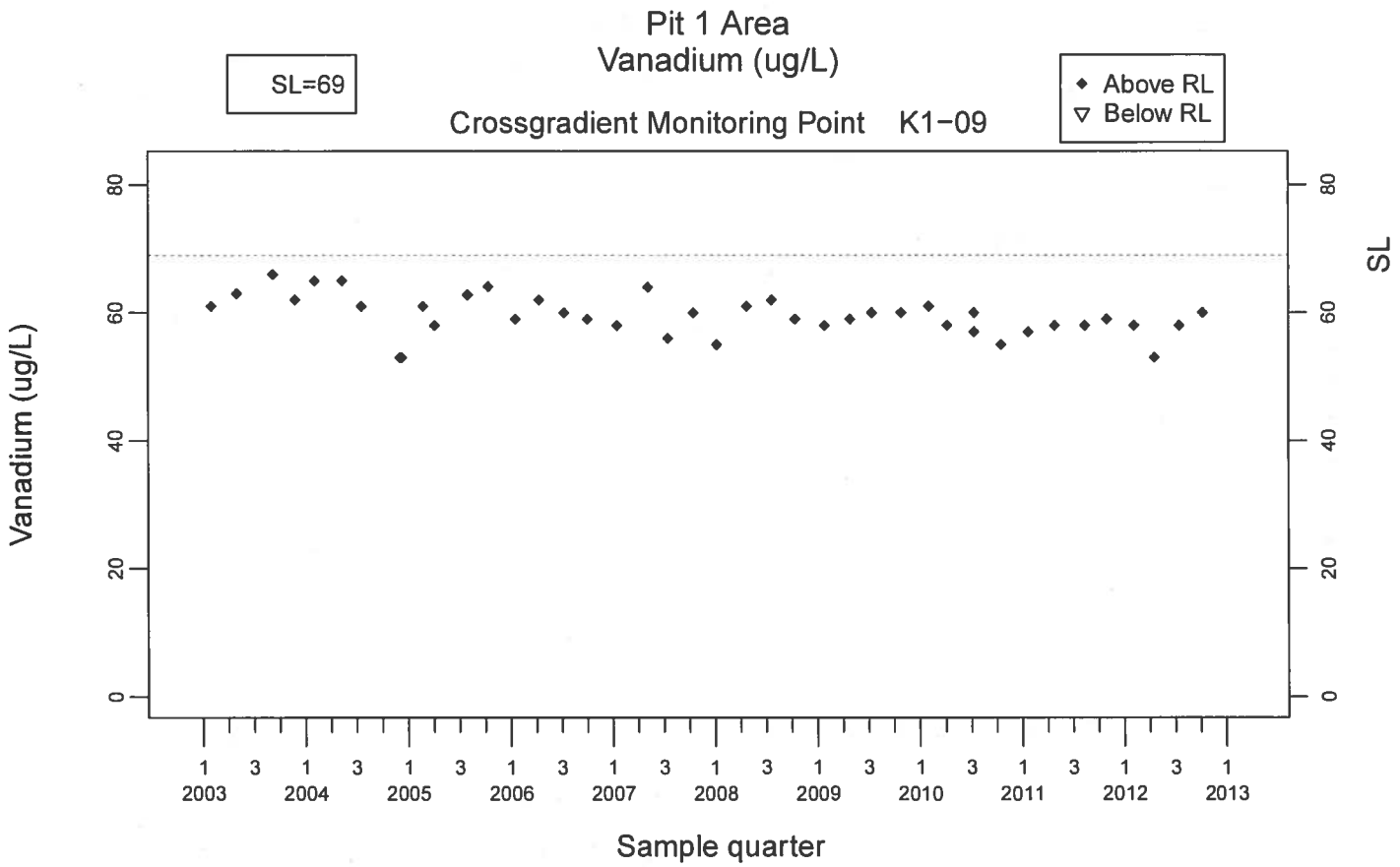

Background Monitoring Point K1-07
Vanadium (ug/L)
0
20
40
60
80
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

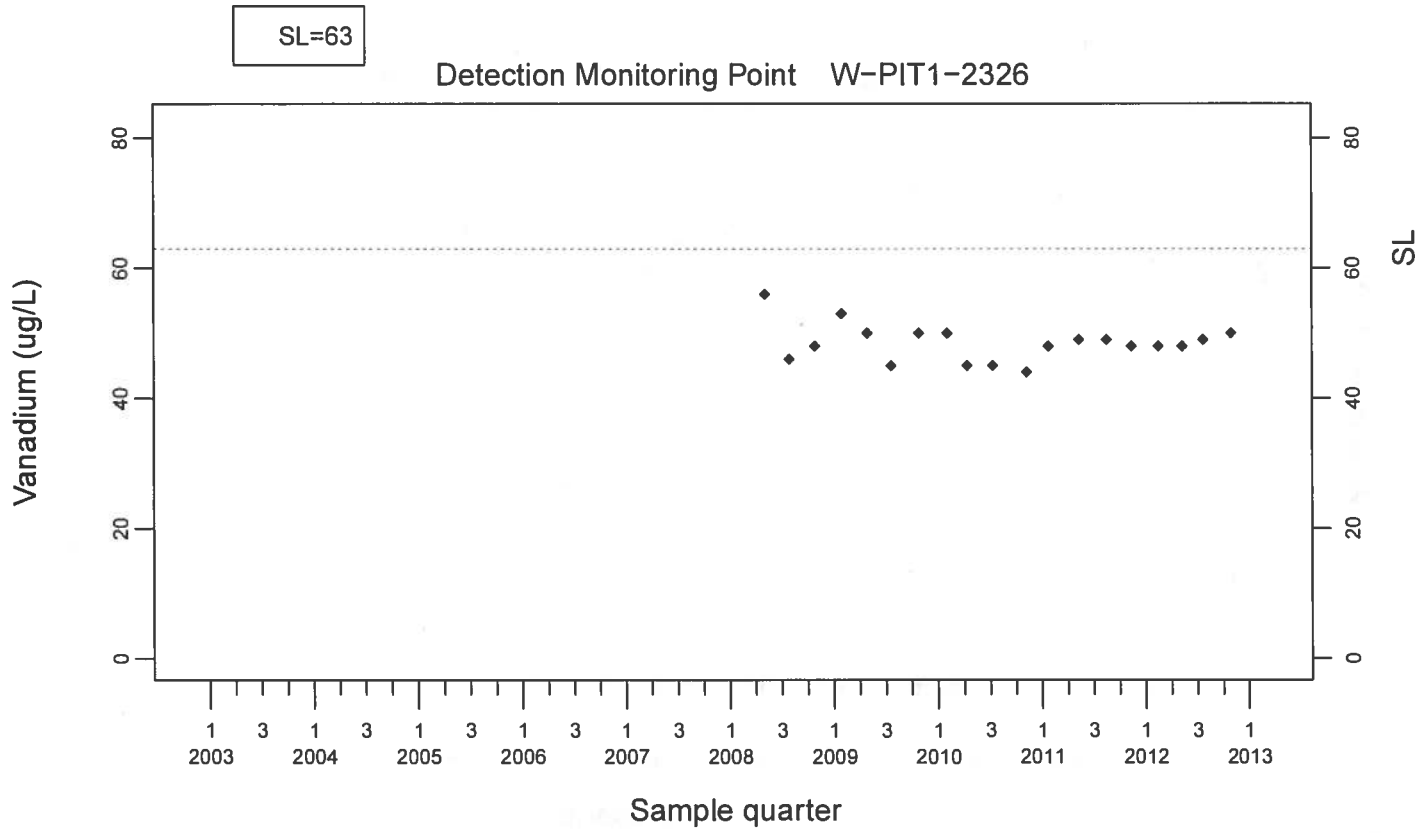

Pit 1 Area
Vanadium (ug/L)
SL=59
Above RL
Below RL
Detection Monitoring Point K1-02B
Vanadium (ug/L)
SL
0
20
40
60
80
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

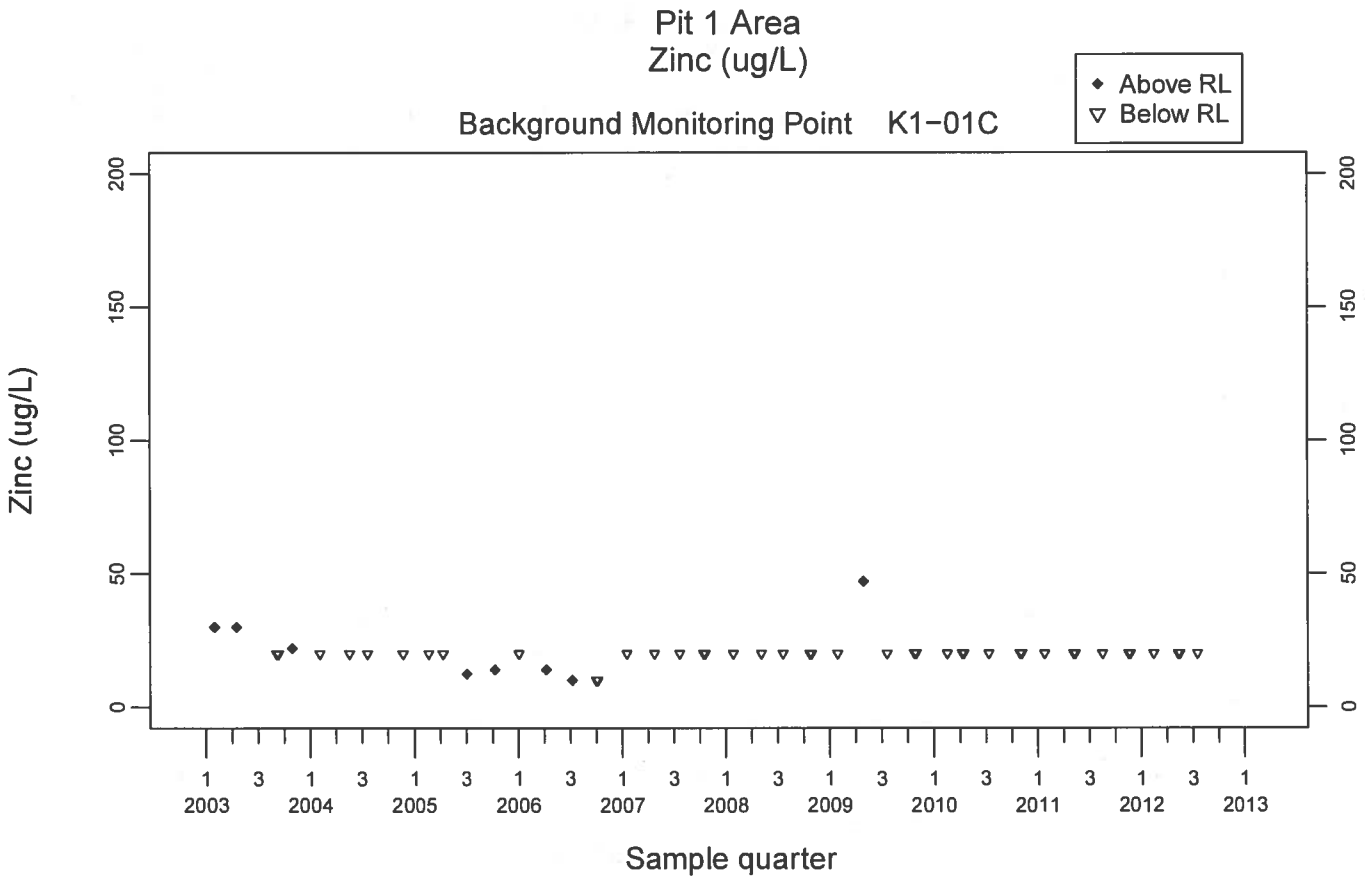

SL=46
Detection Monitoring Point K1-04
Vanadium (ug/L)
SL
0
20
40
60
80
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

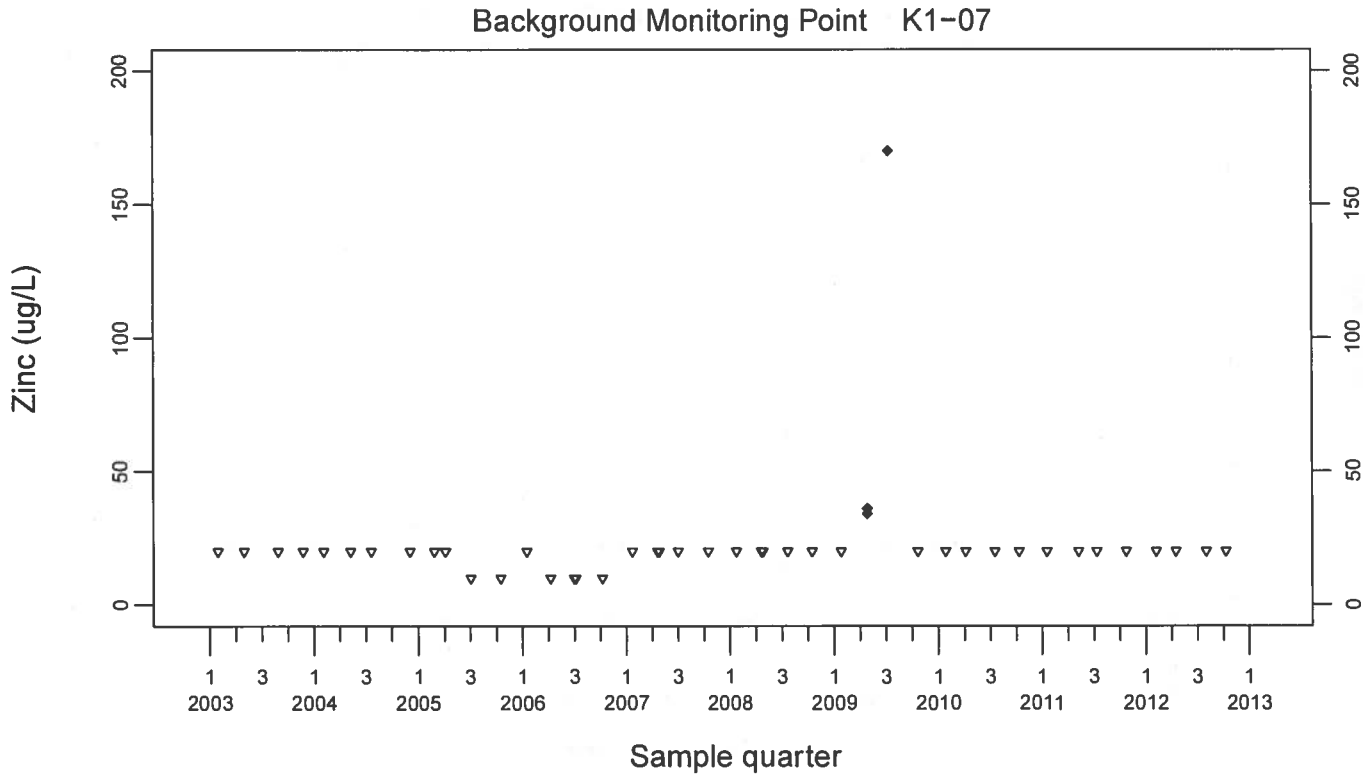

Pit 1 Area
Vanadium (ug/L)
Detection Monitoring Point K1-05
SL=79
Above RL
Below RL
Vanadium (ug/L)
SL
0
20
40
60
80
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

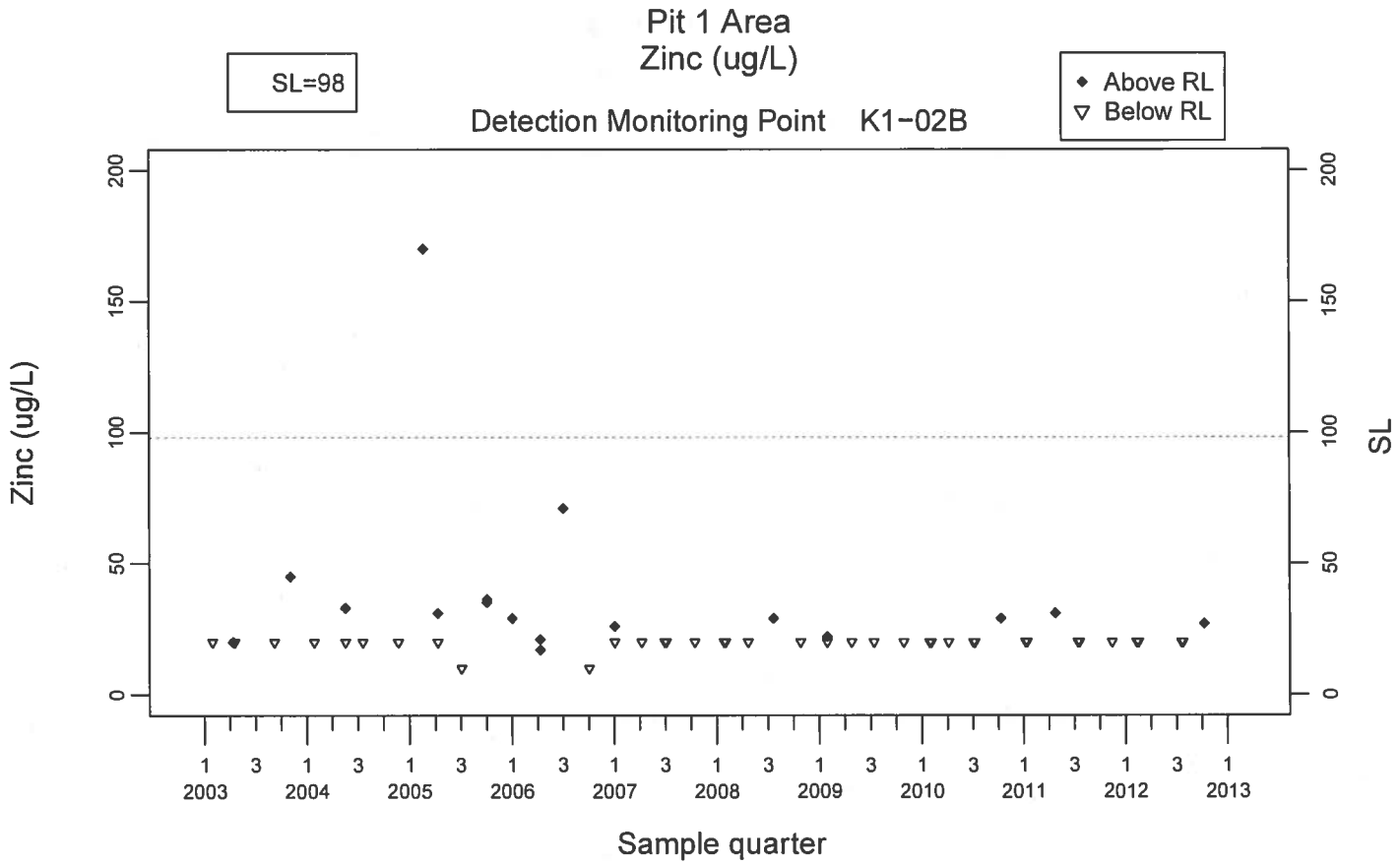

Crossgradient Monitoring Point K1-08
SL=78
Vanadium (ug/L)
SL
0
20
40
60
80
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

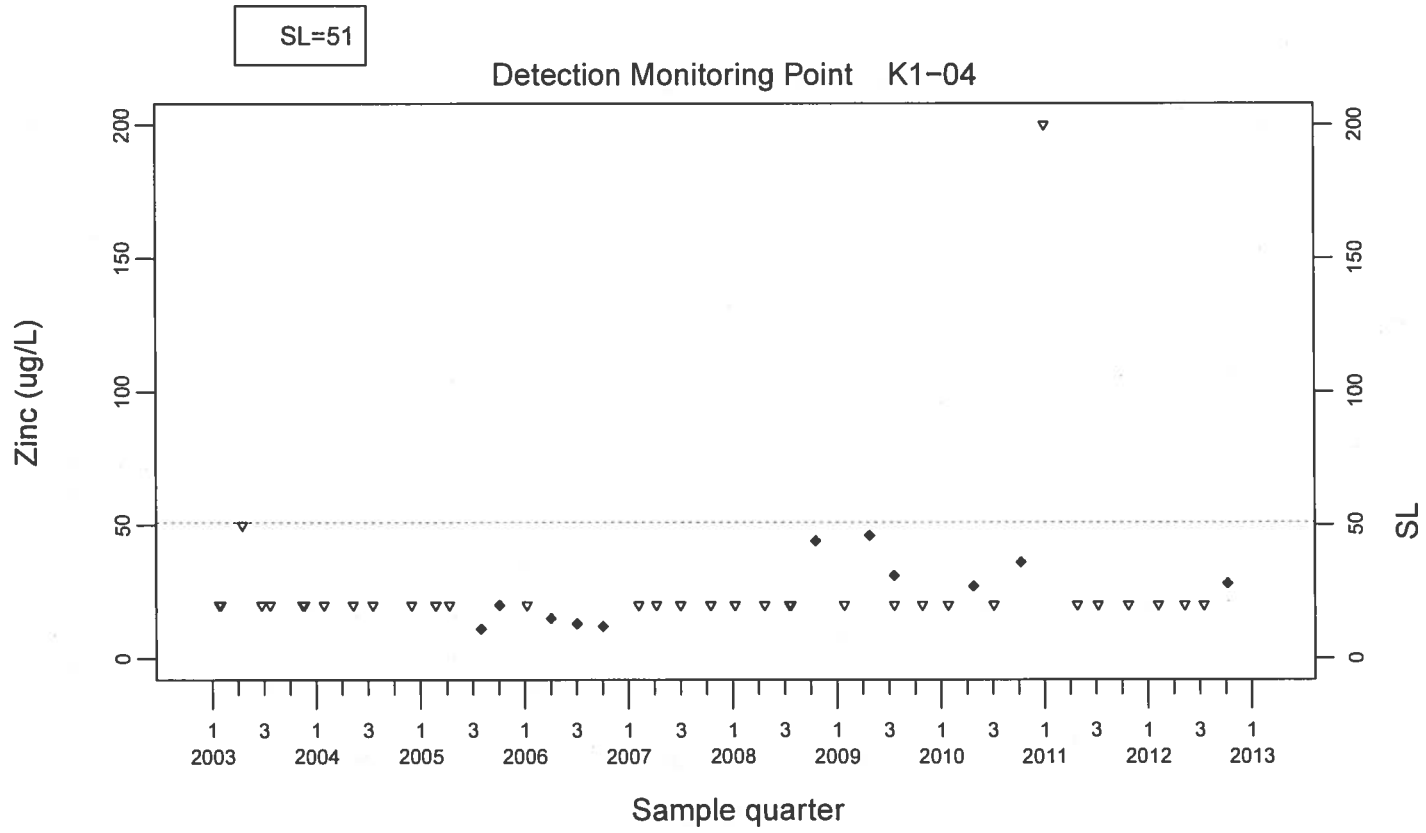

Pit 1 Area
Vanadium (ug/L)
SL=69
Crossgradient Monitoring Point K1-09
Above RL
Below RL
Vanadium (ug/L)
SL
0
20
40
60
80
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

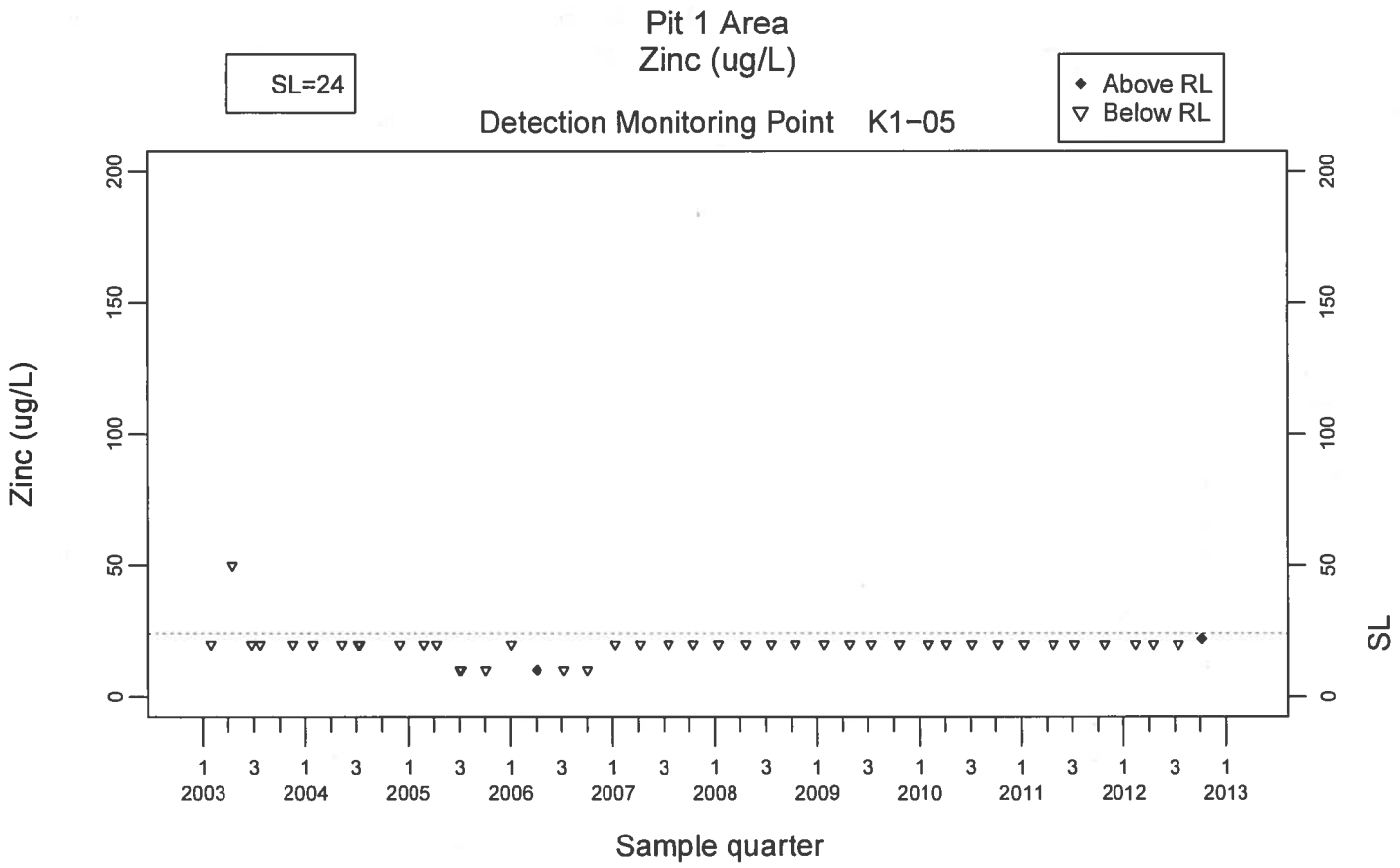

SL=63
Detection Monitoring Point W-PIT1-2326
Vanadium (ug/L)
SL
0
20
40
60
80
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

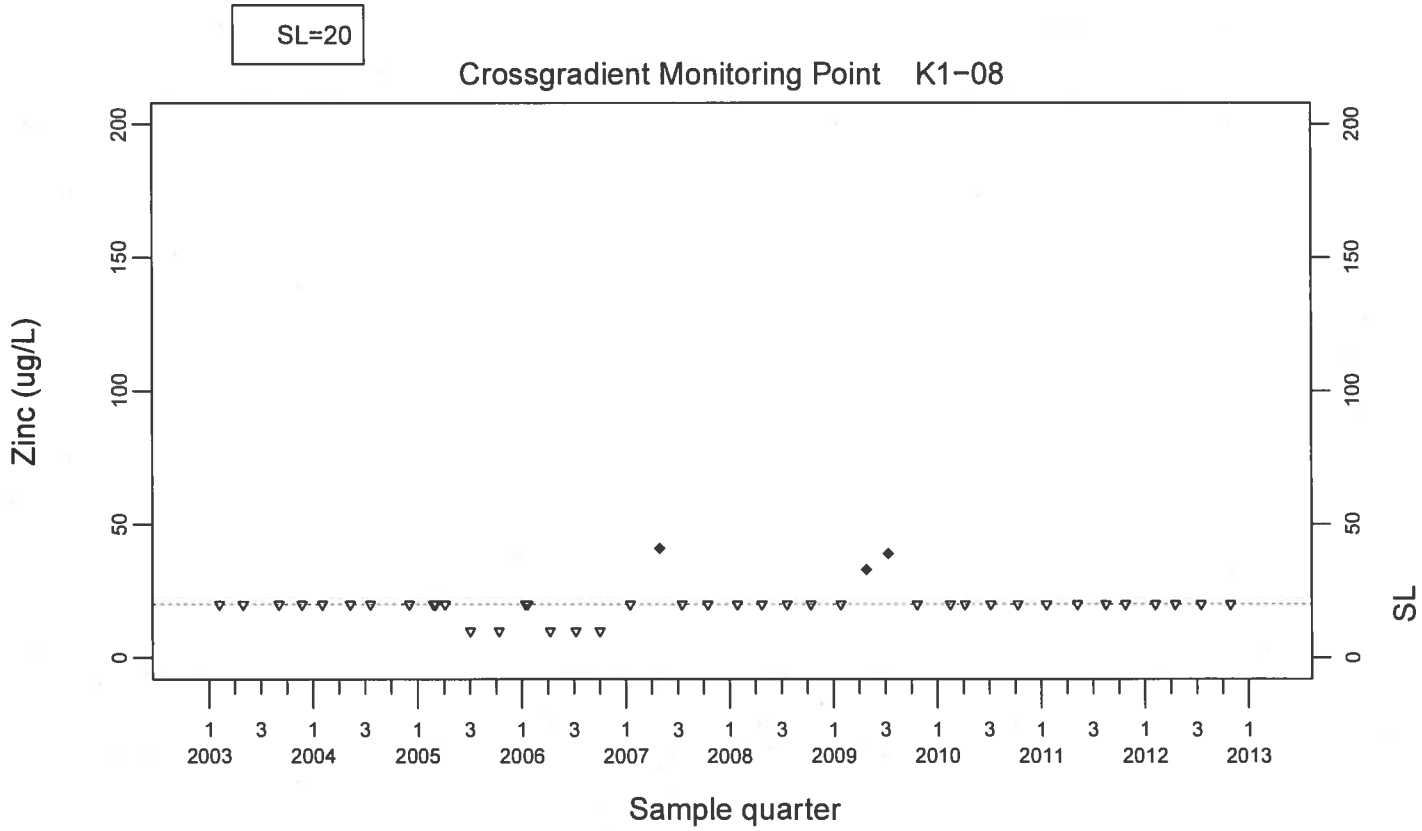

Pit 1 Area
Zinc (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Zinc (ug/L)
0
50
100
150
200
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

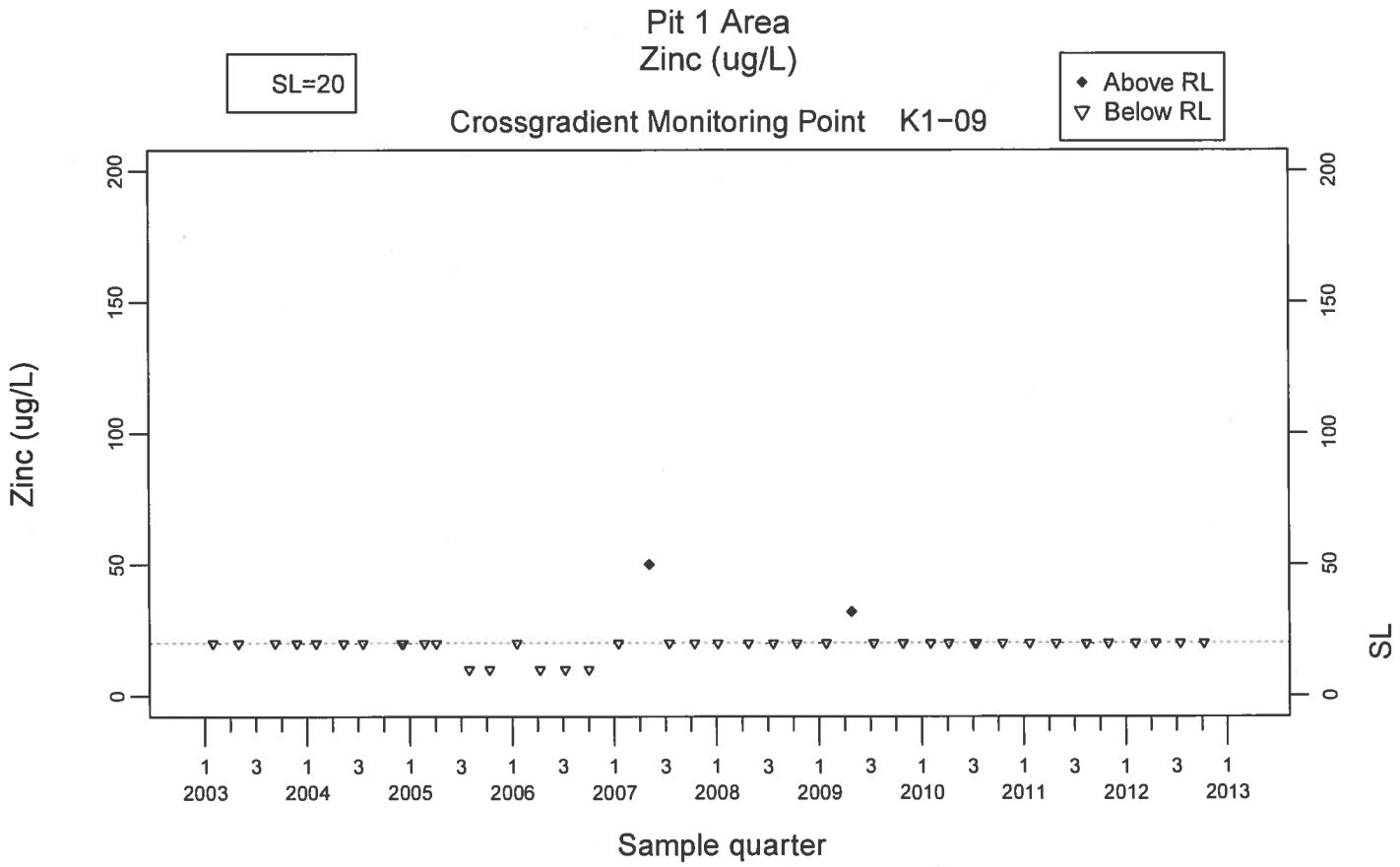

Background Monitoring Point K1-07
Zinc (ug/L)
0
50
100
150
200
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

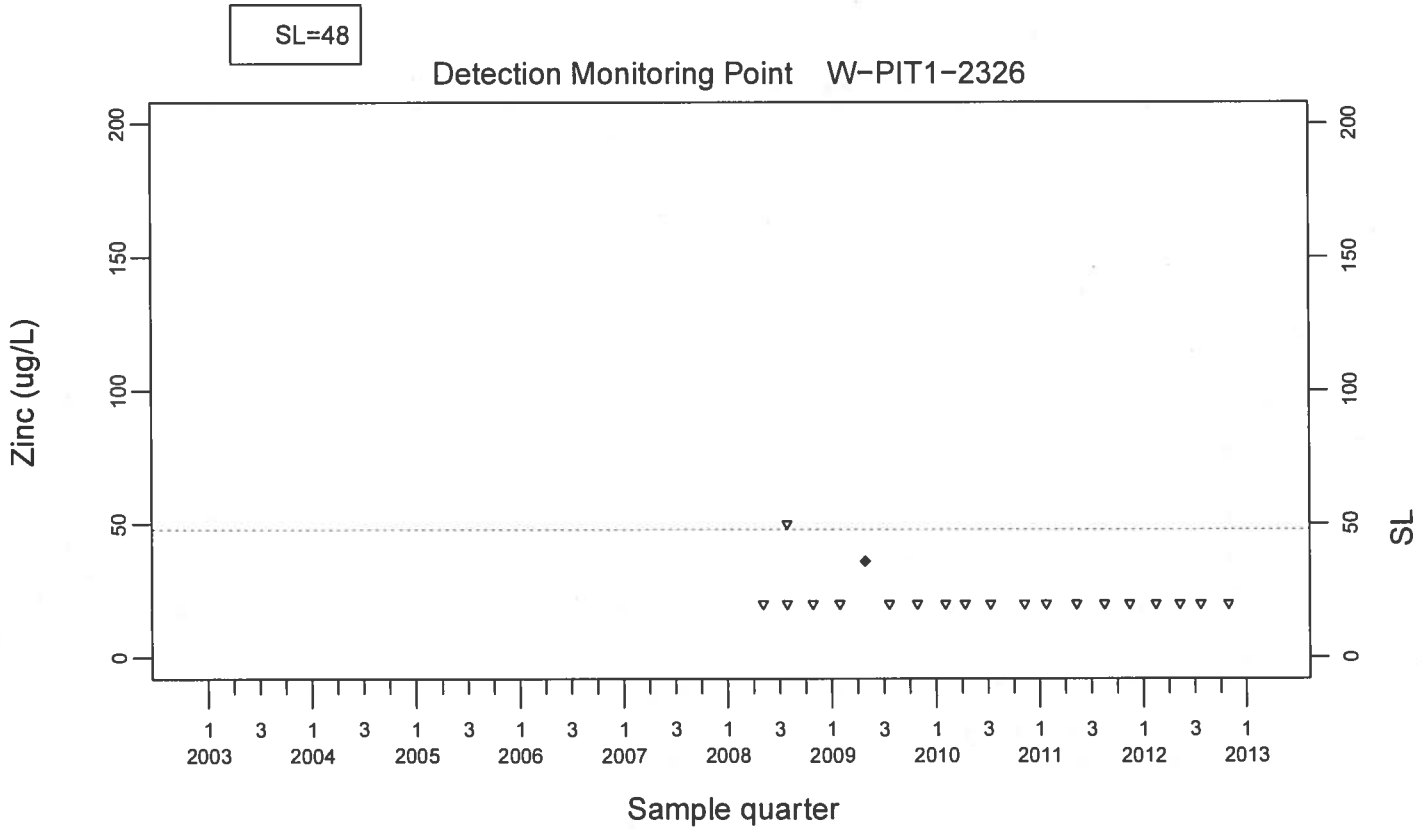

Pit 1 Area
Zinc (ug/L)
SL=98
Above RL
Below RL
Detection Monitoring Point K1-02B
Zinc (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

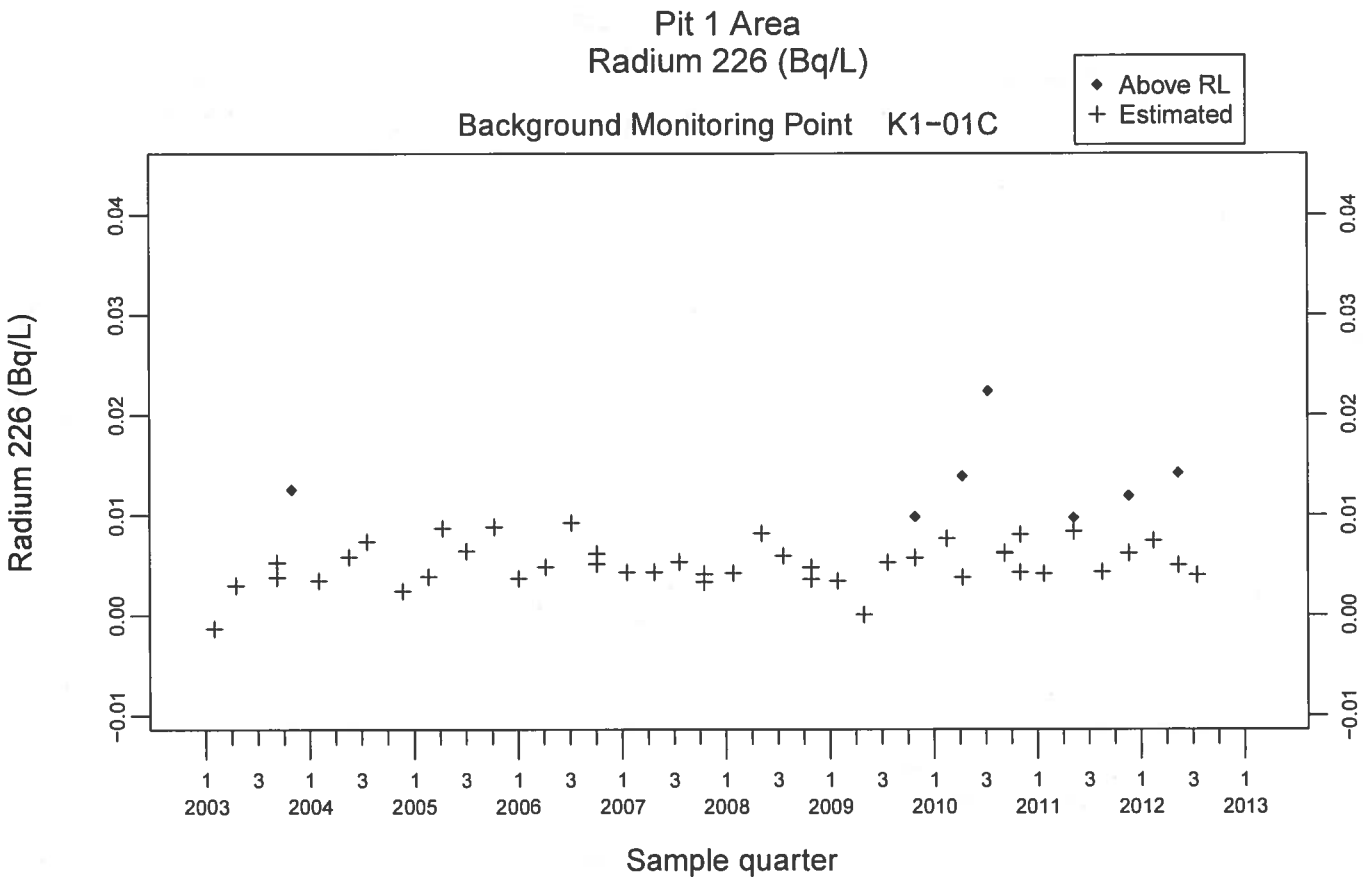

SL=51
Detection Monitoring Point K1-04
Zinc (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

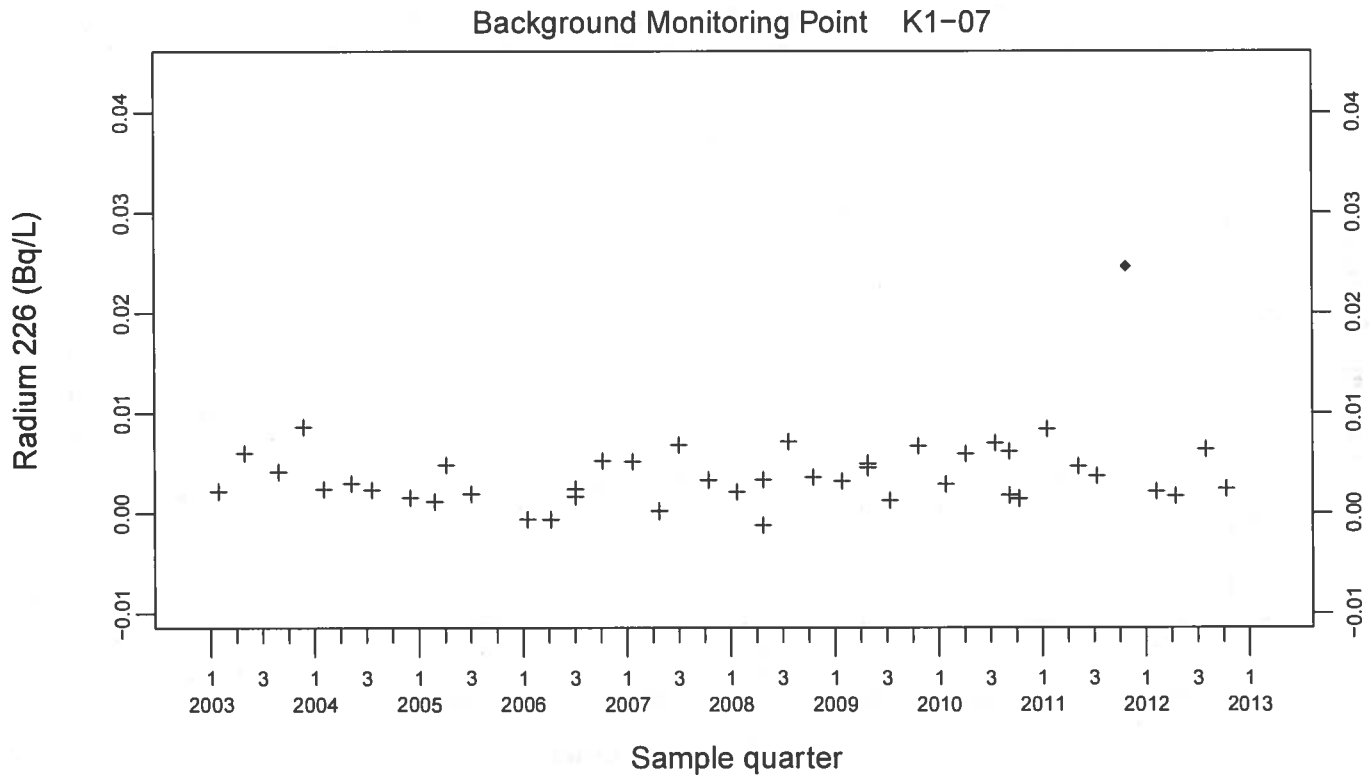

Pit 1 Area
Zinc (ug/L)
SL=24
Above RL
Below RL
Detection Monitoring Point K1-05
Zinc (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

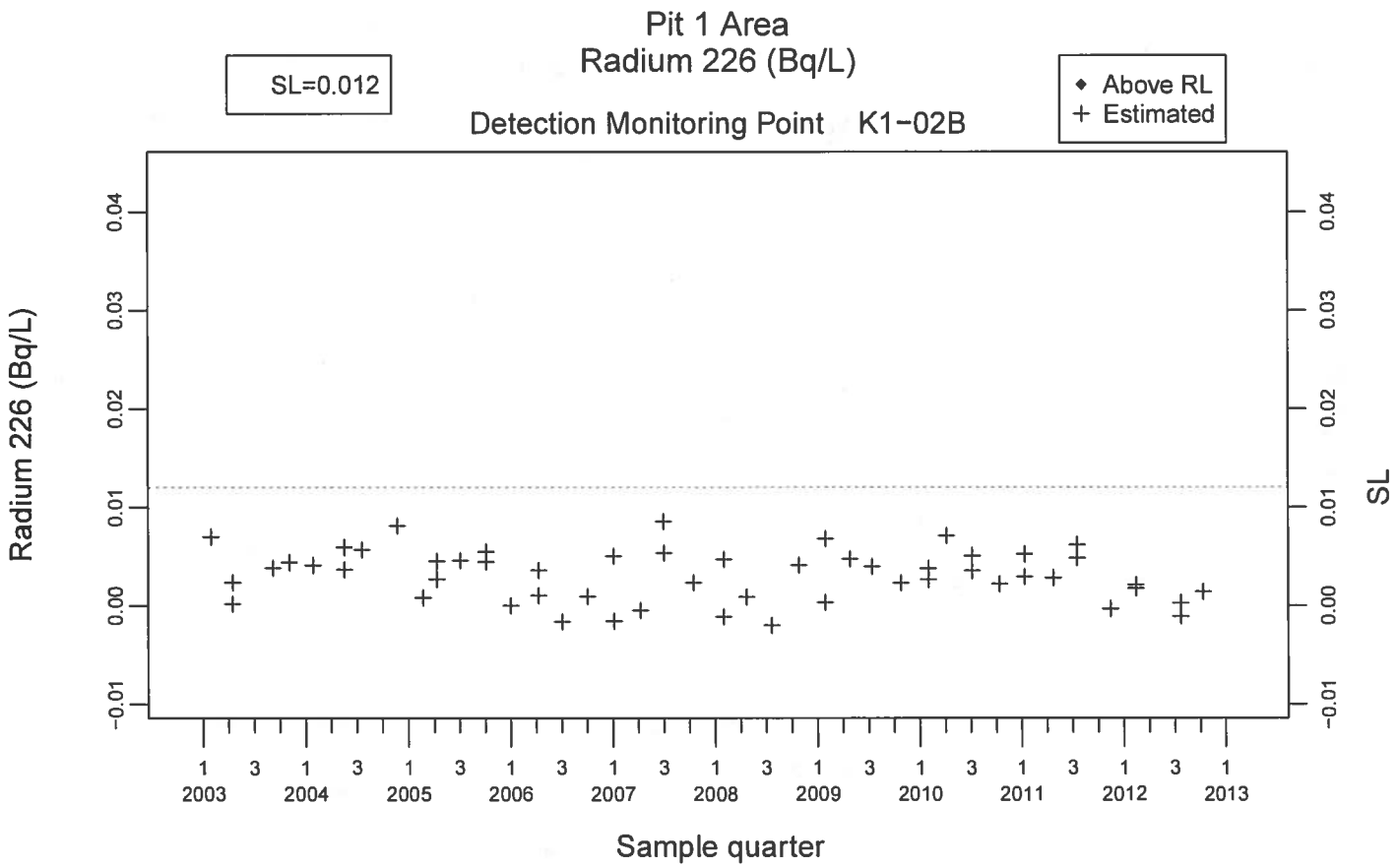

SL=20
Crossgradient Monitoring Point K1-08
Zinc (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

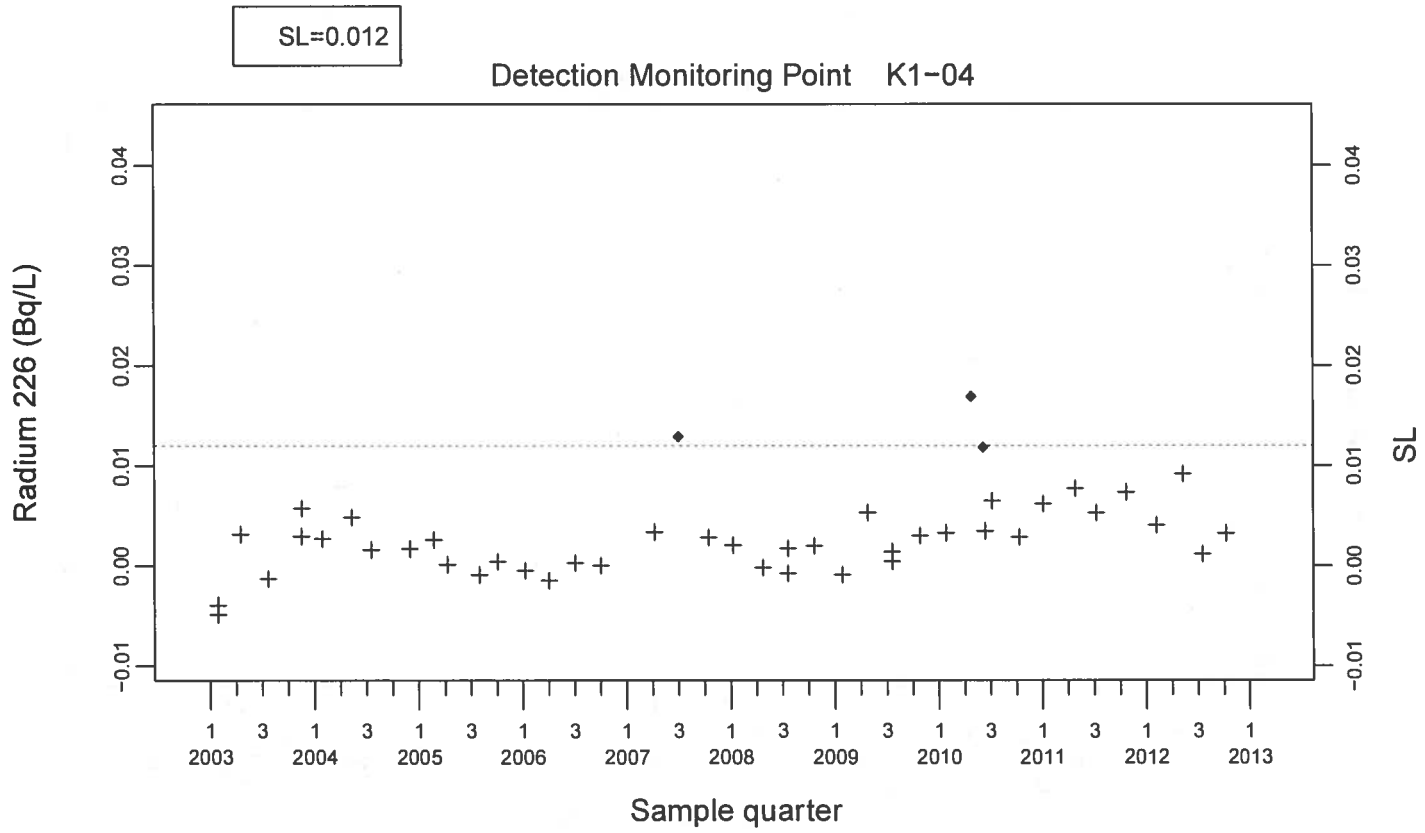

Pit 1 Area
Zinc (ug/L)
SL=20
Crossgradient Monitoring Point K1-09
Above RL
Below RL
Zinc (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

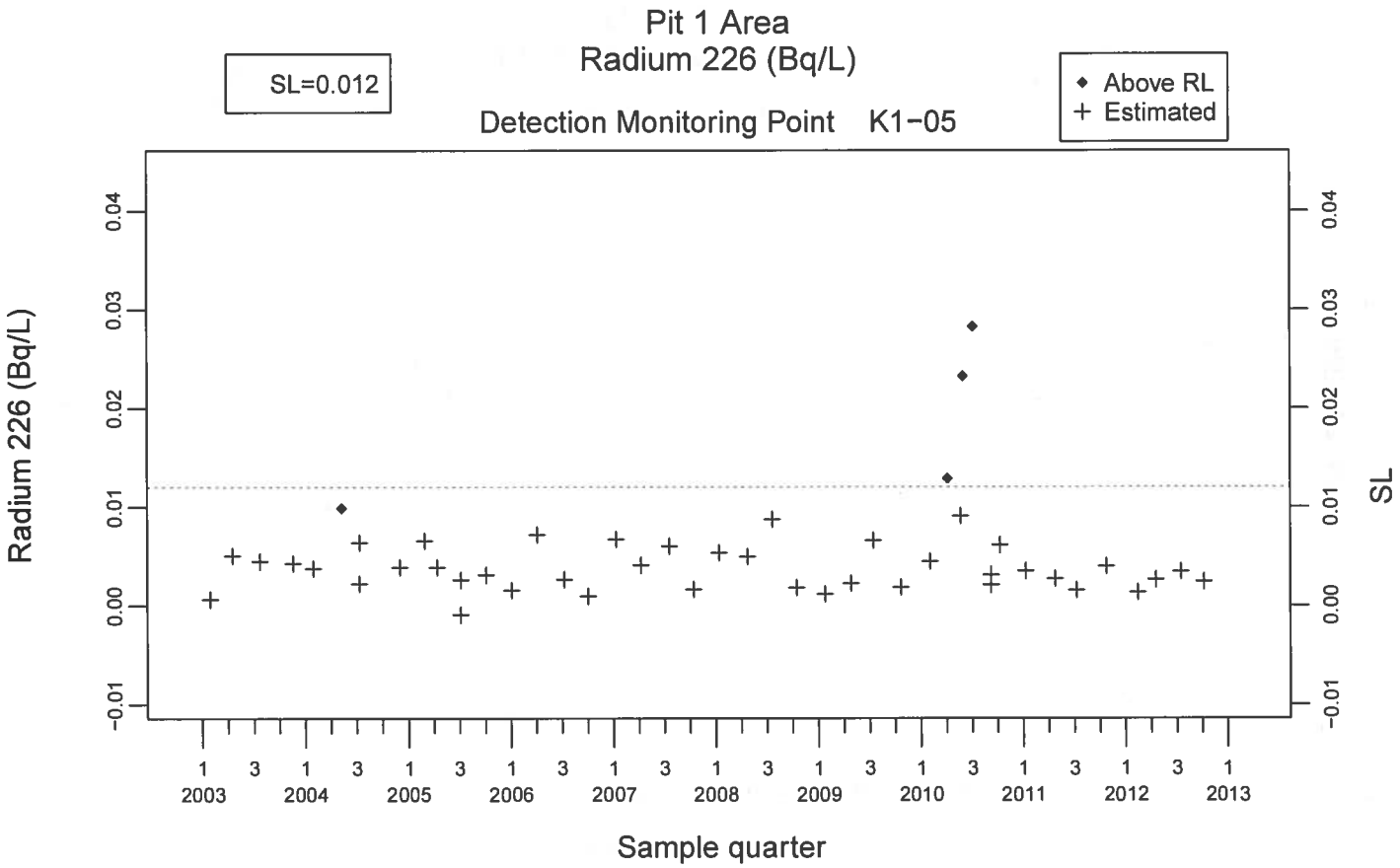

SL=48
Detection Monitoring Point W-PIT1-2326
Zinc (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

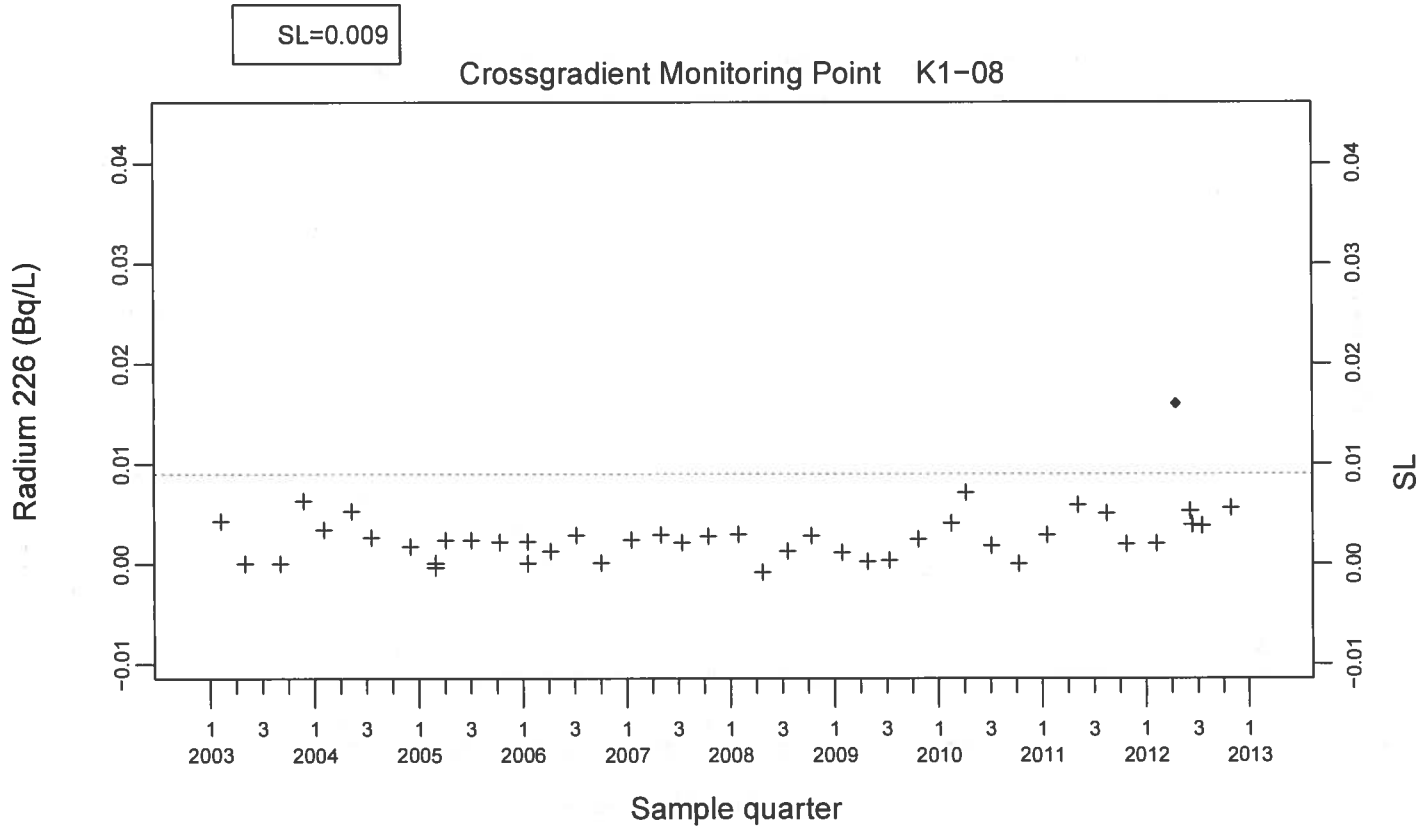

Pit 1 Area
Radium 226 (Bq/L)
Background Monitoring Point K1-01C
Above RL
Estimated
Radium 226 (Bq/L)
0.04
0.03
0.02
0.01
0.00
-0.01
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

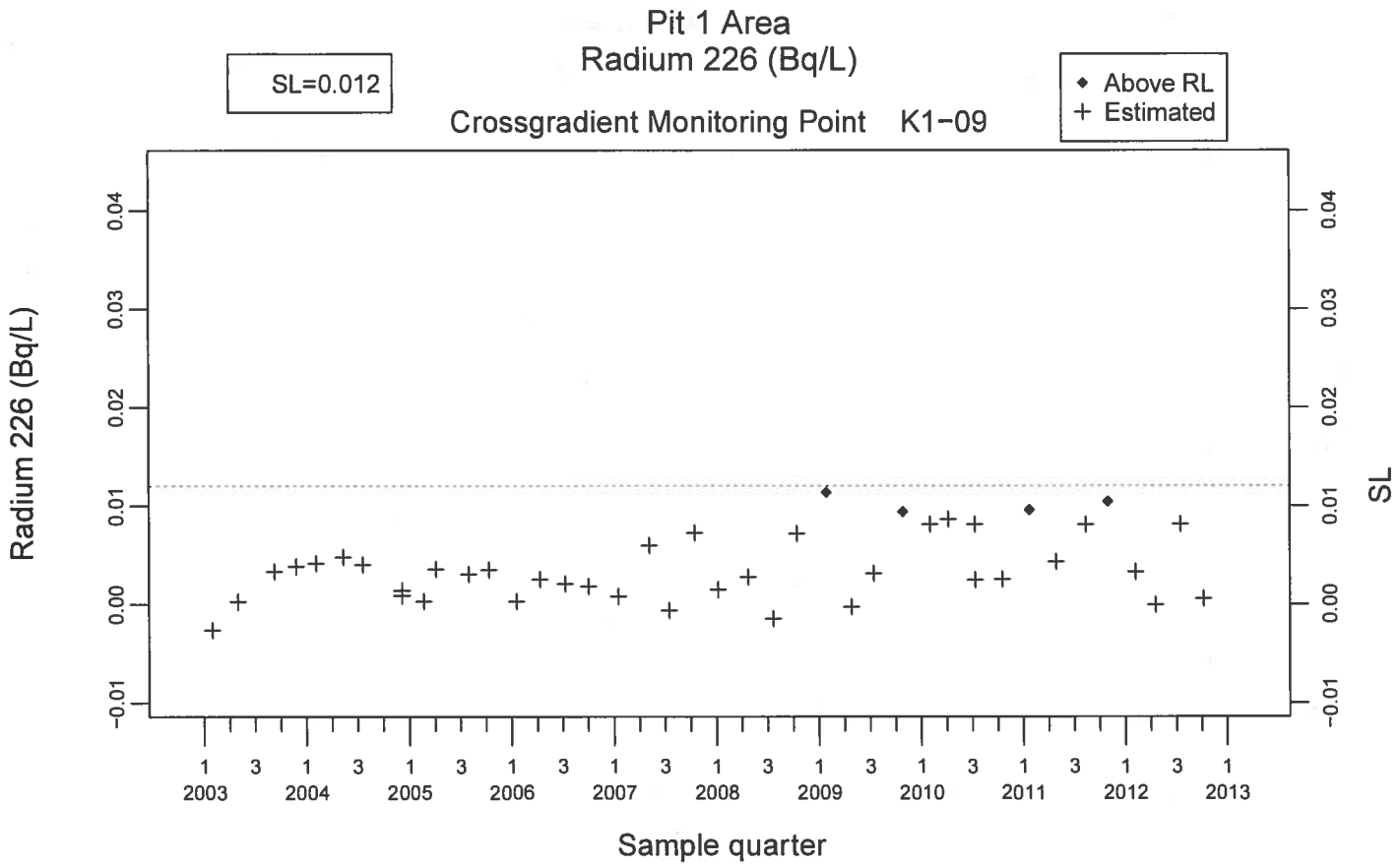

Background Monitoring Point K1-07
Radium 226 (Bq/L)
0.04
0.03
0.02
0.01
0.00
-0.01
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

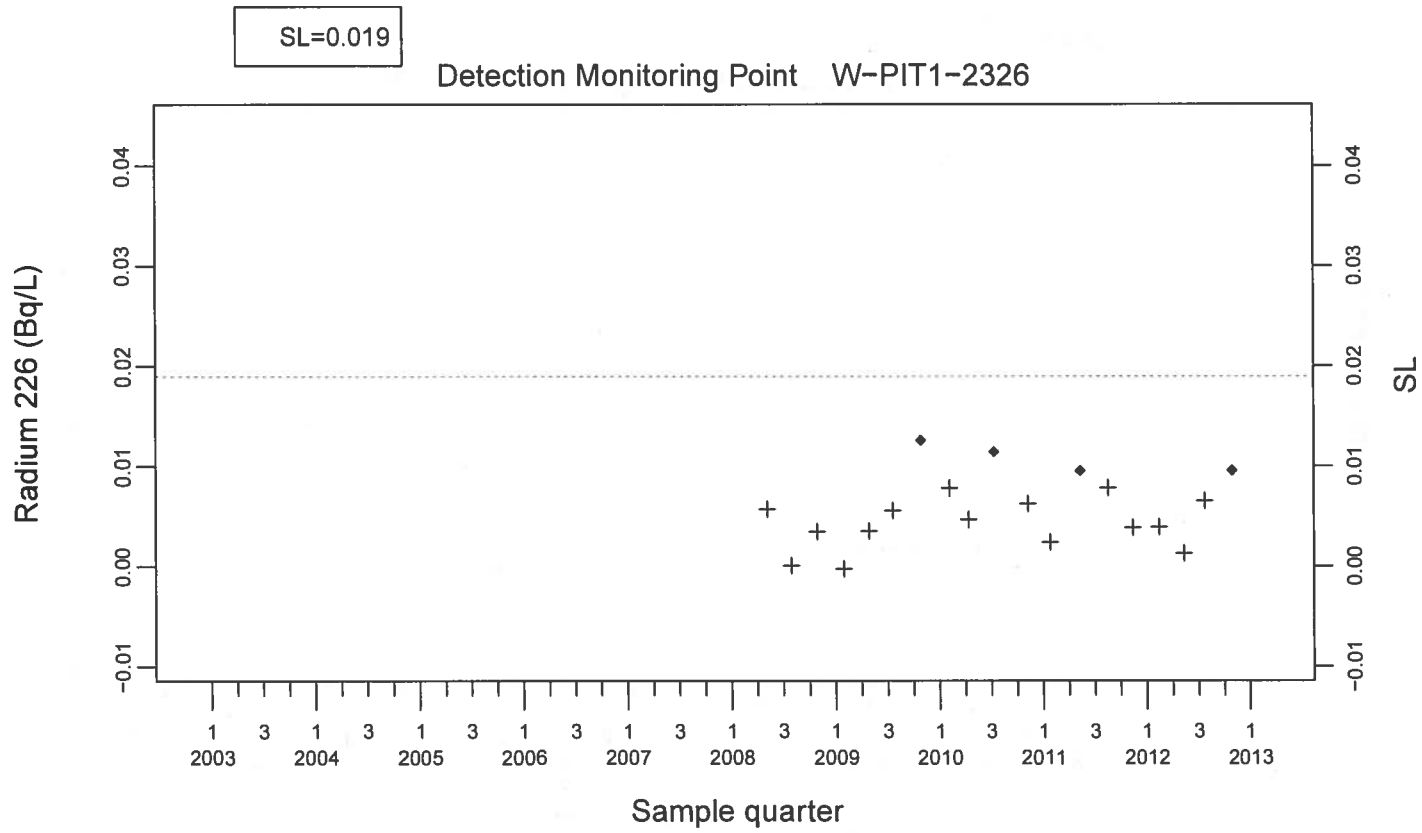

Pit 1 Area
Radium 226 (Bq/L)
SL=0.012
Above RL
Estimated
Detection Monitoring Point K1-02B
Radium 226 (Bq/L)
SL
Sample quarter

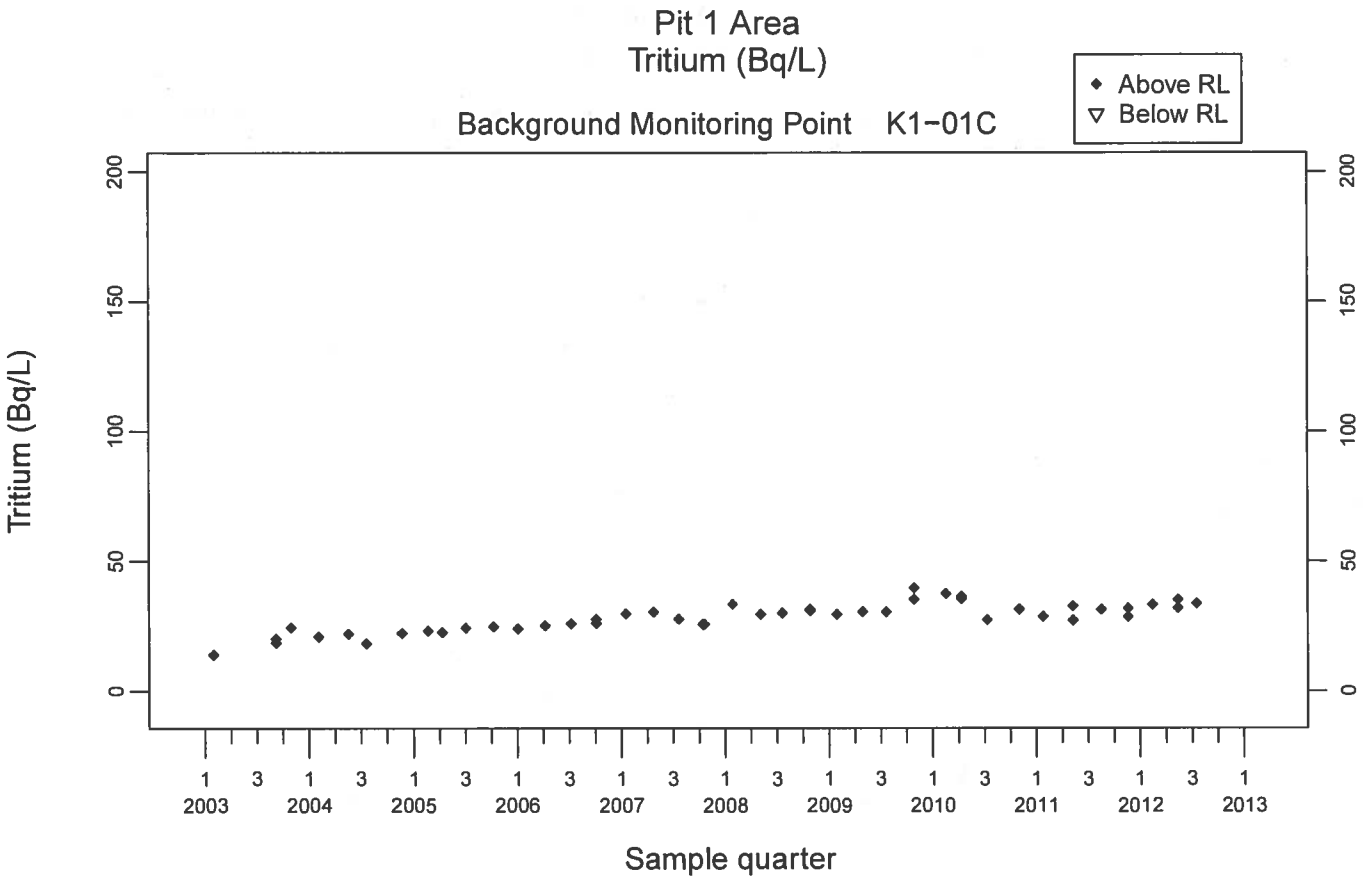

SL=0.012
Detection Monitoring Point K1-04
Radium 226 (Bq/L)
SL
Sample quarter

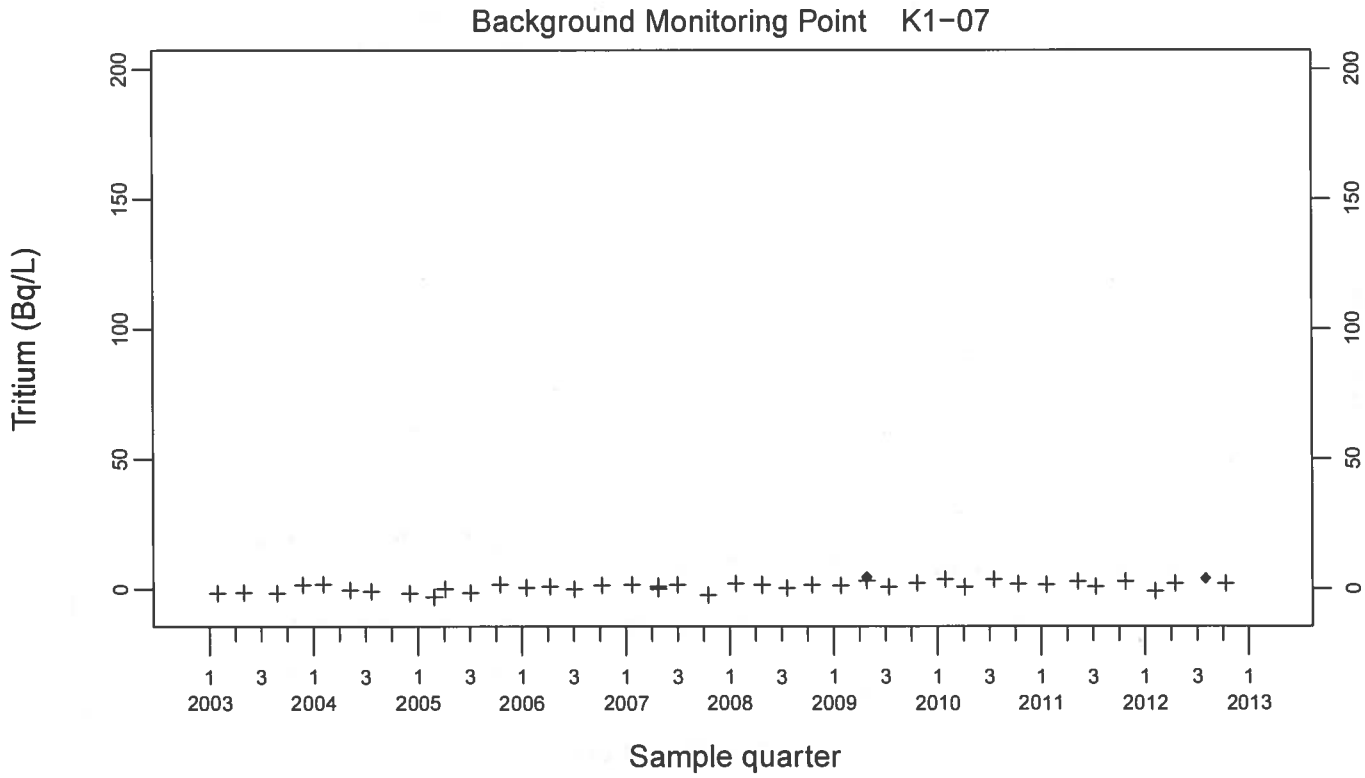

Pit 1 Area
Radium 226 (Bq/L)
SL=0.012
Above RL
Estimated
Detection Monitoring Point K1-05
Radium 226 (Bq/L)
SL
Sample quarter

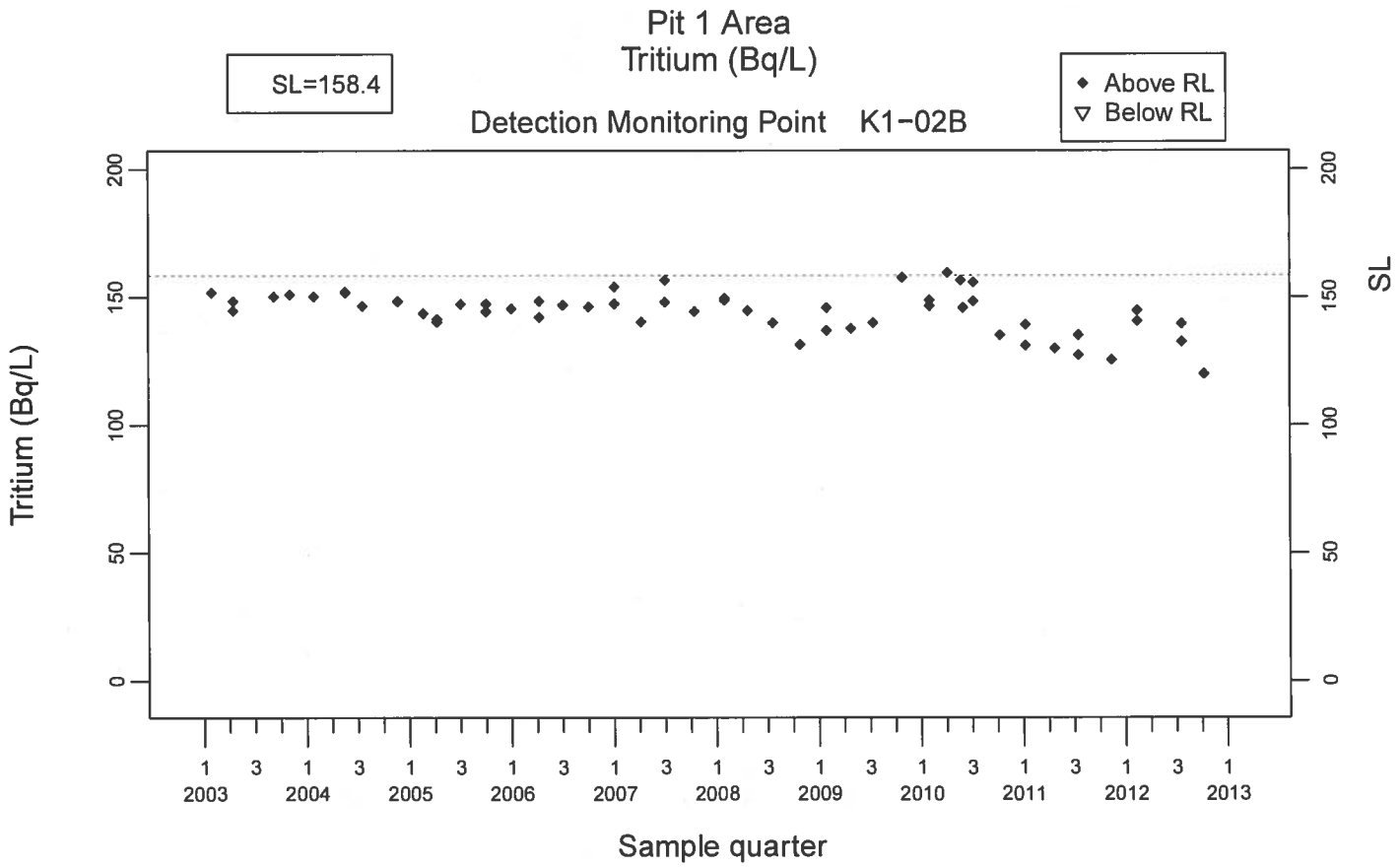

SL=0.009
Crossgradient Monitoring Point K1-08
Radium 226 (Bq/L)
SL
Sample quarter

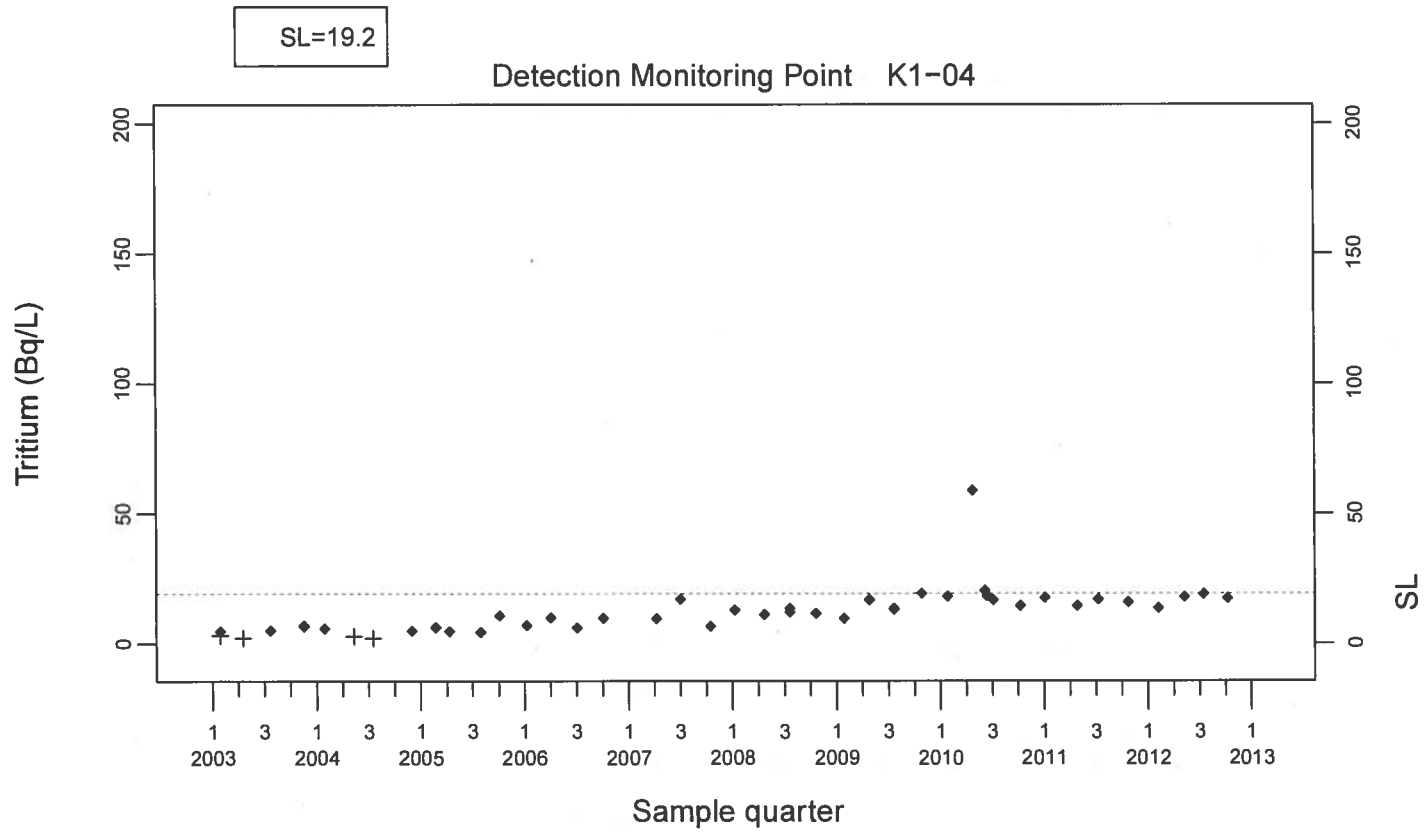

Pit 1 Area
Radium 226 (Bq/L)
SL=0.012
Crossgradient Monitoring Point K1-09
Above RL
Estimated
Radium 226 (Bq/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

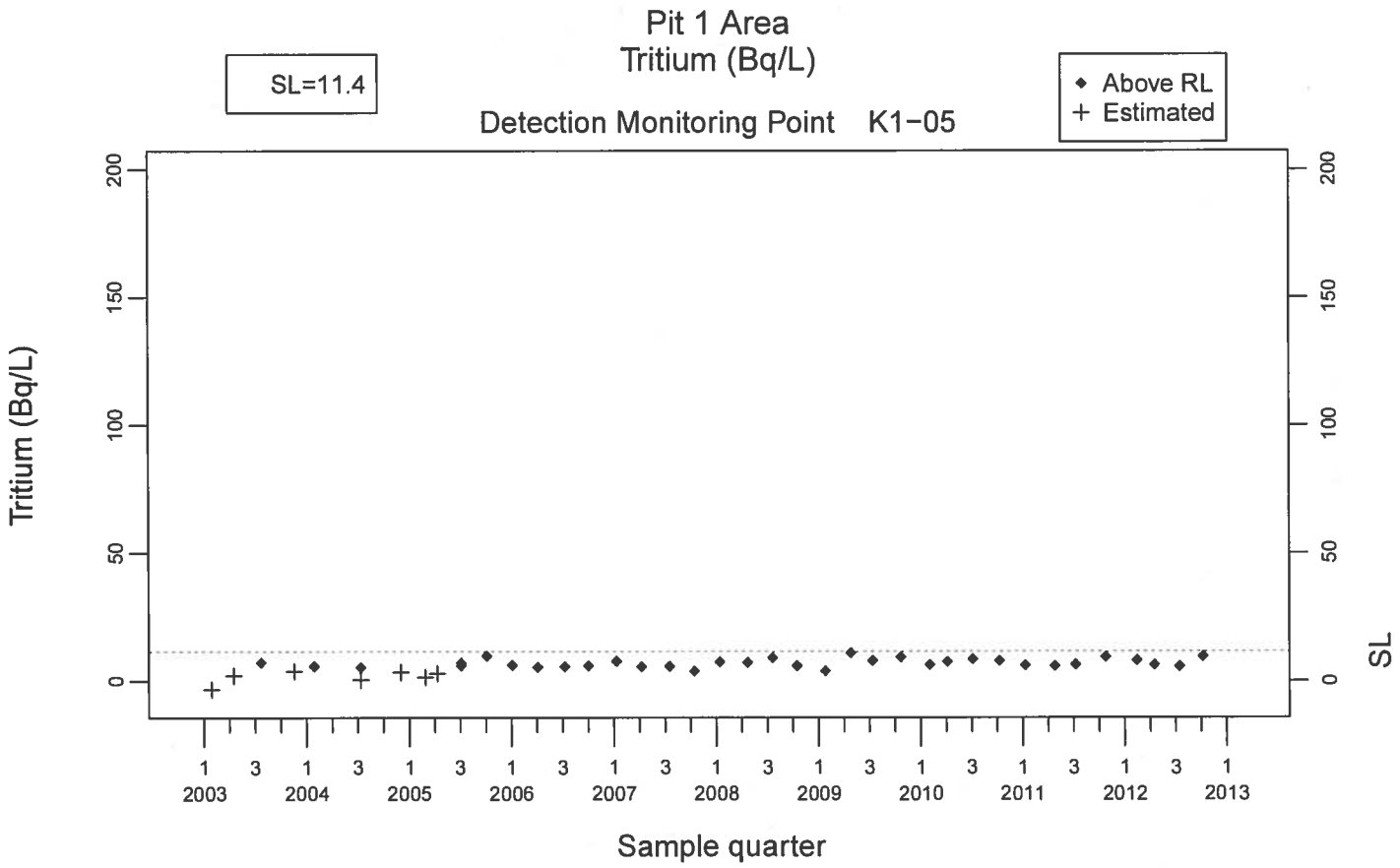

SL=0.019
Detection Monitoring Point W-PIT1-2326
Radium 226 (Bq/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

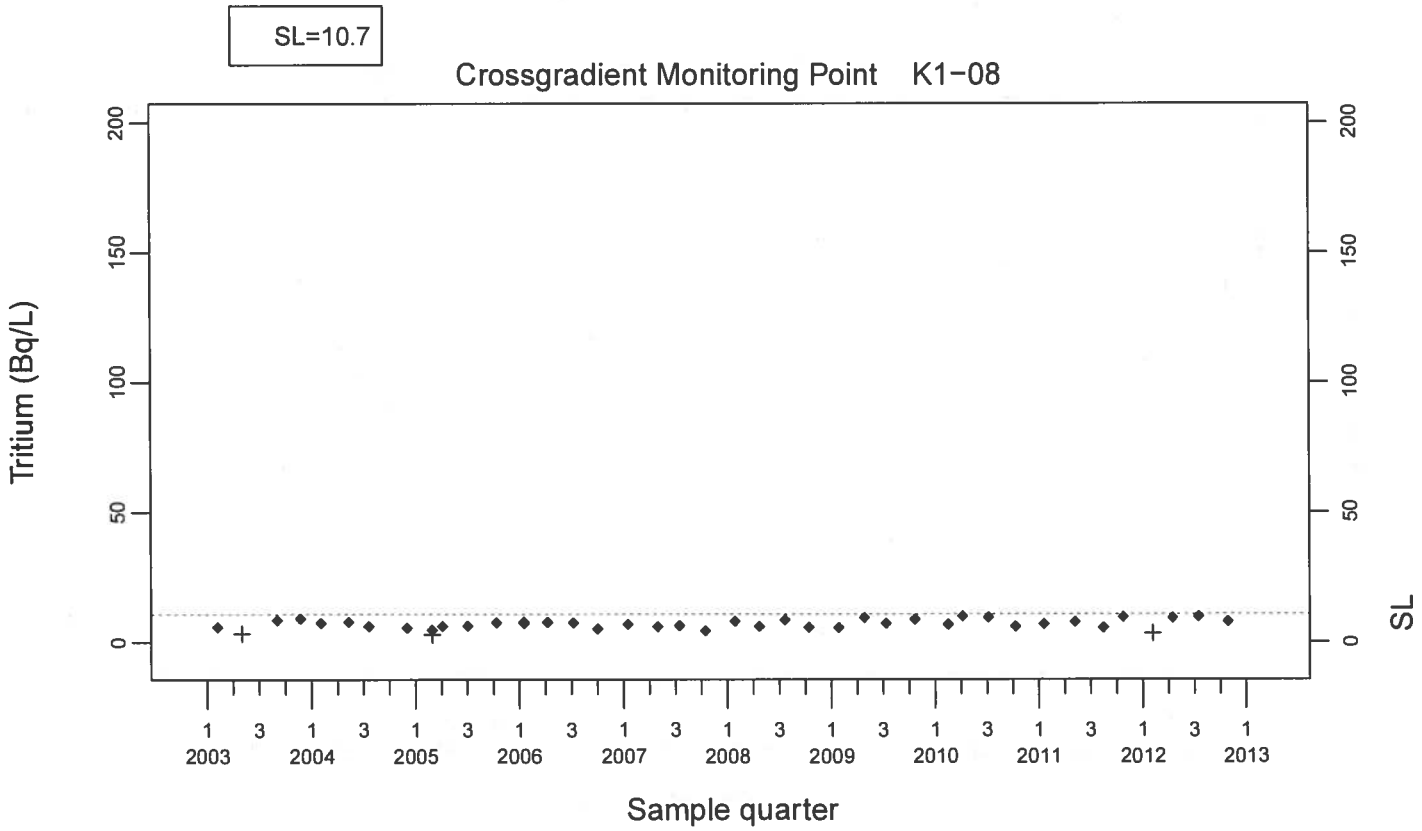

Pit 1 Area
Tritium (Bq/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Tritium (Bq/L)
0
50
100
150
200
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

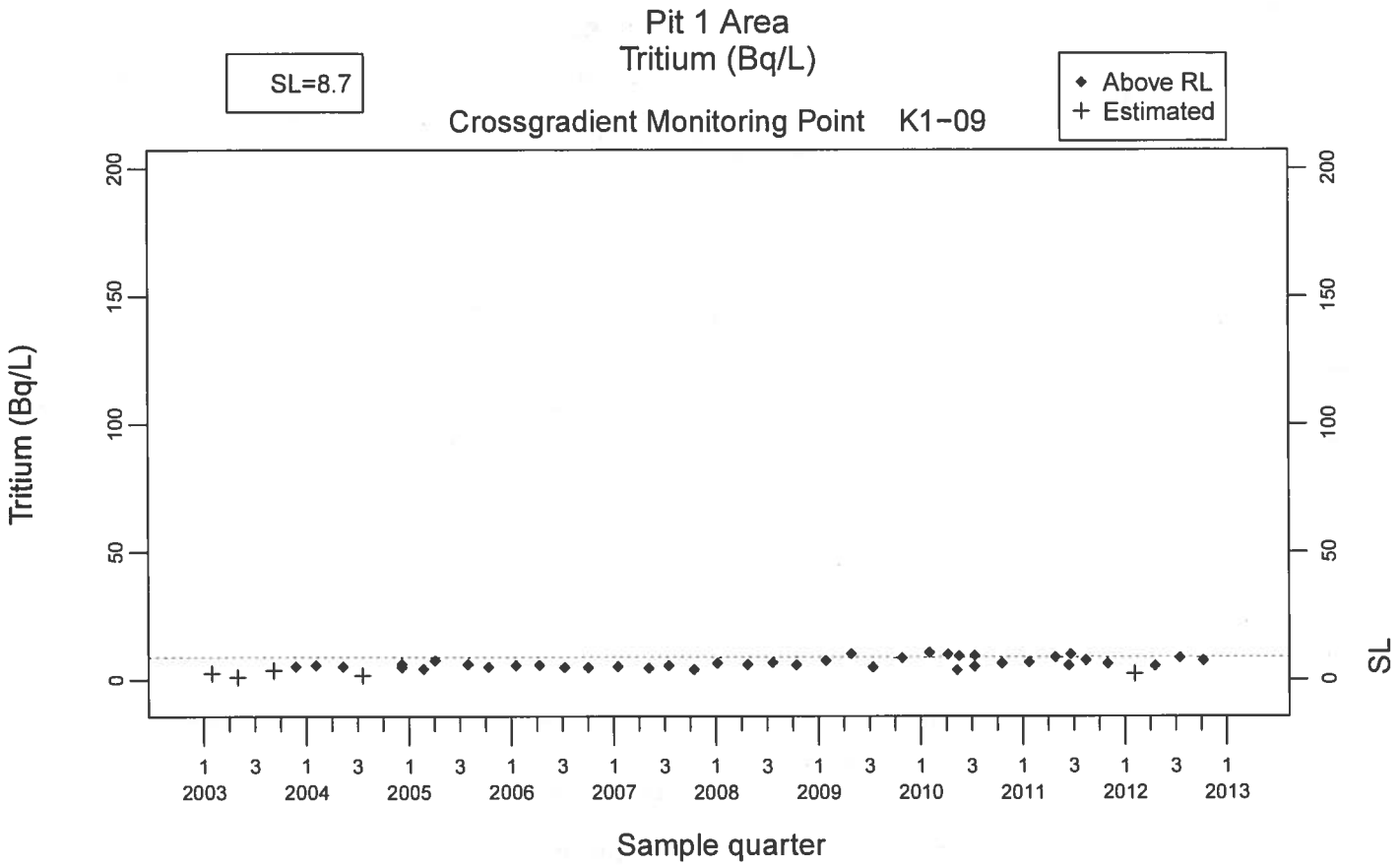

Background Monitoring Point K1-07
Tritium (Bq/L)
0
50
100
150
200
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

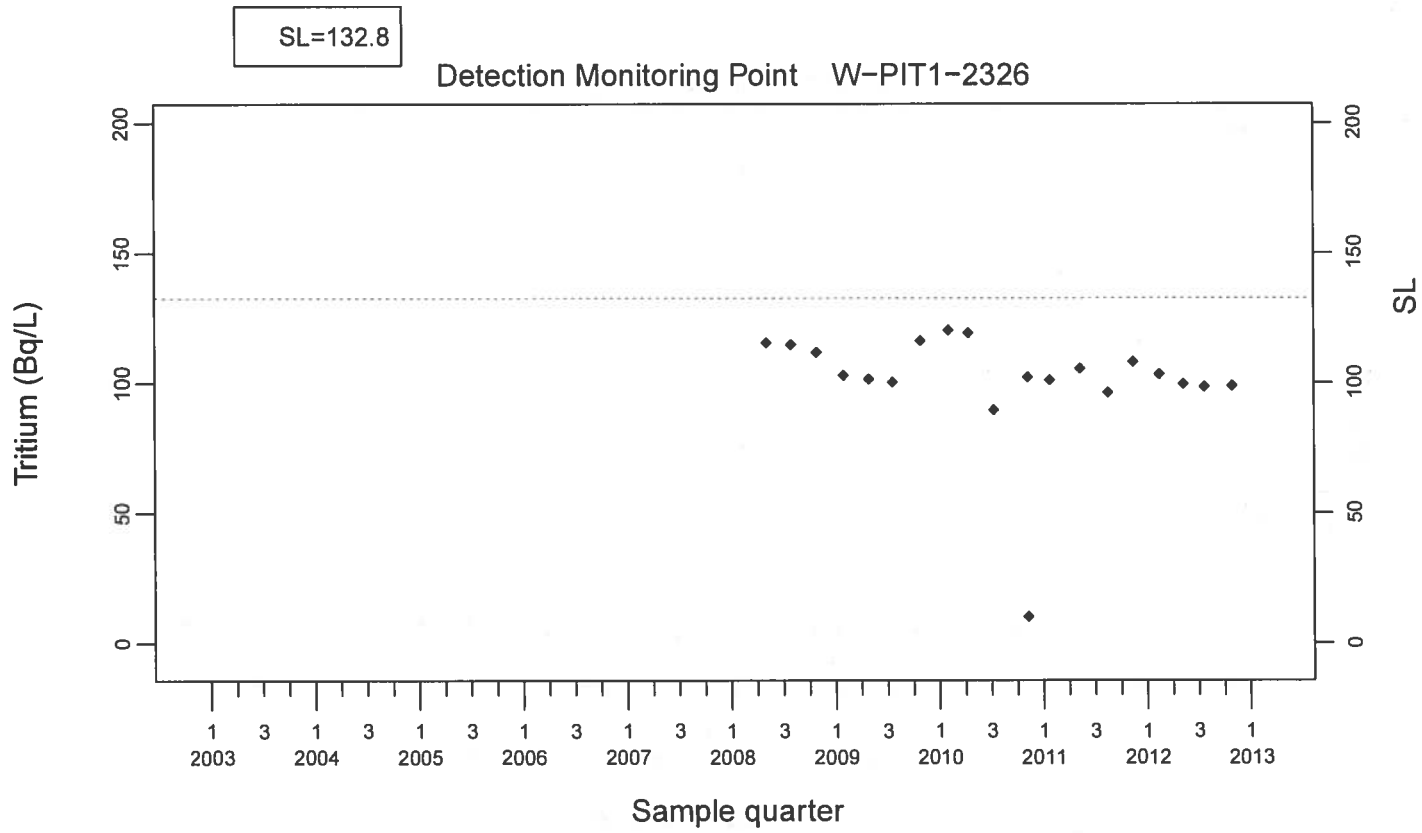

Pit 1 Area
Tritium (Bq/L)
SL=158.4
Above RL
Below RL
Detection Monitoring Point K1-02B
Tritium (Bq/L)
SL
0
50
100
150
200
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

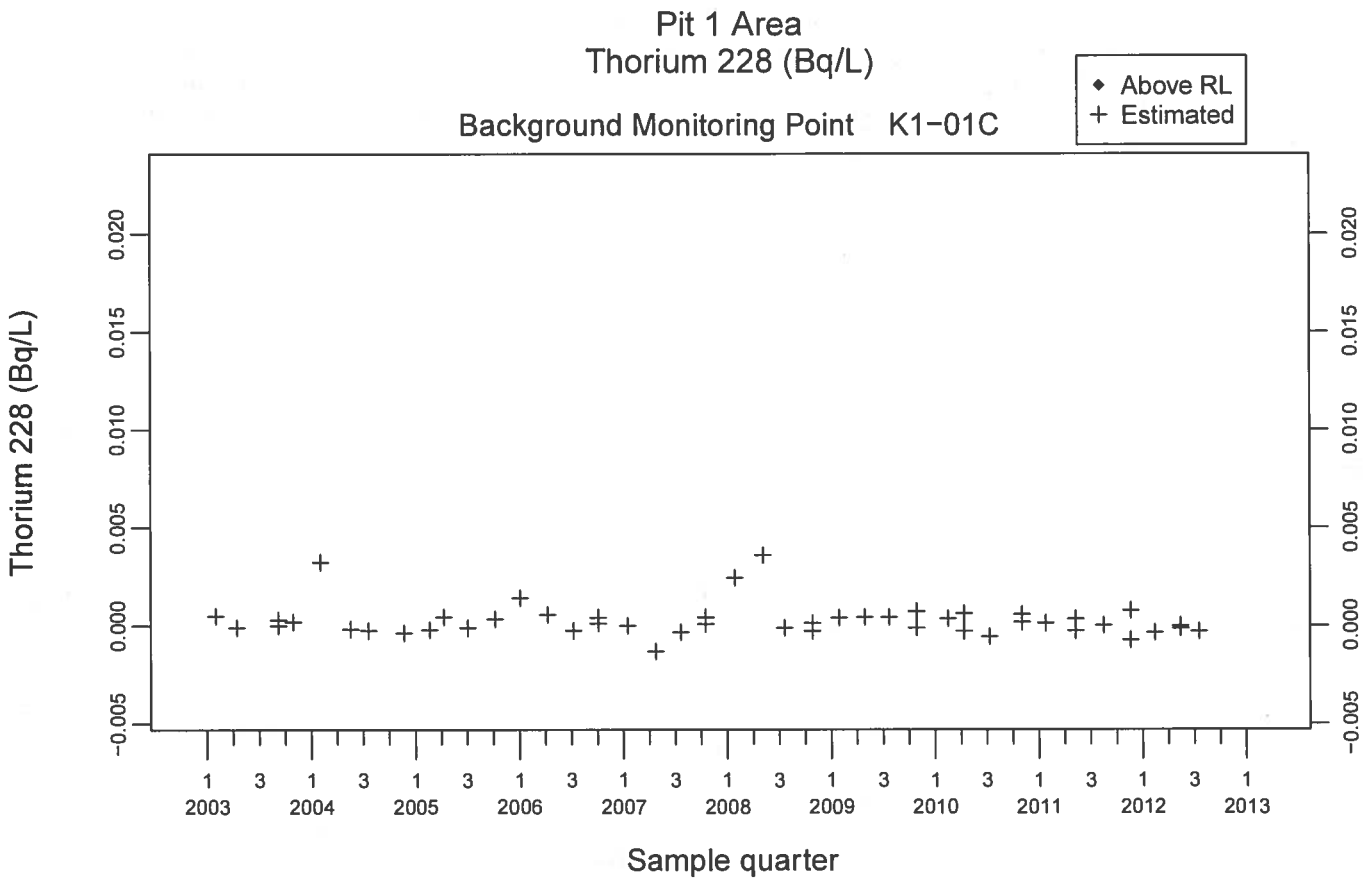

SL=19.2
Detection Monitoring Point K1-04
Tritium (Bq/L)
SL
0
50
100
150
200
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

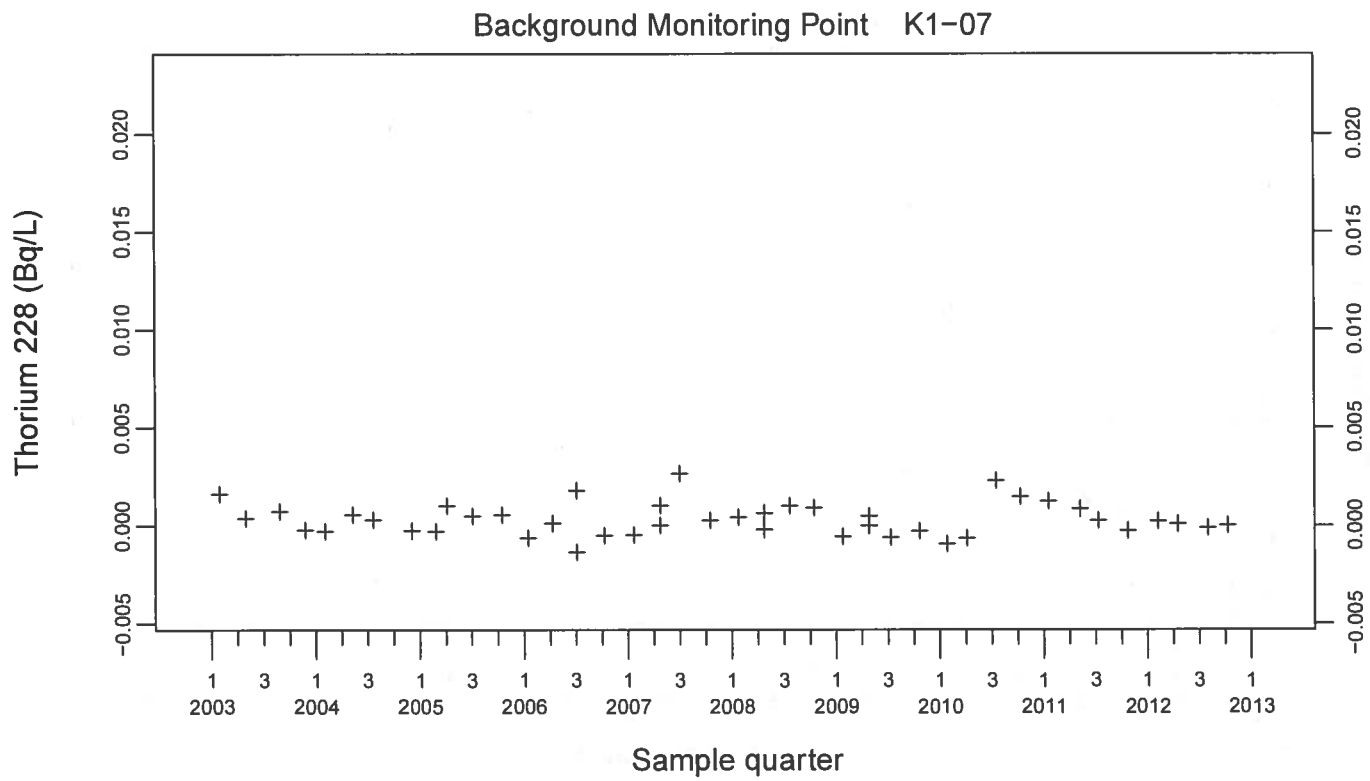

Pit 1 Area
Tritium (Bq/L)
SL=11.4
Above RL
Estimated
Detection Monitoring Point K1-05
Tritium (Bq/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

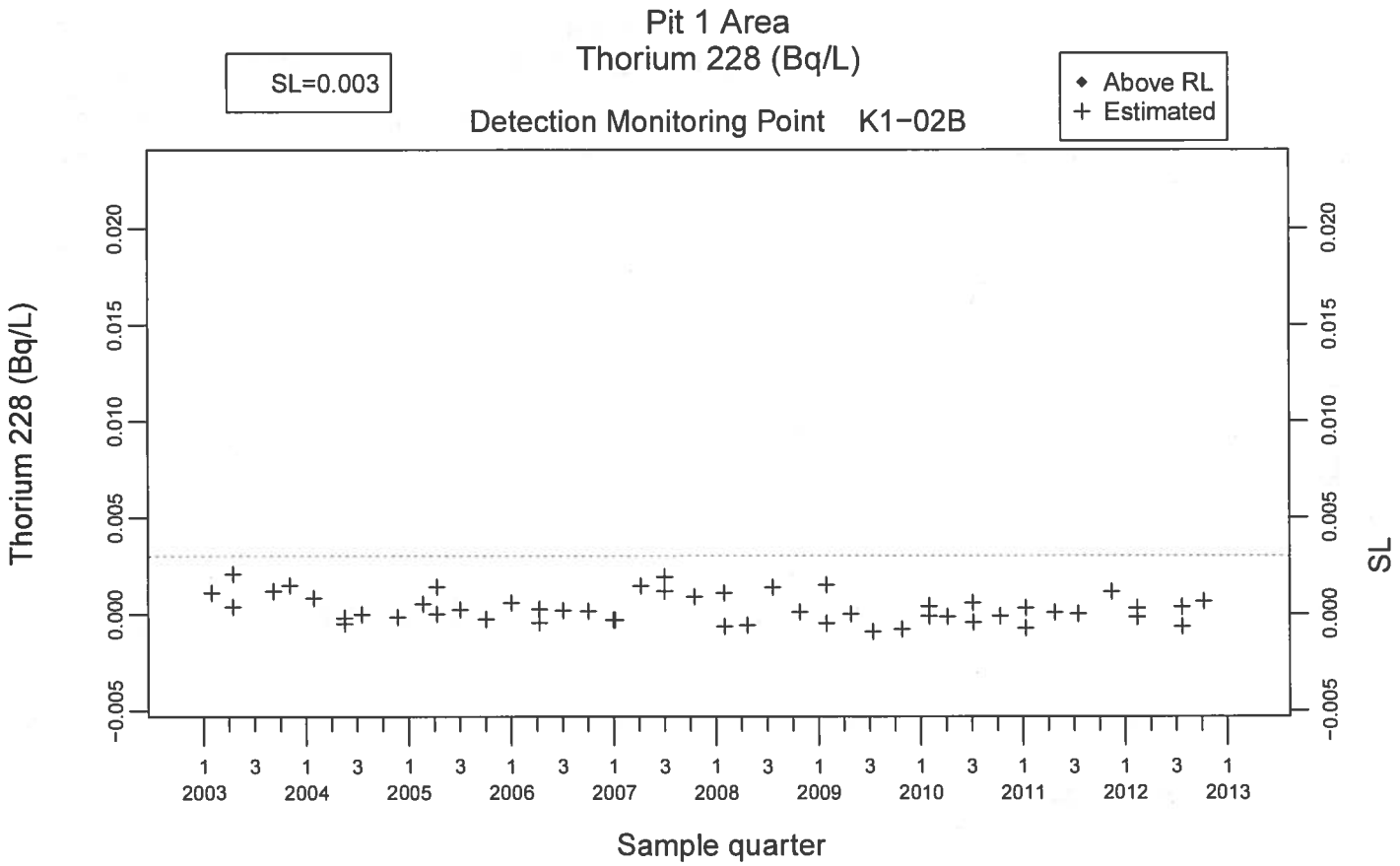

SL=10.7
Crossgradient Monitoring Point K1-08
Tritium (Bq/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

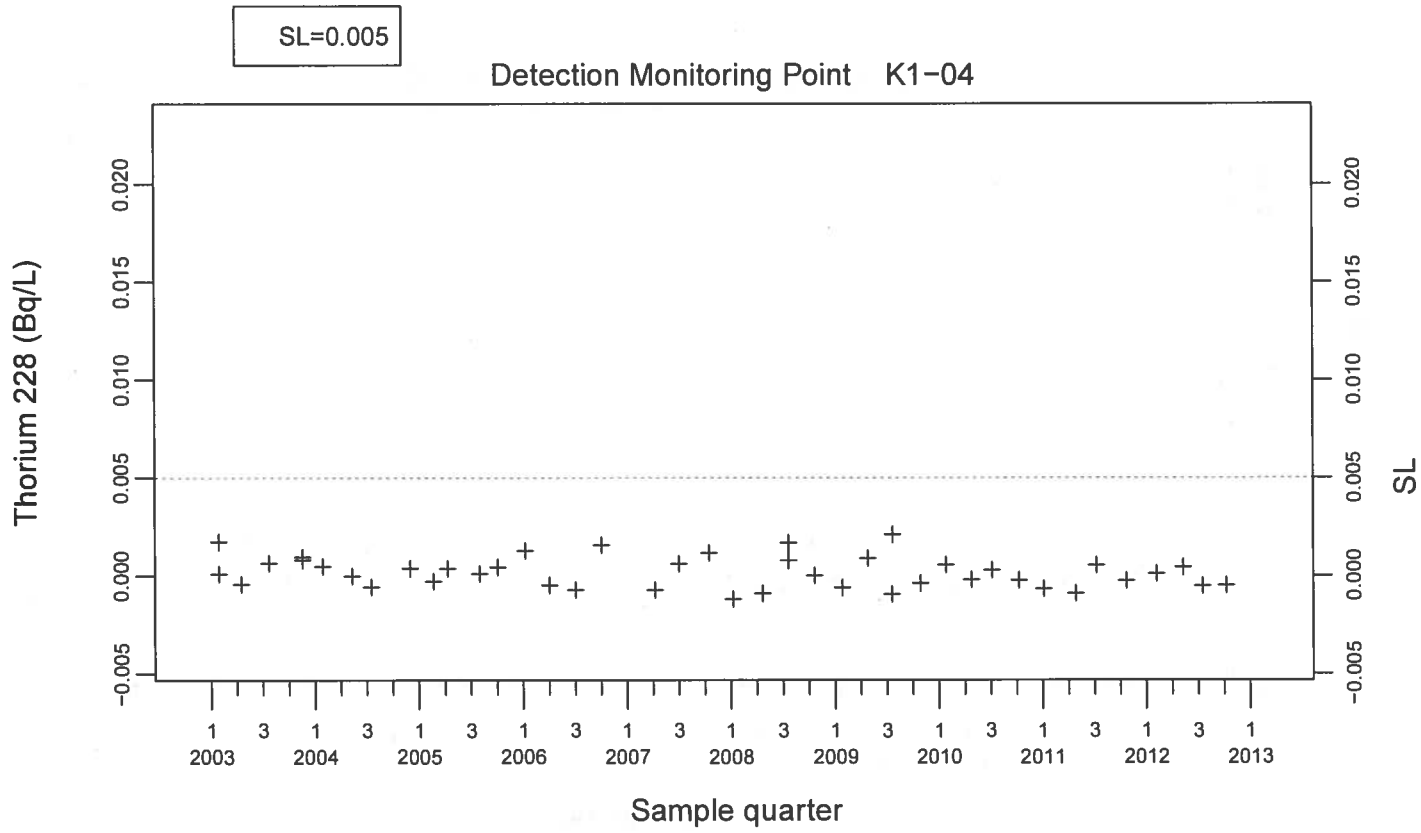

Pit 1 Area
Tritium (Bq/L)
SL=8.7
Crossgradient Monitoring Point K1-09
Above RL
Estimated
Tritium (Bq/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

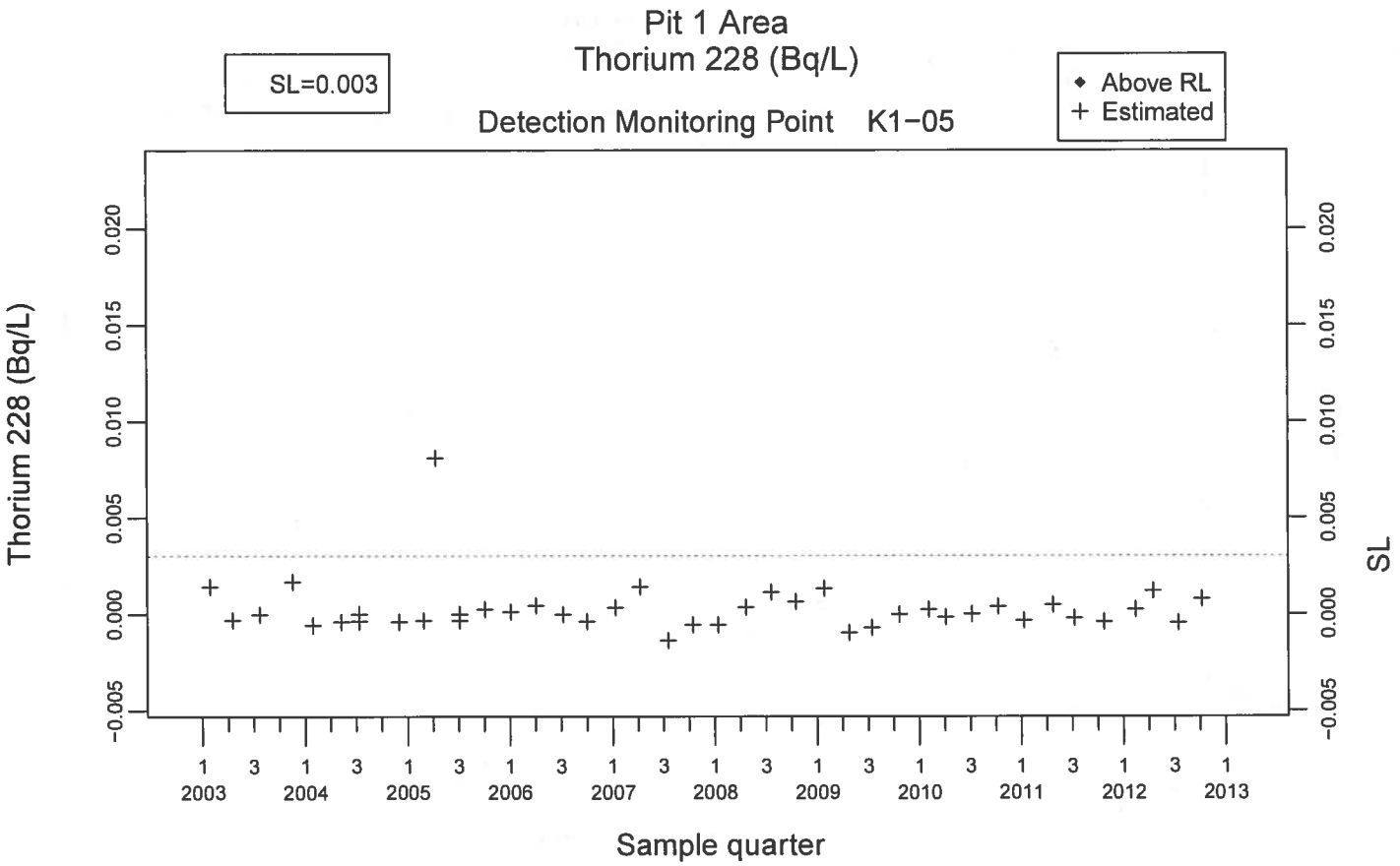

SL=132.8
Detection Monitoring Point W-PIT1-2326
Tritium (Bq/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

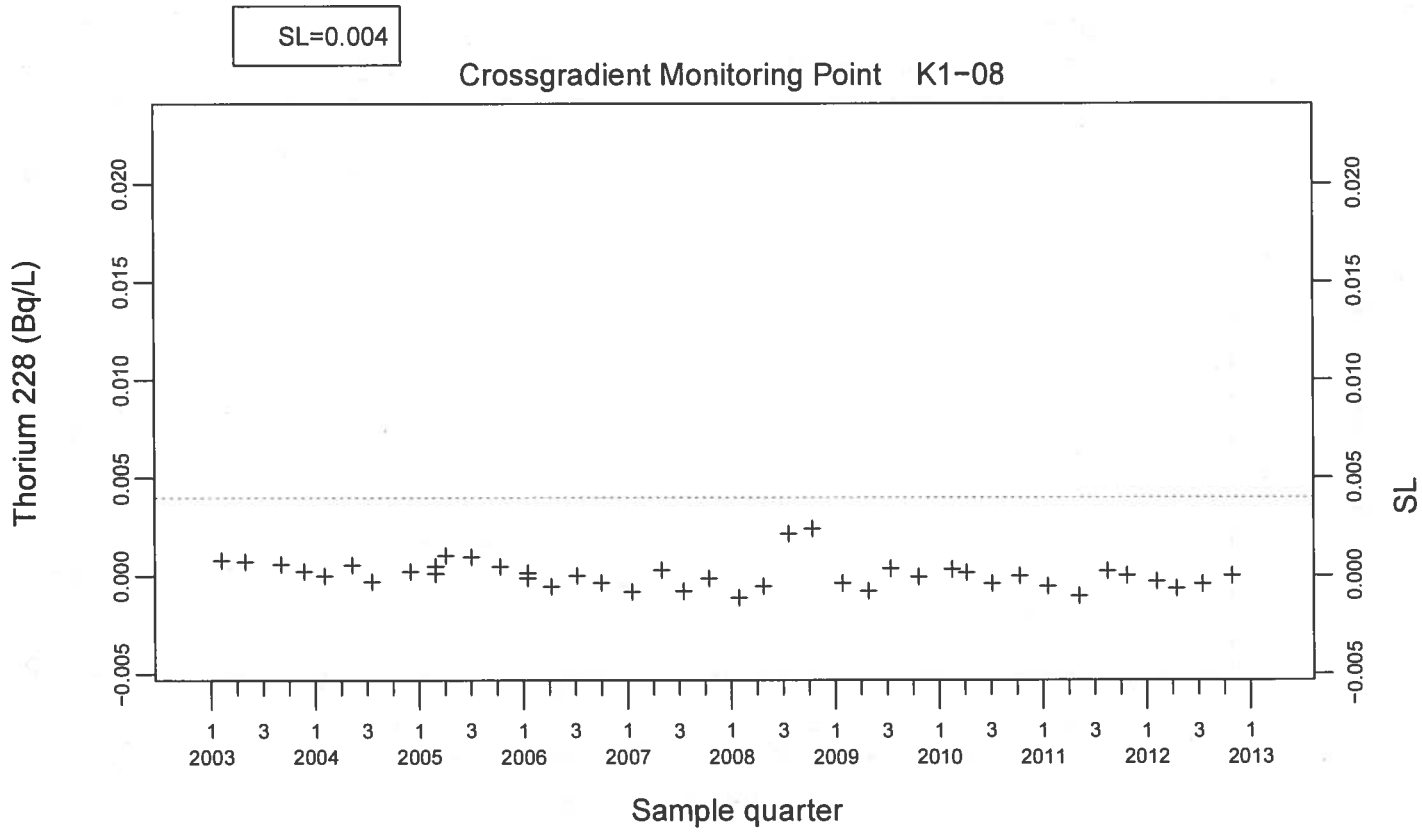

Pit 1 Area
Thorium 228 (Bq/L)
Background Monitoring Point K1-01C
Above RL
Estimated
Thorium 228 (Bq/L)
0.020
0.015
0.010
0.005
0.000
-0.005
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

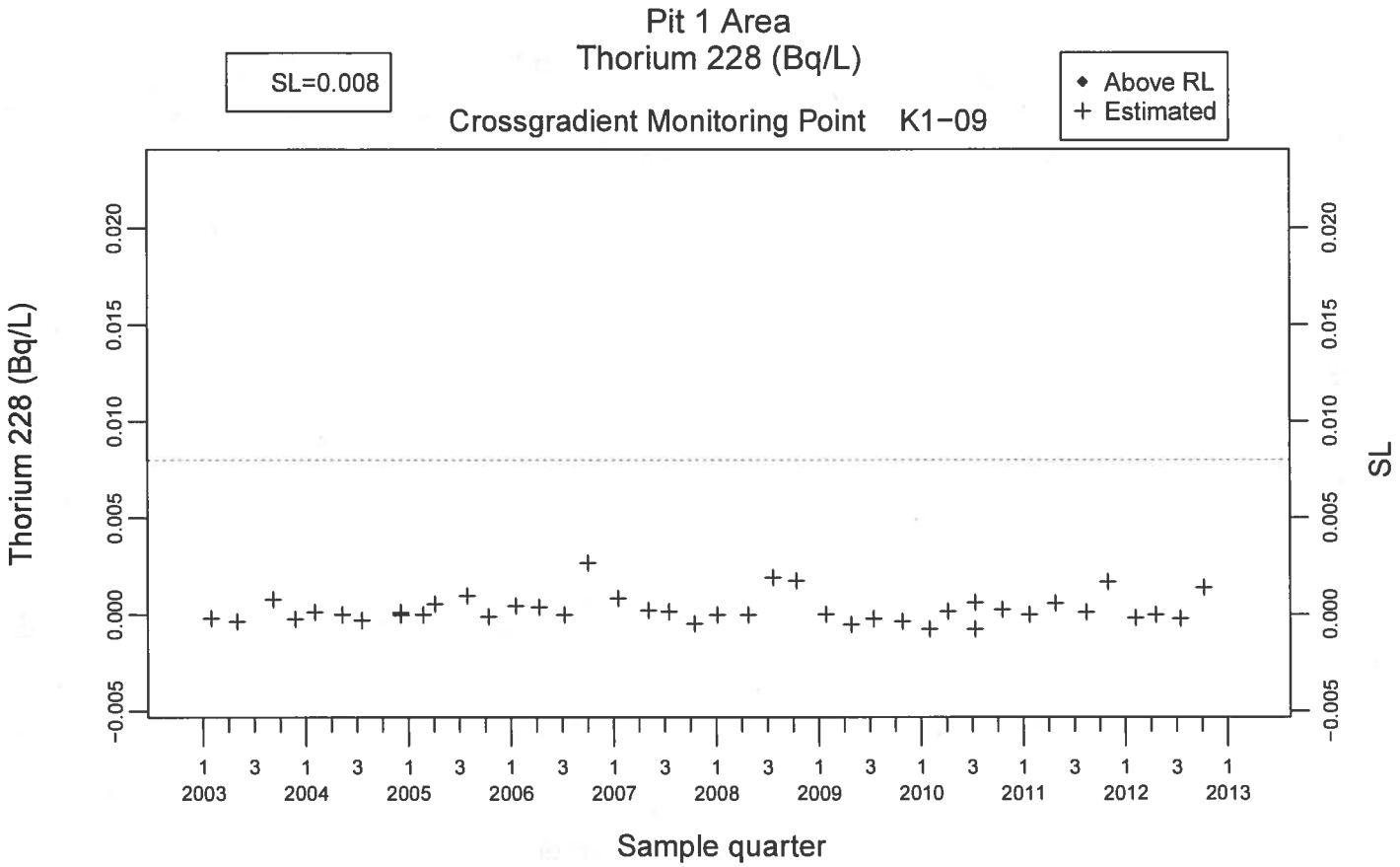

Background Monitoring Point K1-07
Thorium 228 (Bq/L)
0.020
0.015
0.010
0.005
0.000
-0.005
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

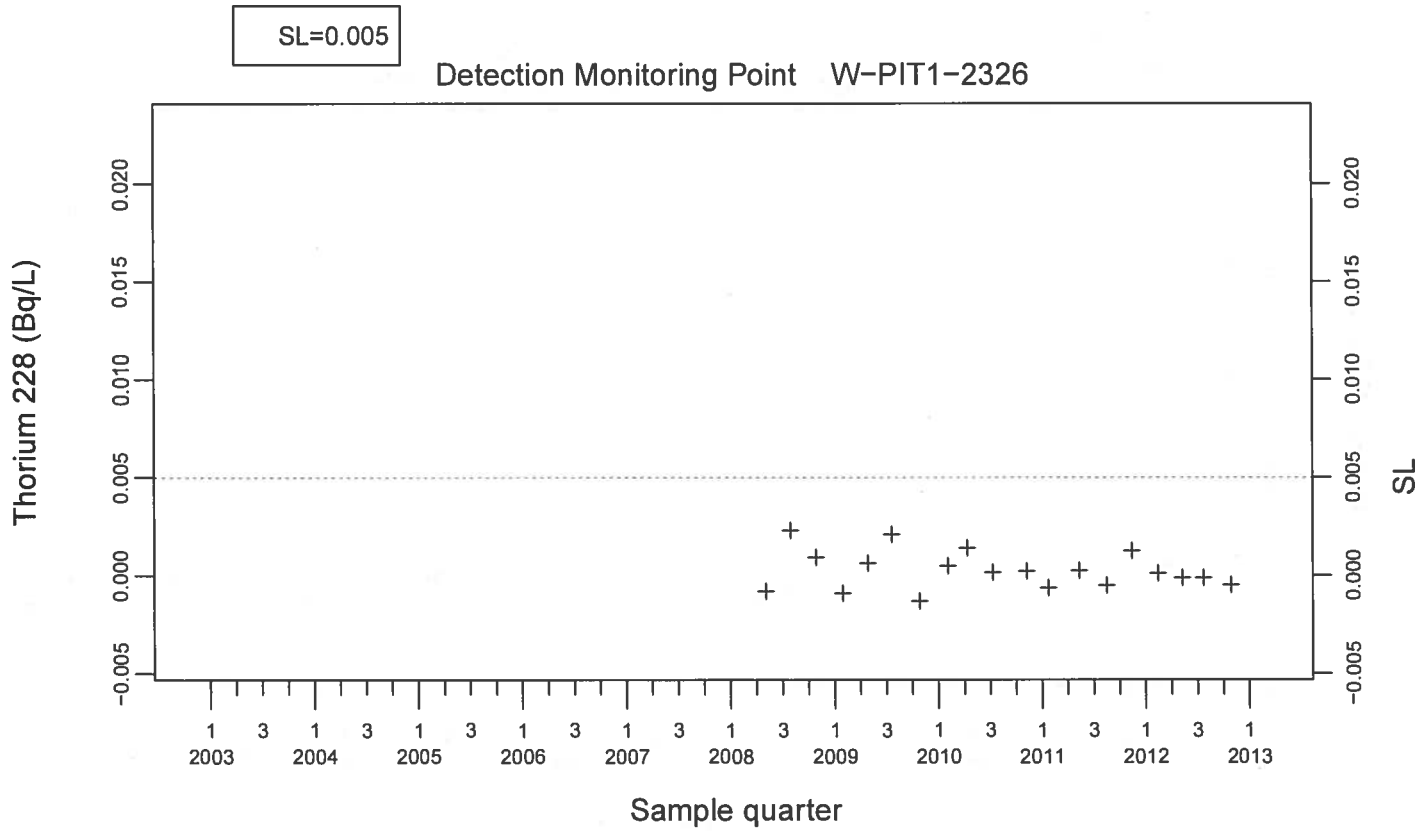

Pit 1 Area
Thorium 228 (Bq/L)
SL=0.003
Detection Monitoring Point K1-02B
Above RL
Estimated
Thorium 228 (Bq/L)
SL
Sample quarter

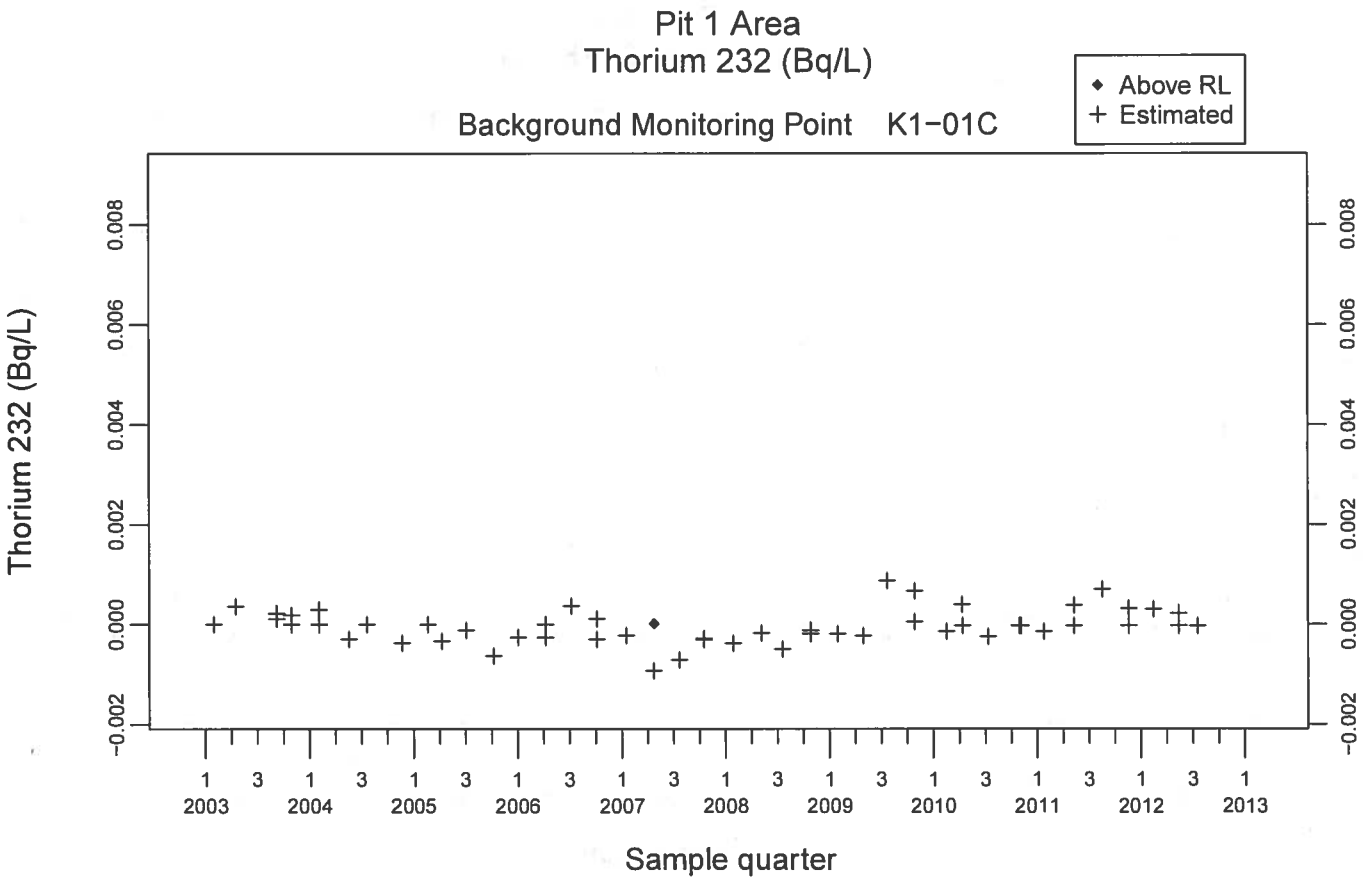

SL=0.005
Detection Monitoring Point K1-04
Thorium 228 (Bq/L)
SL
Sample quarter

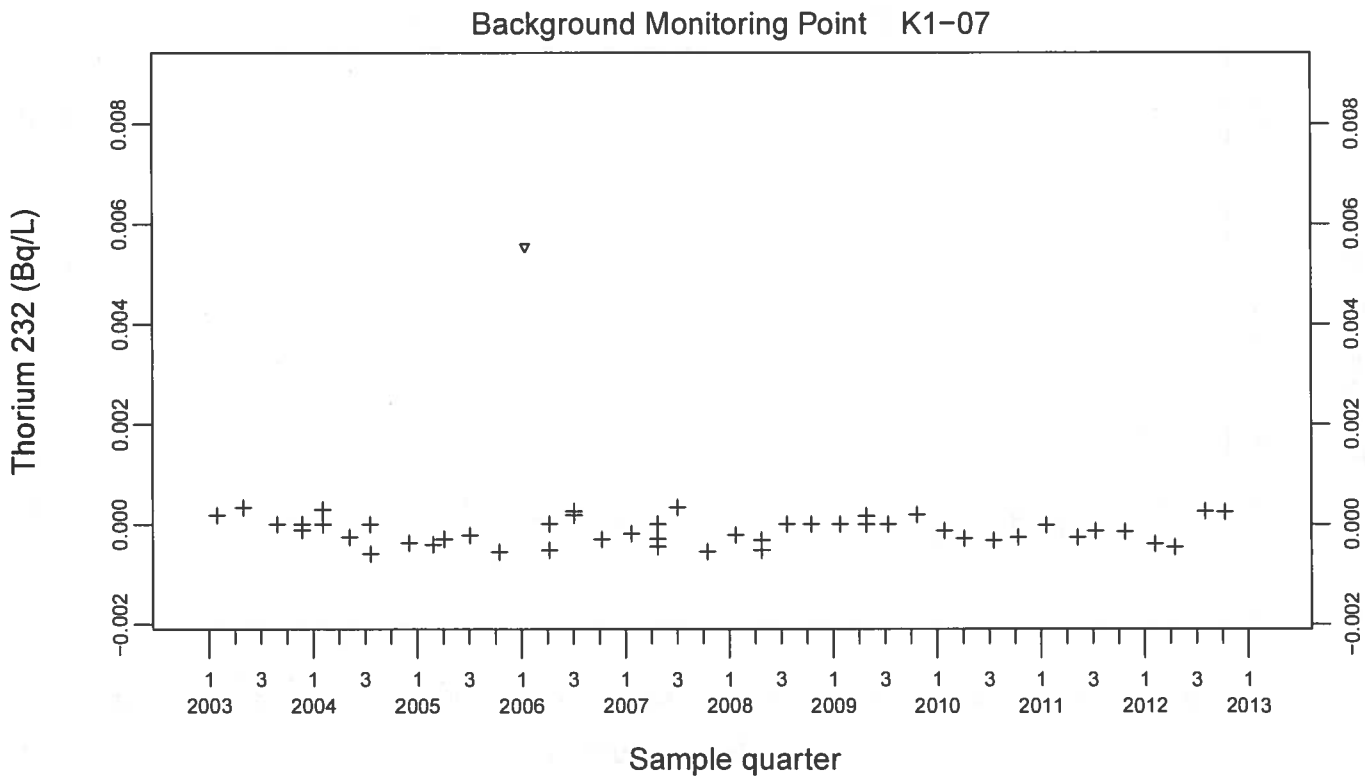

Pit 1 Area
Thorium 228 (Bq/L)
SL=0.003
Above RL
Estimated
Detection Monitoring Point K1-05
Thorium 228 (Bq/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

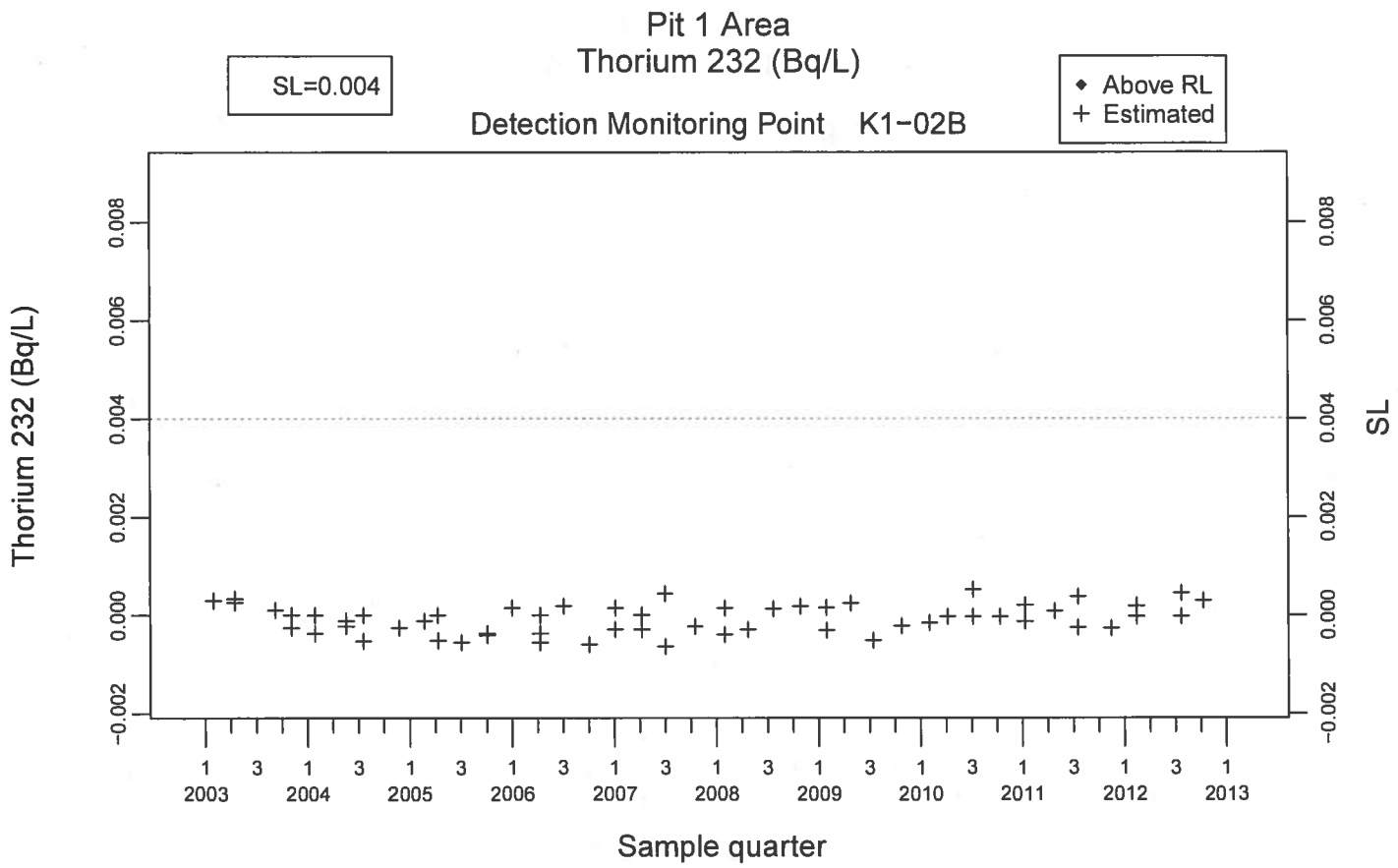

SL=0.004
Crossgradient Monitoring Point K1-08
Thorium 228 (Bq/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

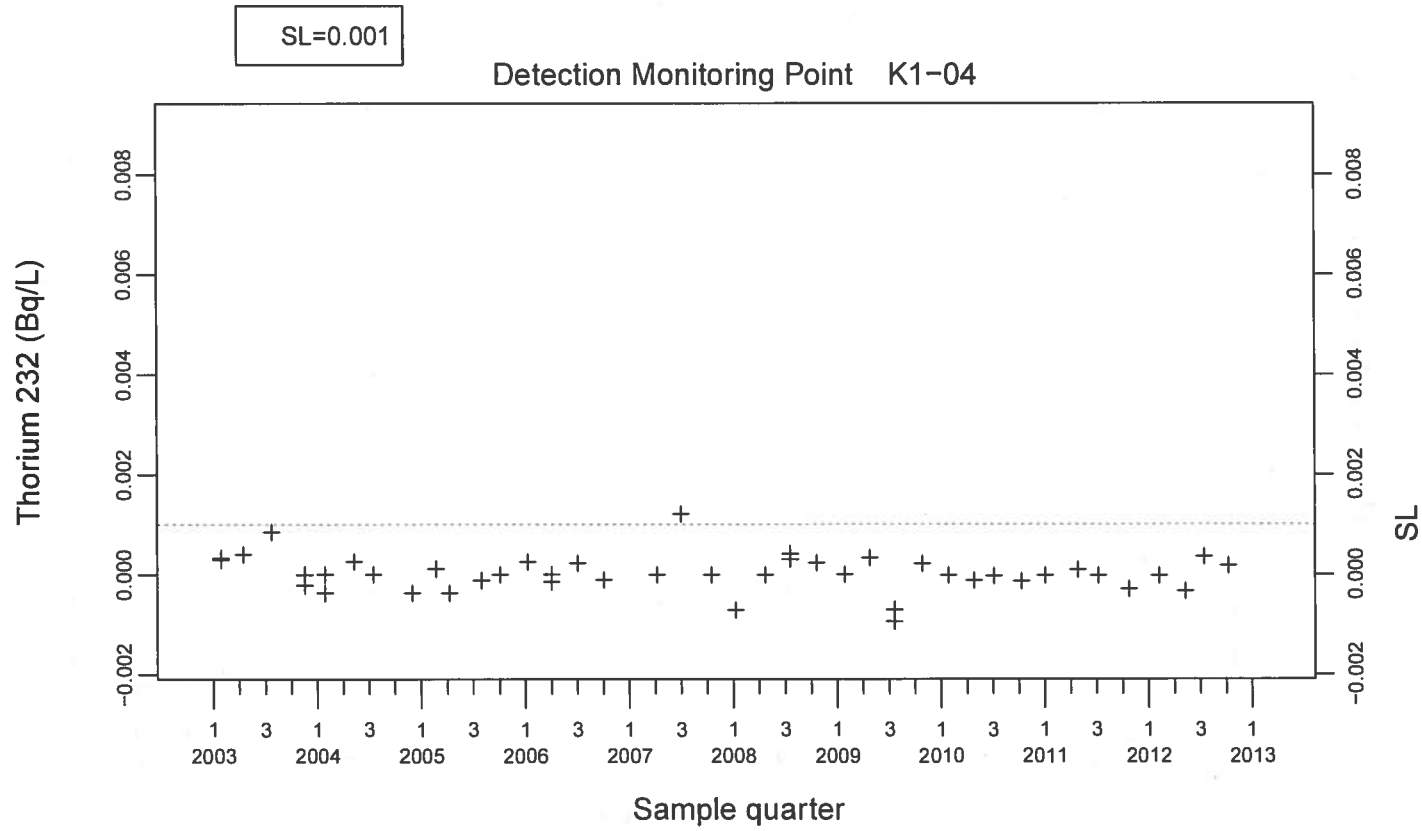

Pit 1 Area
Thorium 228 (Bq/L)
SL=0.008
Crossgradient Monitoring Point K1-09
Above RL
Estimated
Thorium 228 (Bq/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

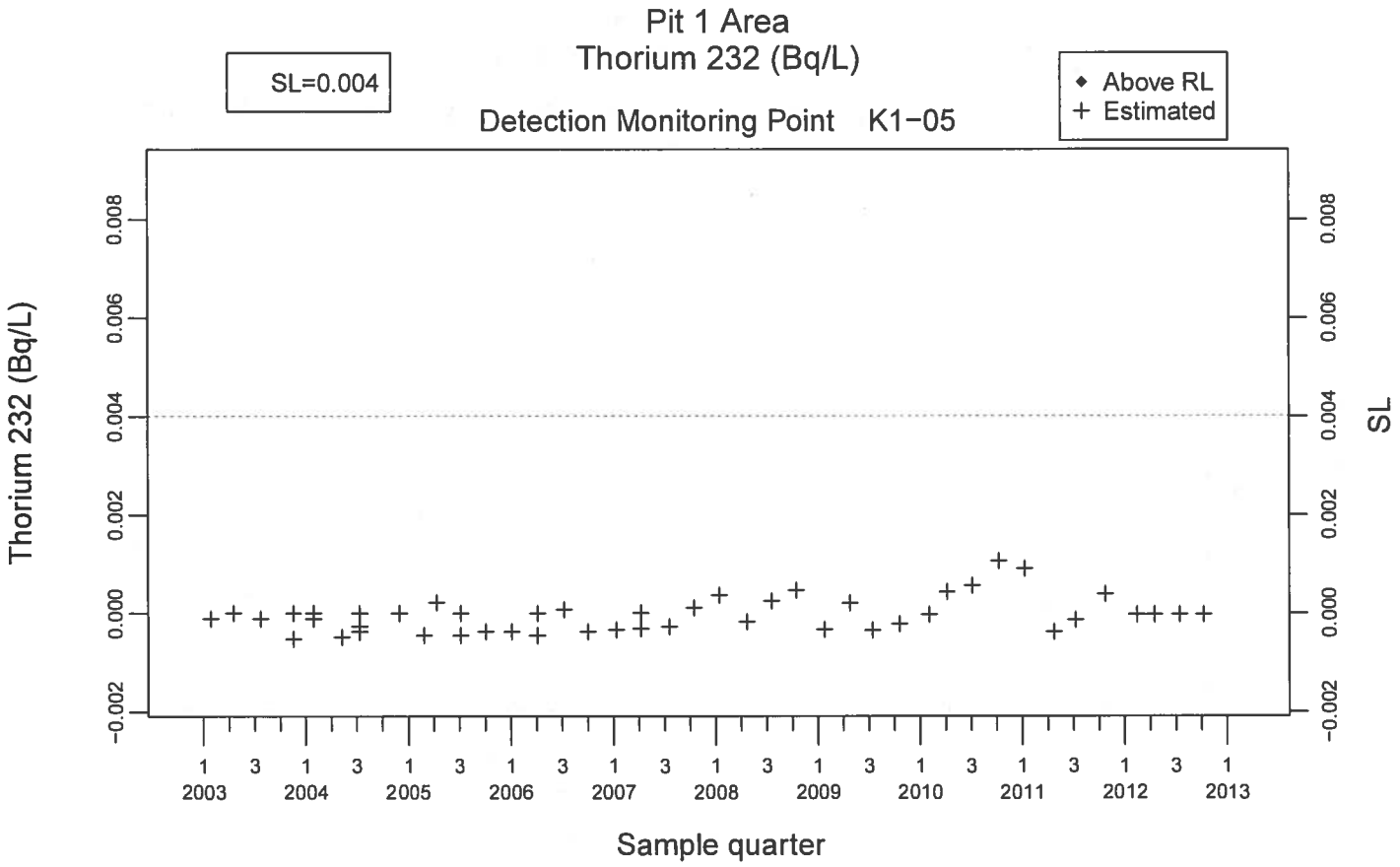

SL=0.005
Detection Monitoring Point W-PIT1-2326
Thorium 228 (Bq/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

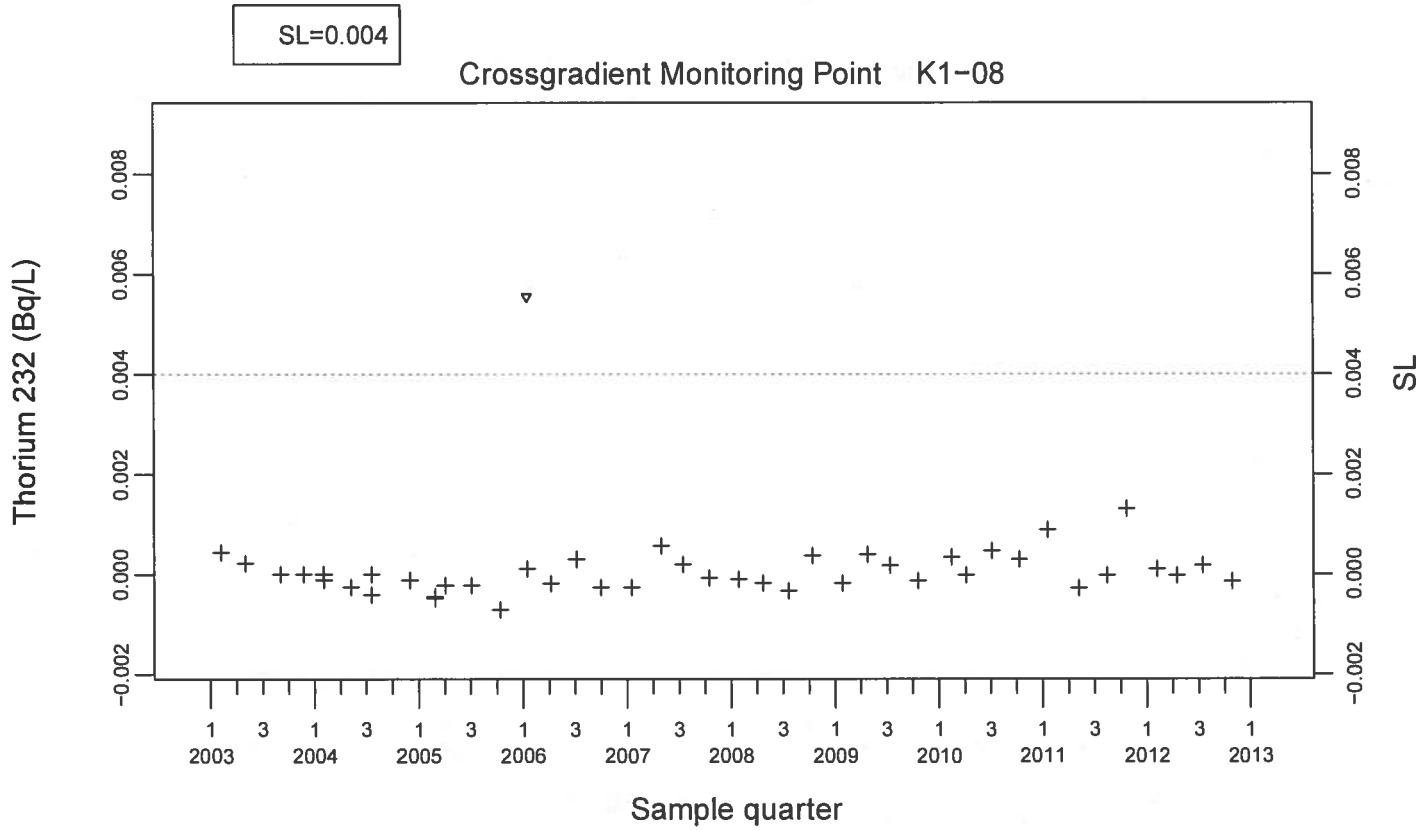

Pit 1 Area
Thorium 232 (Bq/L)
Background Monitoring Point K1-01C
Above RL
Estimated
Thorium 232 (Bq/L)
0.008
0.006
0.004
0.002
0.000
-0.002
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

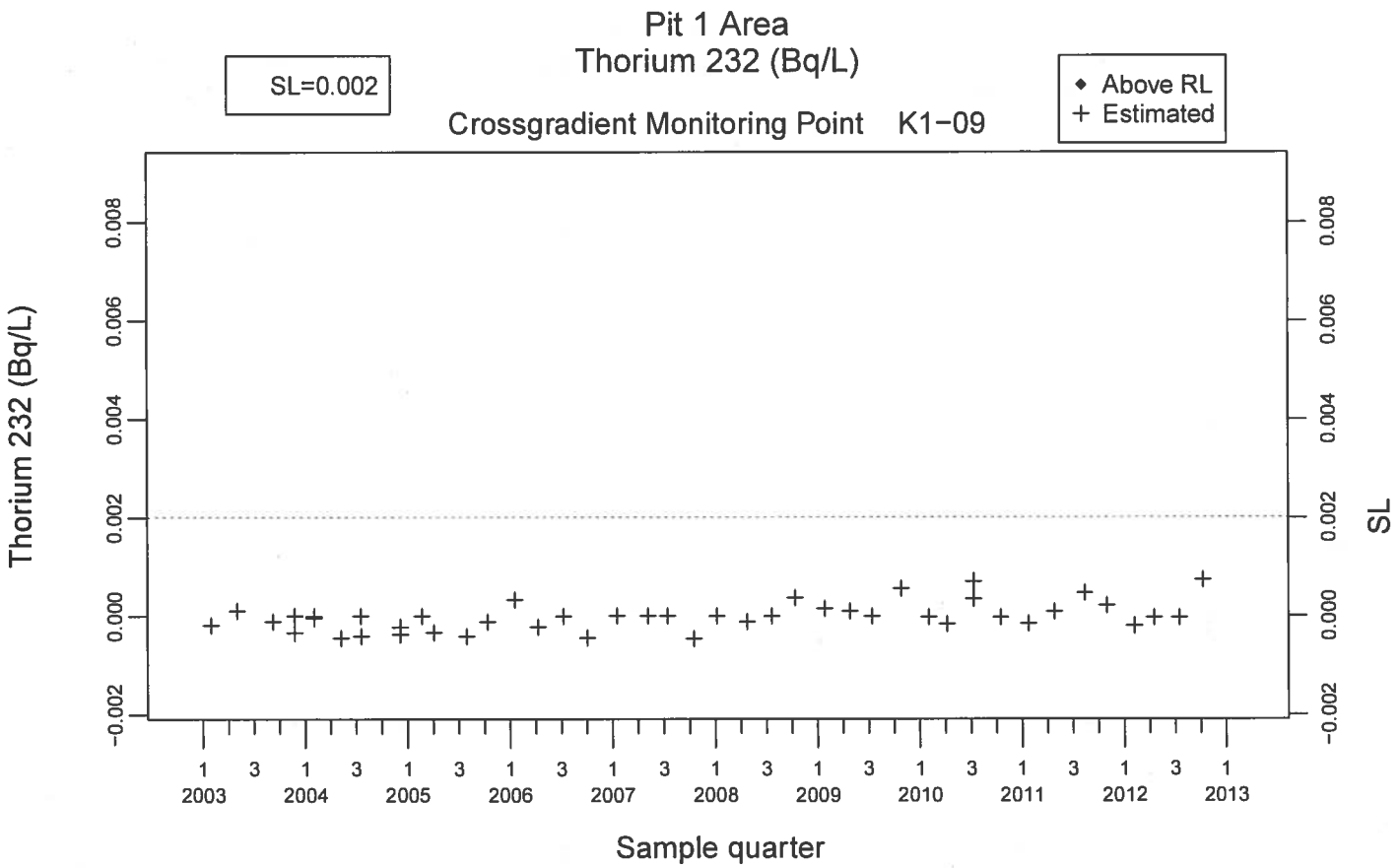

Background Monitoring Point K1-07
Thorium 232 (Bq/L)
0.008
0.006
0.004
0.002
0.000
-0.002
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

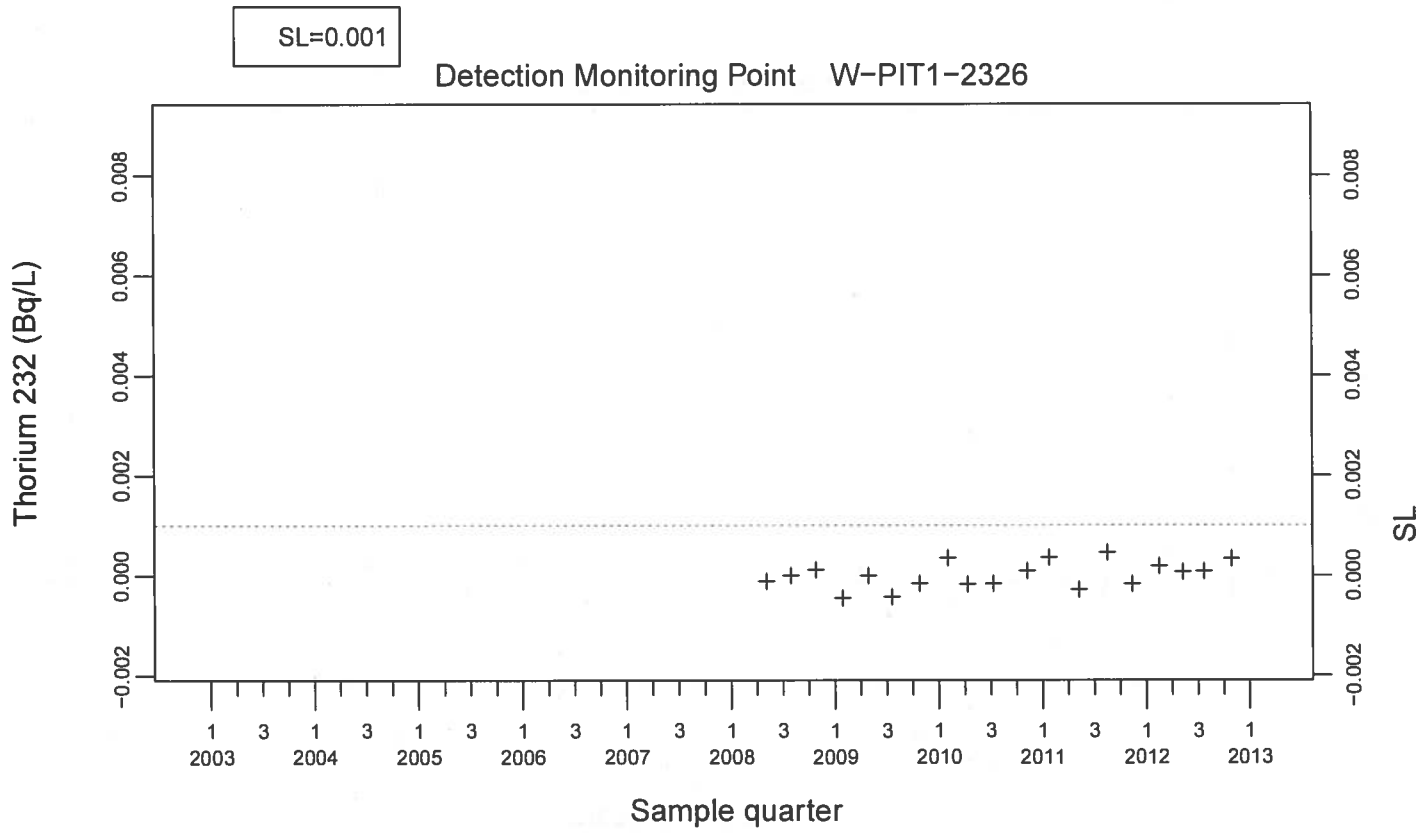

Pit 1 Area
Thorium 232 (Bq/L)
SL=0.004
Above RL
Estimated
Detection Monitoring Point K1-02B
Thorium 232 (Bq/L)
SL
Sample quarter

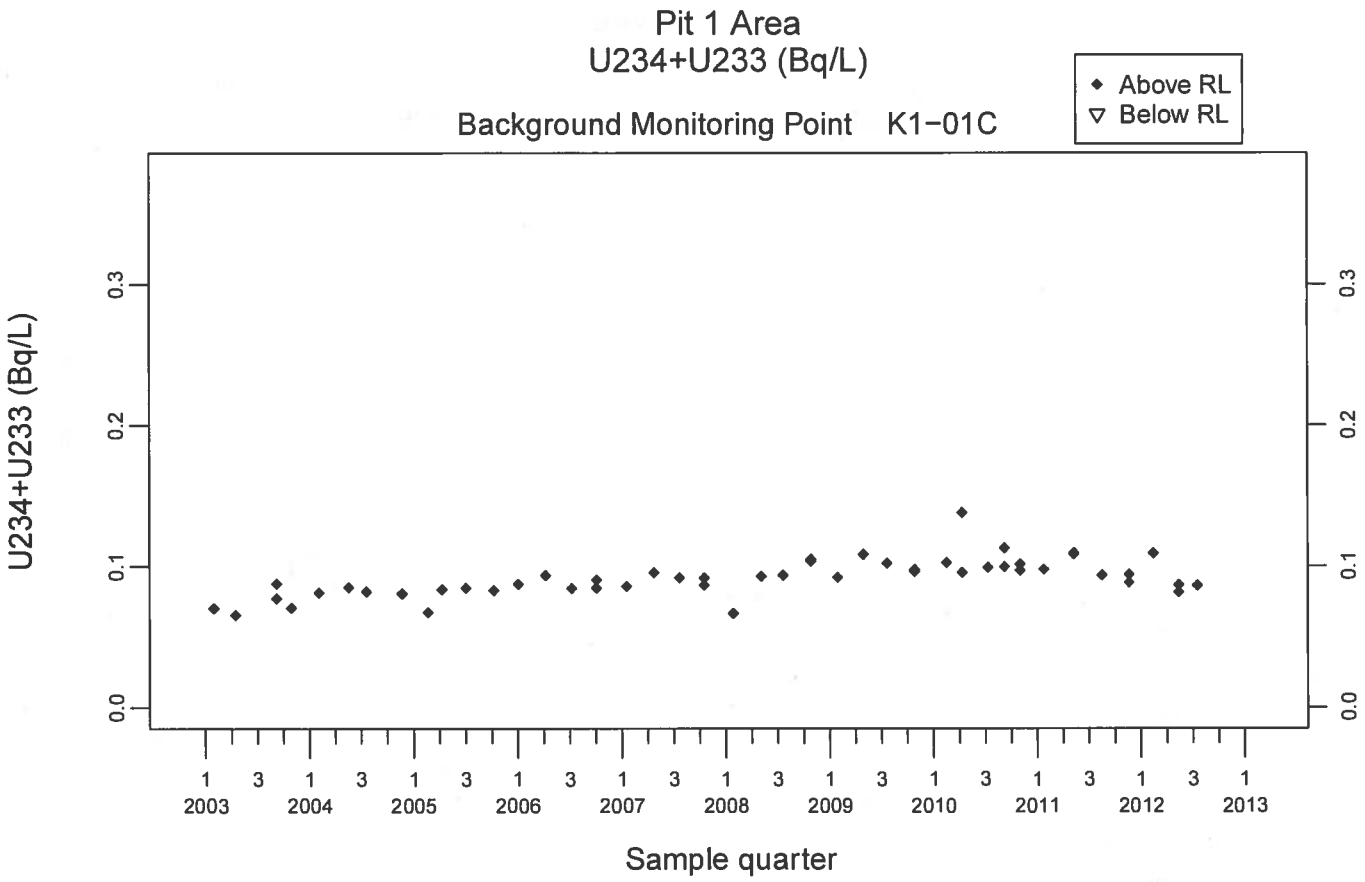

SL=0.001
Detection Monitoring Point K1-04
Thorium 232 (Bq/L)
SL
Sample quarter

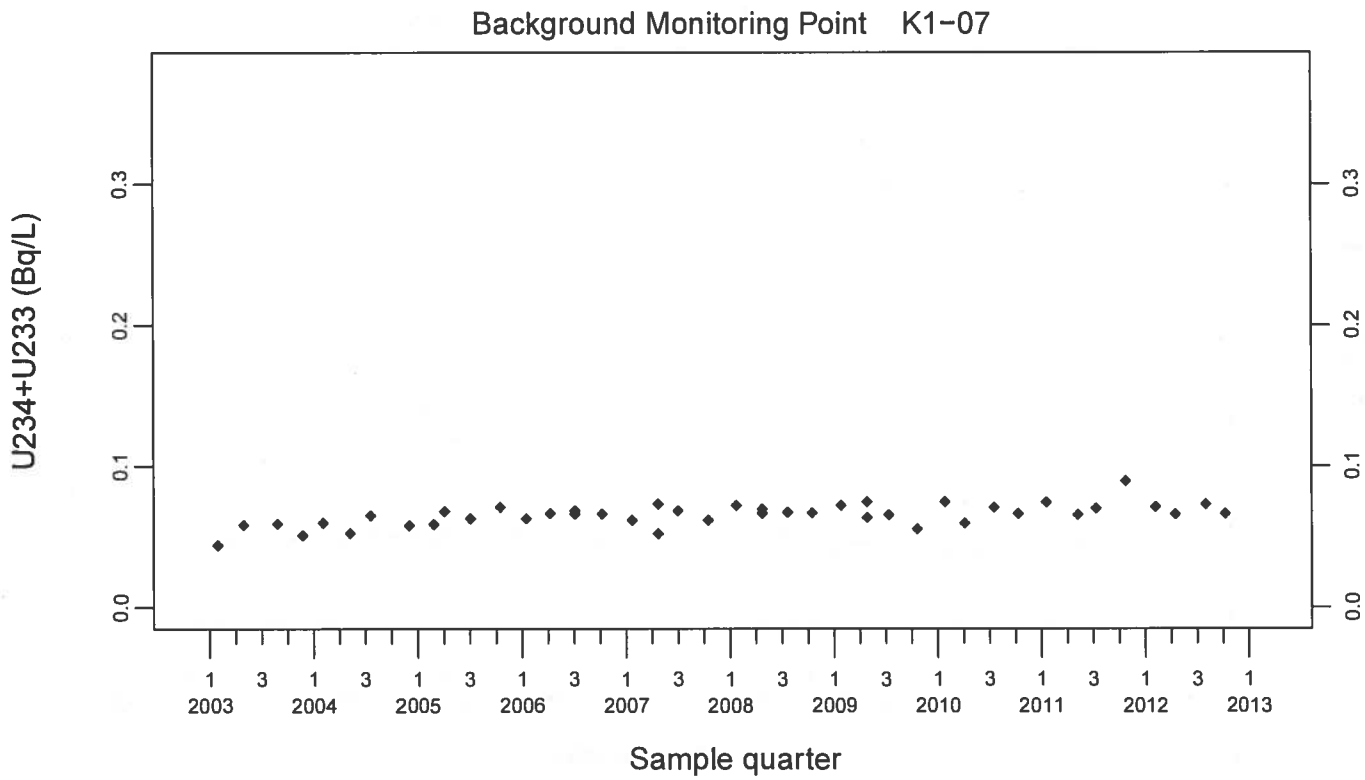

Pit 1 Area
Thorium 232 (Bq/L)
Detection Monitoring Point K1-05
SL=0.004
Above RL
Estimated
Thorium 232 (Bq/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

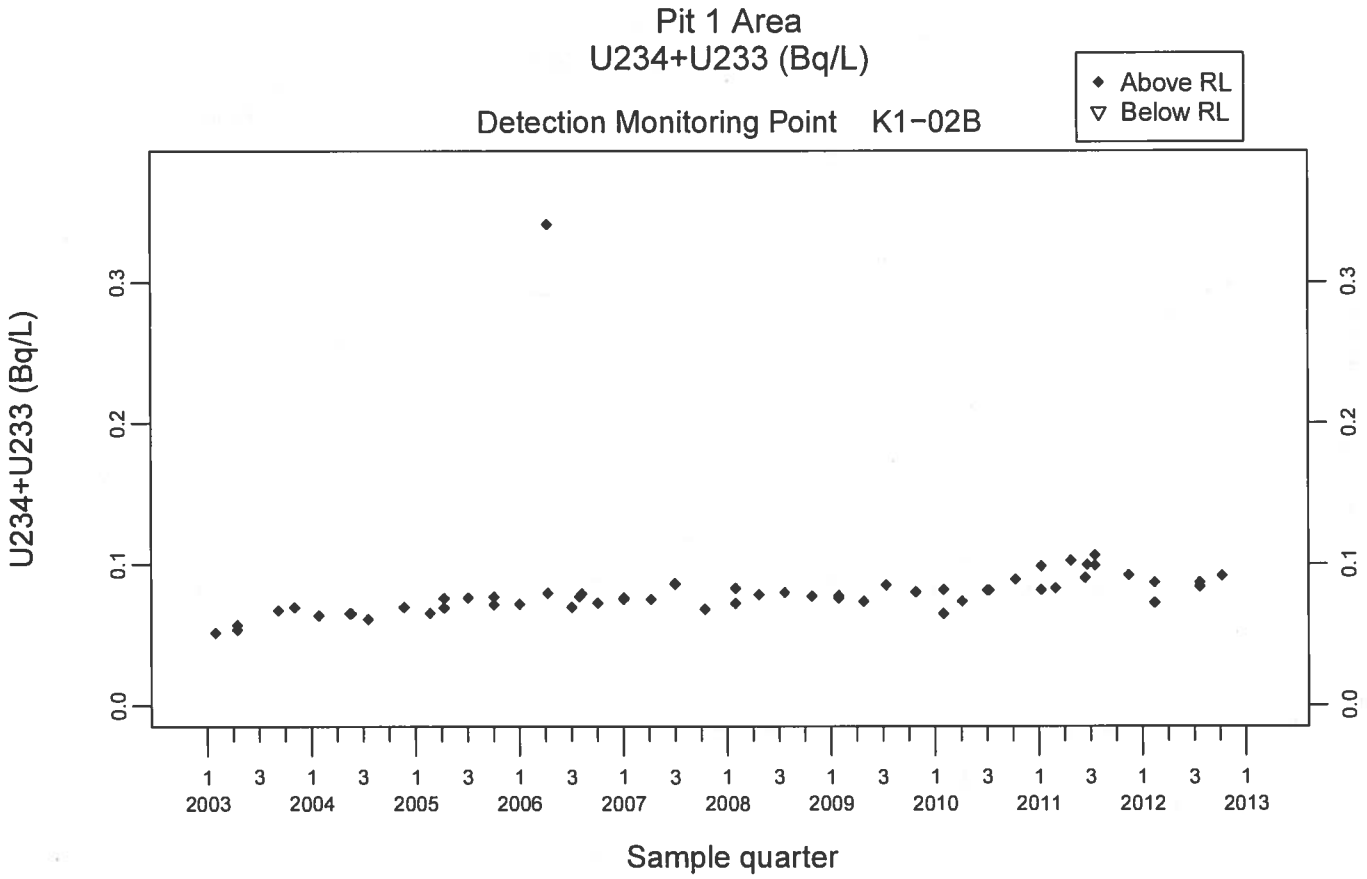

SL=0.004
Crossgradient Monitoring Point K1-08
Thorium 232 (Bq/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

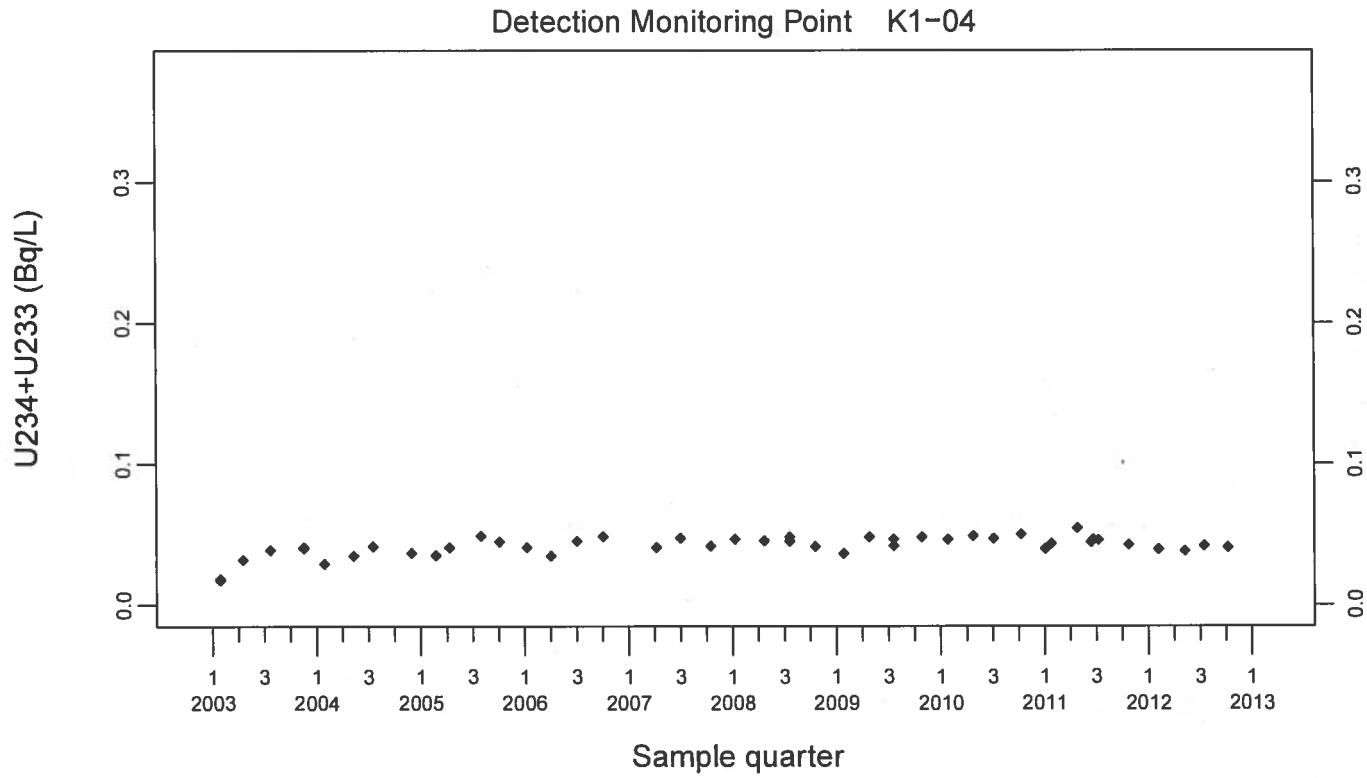

Pit 1 Area
Thorium 232 (Bq/L)
SL=0.002
Crossgradient Monitoring Point K1-09
Above RL
Estimated
Thorium 232 (Bq/L)
SL
Sample quarter

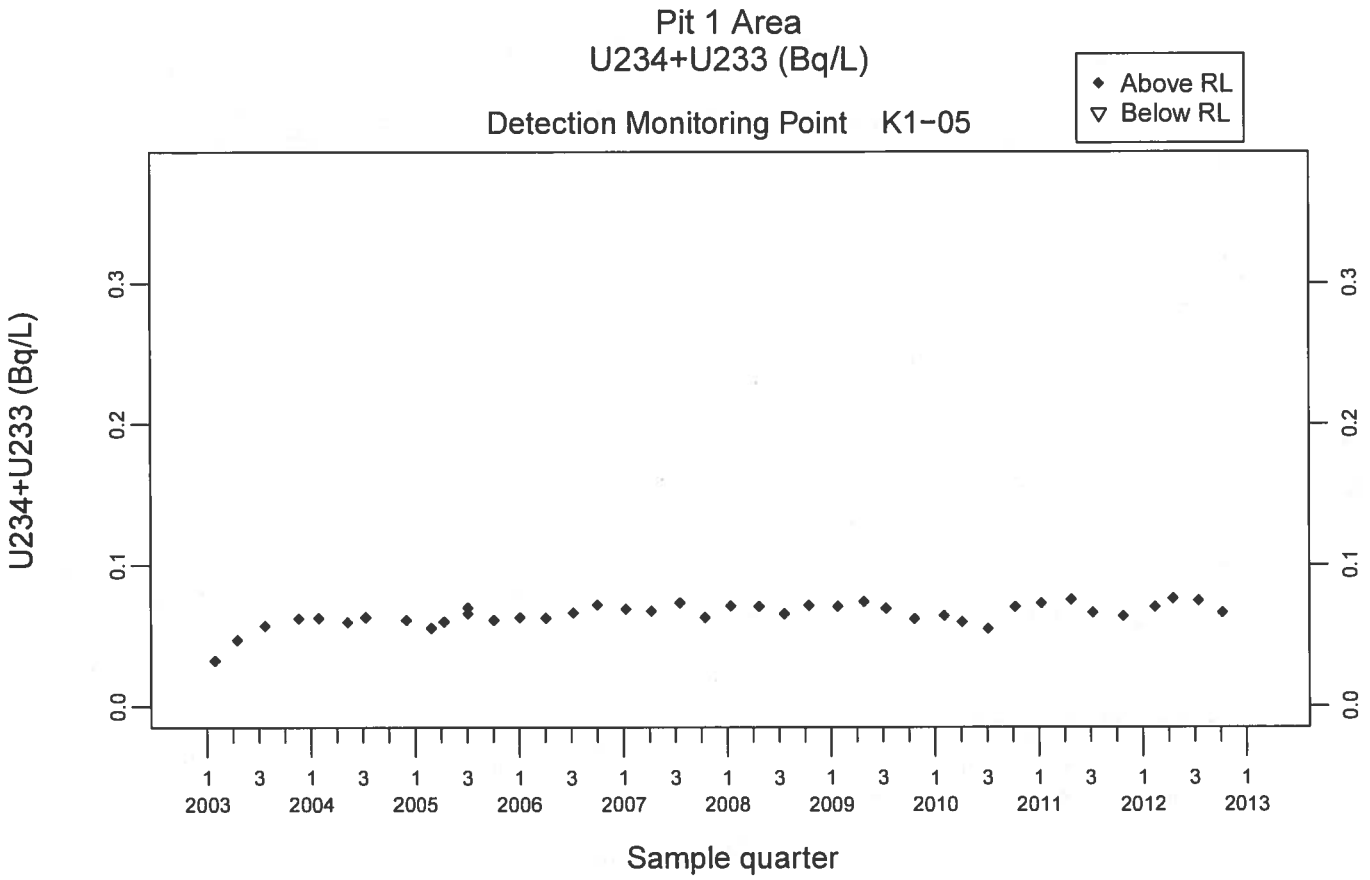

SL=0.001
Detection Monitoring Point W-PIT1-2326
Thorium 232 (Bq/L)
SL
Sample quarter

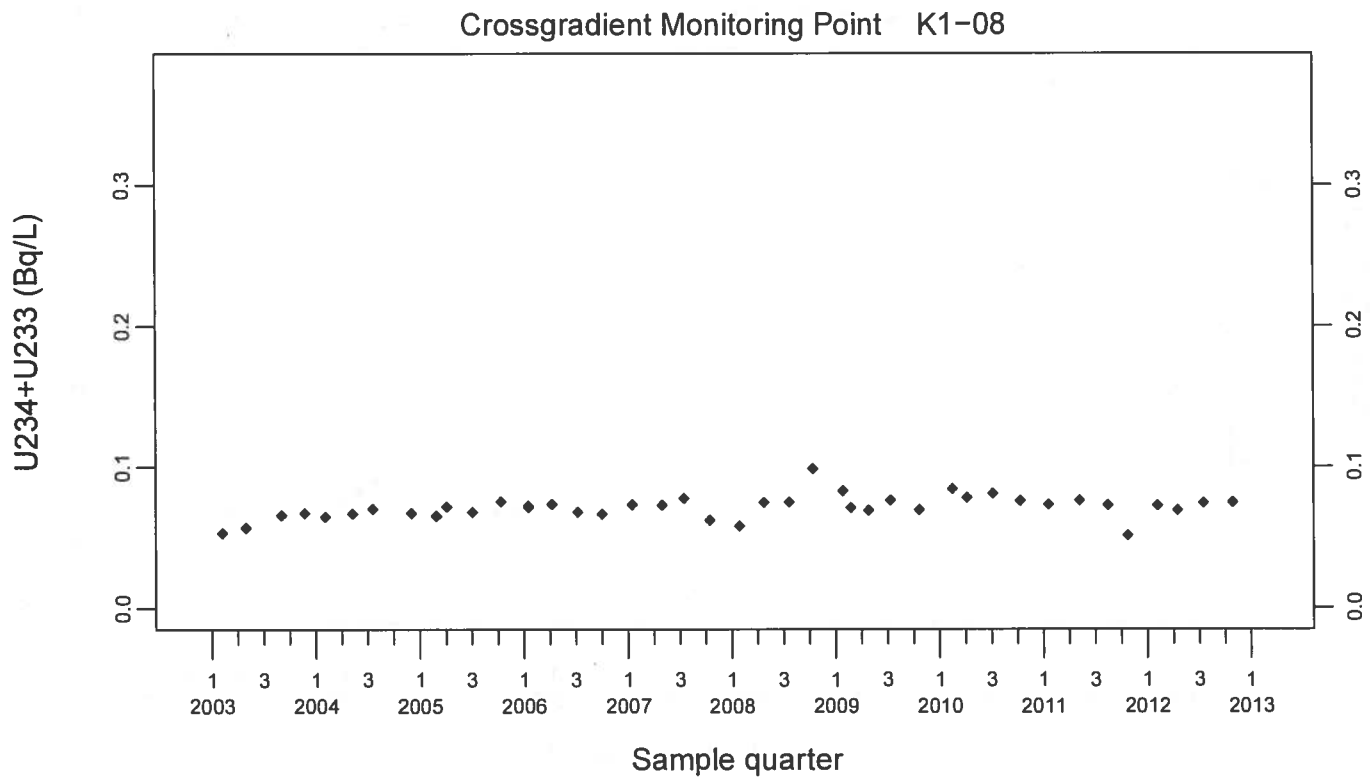

Pit 1 Area
U234+U233 (Bq/L)
Background Monitoring Point K1-01C
Above RL
Below RL
U234+U233 (Bq/L)
0.0
0.1
0.2
0.3
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

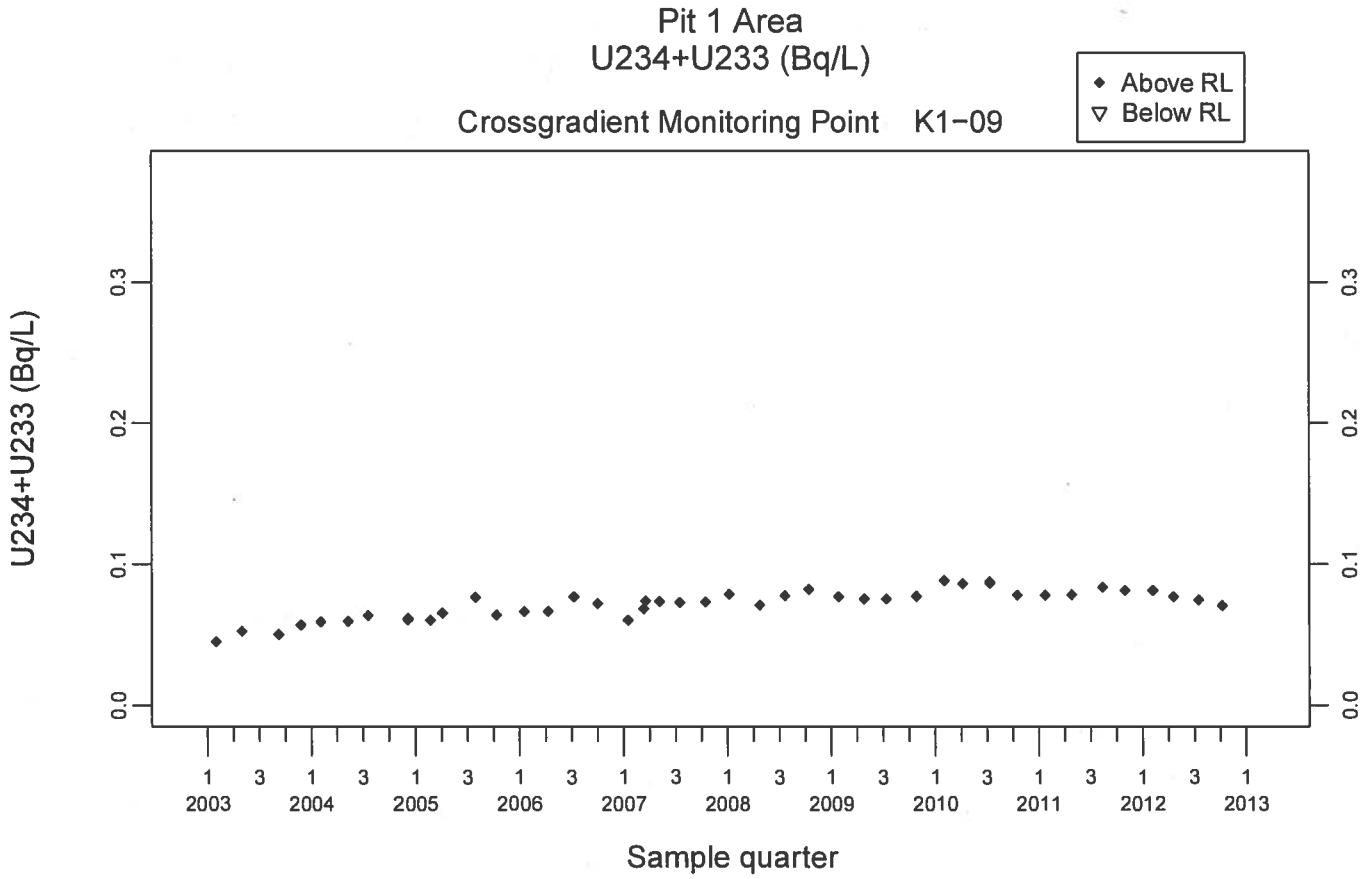

Background Monitoring Point K1-07
U234+U233 (Bq/L)
0.0
0.1
0.2
0.3
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

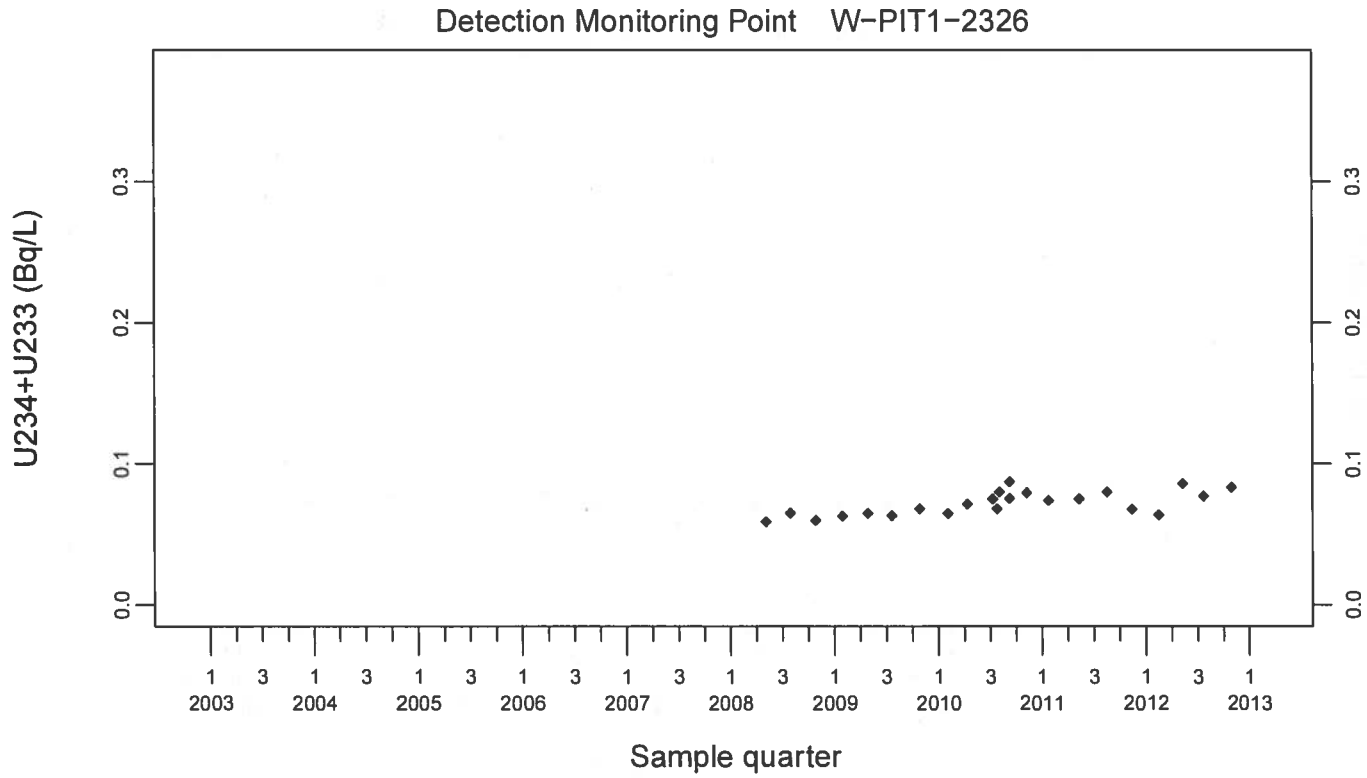

Pit 1 Area
U234+U233 (Bq/L)
Detection Monitoring Point K1-02B
Above RL
Below RL
U234+U233 (Bq/L)
0.0
0.1
0.2
0.3
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

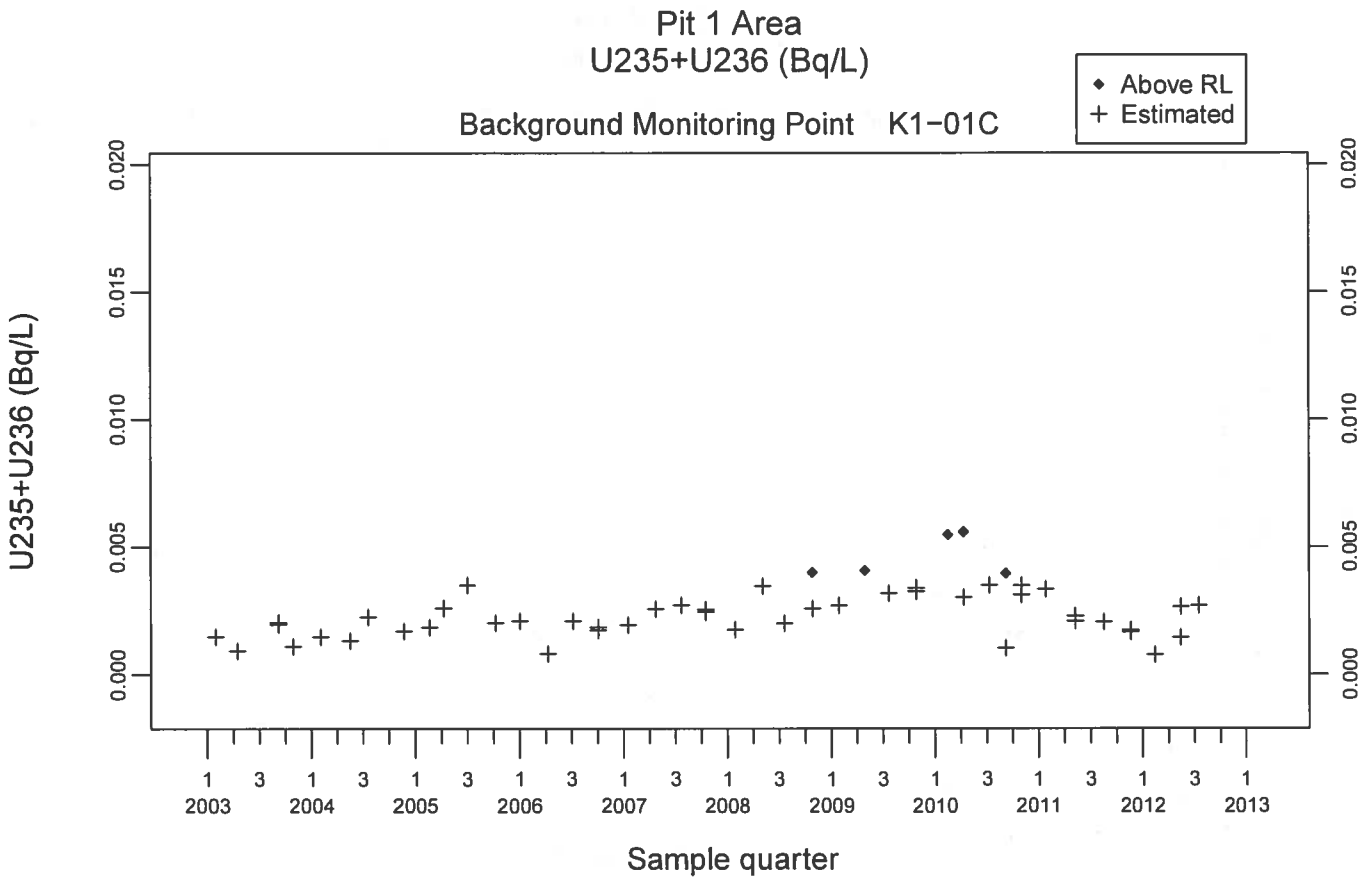

Detection Monitoring Point K1-04
U234+U233 (Bq/L)
0.0
0.1
0.2
0.3
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

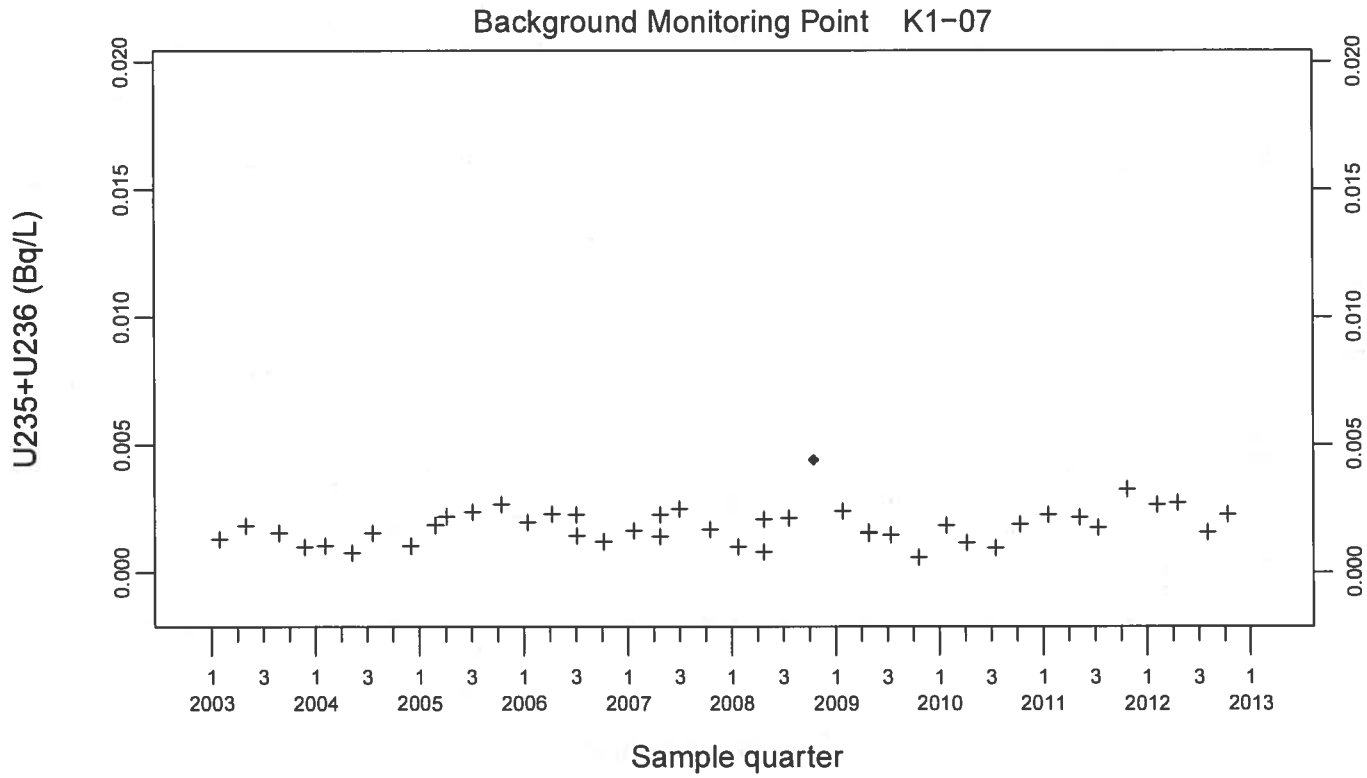

Pit 1 Area
U234+U233 (Bq/L)
Detection Monitoring Point K1-05
Above RL
Below RL
U234+U233 (Bq/L)
0.0
0.1
0.2
0.3
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

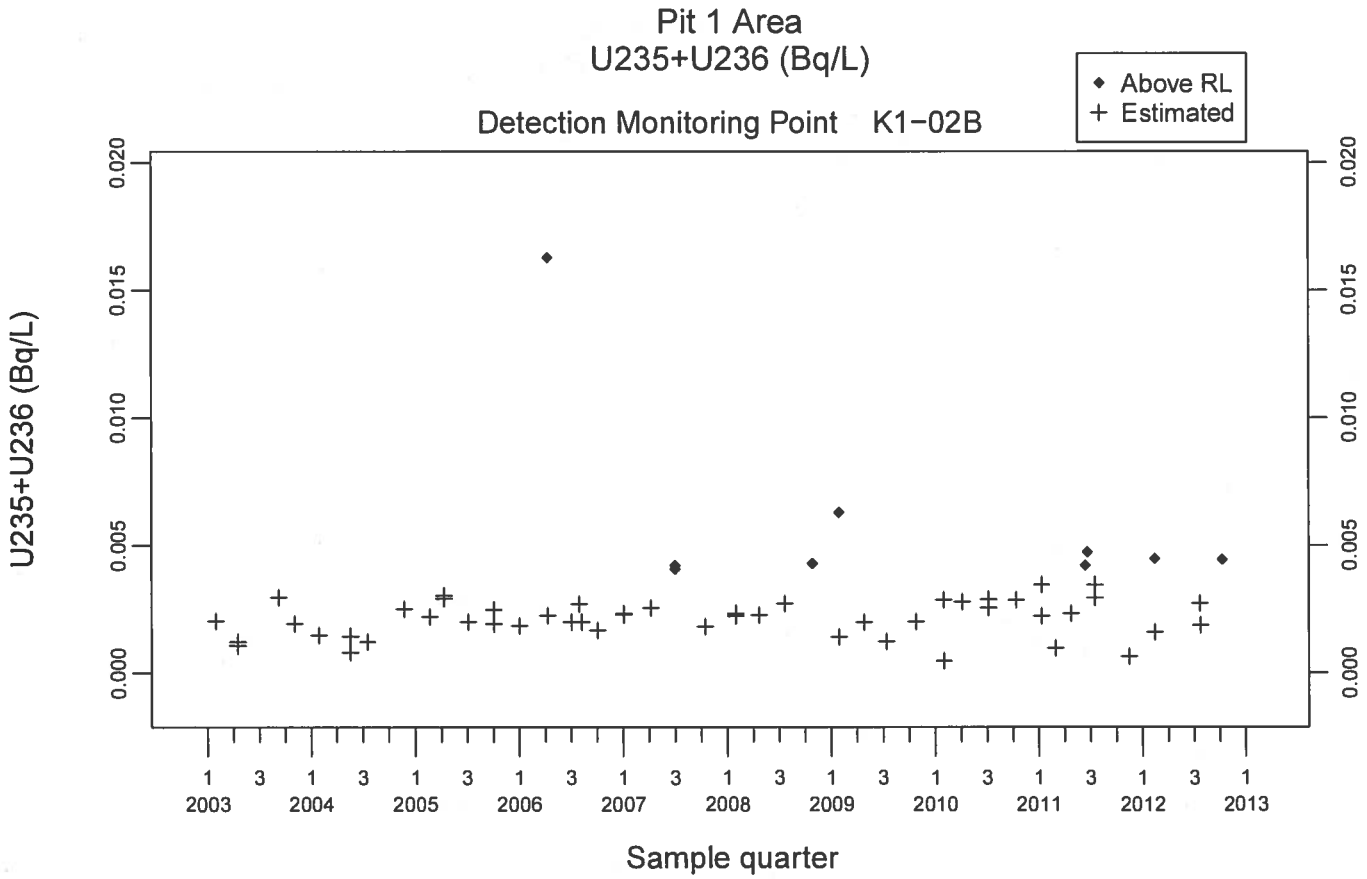

Crossgradient Monitoring Point K1-08
U234+U233 (Bq/L)
0.0
0.1
0.2
0.3
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

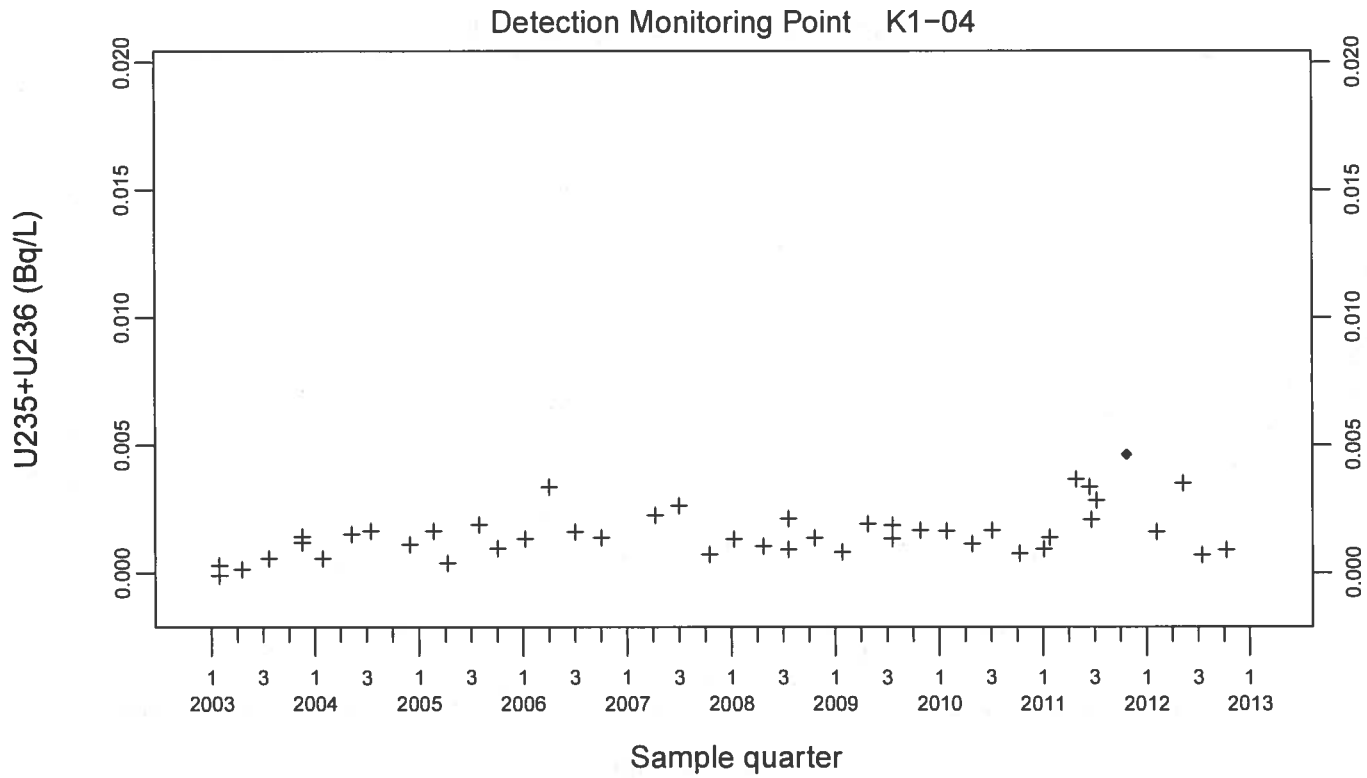

Pit 1 Area
U234+U233 (Bq/L)
Crossgradient Monitoring Point K1-09
Above RL
Below RL
U234+U233 (Bq/L)
0.0
0.1
0.2
0.3
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

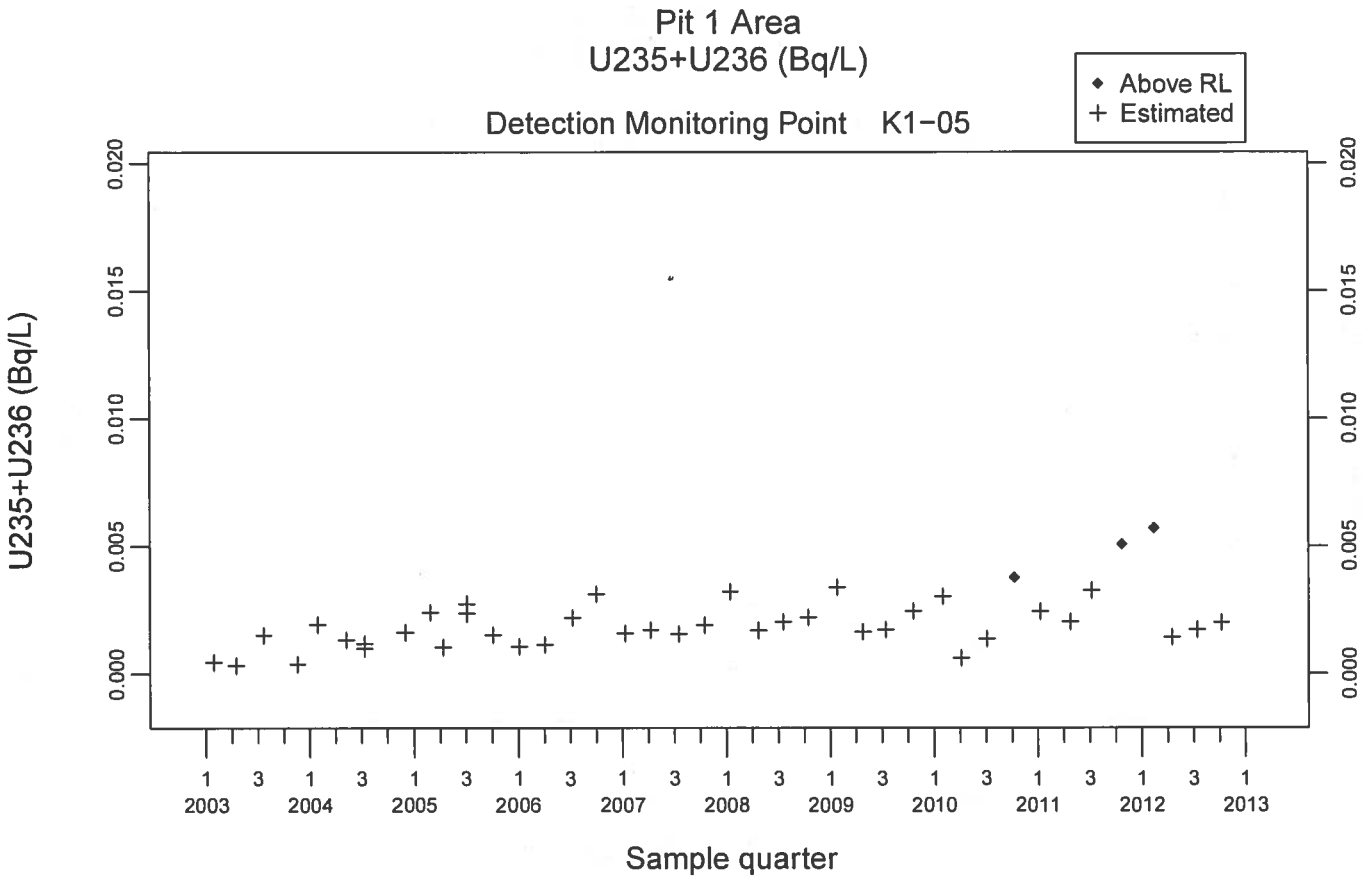

Detection Monitoring Point W-PIT1-2326
U234+U233 (Bq/L)
0.0
0.1
0.2
0.3
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

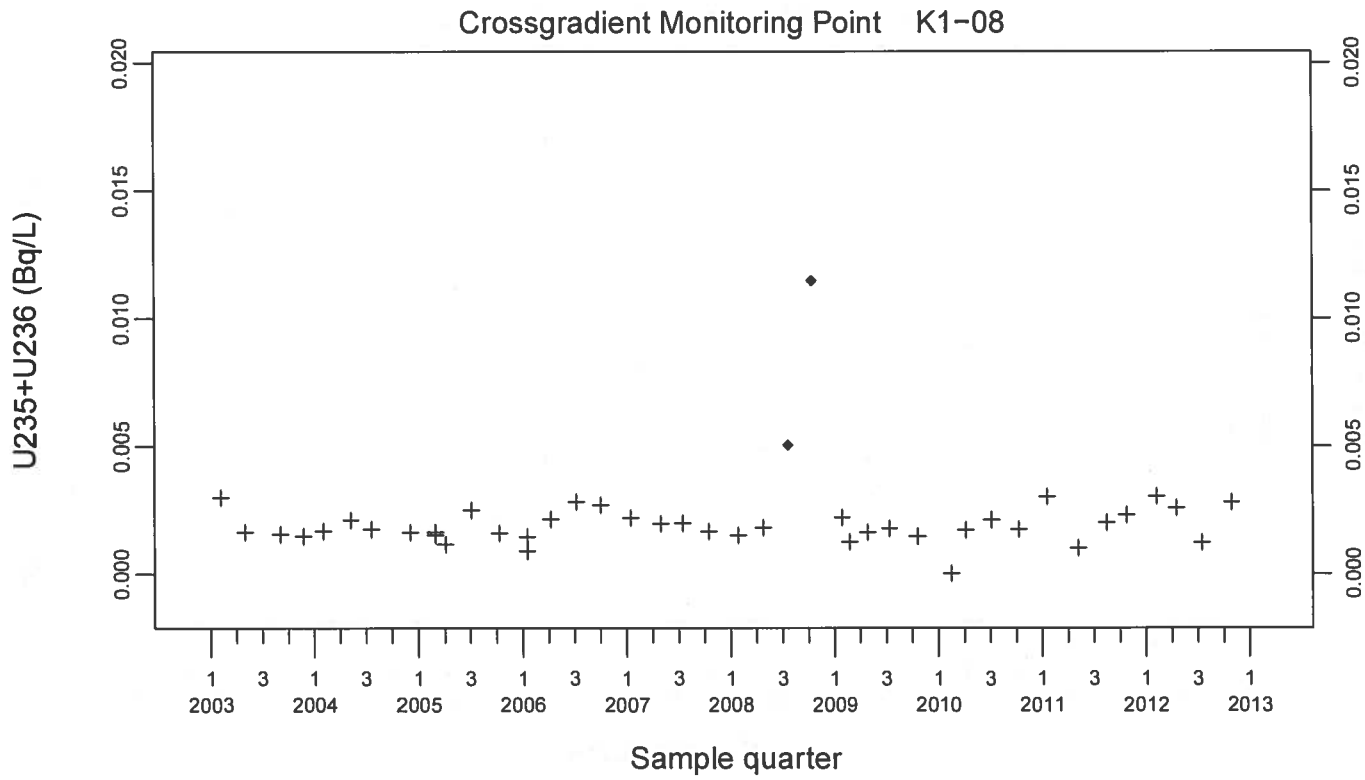

Pit 1 Area
U235+U236 (Bq/L)
Background Monitoring Point K1-01C
Above RL
Estimated
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
0.020
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

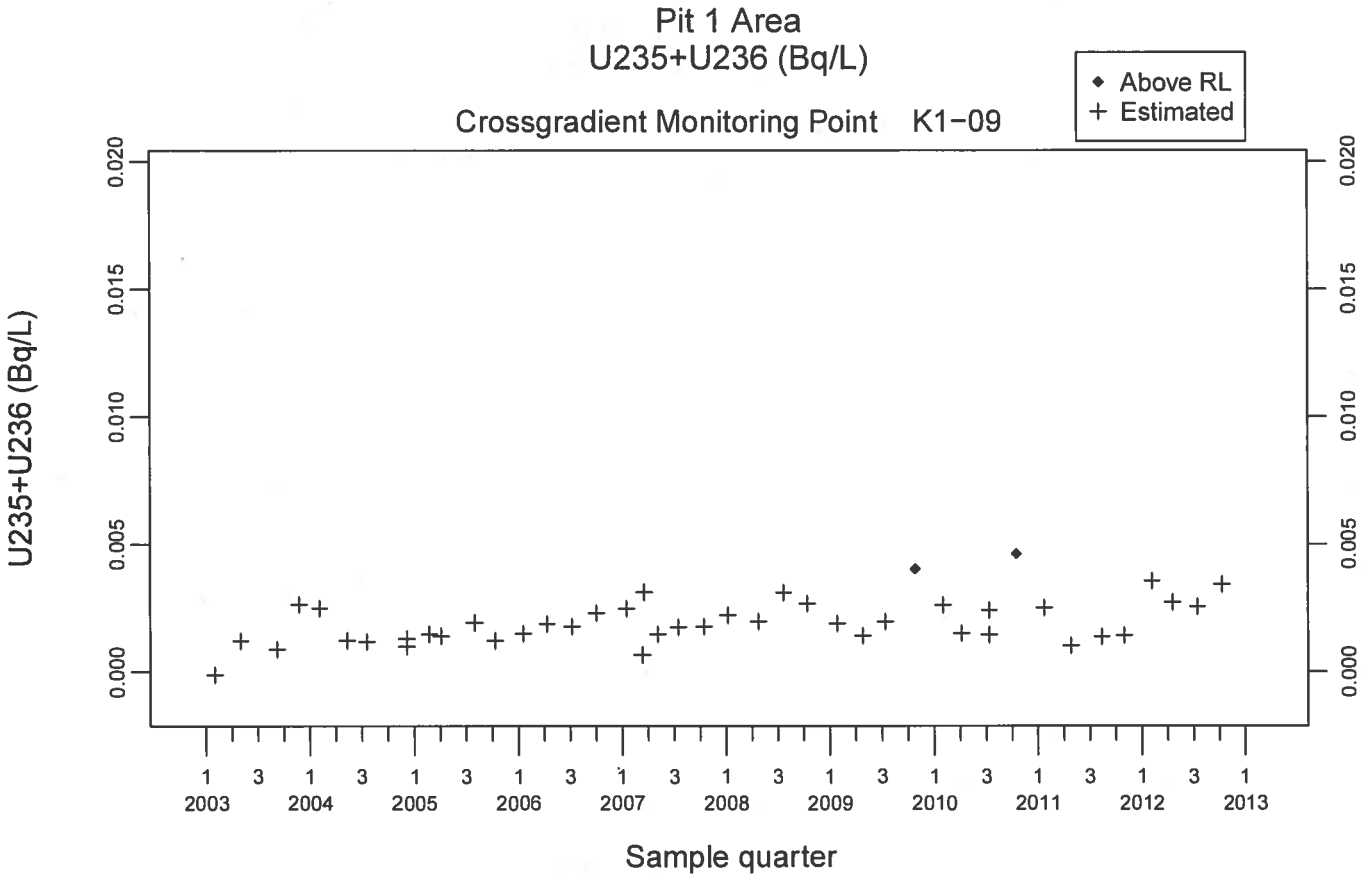

Background Monitoring Point K1-07
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
0.020
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

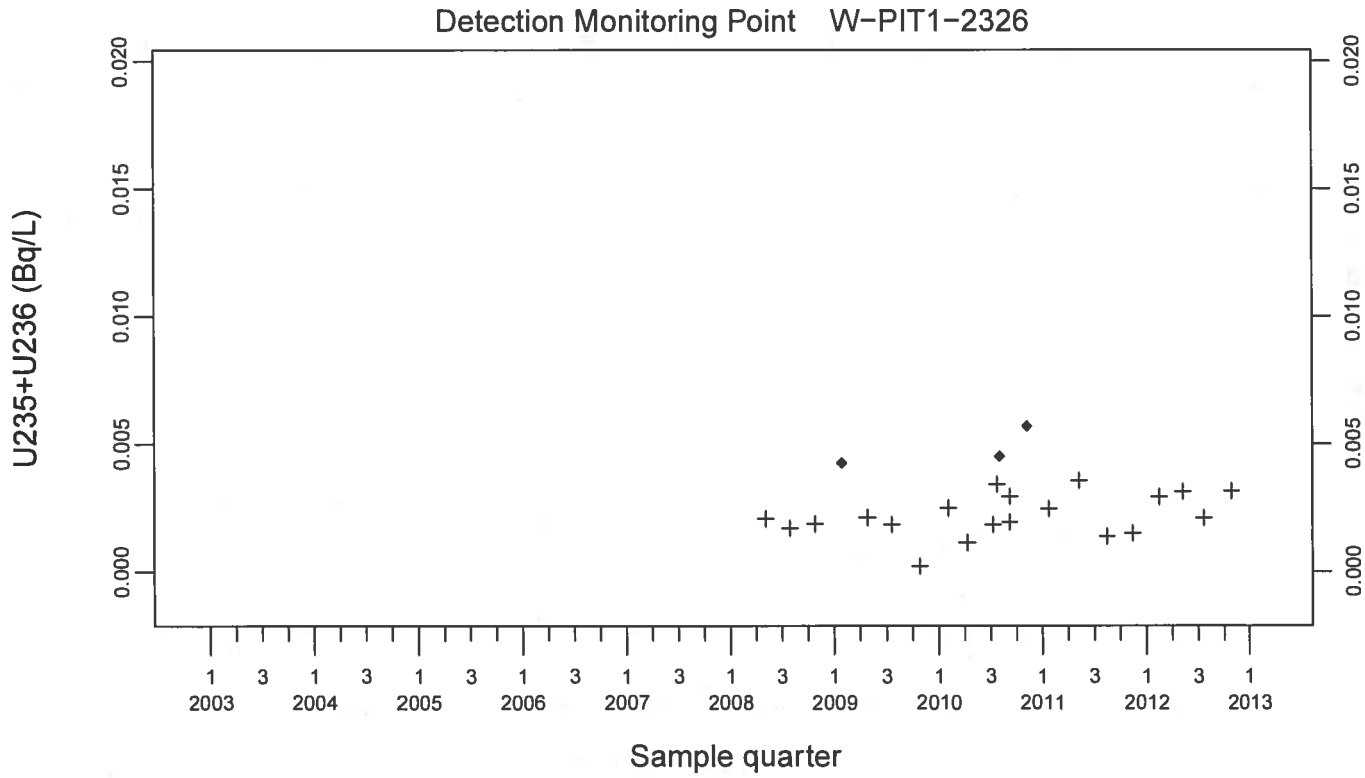

Pit 1 Area
U235+U236 (Bq/L)
Above RL
Estimated
Detection Monitoring Point K1-02B
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
0.020
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

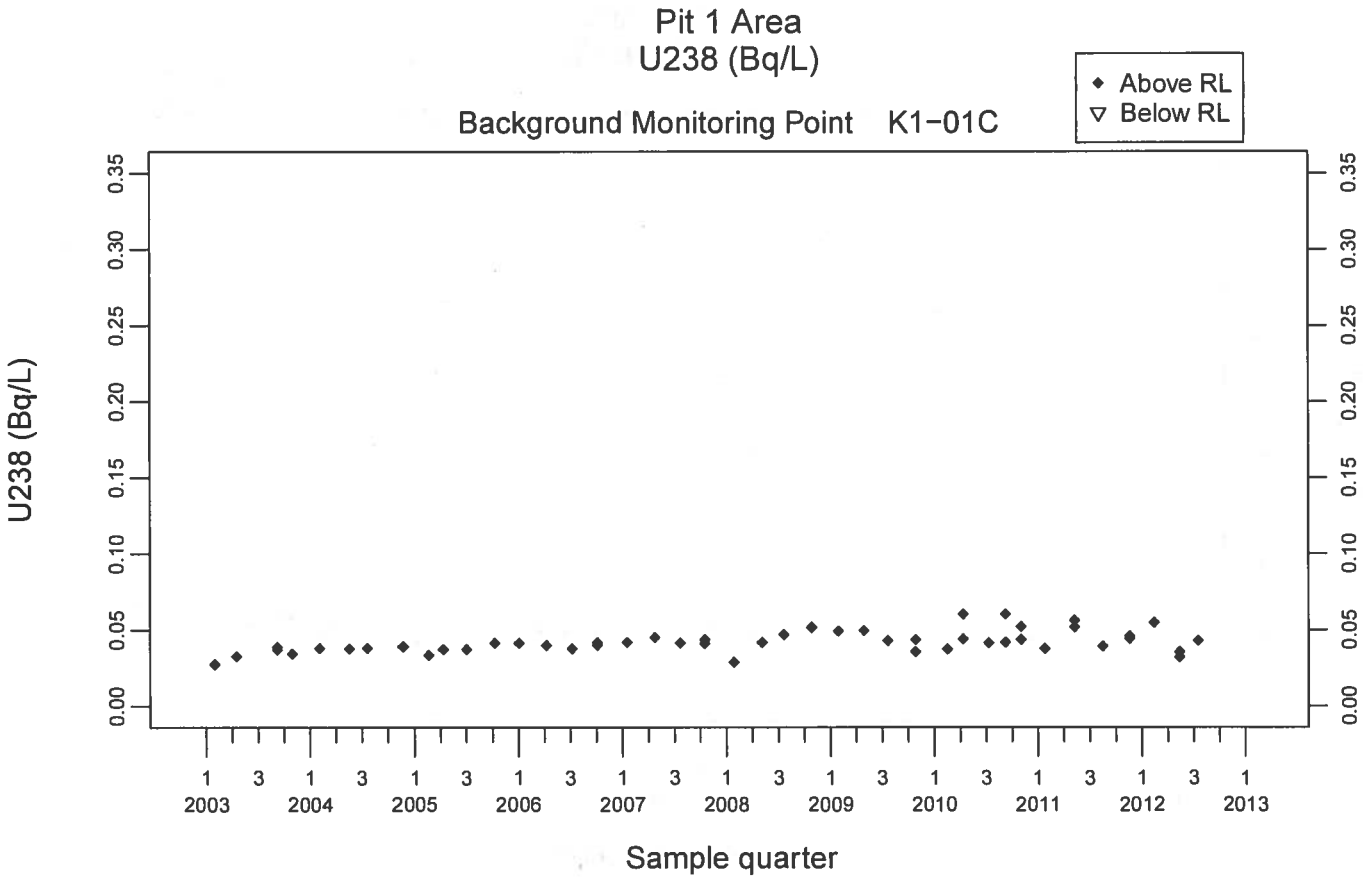

Detection Monitoring Point K1-04
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
0.020
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

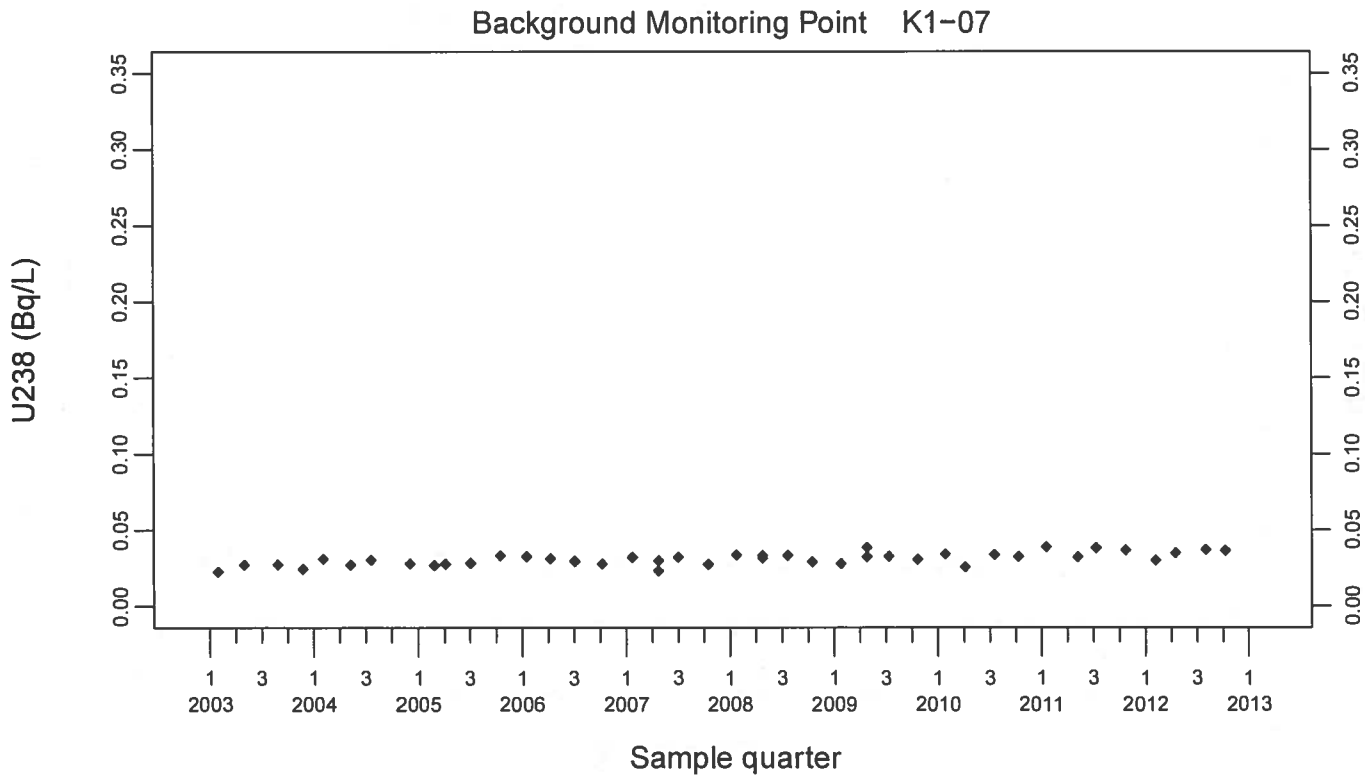

Pit 1 Area
U235+U236 (Bq/L)
Detection Monitoring Point K1-05
Above RL
Estimated
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
0.020
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

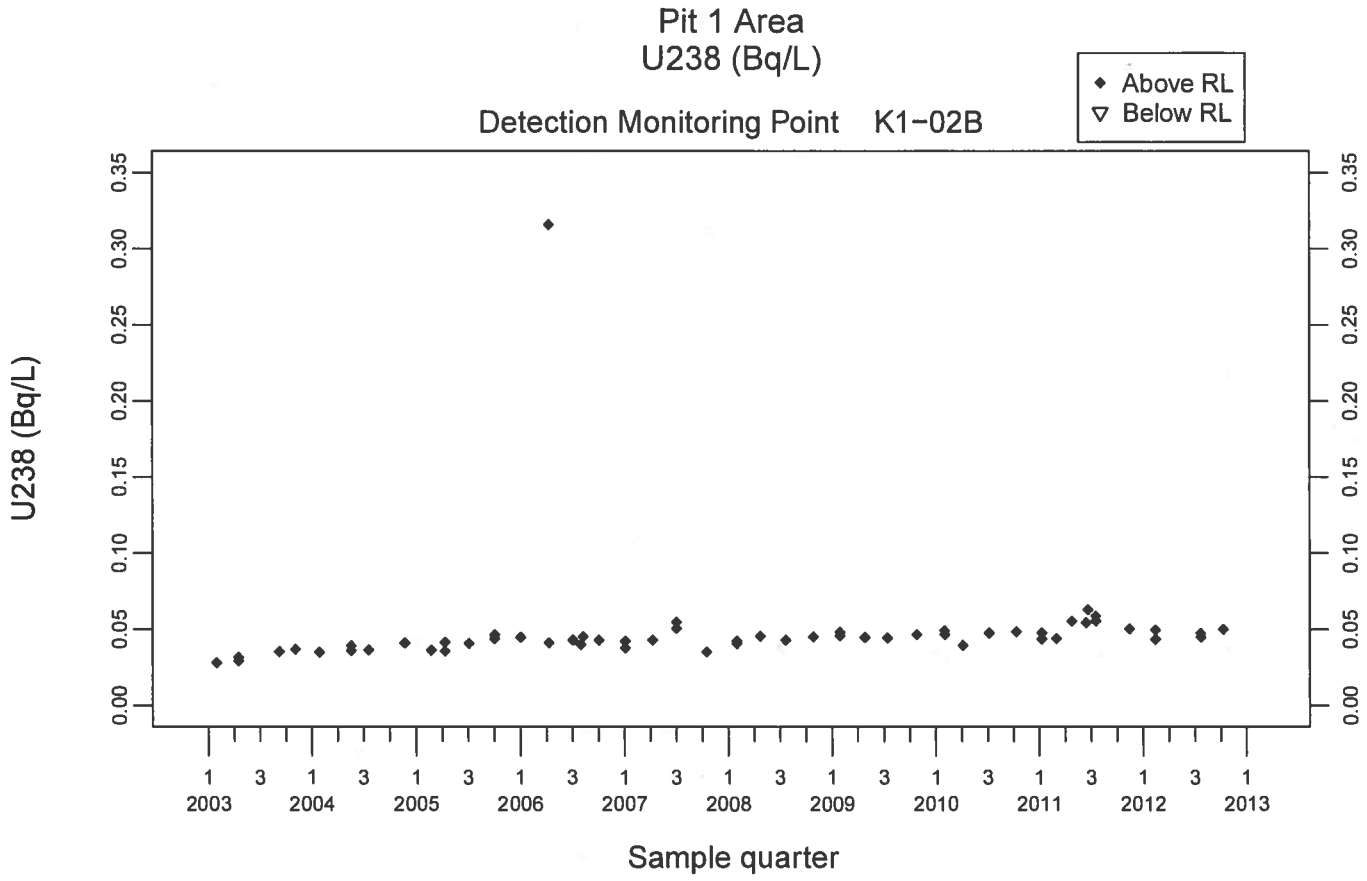

Crossgradient Monitoring Point K1-08
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
0.020
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

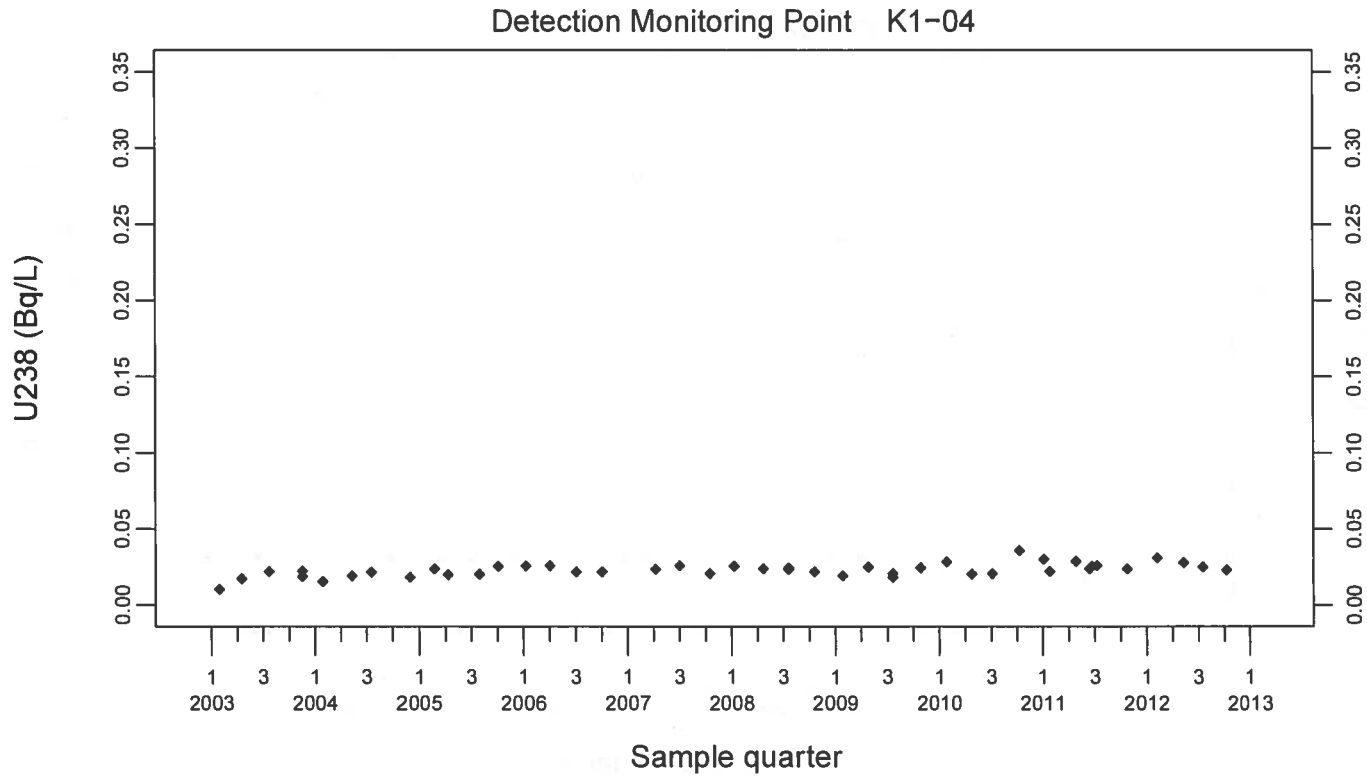

Pit 1 Area
U235+U236 (Bq/L)
Crossgradient Monitoring Point K1-09
Above RL
Estimated
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
0.020
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

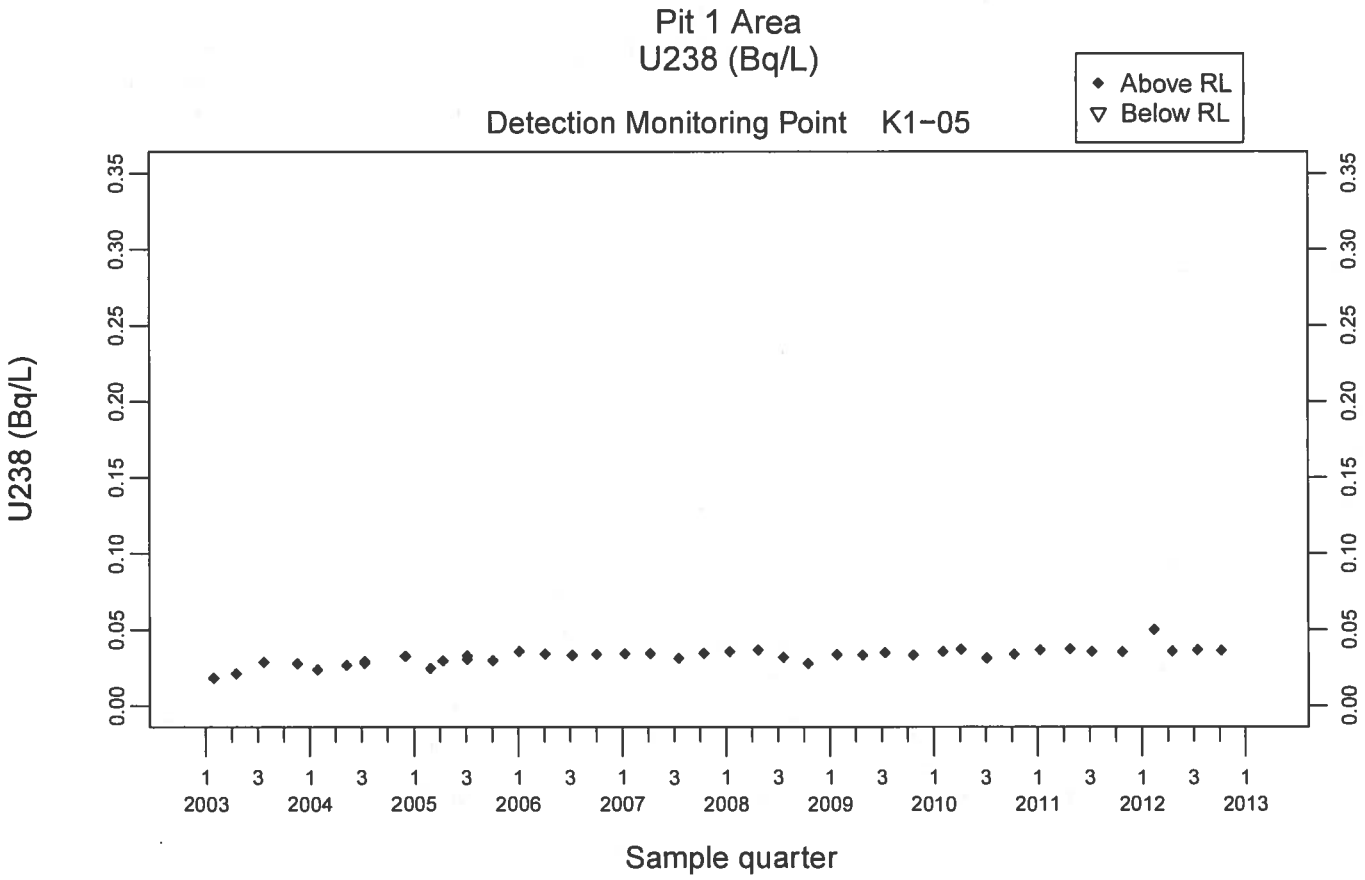

Detection Monitoring Point W-PIT1-2326
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
0.020
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

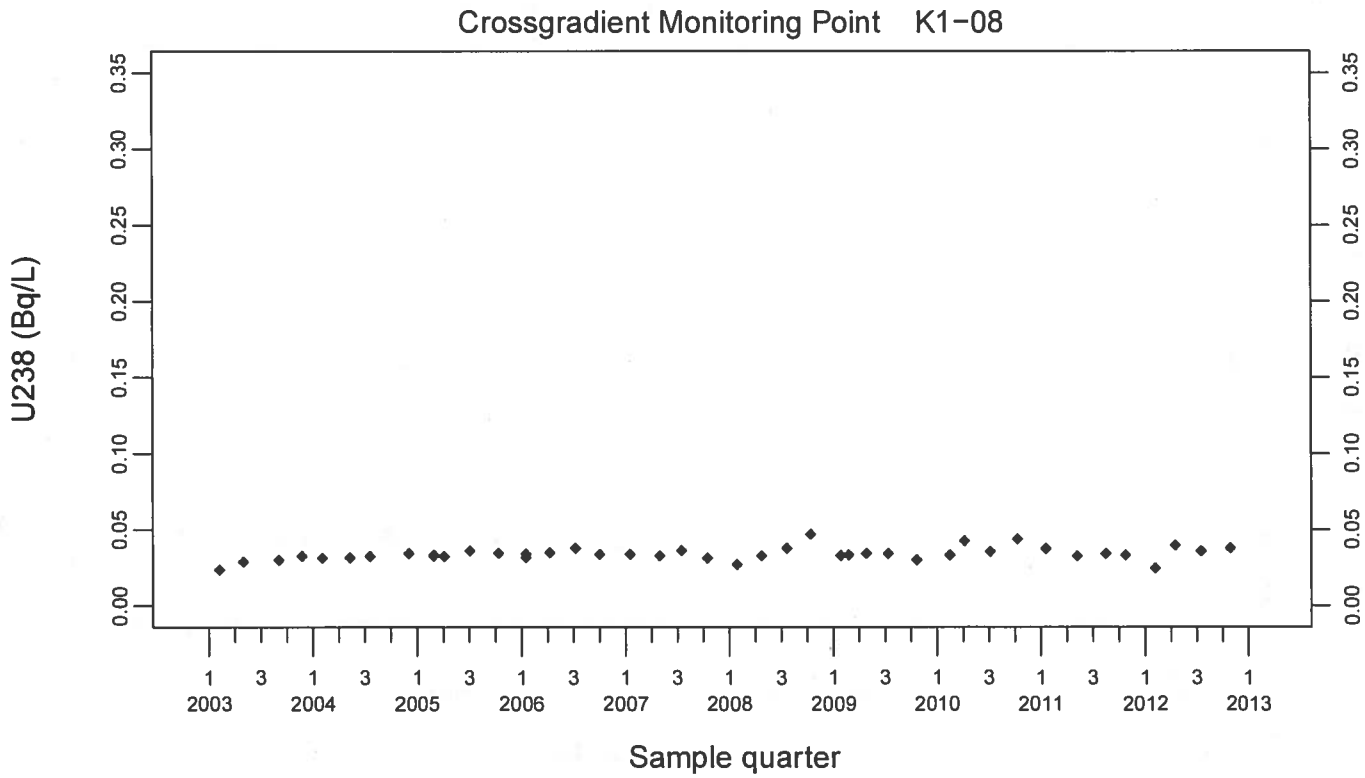

Pit 1 Area
U238 (Bq/L)
Background Monitoring Point K1-01C
Above RL
Below RL
U238 (Bq/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

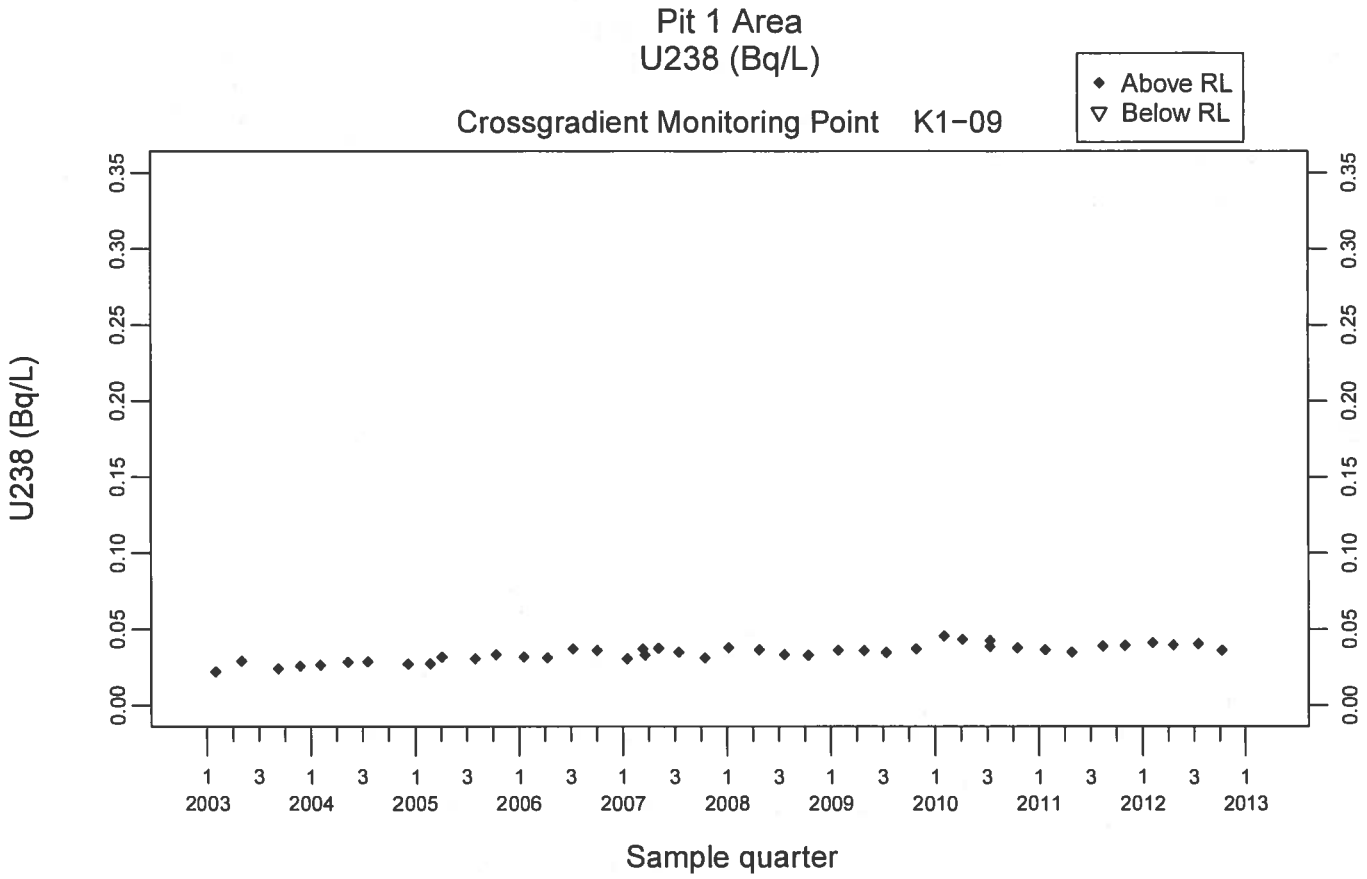

Background Monitoring Point K1-07
U238 (Bq/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

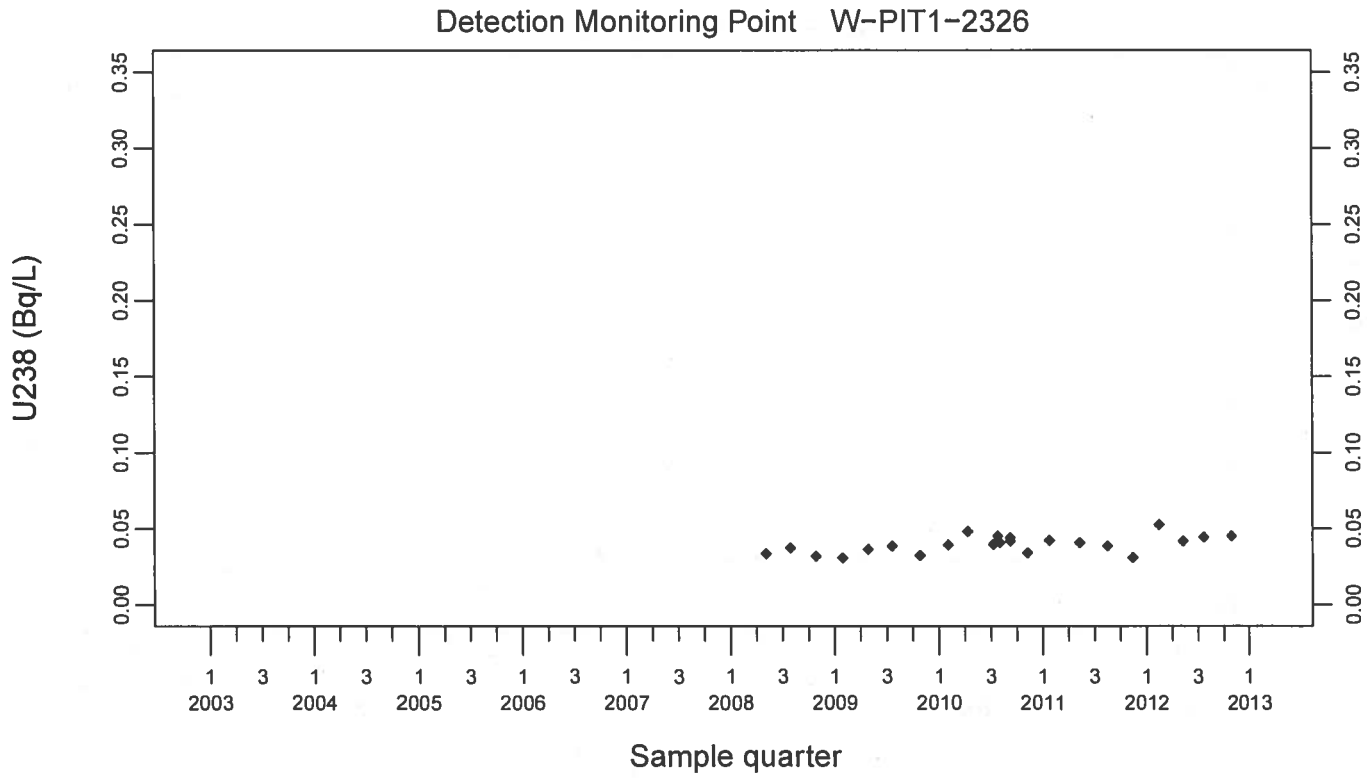

Pit 1 Area
U238 (Bq/L)
Above RL
Below RL
Detection Monitoring Point K1-02B
U238 (Bq/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

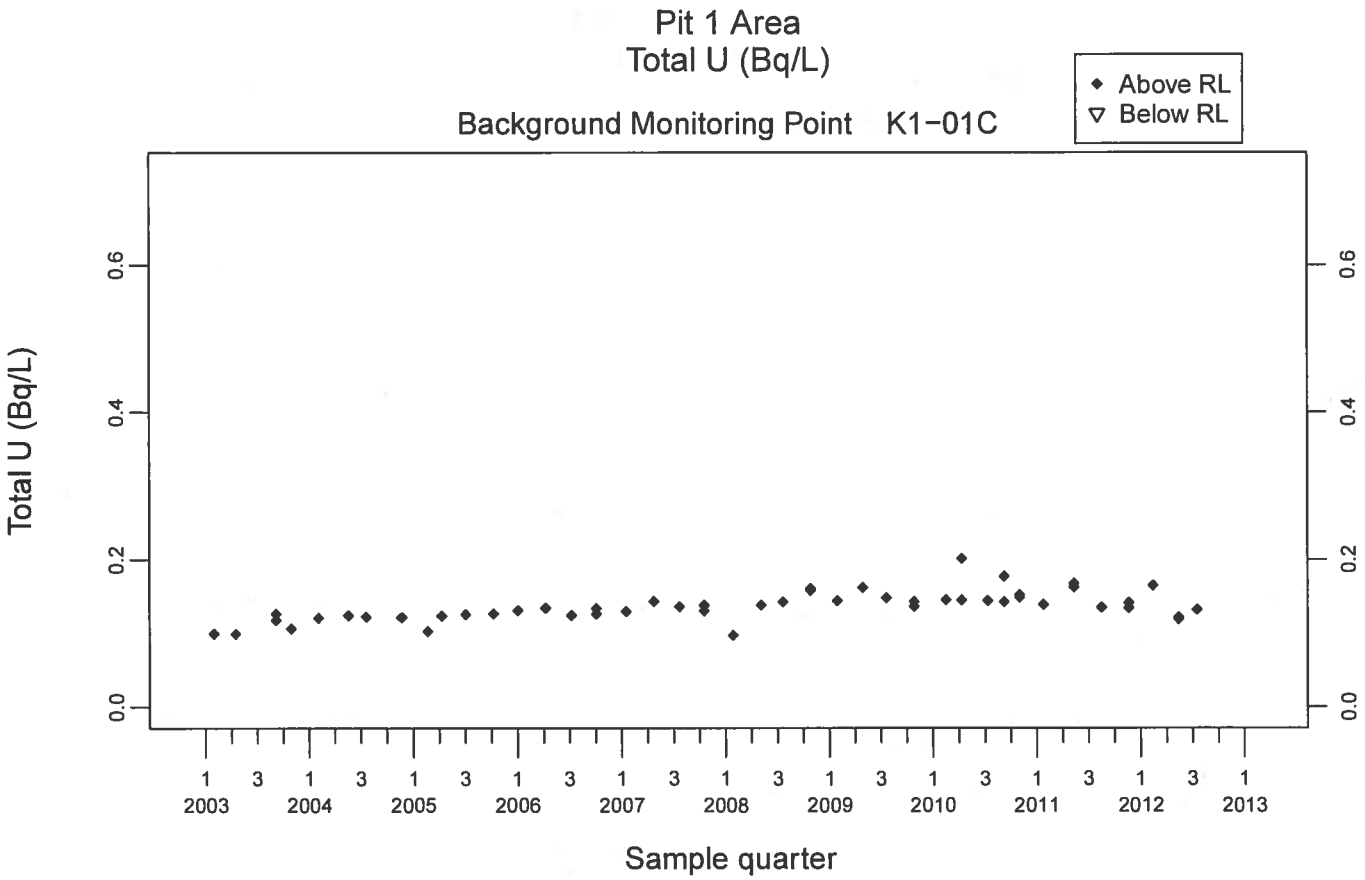

Detection Monitoring Point K1-04
U238 (Bq/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

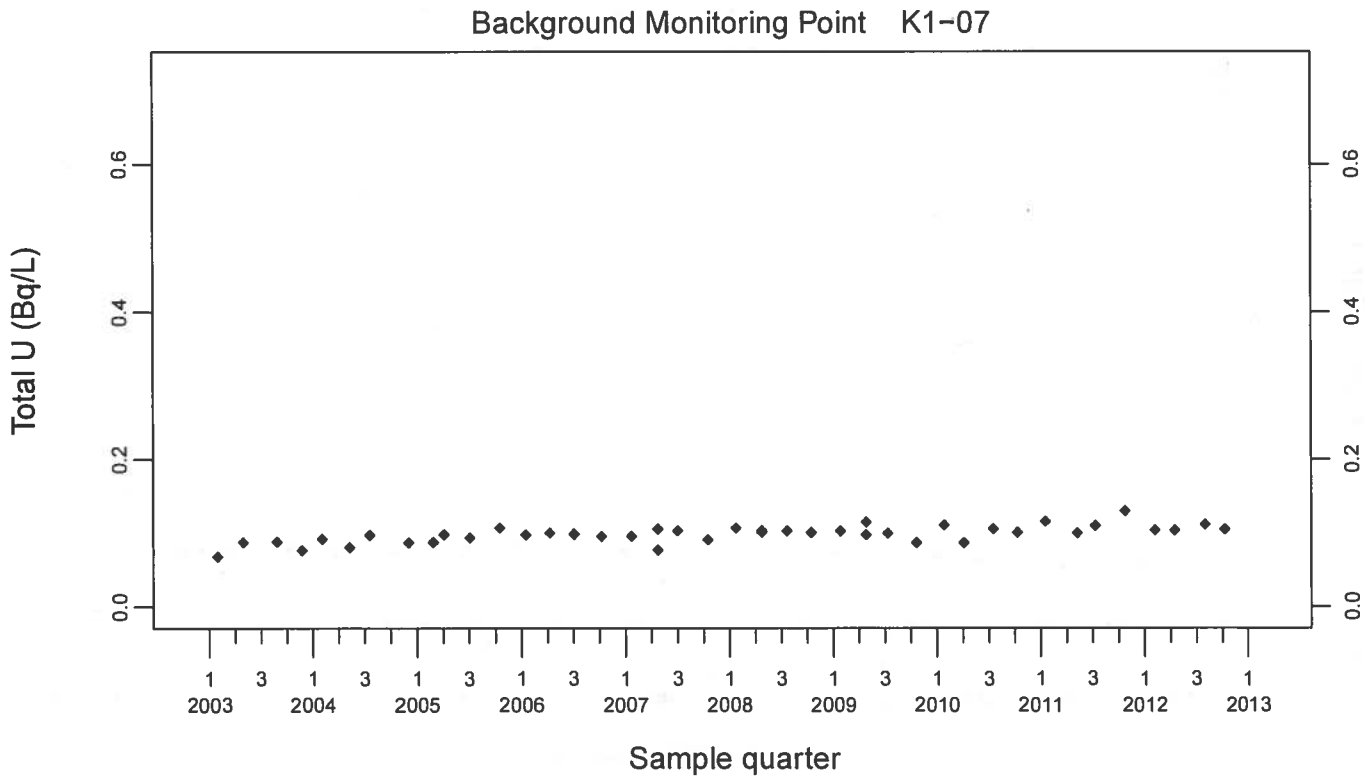

Pit 1 Area
U238 (Bq/L)
Detection Monitoring Point K1-05
Above RL
Below RL
U238 (Bq/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

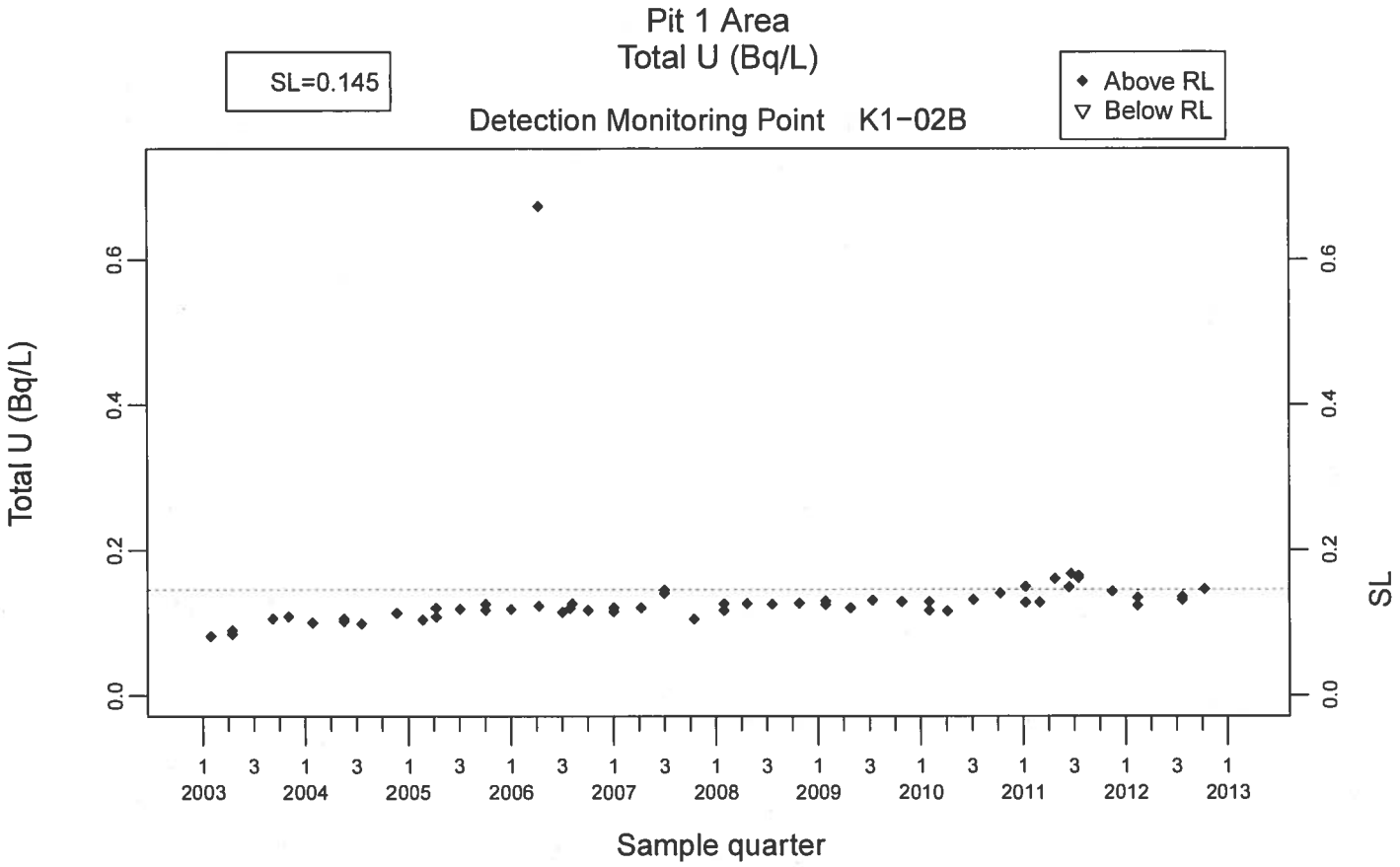

Crossgradient Monitoring Point K1-08
U238 (Bq/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

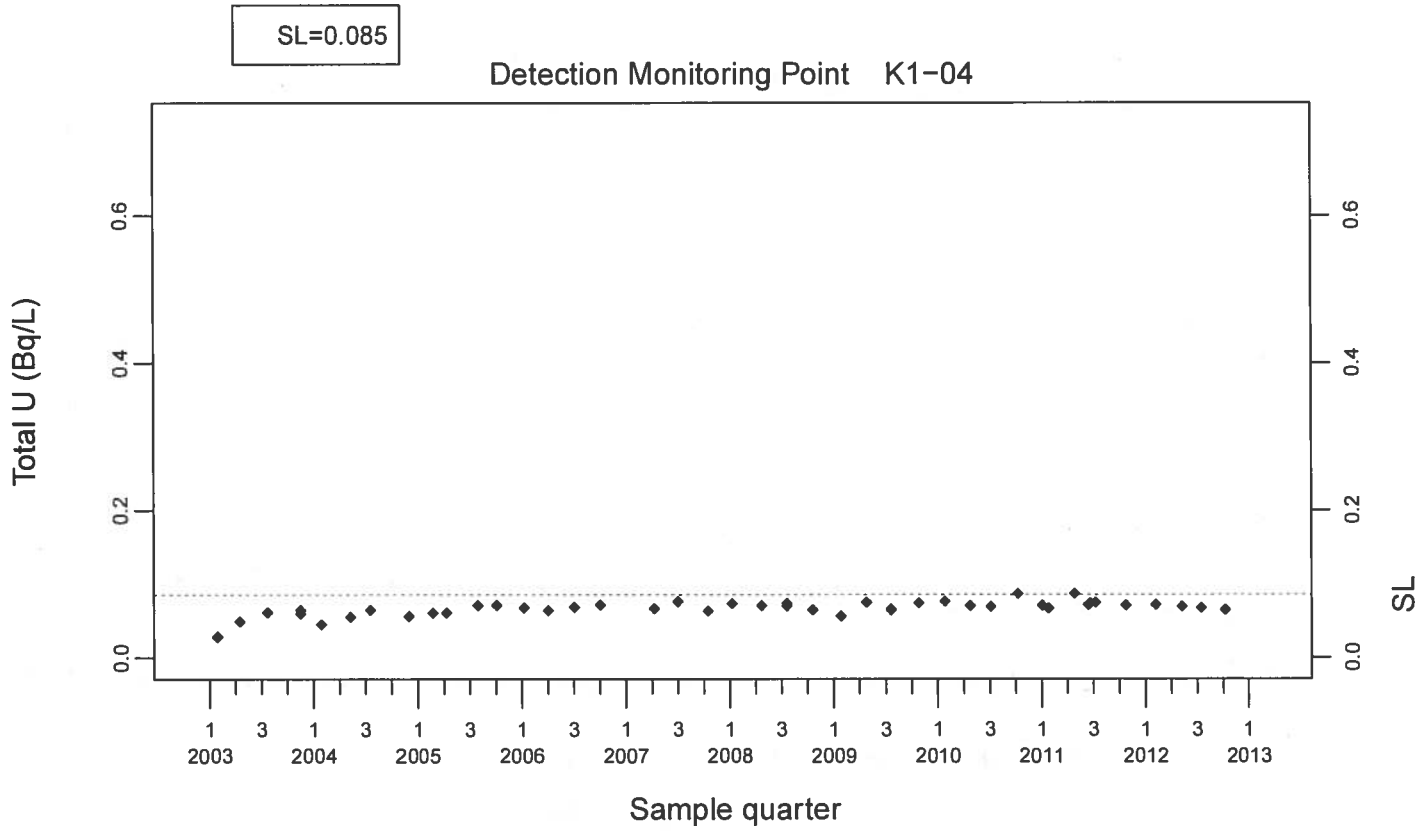

Pit 1 Area
U238 (Bq/L)
Crossgradient Monitoring Point K1-09
Above RL
Below RL
U238 (Bq/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

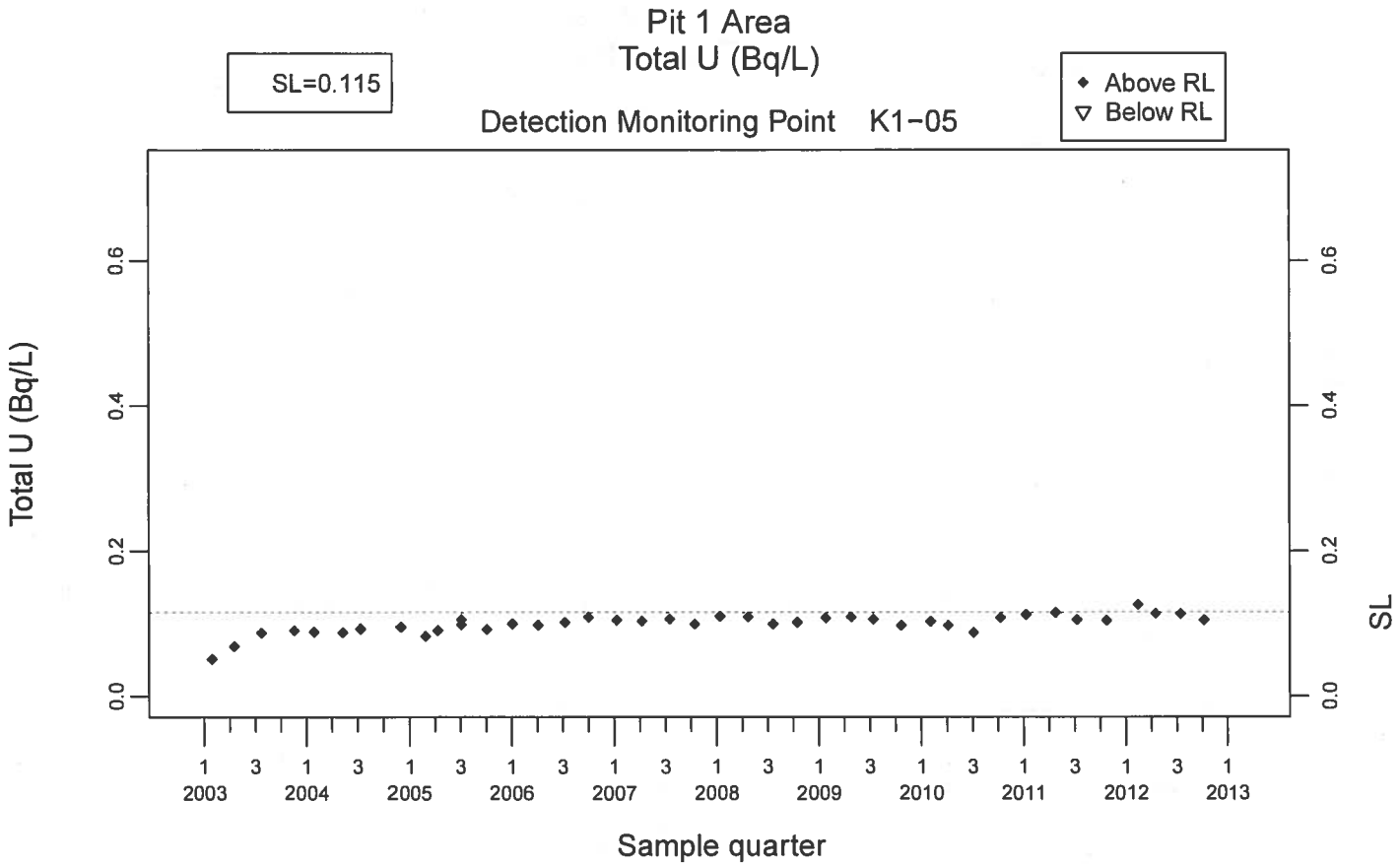

Detection Monitoring Point W-PIT1-2326
U238 (Bq/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

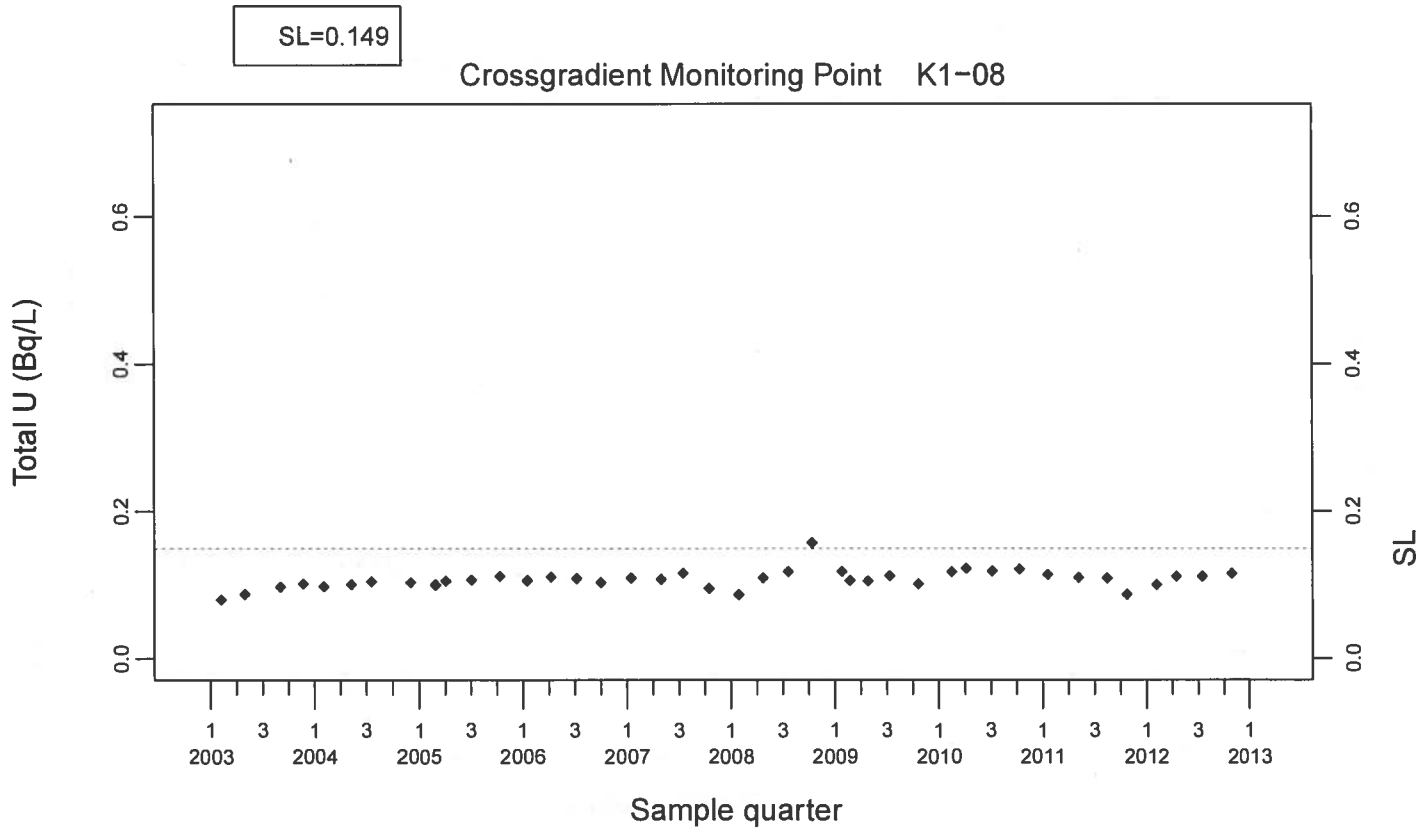

Pit 1 Area
Total U (Bq/L)
Background Monitoring Point K1-01C
Above RL
Below RL
Total U (Bq/L)
0.0
0.2
0.4
0.6
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

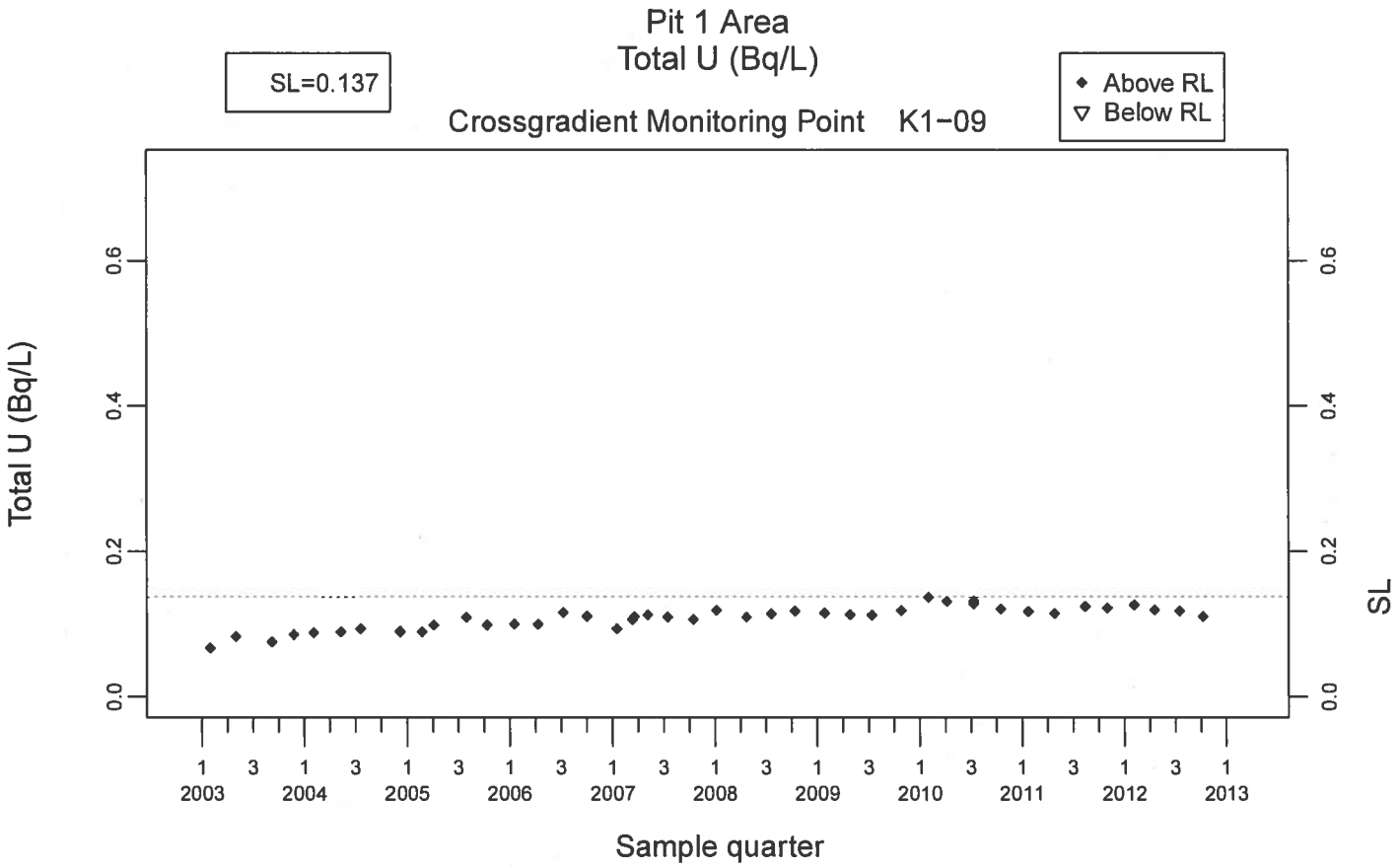

Background Monitoring Point K1-07
Total U (Bq/L)
0.0
0.2
0.4
0.6
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

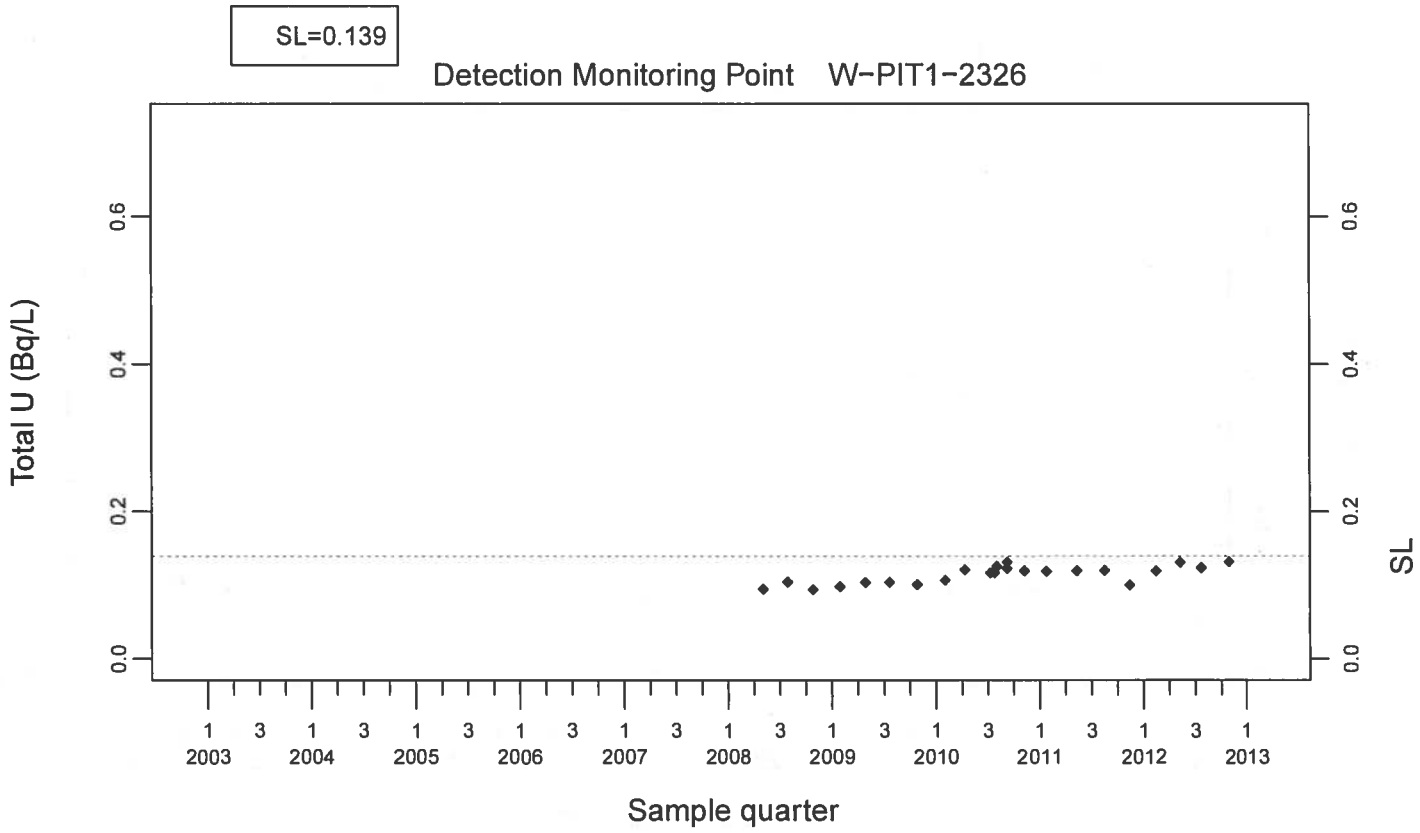

Pit 1 Area
Total U (Bq/L)
SL=0.145
Above RL
Below RL
Detection Monitoring Point K1-02B
Total U (Bq/L)
SL
0.0
0.2
0.4
0.6
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

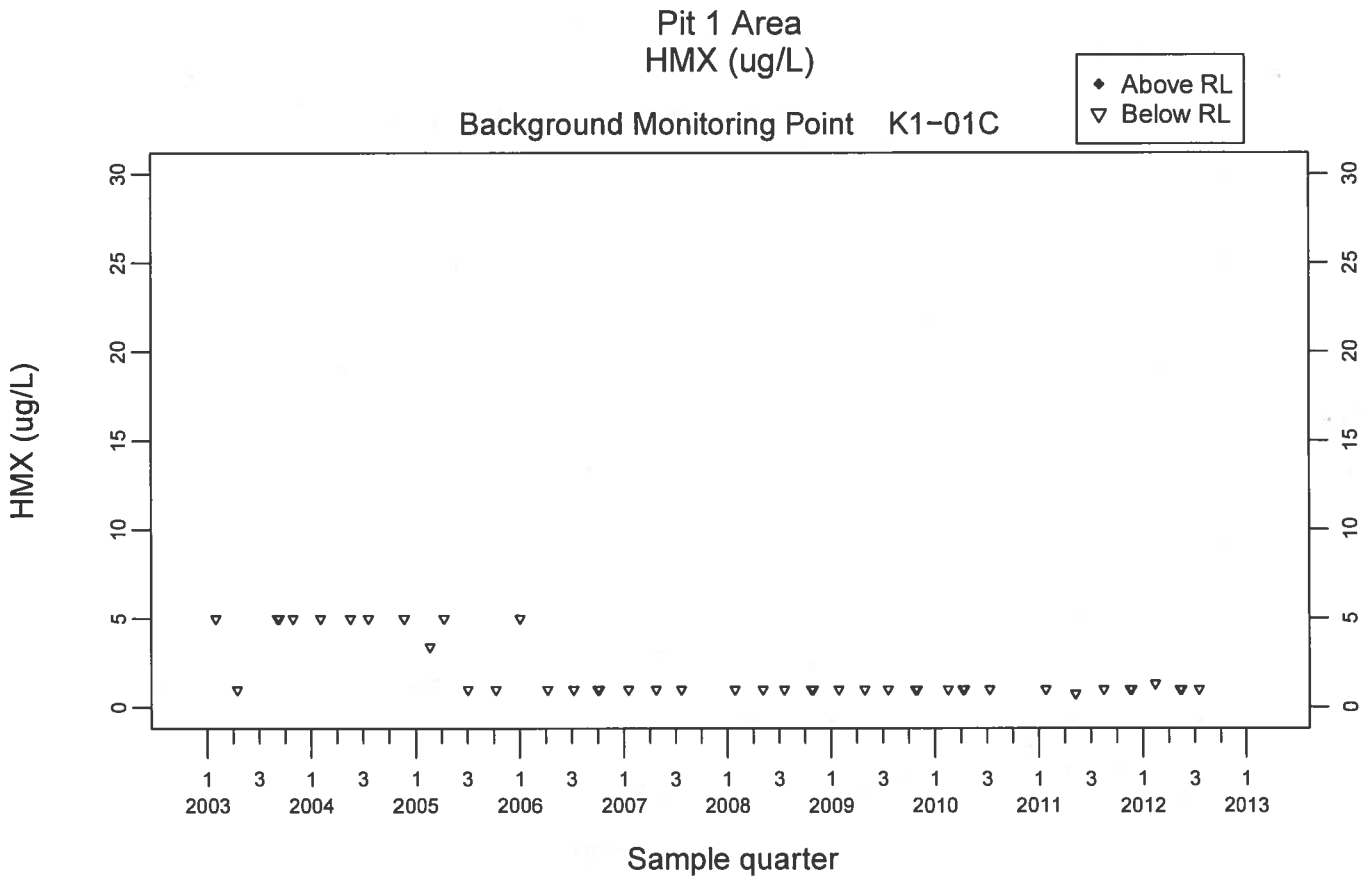

SL=0.085
Detection Monitoring Point K1-04
Total U (Bq/L)
SL
0.0
0.2
0.4
0.6
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

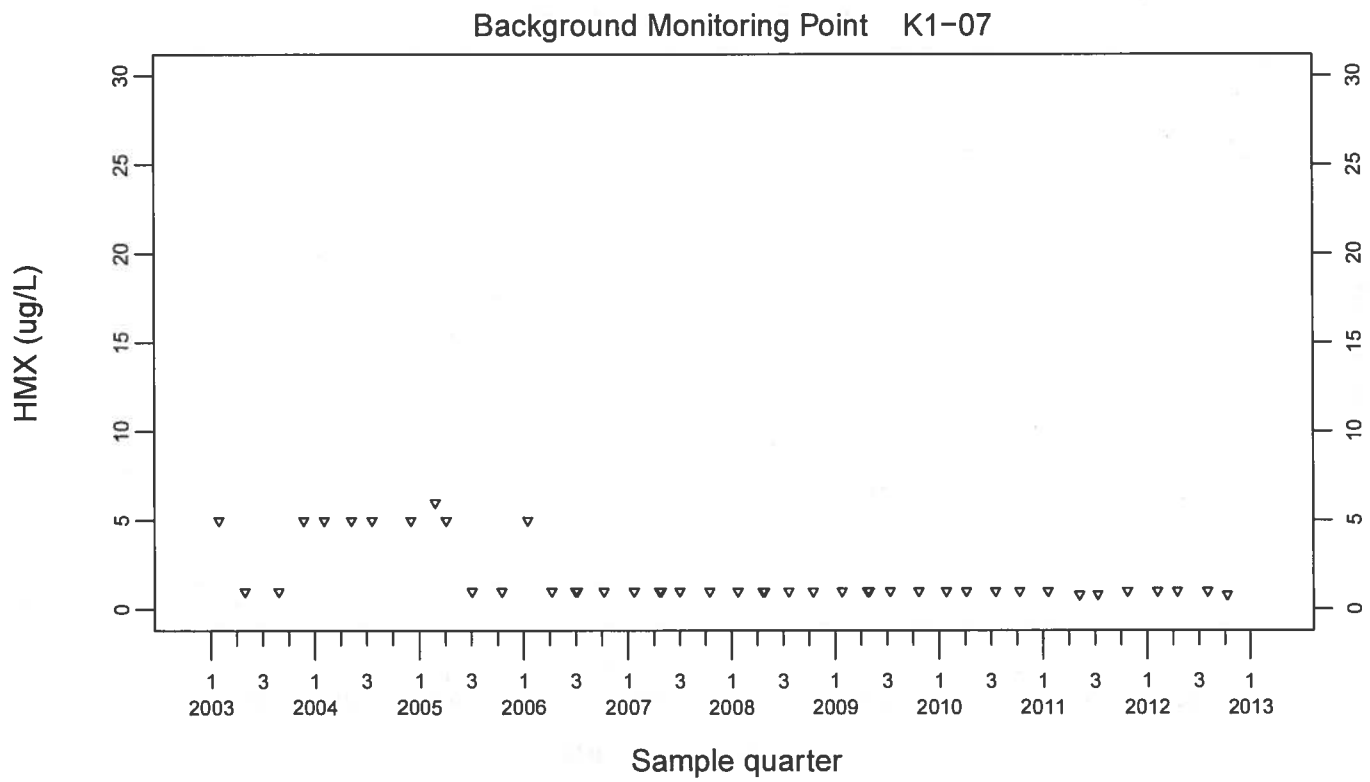

Pit 1 Area
Total U (Bq/L)
SL=0.115
Above RL
Below RL
Detection Monitoring Point K1-05
Total U (Bq/L)
SL
0.0
0.2
0.4
0.6
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

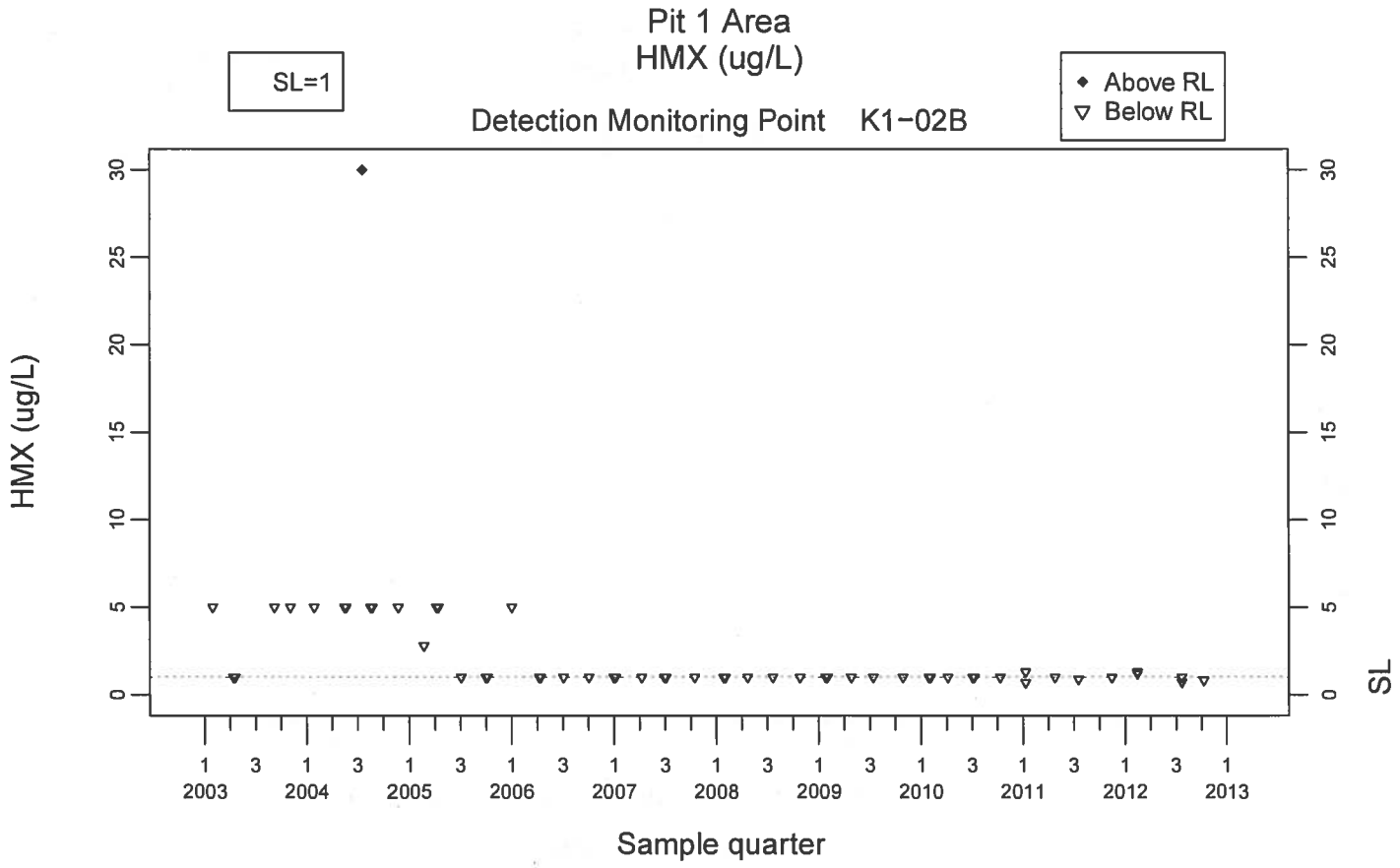

SL=0.149
Crossgradient Monitoring Point K1-08
Total U (Bq/L)
SL
0.0
0.2
0.4
0.6
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

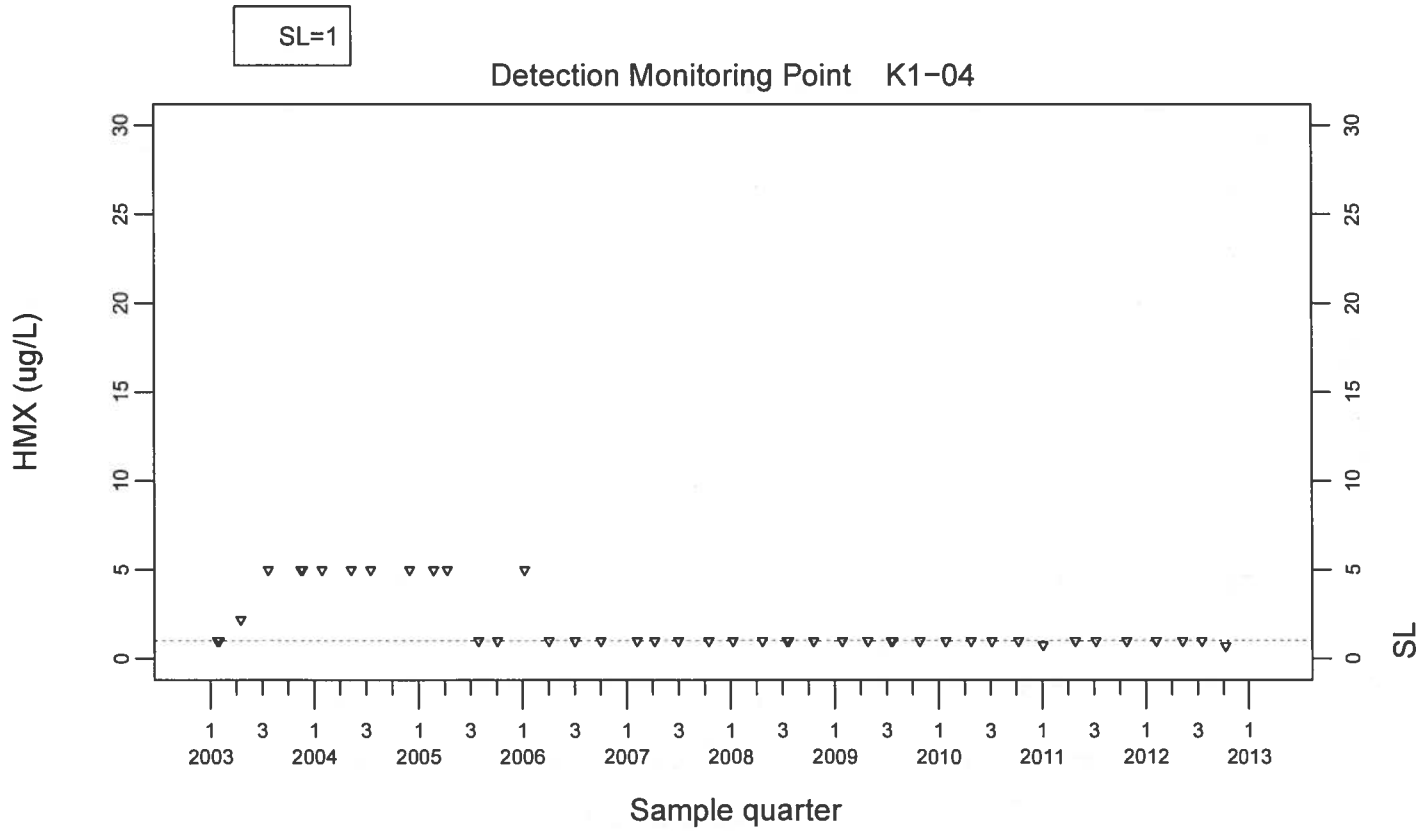

Pit 1 Area
Total U (Bq/L)
SL=0.137
Above RL
Below RL
Crossgradient Monitoring Point K1-09
Total U (Bq/L)
SL
0.0
0.2
0.4
0.6
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

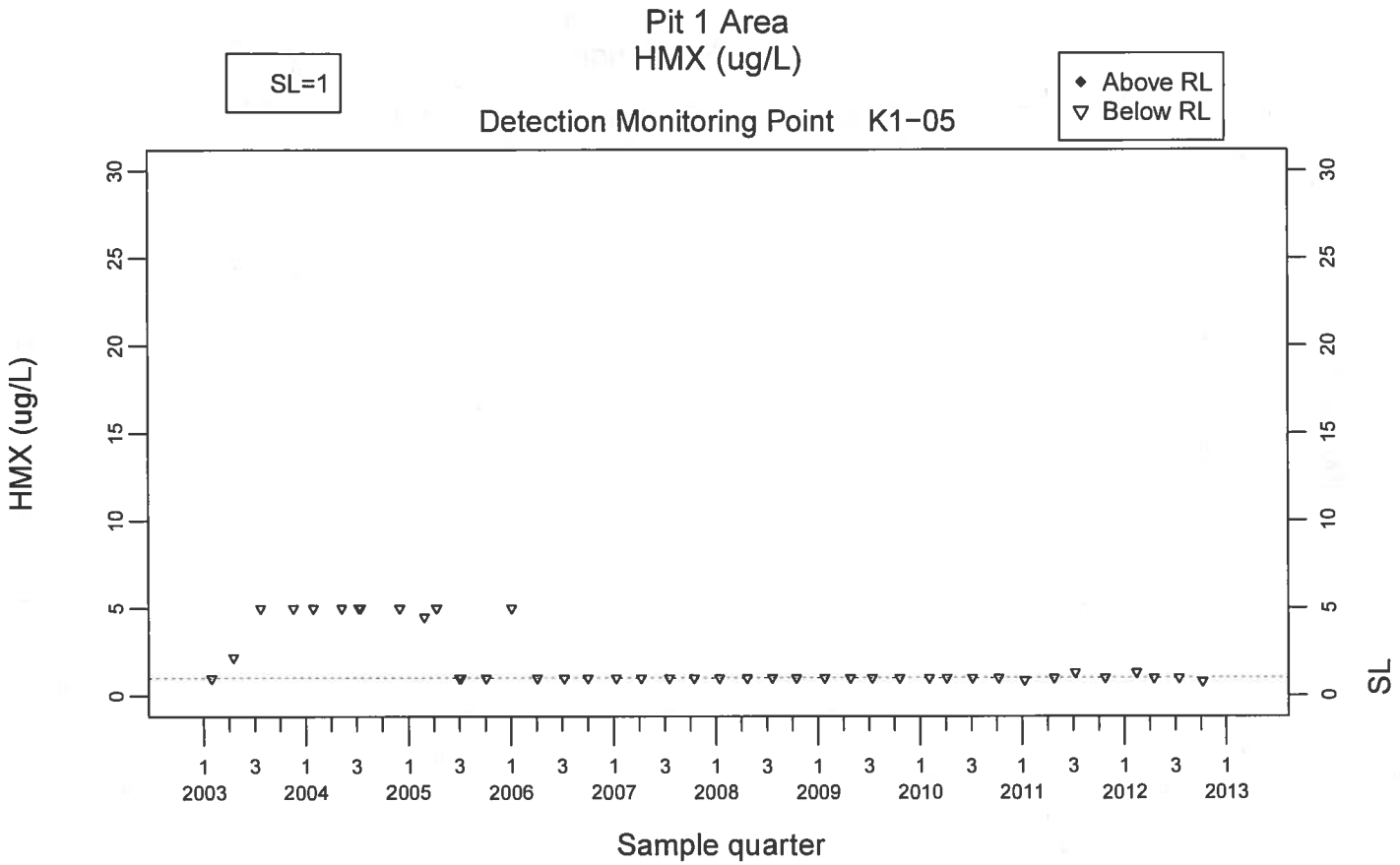

SL=0.139
Detection Monitoring Point W-PIT1-2326
Total U (Bq/L)
SL
0.0
0.2
0.4
0.6
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

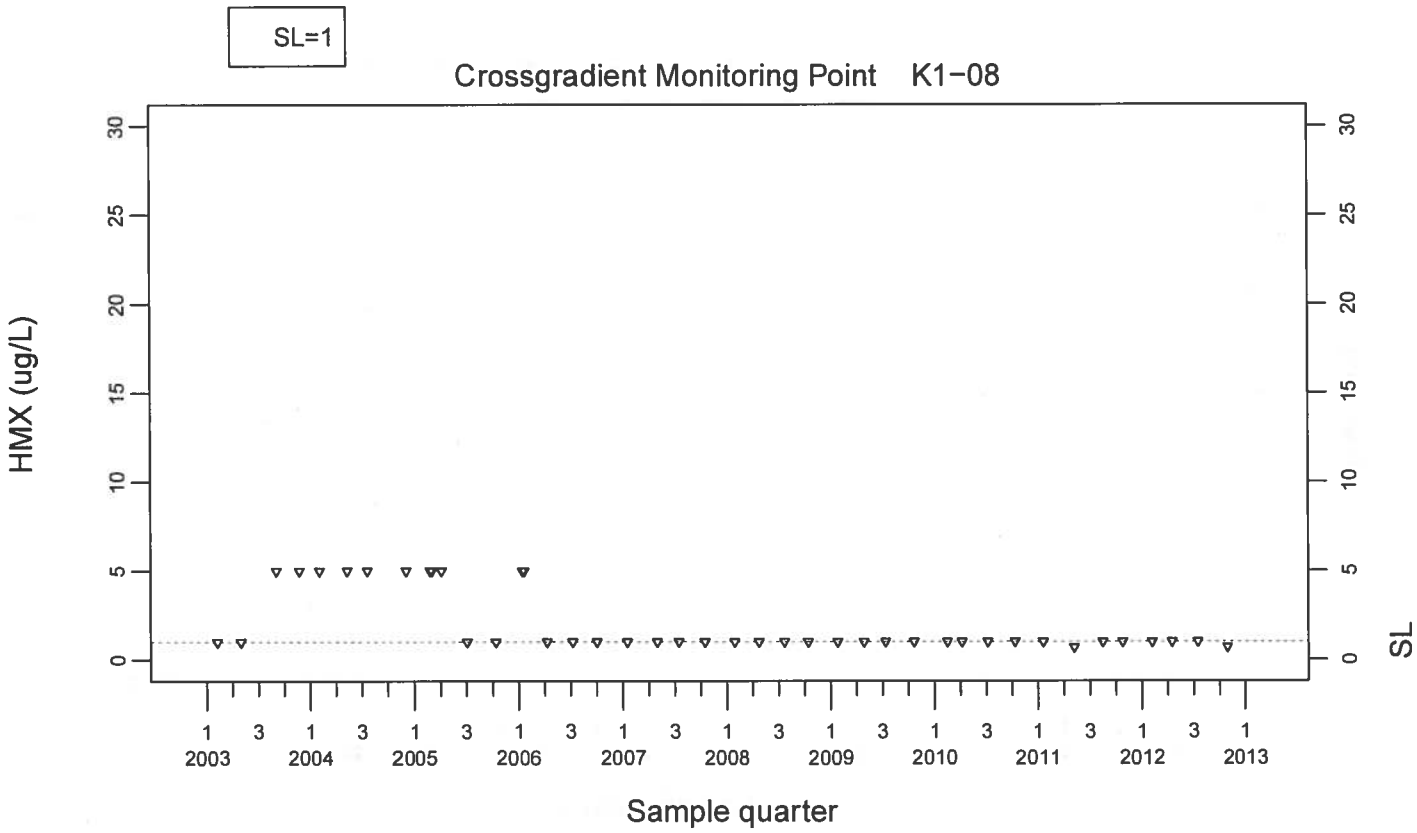

Pit 1 Area
HMX (ug/L)
Background Monitoring Point K1-01C
Above RL
Below RL
HMX (ug/L)
0
5
10
15
20
25
30
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

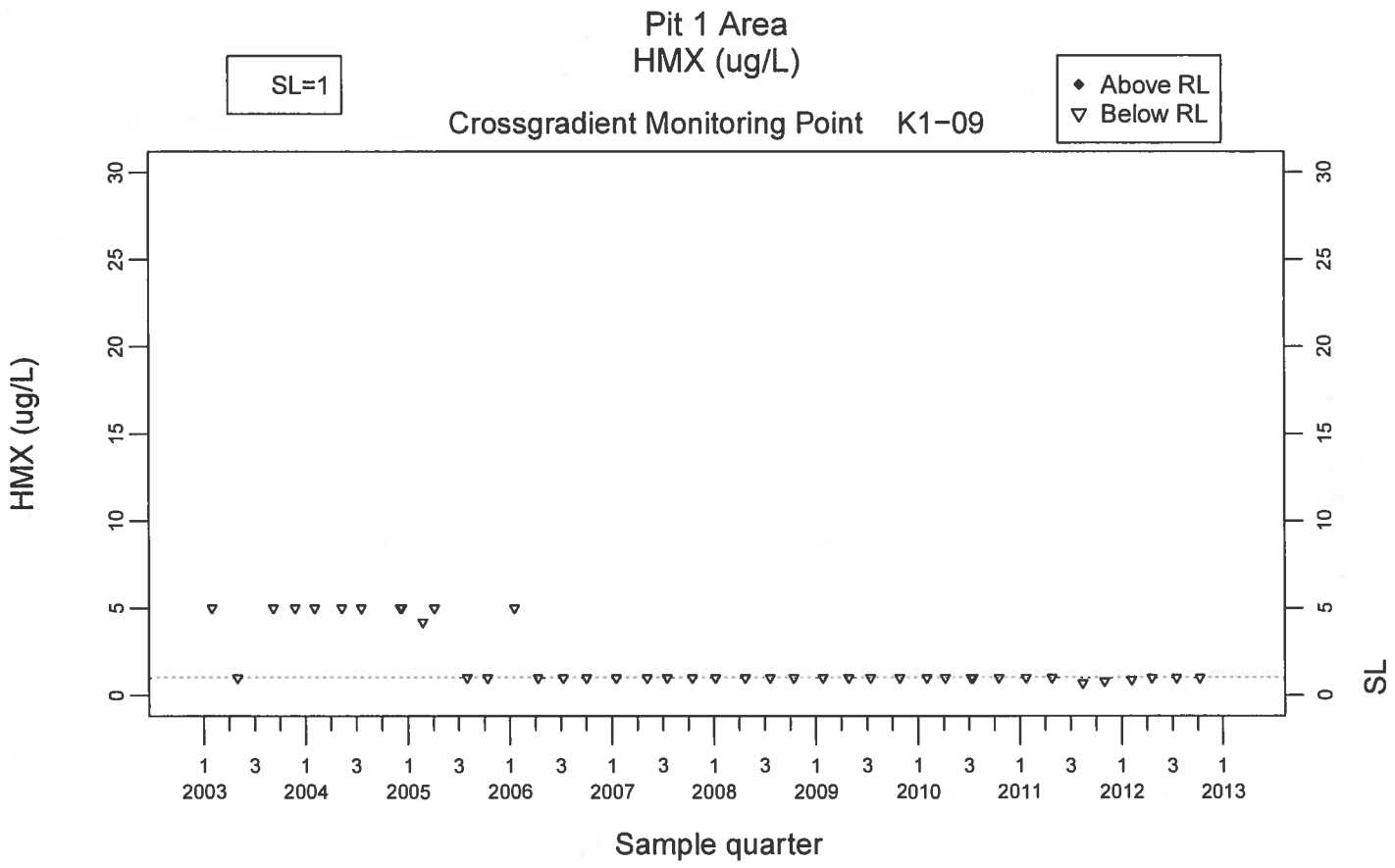

Background Monitoring Point K1-07
HMX (ug/L)
0
5
10
15
20
25
30
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

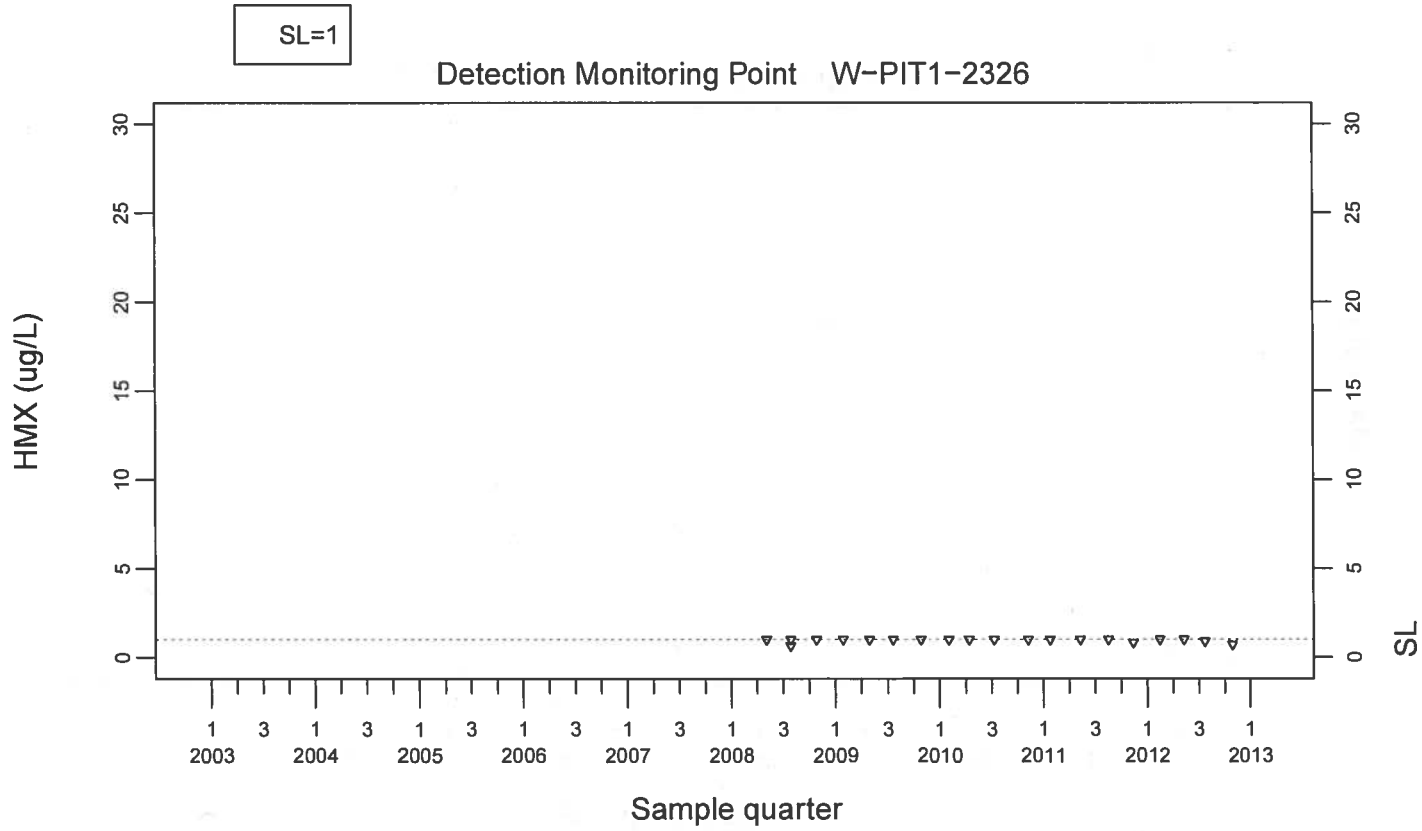

Pit 1 Area
HMX (ug/L)
SL=1
Above RL
Below RL
Detection Monitoring Point K1-02B
HMX (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

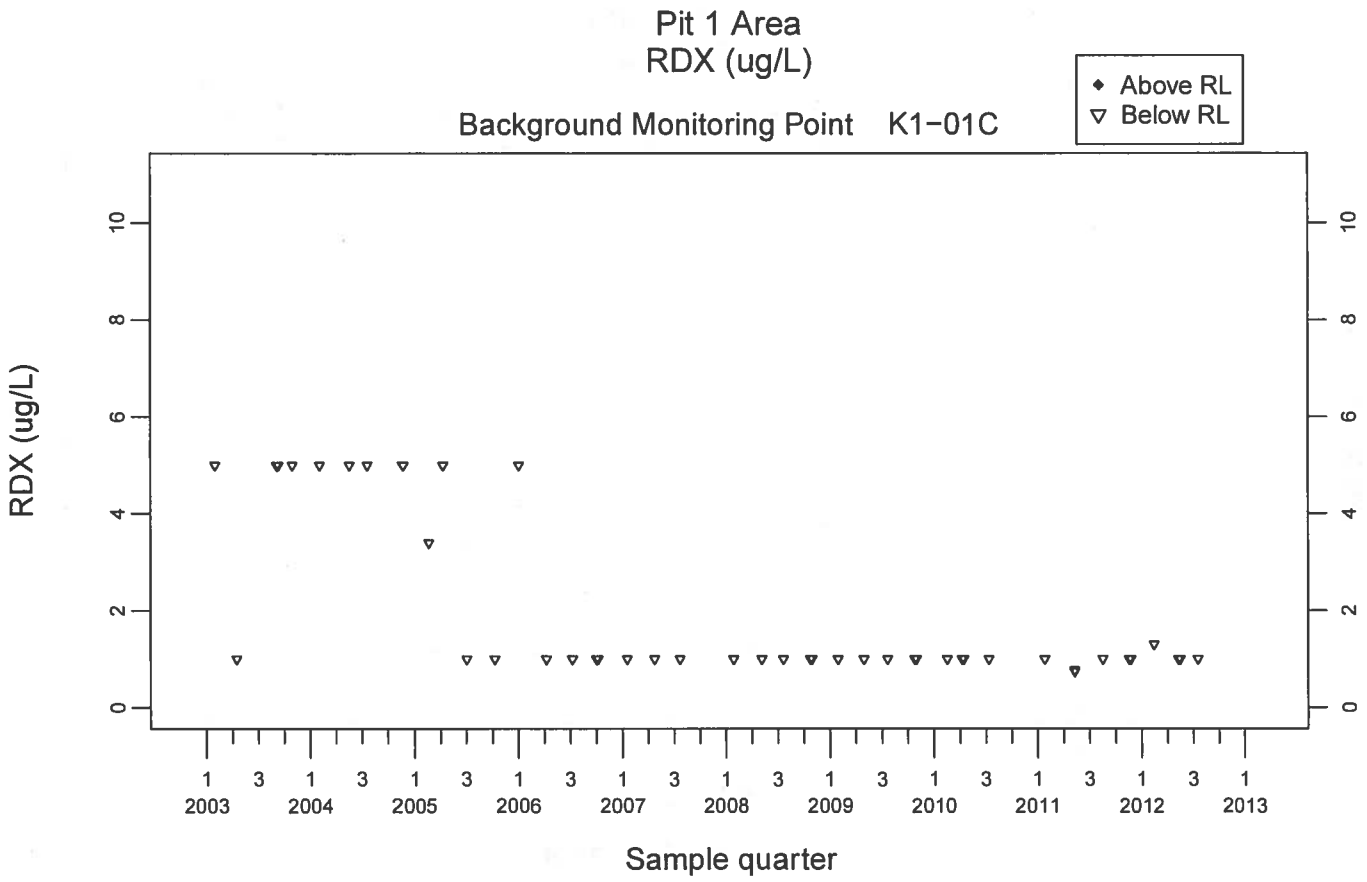

SL=1
Detection Monitoring Point K1-04
HMX (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

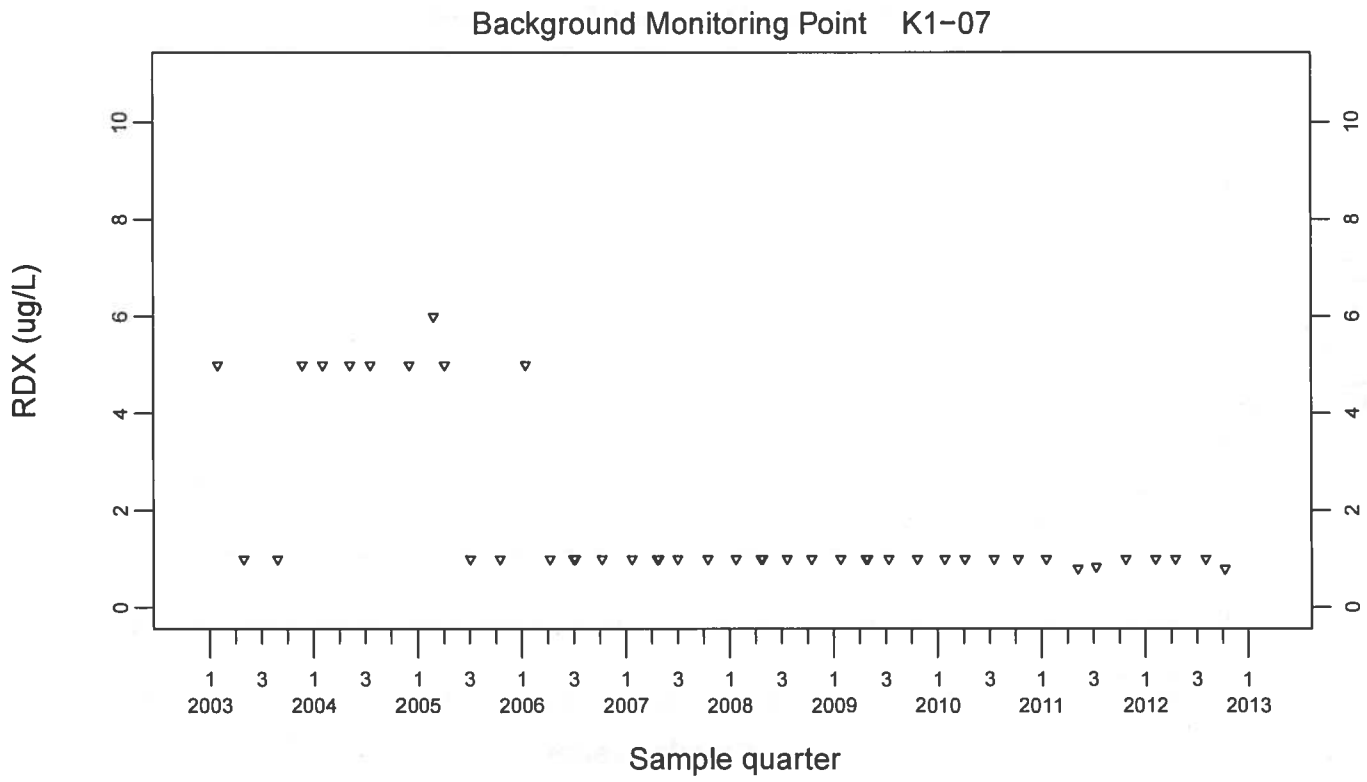

Pit 1 Area
HMX (ug/L)
SL=1
Above RL
Below RL
Detection Monitoring Point K1-05
HMX (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

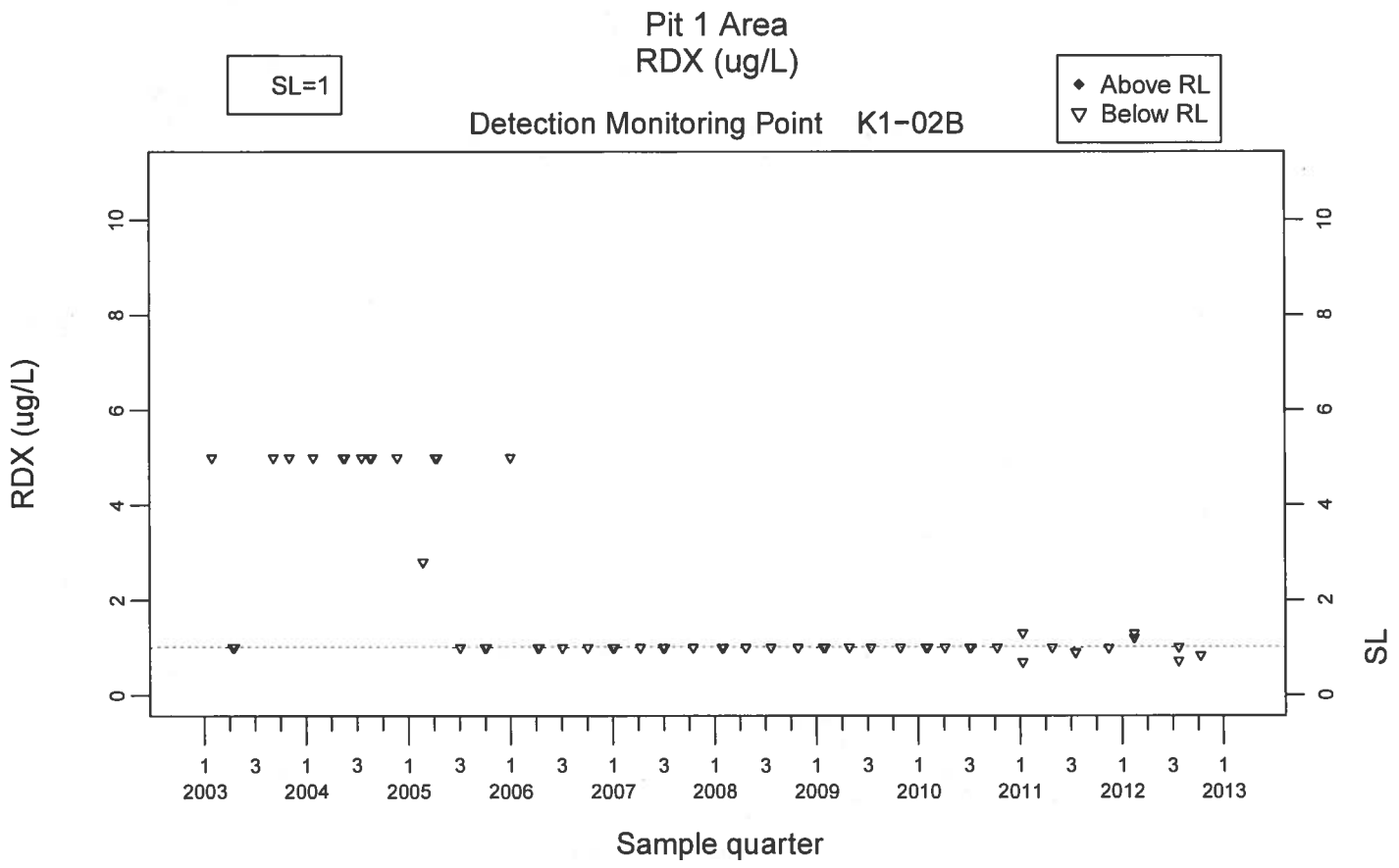

SL=1
Crossgradient Monitoring Point K1-08
HMX (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

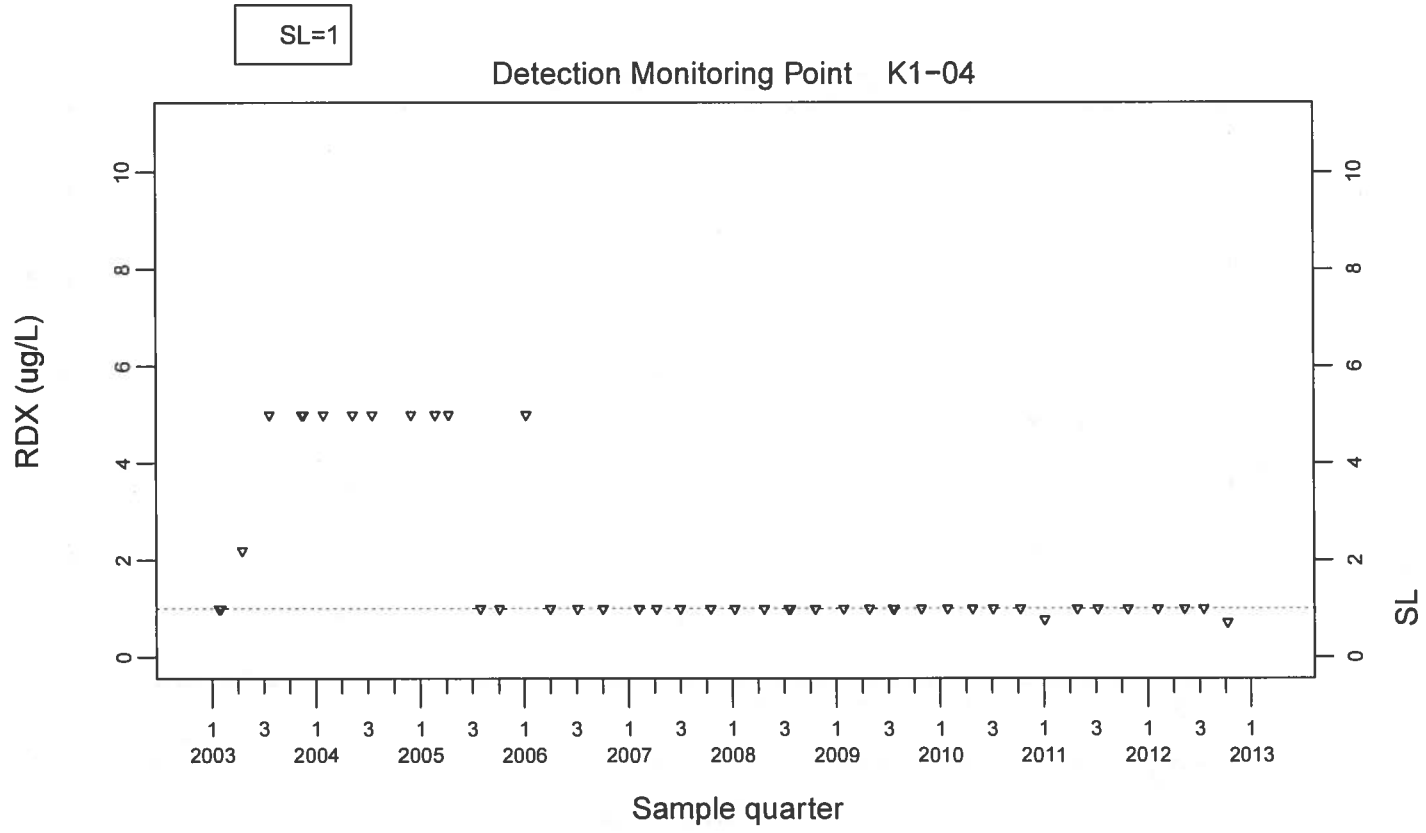

Pit 1 Area
HMX (ug/L)
SL=1
Above RL
Below RL
Crossgradient Monitoring Point K1-09
HMX (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

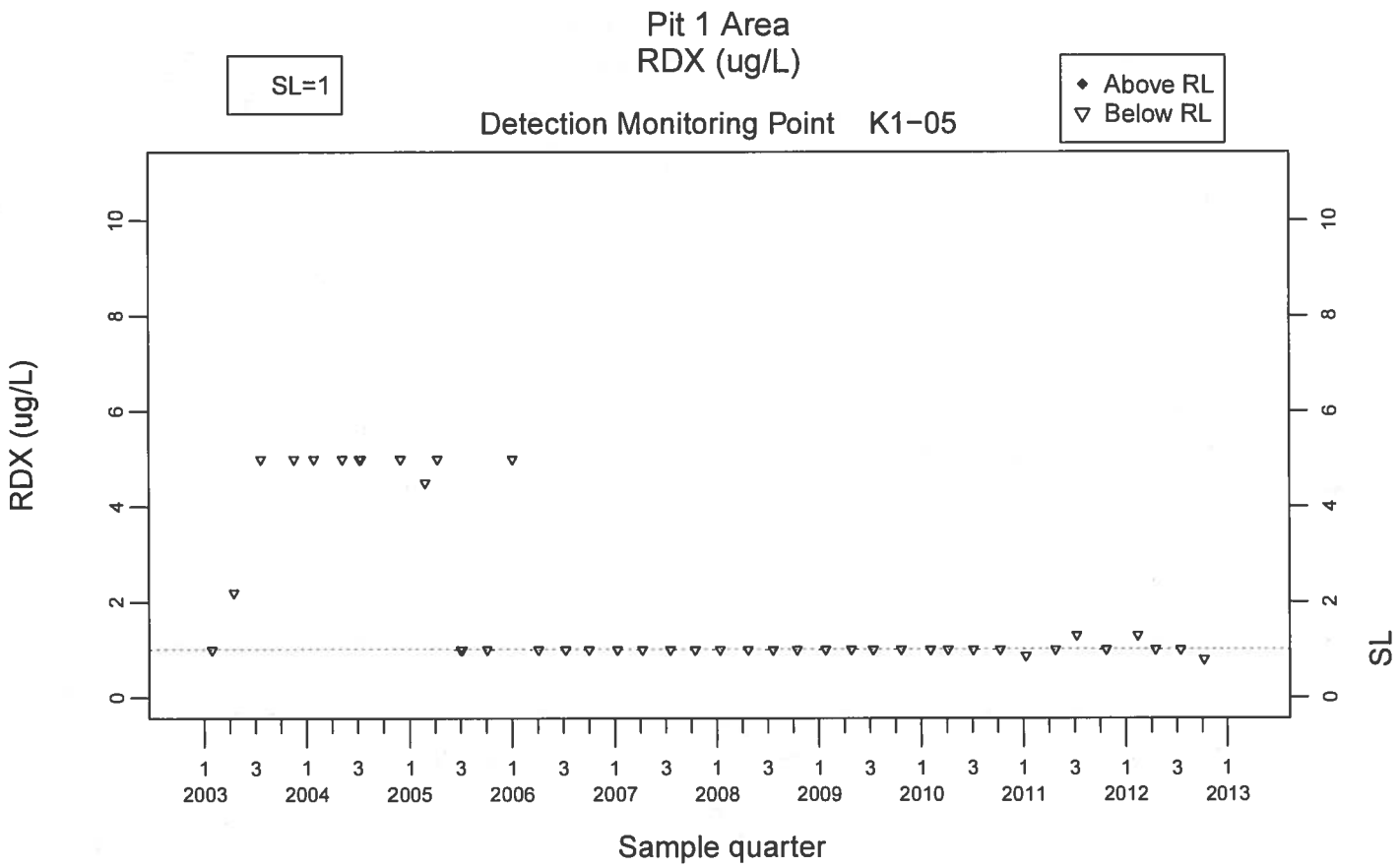

SL=1
Detection Monitoring Point W-PIT1-2326
HMX (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

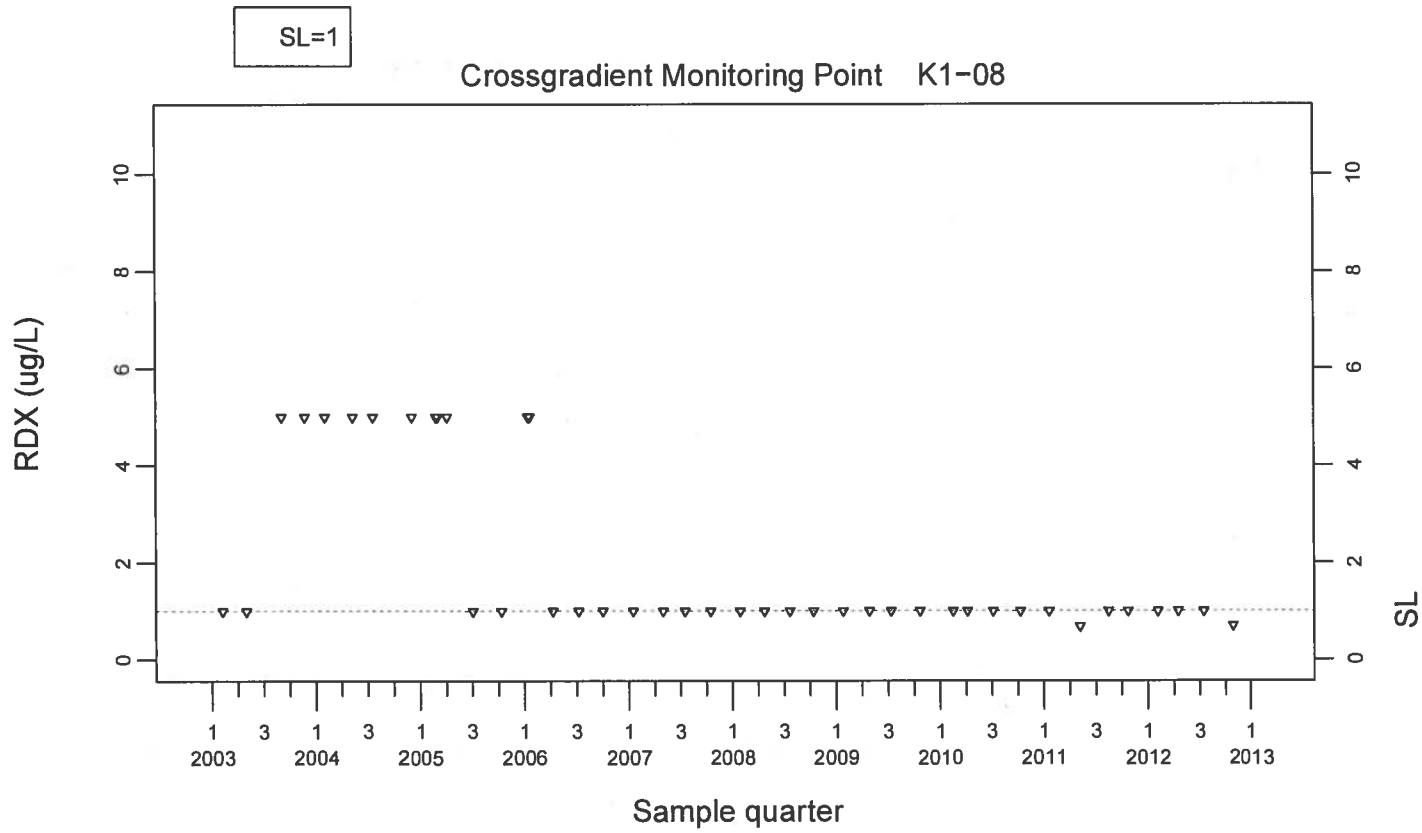

Pit 1 Area
RDX (ug/L)
Above RL
Below RL
Background Monitoring Point K1-01C
RDX (ug/L)
0
2
4
6
8
10
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

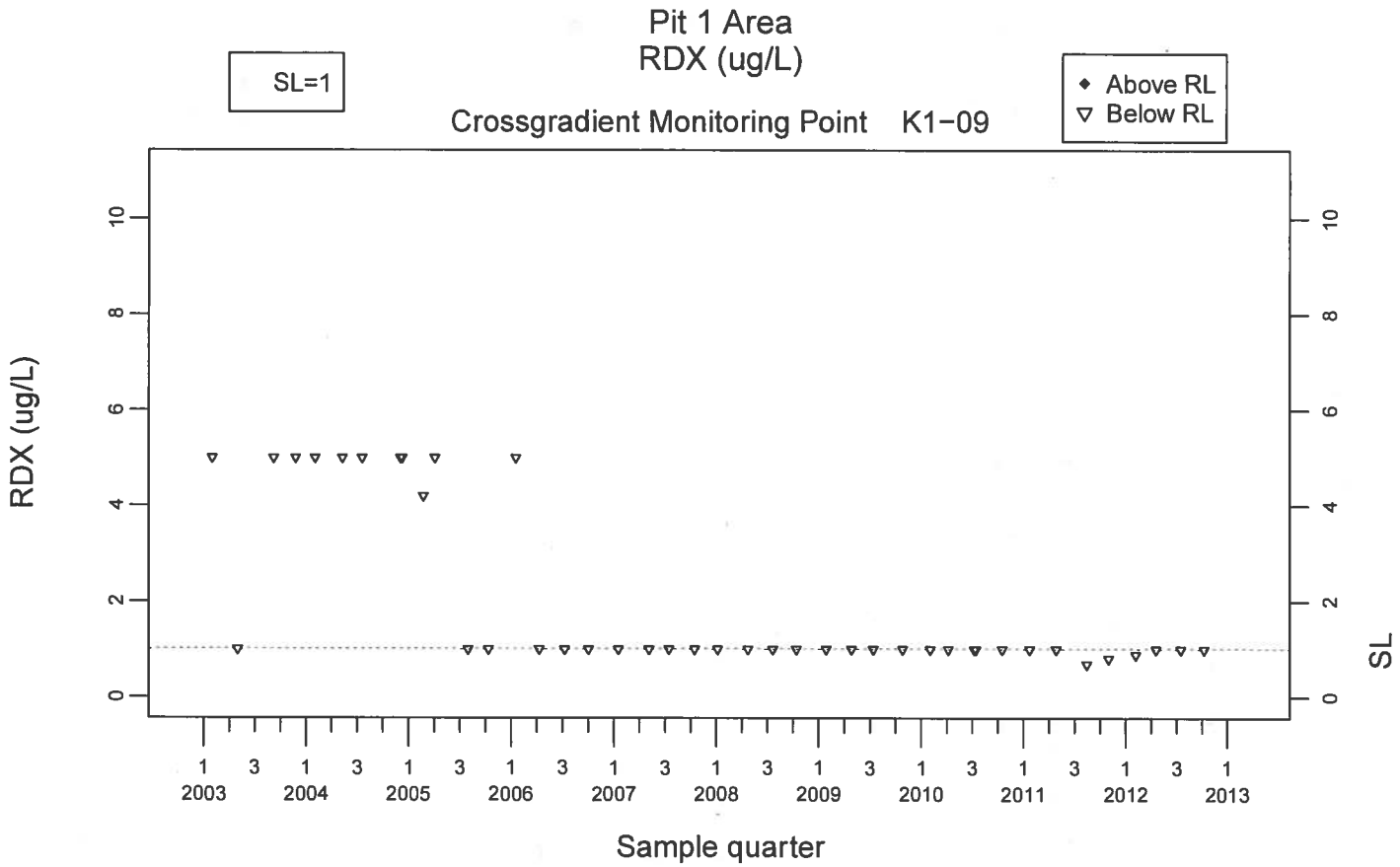

Background Monitoring Point K1-07
RDX (ug/L)
0
2
4
6
8
10
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Sample quarter

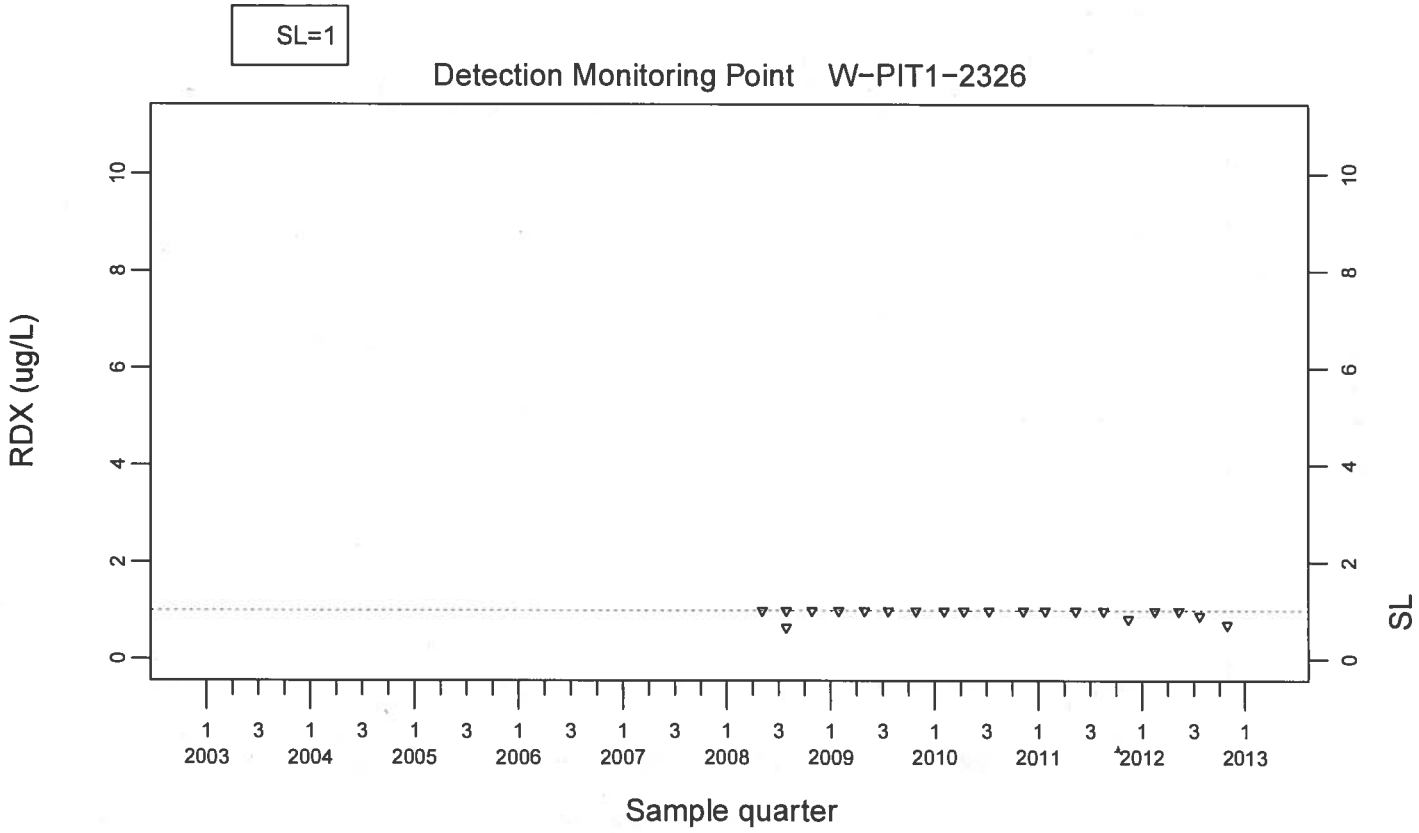

Pit 1 Area
RDX (ug/L)
SL=1
Above RL
Below RL
Detection Monitoring Point K1-02B
RDX (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013


SL=1
Detection Monitoring Point K1-04
RDX (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013


Pit 1 Area
RDX (ug/L)
SL=1
Above RL
Below RL
Detection Monitoring Point K1-05
RDX (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013


SL=1
Crossgradient Monitoring Point K1-08
RDX (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013


Pit 1 Area
RDX (ug/L)
SL=1
Crossgradient Monitoring Point K1-09
Above RL
Below RL
RDX (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013


SL=1
Detection Monitoring Point W-PIT1-2326
RDX (ug/L)
SL
Sample quarter
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

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