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LLNL-AR-411431-20-3

Lawrence Livermore National Laboratory (LLNL) Experimental Test Site (Site 300) Compliance Monitoring Report for Waste Discharge Requirements (WDR) Order No. R5-2008-0148, Second Semester/Annual 2019 Report

A. M. Chan

February 28, 2020

This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Lawrence Livermore National Laboratory

February 27, 2020

Aimee C. Phiri, P.E.
Water Resources Control Engineer
RWQCB – Central Valley
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670-6114

Subject: *Lawrence Livermore National Laboratory (LLNL) Experimental Test Site (Site 300) Compliance Monitoring Program for the Closed Pit 1 Landfill, Fourth Quarter Report for 2019*

Dear Ms. Phiri:

Enclosed please find a copy of the *Lawrence Livermore National Laboratory (LLNL) Experimental Test Site (Site 300) Compliance Monitoring Program Report for the Closed Pit 1 Landfill, Fourth Quarter Report for 2019* that includes a summary and discussion of groundwater monitoring results for this reporting period.

This report was prepared in accordance with the Central Valley Regional Water Quality Control Board (CVRWQCB) Revised Pit 1 Monitoring and Reporting Program (MRP) for permitted Waste Discharge Requirements (WDR) Order 93-100, dated February 18, 2010. All the reporting requirements and results are discussed in the Description of Report Contents or Summary of Analytical Results sections of this report.

No evidence of a new release of constituents of concern from Pit 1 was indicated by the fourth quarter groundwater measurements. However, four constituents of concern (COCs), beryllium, cadmium, zinc, and uranium, were detected above their respective statistical limits (SL). Beryllium and cadmium had not been previously detected in samples from well K1-09 during the entirety of the monitoring program since 2007, when sampling and analysis for beryllium and cadmium was first conducted. Zinc was detected in the duplicate sample for well K1-09 with the last SL exceedance during the first quarter 2019. Total uranium was detected in well W-PIT1-2326, however, previous studies and mass spectrometric uranium isotope testing discuss the natural background variability of total uranium at the pit. The presence of these COCs does not indicate significant evidence of a release from Pit 1. Retest samples have been requested for all four COCs and will be discussed in an upcoming 7-Day letter or the next quarterly report.

Should you have any questions regarding this letter or the enclosed report, please contact Ada Chan in the Water, Air, Monitoring and Analysis Group at LLNL at (925) 422-7758.

ESH-EFA-WQ-20-17014– CQ/AC:mgp

CERTIFICATION STATEMENT

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Crystal Quinly, Manager
Environmental Functional Area
Environment, Safety & Health

Enclosure: Lawrence Livermore National Laboratory Experimental Test Site (Site 300) Compliance Monitoring Program for the Closed Pit 1 Landfill, Fourth Quarter Report 2019

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UCRL-AR-10191-19-4

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

Compliance Monitoring Program for Closed Pit 1 Landfill

Fourth Quarter Report for 2019

Author

Ada Chan

Lawrence Livermore National Laboratory

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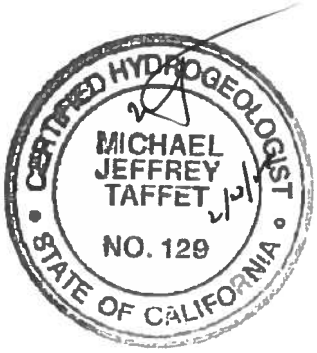

2/27/20

Michael J. Taffet — Date
California Professional Geologist
No. 5616
License expires: May 31, 2021
California Certified
Hydrogeologist No. 129
License Expires: May 31, 2021

Summary

This fourth quarter report for 2019 summarizes compliance activities performed at the Lawrence Livermore National Laboratory (LLNL) Experimental Test Site (Site 300) Pit 1 landfill. Compliance activities at the pit consist of groundwater sampling and analysis, pit cap inspections, and reporting of analytical results. Groundwater monitoring data are contained in **Appendix A, Tables A-1** to **A-4**.

No evidence of a new release of constituents of concern (COCs) from Pit 1 was indicated by the fourth quarter groundwater measurements. However, four constituents of concern (COCs) – beryllium, cadmium, zinc, and uranium – were detected above their respective statistical limits (SLs). Zinc was detected in the duplicate sample for well K1-09 with the last SL exceedance during the first quarter 2019. Details of SL exceedances have been described in past reports and current exceedances are discussed in detail in the Summary of Analytical Results section of this report. The presence of these COCs does not indicate evidence of an actual release from Pit 1.

Introduction

This fourth quarter report for 2019 summarizes compliance monitoring results for closed landfill 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 Resource Conservation and Recovery Act (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.

Because Pit 1 is not part of a response action conducted under CERCLA, the post-closure monitoring and reporting for the Pit 1 Landfill is conducted under Waste Discharge Requirements Order 93-100 and the February 18, 2010 Revised Monitoring and Reporting Program Order 93-100 issued by the California Regional Water Quality Control Board (CRWQCB), Central Valley Region.

Figure 1. Location of LLNL Site 300.

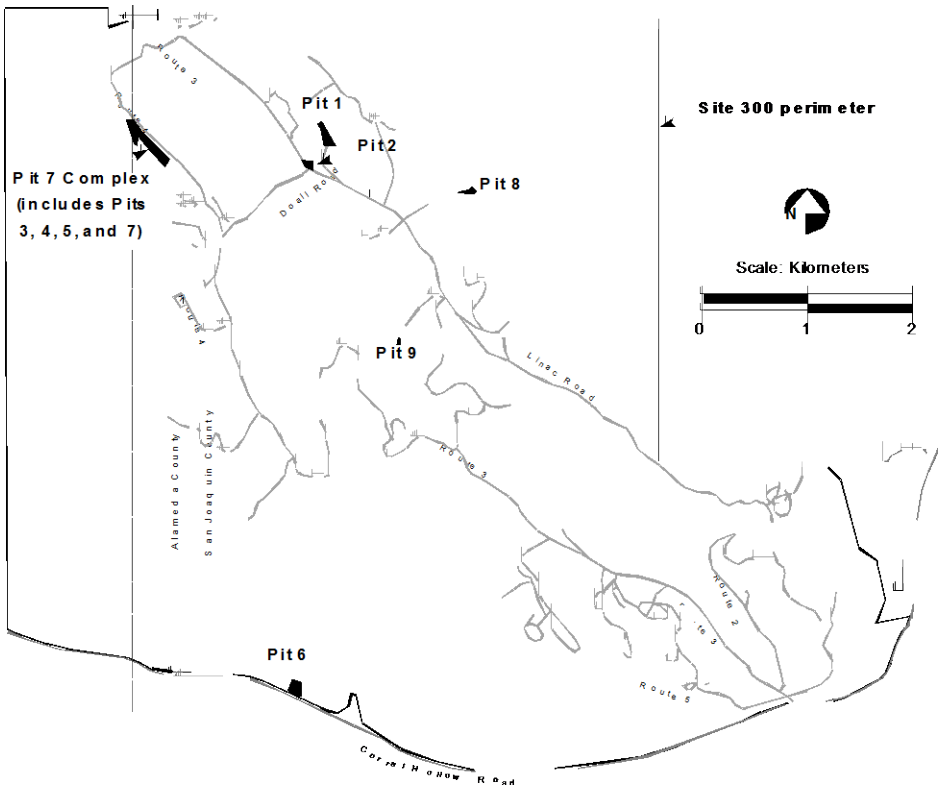

Figure 2. Location of the closed Pit 1 landfill at LLNL Site 300.

Pit 1 is located in the Elk Ravine drainage area about 300 meters (m) or 984 feet (ft) above mean sea level (MSL). Groundwater 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 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; down-gradient wells K1-02B, K1-04, K1-05, and W-PIT1-2326; and cross-gradient wells K1-08 and K1-09. The primary purpose of the detection monitoring wells is to detect any new release of COCs to groundwater. COCs, 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 the Pit 1 detection 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 during the third quarter of 2011 due to well damage. These evaluation monitoring wells were added to the Pit 1 monitoring and reporting requirements to track existing plumes of perchlorate and tritium from up-gradient sources. LLNL collects and analyzes one

sample quarterly from each evaluation monitoring well and annually conducts trend analyses of tritium and perchlorate concentrations.

All the wells are screened in the uppermost water-bearing zone (hydrostratigraphic unit or HSU), which occurs in the Neroly Formation lower blue sandstone ($Tnbs_1$/$Tnbs_0$) HSU. The Neroly Formation contains the main aquifer beneath Site 300. Pit 2, which was closed before RCRA was enacted, is hydrologically upgradient of 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 divert storm water runoff away from the landfill. The diversion channel empties into the adjacent arroyo, which in turns conveys flow towards Elk Ravine.

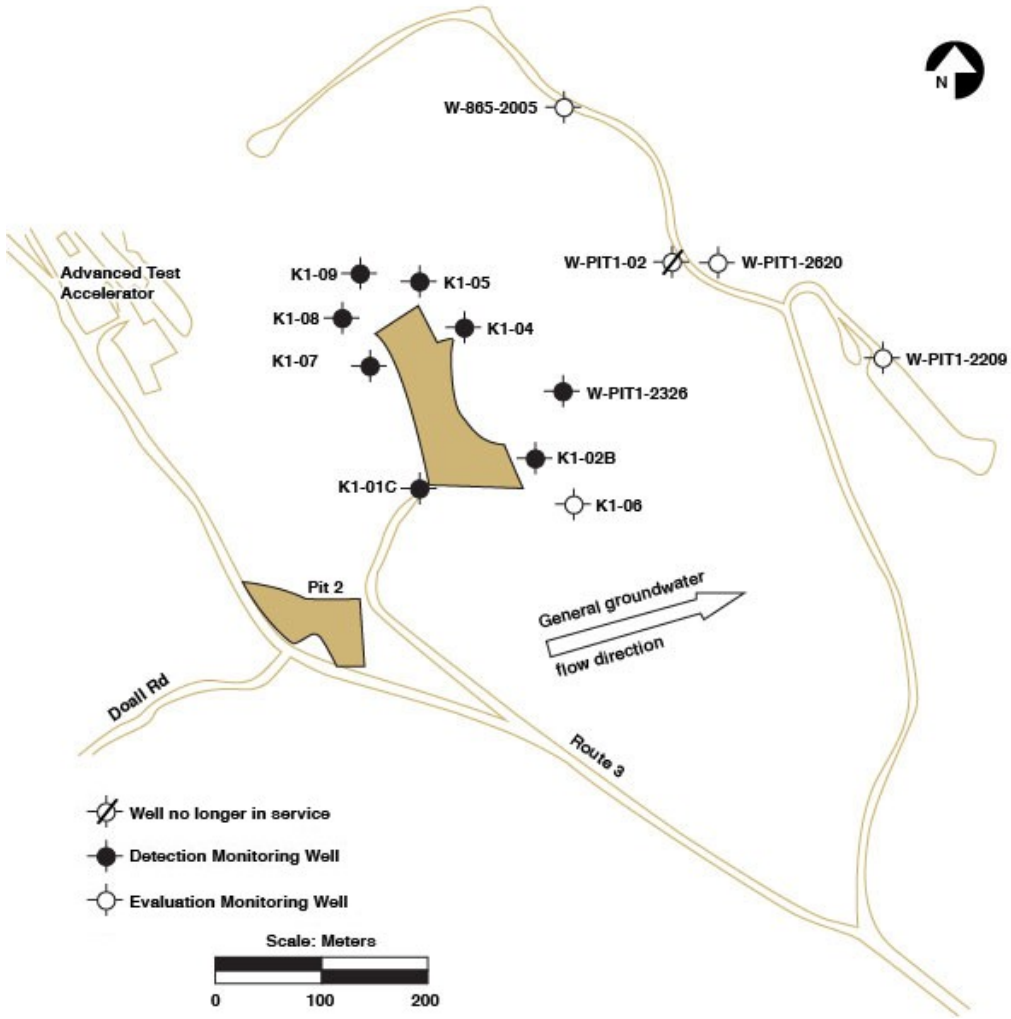

Figure 3. Locations of Pit 1 detection and compliance monitoring wells.

Compliance Monitoring Program Overview

This report fulfills quarterly requirements set forth in the following two sets of 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 (PCPs), Landfill Pits 1 and 7 (Rogers/Pacific Corporation 1990). The PCP was approved by the California Department of Health Services (now the California Department of Toxic Substances Control). The combined requirements include quarterly groundwater sampling and analyses to detect potential releases of COCs from the landfill, annual and post-major storm event visual inspections of pit cap integrity, repairs as necessary to maintain the integrity of the landfill and its water-diversion system, annual elevation measurements of cap survey markers to detect subsidence, an annual inspection of the cap by an independent engineer, and these quarterly written monitoring reports. The fourth quarter Pit 1 report provides statistical limits and graphs of groundwater measurements (Chan, 2018).

Quality Assurance

To ensure quality data, LLNL works within the established Quality Assurance (QA) program of the LLNL Environment, Safety & Health Directorate. LLNL uses protocols and procedures that cover all aspects of groundwater 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, 2016), and the *Environmental Monitoring Plan* (Brunckhorst, 2019). 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 groundwater 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**. 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 summarizes any COC concentrations detected in groundwater samples from detection monitor wells during the fourth quarter of 2019. COC measurements that exceeded SLs or MCLs in drinking water are also discussed in this report.

Appendix A Tables A-1, A-2, and **A-3** contain the groundwater analytical measurements for Pit 1 for the fourth quarter of 2019. **Table A-4** shows the sample dates and **A-5** shows the reporting limits (RLs) for the Pit 1 VOC COCs. In **Tables A-1** through **A-3**, results that are less than the RL are prefaced with a less than sign (<). 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 groundwater sample is less than a low activity reference standard. **Appendix A** also contains a groundwater elevation contour map (**Figure A-1**) for the $Tnbs_1/Tnbs_0$ HSU at Pit 1. This map is only presented in the second and fourth quarter compliance monitoring program reports.

Appendix B explains the methods used to determine the SL for a COC at a monitoring well. Requirements for statistical treatment of groundwater 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 COC 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 2019 at Pit 1 in **Table C-1**.

Appendix D consists of **Table D-1** summarizing COCs 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 contains hydrographs for all compliance monitoring wells.

Appendix G contains field logs for all compliance monitoring wells.

Appendix H consists of the statistical limits and graphs of groundwater measurements.

Summary of Analytical Results

This section summarizes the analytical results for Pit 1 for the fourth quarter of 2019 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 COCs to groundwater from the pit are evident in the data. As part of the MRP, SLs used to monitor groundwater COCs are shown on **Table A-1**. The MRP requires that two confirmation samples be collected from wells where COCs exceed SLs. If either of the two confirmation sample concentrations exceeds the SL, 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 these data are identified in **Appendix B**.

Detection Monitoring Wells

Analytical results indicate that there were three COCs (beryllium, cadmium, and uranium) detected in routine samples above their respective SLs from the Pit 1 wells and one COC (zinc) detected in a duplicate sample above the SL. The presence of these COCs does not indicate an actual release from Pit 1 and details of these SL exceedances are explained below. No other COCs exceeded an SL this quarter and no COCs exceeded an MCL.

Several statistical limit exceedances occurred at cross-gradient well K1-09 during the fourth quarter for the following constituents of concern – beryllium, cadmium, and zinc (in the duplicate sample). Sampling performed on November 4th yielded a beryllium concentration of 1.2 µg/L (SL = 0.5 ug/L), cadmium concentration of 1 ug/L (SL = 0.5 ug/L), and zinc concentration of 21 µg/L (SL = 20 µg/L) in the duplicate sample. Email correspondence was made to Aimee Phiri on January 6th noting the SL exceedance and the collection of two retest samples for the COCs. Beryllium and cadmium had not been previously detected in samples from well K1-09 since 2007, when sampling and analysis for beryllium and cadmium were first conducted. In the duplicate sample for zinc, a SL exceedance was observed, and two retest samples were requested. Zinc was last detected at 36 µg/L in the first quarter of 2019. LLNL will evaluate the beryllium, cadmium, and zinc concentrations from this well when the retest sample results are available, and report results in the next quarterly report or in a 7-Day letter.

Sampling performed on December 17th at down-gradient well W-PIT1-2326 yielded total uranium activities of 0.146 Bq/L and 0.179 Bq/L (SL=0.139 Bq/L) in the routine and duplicate sample respectively. The total uranium activities in this wells and other Pit 1 wells have been discussed in past reports (Blake, 2011; Blake, 2015, Chan, 2019) and in letters to the CVRWQCB (Schultz, 2010 [90-Day Letter]; Pierce, 2011 [Seven-Day Written Notification]). As stated in these letters and reports, the analyses and information that LLNL has provided to the CVRWQCB indicate that the total uranium activities in the Pit 1 wells have historically been within background ranges. Moreover, the mass spectrometric uranium isotope analysis of a fourth quarter 2018 sample from

well W-PIT1-2326 yielded a $^{235}U/^{238}U$ atom ratio of 0.00728, within the natural range near 0.0072. Thus, the SL exceedances of total uranium in Pit 1 well samples do not indicate actual evidence of a release of total uranium from the pit, but rather reflect background variability in total uranium in ground water within a volcaniclastic aquifer. Two retests for total uranium from this quarter were requested and the results will be evaluated in a 7-day letter or in the next quarterly report.

In addition to the normal reporting for detection monitoring wells with COCs and corresponding SLs, this report evaluates additional constituents that have shown elevated concentrations and are monitored under the PCP or under LLNL's surveillance monitoring program per DOE Order 458.1. The concentrations of selected VOCs detected in groundwater samples from detection monitoring wells are summarized and presented as total VOCs (**Table A-2**). VOCs were detected in groundwater samples from upgradient well K1-07 (0.92 µg/L) and cross-gradient wells K1-08 (25 µg/L) and K1-09 (42g/L). Total VOC concentrations are similar to those reported last quarter. The only VOC observed in these samples was Freon-113. The Freon-113 arises from a source at Building 865, about 300 m (984 ft) northwest of Pit 1 (Taffet et al., 2019b). The Freon-113 concentrations for ground water samples collected from wells K1-05, K1-08, and K1-09 are plotted on **Figure 4**, below. The Freon-113 concentration trends for these detection monitoring wells have been relatively similar and have each varied within narrow ranges since 2002. The maximum concentrations of Freon-113 measured in these detection monitoring wells are well below the 1,200 µg/L MCL.

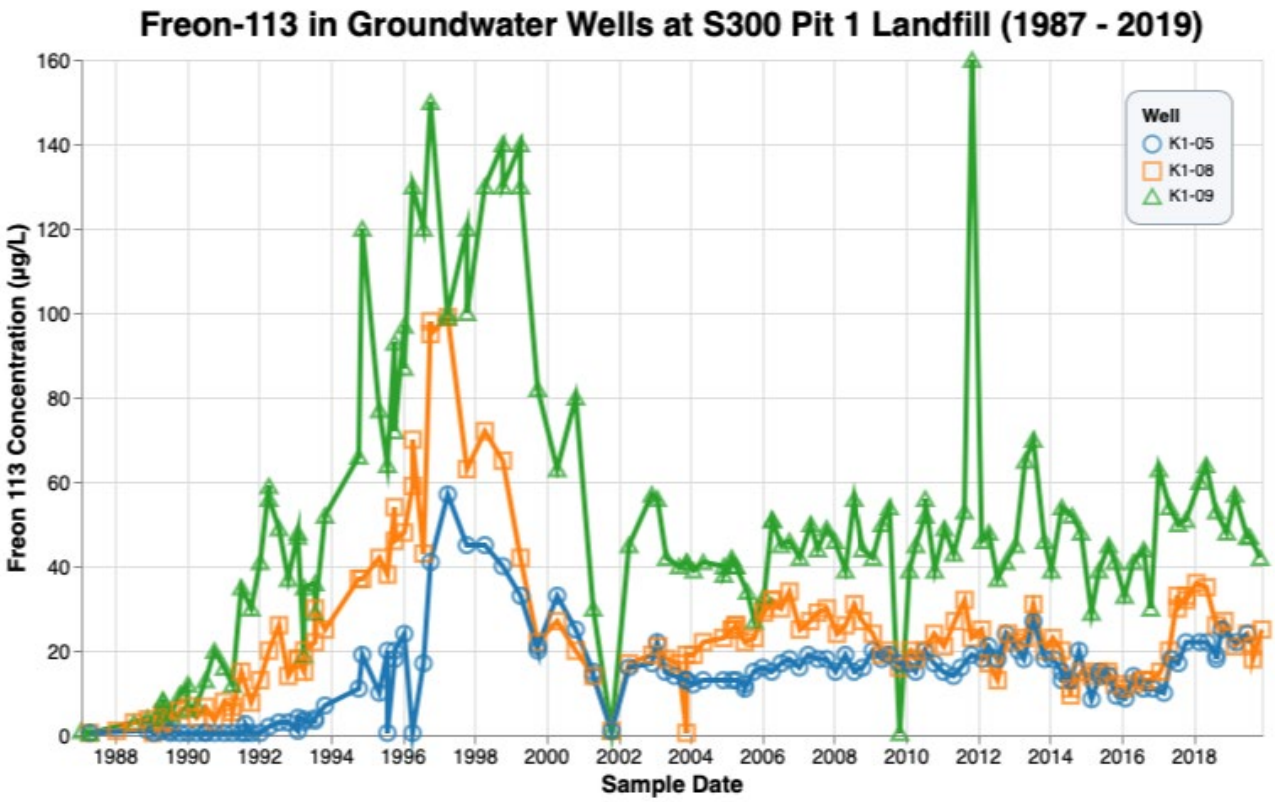

Figure 4. Freon-113 concentrations in groundwater samples from detection monitoring wells at Pit 1.

Evaluation Monitoring Wells

Evaluation monitoring wells are required by the MRP and analytical results for samples from these wells are tabulated in **Table A-3**. The table lists physical parameters as well as perchlorate and tritium analytical data. These wells are used to track the existing plumes of perchlorate and tritium from an up-gradient source. As required by the MRP, annual time-series plots of perchlorate and tritium concentrations in evaluation monitoring wells are presented in each fourth quarter/annual report.

Of the four current evaluation monitoring wells (W-PIT1-2209, W-865-2005, K1-06, and W-PIT1-2620), one well, K1-06, has not been sampled since 2018 due to a non-working pump. However, the well is scheduled to receive a new pump in the coming months. The fourth quarter 2019 sample from one of the evaluation monitoring wells, W-PIT1-2620, yielded 6.2 µg/L of perchlorate, similar to concentrations reported in previous quarterly reports. This is the only evaluation monitoring well that yielded a detection of perchlorate this quarter, exceeding the 6 µg/L MCL for perchlorate. LLNL will continue to monitor the perchlorate concentrations in the evaluation monitoring wells. Perchlorate concentrations in ground water samples collected from the current evaluation monitoring wells and W-PIT1-02 (replaced.by W-PIT1-2620) since 2005 are plotted on **Figure 5**, below.

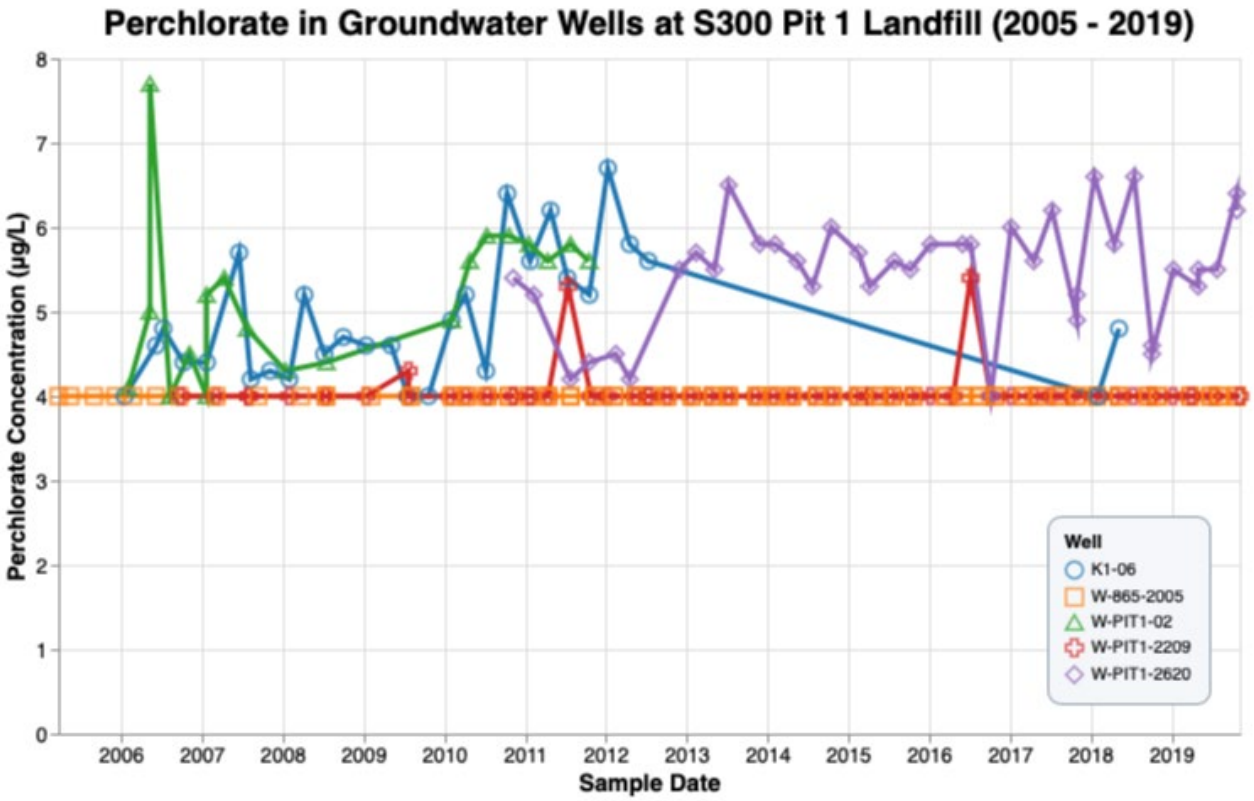

Figure 5. Perchlorate concentrations in groundwater samples from evaluation monitoring wells at Pit 1.

The tritium activities in fourth quarter 2019 samples from the evaluation monitoring wells were all consistent with recent data. Samples from wells W-PIT1-2209 and W-865-2005 yielded tritium activities below the detection limit of 3.7 Bq/L. The tritium activity at well W-PIT1-2620 was 65.5 Bq/L, similar to the previous quarters' activities. Tritium activities in groundwater samples collected from the evaluation monitoring wells since 1995 are plotted on **Figure 6,** below.

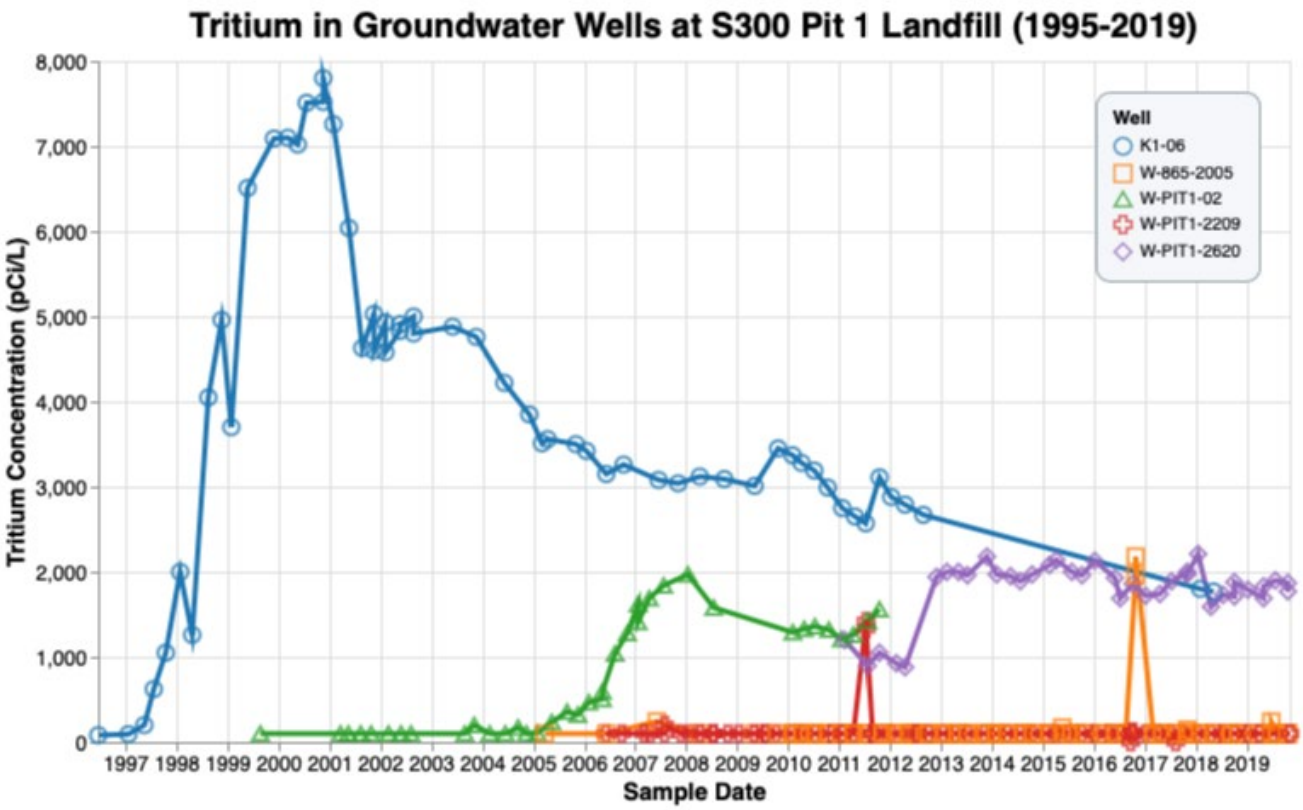

Figure 6. Tritium activities in groundwater samples from evaluation monitoring wells around Pit 1.

Inspection and Maintenance Summary

There were no formal inspections of Pit 1 this quarter. However, the pit cap and drainage structures continued to function properly, and the vegetative cover and drainage system were in proper operating condition.

Regulatory Correspondence and Activities

The CVRWQCB semi-annual inspection with Aimee Phiri and LLNL staff was conducted on October 29, 2019. A walkthrough around Pit 1 and the cap drainage ditch was conducted with no findings reported.

LLNL received CVRWQCB's comments on the August 28, 2019 Statistically Significant

Evidence of a Release of Zinc from Lawrence Livermore National Laboratory Experimental Test Site Pit 1: 90-Day Report on November 6, 2019. LLNL is providing responses to these comments in a letter to be issued concurrently or shortly after submission of this report. Specifically, as part of LLNL's response to CVRWQCB's Comment #4, Table B-1 been added to **Appendix B** and lists the monitoring periods for the data used to calculate the current SL for each well and constituent.

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Acknowledgments

The compliance monitoring program for Pit 1 could not be conducted without the dedicated efforts of many people. Maria Glenn-Padilla provided essential administrative and editorial assistance. Tyler Jackson generated annual plots for the report. 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, Beth Schad, John Radyk, and Lisa Graves provided excellent data management support and ensured data quality. Off-site analytical support was provided by BC Laboratories, Inc., ALS Environmental, and GEL Laboratories. Hydrogeologic and graphic assistance was provided by Jonathan McKaskey. A draft of this report was reviewed by LLNL peers, including the Site 300 Special Projects Manager, Jim Woollett, and Site 300 Manager, Valerie Dibley, whose suggestions and improvements were very much appreciated and incorporated into this report. Lastly, much appreciation goes to Michael Taffet, Professional Geologist from ERD, who provided technical review, editing, and comments on this report.

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
COCs	constituents of concern
CVRWQCB	Central Valley Regional Water Quality Control Board
DOE	U.S. Department of Energy
DTSC	Department of Toxic Substances Control (California)
DWEL	Drinking Water Equivalent Level
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 Groundwater Measurements

Table A-1. Pit 1 detection monitoring wells, constituents of concern, SLs, and quarterly analytical results for 2019.

Quarter			**1**	**2**	**3**	**4**
COC (units)	**Well**	**SL**	**Result**	**Result**	**Result**	**Result**
Arsenic (µg/L)	K1-01C	–[a]	11	–[d]	13	11
	K1-07	–[a]	2.3	–[d]	13	4.5
	K1-02B	15	–[b]	–[b]	–[b]	–[b]
	K1-04	16	11	–[d]	12	12
	K1-05	18	15	13	–[e]	–[e]
	K1-08	17	14	14	15	13
	K1-09	16	12	14	13	3.0
	W-PIT1-2326	14	11	12	11	12
Barium (µg/L)	K1-01C	–[a]	<25	–[d]	<25	<25
	K1-07	–[a]	25	–[d]	28	<25
	K1-02B	26	–[b]	–[b]	–[b]	–[b]
	K1-04	32	28	–[d]	32	30
	K1-05	43	41	38	–[e]	–[e]
	K1-08	49	45	44	43	44
	K1-09	51	44	46	43	<25
	W-PIT1-2326	46	36	36	39	38
Beryllium (µg/L)	K1-01C	–[a]	<0.5	–[d]	<0.5	<0.5
	K1-07	–[a]	<0.5	–[d]	<0.5	2.1
	K1-02B	0.5	–[b]	–[b]	–[b]	–[b]
	K1-04	0.5	<0.5	–[d]	<0.5	<0.5
	K1-05	0.5	<0.5	<0.5	–[e]	–[e]
	K1-08	0.5	<0.5	<0.5	<0.5	<0.5
	K1-09	0.5	<0.5	<0.5	<0.5	1.2[i]
	W-PIT1-2326	0.5	<0.5	<0.5	<0.5	<0.5
Cadmium (µg/L)	K1-01C	–[a]	<0.5	–[d]	<0.5	<0.5
	K1-07	–[a]	<0.5	–[d]	<0.5	2.1
	K1-02B	0.52	–[b]	–[b]	–[b]	–[b]
	K1-04	0.5	<0.5	–[d]	<0.5	<0.5
	K1-05	0.5	<0.5	<0.5	–[e]	–[e]
	K1-08	0.5	<0.5	<0.5	<0.5	<0.5
	K1-09	0.5	<0.5	<0.5	<0.5	1.0[i]
	W-PIT1-2326	0.5	<0.5	<0.5	<0.5	<0.5
Cobalt (µg/L)	K1-01C	–[a]	<25	–[d]	<25	<25
	K1-07	–[a]	<25	–[d]	<25	<25
	K1-02B	25	–[b]	–[b]	–[b]	–[b]
	K1-04	25	<25	–[d]	<25	<25
	K1-05	25	<25	<25	–[e]	–[e]
	K1-08	25	<25	<25	<25	<25

Table A-1. Pit 1 detection monitoring wells, constituents of concern, SLs, and quarterly analytical results for 2019.

Quarter			**1**	**2**	**3**	**4**
COC (units)	**Well**	**SL**	**Result**	**Result**	**Result**	**Result**
	K1-09	25	<25	<25	<25	<25
	W-PIT1-2326	25	<25	<25	<25	<25
Copper (µg/L)	K1-01C	–[a]	<10	–[d]	<10	<10
	K1-07	–[a]	<10	–[d]	<10	<10
	K1-02B	60	–[b]	–[b]	–[b]	–[b]
	K1-04	10	<10	–[d]	<10	<10
	K1-05	30	<10	<10	–[e]	–[e]
	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	–[a]	<2	–[d]	<2	<2
	K1-07	–[a]	<2	–[d]	<2	2.1
	K1-02B	2	–[b]	–[b]	–[b]	–[b]
	K1-04	2	<2	–[d]	<2	<2
	K1-05	2	<2	<2	–[e]	–[e]
	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	–[a]	<5	–[d]	<5	<5
	K1-07	–[a]	<5	–[d]	<5	<5
	K1-02B	9	–[b]	–[b]	–[b]	–[b]
	K1-04	5	<5	–[d]	<5	<5
	K1-05	13	<5	<5	–[e]	–[e]
	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	–[a]	64	–[d]	76	69
	K1-07	–[a]	33	–[d]	67	<25
	K1-02B	59	–[b]	–[b]	–[b]	–[b]
	K1-04	46	31	–[d]	38	34
	K1-05	79	71	65	–[e]	–[e]
	K1-08	78	63	66	67	65
	K1-09	69	63	71	64, 67[f], 68[f]	<25
	W-PIT1-2326	63	51	60	53	50
Zinc (µg/L)	K1-01C	–[a]	57	–[d]	<20	<20
	K1-07	—[a]	28	–[d]	<20	<20
	K1-02B	98	–[b]	–[b]	–[b]	–[b]
	K1-04	51	28	–[d]	<20	27
	K1-05	24	46	<20	–[e]	–[e]

Table A-1. Pit 1 detection monitoring wells, constituents of concern, SLs, and quarterly analytical results for 2019.

Quarter			**1**	**2**	**3**	**4**
COC (units)	**Well**	**SL**	**Result**	**Result**	**Result**	**Result**
	K1-08	20	47	<20	25	<20, 34[g], 27[g]
	K1-09	20	36	<20	<20	<20
	W-PIT1-2326	48	<20	55	<20	<20
Radium 226 (Bq/L)	K1-01C	–[a]	0.000	–[d]	0.009	0.011
	K1-07	–[a]	0.000	–[d]	0.005	0.003
	K1-02B	0.012	–[b]	–[b]	–[b]	–[b]
	K1-04	0.012	0.002	–[d]	0.002	0.003
	K1-05	0.012	0.010	0.004	–[e]	–[e]
	K1-08	0.009	0.001	0.004	0.007	0.000
	K1-09	0.012	0.001	0.004	0.002	0.004
	W-PIT1-2326	0.019	0.002	0.006	0.005	0.002
Tritium (Bq/L)	K1-01C	–[a]	24.2	–[d]	25.0	21.5
	K1-07	–[a]	0.273	–[d]	0.577	2.15
	K1-02B	158	–[b]	–[b]	–[b]	–[b]
	K1-04	19.2	16.1	–[d]	22.6, 20.3[h]	17.5[h], 17.5
	K1-05	11.4	5.85	6.96	–[e]	–[e]
	K1-08	10.7	8.95	6.99	6.18	7.14
	K1-09	8.66	6.10	4.55	5.29	6.51
	W-PIT1-2326	133	86.6	78.8	92.1	81.0
Uranium (total, Bq/L)	K1-01C	–[a]	0.120	–[d]	0.113	0.128
	K1-07	–[a]	0.122	–[d]	0.105	0.116
	K1-02B	0.145	–[b]	–[b]	–[b]	–[b]
	K1-04	0.085	0.069	–[d]	0.082	0.075
	K1-05	0.115	0.108	0.102	–[e]	–[e]
	K1-08	0.149	0.115	0.106	0.117	0.102
	K1-09	0.137	0.125	0.108	0.112	0.113
	W-PIT1-2326	0.139	0.153	0.138	0.135	0.146[i]
Thorium 228 (Bq/L)[c]	K1-01C	–[a]	-0.002	–[d]	0.001	-0.001
	K1-07	–[a]	0.000	–[d]	0.001	0.000
	K1-02B	0.003	–[b]	–[b]	–[b]	–[b]
	K1-04	0.005	-0.001	–[d]	-0.003	0.001
	K1-05	0.003	0.000	0.000	–[e]	–[e]
	K1-08	0.004	-0.001	0.000	0.000	0.001
	K1-09	0.008	-0.001	0.000	-0.001	0.000
	W-PIT1-2326	0.005	0.000	0.002	0.000	0.000
Thorium 232 (Bq/L)[c]	K1-01C	–[a]	-0.001	–[d]	0.001	0.000
	K1-07	–[a]	0.000	–[d]	0.001	0.000
	K1-02B	0.004	–[b]	–[b]	–[b]	–[b]
	K1-04	0.001	0.000	–[d]	0.000	0.000

Table A-1. Pit 1 detection monitoring wells, constituents of concern, SLs, and quarterly analytical results for 2019.

Quarter			1	2	3	4
COC (units)	**Well**	**SL**	**Result**	**Result**	**Result**	**Result**
	K1-05	0.004	0.001	0.000	–[e]	–[e]
	K1-08	0.004	0.002	0.000	0.000	0.002
	K1-09	0.002	0.000	0.000	0.001	0.000
	W-PIT1-2326	0.001	0.000	0.001	0.001	0.003
HMX (µg/L)	K1-01C	–[a]	<1	–[d]	<1	<1.1
	K1-07	–[a]	<1	–[d]	<1	<1
	K1-02B	1	–[b]	–[b]	–[b]	–[b]
	K1-04	1	<1	–[d]	<1	<1.1
	K1-05	1	<1	<1	–[e]	–[e]
	K1-08	1	<1	<1	<1	<1
	K1-09	1	<1	<1	<1	<1
	W-PIT1-2326	1	<1	<1	<1	<1.1
RDX (µg/L)	K1-01C	–[a]	<1	–[d]	<1	<1.1
	K1-07	–[a]	<1	–[d]	<1	<1
	K1-02B	1	–[b]	–[b]	–[b]	–[b]
	K1-04	1	<1	–[d]	<1	<1.1
	K1-05	1	<1	<1	–[e]	–[e]
	K1-08	1	<1	<1	<1	<1
	K1-09	1	<1	<1	<1	<1
	W-PIT1-2326	1	<1	<1	<1	<1.1
Perchlorate (µg/L)	K1-01C	–[a]	<4	–[d]	<4	<4
	K1-07	–[a]	<4	–[d]	<4	<4
	K1-02B	10	<4	–[b]	<4	–[b]
	K1-04	4	<4	–[d]	<4	<4
	K1-05	4	<4	<4	–[e]	–[e]
	K1-08	4	<4	<4	<4	<4
	K1-09	4	<4	<4	<4	<4
	W-PIT1-2326	7.8	4.7	5.0	5.4	4.7

Notes:

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

[b] K1-02B well pump was inoperable. Pump redesign and repair are scheduled in WellTrack.

[c] 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.

[d] Due to red-tailed hawks nesting nearby Pit 1, sample collection was unable to be performed in order to reduce disturbance.

[e] The pump at K1-05 was inoperable. Pump redesign and repair are scheduled in WellTrack.

[f] Retest sample results for vanadium from the SL exceedance from the second quarter.

[g] Laboratory results from the two zinc retest samples for well K1-08 on 10/23/19 and 11/4/19.

[h] Laboratory results from the two tritium retest samples for well K1-04 on 9/30/19 and 10/14/19.

[i] Retest samples have been requested and results will be available 2020 Q1.

Table A-2. Pit 1 additional PCP constituents for the fourth quarter 2019 analytical results for detection monitoring wells.

	Monitoring Well								
	K1-01C	**K1-07**	**K1-04**	**K1-04**	**K1-08**	**K1-08**	**K1-08**	**K1-09**	**W-PIT1-2326**
Date Sampled	Nov 25	Nov 6	Oct 14	Nov 11	Oct 23	Nov 4	Nov 21	Nov 4	Dec 17
Depth to water (ft)	108.60	142.64	157.97	157.88	156.13	156.44	156.39	163.40	182.22
Ground water elevation (ft)	973.34	966.99	964.70	964.79	966.61	966.30	966.35	963.28	965.57
Field pH (Units)	7.47	7.23	7.28	7.38	7.46	7.45	7.44	7.93	7.29
Field Specific Conductance (µmhos/cm)	1437	614	1297	621	632	631	645	641	737
Field Temperature (Degrees C)	22.1	21.3	22.5	22.1	24.4	23.9	23.1	22.6	21.1
Gross alpha (Bq/L)	0.068	0.174	-	0.056	-	-	0.089	0.151	0.005
Gross beta (Bq/L)[(a)]	0.058	0.169	-	0.096	-	-	0.153	0.157	-0.015
Nitrate (as NO_3) (mg/L)	39	30	-	27	-	-	35	35	31
Total VOCs (calculated) (µg/L)	<1000	0.92	-	<1000	-	-	25	42	<1000
Freon 113 (µg/L)	<0.5	0.92	-	<0.5	-	-	25	42	<0.5

[(a)] 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.

Table A-3. Pit 1 evaluation monitoring wells, constituents of concern, physical parameters, and analytical results for fourth quarter 2019.

	W-PIT1-2620	W-PIT1-2209	W-865-2005
Date Sampled	Oct 22	Nov 5	Oct 22
Depth to water (ft)	233.30	218.54	326.83
Ground water elevation (ft)	946.57	947.51	948.04
Tritium (Bq/L)[a]	65.5	1.84	1.11
Field pH (Units)	7.79	7.40	7.77
Field Specific Conductance (µmhos/cm)	1035	671	603
Field Temperature (Degrees C)	24.0	21.7	21.7
Perchlorate (µg/L)	6.2	<4	<4

[a] 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.

Table A-4. Pit 1 groundwater well routine sampling dates.

Location	Quarter	Sample Date
K1-01C	1	27-Feb-2019
	2	_ [a]
	3	30-Jul-2019
	4	25-Nov-2019
K1-02B	1	_ [b]
	2	_ [b]
	3	_ [b]
	4	_ [b]
K1-04	1	28-Feb-2019
	2	_ [a]
	3	7-Aug-2019
	4	11-Nov-2019
K1-05	1	6-Mar-2019
	2	26-Jun-2019
	3	_ [b]
	4	_ [b]
K1-06	1	_ [b]
	2	_ [b]
	3	_ [b]
	4	_ [b]
K1-07	1	25-Feb-2019
	2	_ [a]
	3	15-Jul-2019
	4	6-Nov-2019
K1-08	1	20-Feb-2019
	2	25-Jun-2019
	3	21-Aug-2019
	4	21-Nov-2019
K1-09	1	19-Feb-2019
	2	25-Jun-2019
	3	22-Jul-2019
	4	4-Nov-2019
W-PIT1-2209	1	7-Jan-2019
	2	1-Apr-2019
	3	10-Jul-2019
	4	5-Nov-2019
W-PIT1-2326	1	12-Feb-2019
	2	29-May-2019
	3	31-Jul-2019
	4	17-Dec-2019
W-PIT1-2620	1	9-Jan-2019
	2	_ [a]
	3	25-Jul-2019
	4	22-Oct-2019
W-865-2005	1	25-Mar-2019
	2	25-Jun-2019
	3	5-Aug-2019
	4	22-Oct-2019

[a] Due to red-tailed hawk nesting nearby Pit 1, routine sampling was restricted and not performed.
[b] Wells K1-02B and K1-06 were not sampled due to pump failure. Wells were added to Well Track for pump repair.

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	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
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

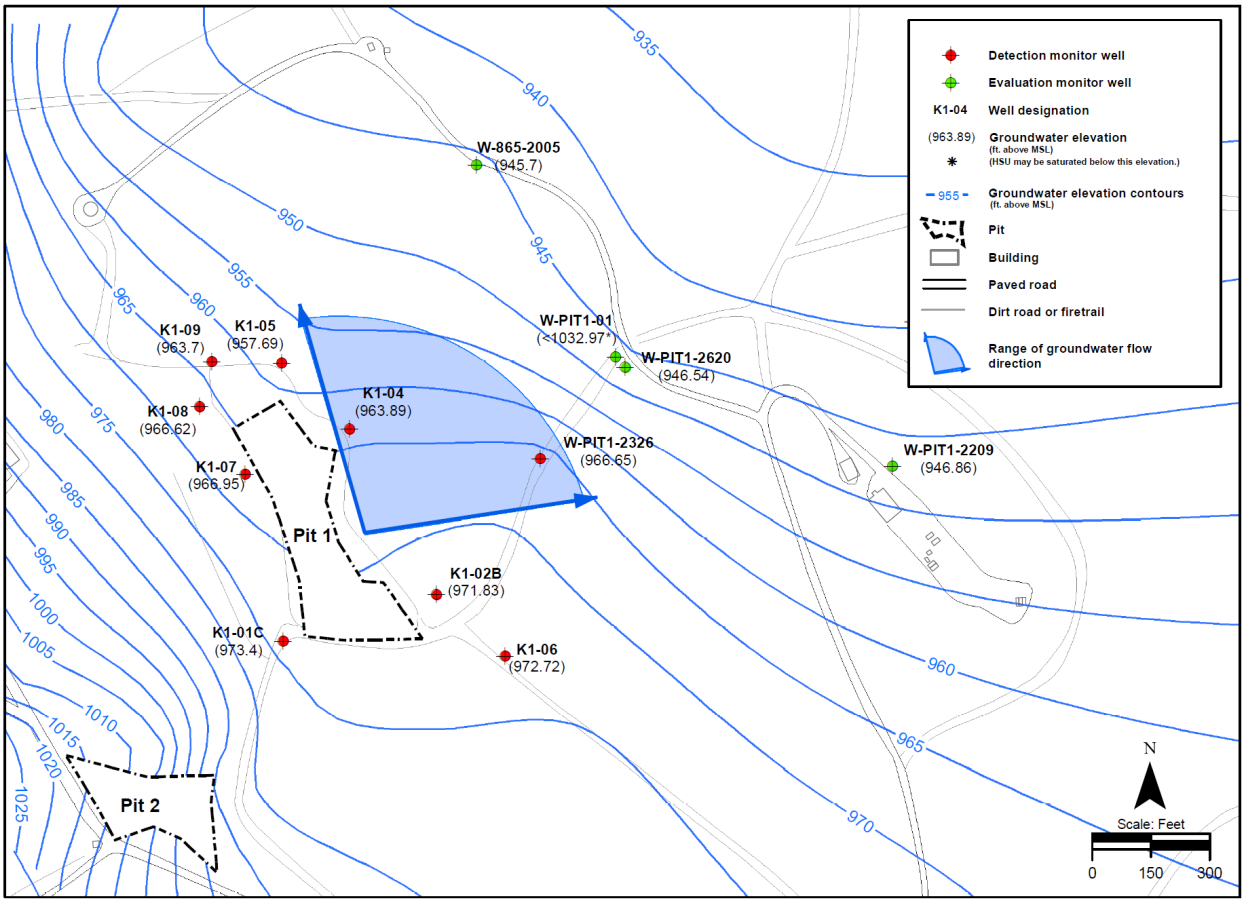


Figure A-1. Potentiometric surface map for the $Tnbs_1/Tnbs_0$ HSU in the Pit 1 area, fourth quarter 2019.

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. **Table 1** displays the monitoring periods for each well and corresponding analyte in which the statistical limit (SL) was calculated and based on. If the analyte does not appear on the list, there was not enough information to calculate an SL using the data and the reporting limit was used.

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 retests also exceed the SL, the result is considered 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.

Table B-1. Monitoring periods for the current statistical limits (SLs) for each analyte and well.

Analyte	Field Location	Minimum Date	Maximum Date
HMX	K1-02B	8/29/84	1/29/09
Arsenic	K1-02B	6/1/84	1/29/09
Arsenic	K1-04	3/13/84	1/27/09
Arsenic	K1-05	3/25/85	1/26/09
Arsenic	K1-08	12/19/85	1/27/09
Arsenic	K1-09	12/18/85	1/27/09
Arsenic	W-865-2005	9/21/04	2/4/09
Arsenic	W-PIT1-02	3/21/01	1/14/08
Arsenic	W-PIT1-2326	5/5/08	1/29/09
Barium	K1-02B	6/1/84	1/29/09
Barium	K1-04	3/13/84	1/27/09
Barium	K1-05	3/25/85	1/26/09
Barium	K1-08	12/19/85	1/27/09
Barium	K1-09	12/18/85	1/27/09
Barium	W-865-2005	9/21/04	2/4/09
Barium	W-PIT1-02	3/21/01	1/14/08
Barium	W-PIT1-2326	5/5/08	1/29/09
Cadmium	K1-02B	6/1/84	1/29/09
Cadmium	W-865-2005	9/21/04	2/4/09
Cobalt	K1-05	10/19/93	1/26/09
Cobalt	K1-08	10/19/93	1/27/09
Cobalt	K1-09	10/19/93	1/27/09
Copper	K1-02B	4/20/87	1/29/09
Copper	K1-05	4/20/87	1/26/09
Lead	W-865-2005	9/21/04	2/4/09
Nickel	K1-02B	6/1/84	1/29/09
Nickel	K1-05	3/25/85	1/26/09
Vanadium	K1-02B	6/1/84	1/29/09
Vanadium	K1-04	6/11/84	1/27/09
Vanadium	K1-05	3/25/85	1/26/09

Analyte	Field Location	Minimum Date	Maximum Date
Vanadium	K1-08	12/19/85	1/27/09
Vanadium	K1-09	12/18/85	1/27/09
Vanadium	W-PIT1-2326	5/5/08	1/29/09
Zinc	K1-02B	4/20/87	1/29/09
Zinc	K1-04	4/20/87	1/27/09
Zinc	K1-05	4/20/87	1/26/09
Zinc	K1-08	4/20/87	1/27/09
Zinc	K1-09	4/20/87	1/27/09
Perchlorate	K1-02B	7/14/98	1/29/09
Perchlorate	K1-06	1/17/06	1/12/09
Perchlorate	W-PIT1-02	3/21/01	7/17/08
Perchlorate	W-PIT1-2326	5/5/08	1/29/09
Radium 226	K1-02B	3/12/84	1/29/09
Radium 226	K1-04	3/13/84	1/27/09
Radium 226	K1-05	3/25/85	1/26/09
Radium 226	K1-08	12/19/85	1/27/09
Radium 226	K1-09	12/18/85	1/27/09
Radium 226	W-PIT1-2326	5/5/08	1/29/09
Thorium 228	K1-02B	10/19/93	1/29/09
Thorium 228	K1-04	10/19/93	1/27/09
Thorium 228	K1-05	10/19/93	1/26/09
Thorium 228	K1-08	10/19/93	1/27/09
Thorium 228	K1-09	10/19/93	1/27/09
Thorium 228	W-PIT1-2326	5/5/08	1/29/09
Thorium 232	K1-02B	10/19/93	1/29/09
Thorium 232	K1-04	10/19/93	1/27/09
Thorium 232	K1-05	10/19/93	1/26/09
Thorium 232	K1-08	10/19/93	1/27/09
Thorium 232	K1-09	10/19/93	1/27/09
Thorium 232	W-PIT1-2326	5/5/08	1/29/09
Total U	K1-02B	6/1/84	1/29/09
Total U	K1-04	6/11/84	1/27/09
Total U	K1-05	3/25/85	1/26/09
Total U	K1-08	12/19/85	1/27/09

Analyte	Field Location	Minimum Date	Maximum Date
Total U	K1-09	12/18/85	1/27/09
Total U	W-PIT1-2326	5/5/08	1/29/09
Tritium	K1-02B	3/12/84	1/29/09
Tritium	K1-04	6/11/84	1/27/09
Tritium	K1-05	3/25/85	1/26/09
Tritium	K1-06	5/26/85	10/1/08
Tritium	K1-08	12/19/85	1/27/09
Tritium	K1-09	12/18/85	1/27/09
Tritium	W-865-2005	3/24/05	4/7/08
Tritium	W-PIT1-02	8/25/99	7/17/08
Tritium	W-PIT1-2209	9/27/06	1/12/09
Tritium	W-PIT1-2326	5/5/08	1/29/09

Appendix C

Quality Assurance Samples

Table C-1. Pit 1 quality assurance for routine, duplicate, and field blank samples for the fourth quarter 2019.

		K1-09	K1-09	W-PIT1-2326	W-PIT1-2326	PIT1FB
Constituent [(a)]	**Units**	**Routine (Nov 4)**	**Duplicate (Nov 4)**	**Routine (Dec 17)**	**Duplicate (Dec 17)**	**Field blank (Dec 17)**
Arsenic	µg/L	3.0	-	12	12	<2
Barium	µg/L	<25	-	38	37	<25
Beryllium	µg/L	1.2	-	<0.5	<0.5	<0.5
Cadmium	µg/L	1.0	-	<0.5	<0.5	<0.5
Cobalt	µg/L	<25	-	<25	<25	<25
Copper	µg/L	<10	-	<10	<10	<10
Lead	µg/L	<2	-	<2	<2	<2
Nickel	µg/L	<5	-	<5	<5	<5
Vanadium	µg/L	<25	-	50	49	<25
Zinc	µg/L	<20	21	<20	<20	<20
Nitrate (as NO_3)	mg/L	35	-	31	32	<0.5
Perchlorate	µg/L	<4	-	4.7	5.3	<4
He compounds						
HMX	µg/L	<1	-	<1.1	<1.1	<1
RDX	µg/L	<1	-	<1.1	<1.1	<1
Radioactivity [(b)]						
Radium 226	Bq/L	0.004 ± 0.003	-	0.002 ± 0.003	0.004 ± 0.004	0.004 ± 0.004
Tritium	Bq/L	6.51 ± 3.14	-	81.0 ± 16.6	86.9 ± 17.8	2.05 ± 2.60
Uranium (total)	Bq/L	0.113 ± 0.011	-	0.146 ± 0.020	0.179 ± 0.022	0.003 ± 0.003
Thorium 228	Bq/L	0.000 ± 0.001	-	0.000 ± 0.002	0.000 ± 0.002	0.000 ± 0.001
Thorium 232	Bq/L	0.000 ± 0.001	-	0.003 ± 0.002	0.000 ± 0.002	0.001 ± 0.001
Gross alpha	Bq/L	0.151 ± 0.065	-	0.005 ± 0.031	0.230 ± 0.091	0.046 ± 0.048
Gross beta	Bq/L	0.157 ± 0.044	-	-0.015 ± 0.031	0.197 ± 0.052	0.070 ± 0.067

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

[(b)] 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

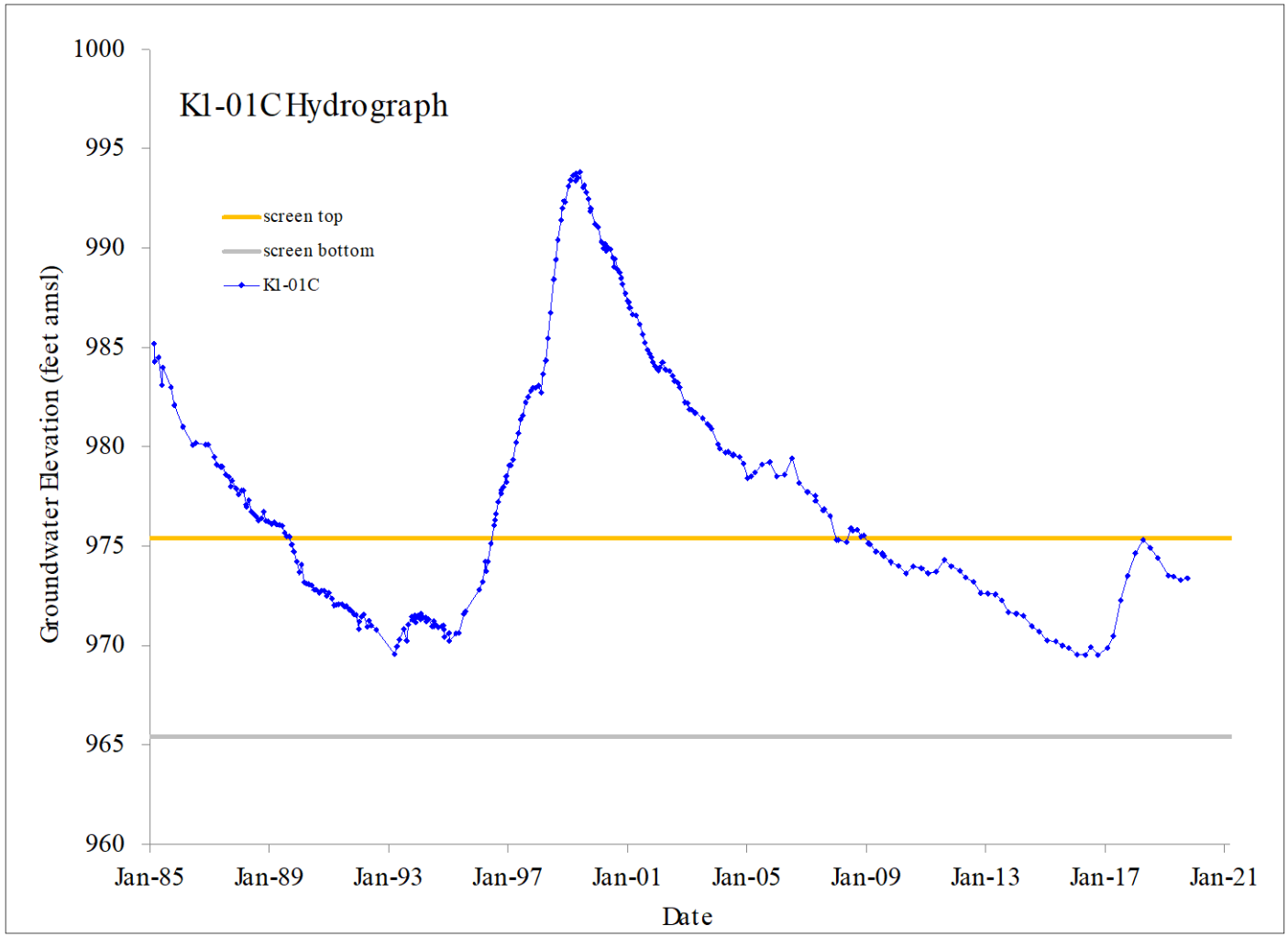
Well Specification and Construction Details for Detection Monitoring and Evaluation Monitoring Wells

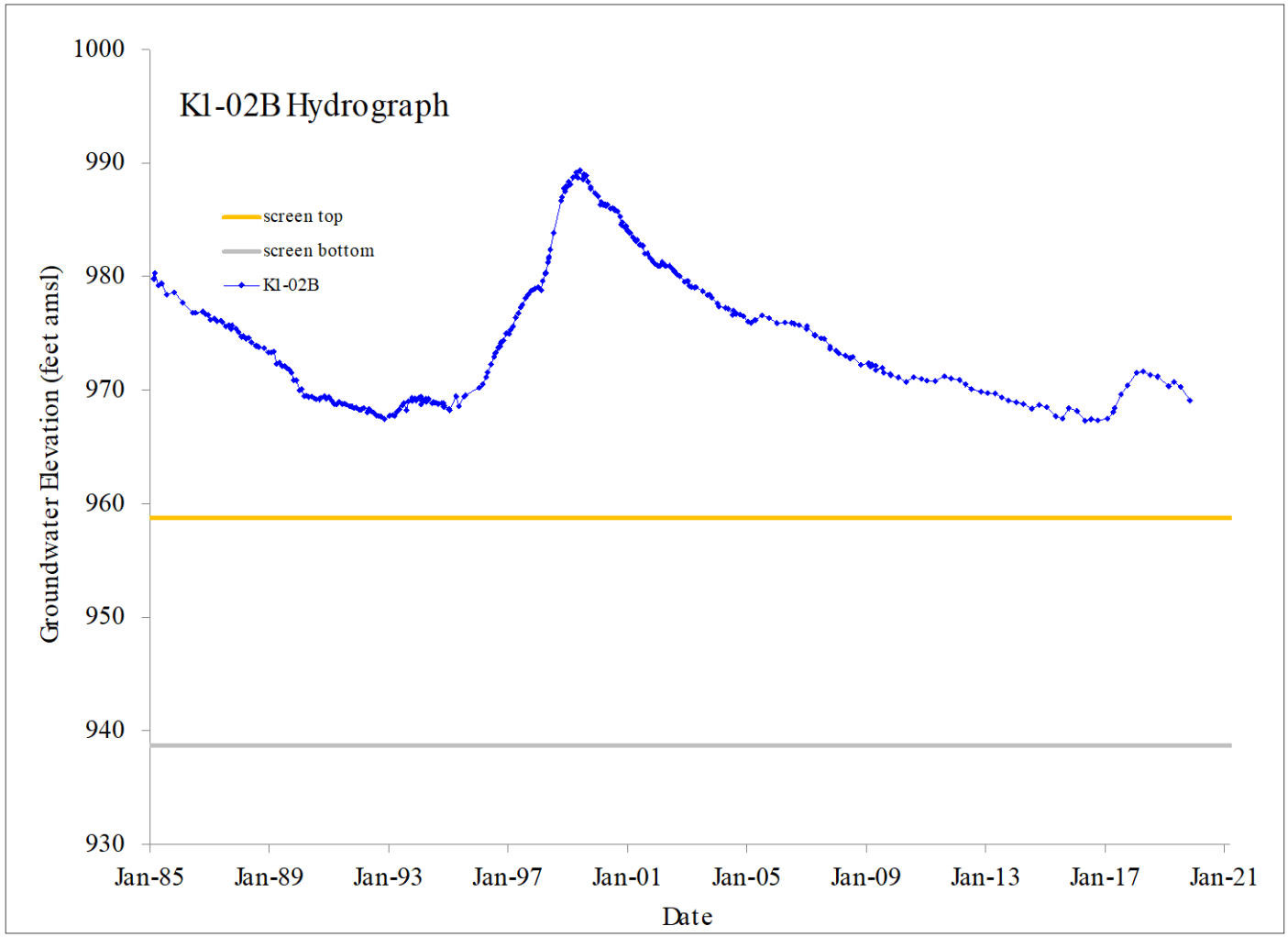
Table E-1. Well specification and construction details of the Pit 1 monitoring network.

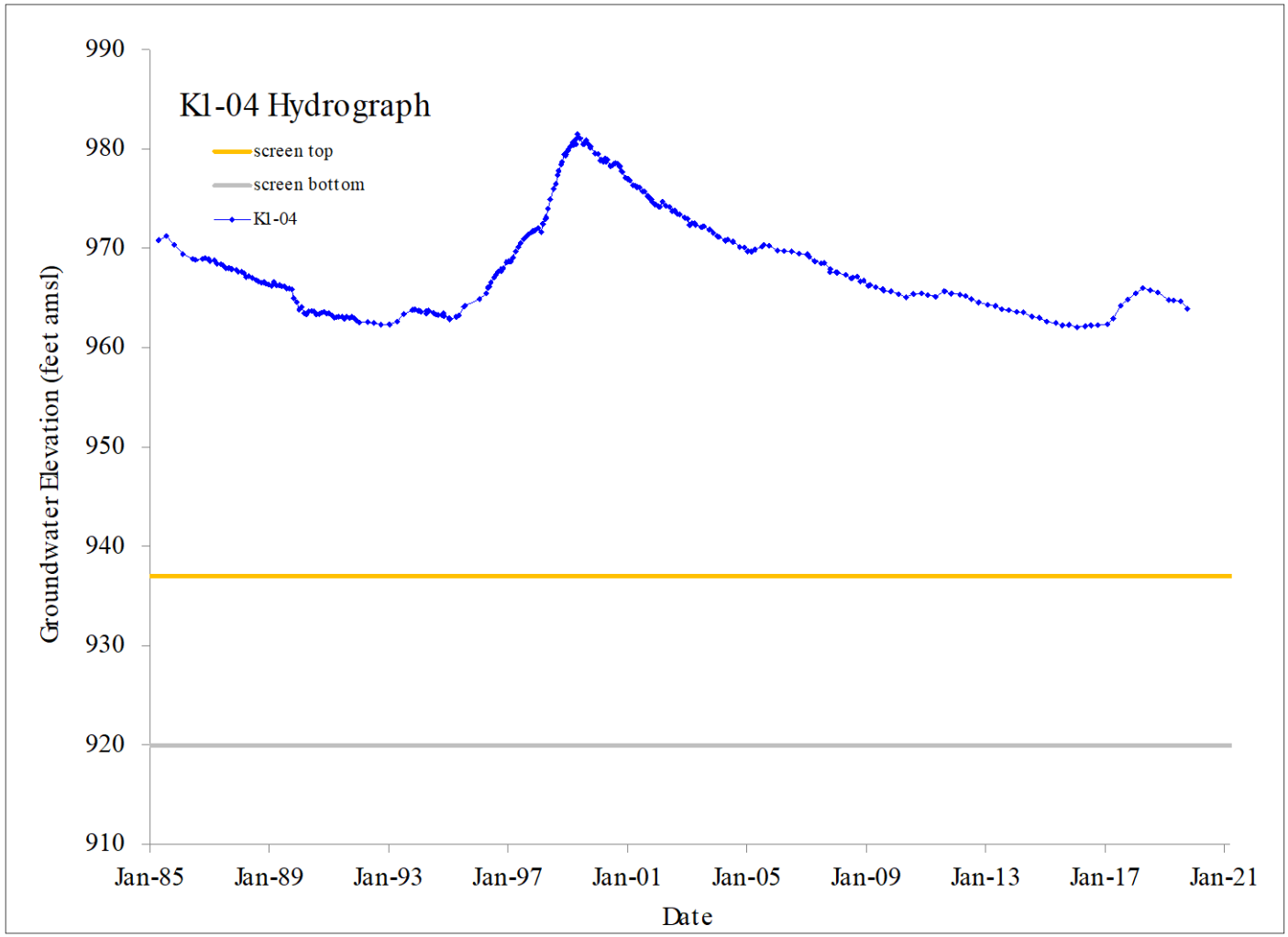
Well	HSU	Northing	Easting	Ground Surface Evaluation	Reference Evaluation	Elevation of Screen Top	Elevation of Screen Bottom	Elevation of Bentonite Top	Elevation of Bentonite Bottom	Elevation of Filter Pack Top	Elevation of Filter Pack Bottom	Elevation of Casing Bottom
K1-01C	$Tnbs_1/Tnbs_0$	427774.28	1699062.3	1,078.92	1,081.94	975.42	965.42	998.92	986.92	986.92	955.92	965.42
K1-02B	$Tnbs_1/Tnbs_0$	427893.78	1699452.58	1,105.23	1,107.23	958.73	938.73	985.23	982.13	982.13	932.73	938.73
K1-04	$Tnbs_1/Tnbs_0$	428315.51	1699231.7	1,120.00	1,122.67	937.00	920.00	978.00	968.00	968.00	919.00	919.00
K1-05	$Tnbs_1/Tnbs_0$	428485.47	1699057.58	1,128.86	1,130.86	965.86	944.86	None	None	972.86	941.86	944.86
K1-06	$Tnbs_1/Tnbs_0$	427736.68	1699627.38	1,087.54	1,089.54	982.54	972.54	None	None	995.54	971.54	972.54
K1-07	$Tnbs_1/Tnbs_0$	428199.97	1698965.54	1,106.63	1,109.63	978.63	958.63	985.63	983.93	983.93	956.63	956.63
K1-08	$Tnbs_1/Tnbs_0$	428373.1	1698848.94	1,120.72	1,122.74	979.72	954.72	991.22	985.72	985.72	952.72	952.72
K1-09	$Tnbs_1/Tnbs_0$	428488.09	1698880.26	1,124.68	1,126.68	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	1,272.87	1,274.87	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	1,179.30	1,181.30	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	1,164.05	1,166.05	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	1,145.79	1,147.79	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	1,177.87	1,179.87	932.87	917.97	947.87	942.57	942.57	914.87	917.55

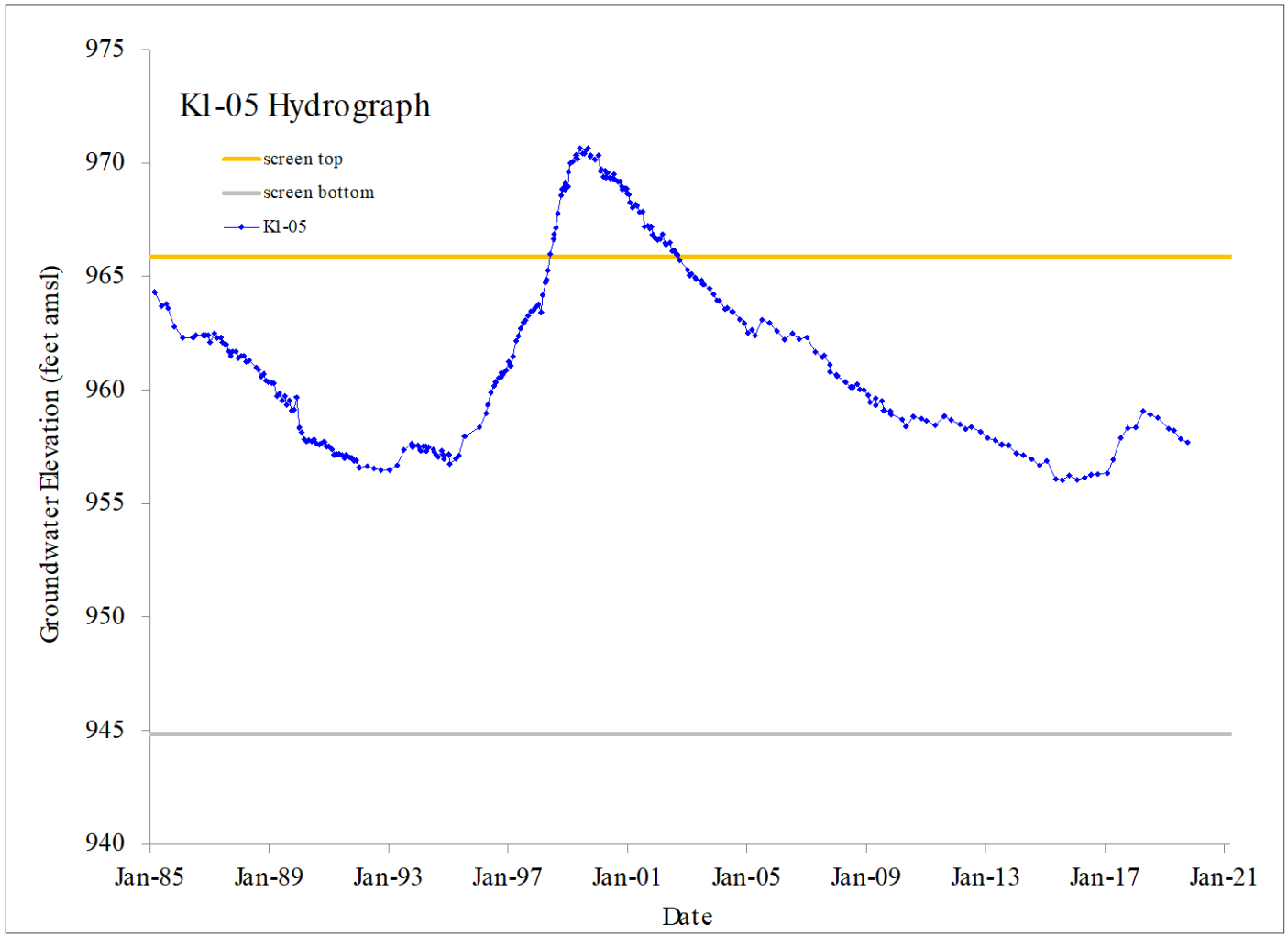
Appendix F

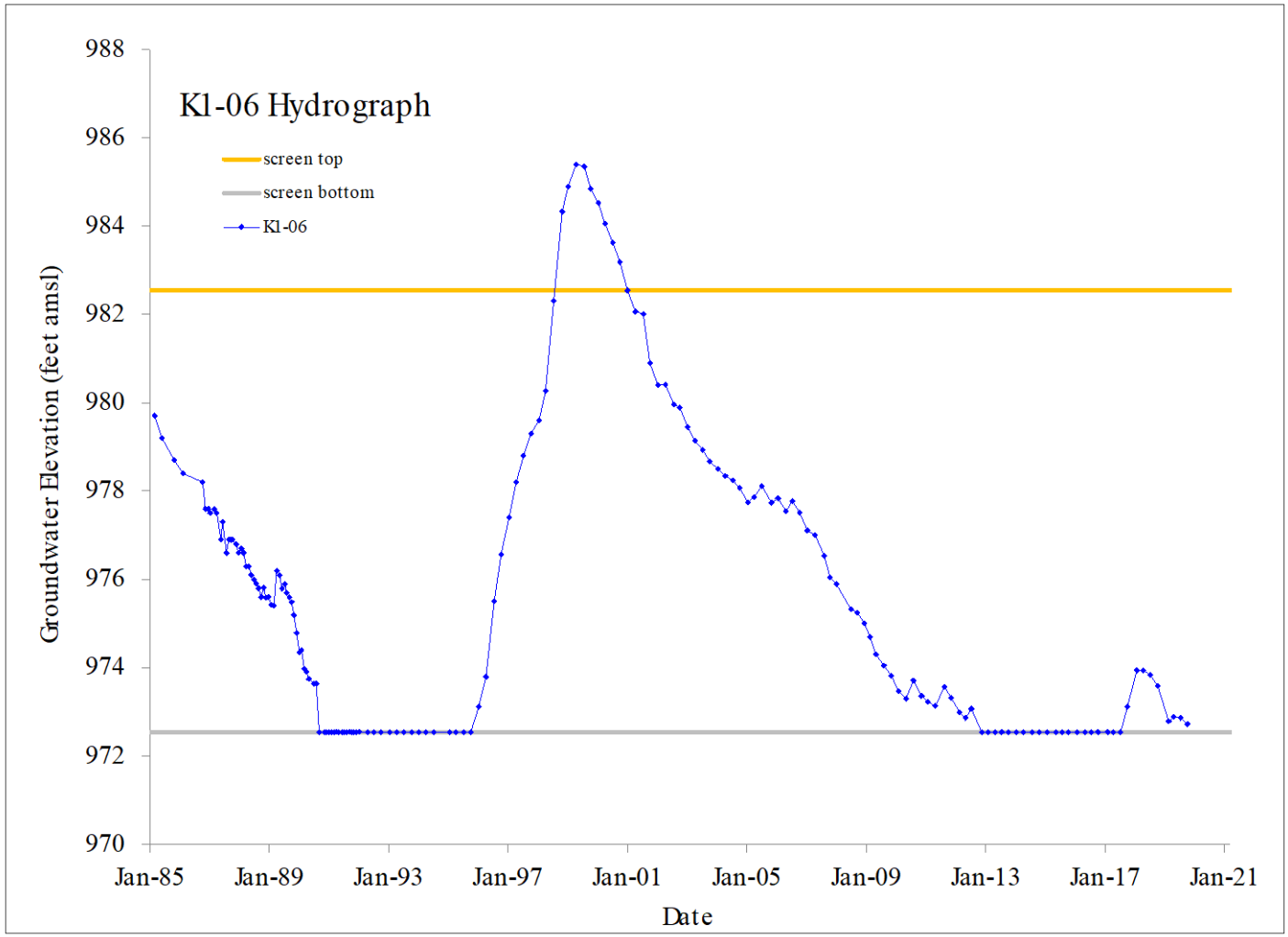
Hydrographs for All Compliance Monitoring Wells

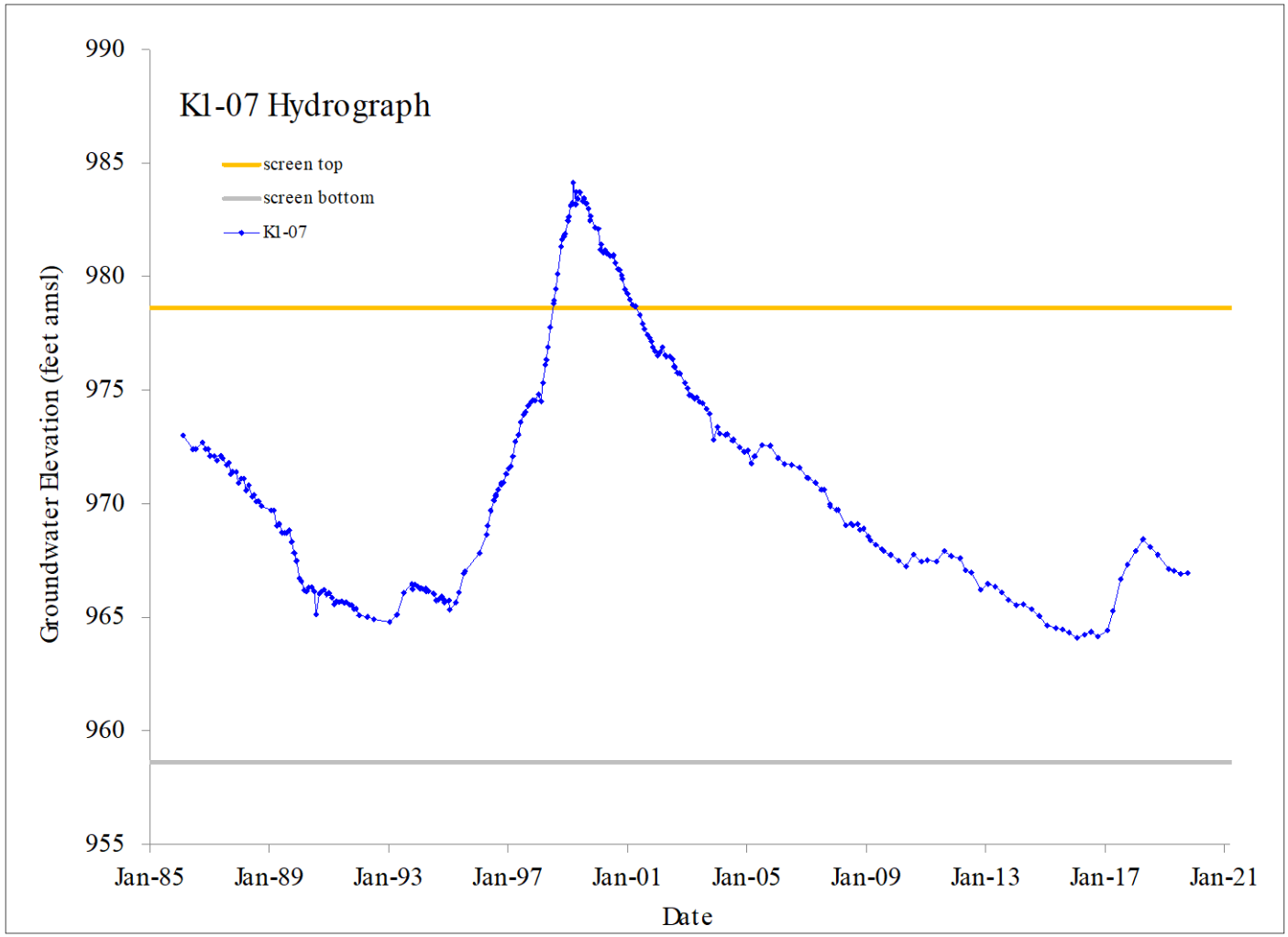

K1-01C Hydrograph
screen top
screen bottom
K1-01C
Groundwater Elevation (feet amsl)
1000
995
990
985
980
975
970
965
960
Jan-85
Jan-89
Jan-93
Jan-97
Jan-01
Jan-05
Jan-09
Jan-13
Jan-17
Jan-21
Date

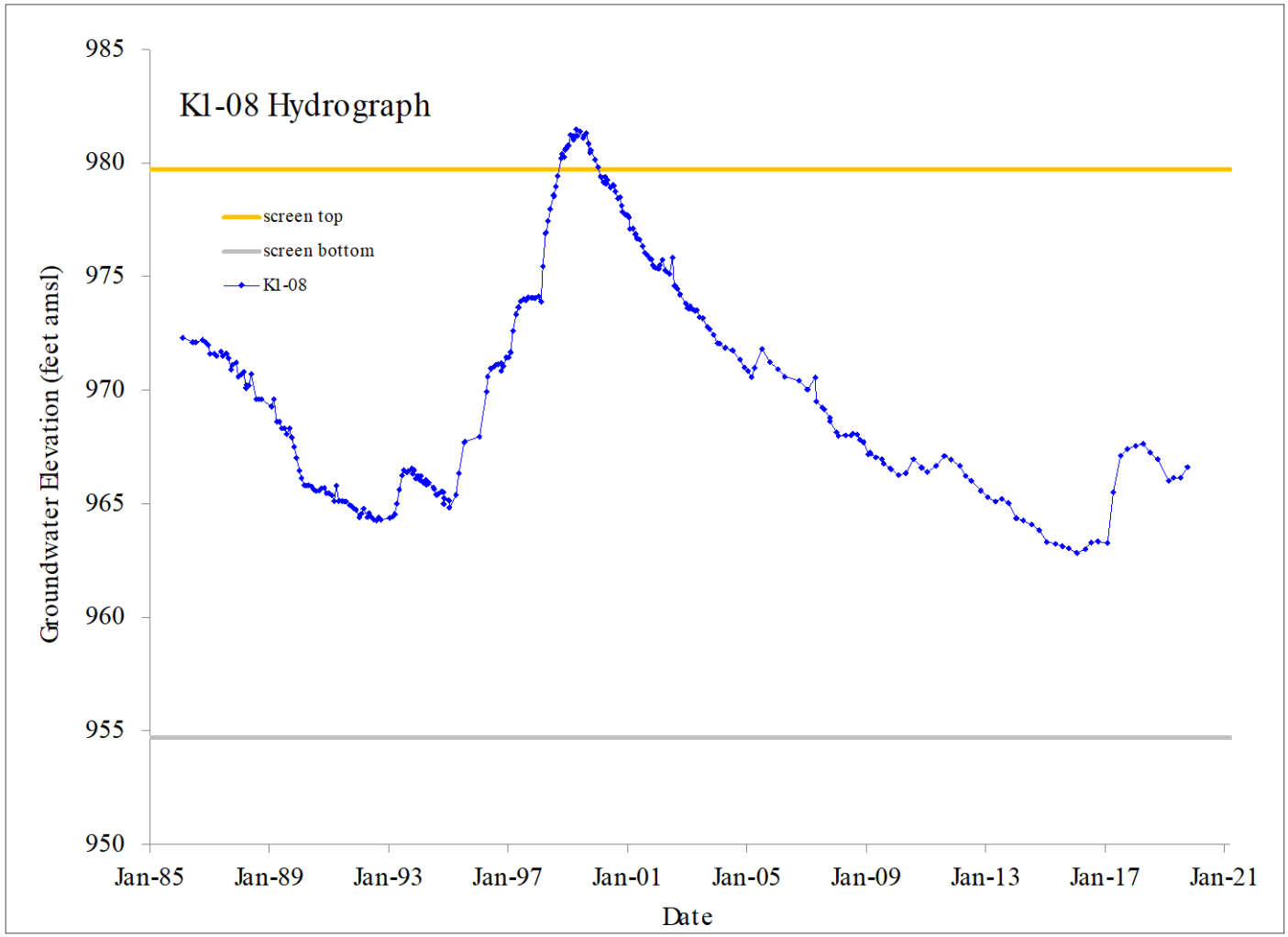

K1-02B Hydrograph
screen top
screen bottom
K1-02B
Groundwater Elevation (feet amsl)
1000
990
980
970
960
950
940
930
Jan-85
Jan-89
Jan-93
Jan-97
Jan-01
Jan-05
Jan-09
Jan-13
Jan-17
Jan-21
Date

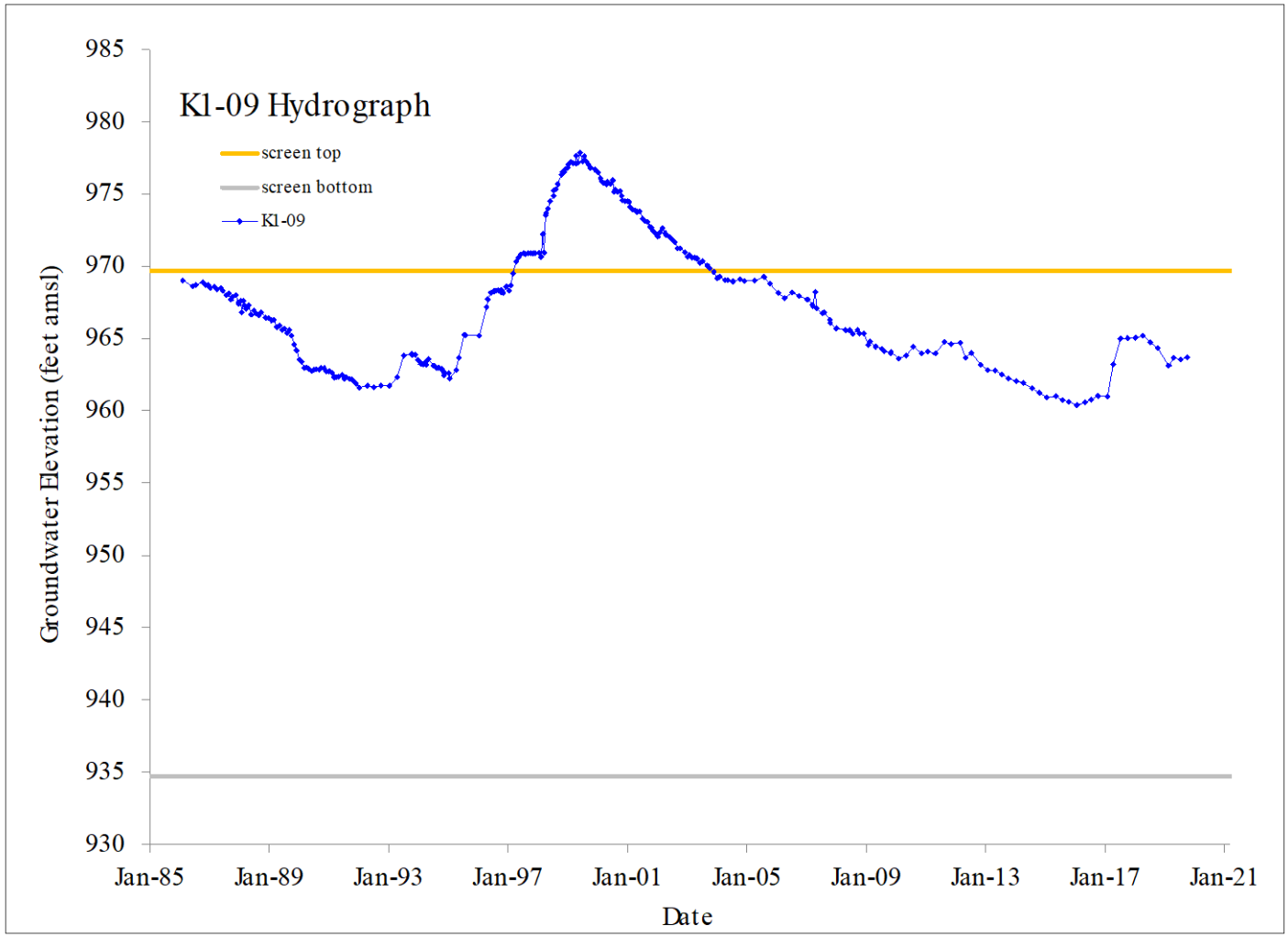

K1-04 Hydrograph
screen top
screen bottom
K1-04
Groundwater Elevation (feet amsl)
990
980
970
960
950
940
930
920
910
Jan-85
Jan-89
Jan-93
Jan-97
Jan-01
Jan-05
Jan-09
Jan-13
Jan-17
Jan-21
Date

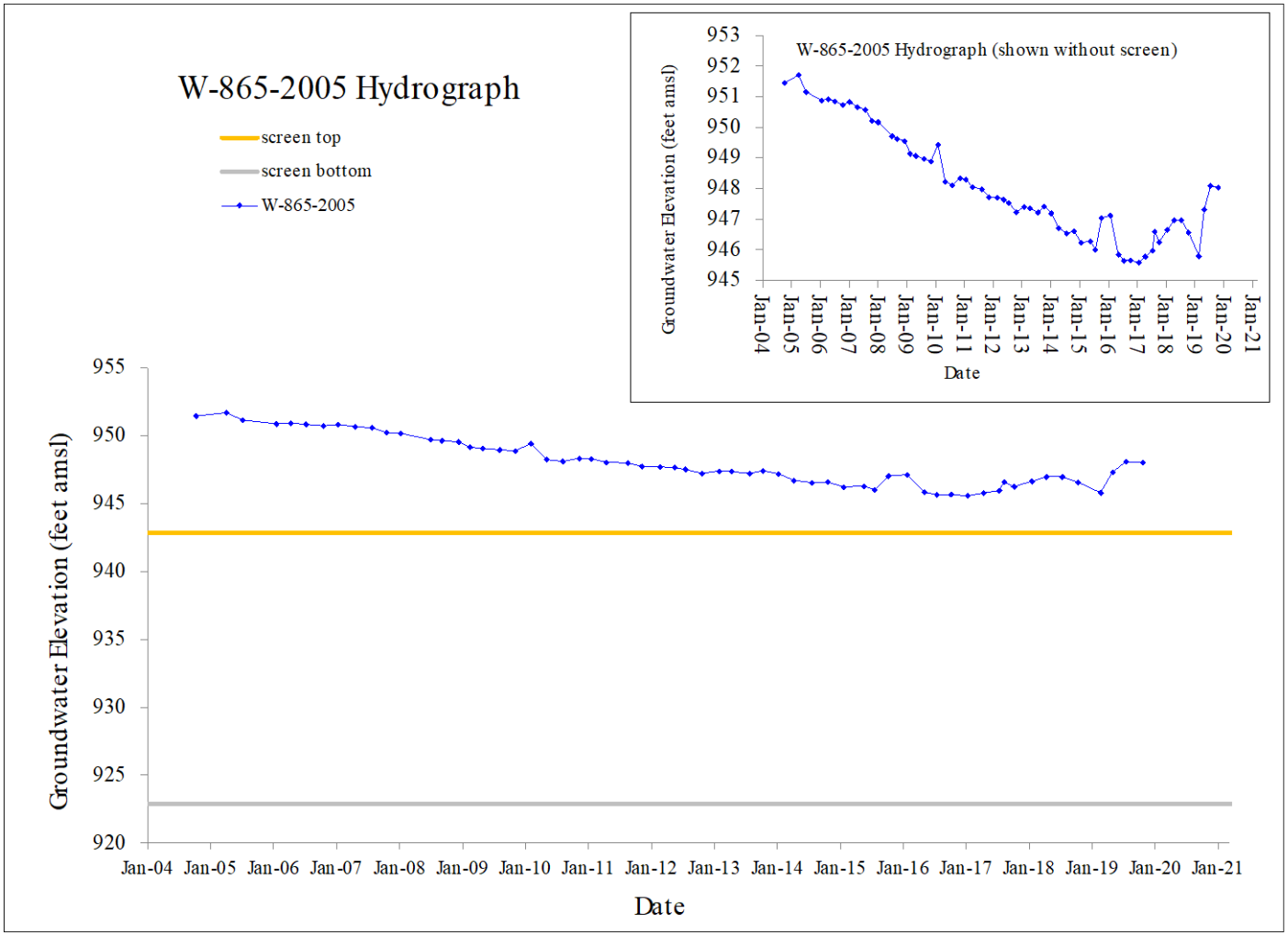

K1-05 Hydrograph
screen top
screen bottom
K1-05
Groundwater Elevation (feet amsl)
975
970
965
960
955
950
945
940
Jan-85
Jan-89
Jan-93
Jan-97
Jan-01
Jan-05
Jan-09
Jan-13
Jan-17
Jan-21
Date

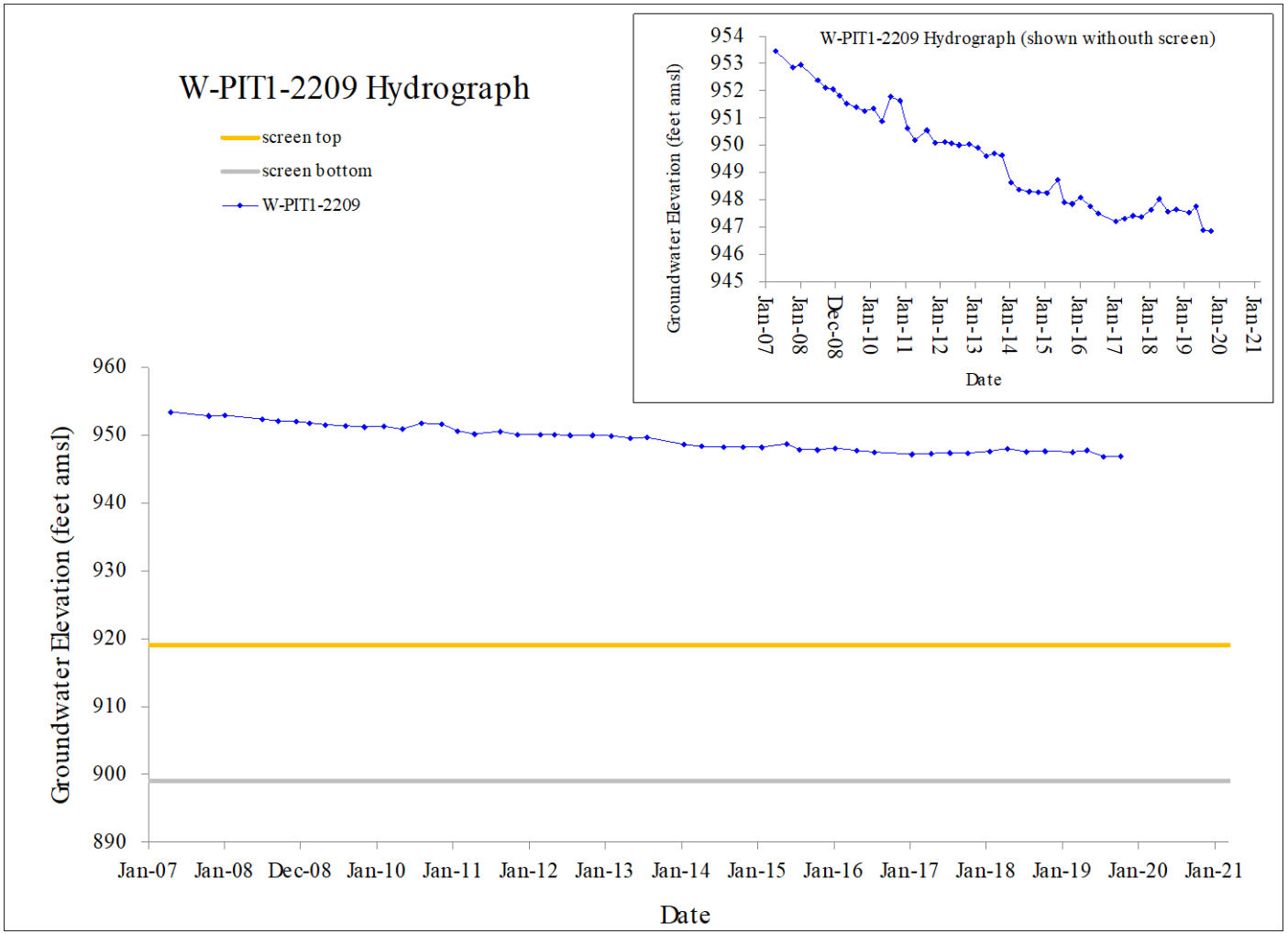

K1-06 Hydrograph
screen top
screen bottom
K1-06
Groundwater Elevation (feet amsl)
988
986
984
982
980
978
976
974
972
970
Jan-85
Jan-89
Jan-93
Jan-97
Jan-01
Jan-05
Jan-09
Jan-13
Jan-17
Jan-21
Date

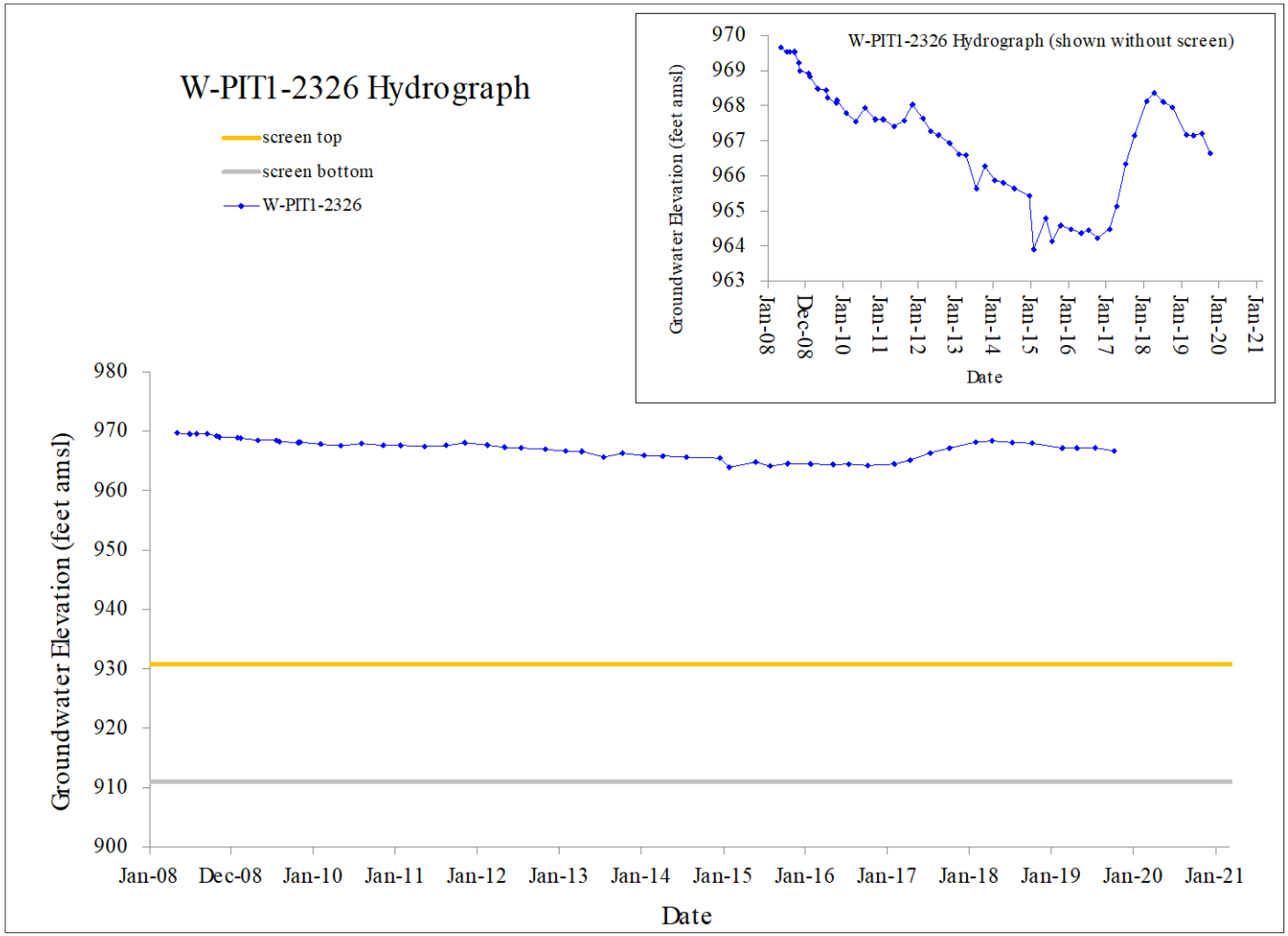

K1-07 Hydrograph
screen top
screen bottom
K1-07
Groundwater Elevation (feet amsl)
990
985
980
975
970
965
960
955
Jan-85
Jan-89
Jan-93
Jan-97
Jan-01
Jan-05
Jan-09
Jan-13
Jan-17
Jan-21
Date

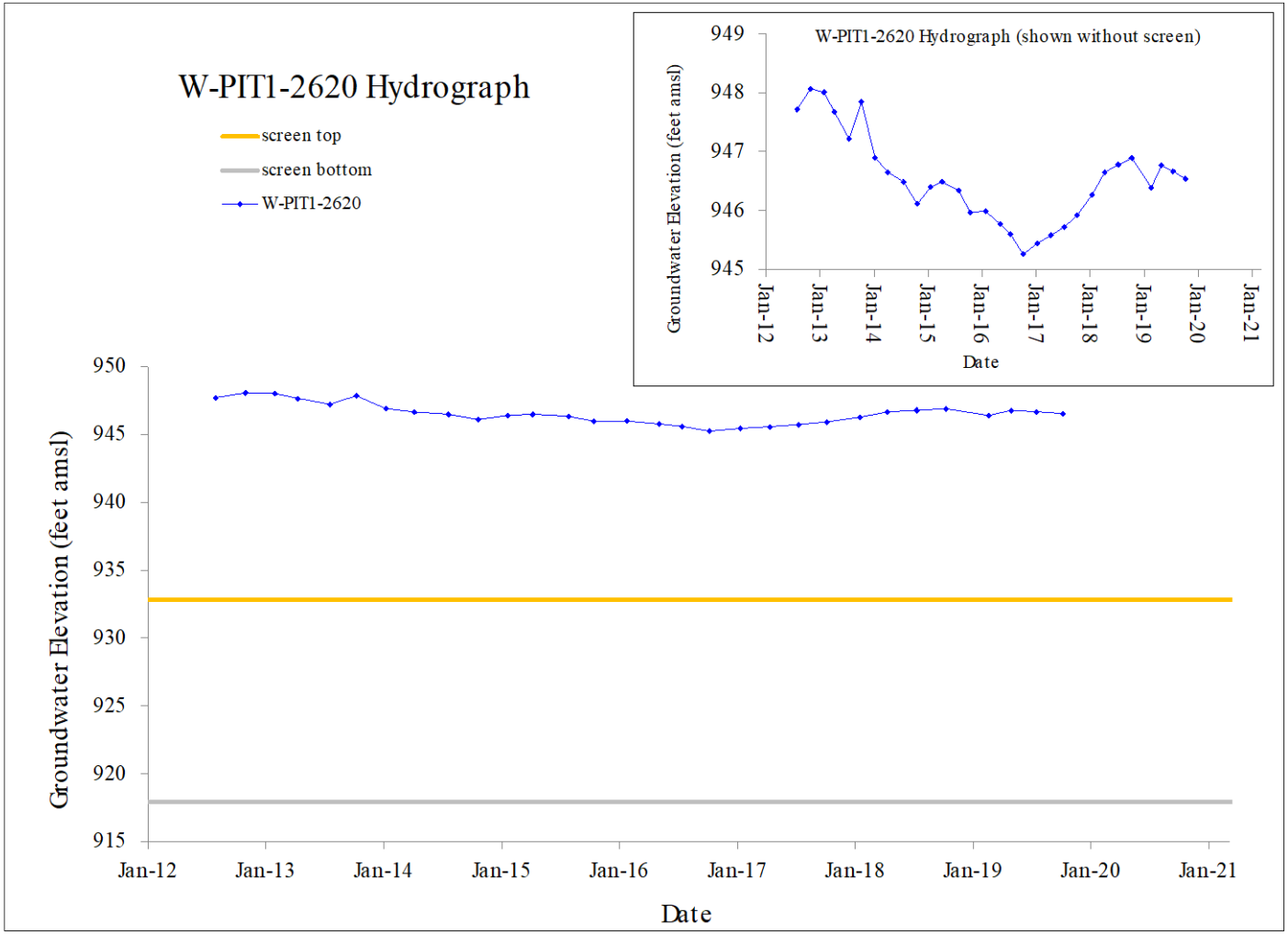

K1-08 Hydrograph
screen top
screen bottom
K1-08
Groundwater Elevation (feet amsl)
985
980
975
970
965
960
955
950
Jan-85
Jan-89
Jan-93
Jan-97
Jan-01
Jan-05
Jan-09
Jan-13
Jan-17
Jan-21
Date


K1-09 Hydrograph
screen top
screen bottom
K1-09
Groundwater Elevation (feet amsl)
985
980
975
970
965
960
955
950
945
940
935
930
Jan-85
Jan-89
Jan-93
Jan-97
Jan-01
Jan-05
Jan-09
Jan-13
Jan-17
Jan-21
Date


W-865-2005 Hydrograph
screen top
screen bottom
W-865-2005
Groundwater 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 Jan-14 Jan-15 Jan-16 Jan-17 Jan-18 Jan-19 Jan-20 Jan-21
Date
W-865-2005 Hydrograph (shown without screen)
Groundwater Elevation (feet amsl)
953
952
951
950
949
948
947
946
945
Jan-04 Jan-05 Jan-06 Jan-07 Jan-08 Jan-09 Jan-10 Jan-11 Jan-12 Jan-13 Jan-14 Jan-15 Jan-16 Jan-17 Jan-18 Jan-19 Jan-20 Jan-21
Date


W-PIT1-2209 Hydrograph
screen top
screen bottom
W-PIT1-2209
Groundwater Elevation (feet amsl)
960
950
940
930
920
910
900
890
Jan-07
Jan-08
Dec-08
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Date
W-PIT1-2209 Hydrograph (shown withouth screen)
Groundwater Elevation (feet amsl)
954
953
952
951
950
949
948
947
946
945
Jan-07
Jan-08
Dec-08
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Date


W-PIT1-2326 Hydrograph
screen top
screen bottom
W-PIT1-2326
Groundwater Elevation (feet amsl)
980
970
960
950
940
930
920
910
900
Jan-08
Dec-08
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Date
W-PIT1-2326 Hydrograph (shown without screen)
Groundwater Elevation (feet amsl)
970
969
968
967
966
965
964
963
Jan-08
Dec-08
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Date


W-PIT1-2620 Hydrograph
screen top
screen bottom
W-PIT1-2620
Groundwater Elevation (feet amsl)
950
945
940
935
930
925
920
915
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Date
W-PIT1-2620 Hydrograph (shown without screen)
Groundwater Elevation (feet amsl)
949
948
947
946
945
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Date

Appendix G

Field Logs for Compliance Monitoring and Evaluation Monitoring Wells

All Ground Water Sampling Data

Target Sample Date: **25-NOV-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **25-Nov-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40038**

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

SCREENED INTERVAL (ft-bmp): **106.82 - 116.82** PUMP INTAKE DEPTH: **115.43**

CASING DEPTH(installed/sounded)(ft-bmp): **113.50 / 122.40 on 26-JAN-15** CASING VOL (Gal/Time): **3.99**

DEPTH TO WATER(ft-bmp): **108.54 on 07-OCT-19** 108.60 VOLUME FACTOR: **0.500**

WATER IN CASING (ft): **7.98** 13.8 CASING DIAMETER/TCASING HT(in): **3.5 / 3.02**

TIME PUMP ON: 1228 INITIAL FLOW RATE (Q=GPM): –

TIME PUMP OFF: 1243 MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1230		–	–	7.47	22.1	1437	89	1	–

METER	SERIAL #	CALIBRATED		
pH :	610084	YES/NO	SAMPLER/EMPLOYER:	**silva90**
SC :		YES/NO	PROJECT:	**3EMG**
mV :		YES/NO	SAMPLE PRESERVATION/AMT of REAGENT:	n/a
H2O:		YES/NO	PURGE VOL/EXCESS H2O DEST:	**0.00 / None**
			TF LOCATION:	**Collect**

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

SAMPLE ID (VERIFY): K1-01C TIME COLLECTED: 1243

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
GE	K1-01C	AS:FILTER	0	O	
GE	K1-01C	AS:THISO	2	1L P	
GE	K1-01C	AS:UISO	2	1L P	
BB	K1-01C	E300.0:NO3	1	250 ml P	
BB	K1-01C	E300.0:PERC	1	250 ml P	1/3-1/2 headspace, & agitate
BB	K1-01C	E8260	3	40 mL V	
BB	K1-01C	E8330:R+H	3	1L A	
GE	K1-01C	E900	1	1L P	
GE	K1-01C	E900:FILTER	0	O	
GE	K1-01C	E906	1	250 ml P	
PF	K1-01C	RA226	1	1L P	
PF	K1-01C	RA226:FILTER	0	O	
BB	K1-01C	WGMGMET1	1	1L P	
BB	K1-01C	WGMGMET1:FILTER	0	O	

Revision: 10/28/2015

ESH-EFA-WQ-20-17014– CQ/AC:mgp

All Ground Water Sampling Data

Target Sample Date: **05-NOV-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **05-Nov-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40030**

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

SCREENED INTERVAL (ft-bmp): **148.80 - 168.80** PUMP INTAKE DEPTH: **169.10**

CASING DEPTH(installed/sounded)(ft-bmp): **166.50 / 174.55 on 14-AUG-14** CASING VOL (Gal/Time): **15.77** 18.2 | Gal

DEPTH TO WATER(ft-bmp): **136.95 on 16-JUL-19** 138.13 VOLUME FACTOR: **0.500**

WATER IN CASING (ft): **31.55** 36.42 CASING DIAMETER/TCASING HT(in): **3.5 / 2.00**

TIME PUMP ON: 1222 INITIAL FLOW RATE (Q=GPM): 1.0

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

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
~~1240~~									
~~1258~~									
~~1316~~									
~~1318~~									
~~1320~~									

METER	SERIAL #	CALIBRATED
pH :	610084	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: **47.31 / PIT7-SRC**
TF LOCATION: **PIT7-SRC**

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

SAMPLE ID (VERIFY): K1-02B / 3VES TIME COLLECTED: ~~1320~~

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
GE	K1-02B	AS:FILTER	0	O	
GE	K1-02B	AS:THISO	2	1L P	
GE	K1-02B	AS:UISO	2	1L P	
BB	K1-02B	E300.0:NO3	1	250 ml P	
BB	K1-02B	E300.0:PERC	1	250 ml P	1/3-1/2 headspace, & agitate
BB	K1-02B	E8260	3	40 mL V	
BB	K1-02B	E8330:R+H	3	1L A	
GE	K1-02B	E900	1	1L P	
GE	K1-02B	E900:FILTER	0	O	
GE	K1-02B	E906	1	250 ml P	
PF	K1-02B	RA226	1	1L P	
PF	K1-02B	RA226:FILTER	0	O	
BB	K1-02B	WGMGMET1	1	1L P	
BB	K1-02B	WGMGMET1:FILTER	0	O	

Pump inoperable

No Samples
Will attempt again at a later date if pump is repaired.

Revision: 10/28/2015
ESH-EFA-WQ-20-17014– CQ/AC:mgp

All Ground Water Sampling Data

Target Sample Date: **11-NOV-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **11-Nov-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40033**

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

SCREENED INTERVAL (ft-bmp): **185.97 - 202.97** PUMP INTAKE DEPTH: **195.10**

CASING DEPTH(installed/sounded)(ft-bmp): **201.00 / 204.15 on 28-JAN-15** CASING VOL (Gal/Time): **22.84** 23.2 x 3 = 69.6 Gal

DEPTH TO WATER(ft-bmp): **157.97 on 14-OCT-19** 157.88 VOLUME FACTOR: **0.500**

WATER IN CASING (ft): **45.70** 46.27 CASING DIAMETER/TCASING HT(in): **3.5 / 2.67**

TIME PUMP ON: 0957 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
1017		23.2	1	7.39	21.9	619.3	184	1	162.87
1037		46.4	2	7.38	21.9	620.6	188	1	169.20
1057		69.6	3	7.40	22.1	622.8	179	1	173.34
1059				7.37	22.1	621.9	178		
1101				7.38	22.1	621.3	175		

METER	SERIAL #	CALIBRATED		
pH :	616084	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:	**68.52 / S300-DRUM**
			TF LOCATION:	**S300**

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

SAMPLE ID (VERIFY): K1-04 / 3VES TIME COLLECTED: 1114

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
GE	K1-04	AS:FILTER	0	O	
GE	K1-04	AS:THISO	2	1L P	
GE	K1-04	AS:UISO	2	1L P	
BB	K1-04	E300.0:NO3	1	250 ml P	
BB	K1-04	E300.0:PERC	1	250 ml P	1/3-1/2 headspace, & agitate
BB	K1-04	E8260	3	40 mL V	
BB	K1-04	E8330:R+H	3	1L A	
GE	K1-04	E900	1	1L P	
GE	K1-04	E900:FILTER	0	O	
GE	K1-04	E906	1	250 ml P	
PF	K1-04	RA226	1	1L P	
PF	K1-04	RA226:FILTER	0	O	
BB	K1-04	WGMGMET1	1	1L P	
BB	K1-04	WGMGMET1:FILTER	0	O	

All Ground Water Sampling Data 2nd Retest

Target Sample Date: **14-OCT-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **14-Oct-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40019**

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

SCREENED INTERVAL (ft-bmp): **185.97 - 202.97** PUMP INTAKE DEPTH: **195.10**

CASING DEPTH(installed/sounded)(ft-bmp): **201.00 / 204.15 on 28-JAN-15** CASING VOL (Gal/Time): **22.89**

DEPTH TO WATER(ft-bmp): **157.88 on 07-AUG-19** 159.97 VOLUME FACTOR: **0.500**

WATER IN CASING (ft): **45.79** CASING DIAMETER/TCASING HT(in): **3.5 / 2.67**

TIME PUMP ON: 1019 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
1030		23.1	1	7.33	22.6	1312	82	1	161.04
1051		46.2	2	7.30	22.5	1309	80	1	↓
1112		69.3	3	7.30	22.5	1305	83	1	Broke Sticks
1114				7.28	22.5	1301	79		
1116				7.28	22.5	1297	77		

METER	SERIAL #	CALIBRATED
pH :	610084	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: **68.66 / S300-DRUM**
TF LOCATION: **S300**

QC SAMPLE ID: **K1-04** QC LAB(S): **GEL** QC SAMPLE TIME:

SAMPLE ID (VERIFY): K1-04/3VES TIME COLLECTED: 1119

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
GE	K1-04	E906	1	250 ml P	

2nd RE-TEST

RECEIVED
OCT 18 2019
ERD-DATA MGMT

Revision: 10/28/2015

All Ground Water Sampling Data

Target Sample Date: **25-NOV-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **25-Nov-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40038**

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

SCREENED INTERVAL (ft-bmp): **165.30 - 186.30** INTAKE DEPTH: **0.00**

CASING DEPTH(installed/sounded)(ft-bmp): **184.00 / 186.30 on 21-NOV-84** CASING VOL (Gal/Time): **13.09**

DEPTH TO WATER(ft-bmp): **173.17 on 07-OCT-19** VOLUME FACTOR: **1.020**

WATER IN CASING (ft): **12.83** CASING DIAMETER/TCASING HT(in): **5 / 2.00**

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 :		YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: **silva90**
PROJECT: **3EMG**
SAMPLE PRESERVATION/AMT of REAGENT:
PURGE VOL/EXCESS H2O DEST: **39.26 / S300-DRUM**
TF LOCATION: **S300**

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

SAMPLE ID (VERIFY): TIME COLLECTED: 1243

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
GE	K1-05	AS:FILTER	0	O	
GE	K1-05	AS:THISO	2	1L P	
GE	K1-05	AS:UISO	2	1L P	
BB	K1-05	E300.0:NO3	1	250 ml P	
BB	K1-05	E300.0:PERC	1	250 ml P	1/3-1/2 headspace, & agitate
BB	K1-05	E8260	3	40 mL V	
BB	K1-05	E8330:R+H	3	1L A	
GE	K1-05	E900	1	1L P	
GE	K1-05	E900:FILTER	0	O	
GE	K1-05	E906	1	250 ml P	
PF	K1-05	RA226	1	1L P	
PF	K1-05	RA226:FILTER	0	O	
BB	K1-05	WGMGMET1	1	1L P	
BB	K1-05	WGMGMET1:FILTER	0	O	

No Samples pump not operable
Generator puts load on pump but no breakers
Pop.

All Ground Water Sampling Data

Target Sample Date: **30-OCT-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **30-Oct-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40028**

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

SCREENED INTERVAL (ft-bmp): **107.30 - 117.30** INTAKE DEPTH: **0.00**

CASING DEPTH(installed/sounded)(ft-bmp): **115.00 / 117.30 on 19-NOV-84** CASING VOL (Gal/Time): **0.33**

DEPTH TO WATER(ft-bmp): **116.68 on 16-JUL-19** VOLUME FACTOR: **1.020**

WATER IN CASING (ft): **0.32** CASING DIAMETER/TCASING HT(in): **5 / 2.00**

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 :		YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: **silva90**
PROJECT: **3EMG**
SAMPLE PRESERVATION/AMT of REAGENT:
PURGE VOL/EXCESS H2O DEST: **0.00 / None**
TF LOCATION: **Collect**

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

SAMPLE ID (VERIFY): TIME COLLECTED:

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
TS	K1-06	E300.0:PERC	1	250 mL P	1/3-1/2 headspace, & agitate
GE	K1-06	E906	1	250 ml P	

No Samples
INSuff H2O to collect Samples

NOTE:
Purge rate/time: N/A since est_sus_flow = 0
Purge Volume: 0 gal.
Revision: 10/28/2015

All Ground Water Sampling Data

Target Sample Date: **06-NOV-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **06-Nov-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40031**

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

SCREENED INTERVAL (ft-bmp): **131.30 - 151.30** INTAKE DEPTH: **0.00**

CASING DEPTH(installed/sounded)(ft-bmp): **150.00 / 153.30 on 28-OCT-85** CASING VOL (Gal/Time): **8.50** 8.8 13-0

DEPTH TO WATER(ft-bmp): **142.71 on 15-JUL-19** 142.64 VOLUME FACTOR: **0.826** 26.4 Gal

WATER IN CASING (ft): **10.29** 10.66 CASING DIAMETER/TCASING HT(in): **4.5 / 3.00**

TIME PUMP ON: 0940 INITIAL FLOW RATE (Q=GPM): 1.0 Q

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

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
0944		8.8	1	7.25	20.7	613.5	-78	1	144.77
0959		17.6	2	7.22	21.0	610.3	-83	1	145.89
1008		26.4	3	7.22	21.1	611.7	-81	1	146.32
1010				7.23	21.1	613.1	-79		
1012				7.23	21.3	613.7	-80		
1014									

METER SERIAL # CALIBRATED
pH : 610084 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: **25.50 / S300-DRUM**
TF LOCATION: **S300**

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

SAMPLE ID (VERIFY): K1-07/3VES TIME COLLECTED: 1022

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
GE	K1-07	AS:FILTER	0	O	
GE	K1-07	AS:THISO	2	1L P	
GE	K1-07	AS:UISO	2	1L P	
BB	K1-07	E300.0:NO3	1	250 ml P	
BB	K1-07	E300.0:PERC	1	250 ml P	1/3-1/2 headspace, & agitate
BB	K1-07	E8260	3	40 mL V	
BB	K1-07	E8330:R+H	3	1L A	
GE	K1-07	E900	1	1L P	
GE	K1-07	E900:FILTER	0	O	
GE	K1-07	E906	1	250 ml P	
PF	K1-07	RA226	1	1L P	
PF	K1-07	RA226:FILTER	0	O	
BB	K1-07	WGMGMET1	1	1L P	
BB	K1-07	WGMGMET1:FILTER	0	O	

Revision: 10/28/2015

ESH-EFA-WQ-20-17014– CQ/AC:mgp

All Ground Water Sampling Data

Target Sample Date: **21-NOV-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **21-Nov-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40037**

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

SCREENED INTERVAL (ft-bmp): **143.32 - 168.32** INTAKE DEPTH: **0.00**

CASING DEPTH(installed/sounded)(ft-bmp): **168.00 / 170.32 on 31-OCT-85** CASING VOL (Gal/Time): **11.22** 11.5 + 3w =

DEPTH TO WATER(ft-bmp): **156.44 on 04-NOV-19** 156.39 VOLUME FACTOR: **0.826** 34.5 Gal

WATER IN CASING (ft): **13.58** 13.93 CASING DIAMETER/TCASING HT(in): **4.5 / 2.02**

TIME PUMP ON: 1133 INITIAL FLOW RATE (Q=GPM): .9 Q

TIME PUMP OFF: 1220 MEASURED BY: FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1145		11.5	1	7.50	23.2	644.2	119	1	161.33
1157		23	2	7.50	23.1	648.1	122	1	162.96
1209		34.5	3	7.47	23.1	646.3	120	1	Top of Pump
1211				7.46	23.1	646.0	117		
1213				7.44	23.1	645.3	119		

METER SERIAL # CALIBRATED
pH : 610084 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: **33.66 / S300-DRUM**
TF LOCATION: **S300**

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

SAMPLE ID (VERIFY): K1-08/ 3VES TIME COLLECTED: 1220

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
GE	K1-08	AS:FILTER	0	O	
GE	K1-08	AS:THISO	2	1L P	
GE	K1-08	AS:UISO	2	1L P	
BB	K1-08	E300.0:NO3	1	250 ml P	
BB	K1-08	E300.0:PERC	1	250 ml P	1/3-1/2 headspace, & agitate
BB	K1-08	E8260	3	40 mL V	
BB	K1-08	E8330:R+H	3	1L A	
GE	K1-08	E900	1	1L P	
GE	K1-08	E900:FILTER	0	O	
GE	K1-08	E906	1	250 ml P	
PF	K1-08	RA226	1	1L P	
PF	K1-08	RA226:FILTER	0	O	
BB	K1-08	WGMGMET1	1	1L P	
BB	K1-08	WGMGMET1:FILTER	0	O	

1st Retest

All Ground Water Sampling Data

Target Sample Date: **23-OCT-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **23-Oct-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40025**

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

SCREENED INTERVAL (ft-bmp): **143.32 - 168.32** INTAKE DEPTH: **0.00**

CASING DEPTH(installed/sounded)(ft-bmp): **168.00 / 170.32 on 31-OCT-85** CASING VOL (Gal/Time): **11.24** 11.7 x 3 = 35.1 Gal

DEPTH TO WATER(ft-bmp): **156.42 on 21-AUG-19** 156.13 VOLUME FACTOR: **0.826**

WATER IN CASING (ft): **13.60** 14.19 CASING DIAMETER/TCASING HT(in): **4.5 / 2.02**

TIME PUMP ON: 1106 INITIAL FLOW RATE (Q=GPM): .9 a

TIME PUMP OFF: 1152 MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1119		11.7	1	7.50	24.1	629.2	120	1	161.34
1132		23.4	2	7.47	24.3	630.4	118	1	162.30
1145		35.1	3	7.46	24.4	630.7	115	1	Hitting Pump
1147				7.49	24.4	631.2	114		
1149				7.46	24.4	631.8	115		

METER SERIAL # CALIBRATED
pH : 600584 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: **33.71 / S300-DRUM**
TF LOCATION: **S300**

QC SAMPLE ID: **K1-08 850FB** QC LAB(S): **BCLABS-BAK** QC SAMPLE TIME: 1152

SAMPLE ID (VERIFY): TIME COLLECTED: 1152

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
BB	850FB	E200.7:FILTER	0	O	
BB	K1-08	E200.7:FILTER	0	O	
BB	K1-08	E200.7:ZN	1	500 mL P	
BB	850FB	E200.7:ZN	1	500 mL P	

1st Re-Sample

Revision: 10/28/2015

ESH-EFA-WQ-20-17014– CQ/AC:mgp

All Ground Water Sampling Data 2nd Retest

Target Sample Date: **04-NOV-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **04-Nov-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40029**

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

SCREENED INTERVAL (ft-bmp): **143.32 - 168.32** INTAKE DEPTH: **0.00**

CASING DEPTH(installed/sounded)(ft-bmp): **168.00 / 170.32 on 31-OCT-85** CASING VOL (Gal/Time): **11.24** 11.5 x 3.0

DEPTH TO WATER(ft-bmp): **156.42 on 21-AUG-19** 156.44 VOLUME FACTOR: **0.826** = 34.5

WATER IN CASING (ft): **13.60** 13.88 CASING DIAMETER/TCASING HT(in): **4.5 / 2.02**

TIME PUMP ON: 1000 INITIAL FLOW RATE (Q=GPM):

TIME PUMP OFF: 1047 MEASURED BY:FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1013		11.5	1	7.50	23.5	629.2	110	\	161.50
1027		23	2	7.47	23.5	630.1	105	\	162.33
1040		35	3	7.46	23.5	629.7	111	\	Hitting pump
1042				7.47	23.5	631.1	113		
1044				7.45	23.4	630.9	111		

METER	SERIAL #	CALIBRATED
pH :	610084	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: **33.71 / S300-DRUM**
TF LOCATION: **S300**

QC SAMPLE ID:**K1-08 850FB** QC LAB(S): **BCLABS-BAK** QC SAMPLE TIME: 1047

SAMPLE ID (VERIFY): K1-08/ 3045 TIME COLLECTED: 1047

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
BB	K1-08	E200.7:FILTER	0	O	
BB	850FB	E200.7:FILTER	0	O	
BB	K1-08	E200.7:ZN	1	500 mL P	
BB	850FB	E200.7:ZN	1	500 mL P	

2nd RE-Sample

RECEIVED
NOV 07 2019
ERD-DATA MGMT

All Ground Water Sampling Data

Target Sample Date: **04-NOV-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **05-Nov-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40029**

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

SCREENED INTERVAL (ft-bmp): **157.30 - 192.30** INTAKE DEPTH: **0.00**

CASING DEPTH(installed/sounded)(ft-bmp): **192.00 / 194.30 on 05-NOV-85** CASING VOL (Gal/Time): **25.31**

DEPTH TO WATER(ft-bmp): **163.37 on 15-AUG-19** 163.40 VOLUME FACTOR: **0.826**

WATER IN CASING (ft): **30.63** 30.9 CASING DIAMETER/TCASING HT(in): **4.5 / 2.00**

TIME PUMP ON: 1055 INITIAL FLOW RATE (Q=GPM): 1.1

TIME PUMP OFF: 1217 MEASURED BY: FLOW METER / GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1114		25.6	1	7.90	22.7	641.3	104	1	165.83
1141		51.2	2	7.92	22.7	640.7	101	1	Probe Sticks
1204		76.8	3	7.94	22.7	638.3	101	1	↓
1206				7.94	22.7	640.1	99		
1209				7.93	22.6	640.7	100		

METER	SERIAL #	CALIBRATED
pH :	610084	YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: **silva90**
PROJECT: **3EMG**
SAMPLE PRESERVATION/AMT of REAGENT: —
PURGE VOL/EXCESS H2O DEST: **75.92 / S300-DRUM**
TF LOCATION: **S300**

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

SAMPLE ID (VERIFY): K1-09 | 3VES TIME COLLECTED: 1217

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
GE	K1-09	AS:FILTER	0	O	
GE	K1-09	AS:THISO	2	1L P	
GE	K1-09	AS:UISO	2	1L P	
BB	K1-09	E300.0:NO3	1	250 ml P	
BB	K1-09	E300.0:PERC	1	250 ml P	1/3-1/2 headspace, & agitate
BB	K1-09	E8260	3	40 mL V	
BB	K1-09	E8330:R+H	3	1L A	
GE	K1-09	E900	1	1L P	
GE	K1-09	E900:FILTER	0	O	
GE	K1-09	E906	1	250 ml P	
PF	K1-09	RA226	1	1L P	
PF	K1-09	RA226:FILTER	0	O	
BB	K1-09	WGMGMET1	1	1L P	
BB	K1-09	WGMGMET1:FILTER	0	O	

All Ground Water Sampling Data

Target Sample Date: **05-NOV-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **05-Nov-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40030**

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

SCREENED INTERVAL (ft-bmp): **247.30 - 267.30** PUMP INTAKE DEPTH: **265.20**

CASING DEPTH(installed/sounded)(ft-bmp): **266.00 / 268.20 on 11-MAY-06** CASING VOL (Gal/Time): **49.81** 50.6 X 3 =

DEPTH TO WATER(ft-bmp): **219.17 on 16-JUL-19** 218.54 VOLUME FACTOR: **1.020** 151.8 Gal

WATER IN CASING (ft): **48.83** 49.66 CASING DIAMETER/TCASING HT(in): **5 / 2.00**

TIME PUMP ON: 0939 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
1026		50.6	1	7.41	22.8	669.3	104	1	220.21
1102		101.2	2	7.40	21.7	668.8	102	1	
1158		151.8	3	7.39	21.7	669.3	105	1	
1200				7.42	21.7	670.2	108		
1202				7.40	21.7	671.0	106		

METER	SERIAL #	CALIBRATED
pH :	610084	YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: **silva90**
PROJECT: **3CMP 3GIV 3EMG**
SAMPLE PRESERVATION/AMT of REAGENT: NA
PURGE VOL/EXCESS H2O DEST: **149.42 / None**
TF LOCATION: **Collect**

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

SAMPLE ID (VERIFY): W-PIT1-2209 / 3VES TIME COLLECTED: 1208

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
GE	W-PIT1-2209	AS:FILTER	0	O	
GE	W-PIT1-2209	AS:UISO	2	1L P	
BB	W-PIT1-2209	E300.0:NO3	1	250 ml P	
BB	W-PIT1-2209	E300.0:PERC	1	250 ml P	1/3-1/2 headspace, & agitate
BB	W-PIT1-2209	E624MOD	3	40 mL V	
GE	W-PIT1-2209	E906	1	250 ml P	

All Ground Water Sampling Data

Target Sample Date: **17-DEC-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **17-Dec-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40045**

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

SCREENED INTERVAL (ft-bmp): **217.30 - 237.02** INTAKE DEPTH: **0.00**

CASING DEPTH(installed/sounded)(ft-bmp): **235.12 / 237.42 on 09-OCT-07** CASING VOL (Gal/Time): **57.10** 56.3 x 3 vol =

DEPTH TO WATER(ft-bmp): **181.14 on 07-OCT-19** 182.22 VOLUME FACTOR: **1.020** 168.9 Gal

WATER IN CASING (ft): **55.98** 55.20 CASING DIAMETER/TCASING HT(in): **5 / 2.00**

TIME PUMP ON: 1215 INITIAL FLOW RATE (Q=GPM): 2.0 Q

TIME PUMP OFF: 1349 MEASURED BY: FLOW METER/ GRAD CYL./ BUCKET/ OTHER

TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1243		56.3	1	7.30	21.0	740.1	122	1	187.42
1311		112.6	2	7.29	21.0	739.3	125	1	193.13
1330		168.9	3	7.27	21.0	738.2	123	1	194.02
1332				7.30	21.0	737.9	125		
1334				7.29	21.1	737.1	122		

METER	SERIAL #	CALIBRATED		
pH :	G100847	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:	**171.30 / PIT7-SRC**
			TF LOCATION:	**PIT7-SRC**

QC SAMPLE ID: **PIT1FB W-PIT1-78Y** QC LAB(S): **GEL, BCLABS-BAK** QC SAMPLE TIME: 1406

SAMPLE ID (VERIFY): W-PIT1-~~2326~~ 2326 / 3045 TIME COLLECTED: 1349

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
GE	W-PIT1-78Y	AS:FILTER	0	O	
GE	PIT1FB	AS:FILTER	0	O	
GE	W-PIT1-2326	AS:FILTER	0	O	
GE	W-PIT1-2326	AS:THISO	2	1L P	
GE	W-PIT1-78Y	AS:THISO	2	1L P	
GE	PIT1FB	AS:THISO	2	1L P	
GE	W-PIT1-78Y	AS:UISO	2	1L P	
GE	W-PIT1-2326	AS:UISO	2	1L P	
GE	PIT1FB	AS:UISO	2	1L P	
BB	PIT1FB	E300.0:NO3	1	250 ml P	
BB	W-PIT1-78Y	E300.0:NO3	1	250 ml P	
BB	W-PIT1-2326	E300.0:NO3	1	250 ml P	
BB	PIT1FB	E300.0:PERC	1	250 ml P	1/3-1/2 headspace, & agitate
BB	W-PIT1-78Y	E300.0:PERC	1	250 ml P	1/3-1/2 headspace, & agitate
BB	W-PIT1-2326	E300.0:PERC	1	250 ml P	1/3-1/2 headspace, & agitate
BB	W-PIT1-78Y	E8260	3	40 mL V	
BB	PIT1FB	E8260	3	40 mL V	
BB	W-PIT1-2326	E8260	3	40 mL V	
BB	PIT1FB	E8330:R+H	2	1L A	
BB	W-PIT1-2326	E8330:R+H	3	1L A	
BB	W-PIT1-78Y	E8330:R+H	3	1L A	
GE	W-PIT1-2326	E900	1	1L P	
GE	W-PIT1-78Y	E900	1	1L P	

Revision: 10/28/2015

ESH-EFA-WQ-20-17014– CQ/AC:mgp

All Ground Water Sampling Data

Target Sample Date: **17-DEC-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **17-Dec-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40045**

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

SCREENED INTERVAL (ft-bmp): **217.30 - 237.02** INTAKE DEPTH: **0.00**

CASING DEPTH(installed/sounded)(ft-bmp): **235.12 / 237.42 on 09-OCT-07** CASING VOL (Gal/Time): **57.10**

DEPTH TO WATER(ft-bmp): **181.14 on 07-OCT-19** VOLUME FACTOR: **1.020**

WATER IN CASING (ft): **55.98** CASING DIAMETER/TCASING HT(in): **5 / 2.00**

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 :		YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: **silva90**
PROJECT: **3EMG**
SAMPLE PRESERVATION/AMT of REAGENT:
PURGE VOL/EXCESS H2O DEST: **171.30 / PIT7-SRC**
TF LOCATION: **PIT7-SRC**

QC SAMPLE ID:**W-PIT1-78Y PIT1FB** QC LAB(S):**BCLABS-BAK, ALS-PARAGN, GEL** QC SAMPLE TIME:

SAMPLE ID (VERIFY): TIME COLLECTED:

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
GE	PIT1FB	E900	1	1L P	
GE	PIT1FB	E900:FILTER	0	O	
GE	W-PIT1-2326	E900:FILTER	0	O	
GE	W-PIT1-78Y	E900:FILTER	0	O	
GE	PIT1FB	E906	1	250 ml P	
GE	W-PIT1-2326	E906	1	250 ml P	
GE	W-PIT1-78Y	E906	1	250 ml P	
PF	PIT1FB	RA226	1	1L P	
PF	W-PIT1-78Y	RA226	1	1L P	
PF	W-PIT1-2326	RA226	1	1L P	
PF	W-PIT1-78Y	RA226:FILTER	0	O	
PF	PIT1FB	RA226:FILTER	0	O	
PF	W-PIT1-2326	RA226:FILTER	0	O	
BB	PIT1FB	WGMGMET1	1	1L P	
BB	W-PIT1-78Y	WGMGMET1	1	1L P	
BB	W-PIT1-2326	WGMGMET1	1	1L P	
BB	W-PIT1-2326	WGMGMET1:FILTER	0	O	
BB	W-PIT1-78Y	WGMGMET1:FILTER	0	O	
BB	PIT1FB	WGMGMET1:FILTER	0	O	

Revision: 10/28/2015

ESH-EFA-WQ-20-17014– CQ/AC:mgp

All Ground Water Sampling Data

Target Sample Date: **22-OCT-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **22-Oct-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40024**

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

SCREENED INTERVAL (ft-bmp): **247.30 - 262.20** PUMP INTAKE DEPTH: **254.97**

CASING DEPTH(installed/sounded)(ft-bmp): **260.32 / 262.50 on 04-SEP-12** CASING VOL (Gal/Time): **29.66** 29.8 x 3 = 89.4

DEPTH TO WATER(ft-bmp): **233.24 on 25-JUL-19** 233.30 VOLUME FACTOR: **1.020** 89.4 Gal

WATER IN CASING (ft): **29.08** 29.70 CASING DIAMETER/TCASING HT(in): **5 / 2.00**

TIME PUMP ON: ~~0953~~ 1203 INITIAL FLOW RATE (Q=GPM): 1.0

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

	TIME	Q	GAL PURGED	VOLUMES	pH	TEMP C	SC	mV	OG	DTW
1233	~~1023~~		30	1	7.77	23.9	1033	-84	1	236.45
1303	~~1053~~		60	2	7.79	23.9	1040	-80	1	NM
1333	~~1123~~		90	3	7.81	23.9	1042	-82	1	Probe sticks
1335	~~1125~~				7.80	23.9	1037	-77		
1337	~~1127~~				7.79	24.0	1035	-74		

METER	SERIAL #	CALIBRATED
pH :	610084	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: **88.98 / PIT7-SRC**
TF LOCATION: **PIT7-SRC**

QC SAMPLE ID: **W-PIT1-241Y** QC LAB(S): **TALSAC, GEL** QC SAMPLE TIME: 1215

SAMPLE ID (VERIFY): W-PIT1-2620 TIME COLLECTED: 1342

LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
TS	W-PIT1-2620	E300.0:PERC	1	250 mL P	1/3-1/2 headspace, & agitate
TS	W-PIT1-241Y	E300.0:PERC	1	250 mL P	1/3-1/2 headspace, & agitate
TS	W-PIT1-241Y	E624MOD	3	40 mL V	
TS	W-PIT1-2620	E624MOD	3	40 mL V	
GE	W-PIT1-241Y	E906	1	250 ml P	
GE	W-PIT1-2620	E906	1	250 ml P	

M-08

Revision: 10/28/2015

ESH-EFA-WQ-20-17014– CQ/AC:mgp

All Ground Water Sampling Data

Target Sample Date: **22-OCT-2019** Month: Norm Qtr: **4** Norm Year: **2019**

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

DATE: **22-Oct-2019** LOG BOOK (DOCUMENT CONTROL) #: **AA40024**

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

SCREENED INTERVAL (ft-bmp): **332.30 - 352.30** INTAKE DEPTH: **0.00**

CASING DEPTH(installed/sounded)(ft-bmp): **351.00 / 353.20 on 11-DEC-03** CASING VOL (Gal/Time): **26.73**

DEPTH TO WATER(ft-bmp): **326.79 on 05-AUG-19** 326.83 VOLUME FACTOR: **1.020**

WATER IN CASING (ft): **26.21** 26.37 CASING DIAMETER/TCASING HT(in): **5 / 2.00**

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
1031		—	—	7.77	21.7	603.0	173	1	—

METER	SERIAL #	CALIBRATED
pH :	610584	YES/NO
SC :		YES/NO
mV :		YES/NO
H2O:		YES/NO

SAMPLER/EMPLOYER: **silva90**
PROJECT: **3EMG**
SAMPLE PRESERVATION/AMT of REAGENT:
PURGE VOL/EXCESS H2O DEST: **0.00 / S300-DRUM**
TF LOCATION: **S300**

QC SAMPLE ID: **865FB W-865-64Y** QC LAB(S): **TALSAC, GEL** QC SAMPLE TIME: 0920

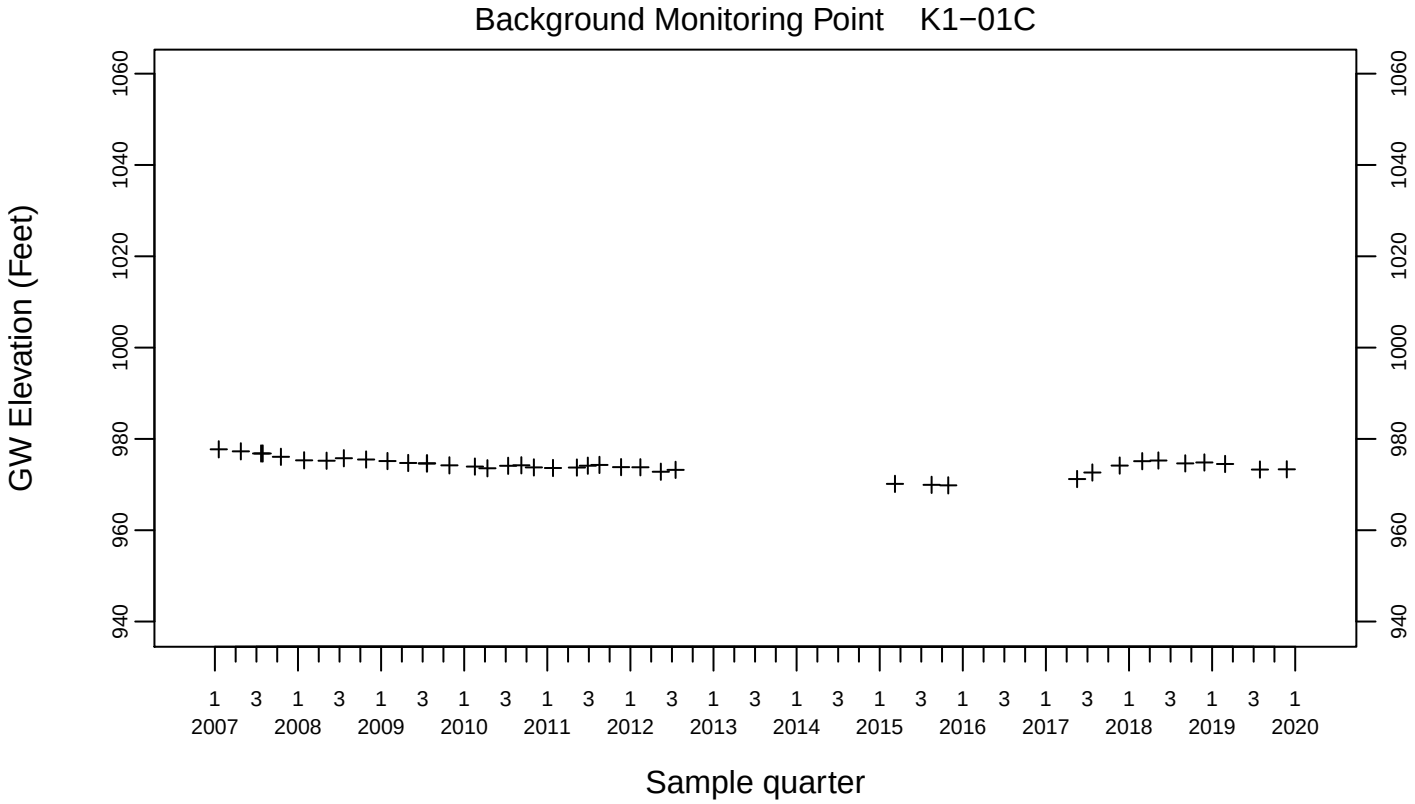
SAMPLE ID (VERIFY): W-865-2005 / GRBA TIME COLLECTED: 1039

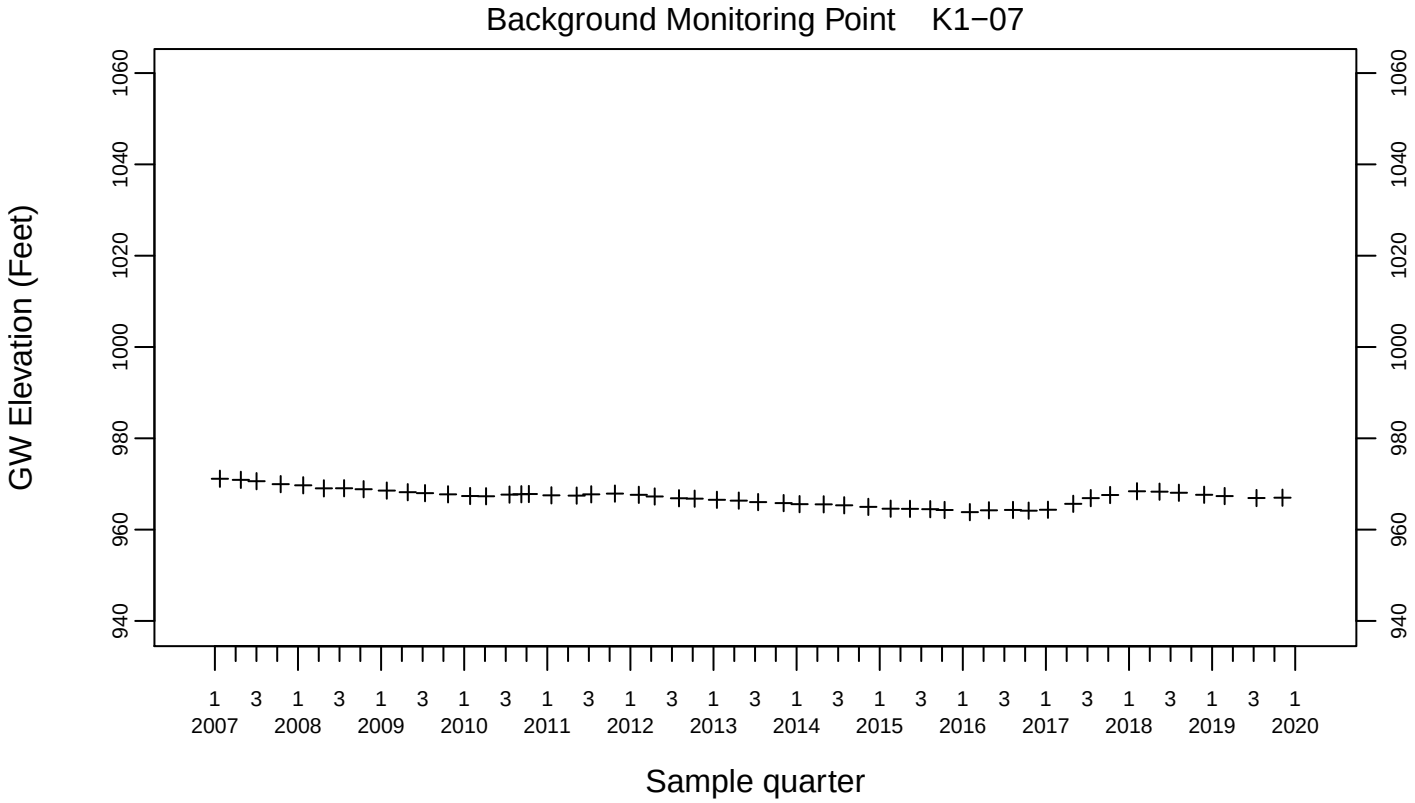
LAB	LAB_LOC_NAME	REQUESTED ANALYSIS	#	TYPE	SAMPLER_REMARKS
TS	865FB	E300.0:PERC	1	250 mL P	1/3-1/2 headspace, & agitate
TS	W-865-64Y	E300.0:PERC	1	250 mL P	1/3-1/2 headspace, & agitate
TS	W-865-2005	E300.0:PERC	1	250 mL P	1/3-1/2 headspace, & agitate
GE	865FB	E906	1	250 ml P	
GE	W-865-64Y	E906	1	250 ml P	
GE	W-865-2005	E906	1	250 ml P	

Appendix H

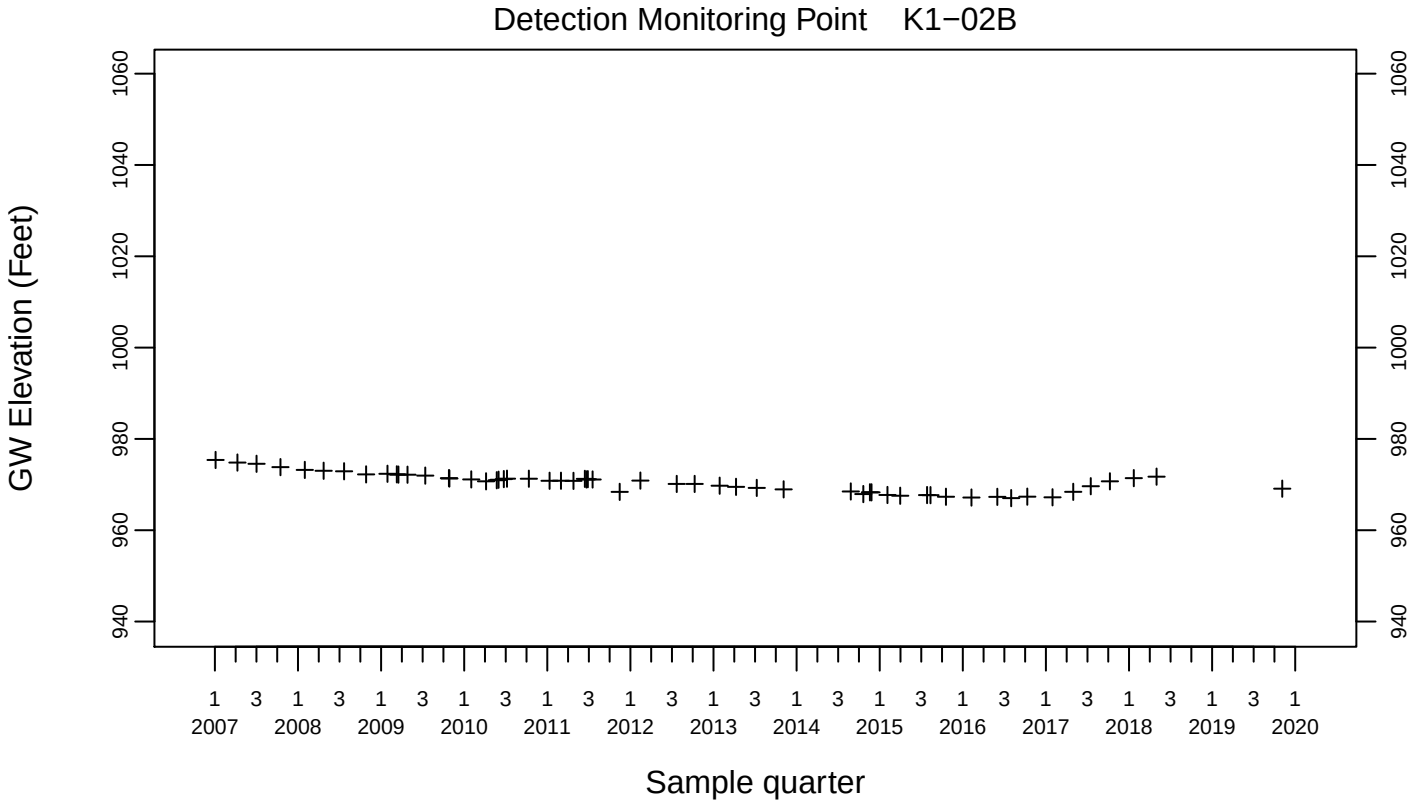
Statistical Limits and Graphs of Ground Water Measurements

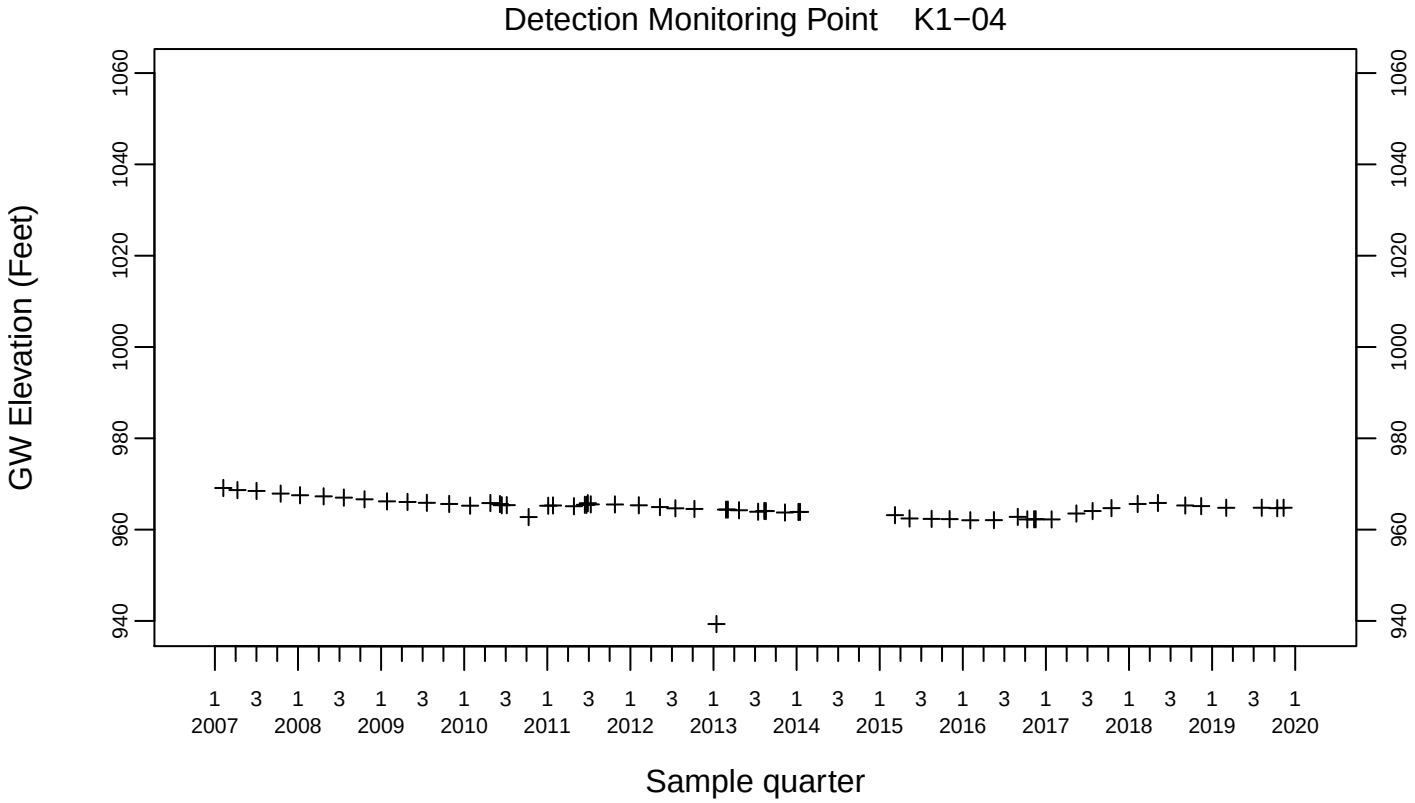
Pit 1 Area
GW Elevation (Feet)





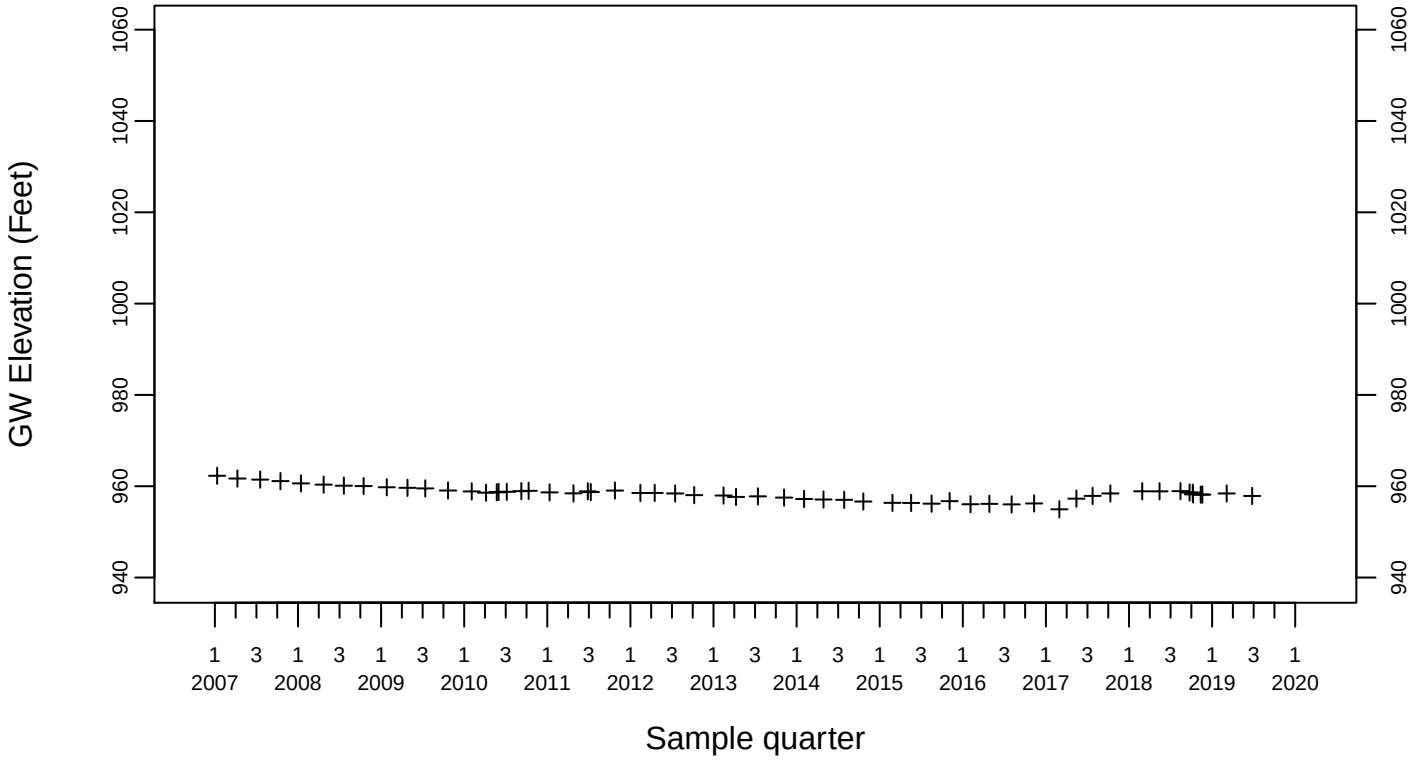
Pit 1 Area
GW Elevation (Feet)



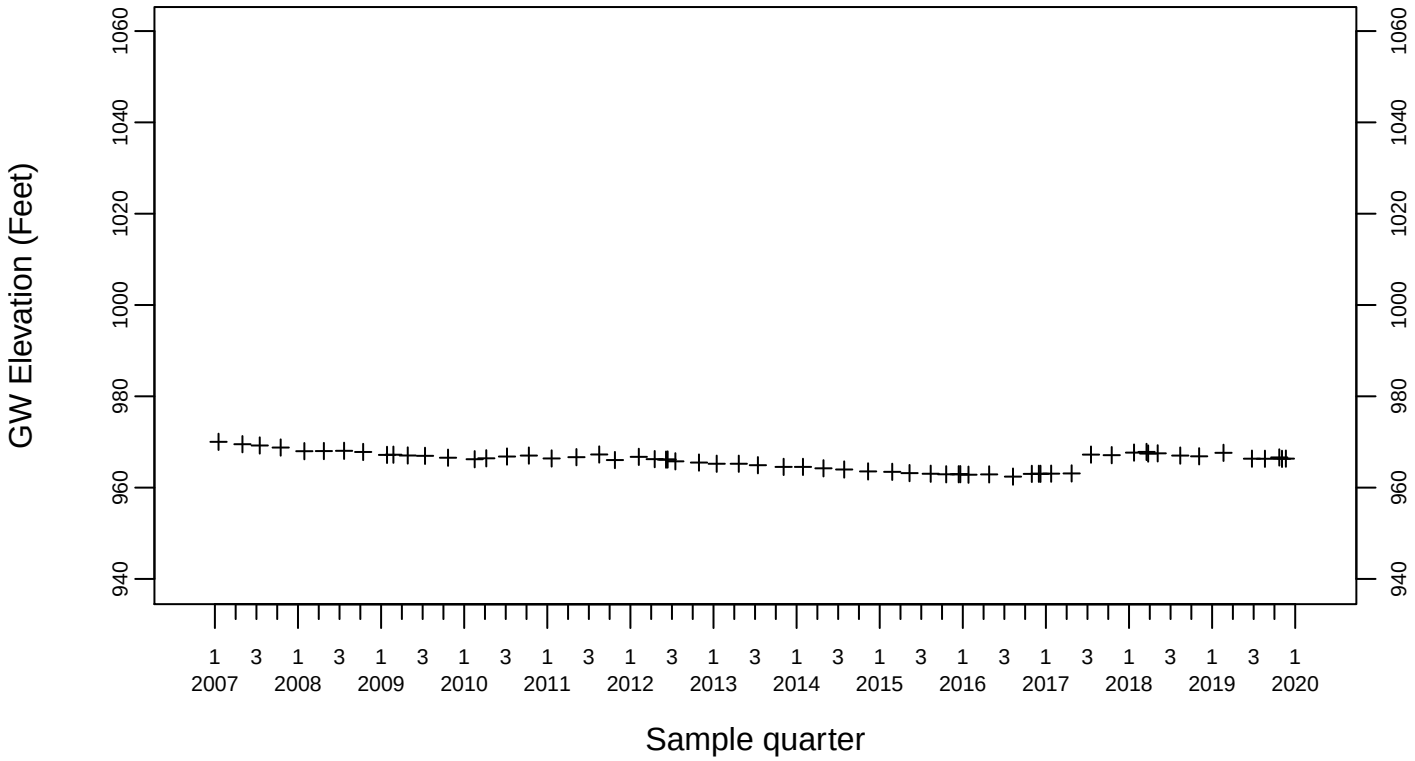


Pit 1 Area
GW Elevation (Feet)

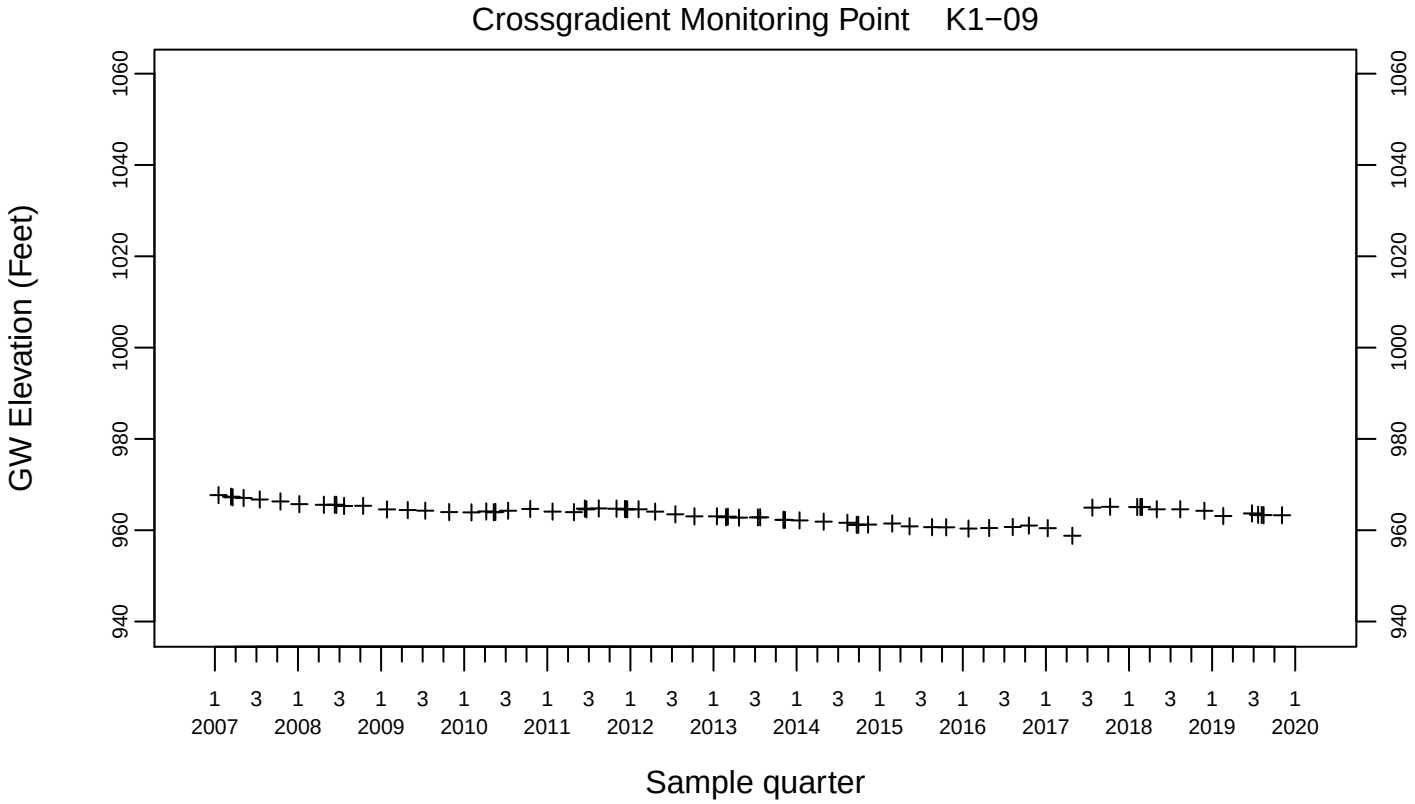
Detection Monitoring Point K1−05

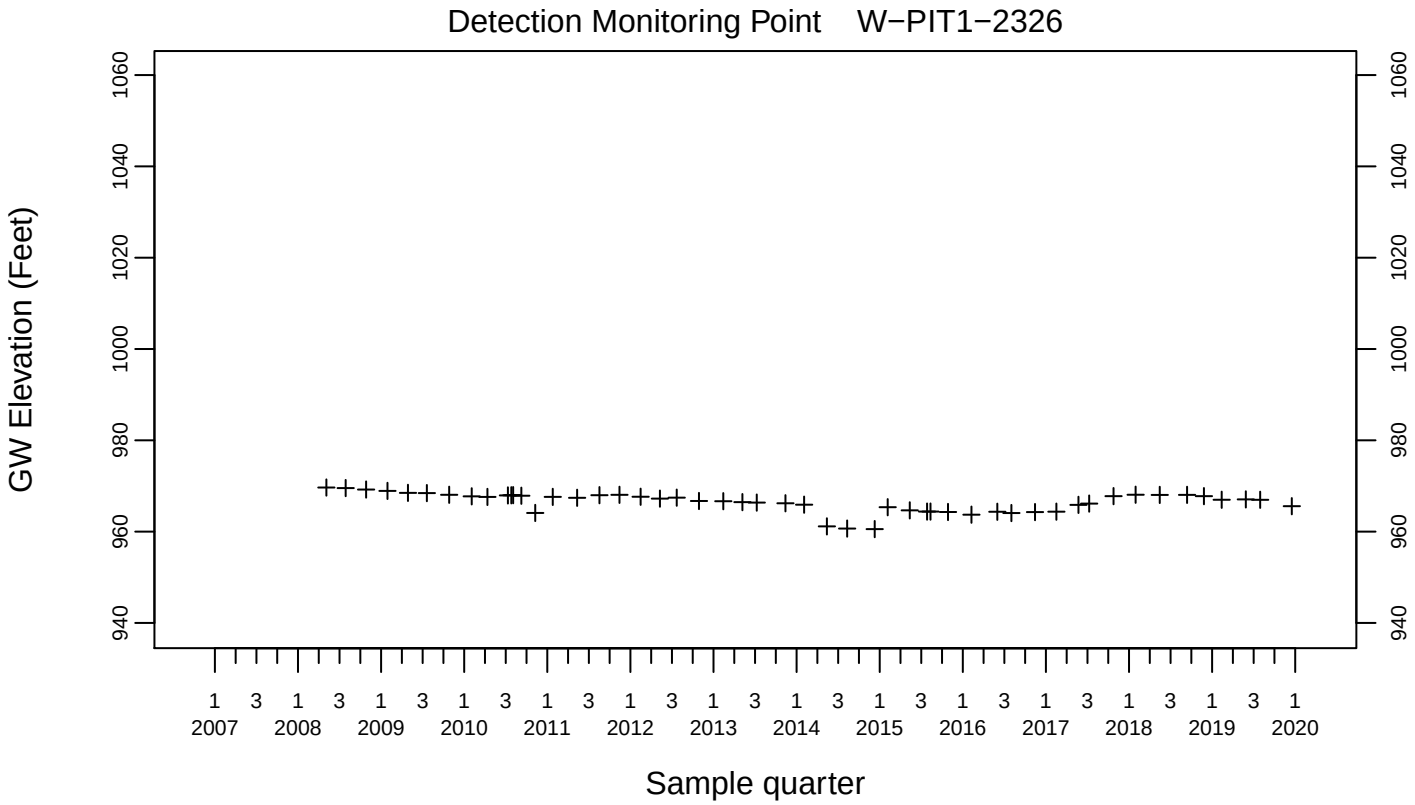


Crossgradient Monitoring Point K1−08



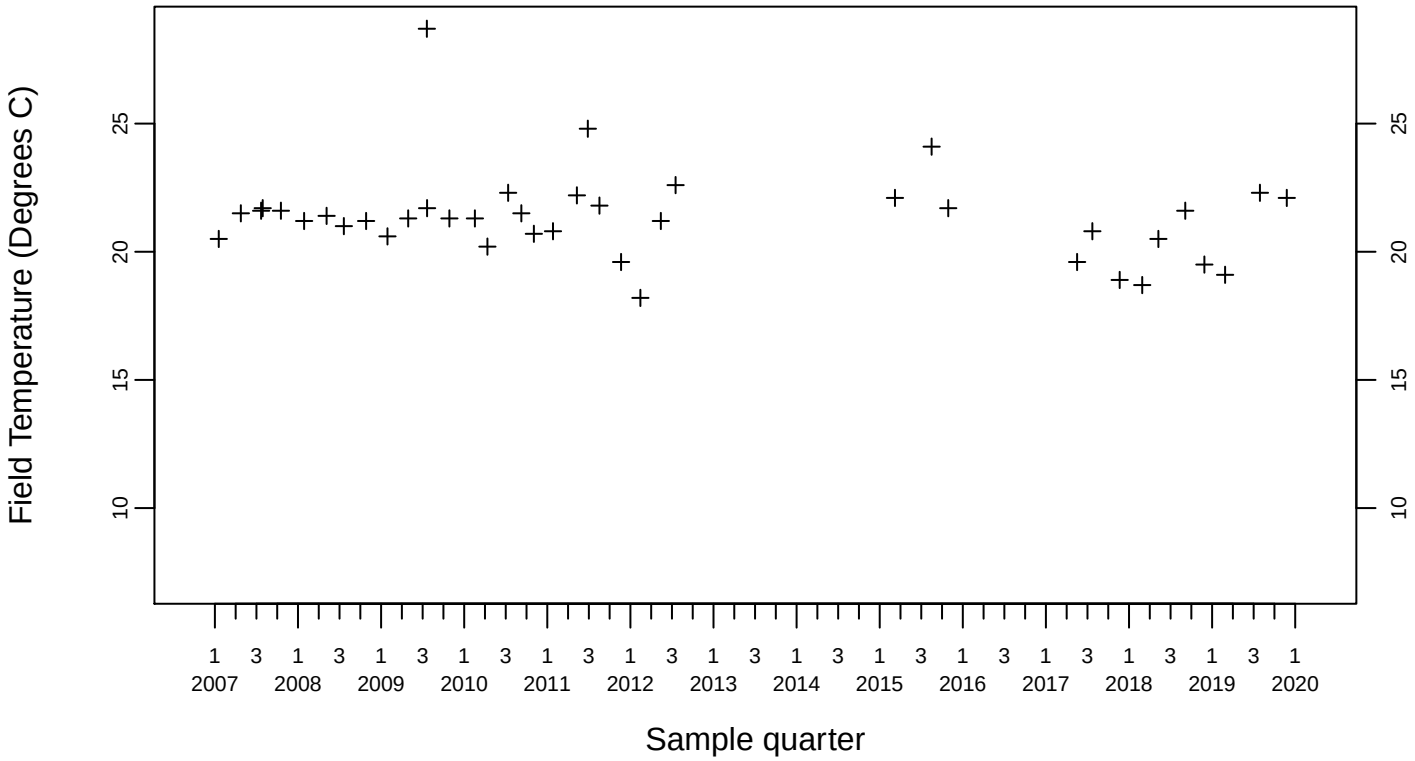
Pit 1 Area
GW Elevation (Feet)



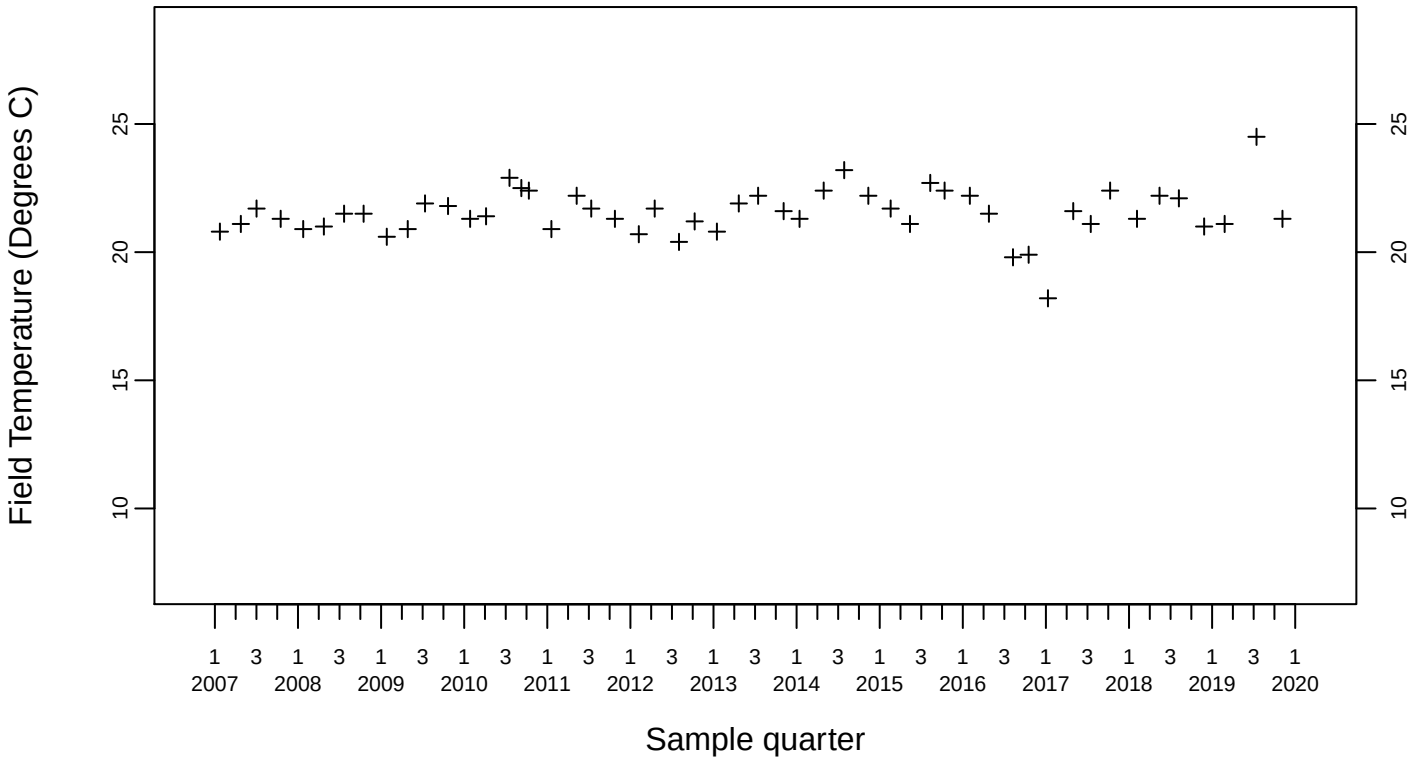


Pit 1 Area
Field Temperature (Degrees C)

Background Monitoring Point K1−01C

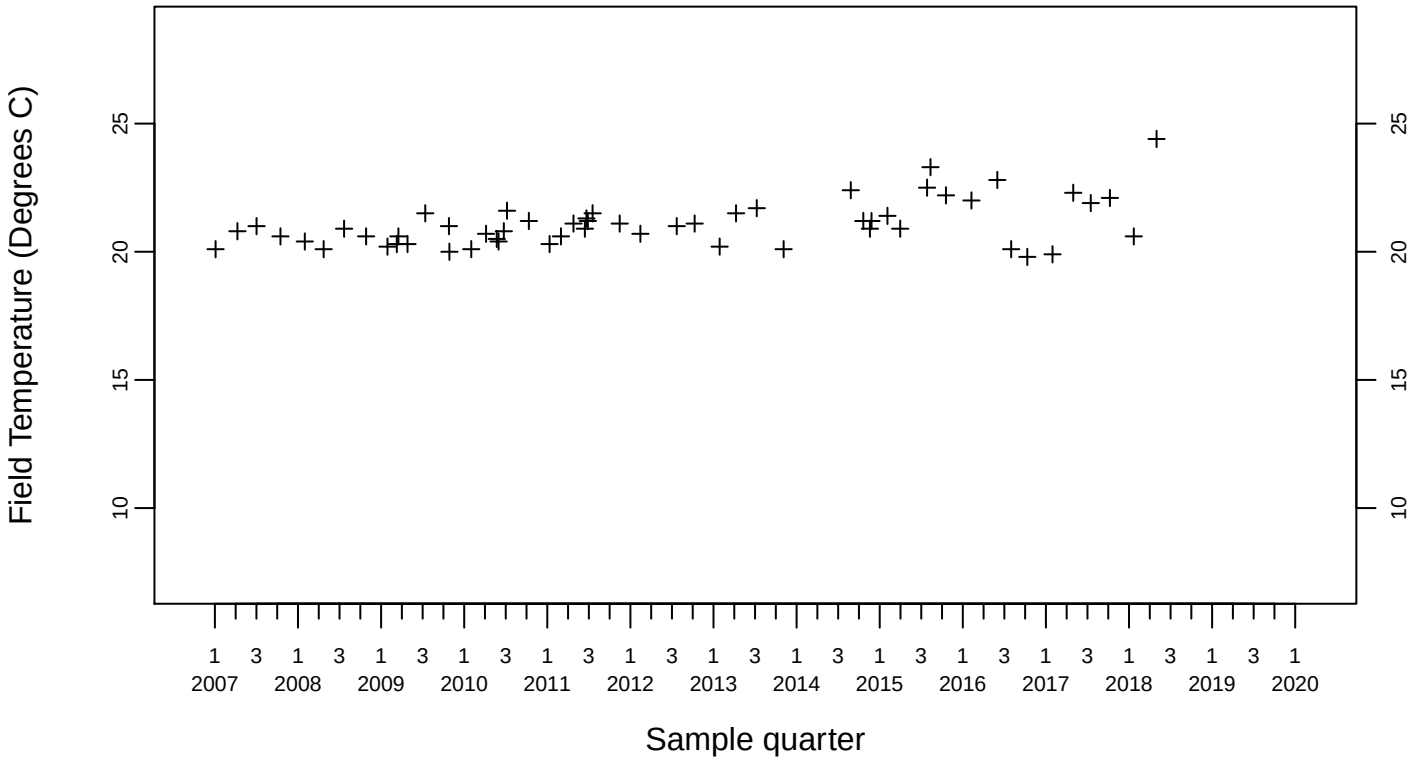


Background Monitoring Point K1−07

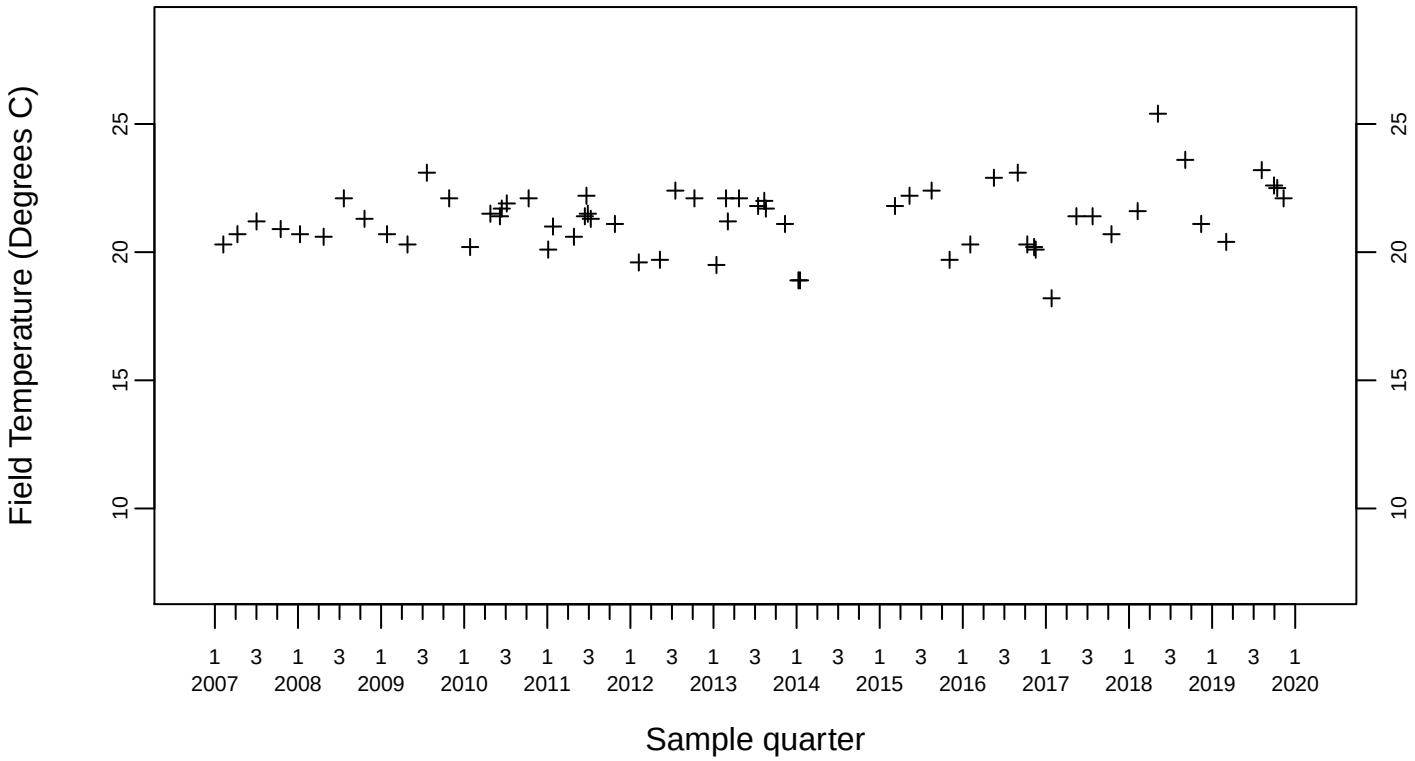


Pit 1 Area
Field Temperature (Degrees C)

Detection Monitoring Point K1−02B

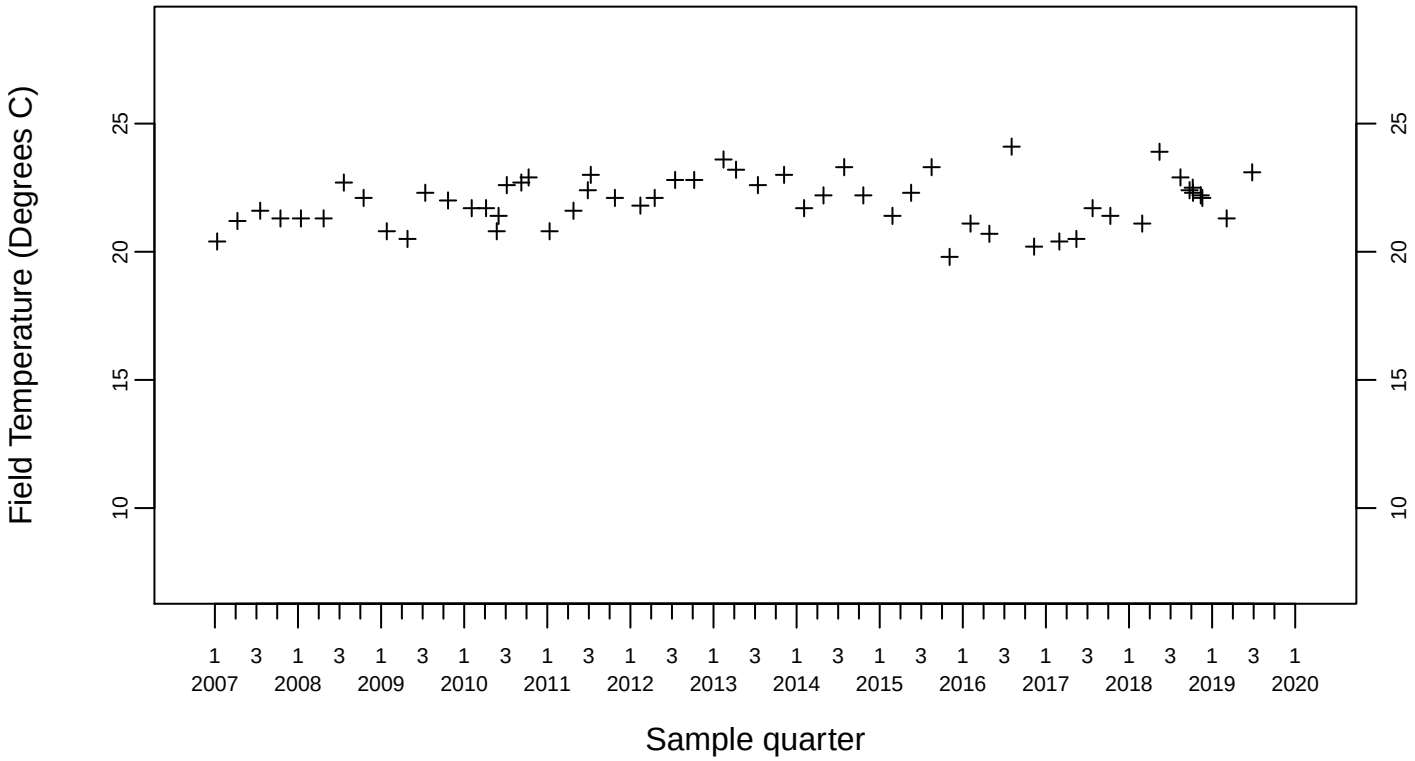


Detection Monitoring Point K1−04

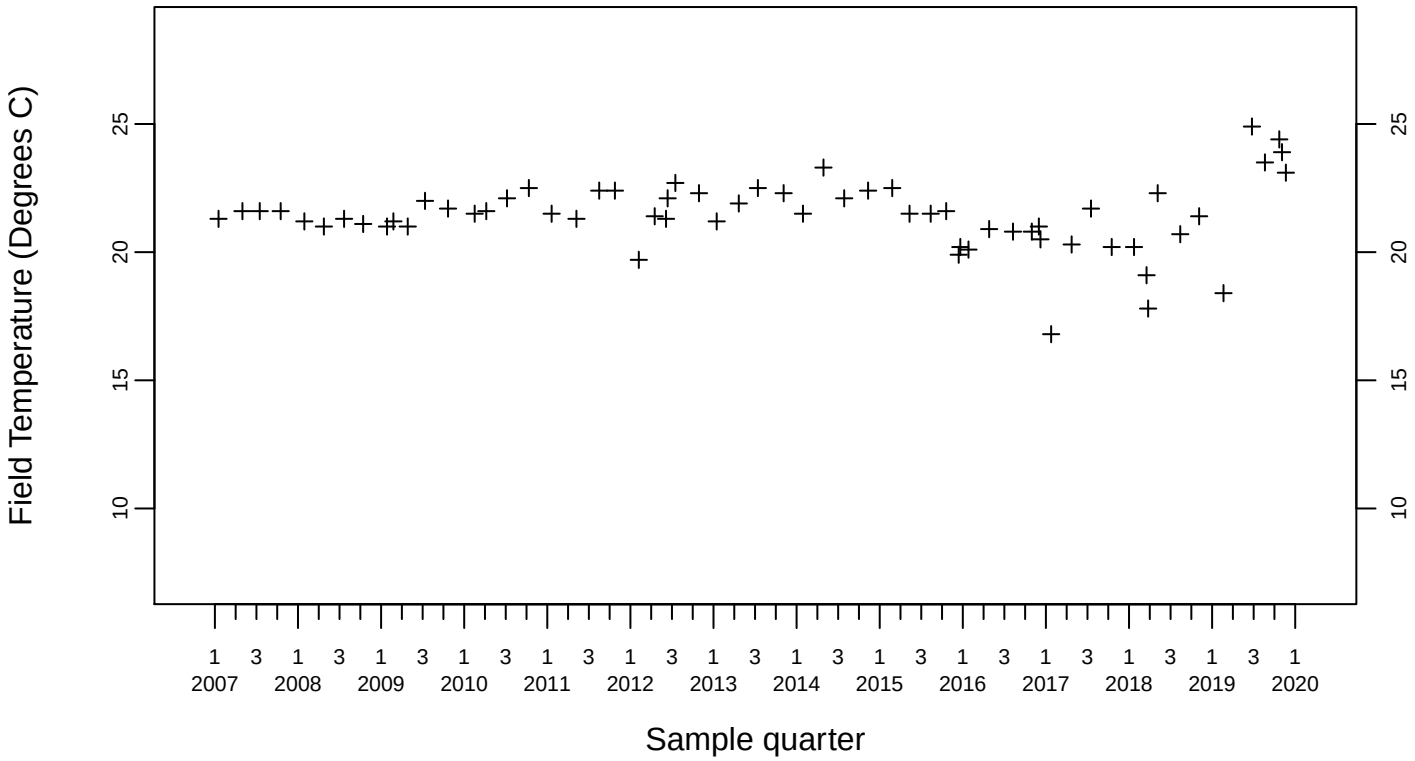


Pit 1 Area
Field Temperature (Degrees C)

Detection Monitoring Point K1−05

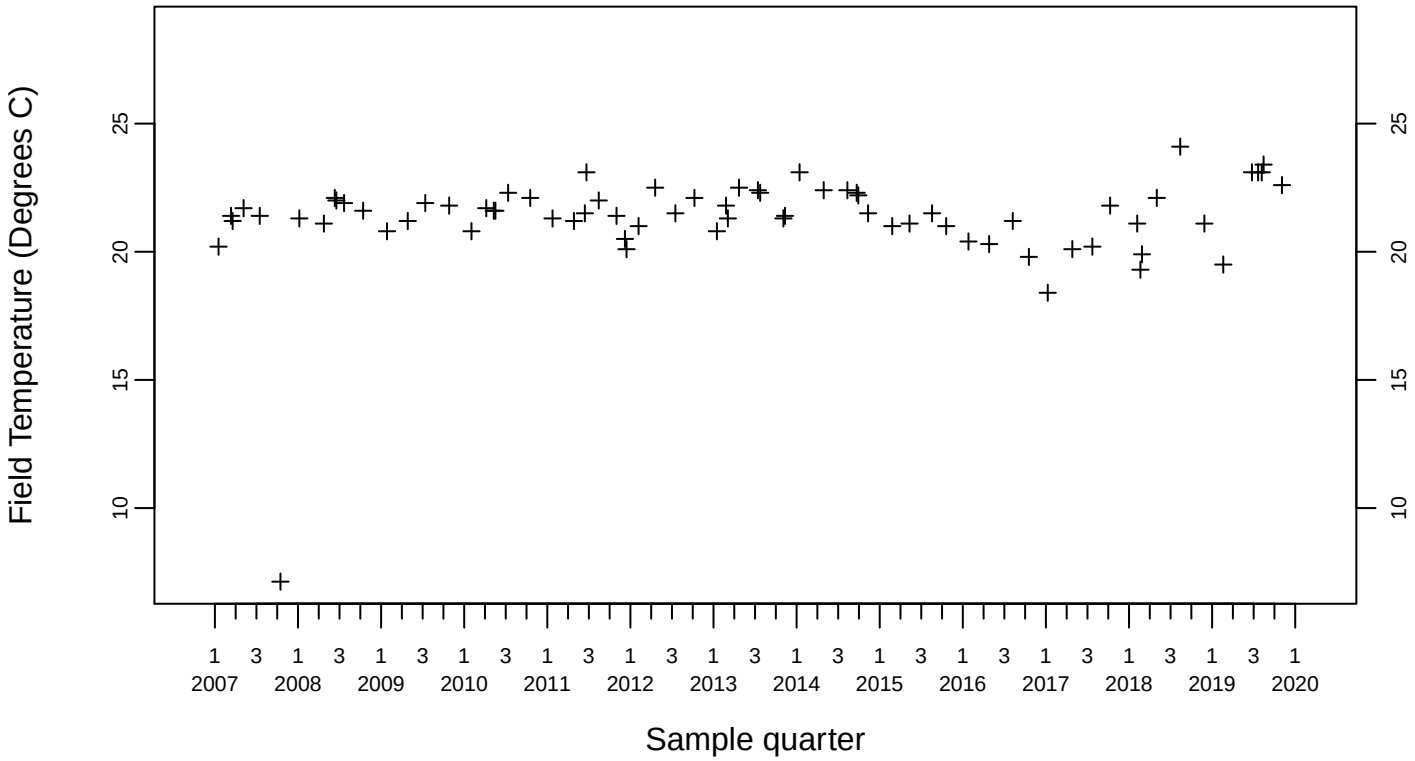


Crossgradient Monitoring Point K1−08

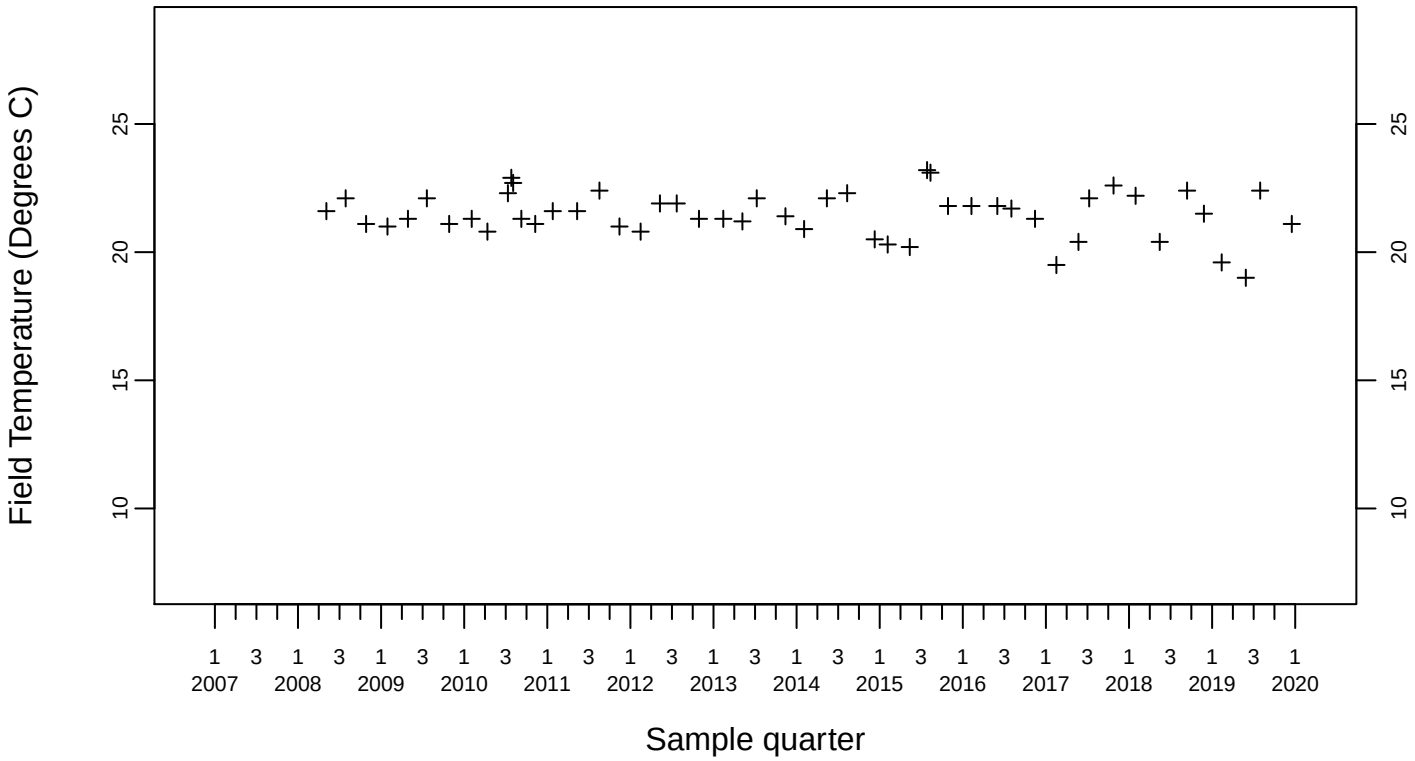


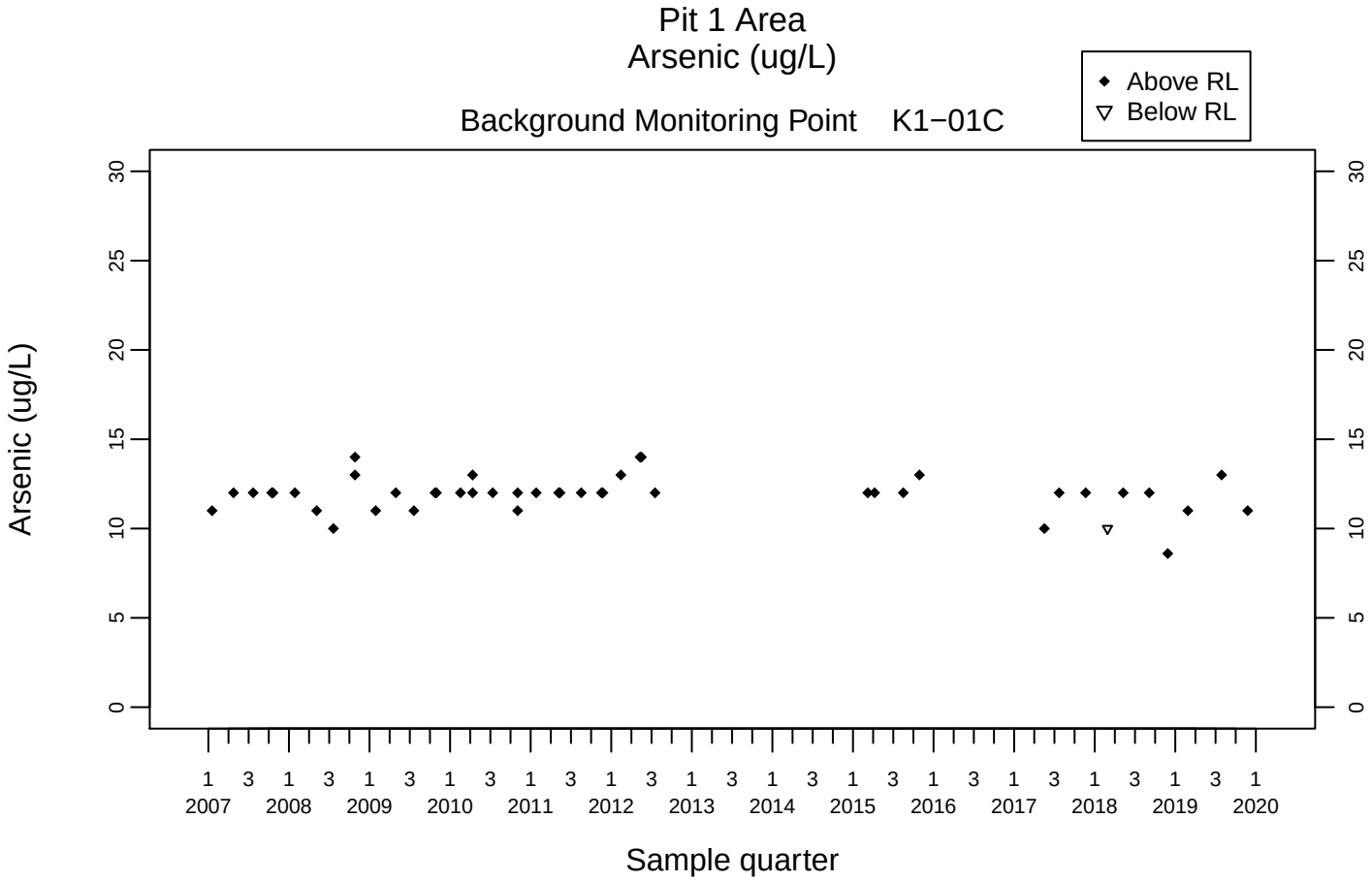
Pit 1 Area
Field Temperature (Degrees C)

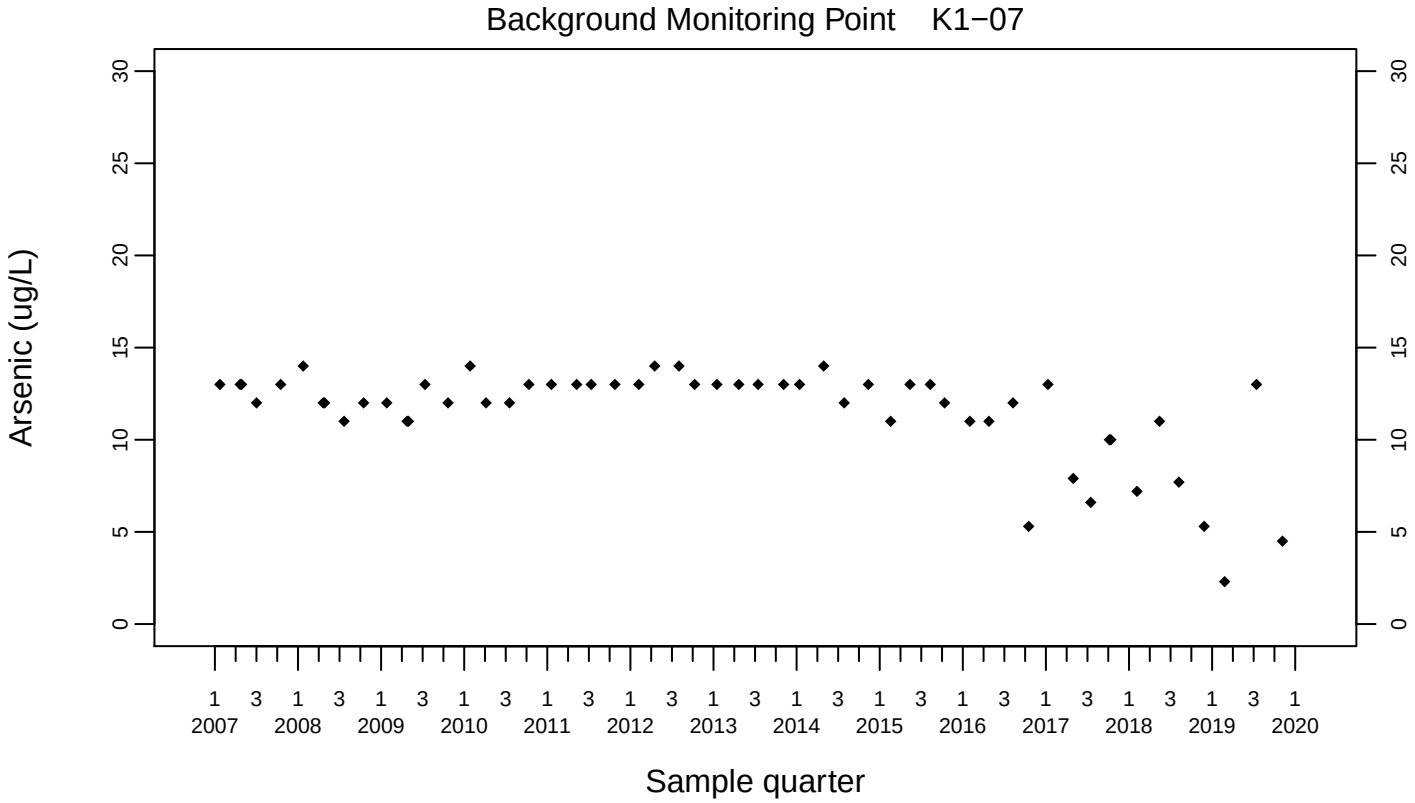
Crossgradient Monitoring Point K1−09

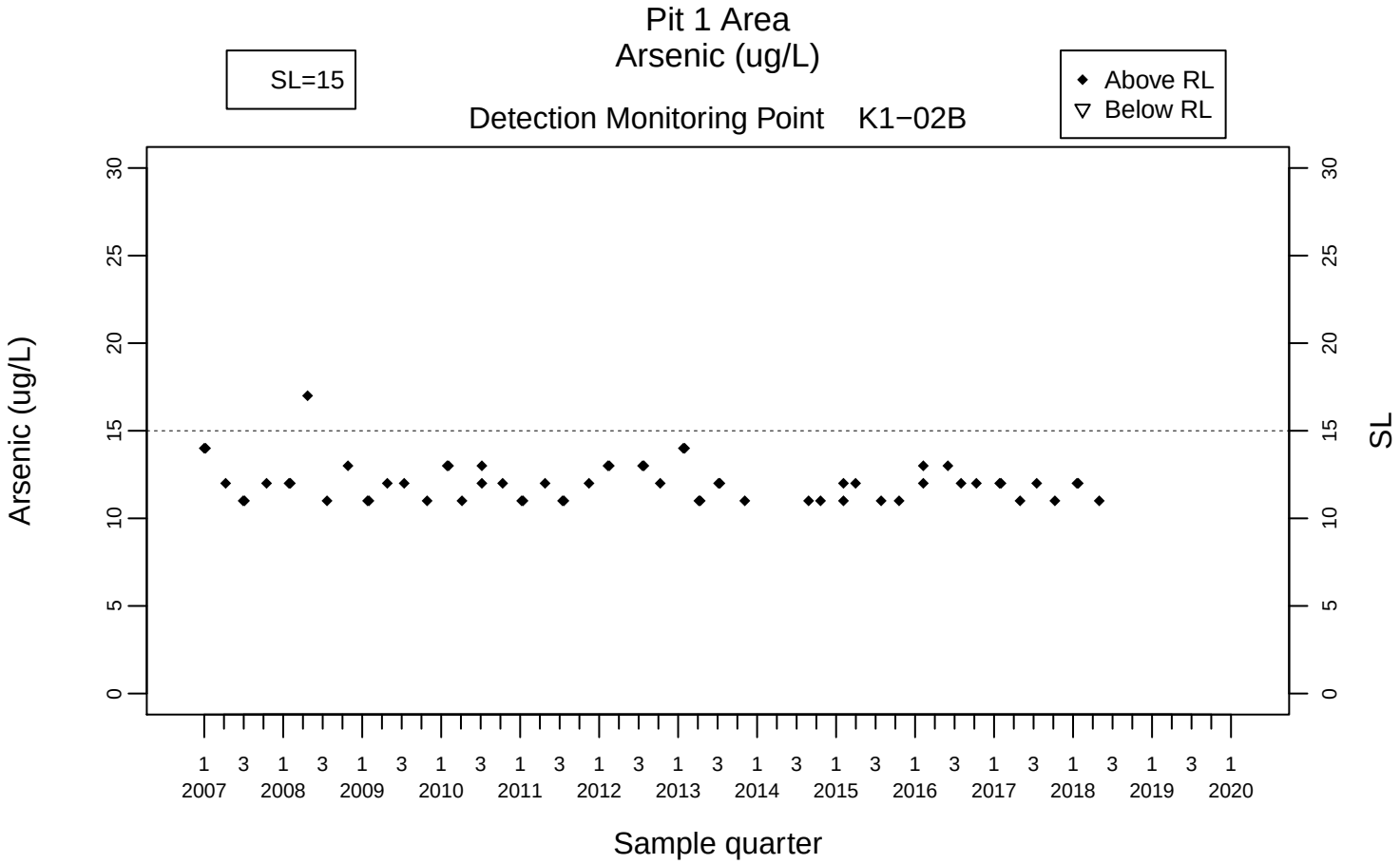


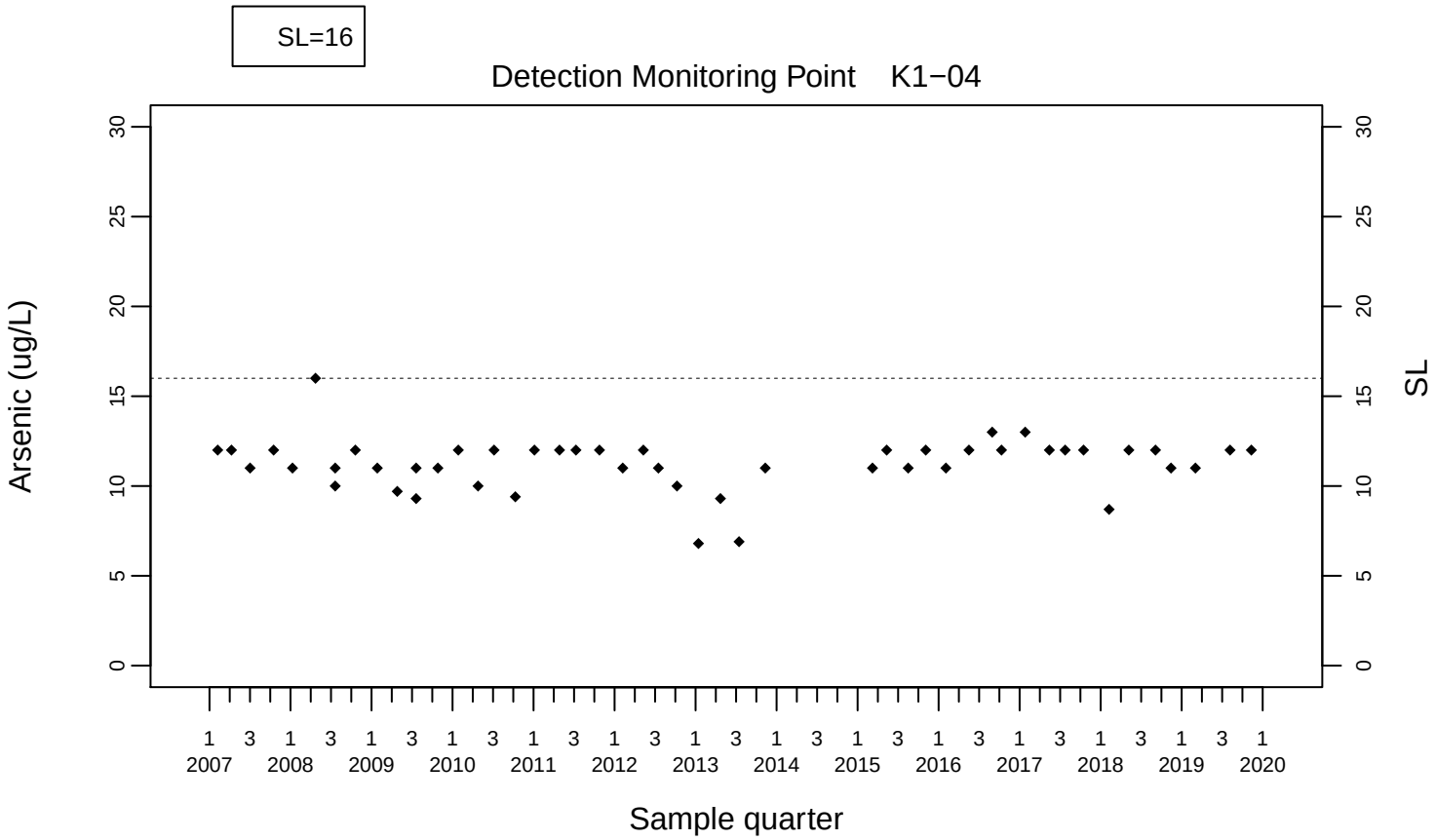
Detection Monitoring Point W−PIT1−2326

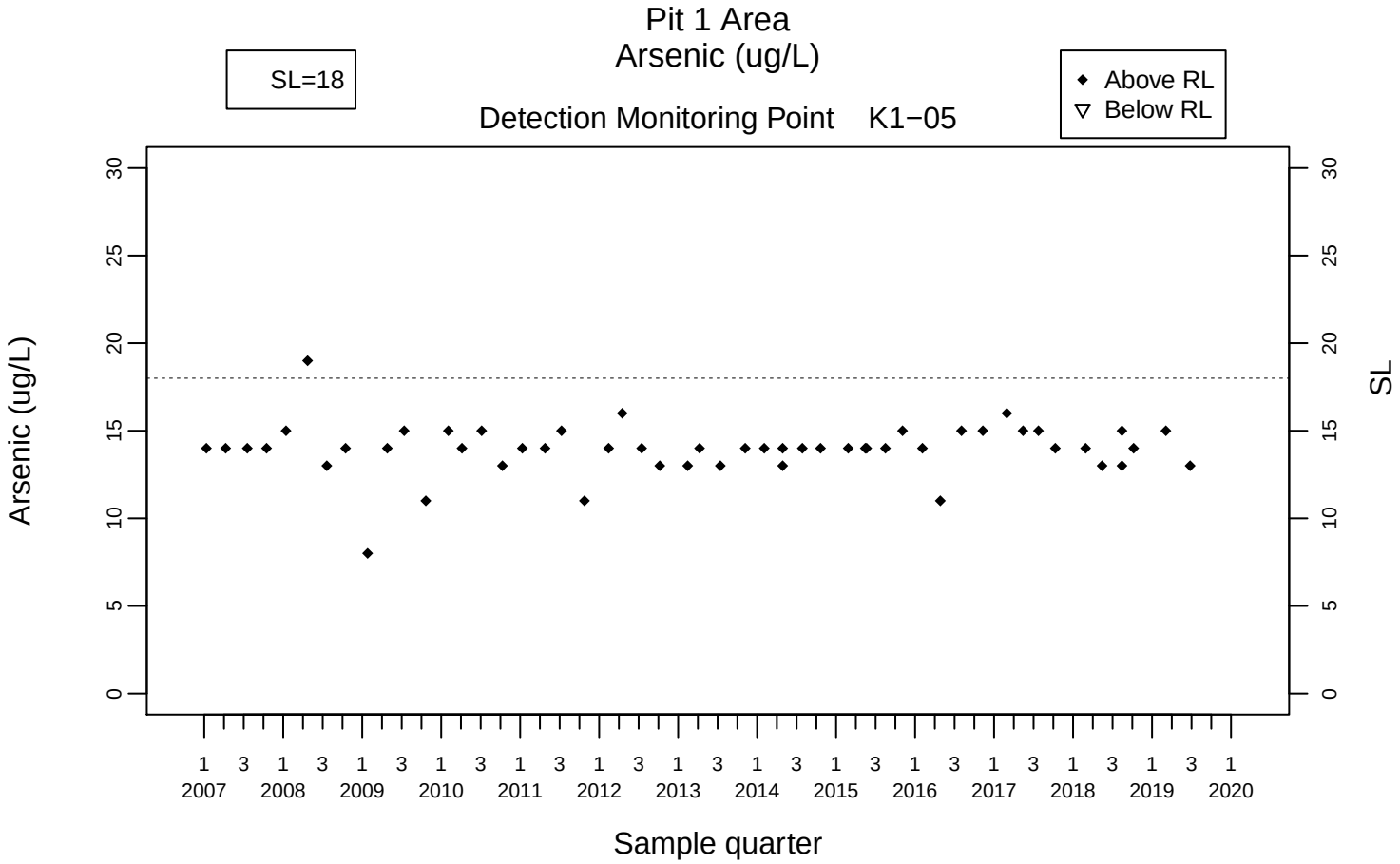


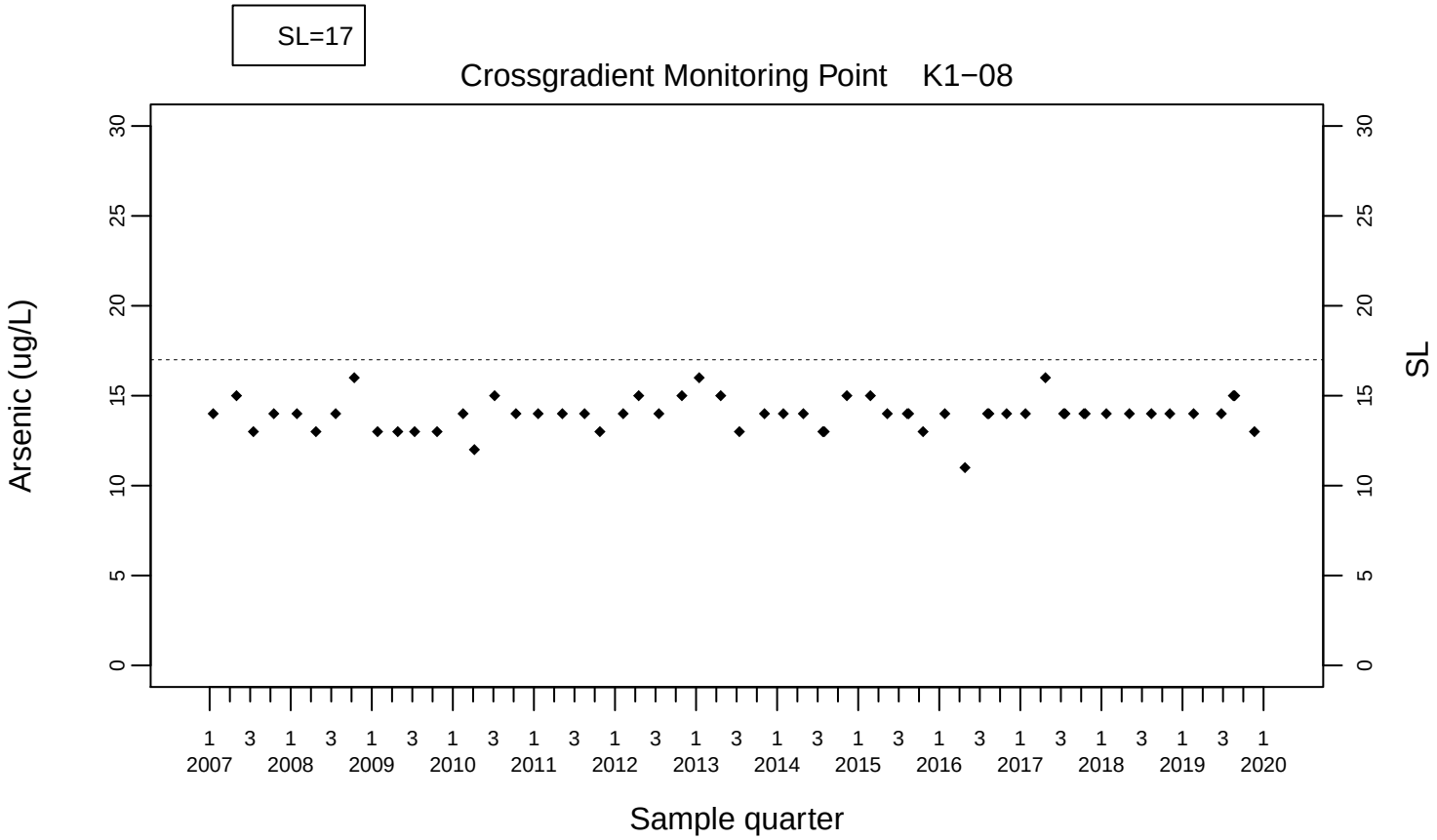

Pit 1 Area
Arsenic (ug/L)
Background Monitoring Point K1−01C
Above RL
Below RL
Arsenic (ug/L)
Sample quarter

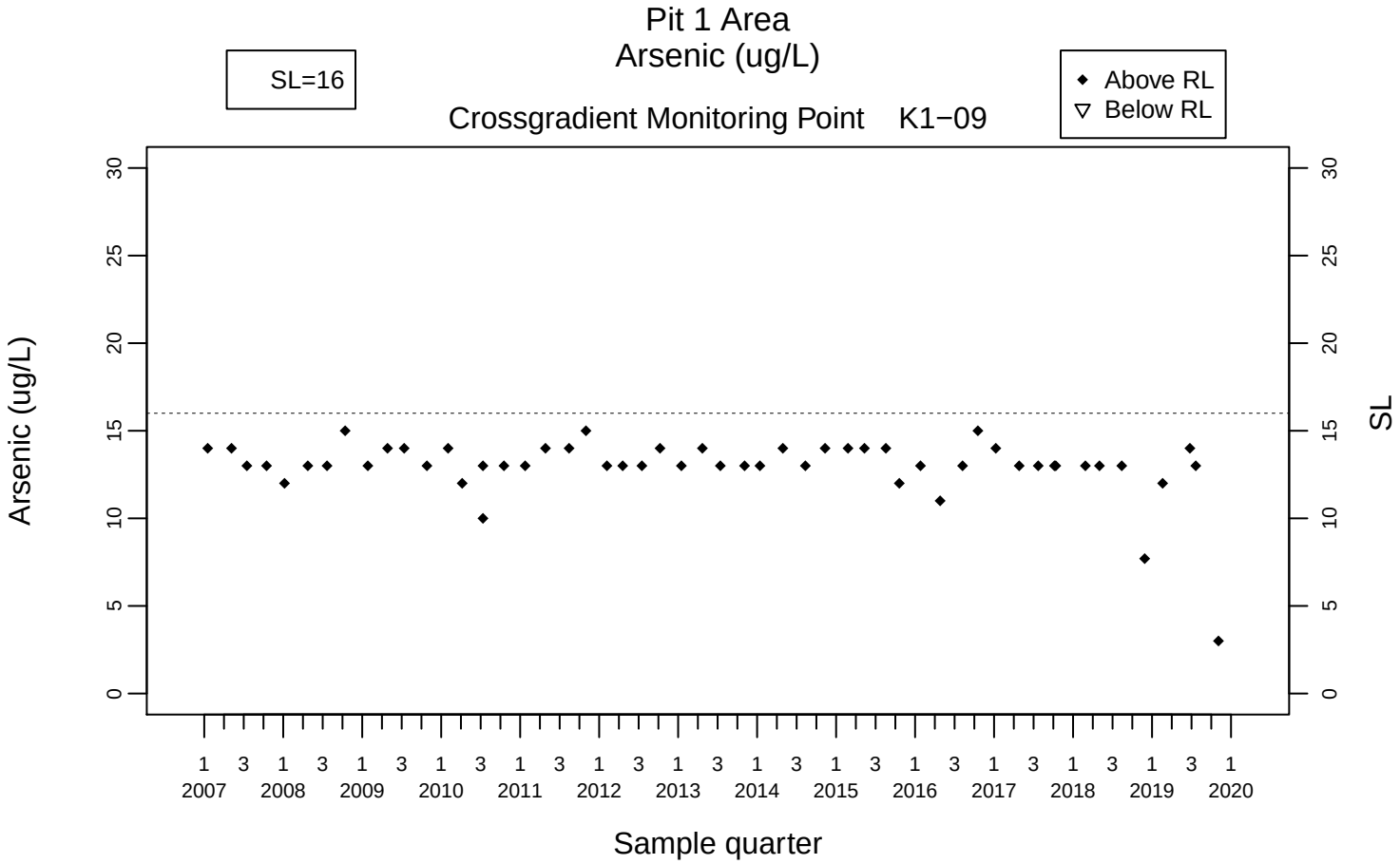

Background Monitoring Point K1−07
Arsenic (ug/L)
Sample quarter

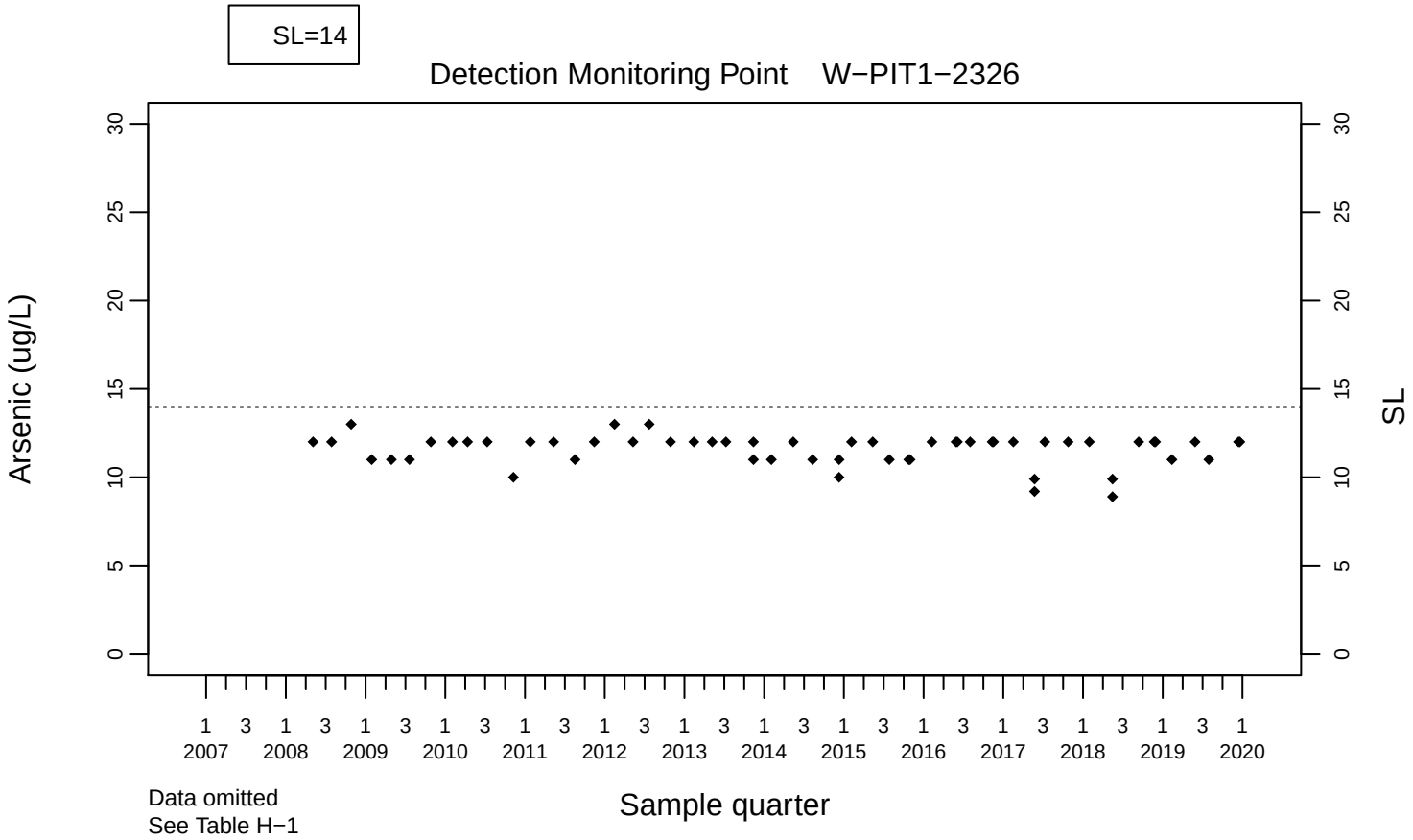

Pit 1 Area
Arsenic (ug/L)
SL=15
Above RL
Below RL
Detection Monitoring Point K1−02B
Arsenic (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020


SL=16
Detection Monitoring Point K1−04
Arsenic (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

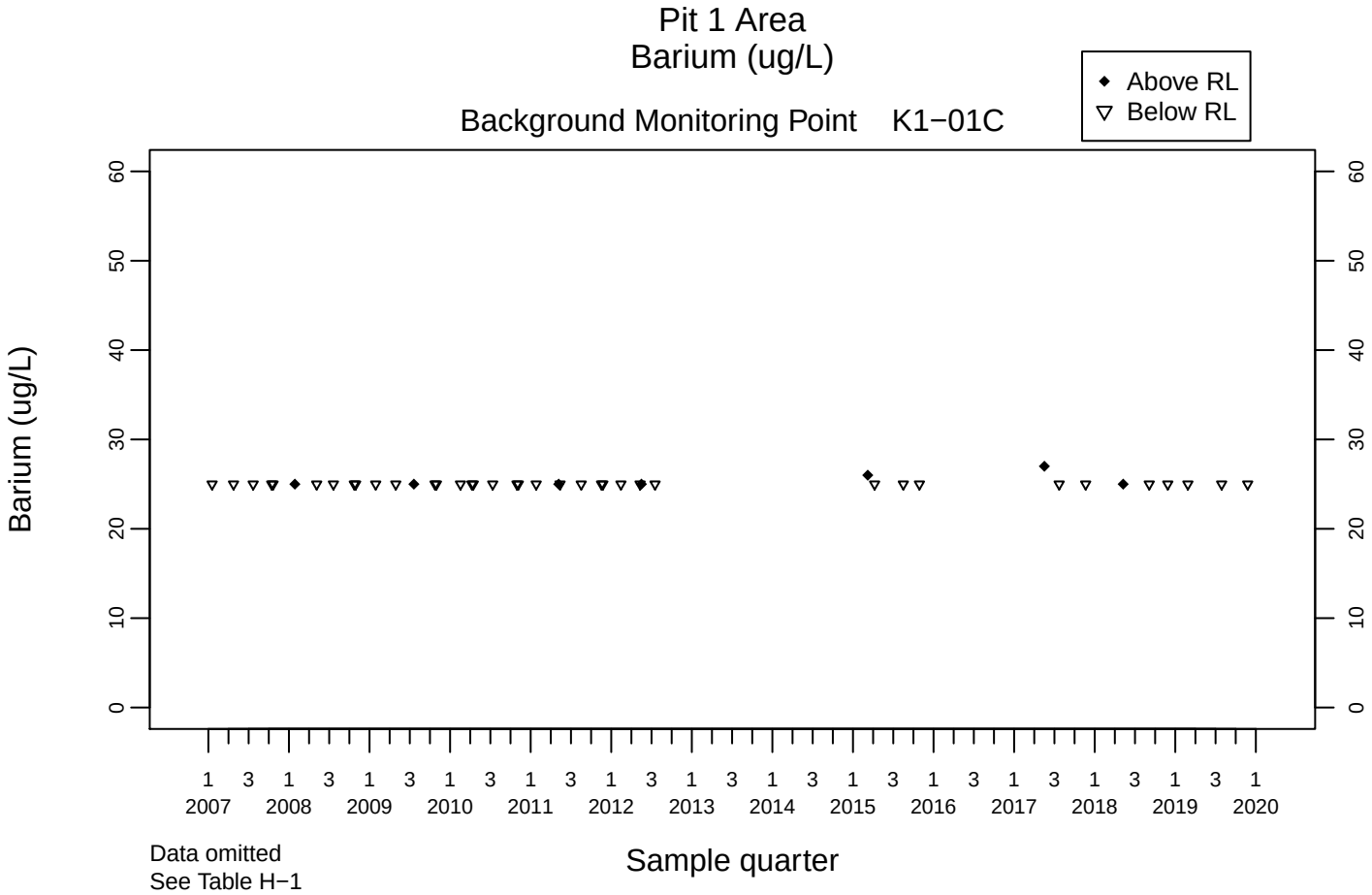

Pit 1 Area
Arsenic (ug/L)
SL=18
Above RL
Below RL
Detection Monitoring Point K1−05
Arsenic (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

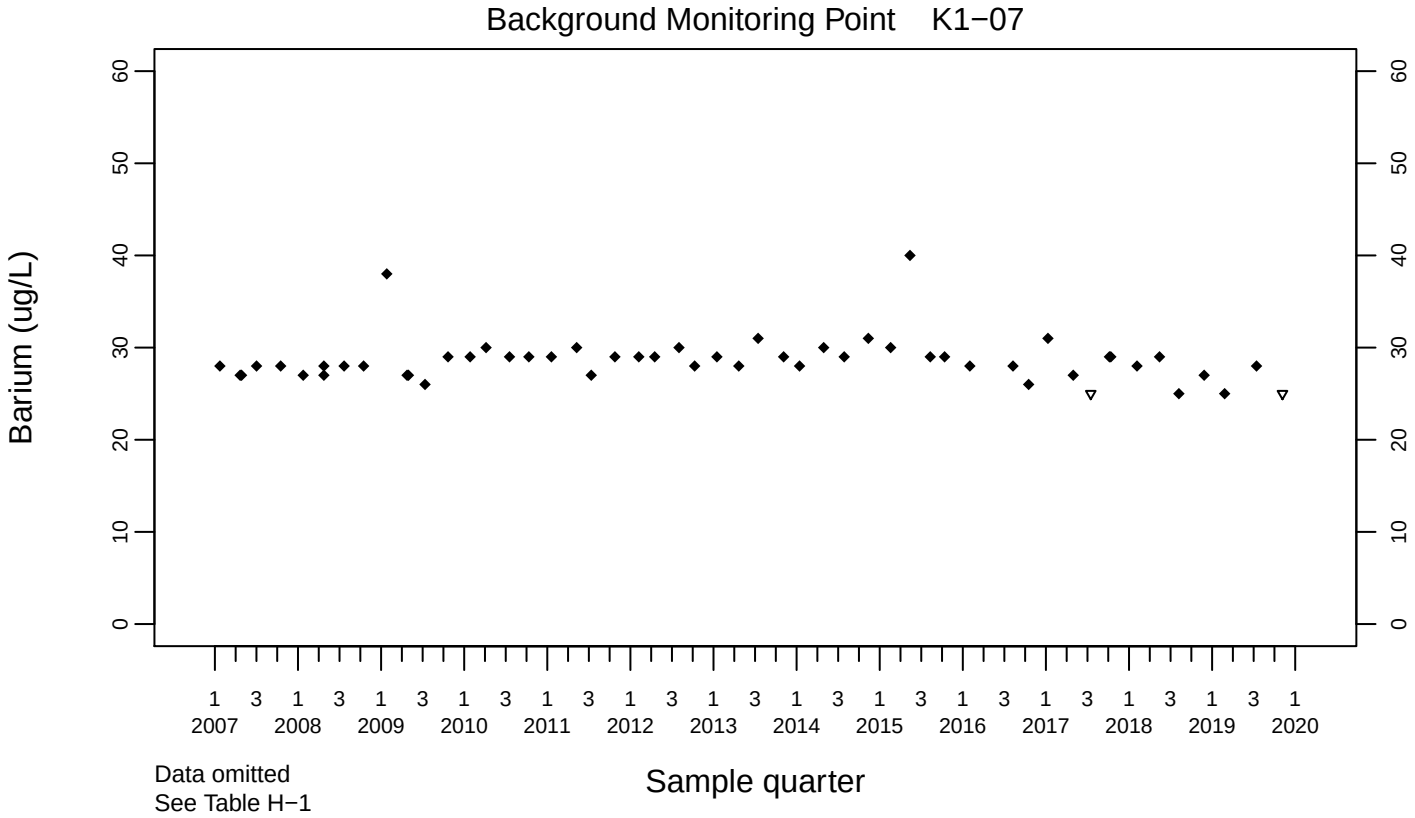

SL=17
Crossgradient Monitoring Point K1−08
Arsenic (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

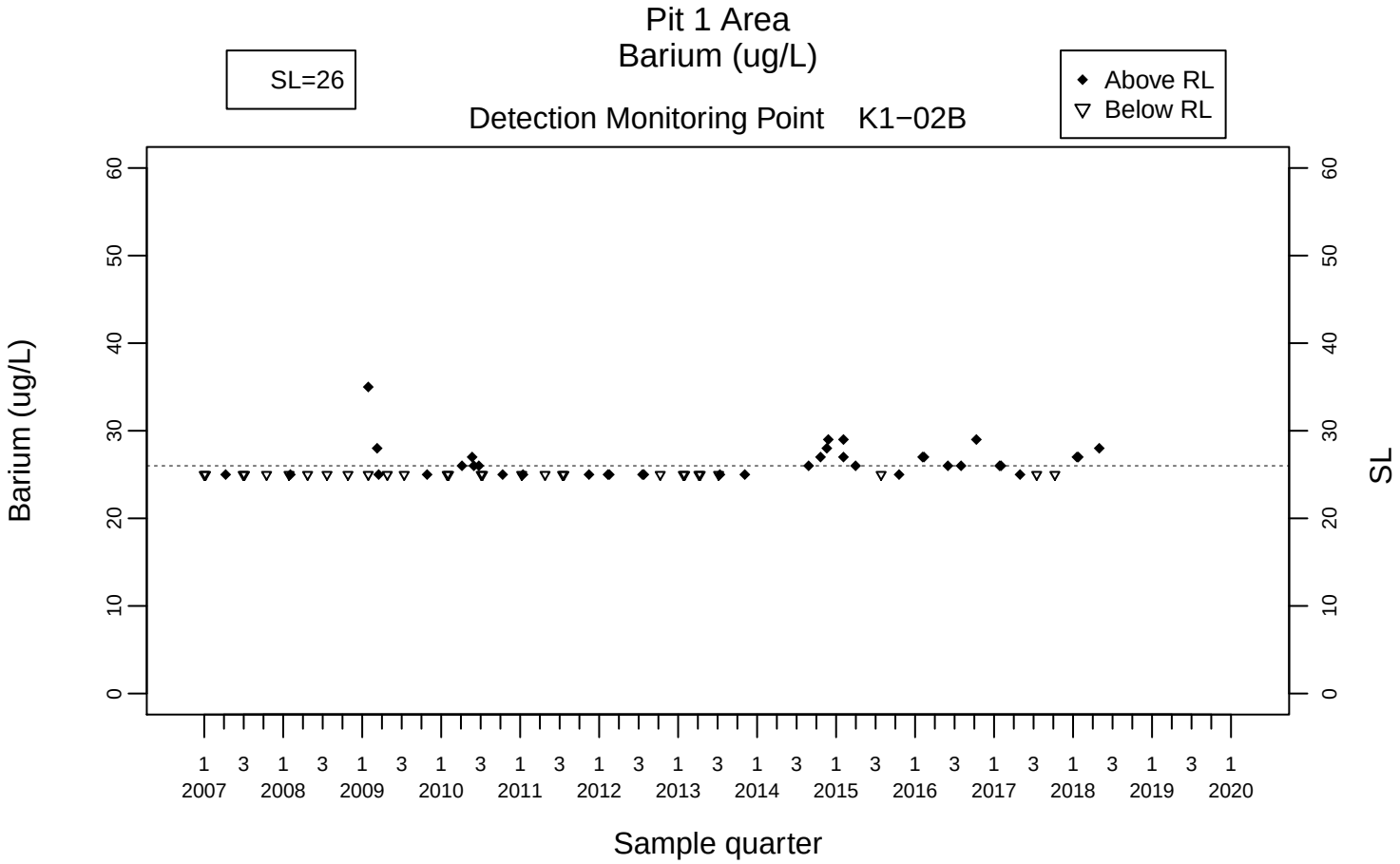


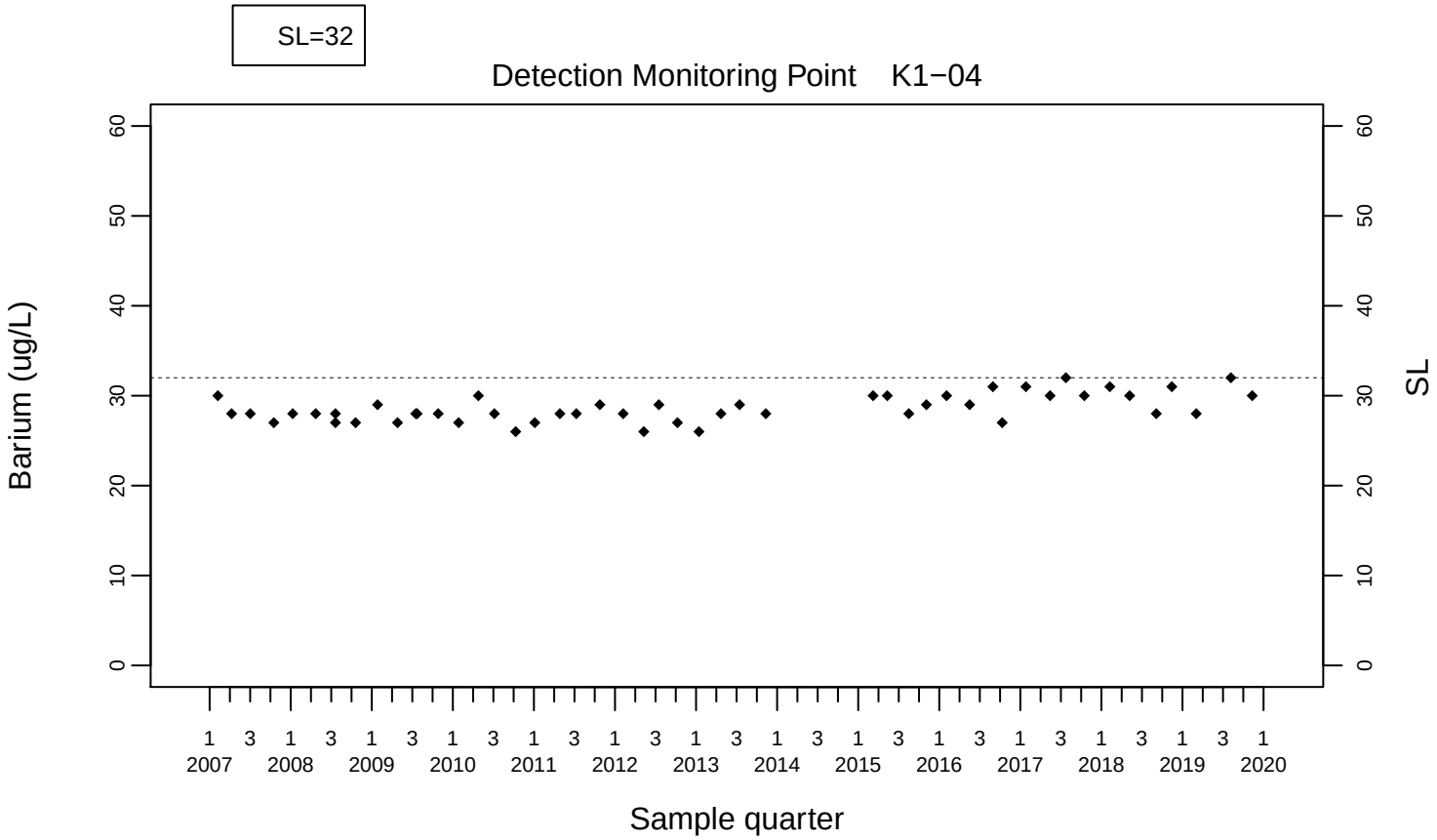


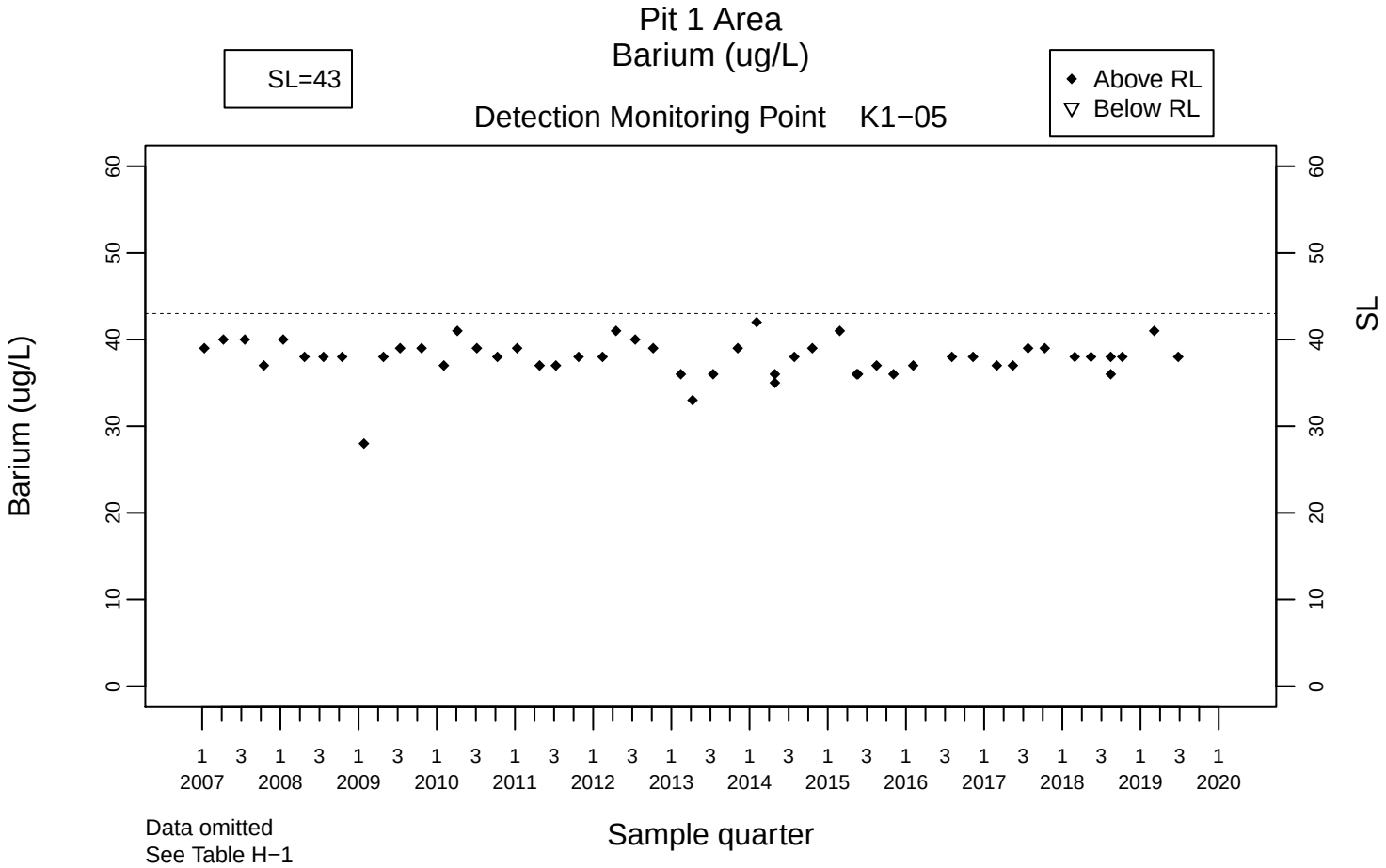
Data omitted
See Table H−1

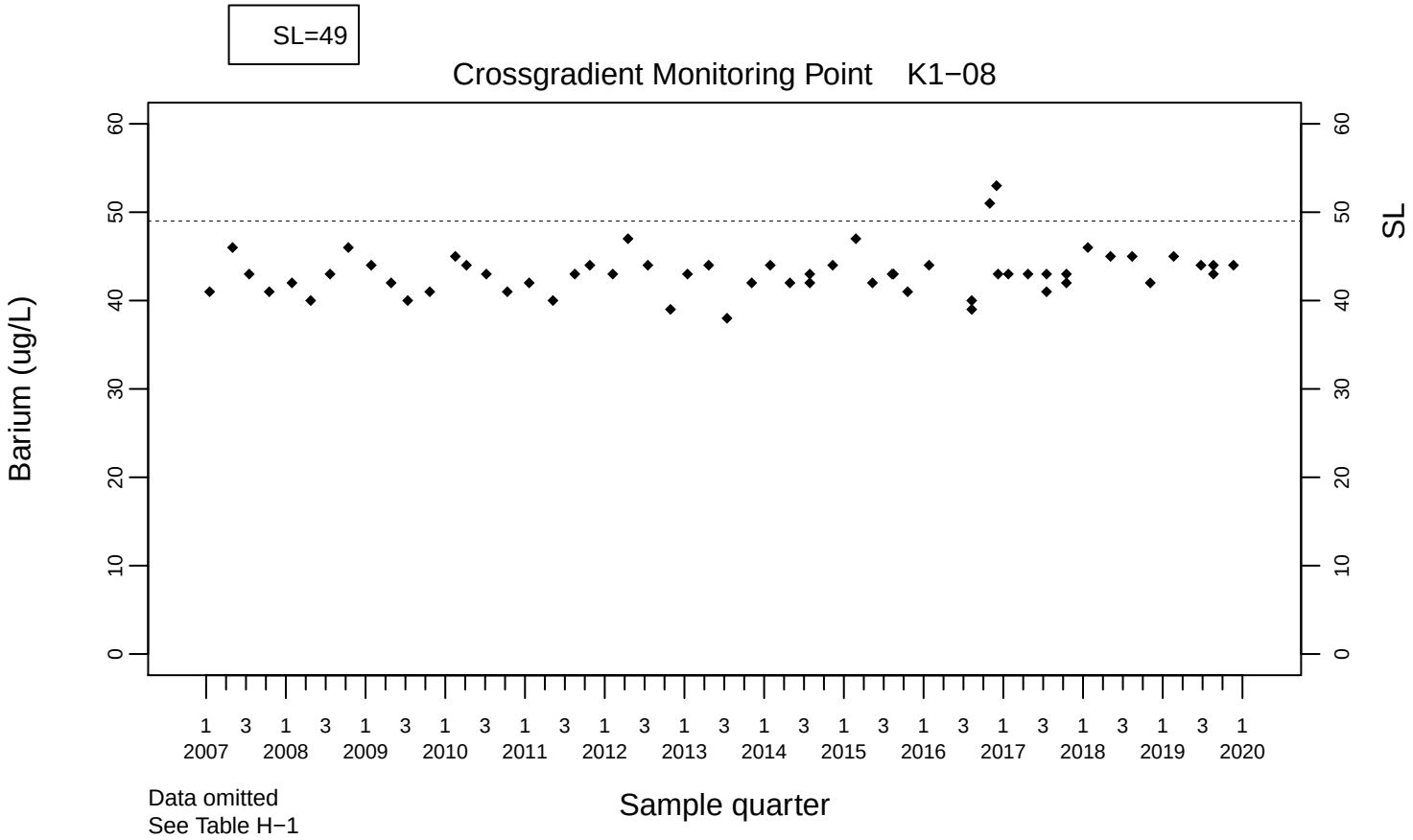

Pit 1 Area
Barium (ug/L)
Background Monitoring Point K1−01C
Above RL
Below RL
Barium (ug/L)
0
10
20
30
40
50
60
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Data omitted
See Table H−1
Sample quarter

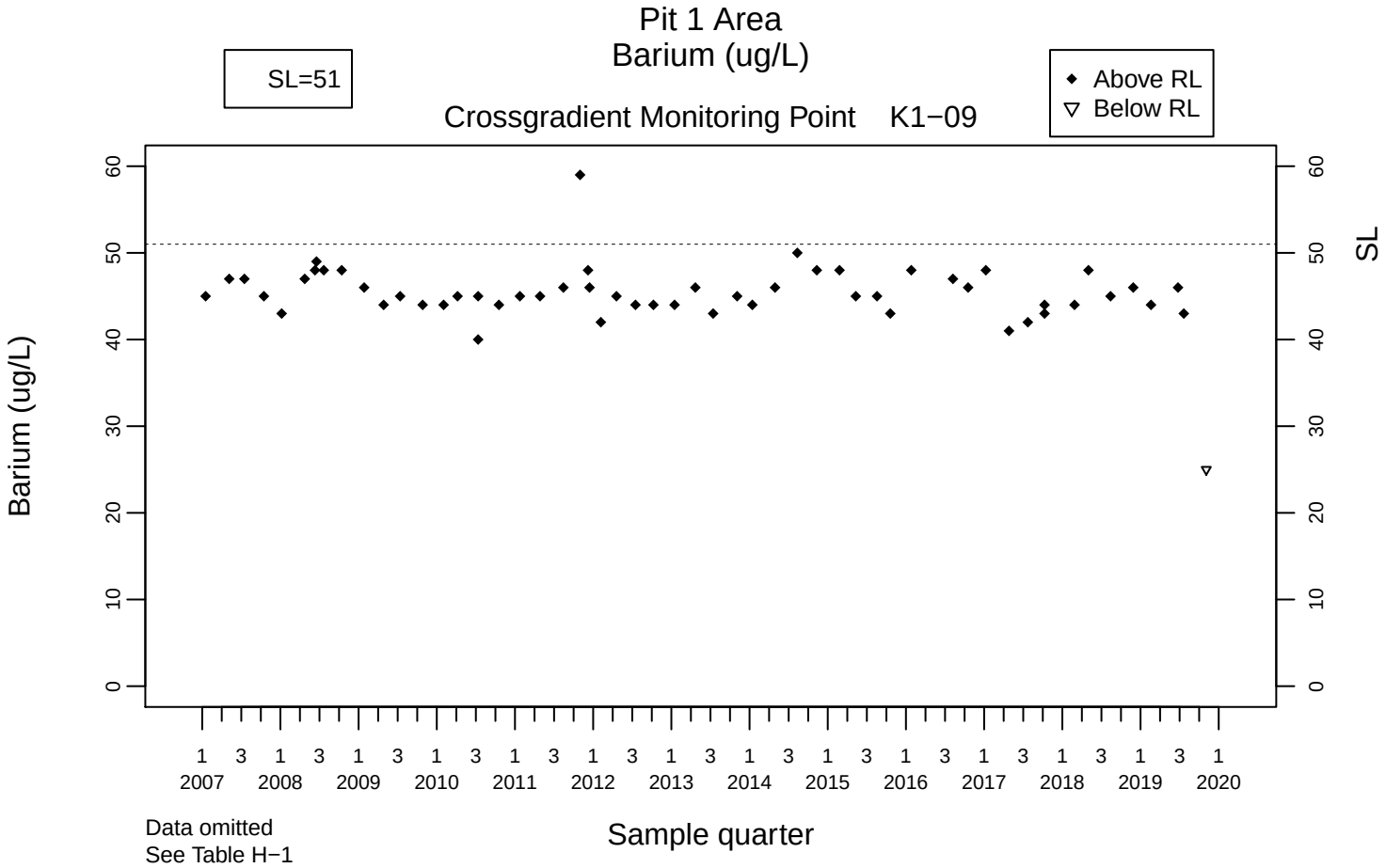

Background Monitoring Point K1−07
Barium (ug/L)
0
10
20
30
40
50
60
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Data omitted
See Table H−1
Sample quarter

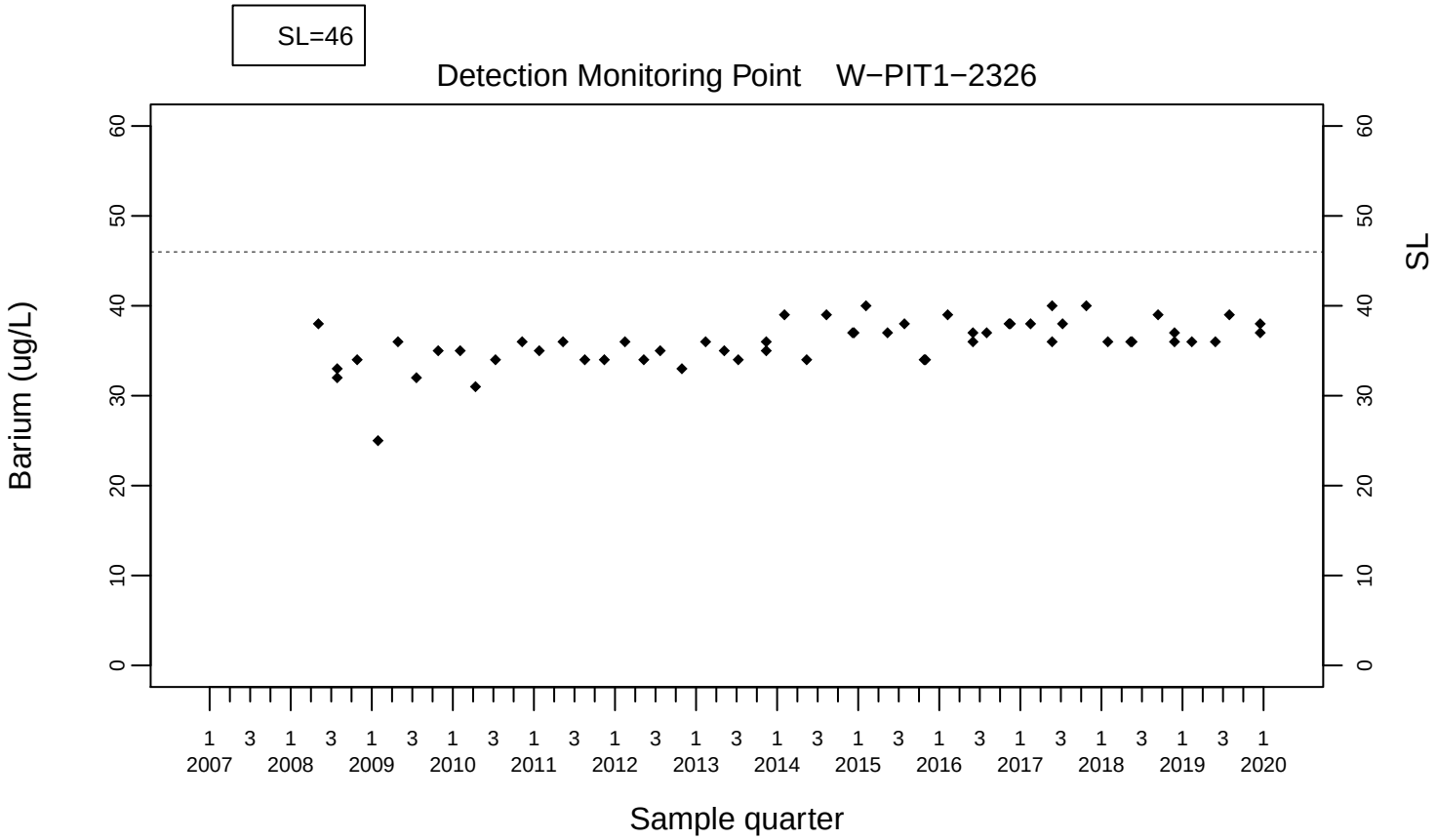

Pit 1 Area
Barium (ug/L)
SL=26
Above RL
Below RL
Detection Monitoring Point K1−02B
Barium (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

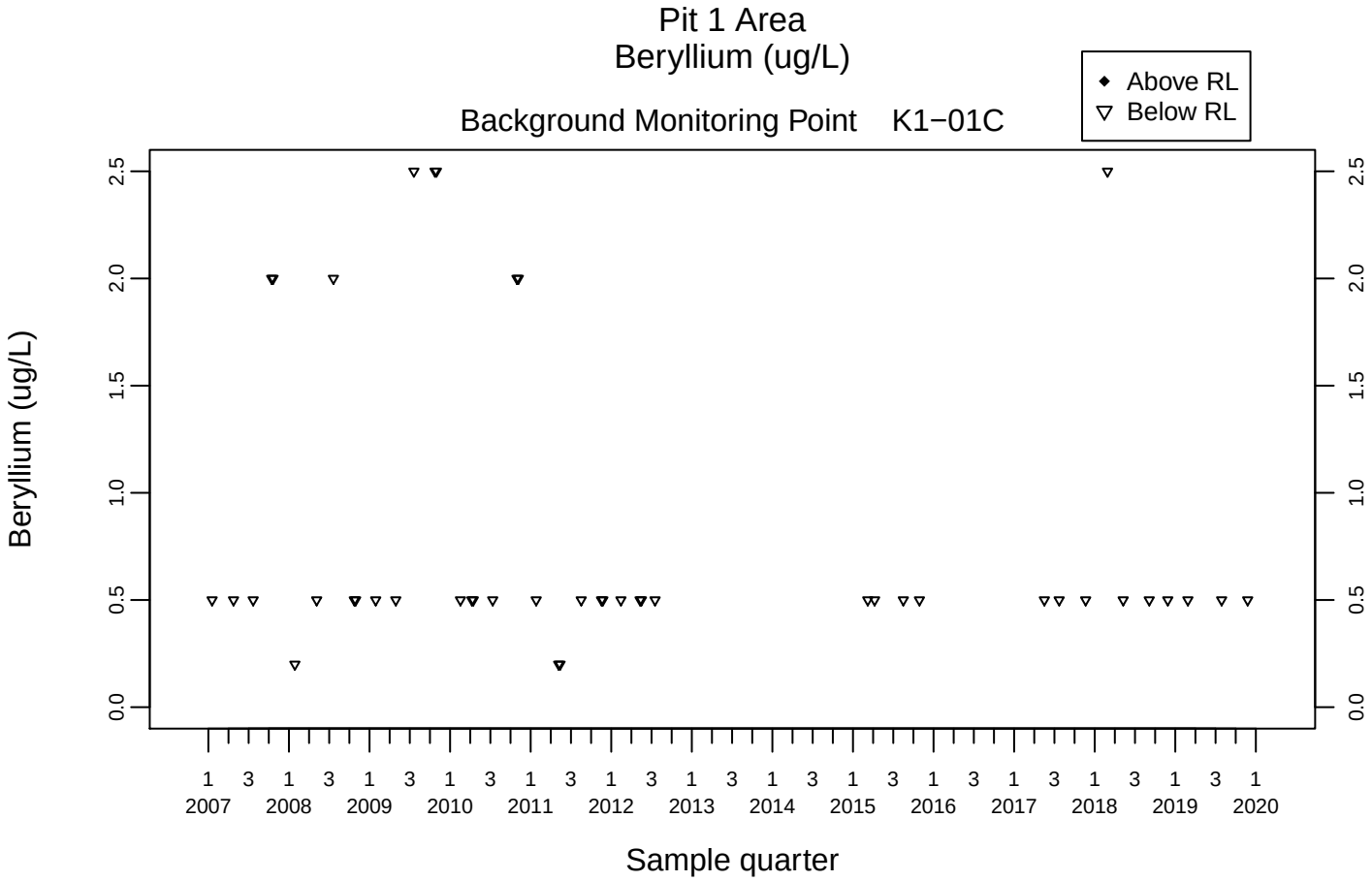

SL=32
Detection Monitoring Point K1−04
Barium (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

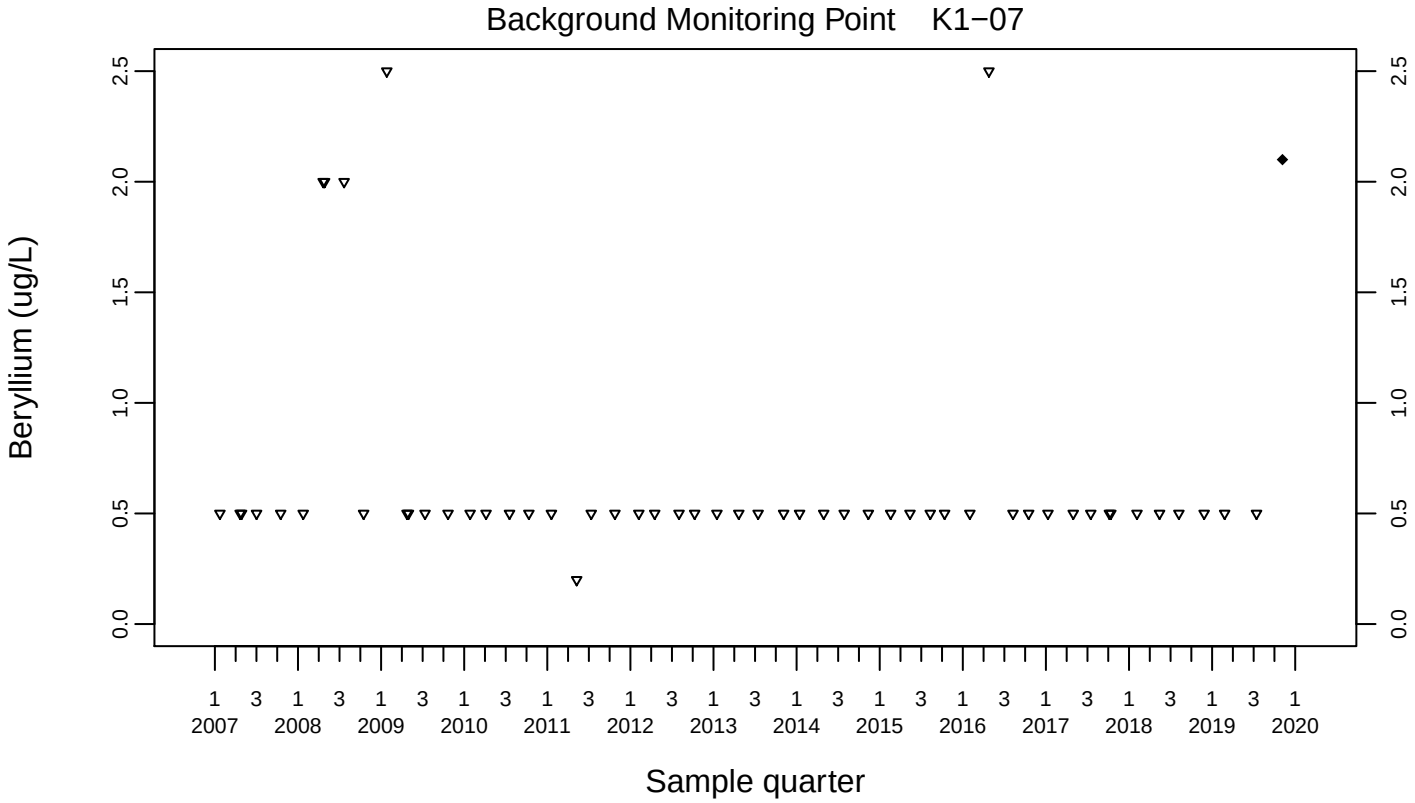

Pit 1 Area
Barium (ug/L)
SL=43
Above RL
Below RL
Detection Monitoring Point K1−05
Barium (ug/L)
SL
Sample quarter
Data omitted
See Table H−1

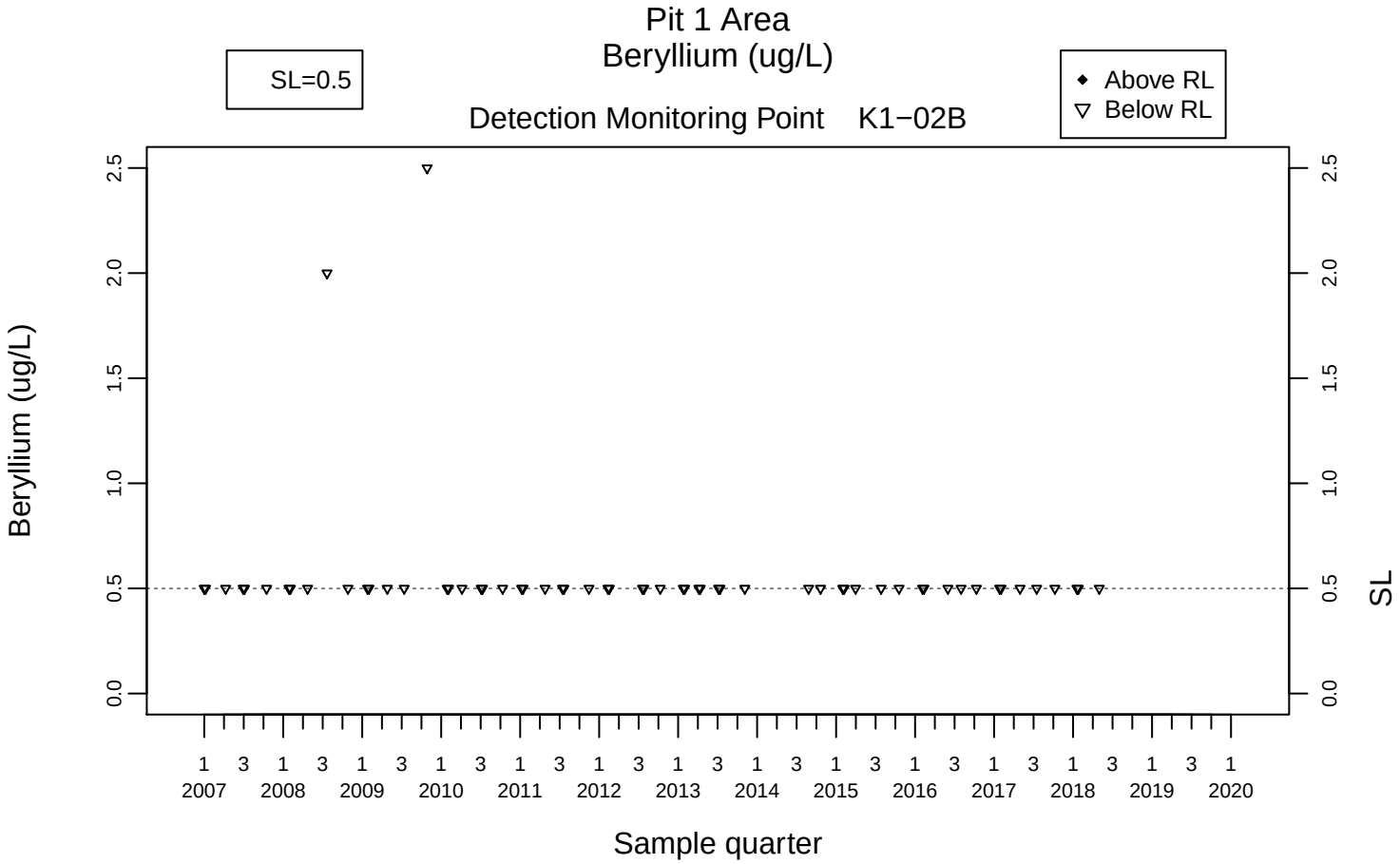

SL=49
Crossgradient Monitoring Point K1−08
Barium (ug/L)
SL
Sample quarter
Data omitted
See Table H−1

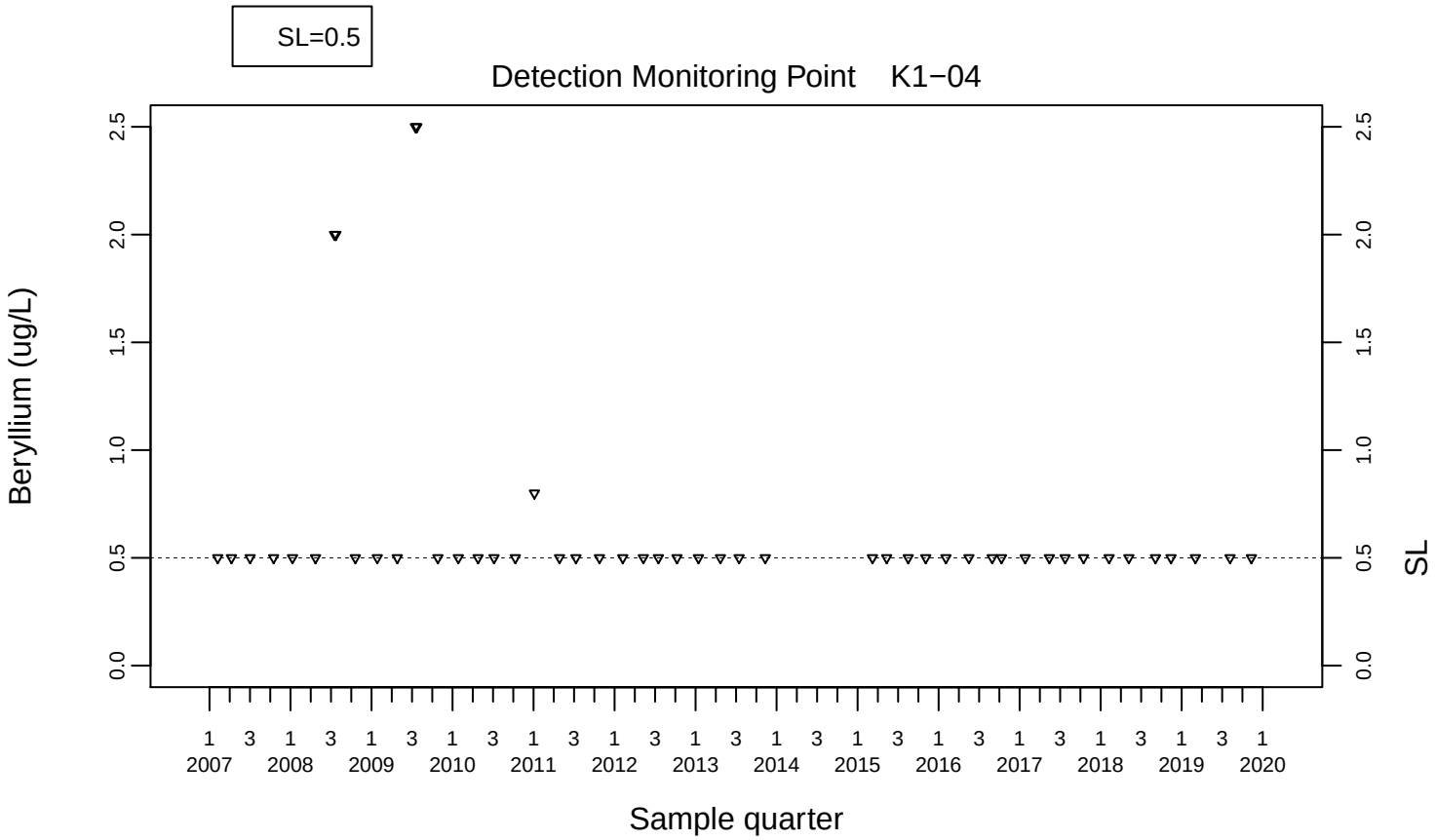

Pit 1 Area
Barium (ug/L)
SL=51
Crossgradient Monitoring Point K1−09
Above RL
Below RL
Barium (ug/L)
SL
Sample quarter
Data omitted
See Table H−1

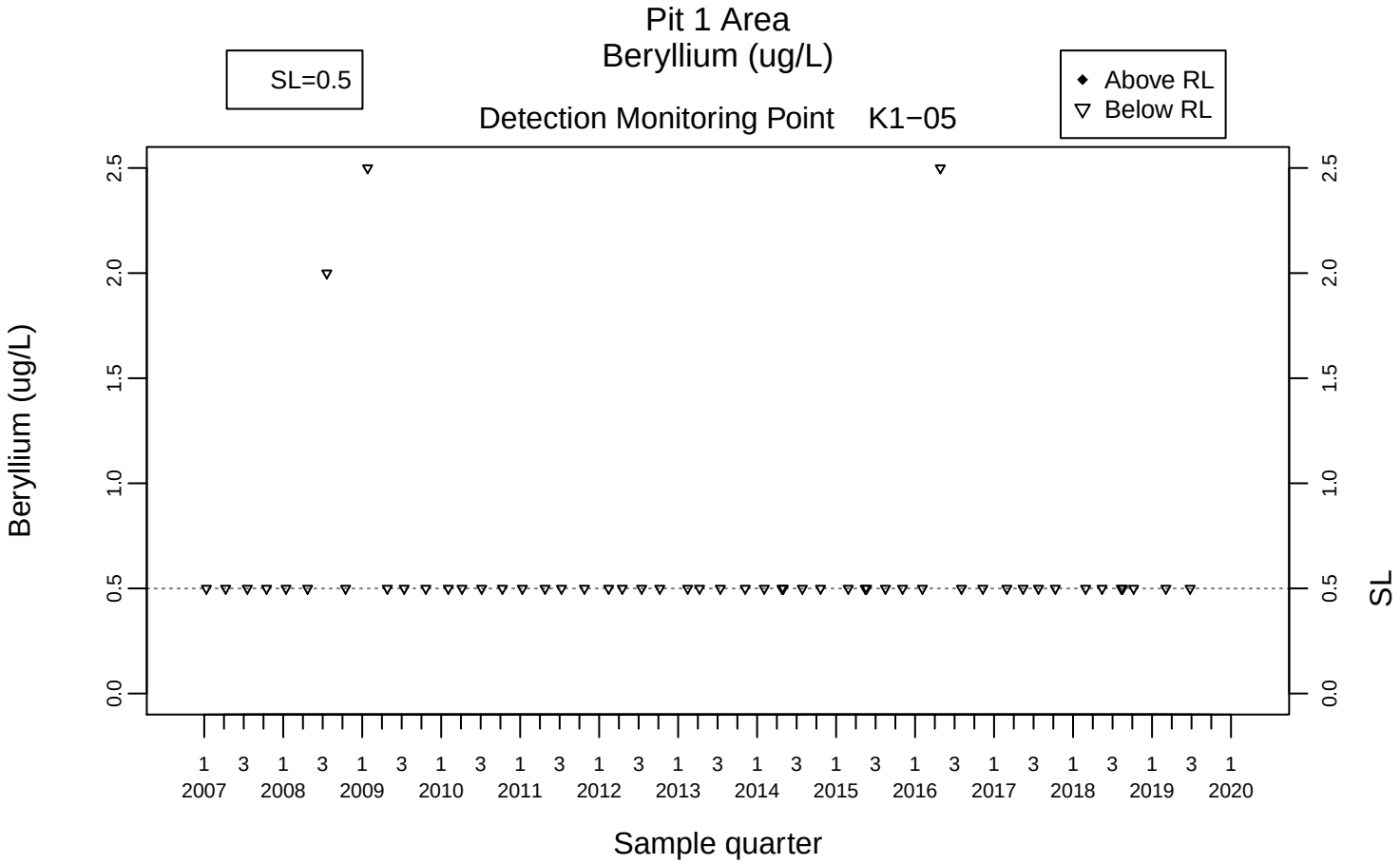

SL=46
Detection Monitoring Point W−PIT1−2326
Barium (ug/L)
SL
Sample quarter

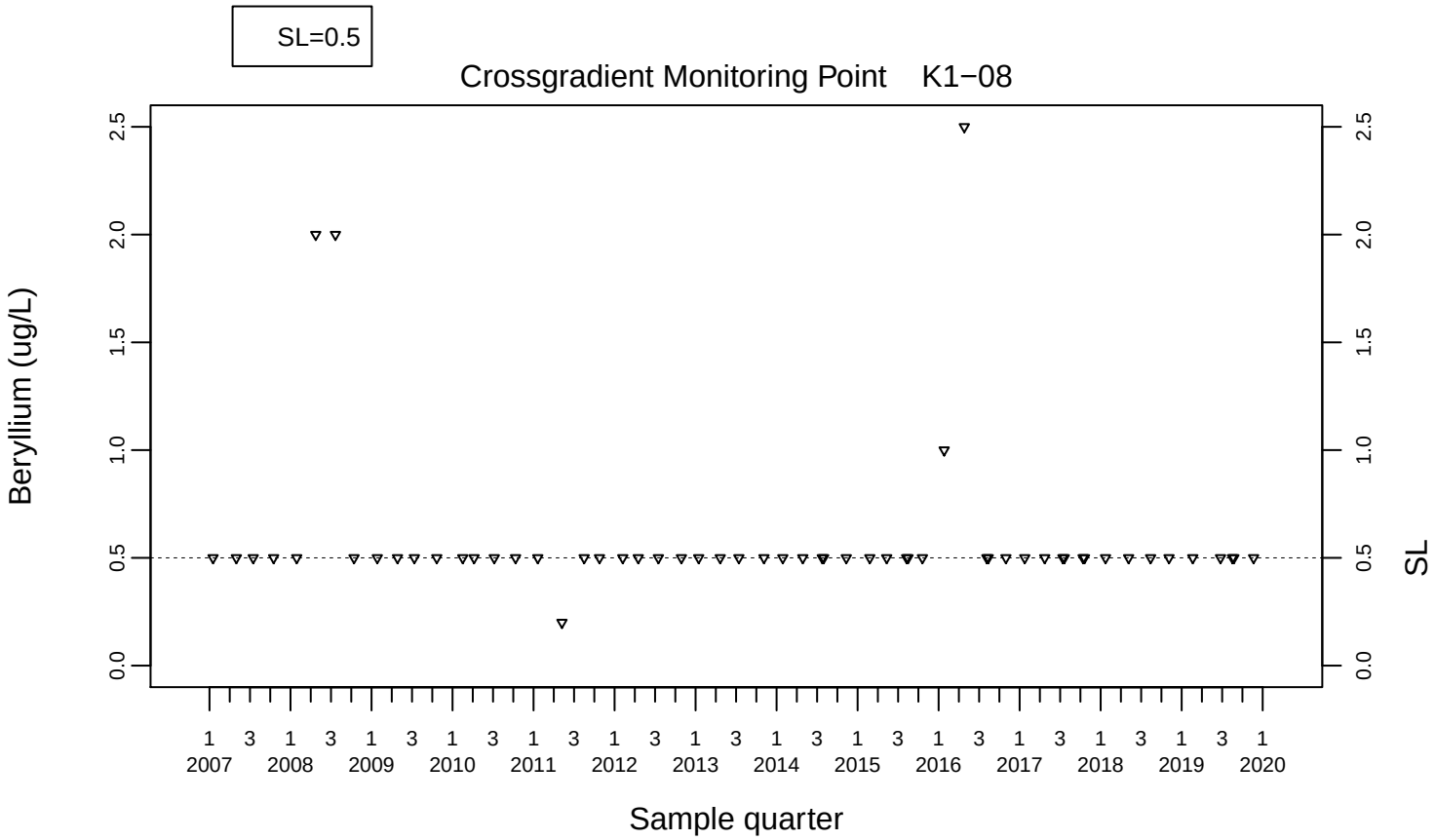

Pit 1 Area
Beryllium (ug/L)
Background Monitoring Point K1−01C
Above RL
Below RL
Beryllium (ug/L)
Sample quarter

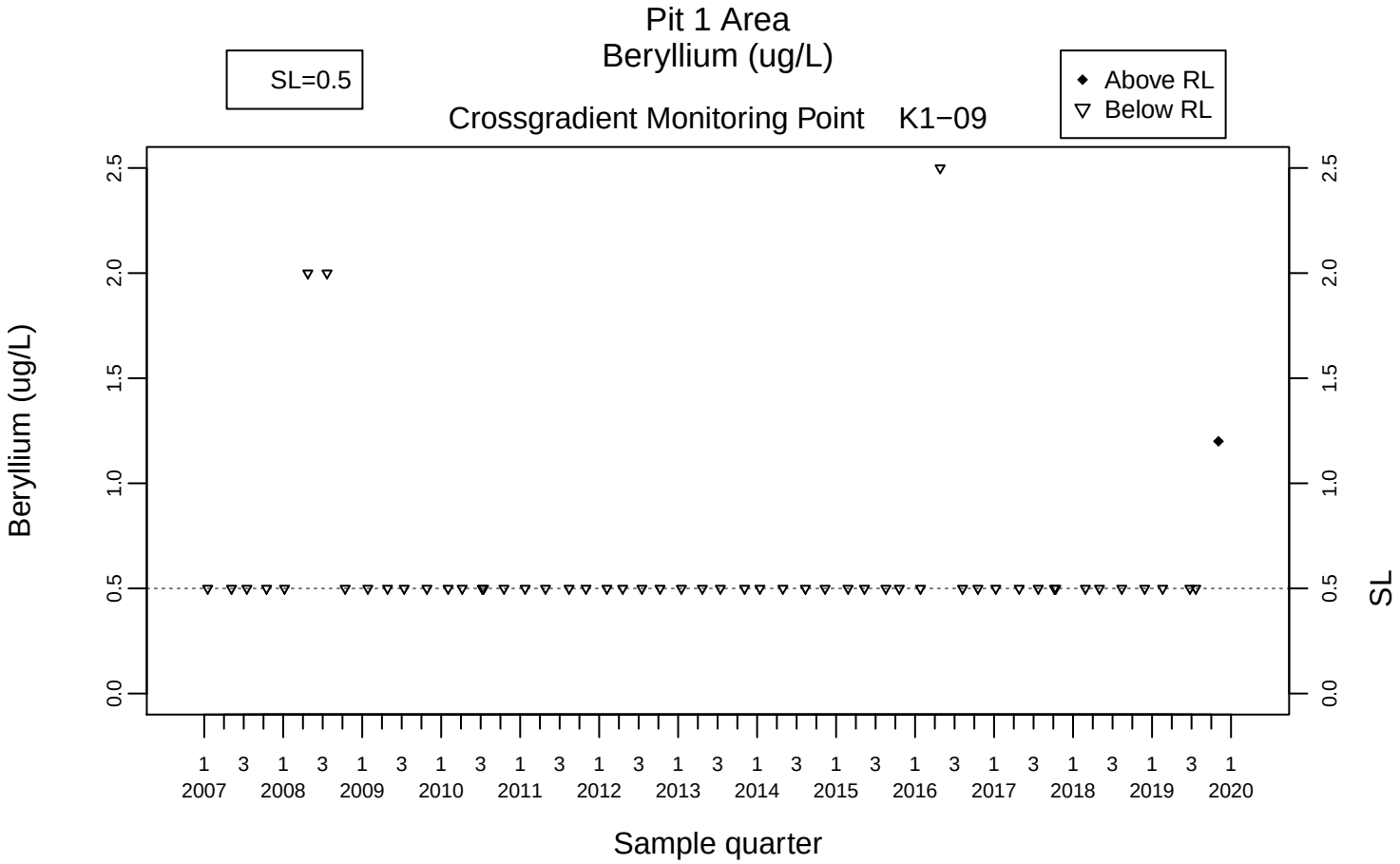

Background Monitoring Point K1−07
Beryllium (ug/L)
Sample quarter

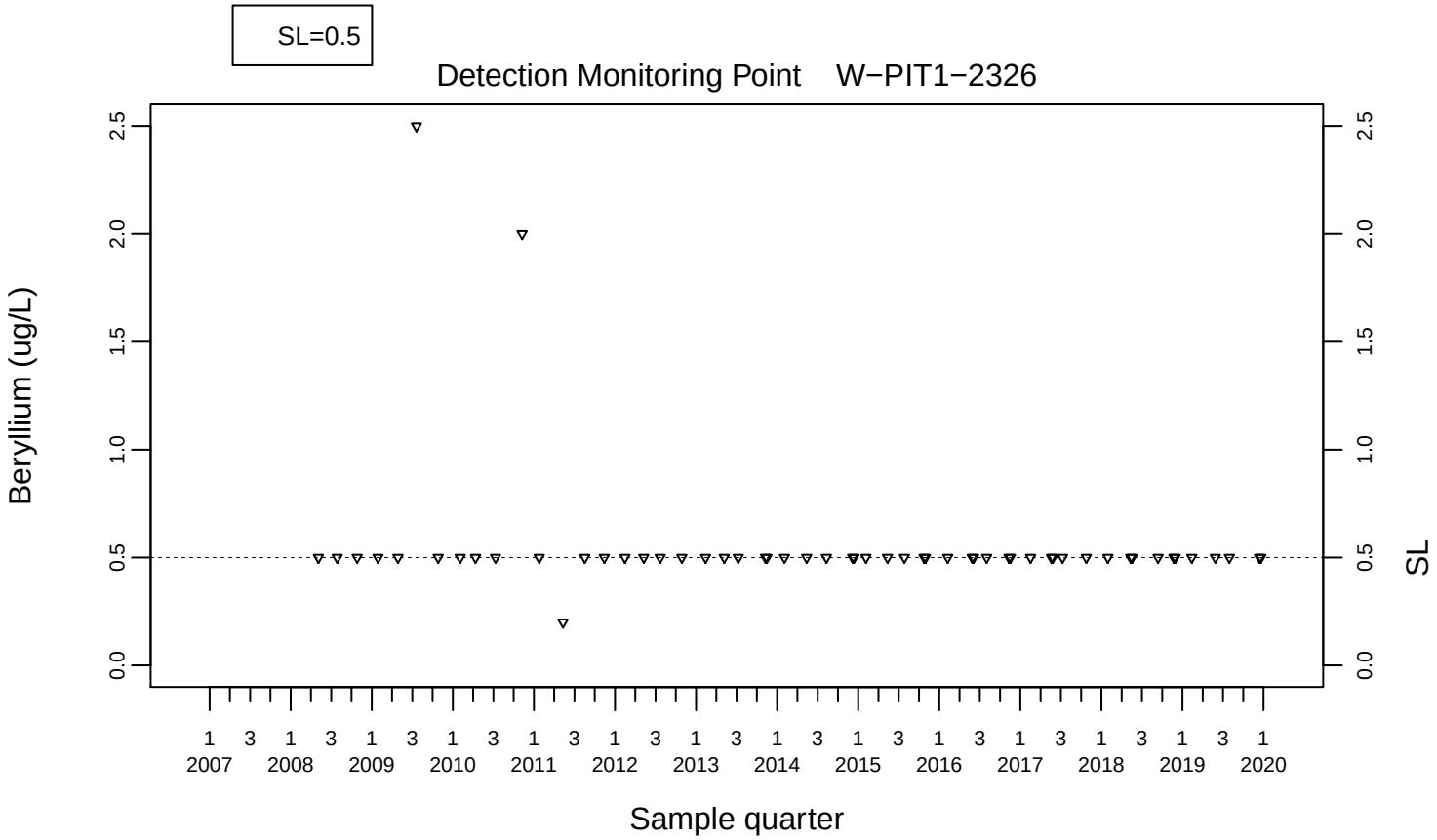

Pit 1 Area
Beryllium (ug/L)
SL=0.5
Above RL
Below RL
Detection Monitoring Point K1−02B
Beryllium (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

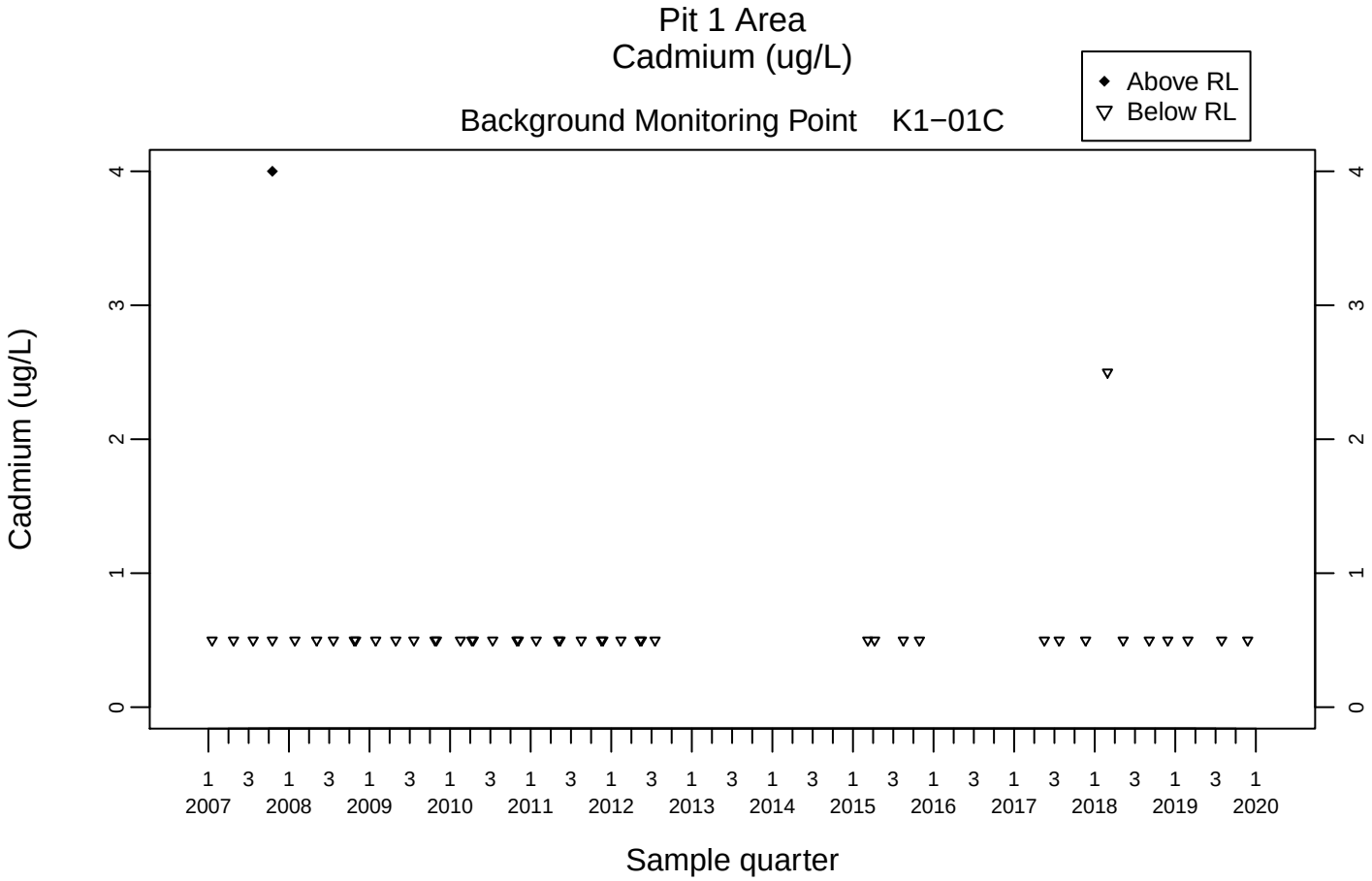

SL=0.5
Detection Monitoring Point K1−04
Beryllium (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

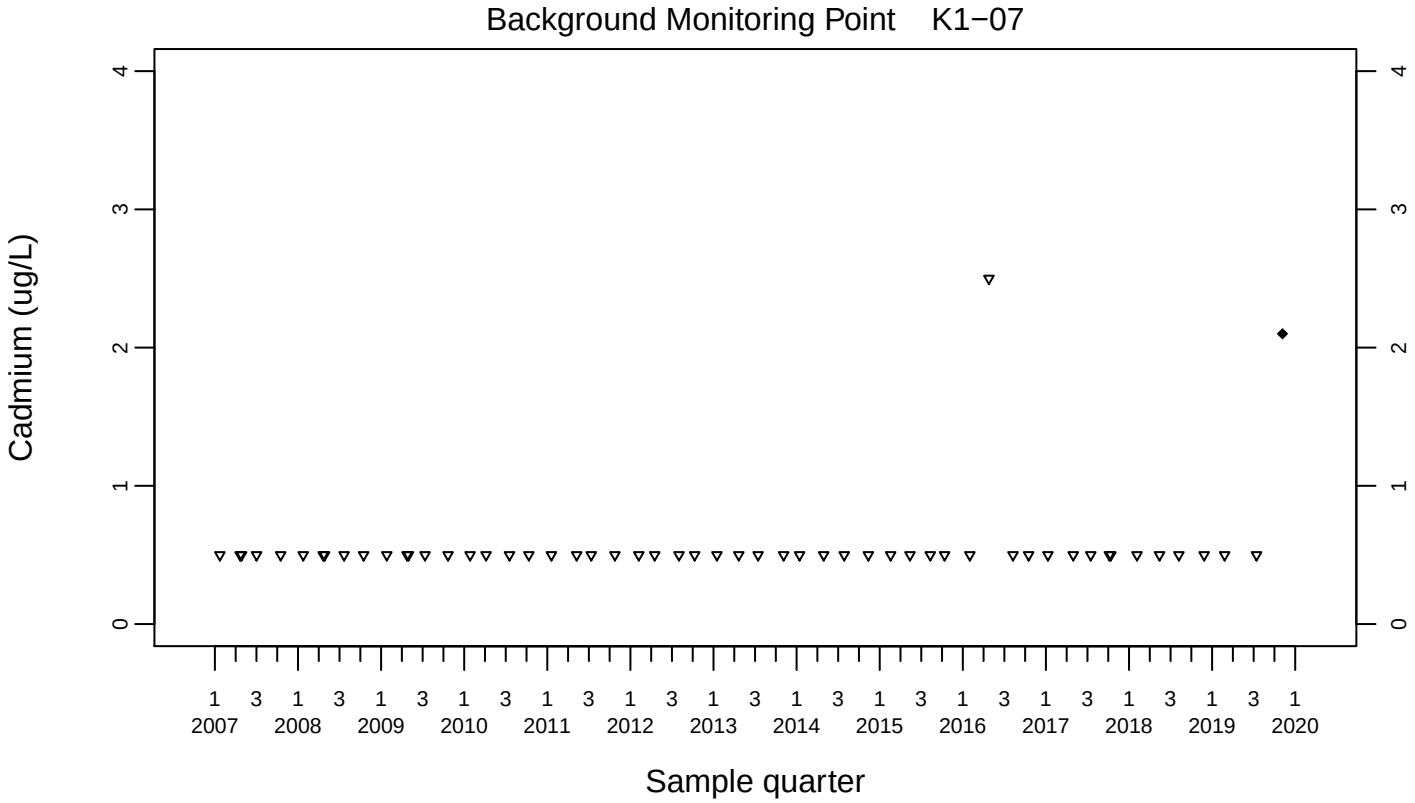

Pit 1 Area
Beryllium (ug/L)
SL=0.5
Above RL
Below RL
Detection Monitoring Point K1−05
Beryllium (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

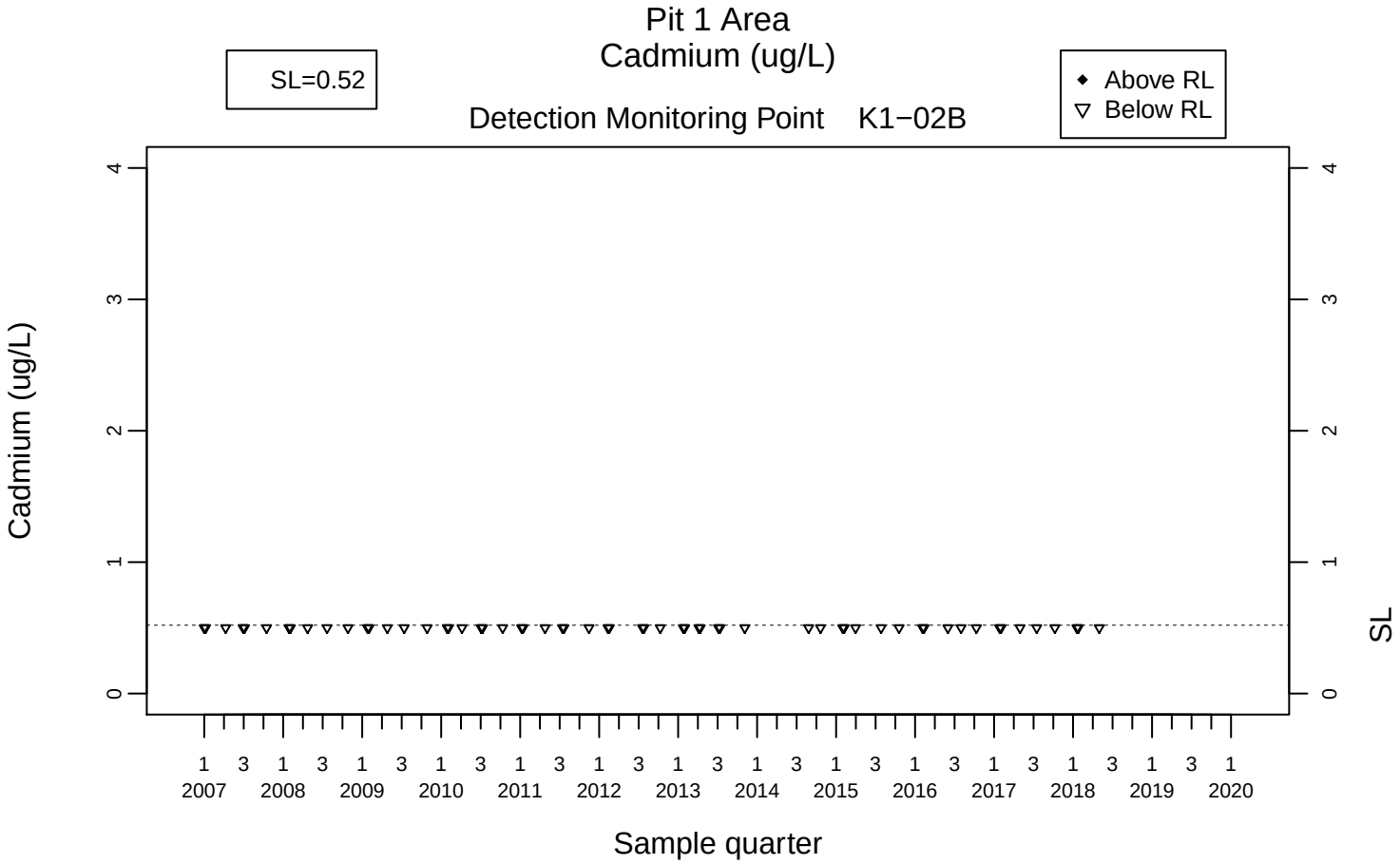

SL=0.5
Crossgradient Monitoring Point K1−08
Beryllium (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

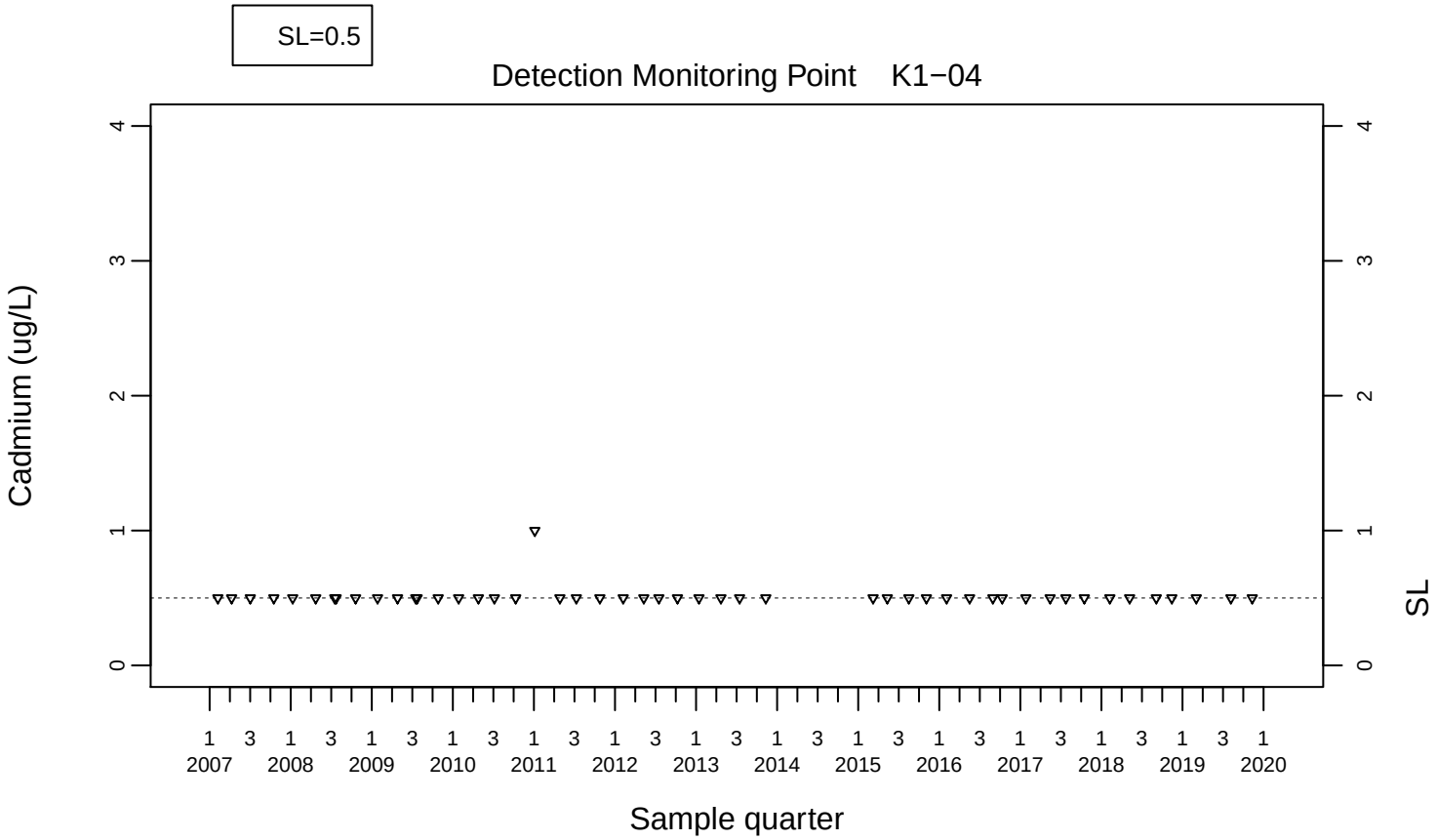

Pit 1 Area
Beryllium (ug/L)
SL=0.5
Above RL
Below RL
Crossgradient Monitoring Point K1−09
Beryllium (ug/L)
SL
Sample quarter

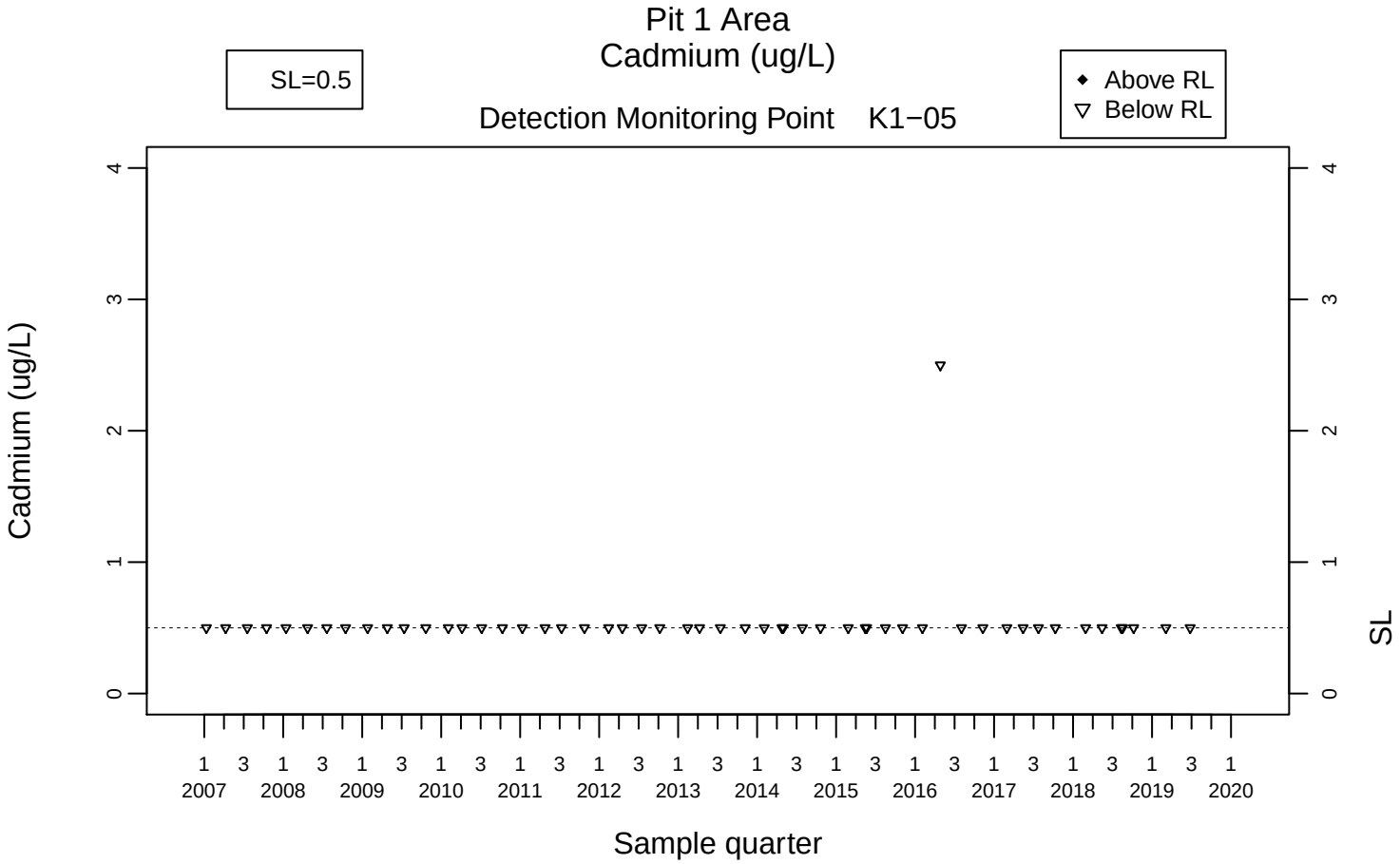

SL=0.5
Detection Monitoring Point W−PIT1−2326
Beryllium (ug/L)
SL
Sample quarter

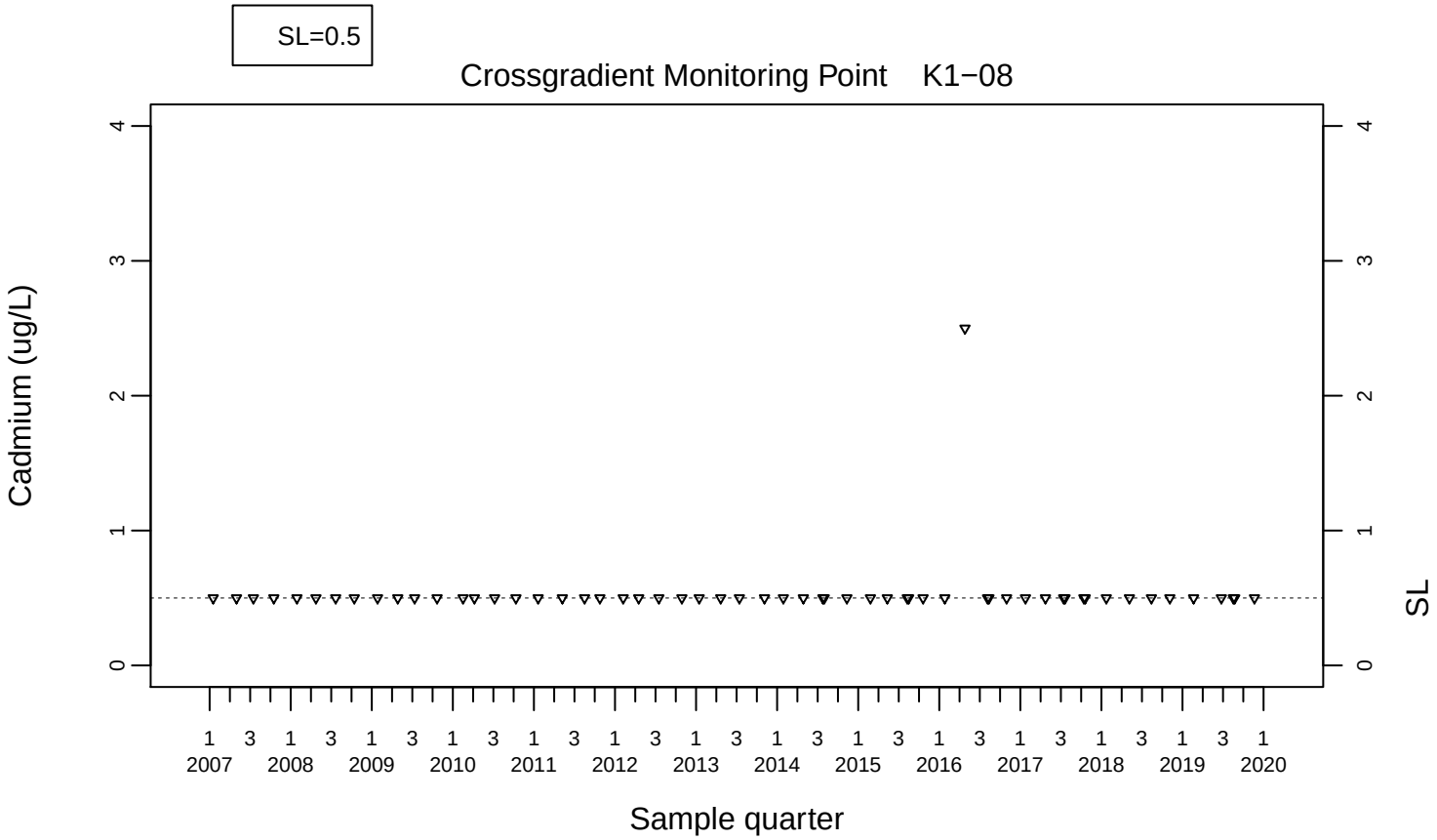

Pit 1 Area
Cadmium (ug/L)
Background Monitoring Point K1−01C
Above RL
Below RL
Cadmium (ug/L)
Sample quarter
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

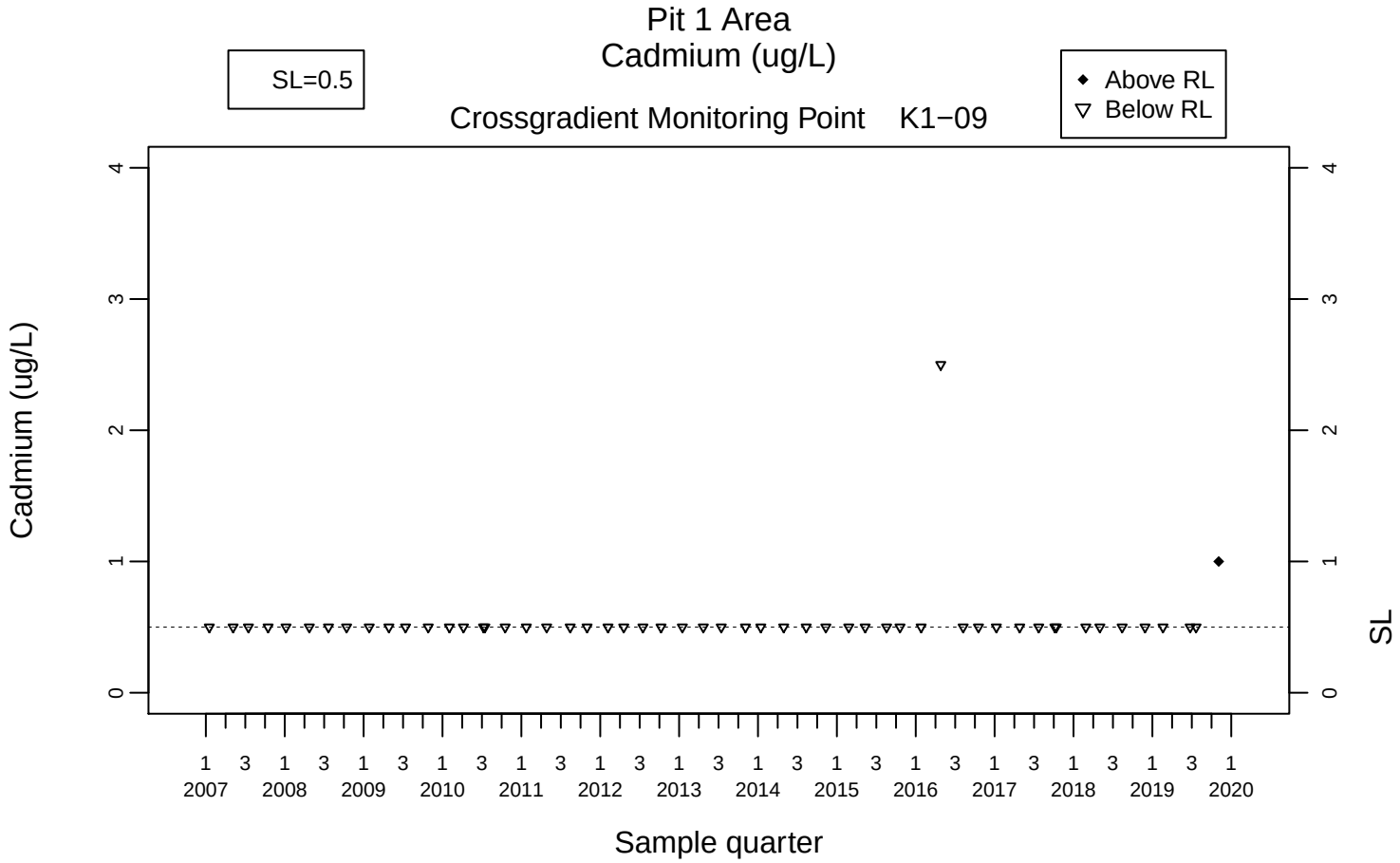

Background Monitoring Point K1−07
Cadmium (ug/L)
Sample quarter
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

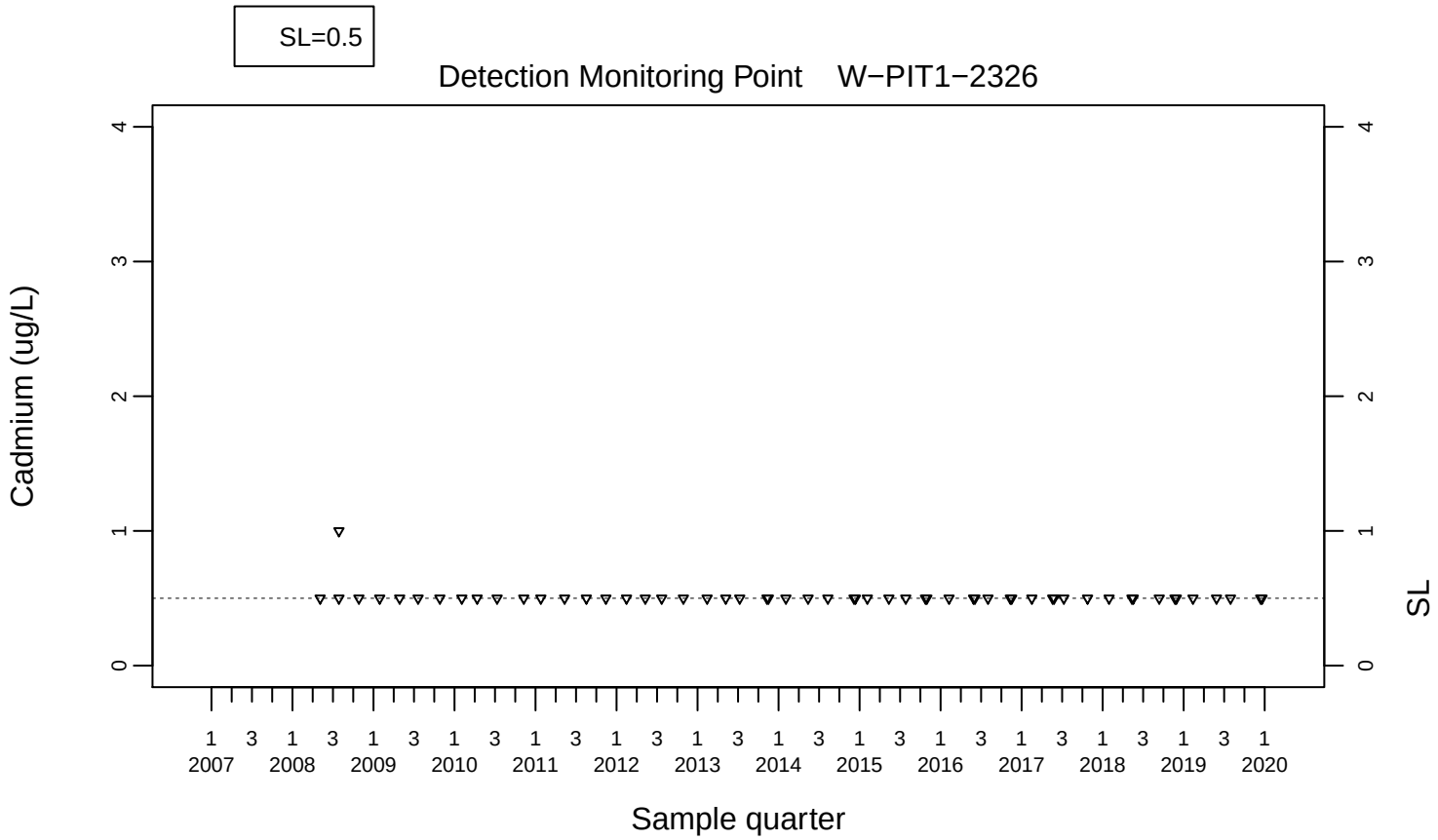

Pit 1 Area
Cadmium (ug/L)
SL=0.52
Above RL
Below RL
Detection Monitoring Point K1−02B
Cadmium (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

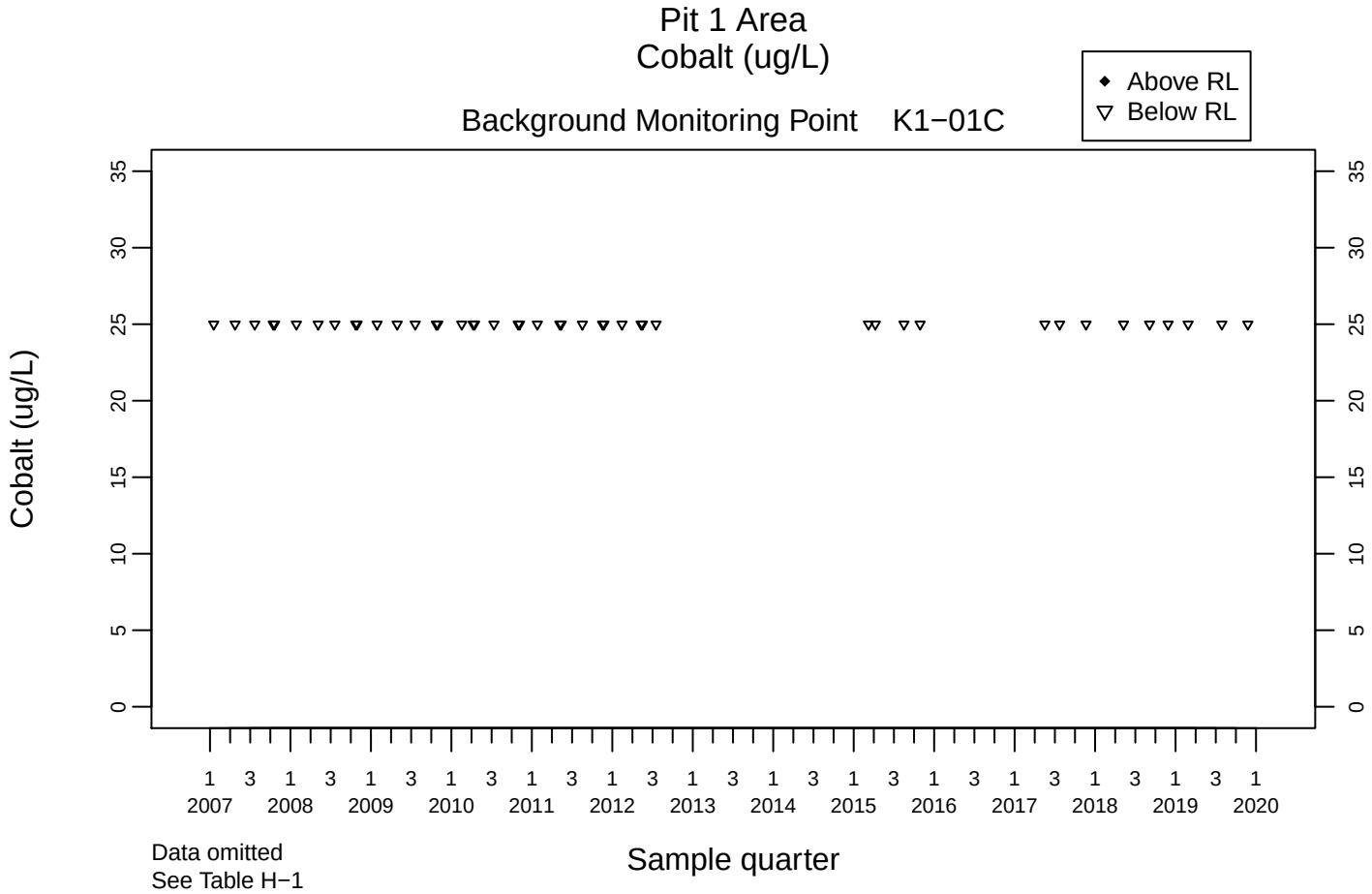

SL=0.5
Detection Monitoring Point K1−04
Cadmium (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

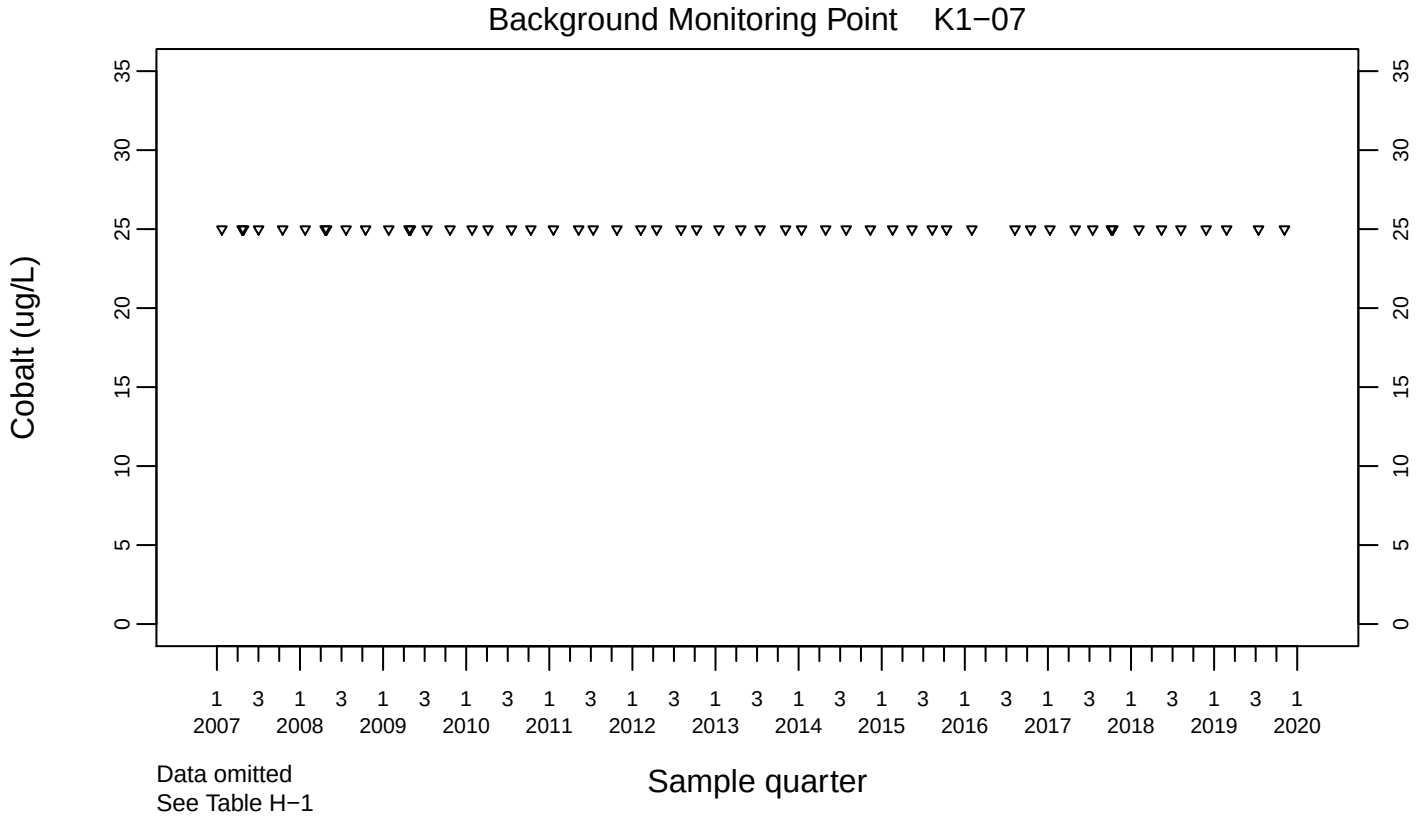

Pit 1 Area
Cadmium (ug/L)
SL=0.5
Above RL
Below RL
Detection Monitoring Point K1−05
Cadmium (ug/L)
SL
Sample quarter

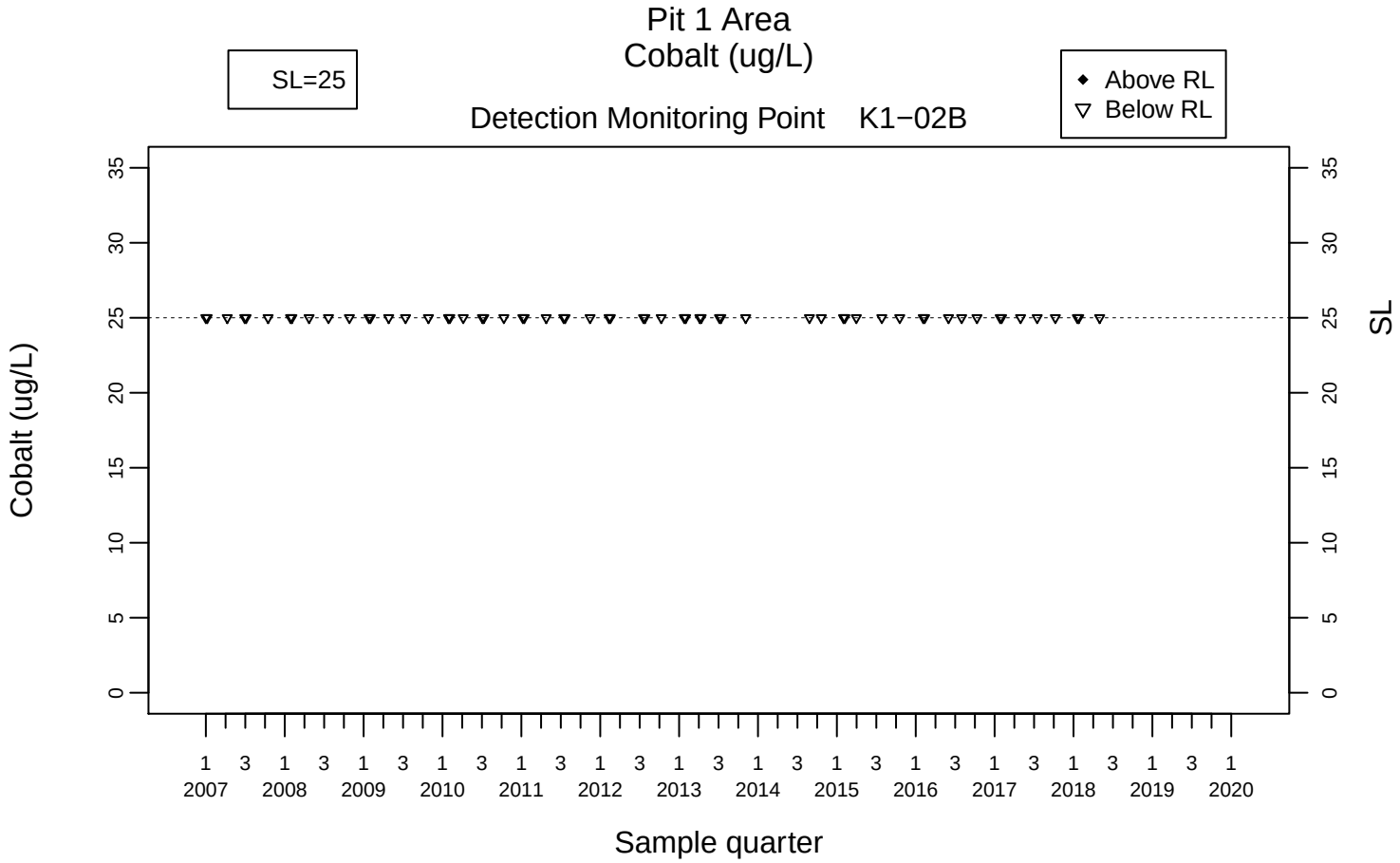

SL=0.5
Crossgradient Monitoring Point K1−08
Cadmium (ug/L)
SL
Sample quarter

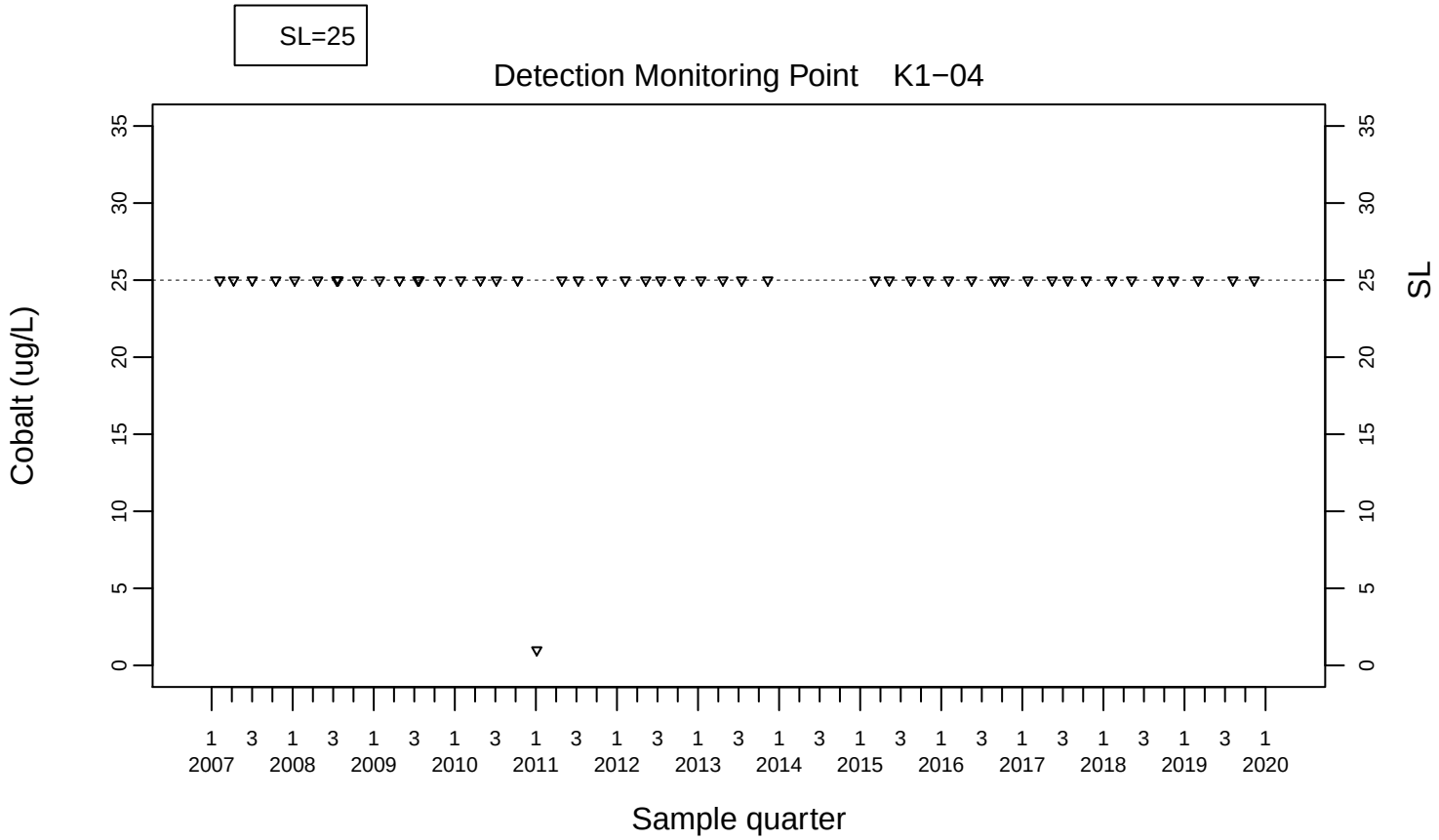

Pit 1 Area
Cadmium (ug/L)
SL=0.5
Crossgradient Monitoring Point K1−09
Above RL
Below RL
Cadmium (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

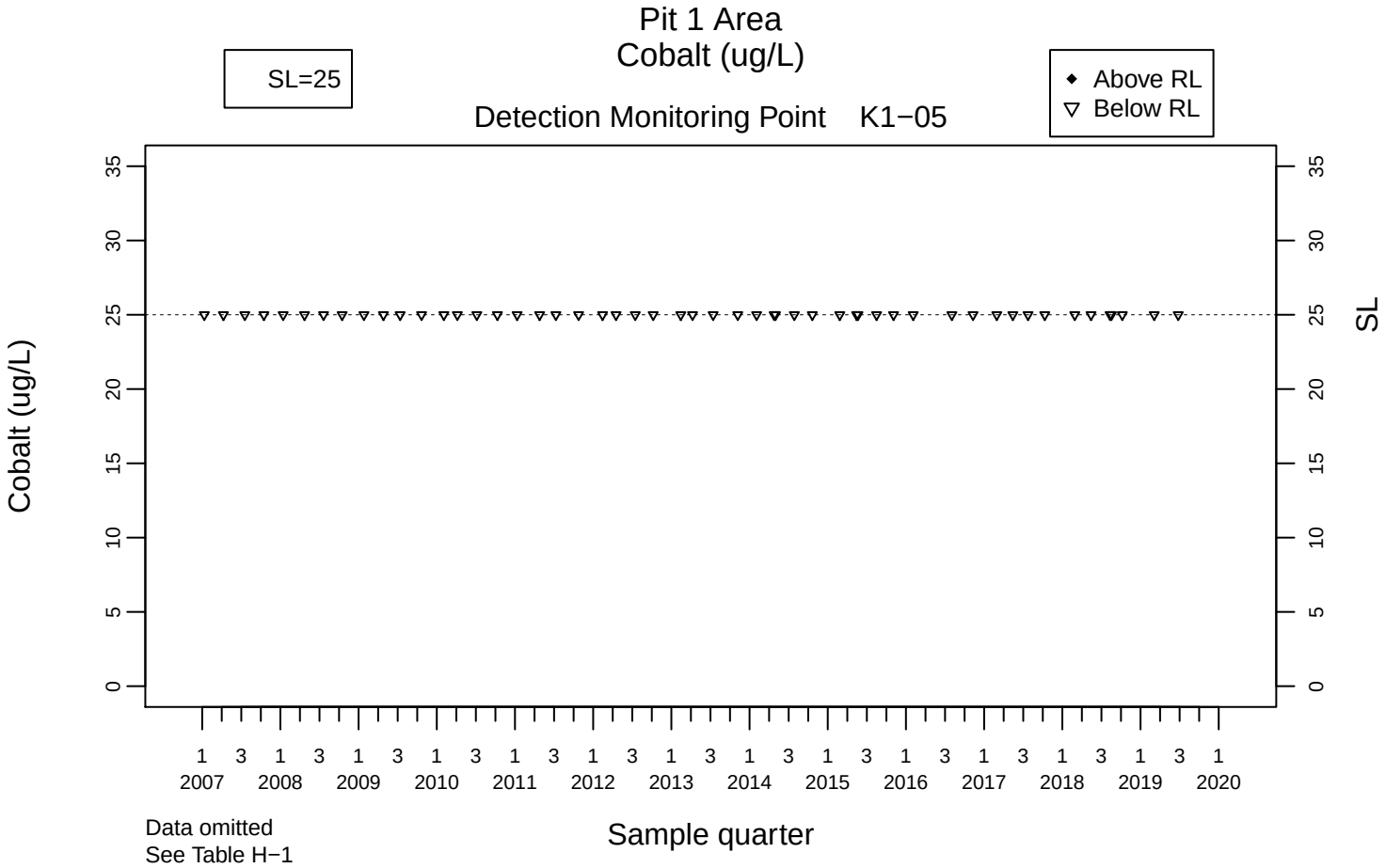

SL=0.5
Detection Monitoring Point W−PIT1−2326
Cadmium (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

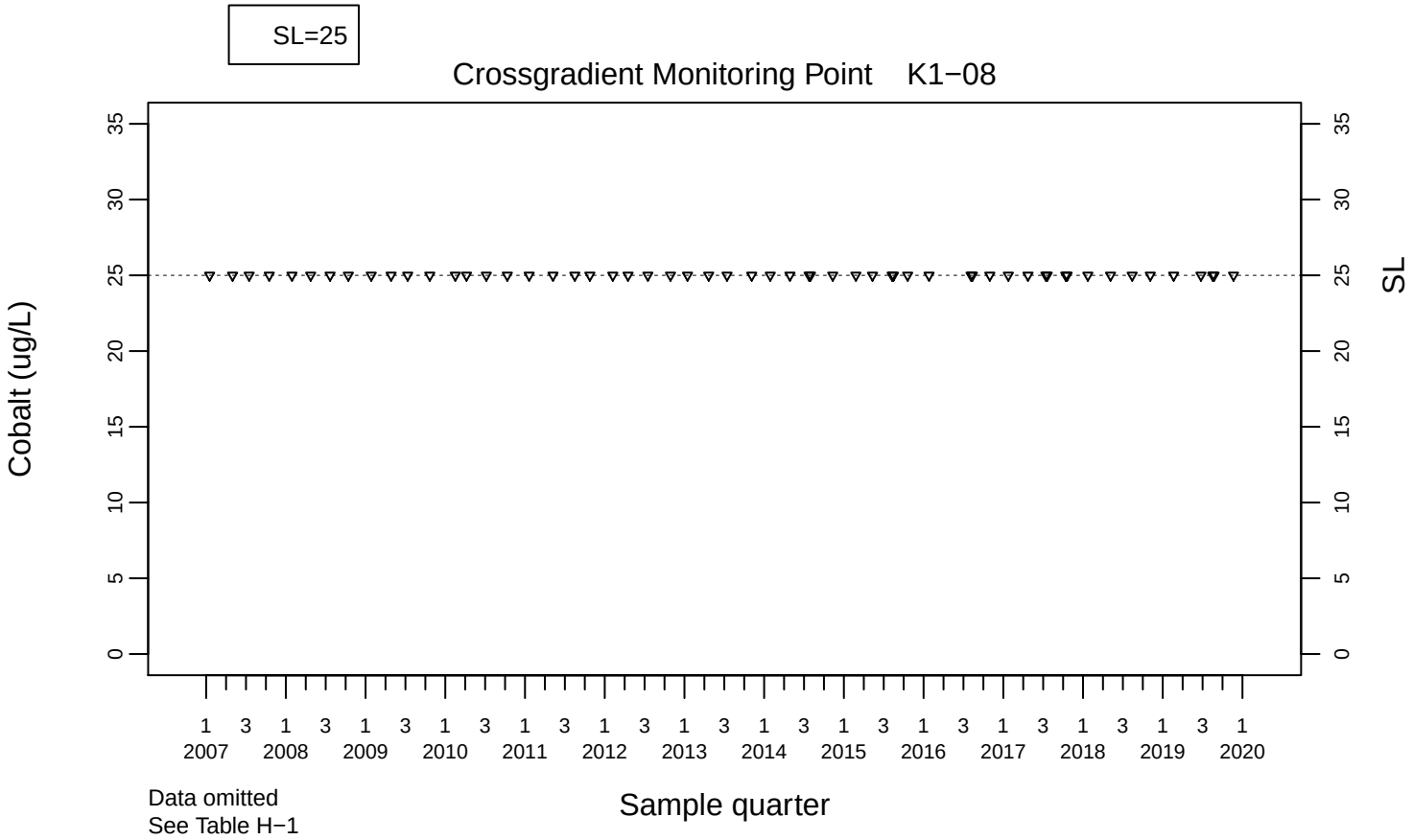

Pit 1 Area
Cobalt (ug/L)
Background Monitoring Point K1−01C
Above RL
Below RL
Cobalt (ug/L)
0
5
10
15
20
25
30
35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Data omitted
See Table H−1
Sample quarter

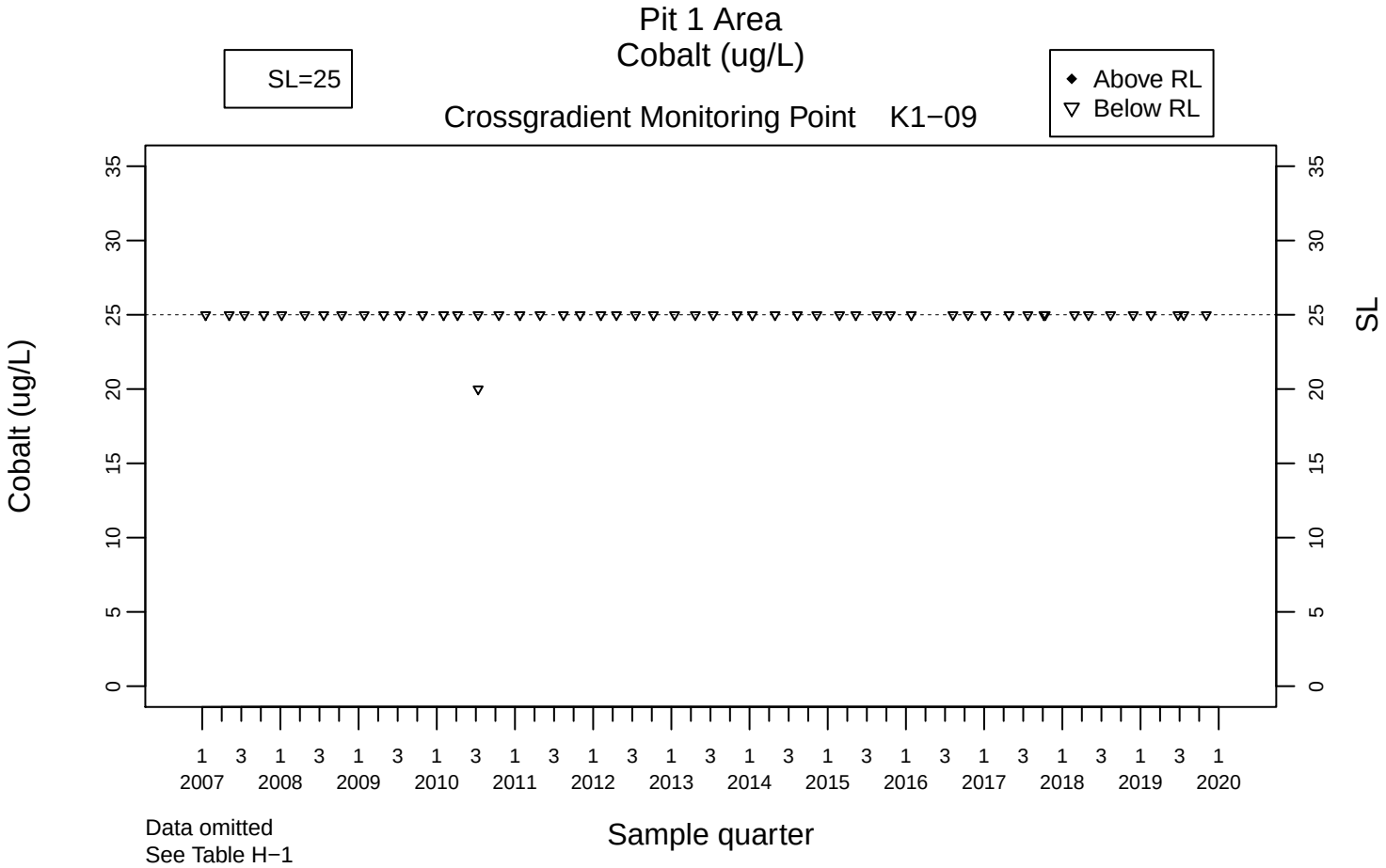

Background Monitoring Point K1−07
Cobalt (ug/L)
0
5
10
15
20
25
30
35
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Data omitted
See Table H−1
Sample quarter

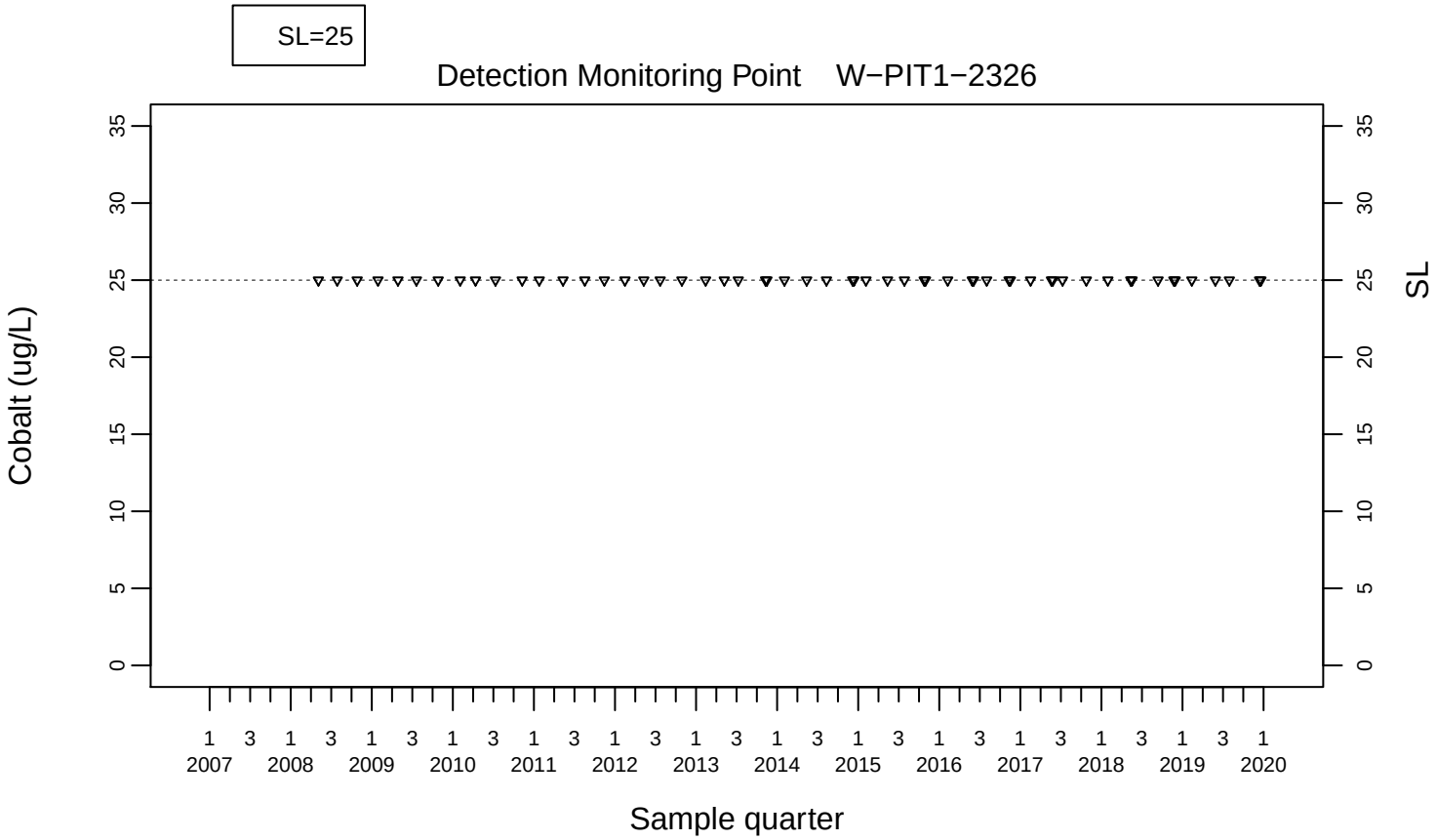

Pit 1 Area
Cobalt (ug/L)
SL=25
Above RL
Below RL
Detection Monitoring Point K1−02B
Cobalt (ug/L)
SL
Sample quarter

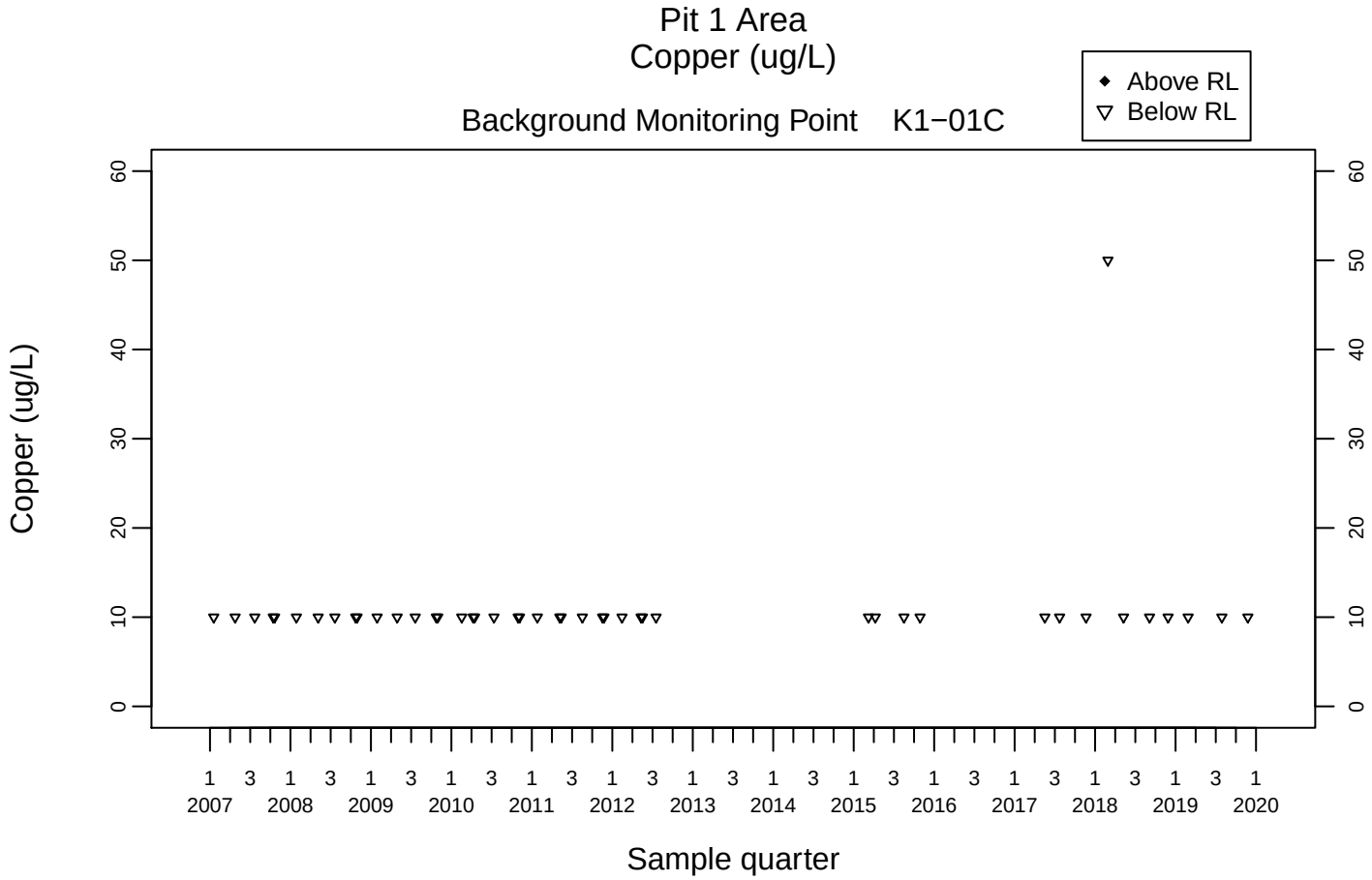

SL=25
Detection Monitoring Point K1−04
Cobalt (ug/L)
SL
Sample quarter

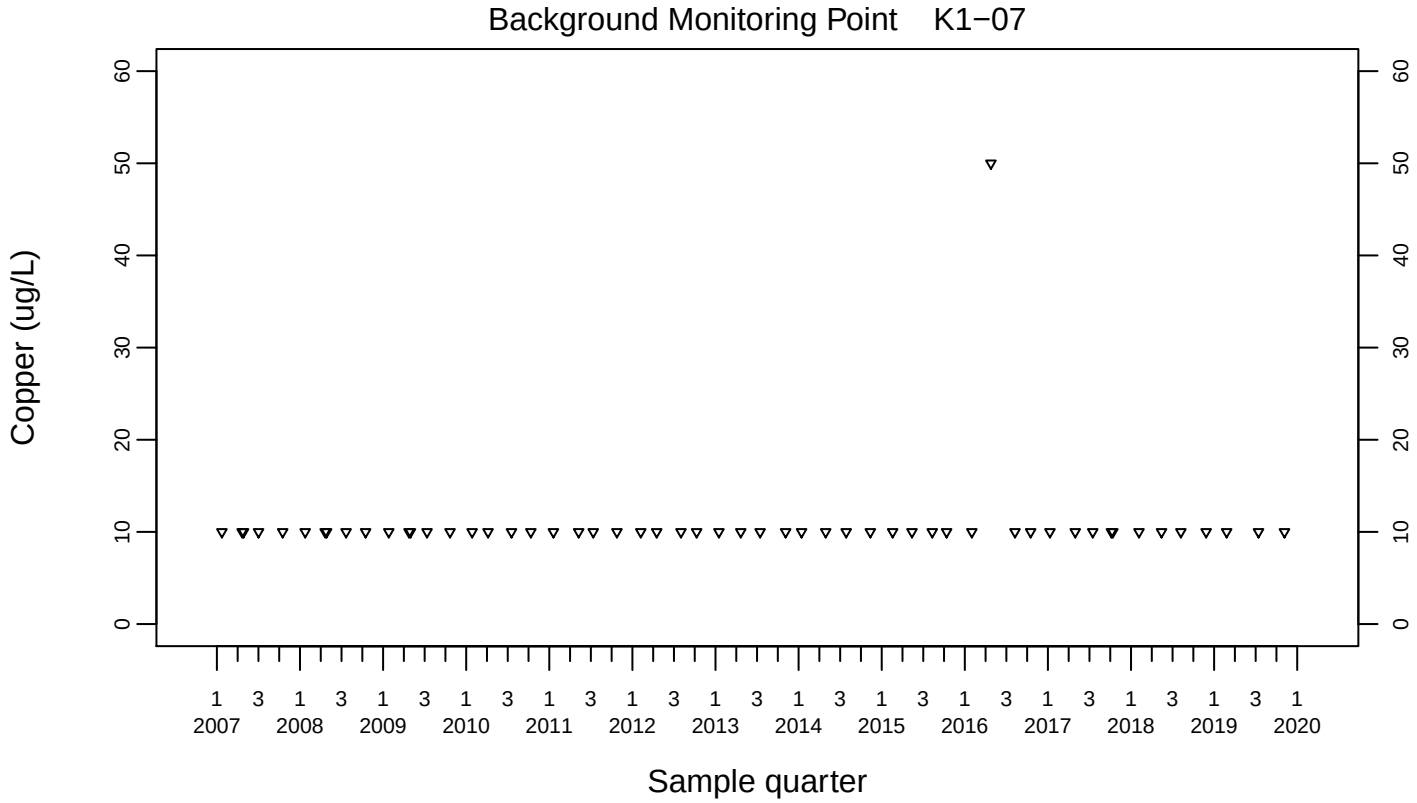

Pit 1 Area
Cobalt (ug/L)
SL=25
Above RL
Below RL
Detection Monitoring Point K1−05
Cobalt (ug/L)
SL
Sample quarter
Data omitted
See Table H−1

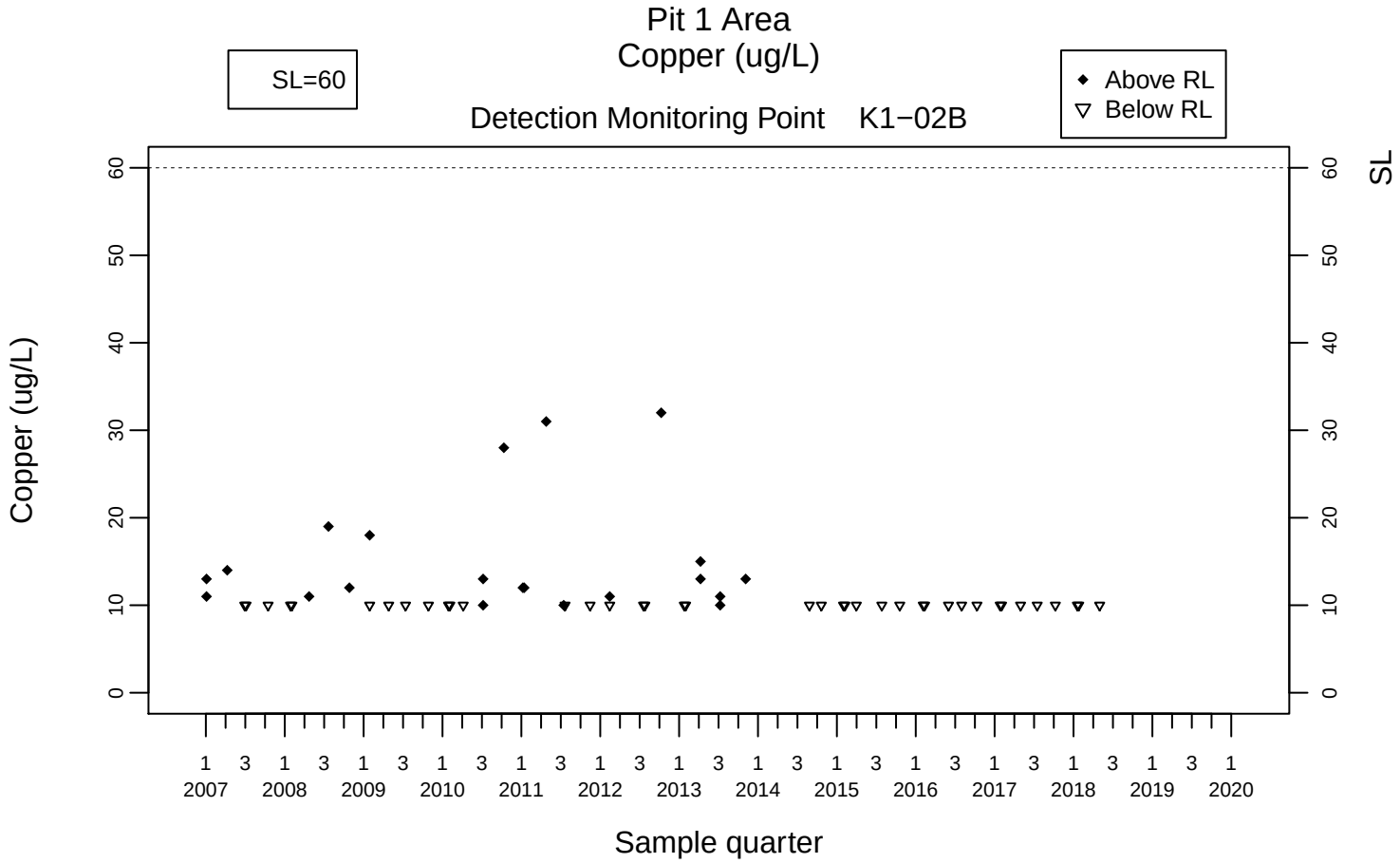

SL=25
Crossgradient Monitoring Point K1−08
Cobalt (ug/L)
SL
Sample quarter
Data omitted
See Table H−1

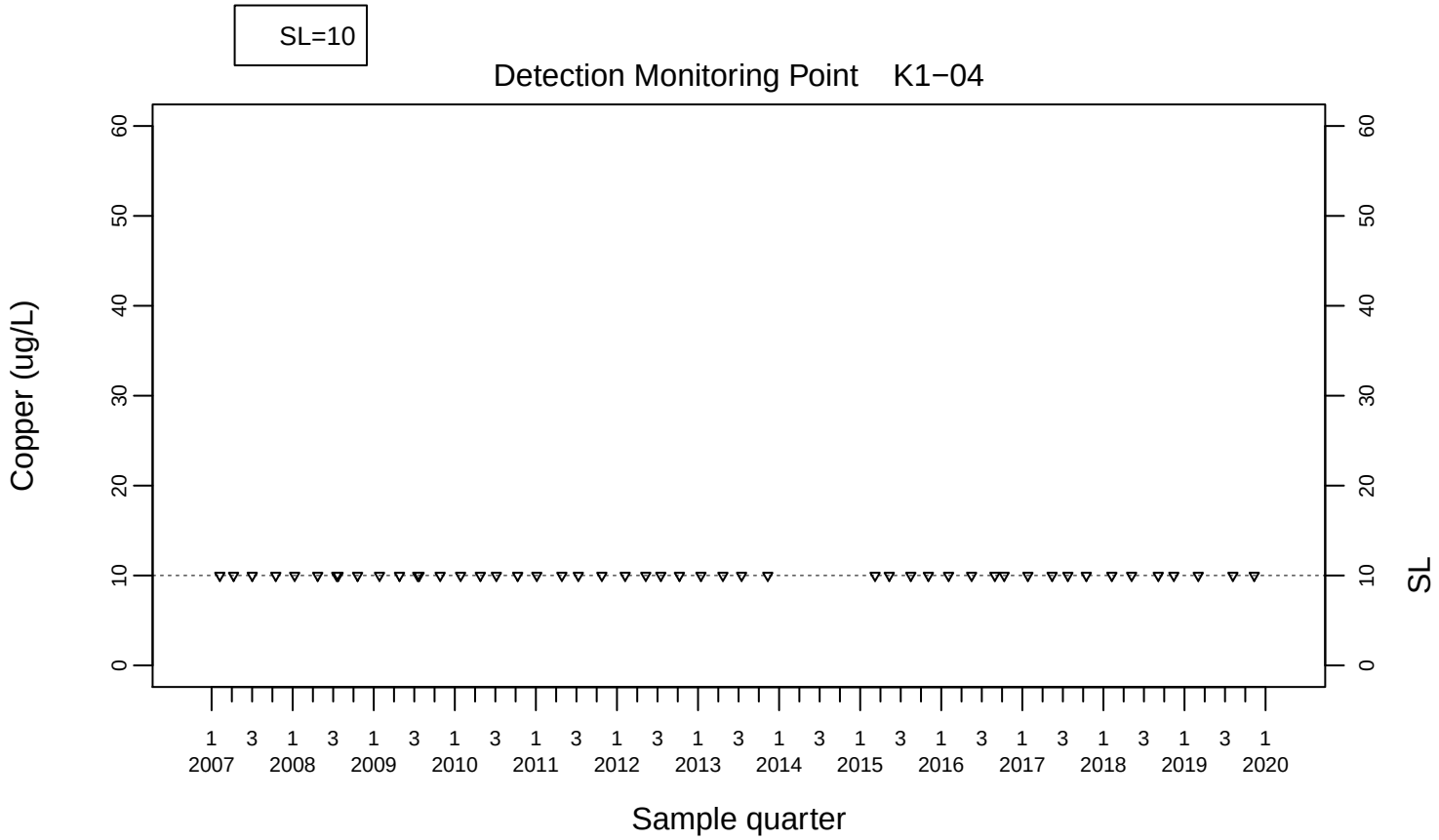

Pit 1 Area
Cobalt (ug/L)
SL=25
Crossgradient Monitoring Point K1−09
Above RL
Below RL
Cobalt (ug/L)
SL
Sample quarter
Data omitted
See Table H−1

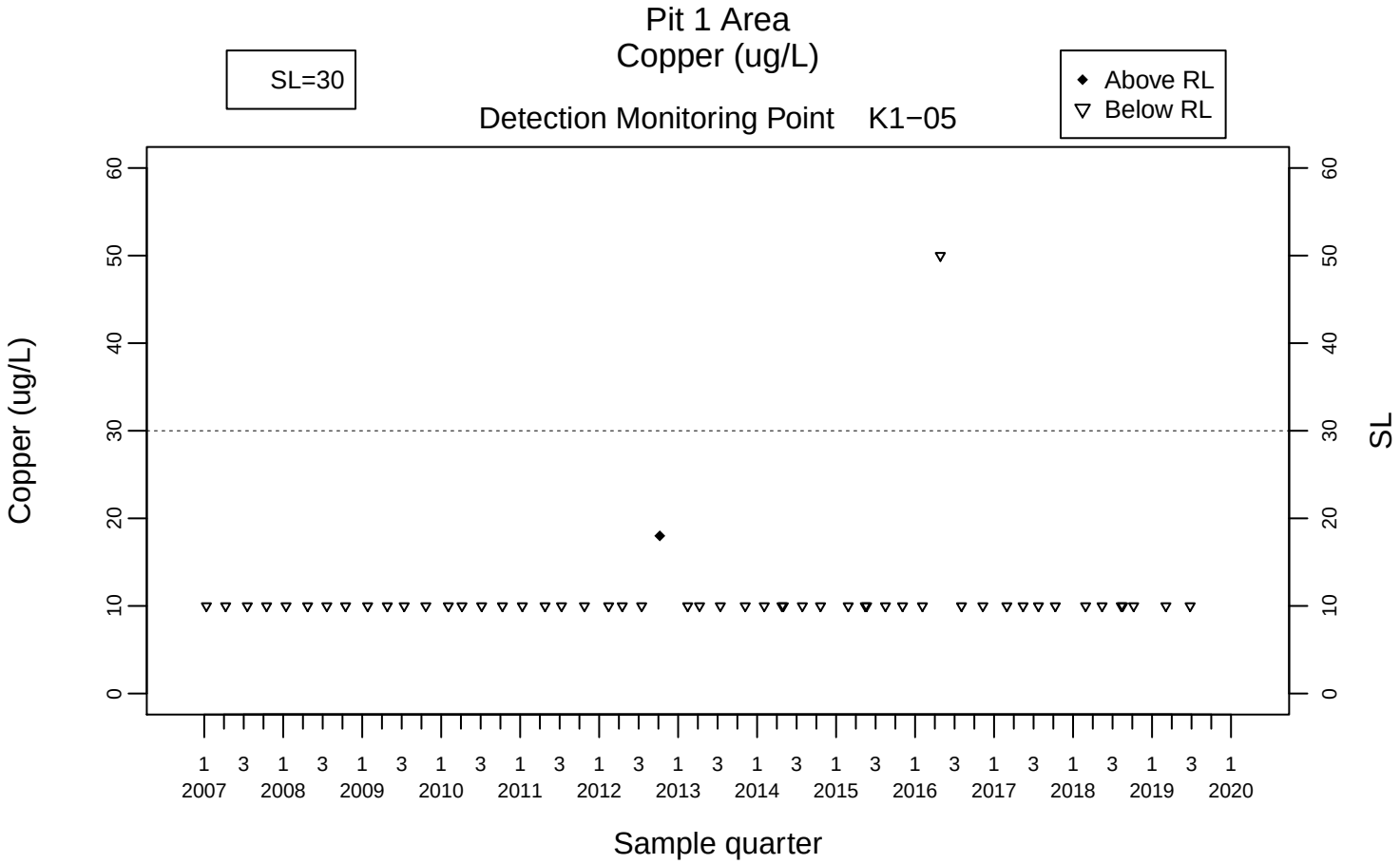

SL=25
Detection Monitoring Point W−PIT1−2326
Cobalt (ug/L)
SL
Sample quarter

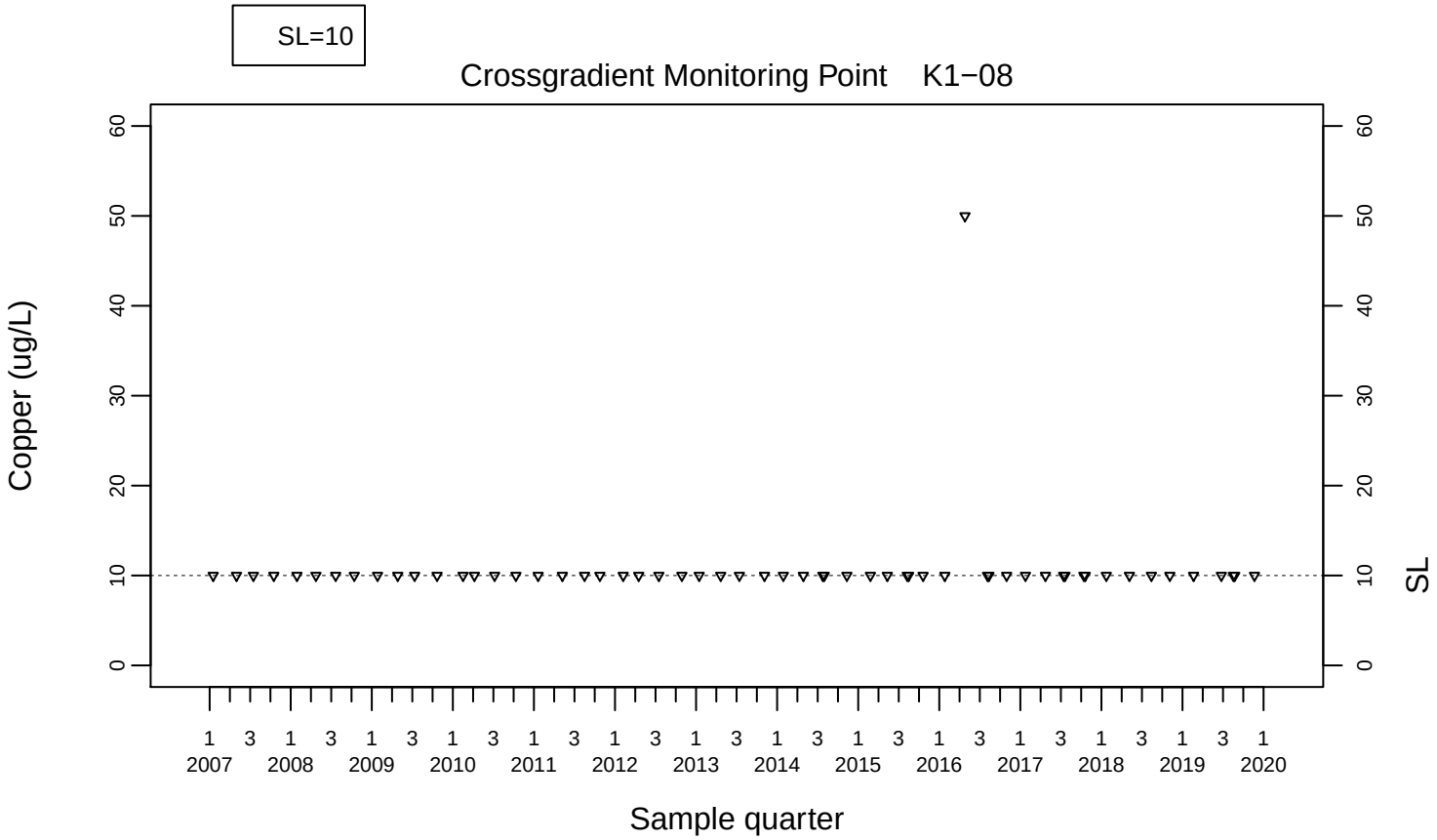

Pit 1 Area
Copper (ug/L)
Background Monitoring Point K1−01C
Above RL
Below RL
Copper (ug/L)
0
10
20
30
40
50
60
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

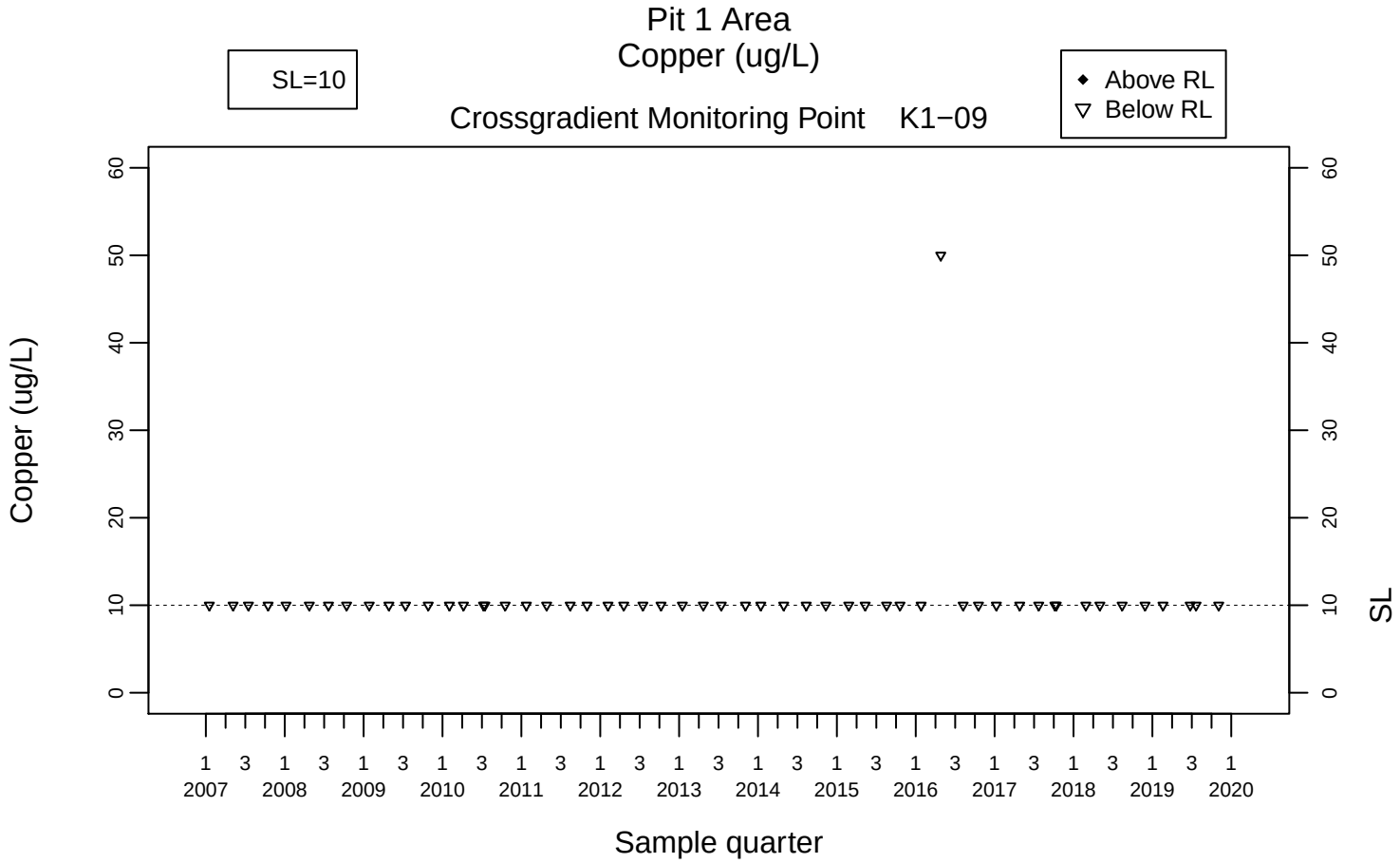

Background Monitoring Point K1−07
Copper (ug/L)
0
10
20
30
40
50
60
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

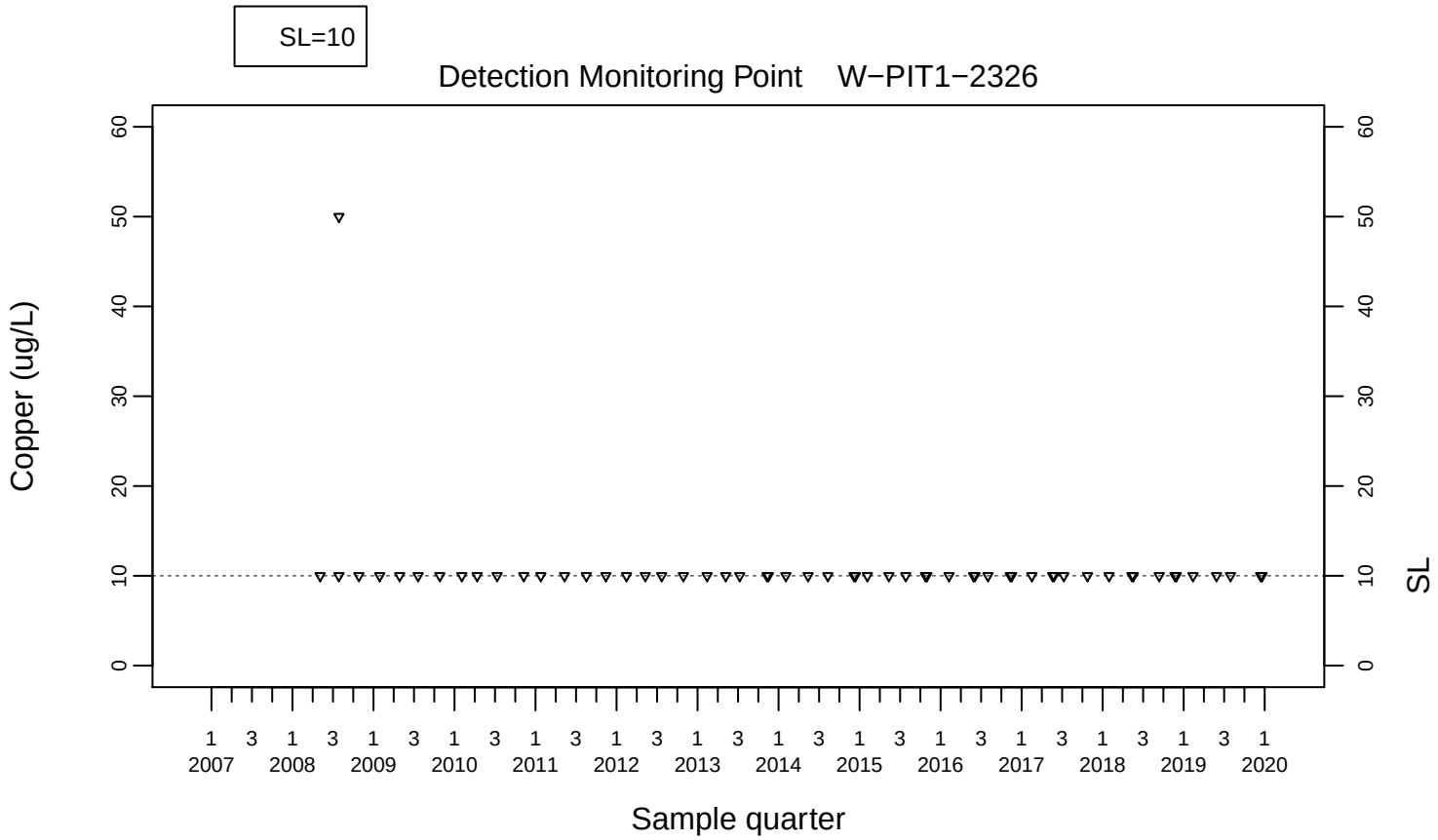

Pit 1 Area
Copper (ug/L)
SL=60
Above RL
Below RL
Detection Monitoring Point K1−02B
Copper (ug/L)
SL
Sample quarter

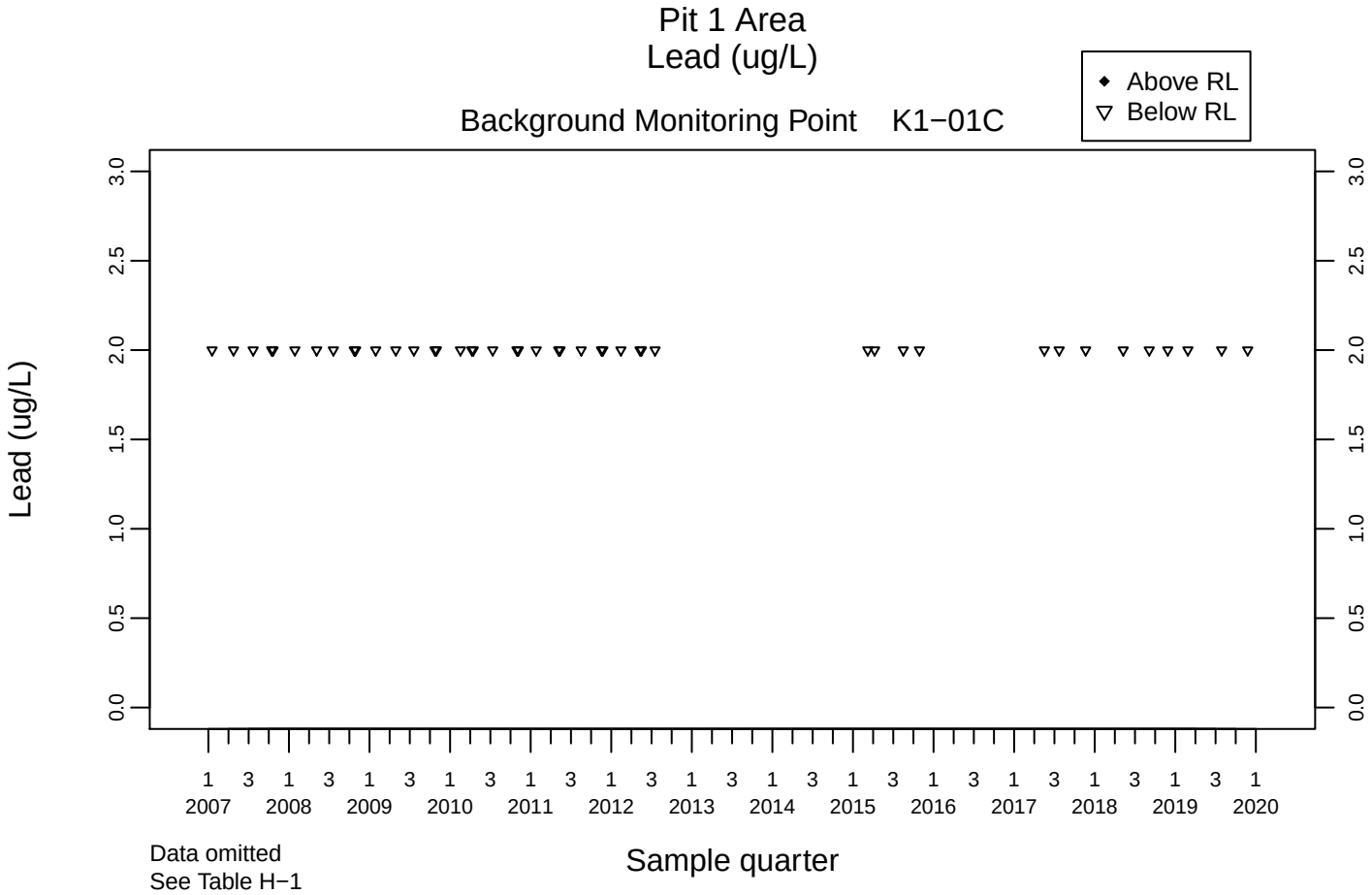

SL=10
Detection Monitoring Point K1−04
Copper (ug/L)
SL
Sample quarter

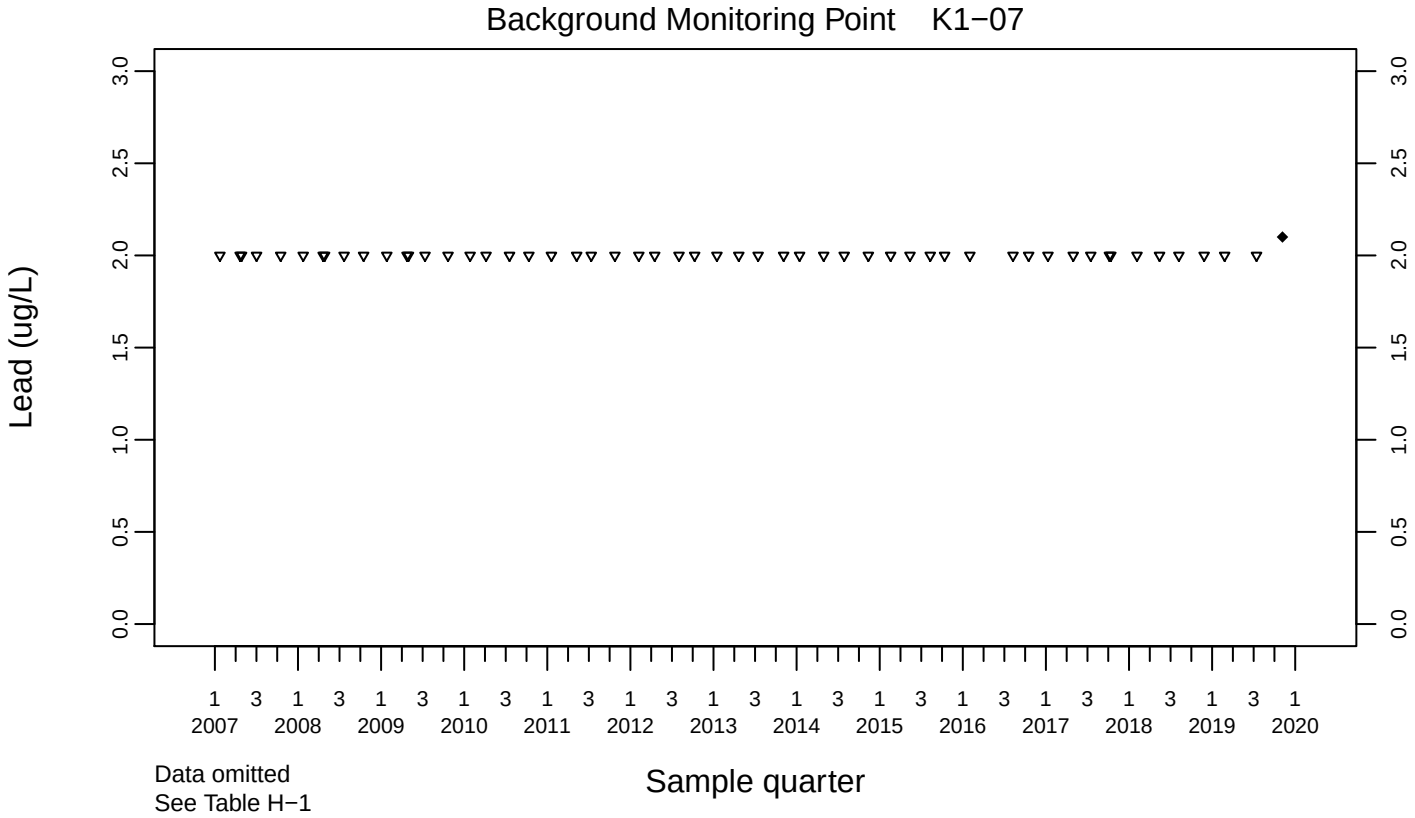

Pit 1 Area
Copper (ug/L)
SL=30
Above RL
Below RL
Detection Monitoring Point K1−05
Copper (ug/L)
SL
Sample quarter

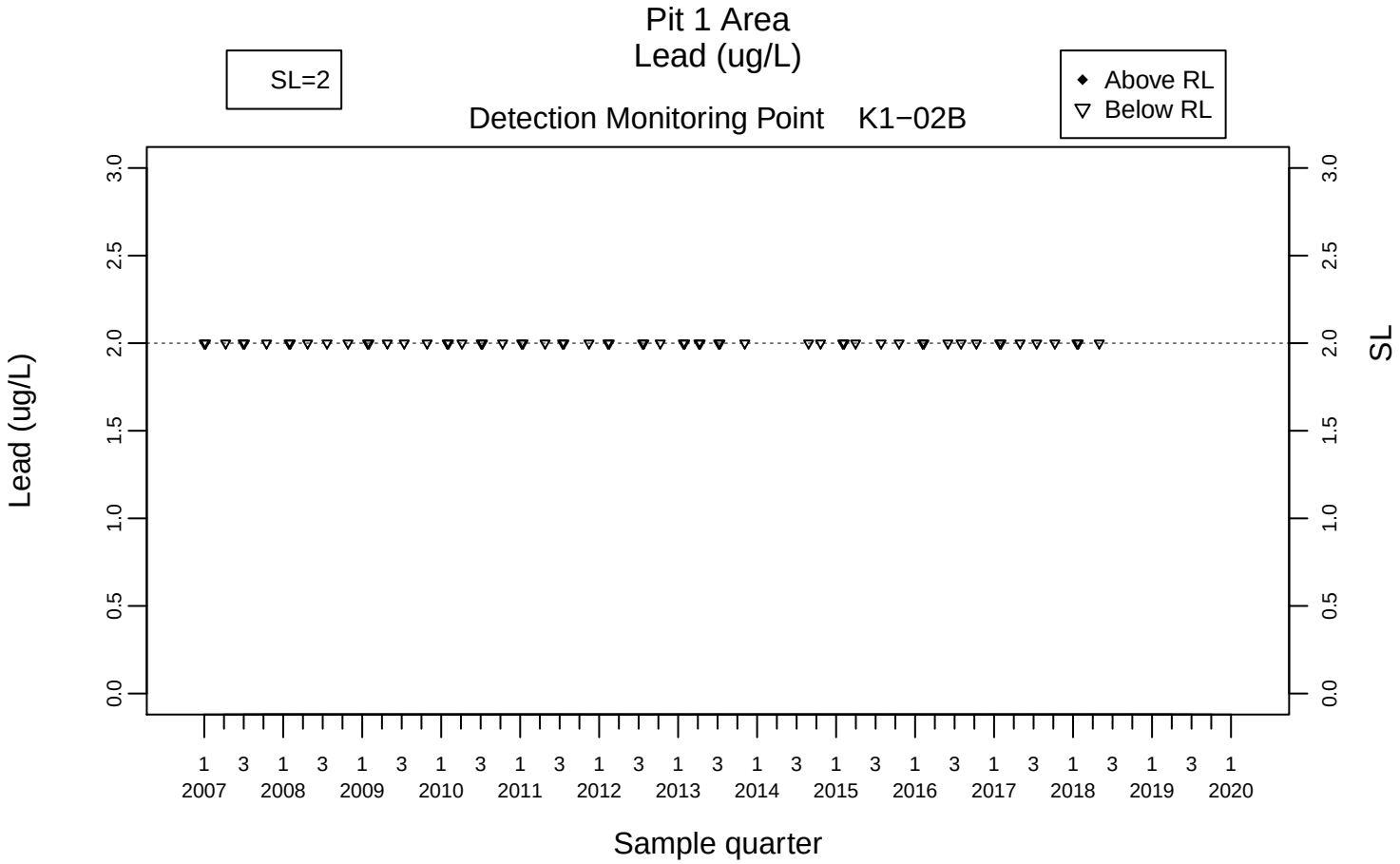

SL=10
Crossgradient Monitoring Point K1−08
Copper (ug/L)
SL
Sample quarter

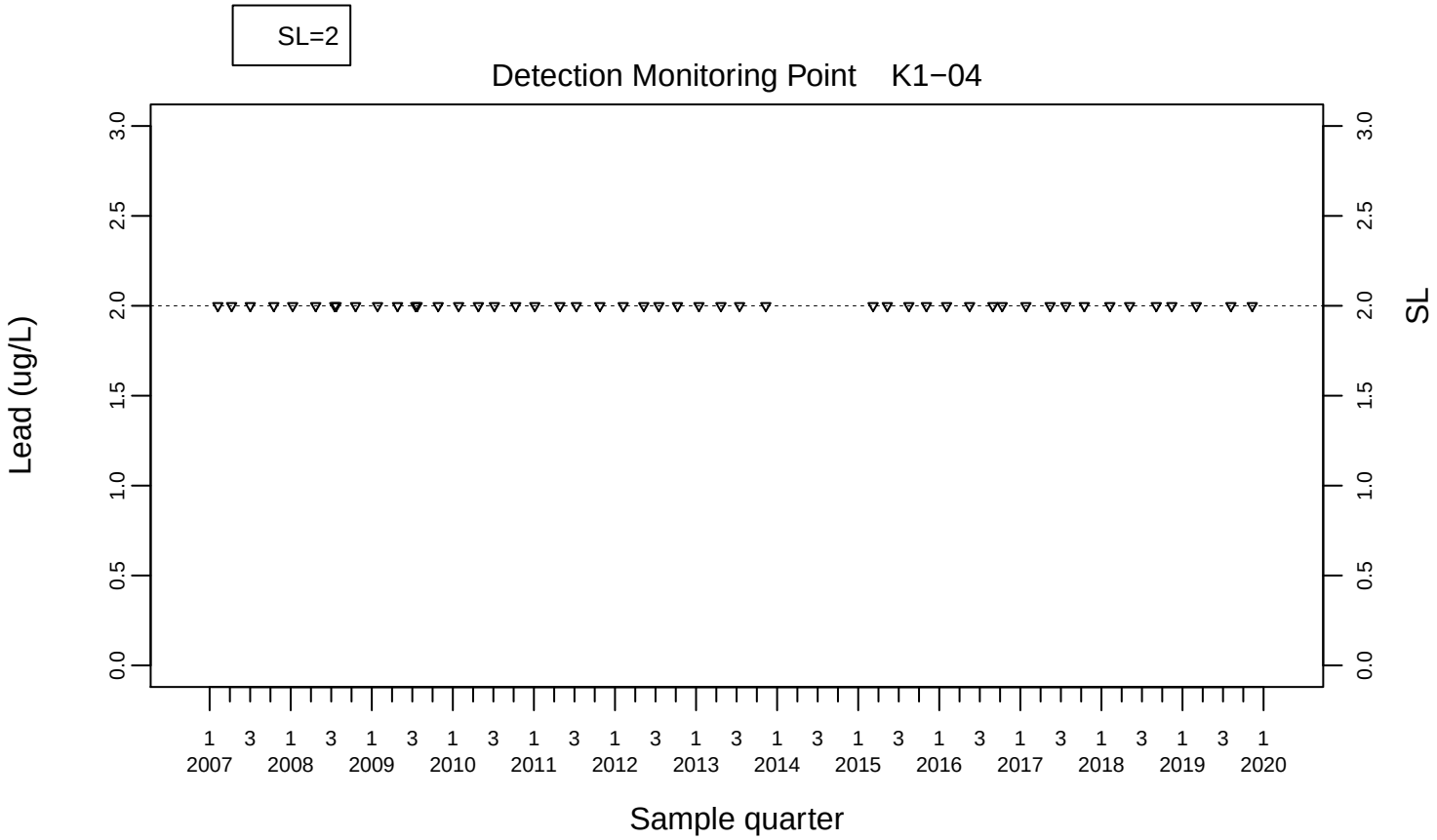

Pit 1 Area
Copper (ug/L)
Crossgradient Monitoring Point K1−09
SL=10
Above RL
Below RL
Copper (ug/L)
SL
Sample quarter
0
10
20
30
40
50
60
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

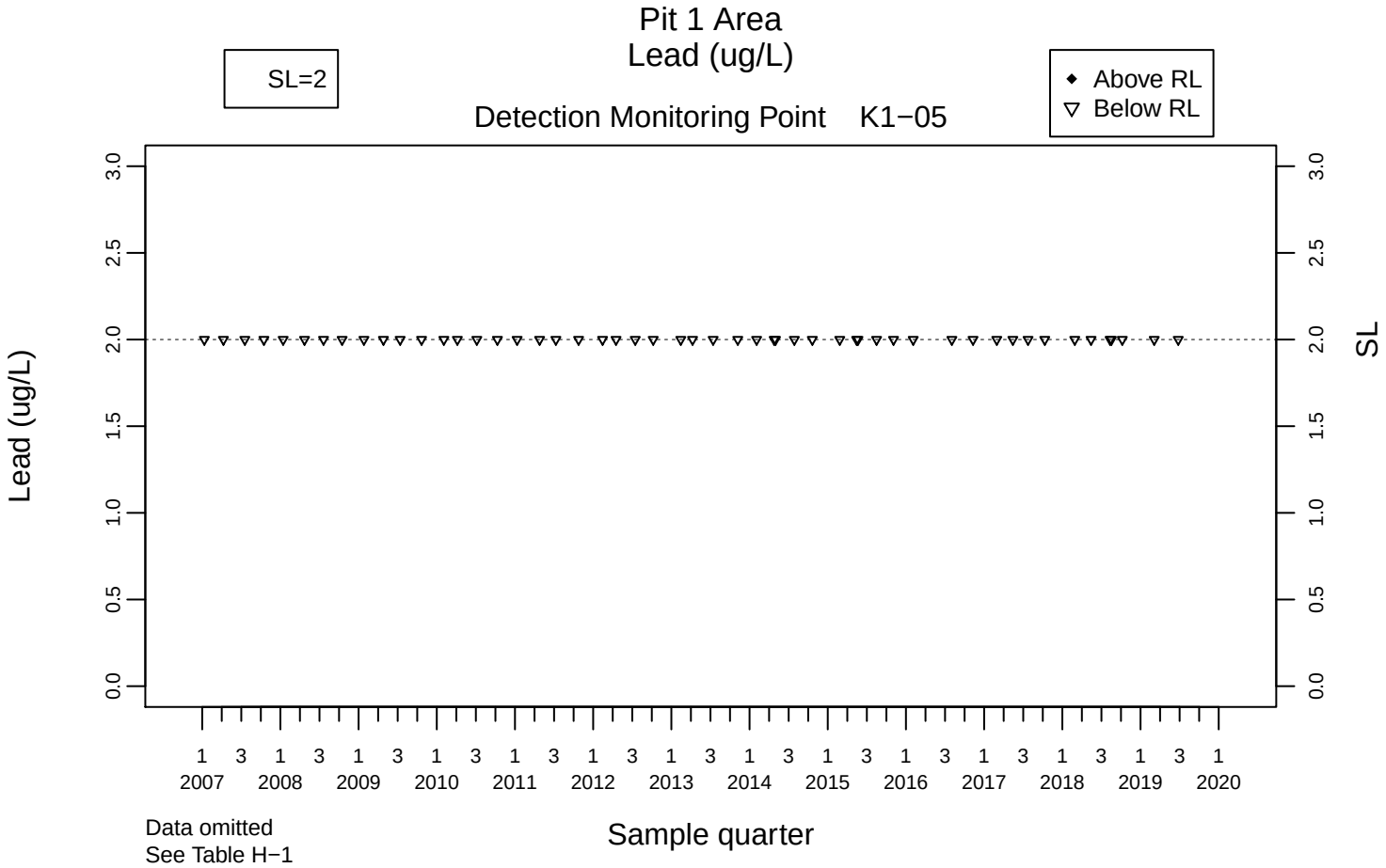

Detection Monitoring Point W−PIT1−2326
SL=10
Copper (ug/L)
SL
Sample quarter
0
10
20
30
40
50
60
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

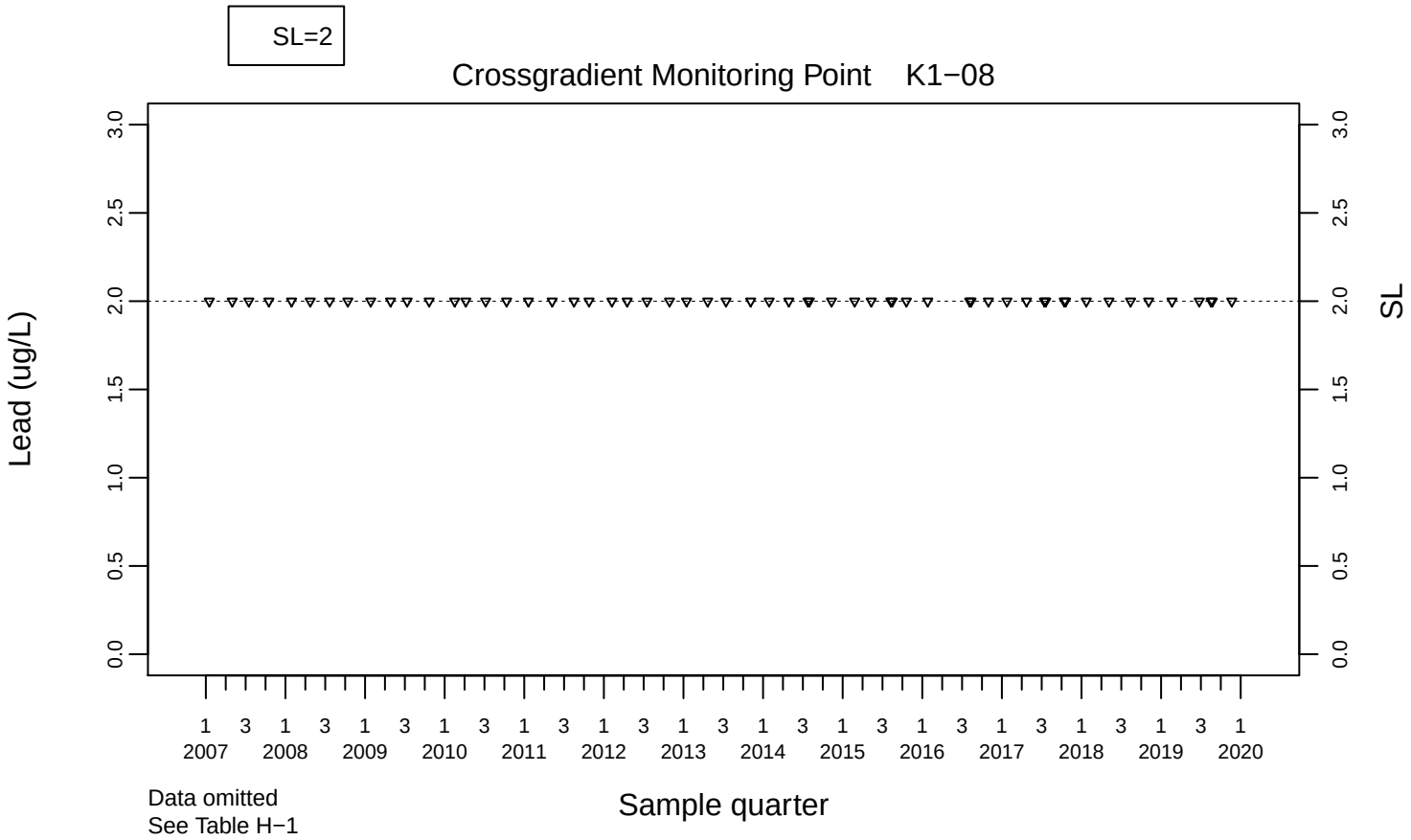

Pit 1 Area
Lead (ug/L)
Above RL
Below RL
Background Monitoring Point K1−01C
Lead (ug/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Data omitted
See Table H−1
Sample quarter

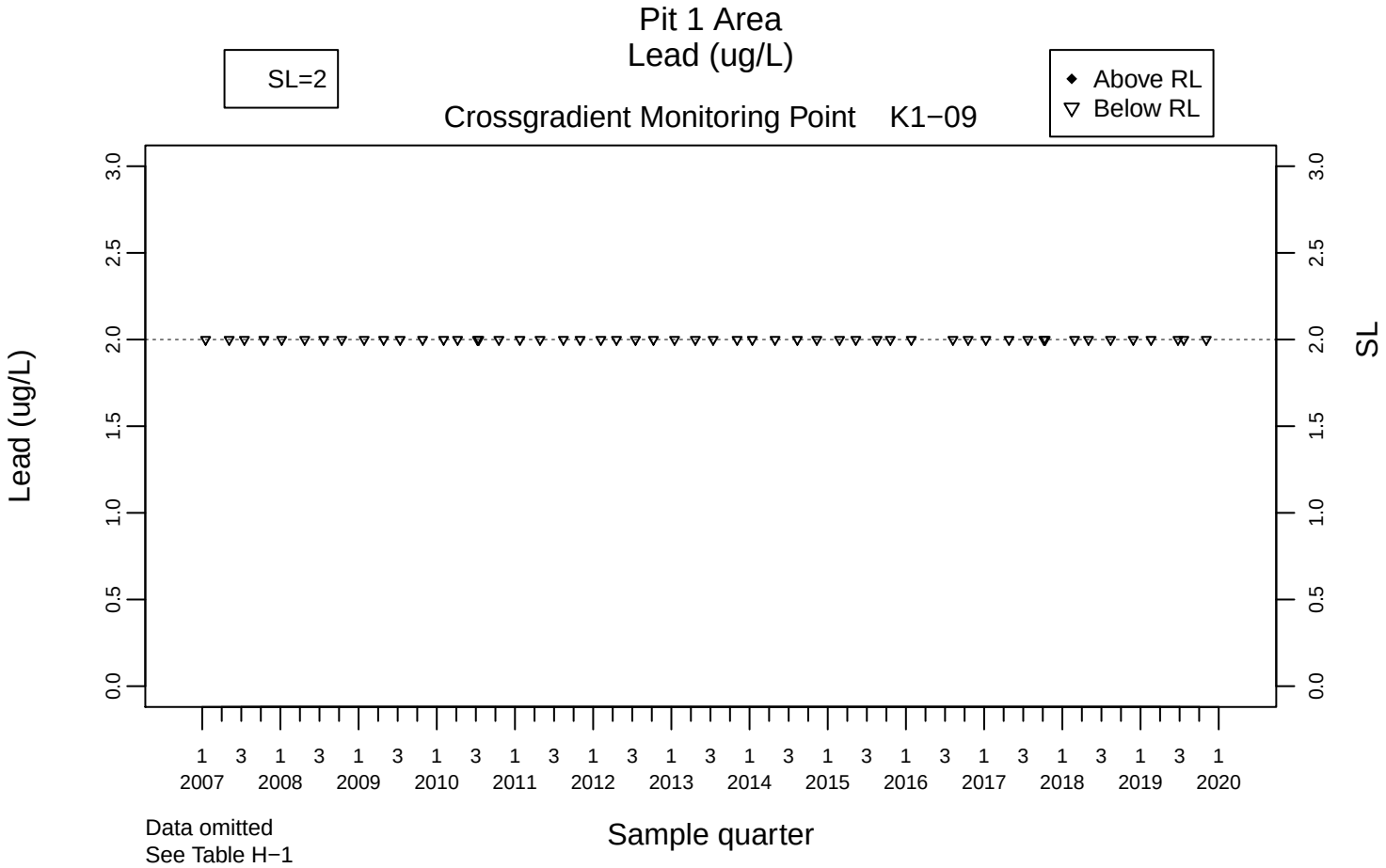

Background Monitoring Point K1−07
Lead (ug/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Data omitted
See Table H−1
Sample quarter

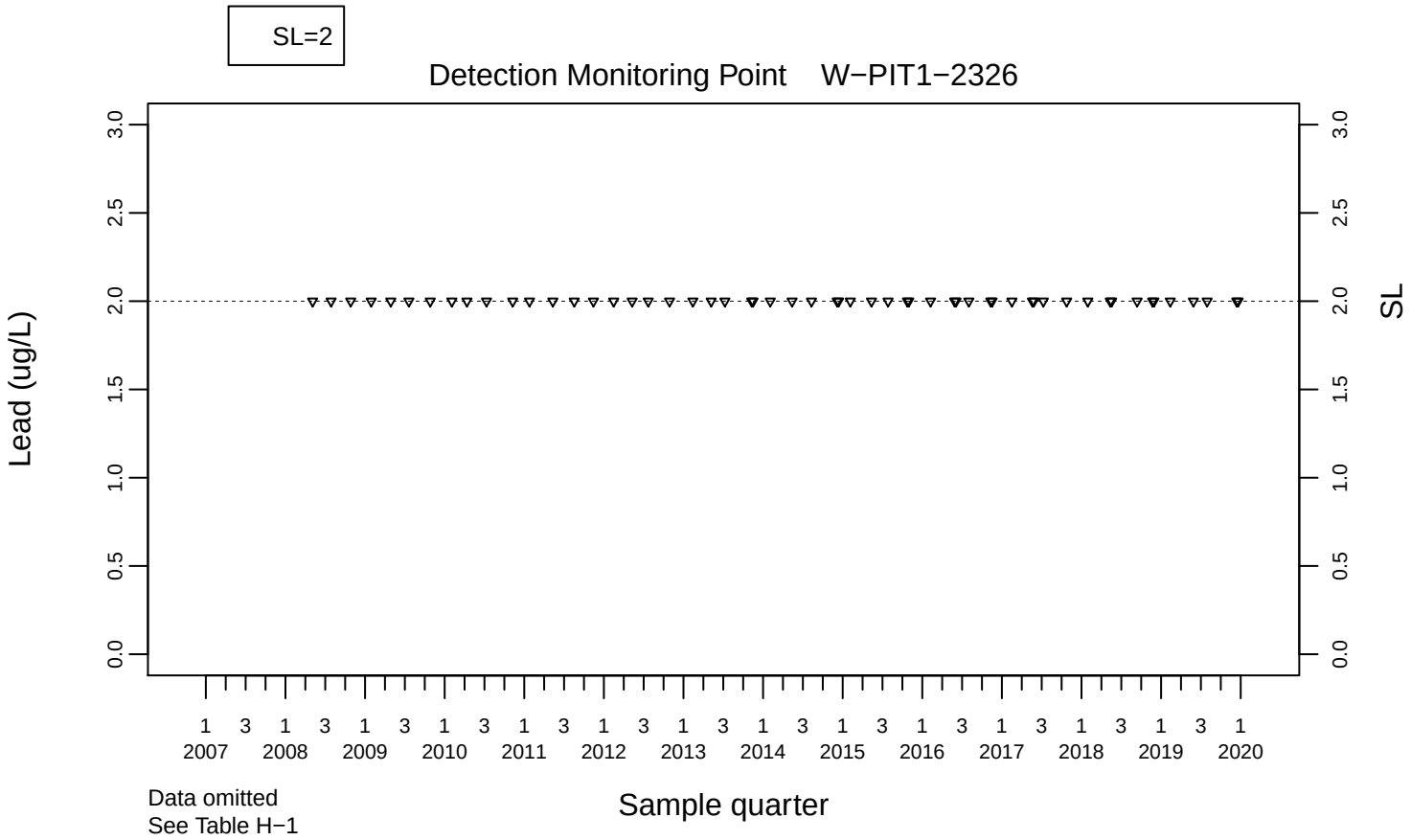

Pit 1 Area
Lead (ug/L)
SL=2
Above RL
Below RL
Detection Monitoring Point K1−02B
Lead (ug/L)
SL
Sample quarter

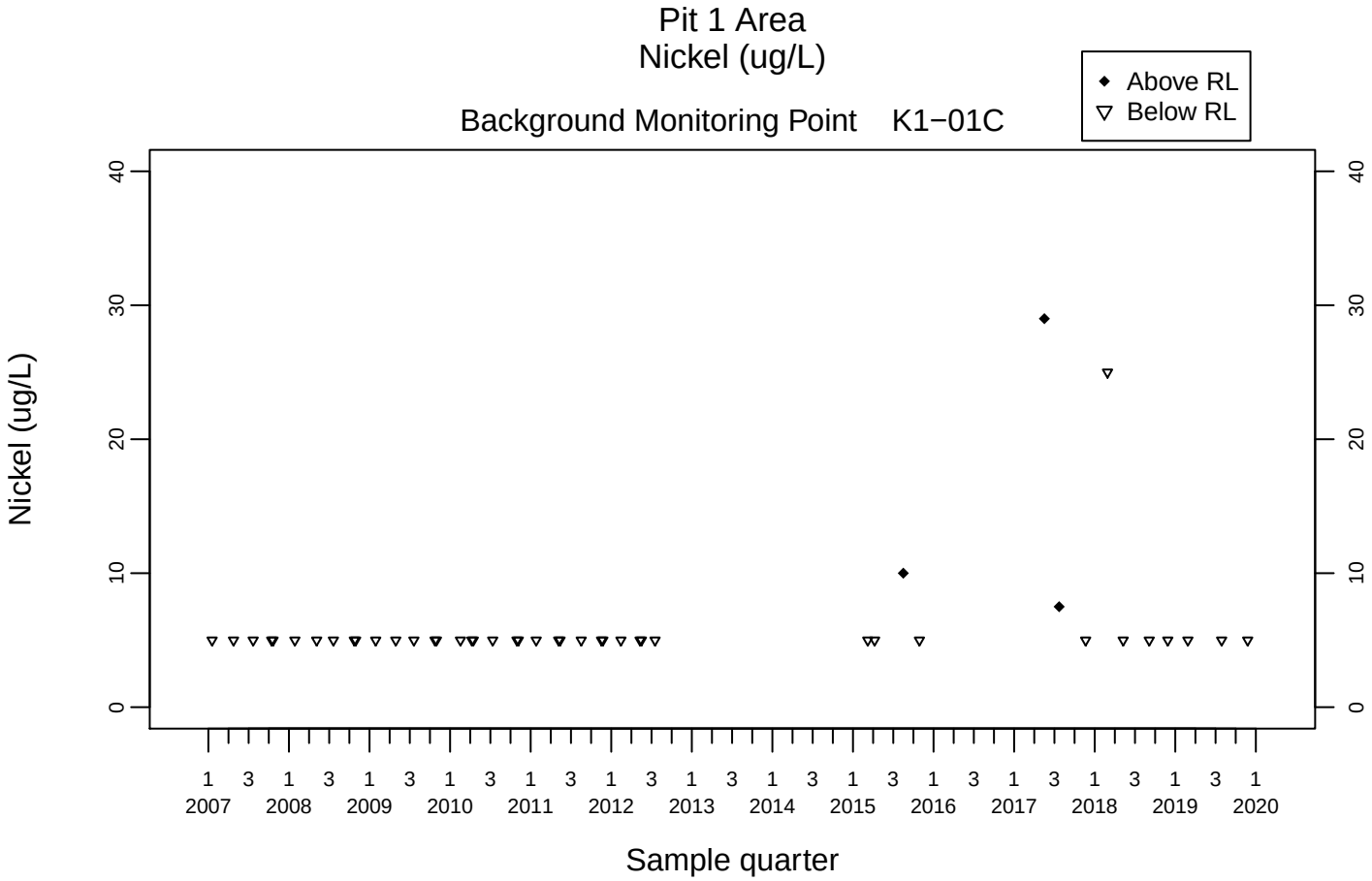

SL=2
Detection Monitoring Point K1−04
Lead (ug/L)
SL
Sample quarter

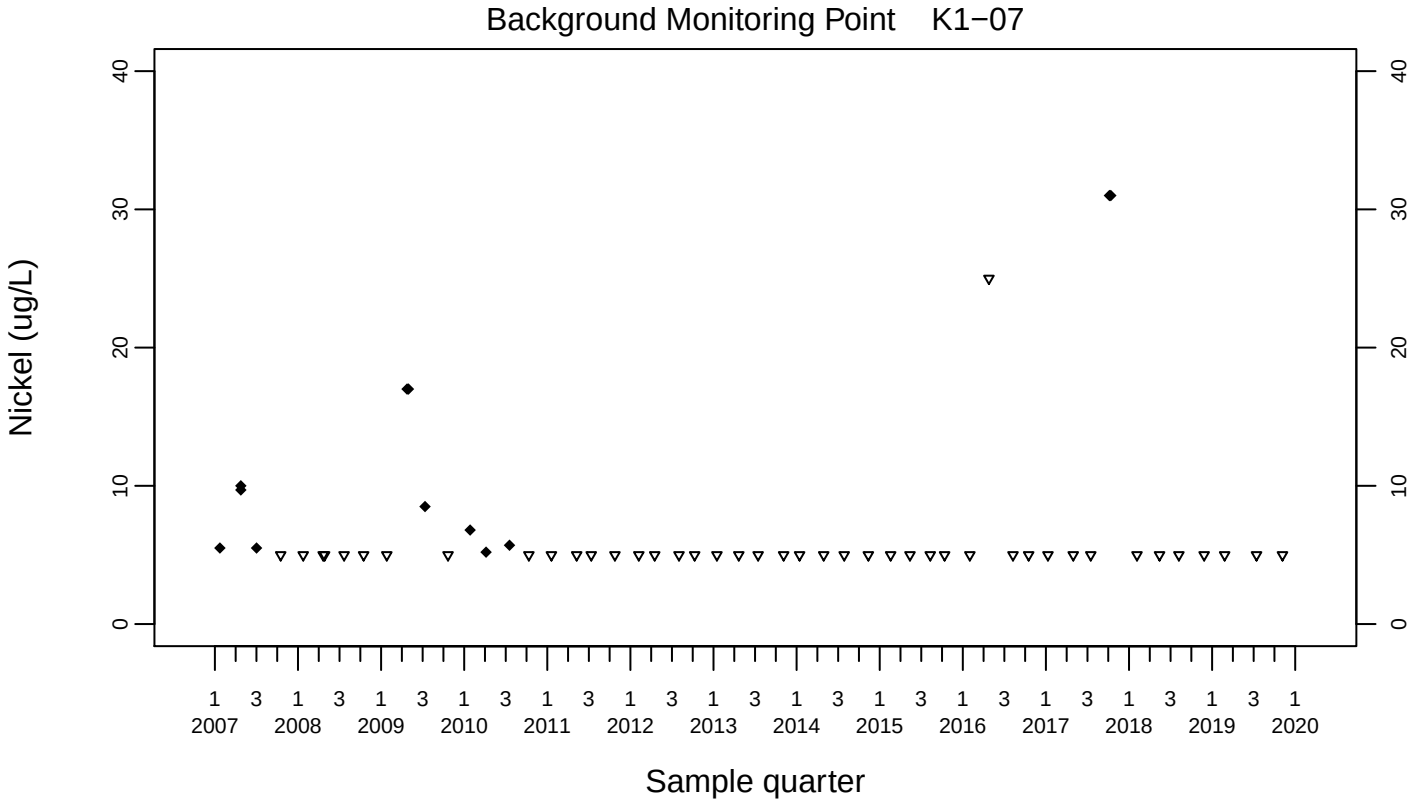

Pit 1 Area
Lead (ug/L)
SL=2
Above RL
Below RL
Detection Monitoring Point K1−05
Lead (ug/L)
SL
Sample quarter
Data omitted
See Table H−1

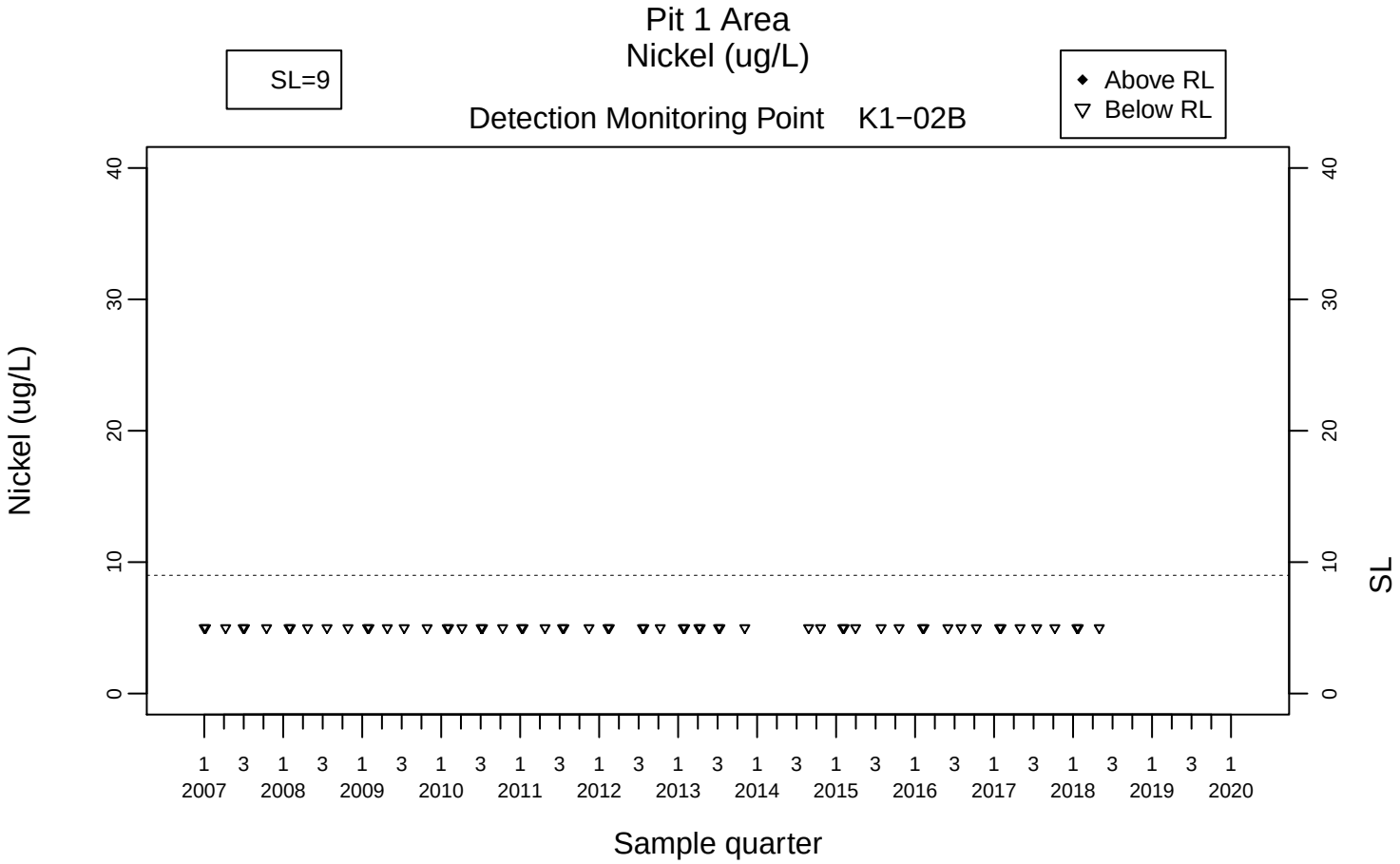

SL=2
Crossgradient Monitoring Point K1−08
Lead (ug/L)
SL
Sample quarter
Data omitted
See Table H−1

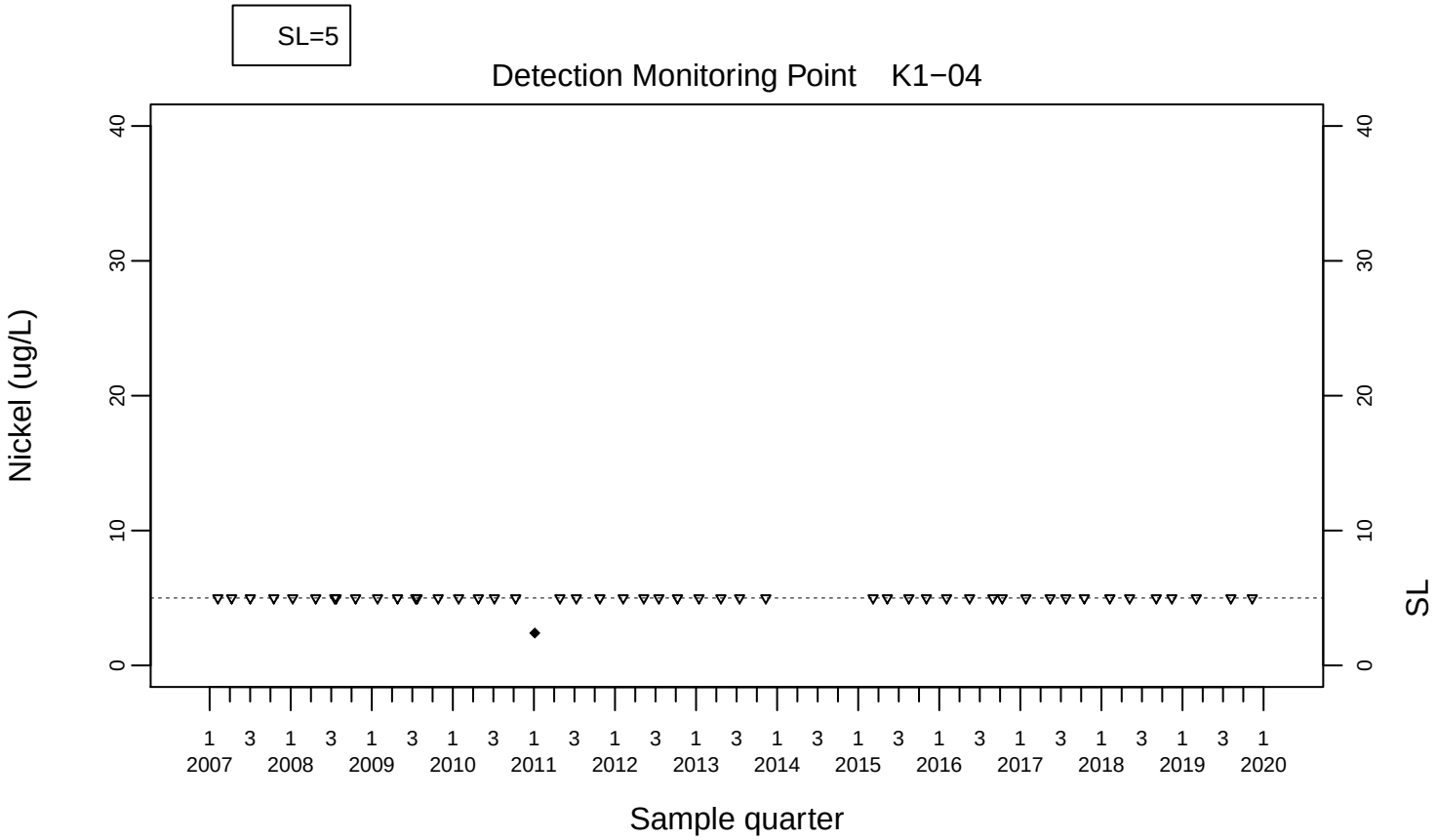

Pit 1 Area
Lead (ug/L)
SL=2
Above RL
Below RL
Crossgradient Monitoring Point K1−09
Lead (ug/L)
SL
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Data omitted
See Table H−1
Sample quarter

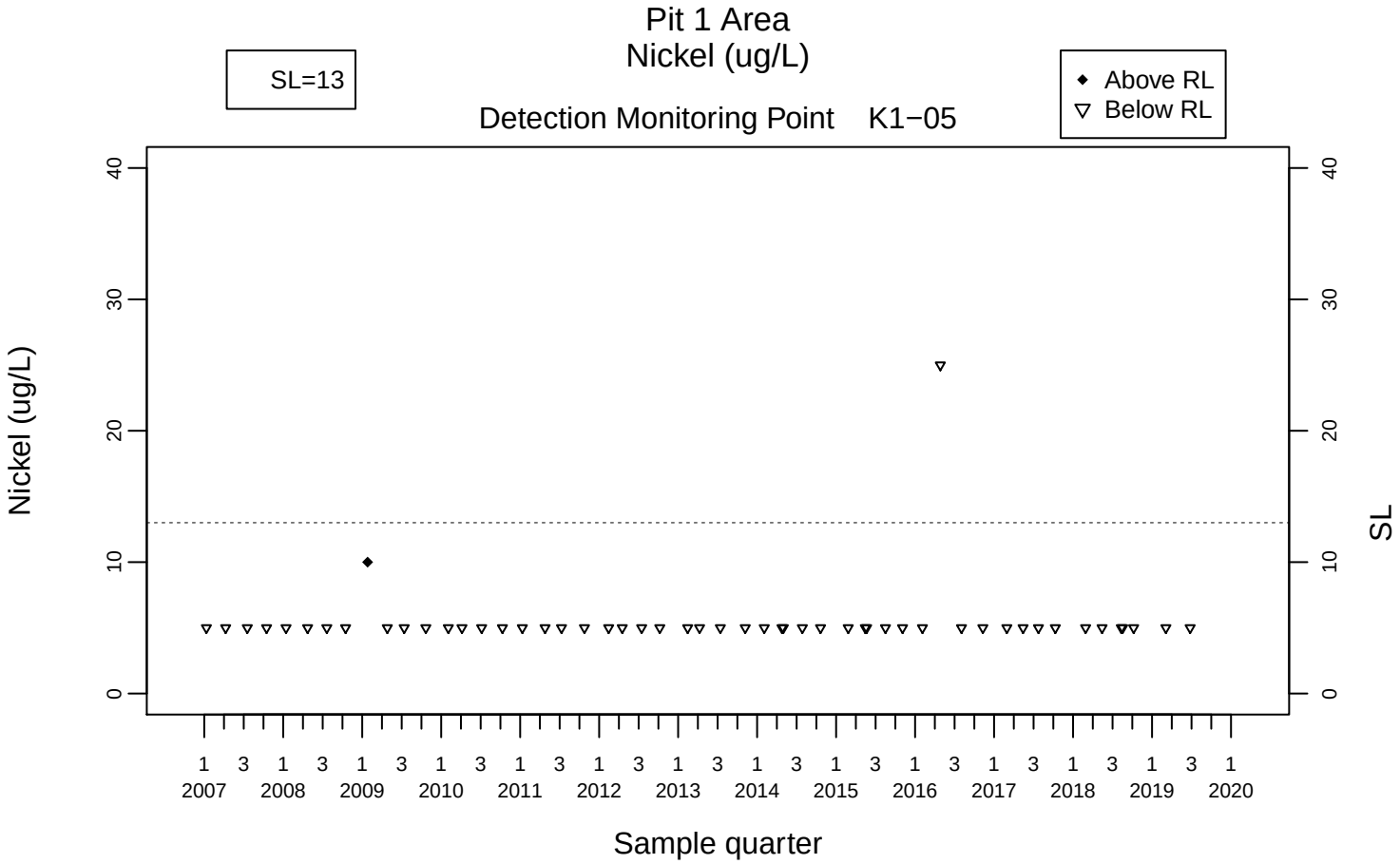

SL=2
Detection Monitoring Point W−PIT1−2326
Lead (ug/L)
SL
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Data omitted
See Table H−1
Sample quarter

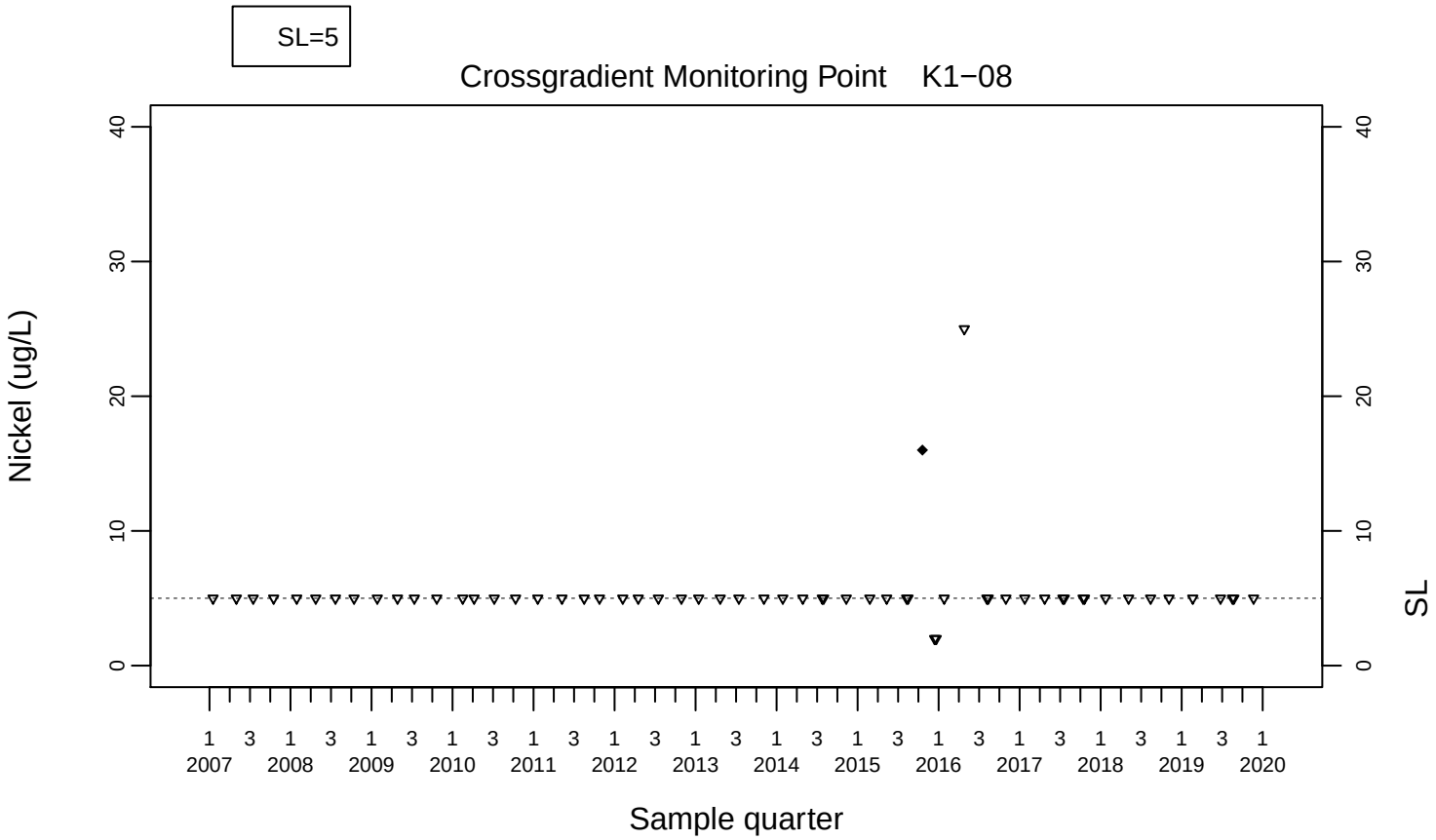

Pit 1 Area
Nickel (ug/L)
Background Monitoring Point K1−01C
Above RL
Below RL
Nickel (ug/L)
0
10
20
30
40
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

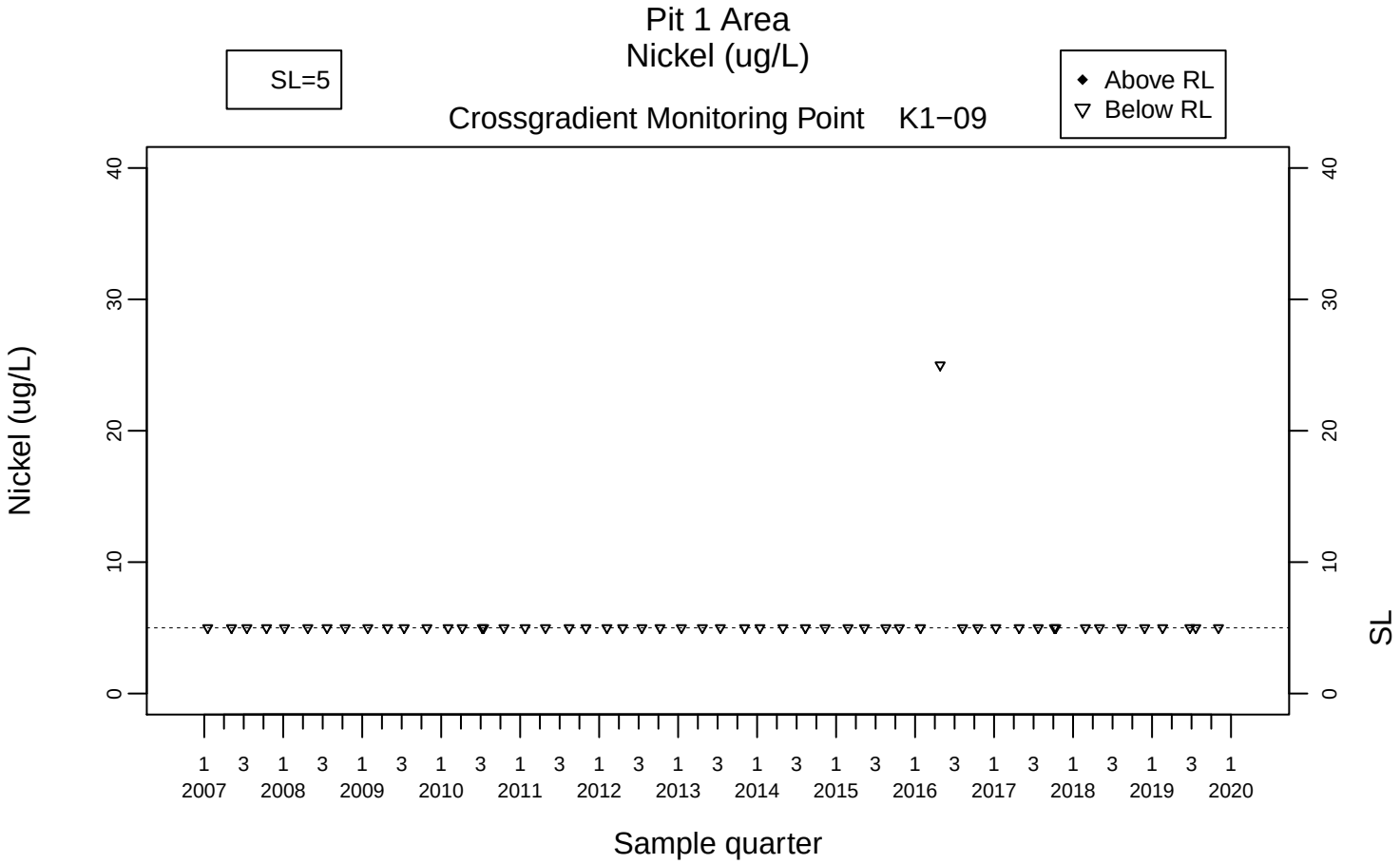

Background Monitoring Point K1−07
Nickel (ug/L)
0
10
20
30
40
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

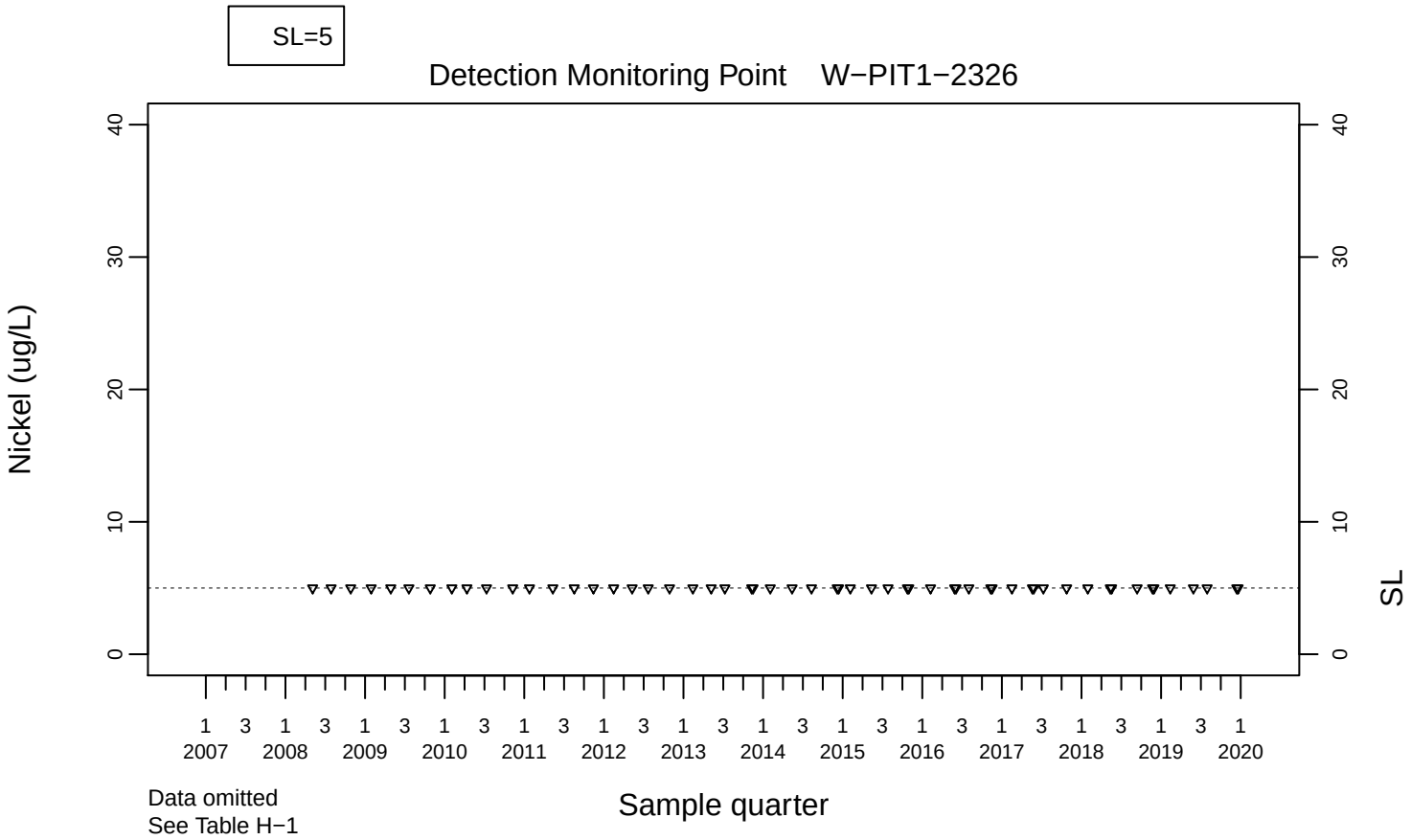

Pit 1 Area
Nickel (ug/L)
SL=9
Above RL
Below RL
Detection Monitoring Point K1−02B
Nickel (ug/L)
SL
Sample quarter

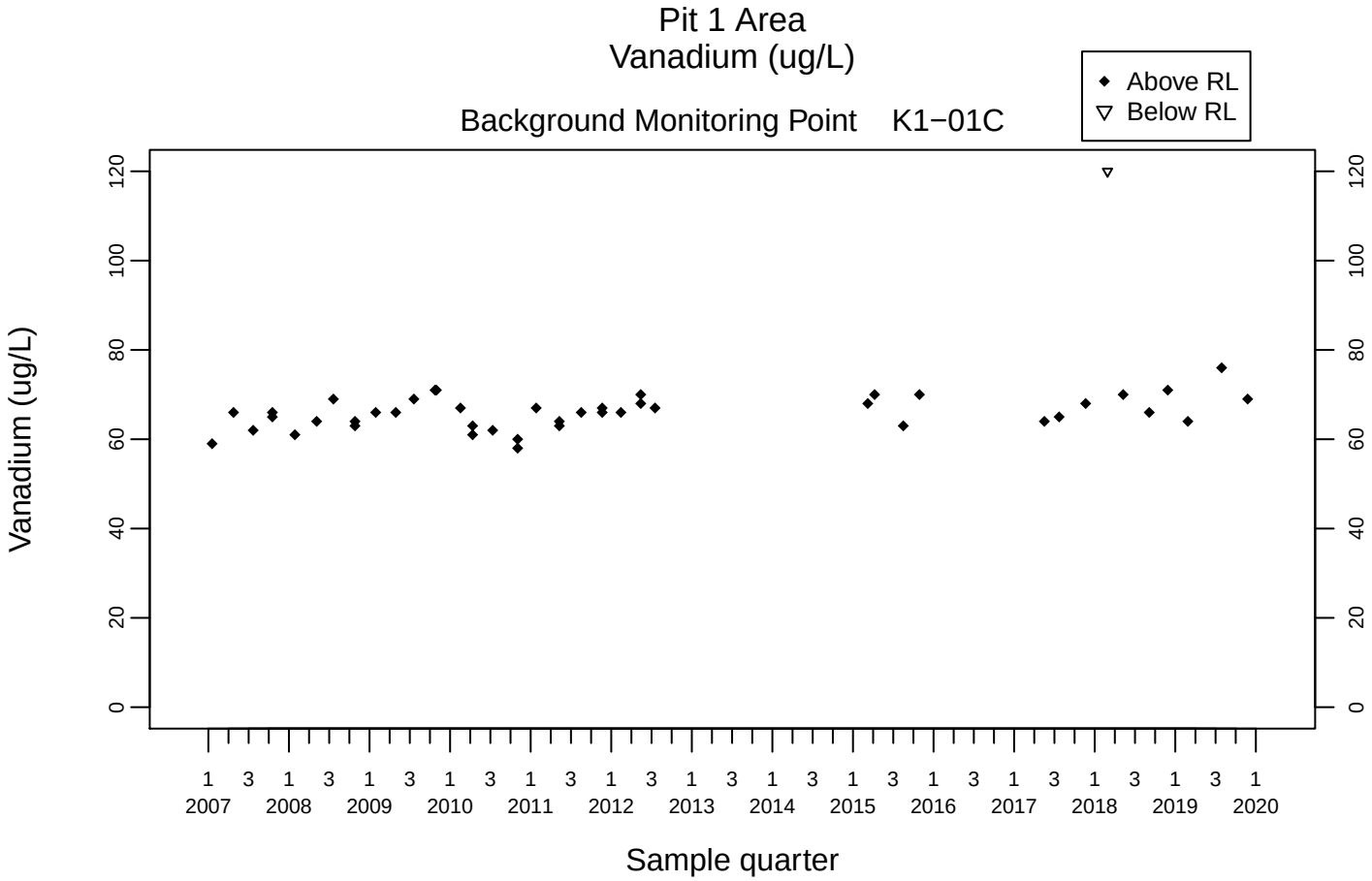

SL=5
Detection Monitoring Point K1−04
Nickel (ug/L)
SL
Sample quarter

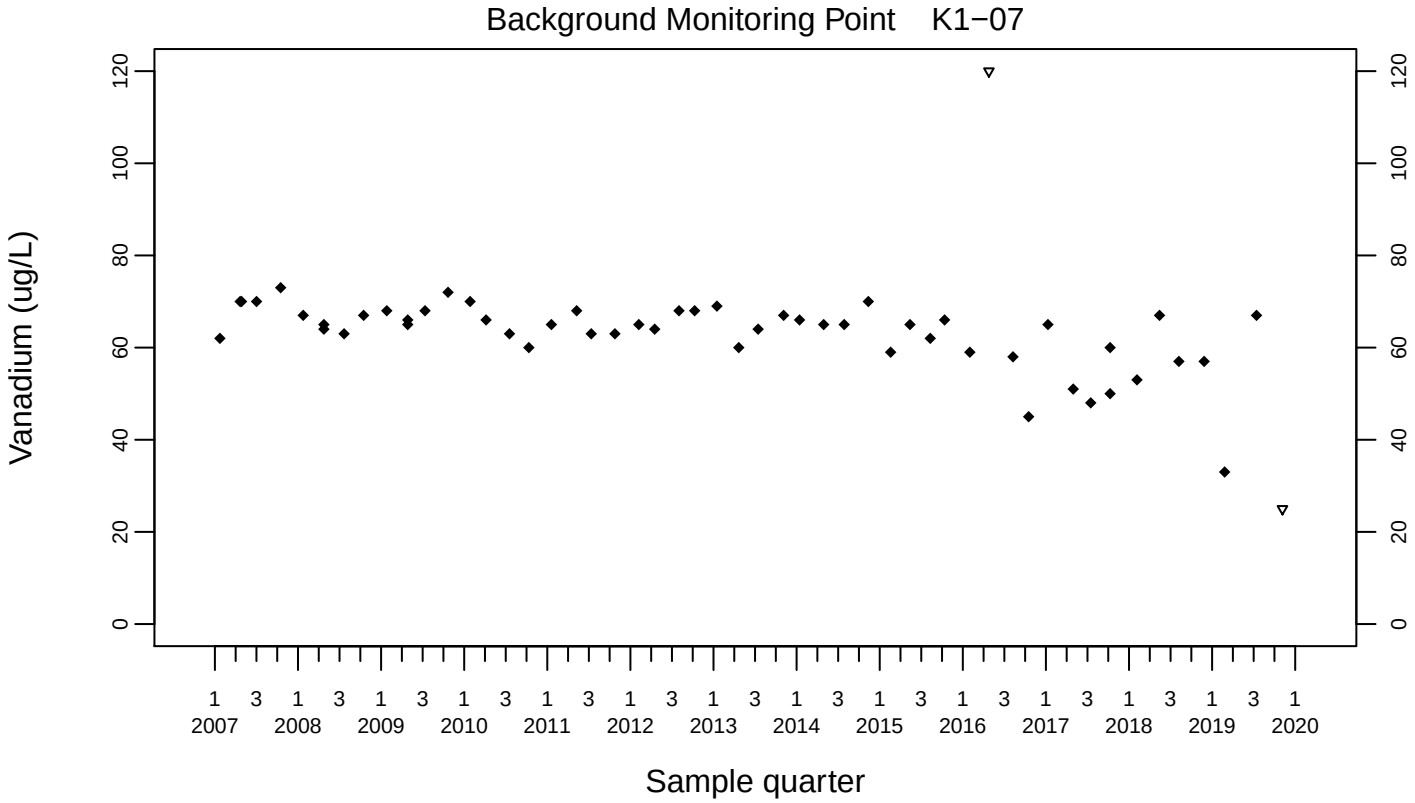

Pit 1 Area
Nickel (ug/L)
SL=13
Above RL
Below RL
Detection Monitoring Point K1−05
Nickel (ug/L)
SL
Sample quarter
0
10
20
30
40
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

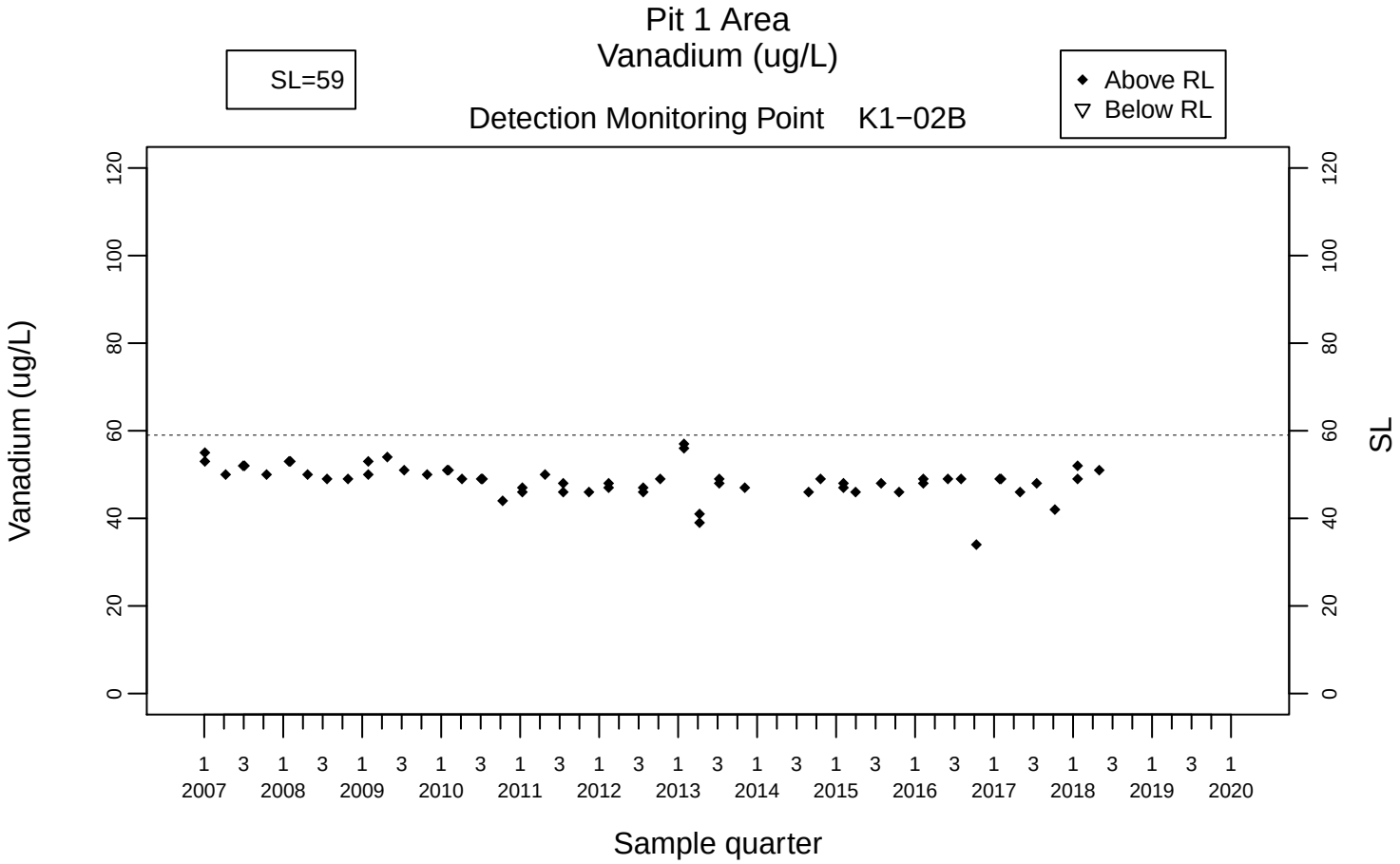

SL=5
Crossgradient Monitoring Point K1−08
Nickel (ug/L)
SL
Sample quarter
0
10
20
30
40
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

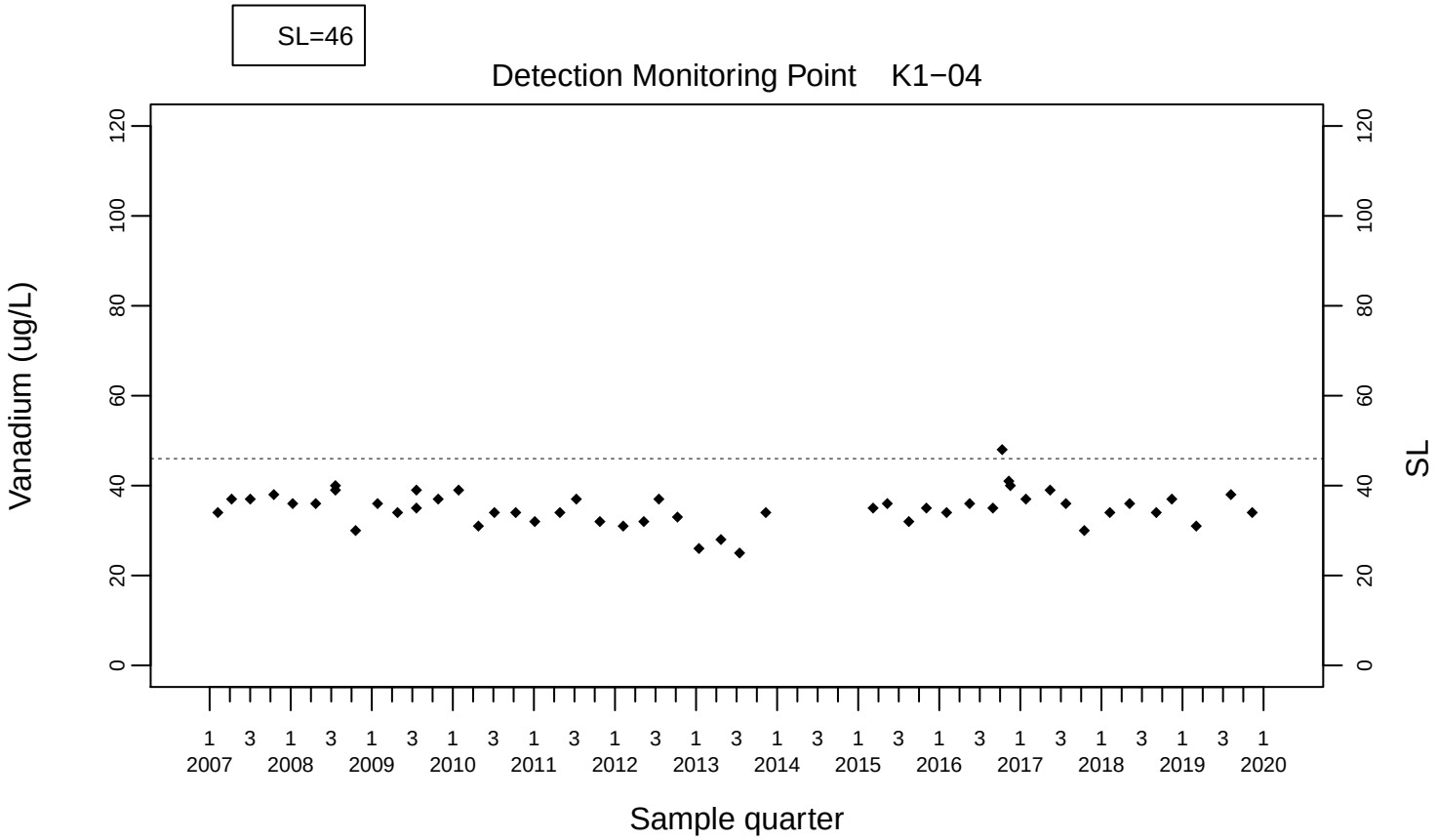

Pit 1 Area
Nickel (ug/L)
SL=5
Above RL
Below RL
Crossgradient Monitoring Point K1−09
Nickel (ug/L)
SL
Sample quarter

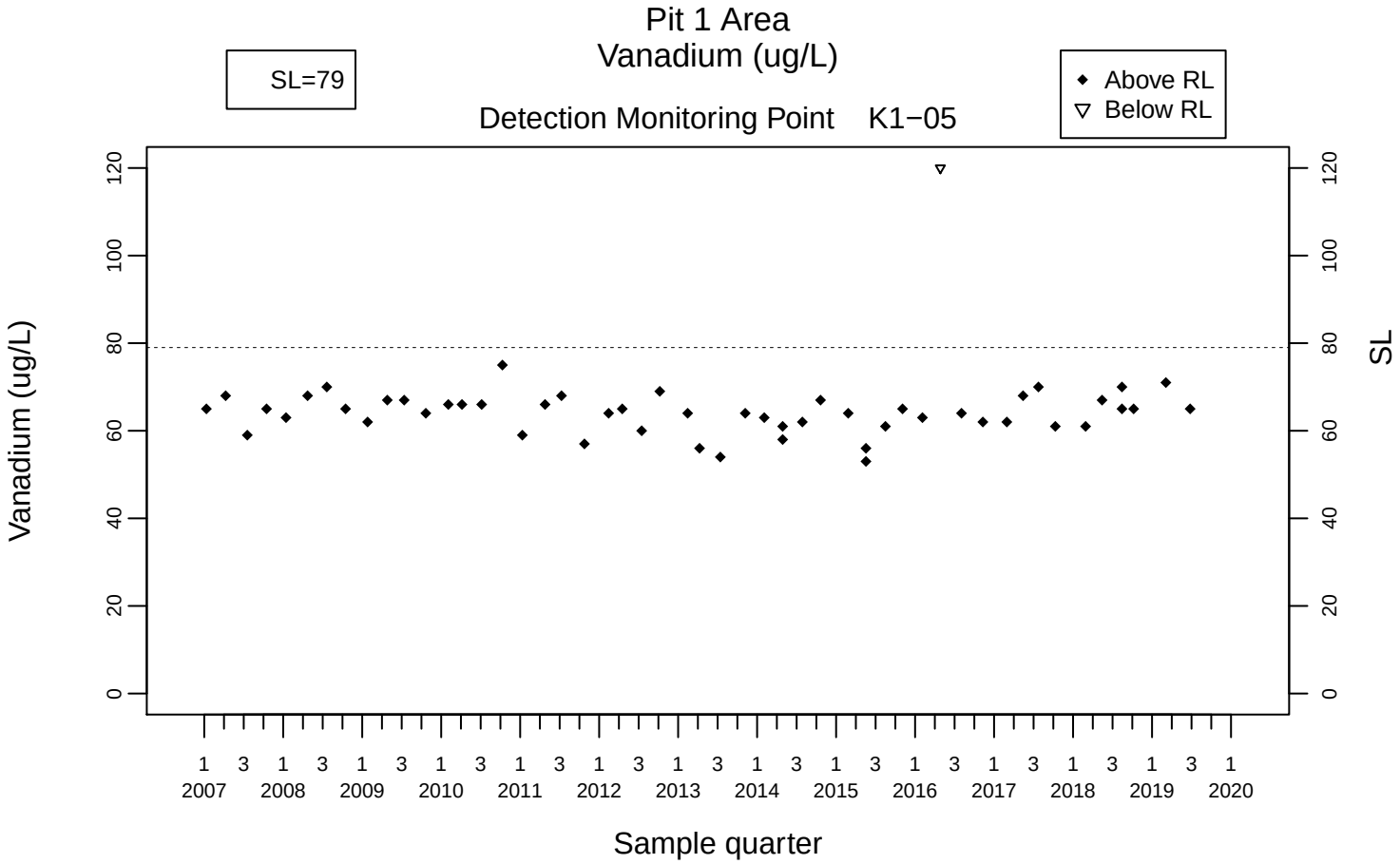

SL=5
Detection Monitoring Point W−PIT1−2326
Nickel (ug/L)
SL
Sample quarter
Data omitted
See Table H−1

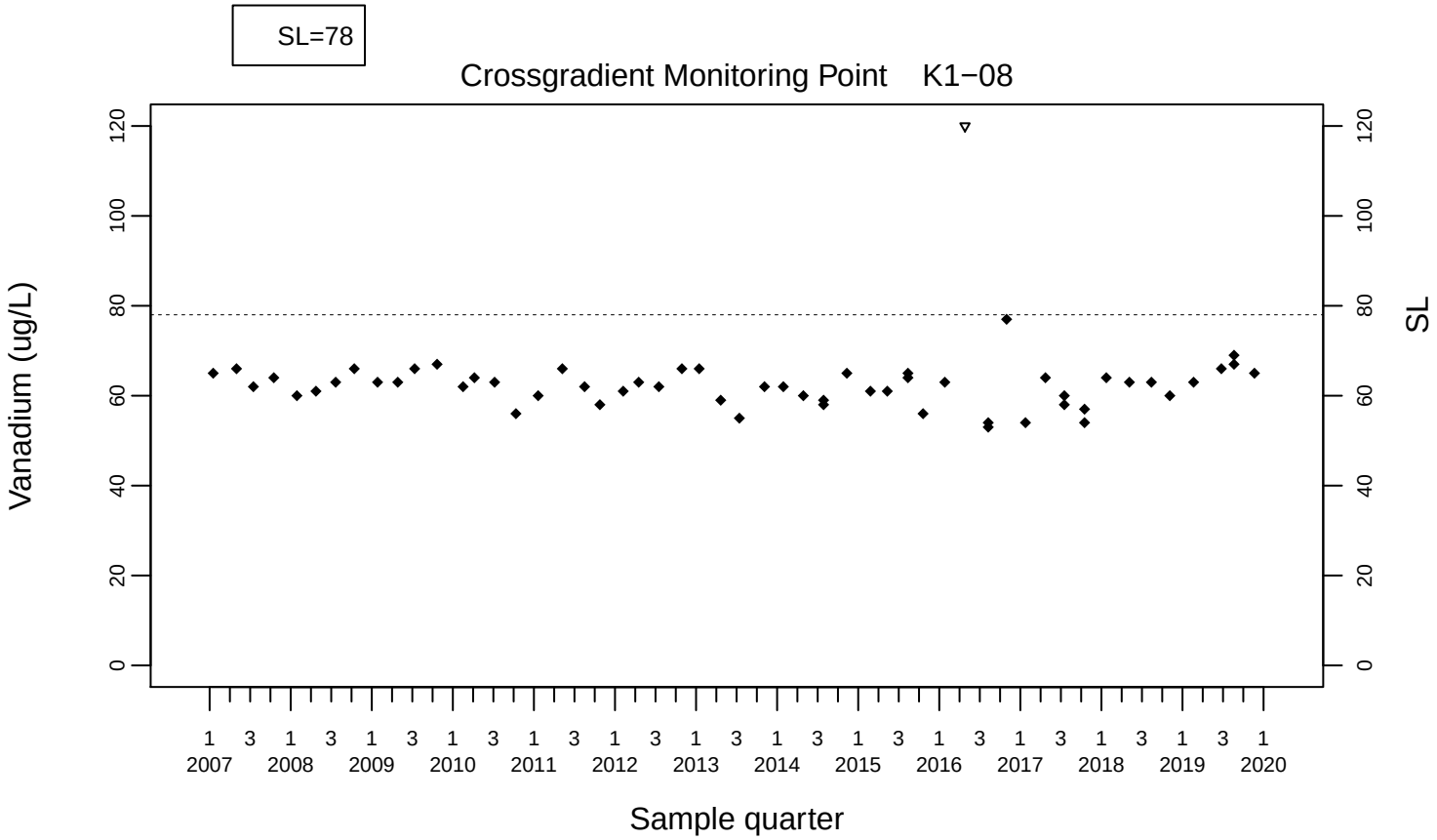

Pit 1 Area
Vanadium (ug/L)
Background Monitoring Point K1−01C
Above RL
Below RL
Vanadium (ug/L)
0
20
40
60
80
100
120
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

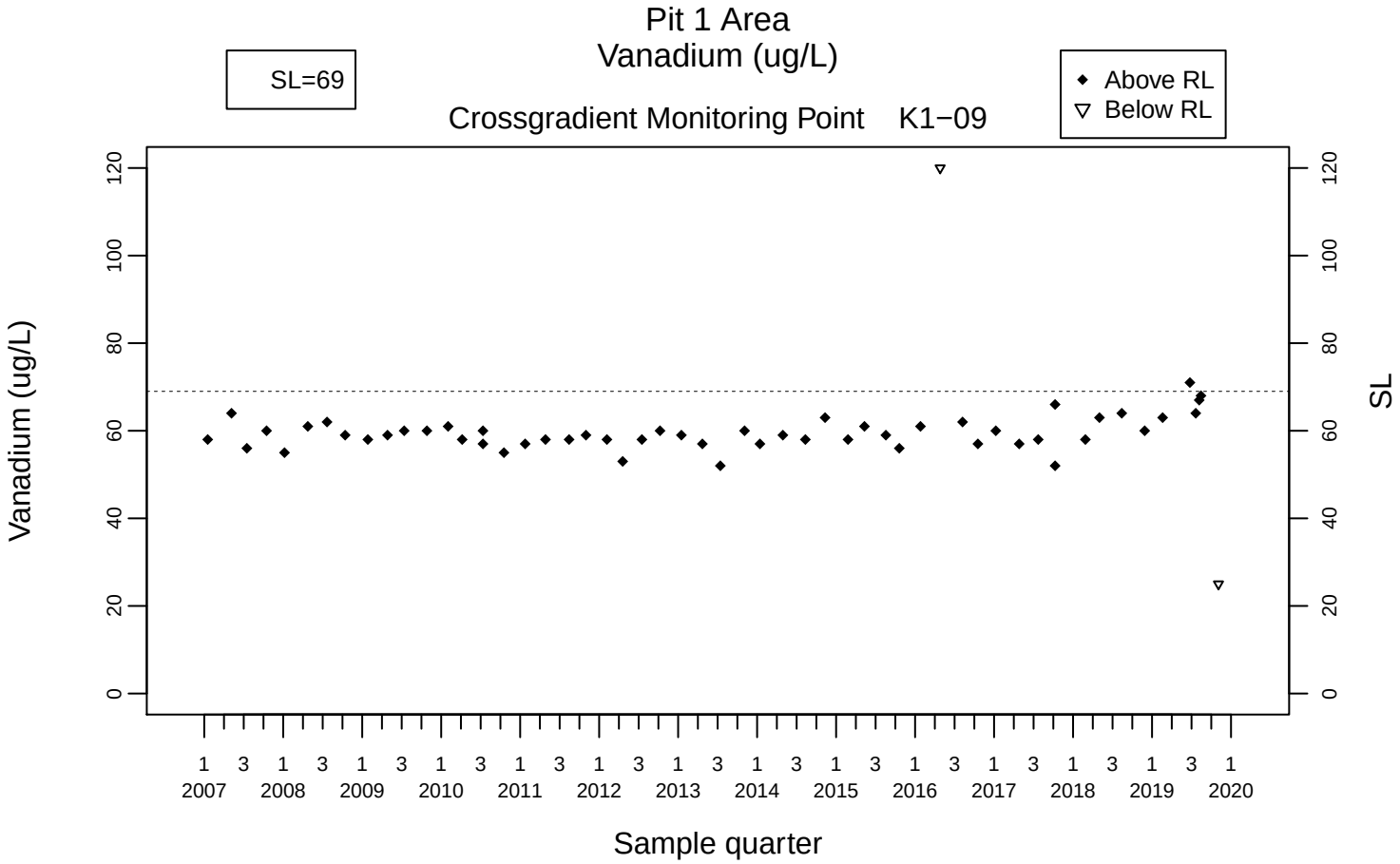

Background Monitoring Point K1−07
Vanadium (ug/L)
0
20
40
60
80
100
120
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

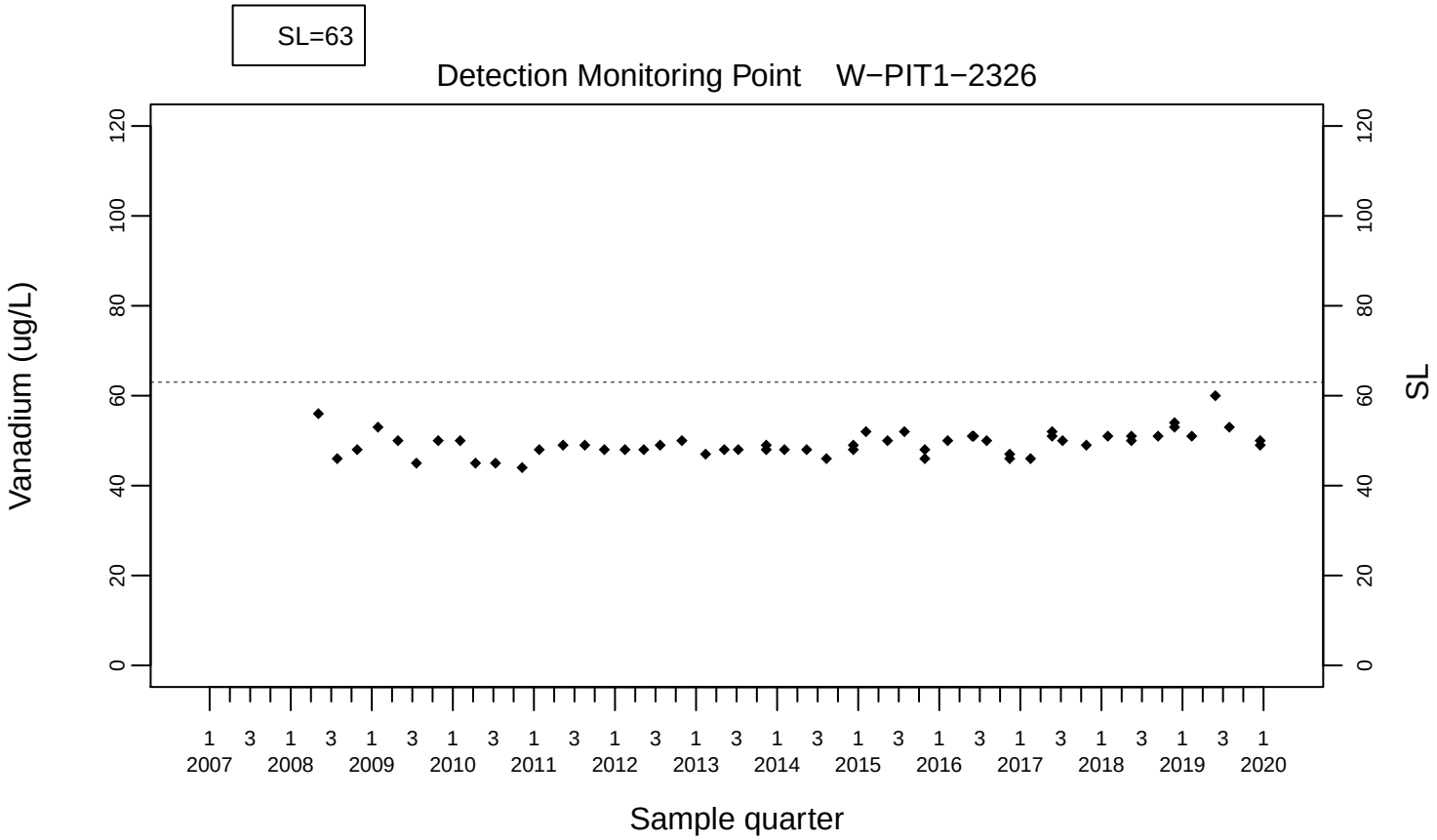

Pit 1 Area
Vanadium (ug/L)
SL=59
Above RL
Below RL
Detection Monitoring Point K1−02B
Vanadium (ug/L)
SL
Sample quarter

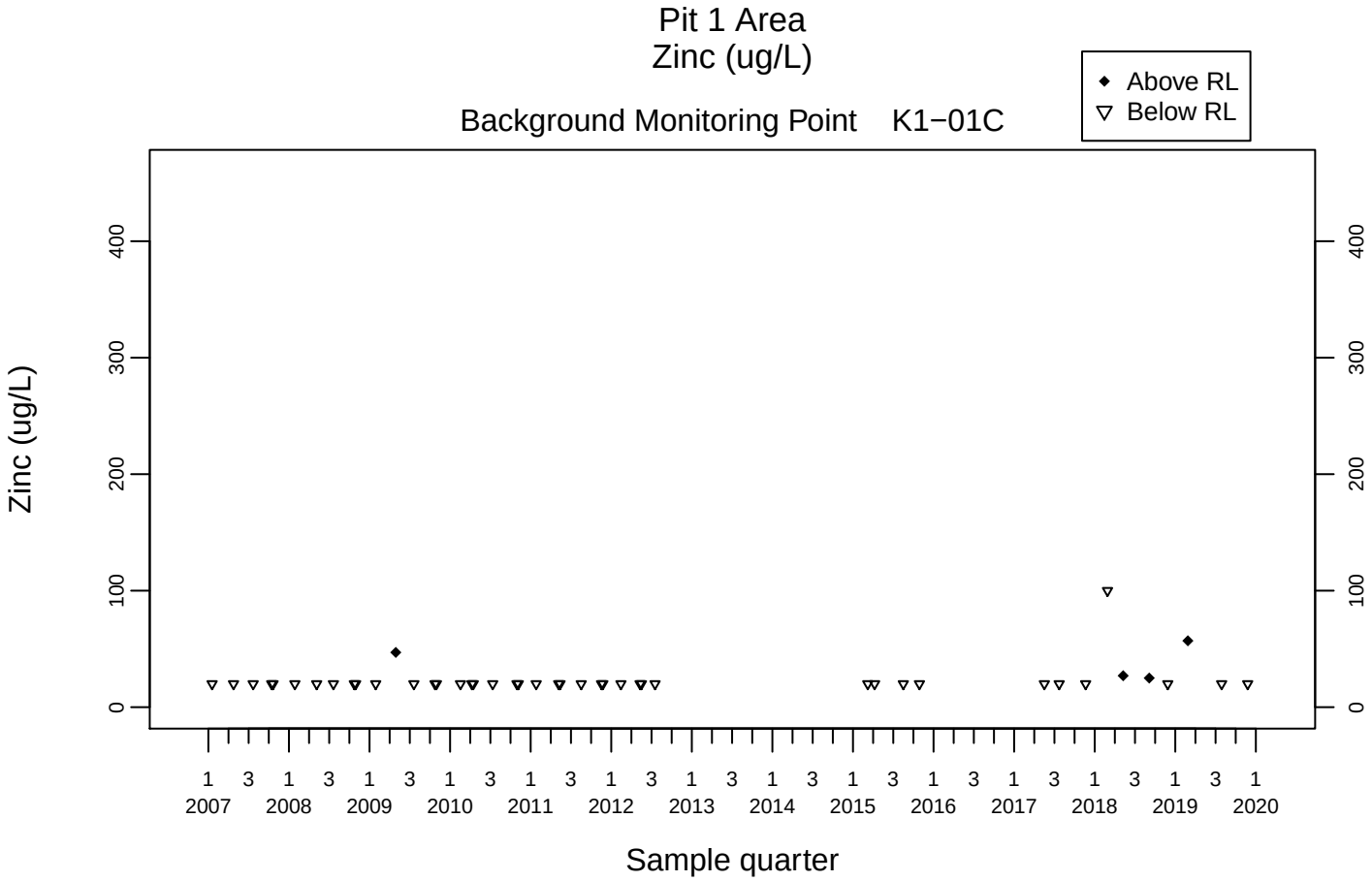

SL=46
Detection Monitoring Point K1−04
Vanadium (ug/L)
SL
Sample quarter

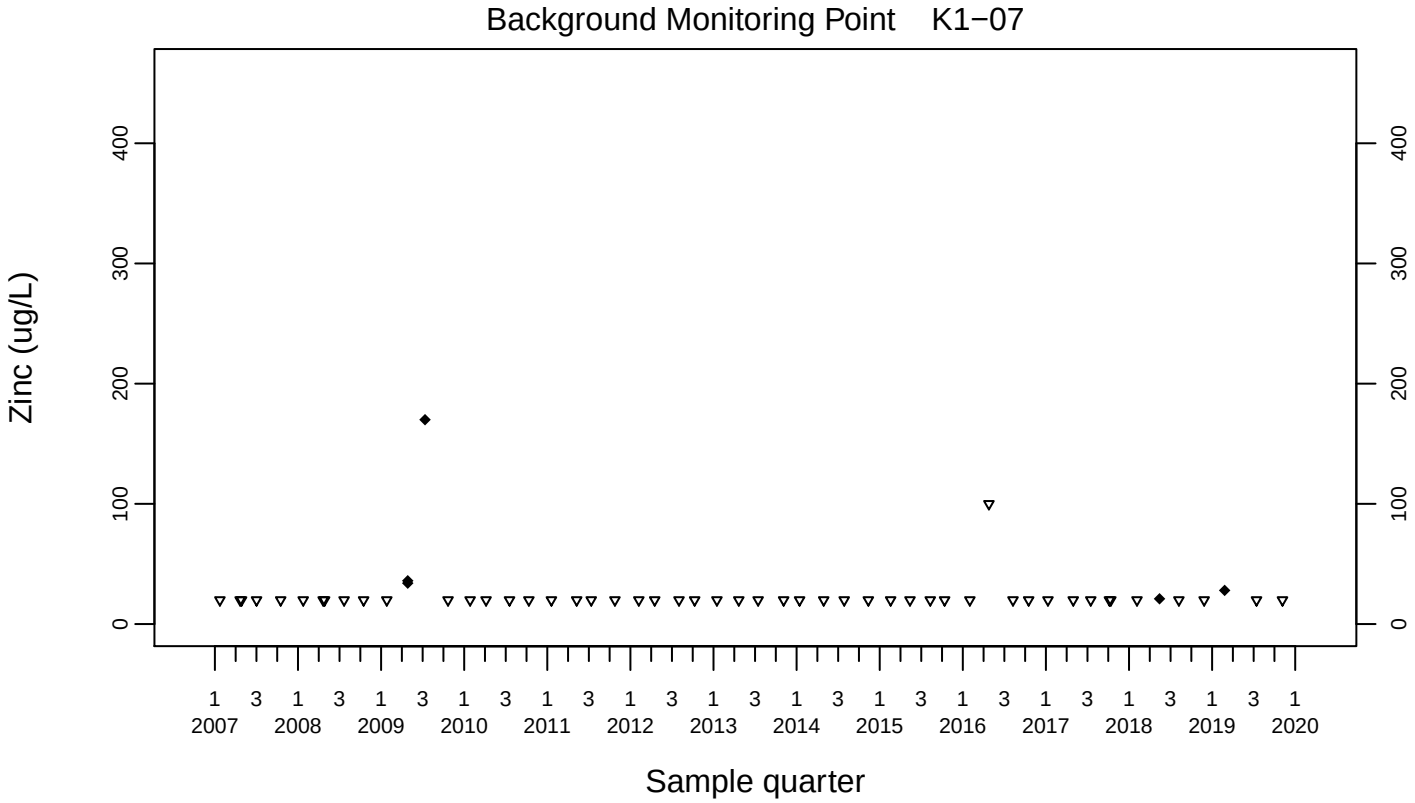

Pit 1 Area
Vanadium (ug/L)
SL=79
Above RL
Below RL
Detection Monitoring Point K1−05
Vanadium (ug/L)
SL
Sample quarter

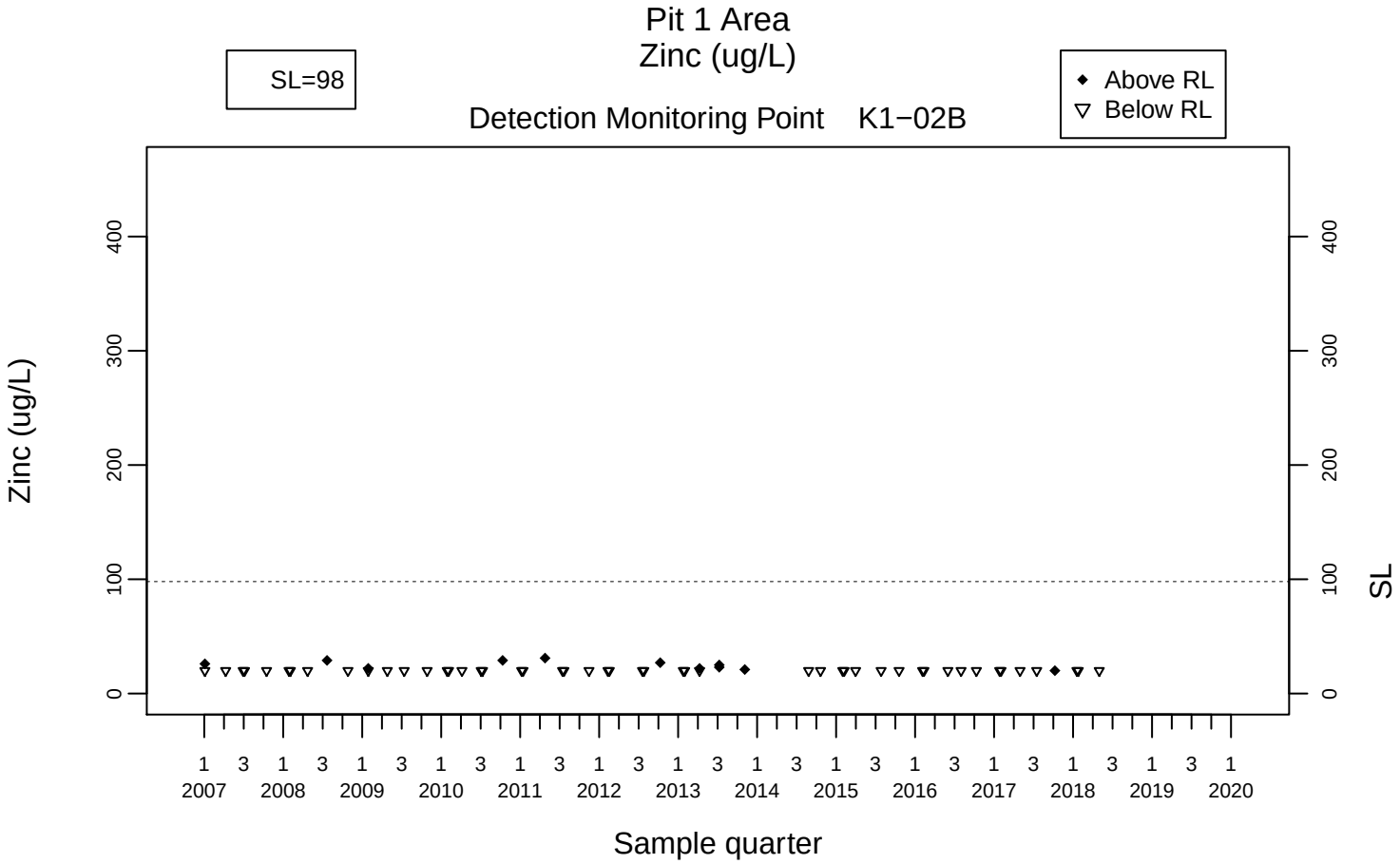

SL=78
Crossgradient Monitoring Point K1−08
Vanadium (ug/L)
SL
Sample quarter

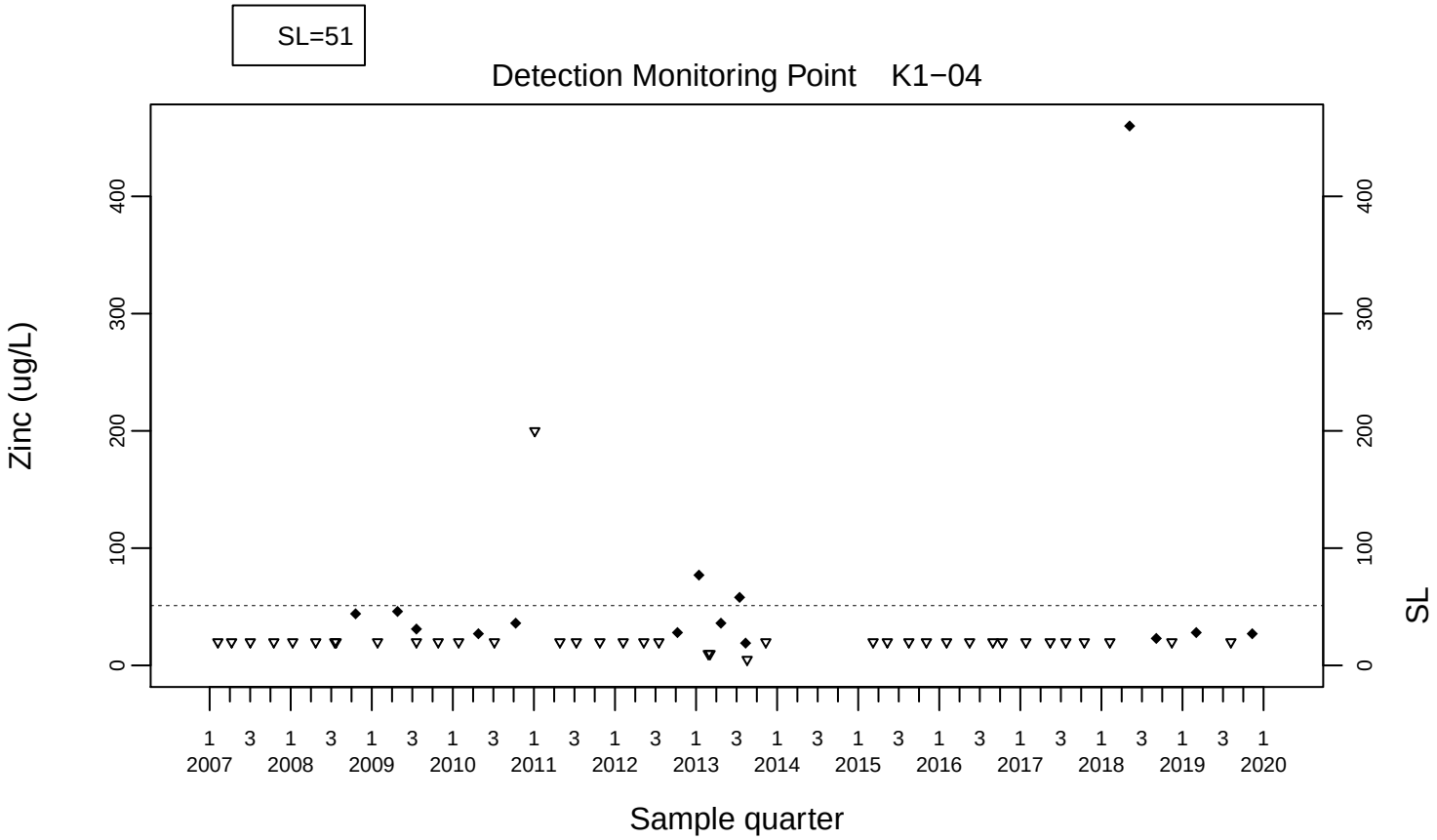

Pit 1 Area
Vanadium (ug/L)
SL=69
Crossgradient Monitoring Point K1−09
Above RL
Below RL
Vanadium (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

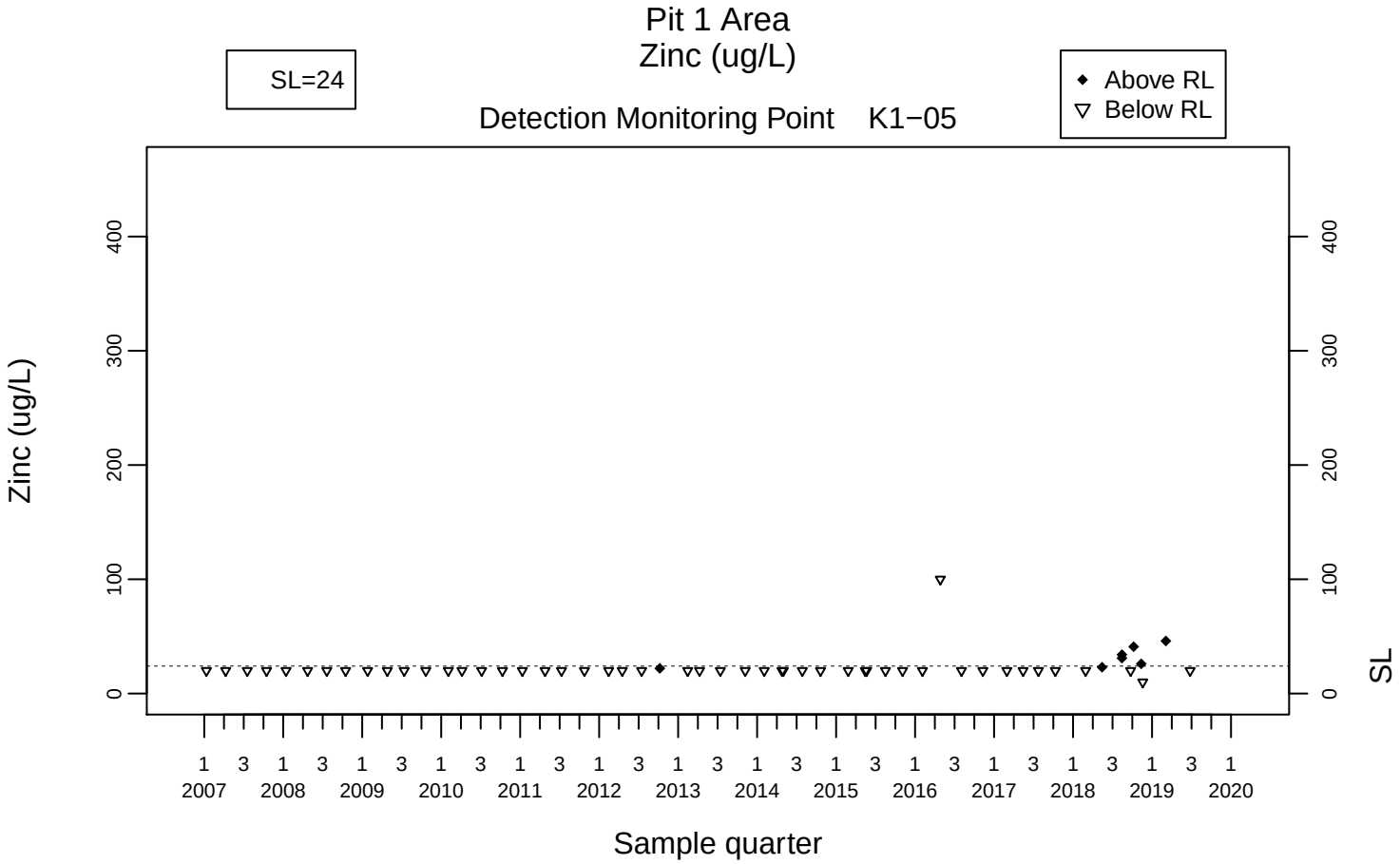

SL=63
Detection Monitoring Point W−PIT1−2326
Vanadium (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

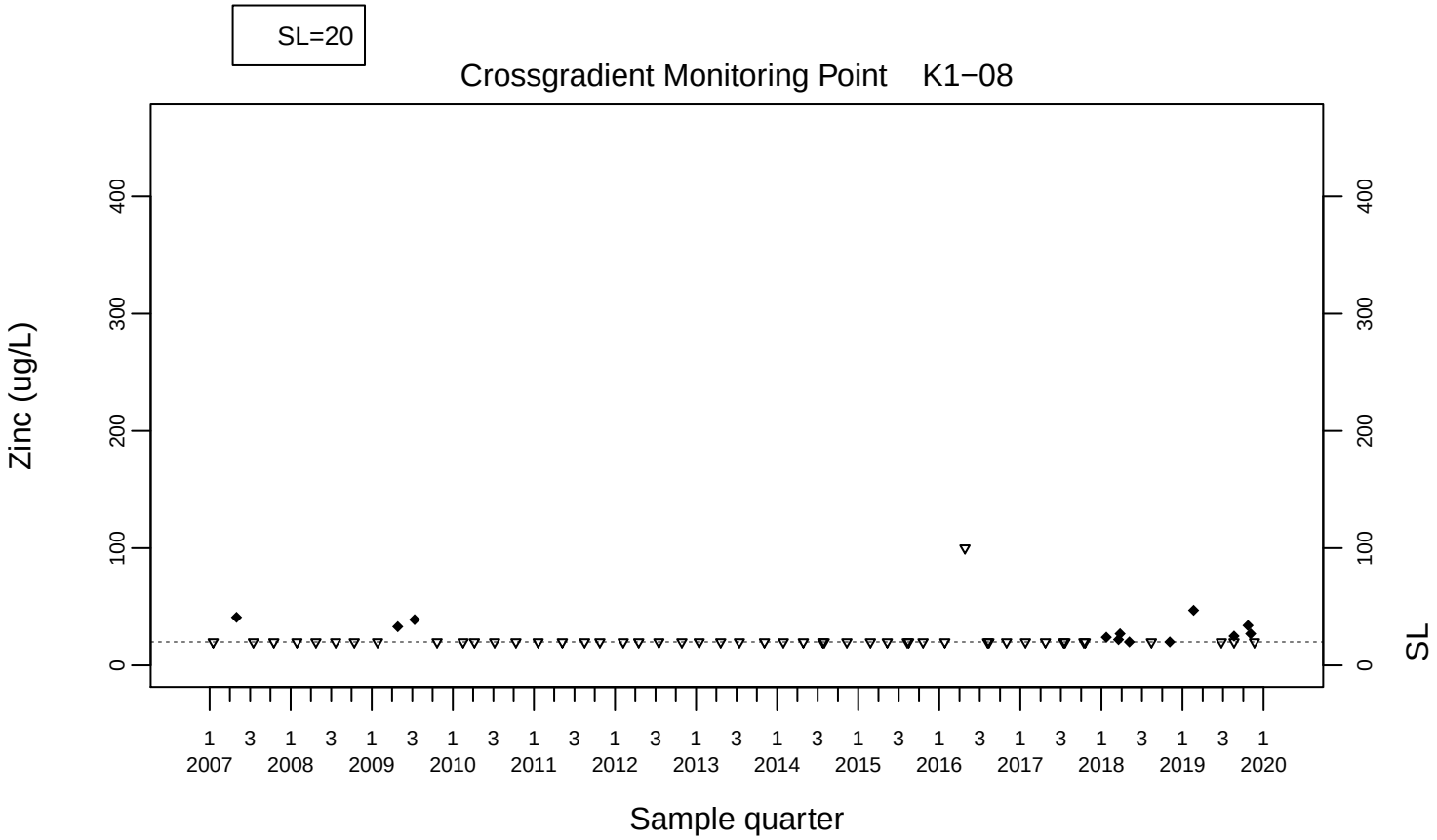

Pit 1 Area
Zinc (ug/L)
Background Monitoring Point K1−01C
Above RL
Below RL
Zinc (ug/L)
0
100
200
300
400
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

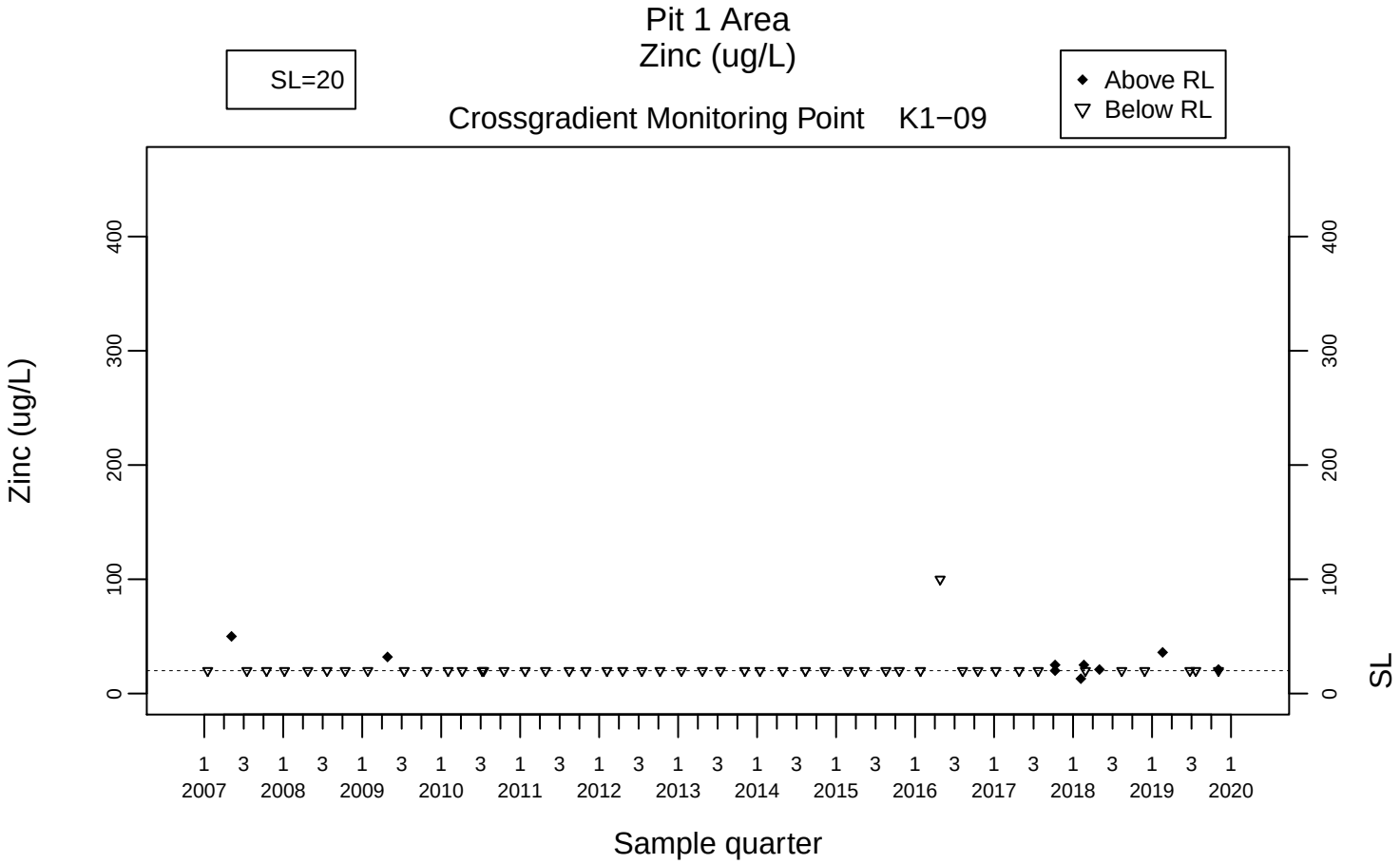

Background Monitoring Point K1−07
Zinc (ug/L)
0
100
200
300
400
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

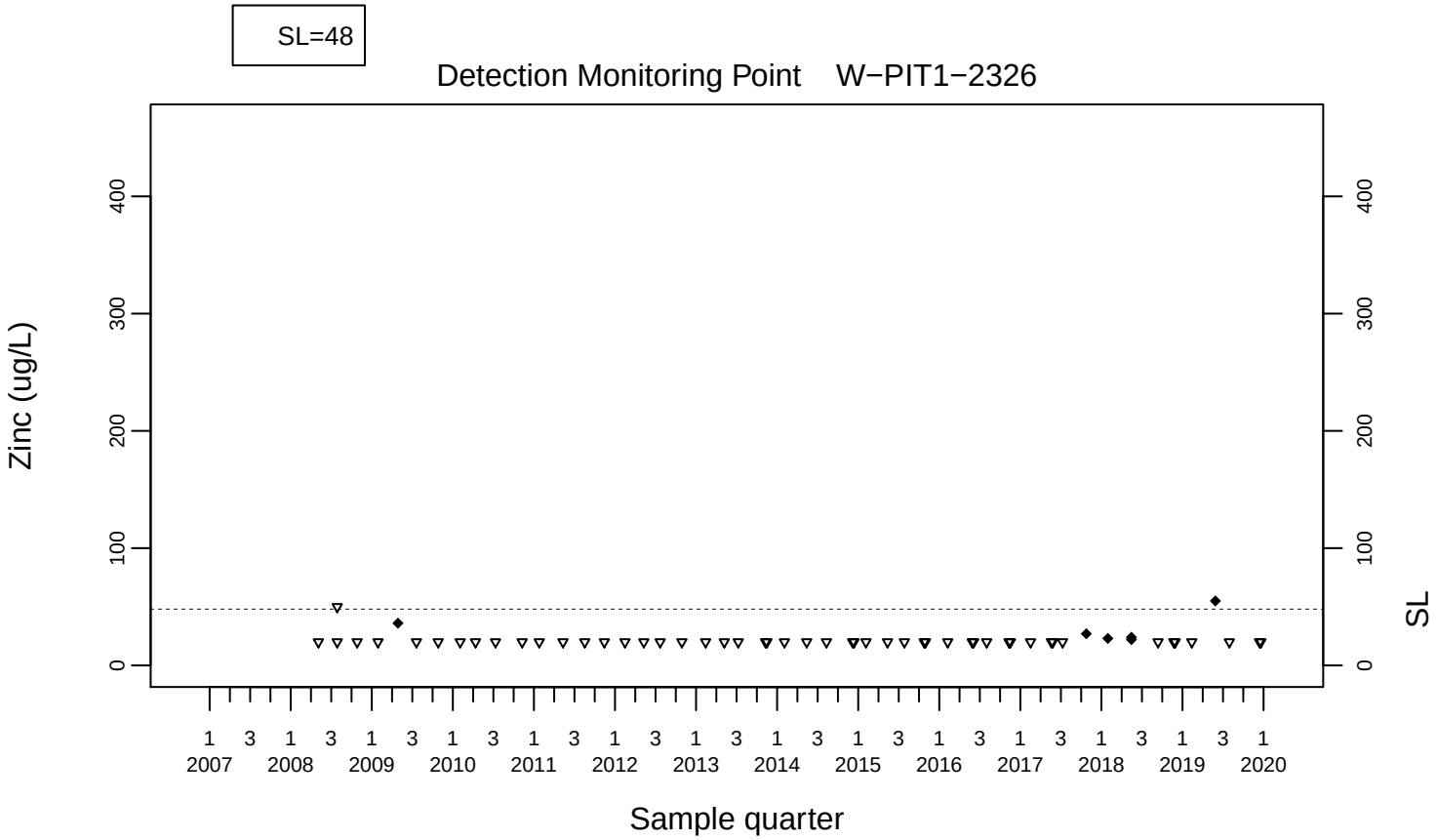

Pit 1 Area
Zinc (ug/L)
SL=98
Above RL
Below RL
Detection Monitoring Point K1−02B
Zinc (ug/L)
SL
Sample quarter

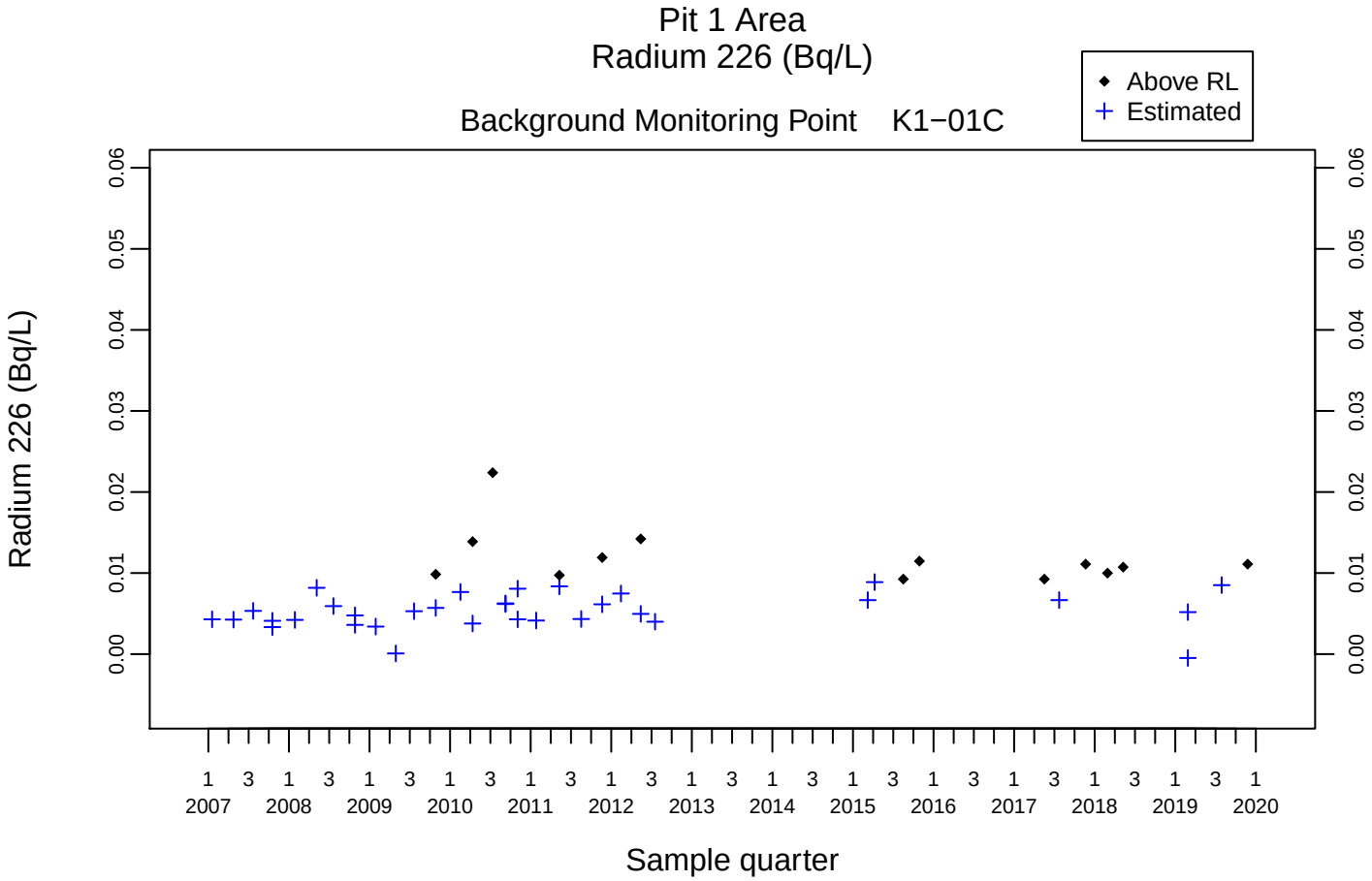

SL=51
Detection Monitoring Point K1−04
Zinc (ug/L)
SL
Sample quarter

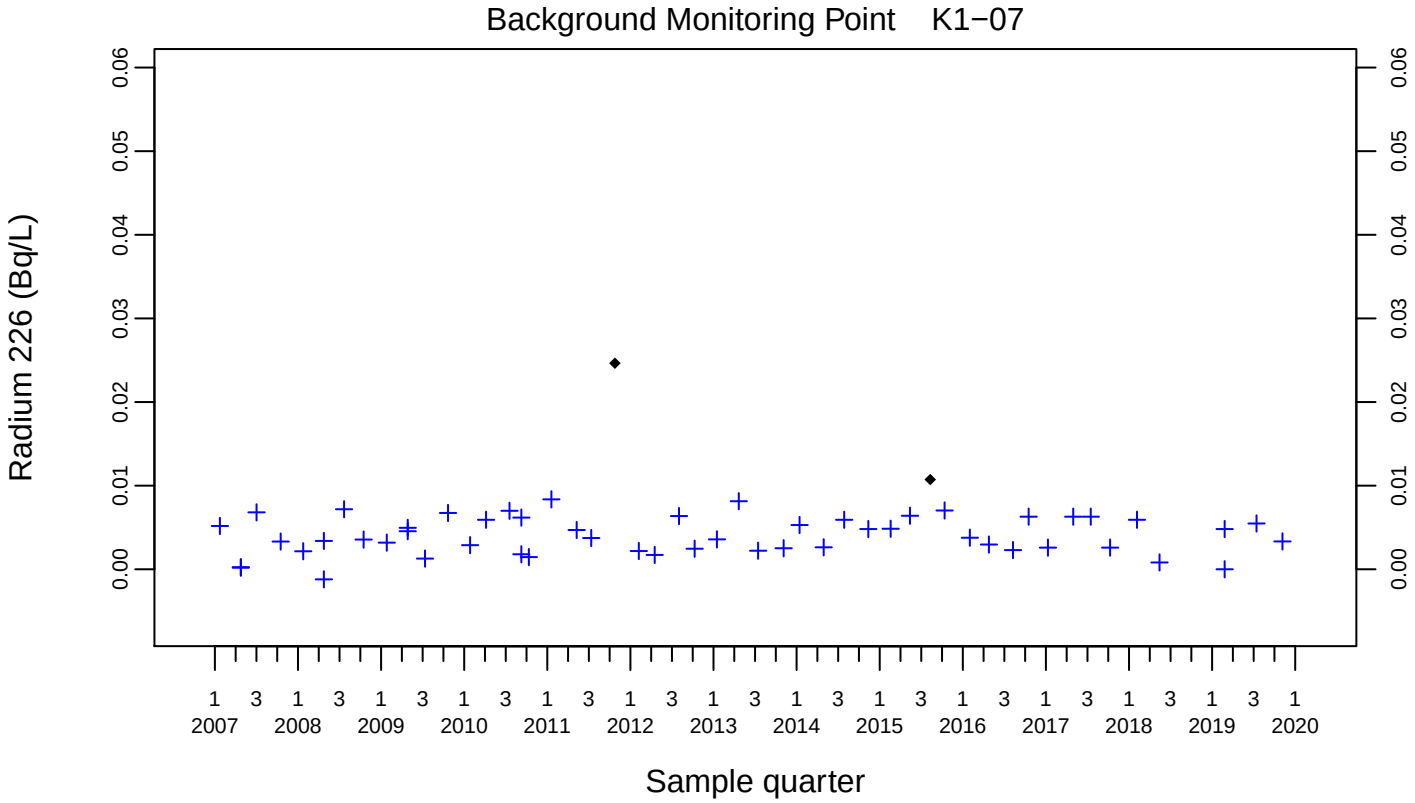

Pit 1 Area
Zinc (ug/L)
SL=24
Above RL
Below RL
Detection Monitoring Point K1−05
Zinc (ug/L)
SL
Sample quarter

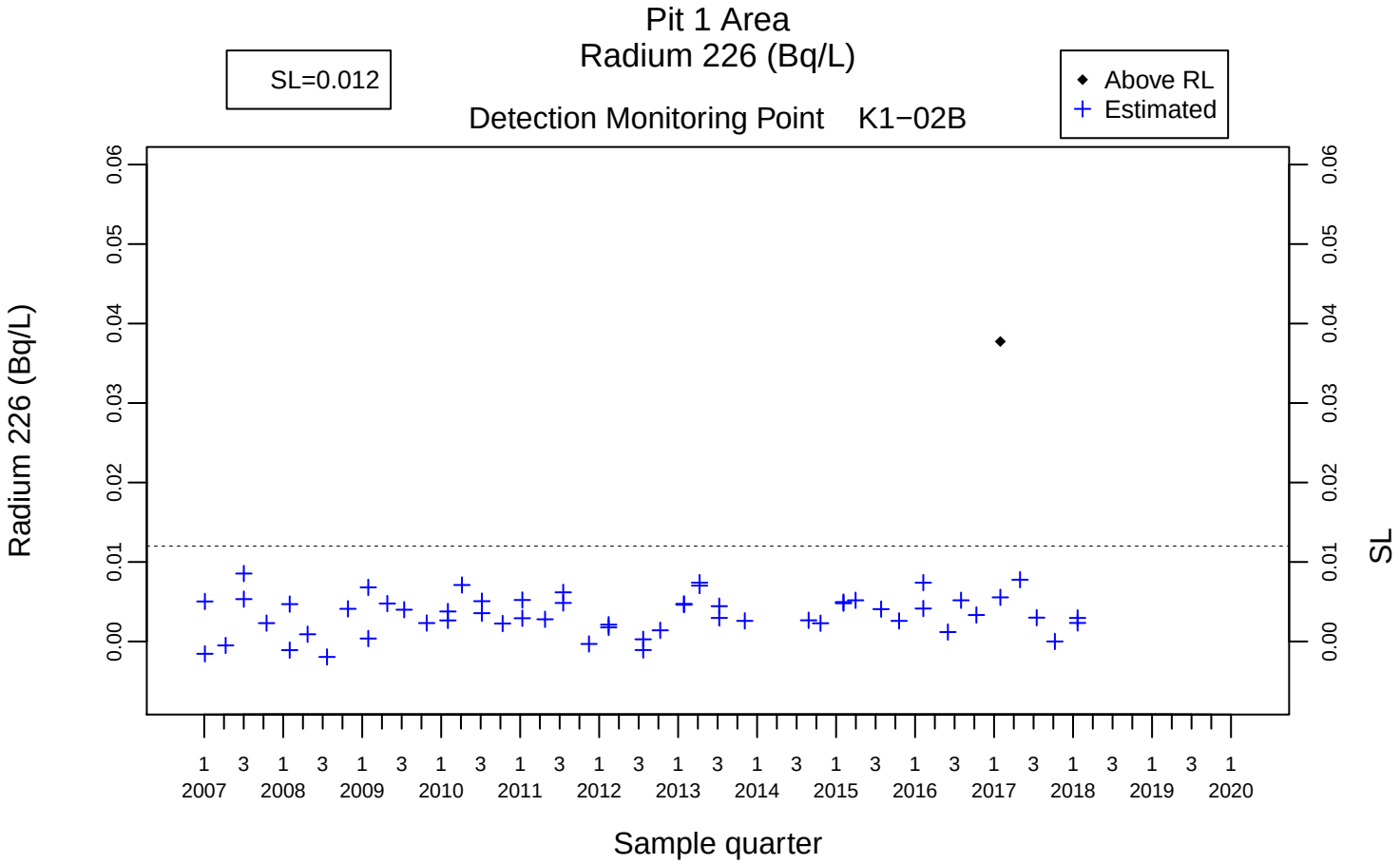

SL=20
Crossgradient Monitoring Point K1−08
Zinc (ug/L)
SL
Sample quarter

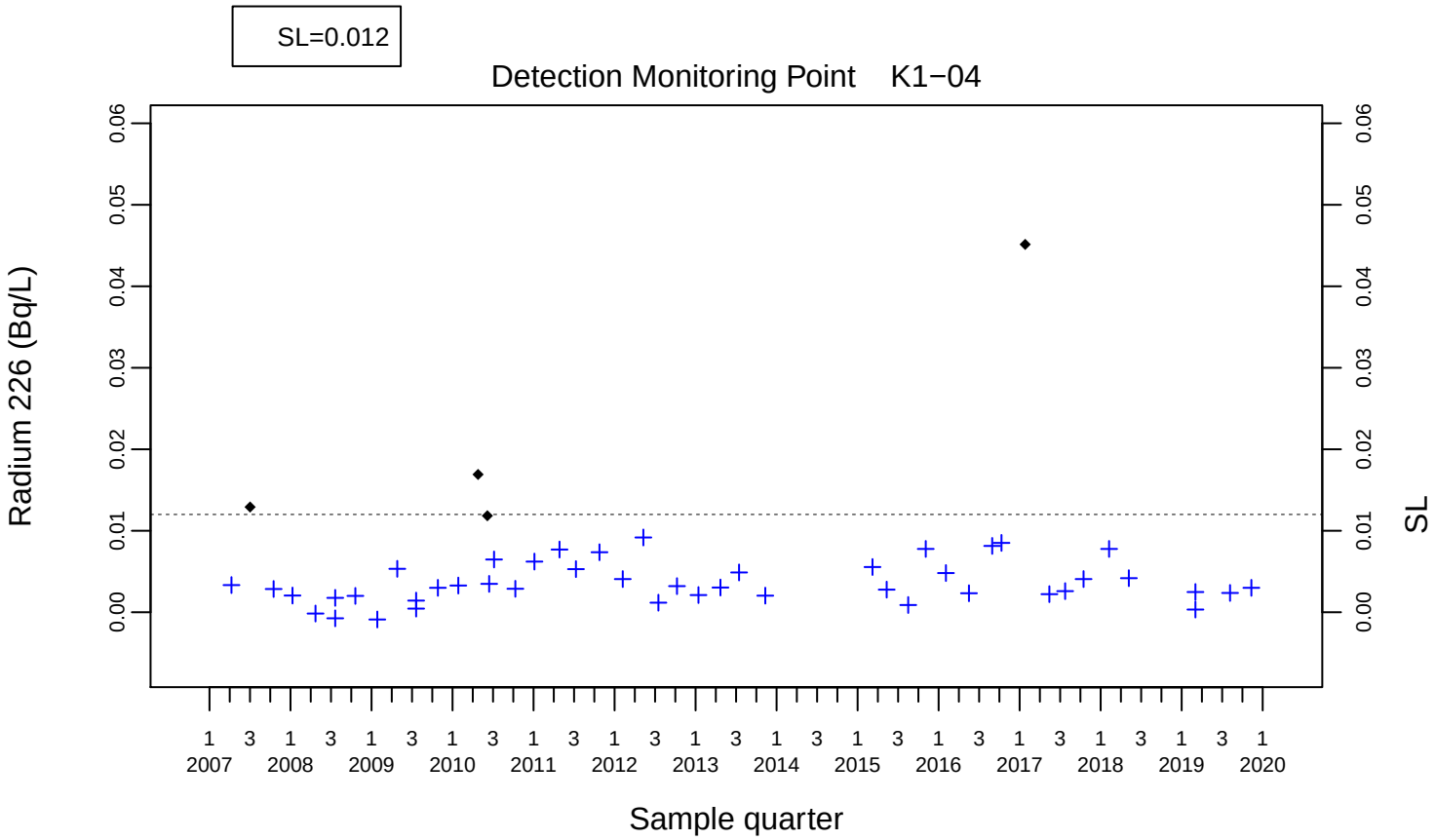

Pit 1 Area
Zinc (ug/L)
SL=20
Crossgradient Monitoring Point K1−09
Above RL
Below RL
Zinc (ug/L)
SL
Sample quarter

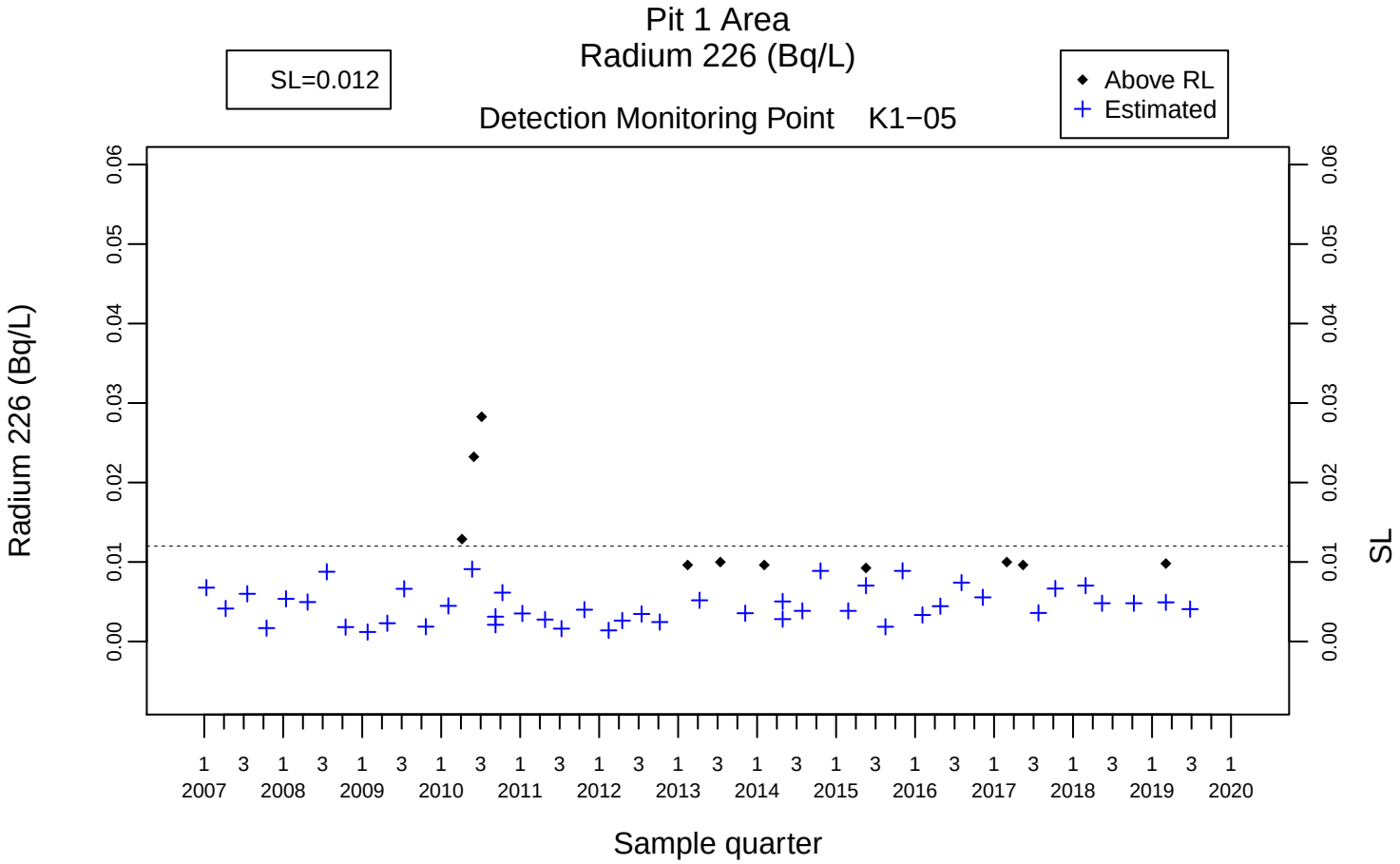

SL=48
Detection Monitoring Point W−PIT1−2326
Zinc (ug/L)
SL
Sample quarter

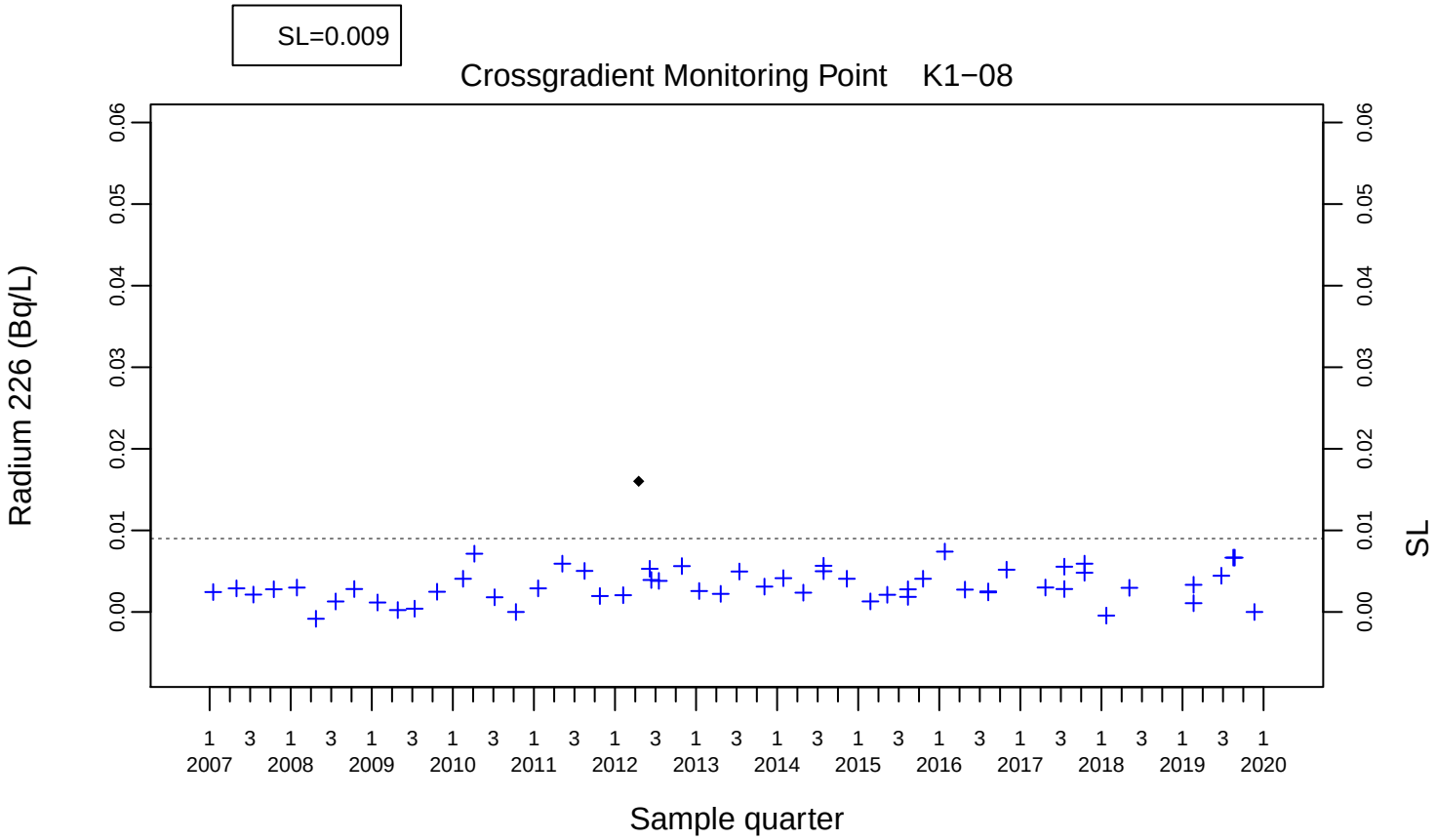

Pit 1 Area
Radium 226 (Bq/L)
Background Monitoring Point K1−01C
Above RL
Estimated
Radium 226 (Bq/L)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

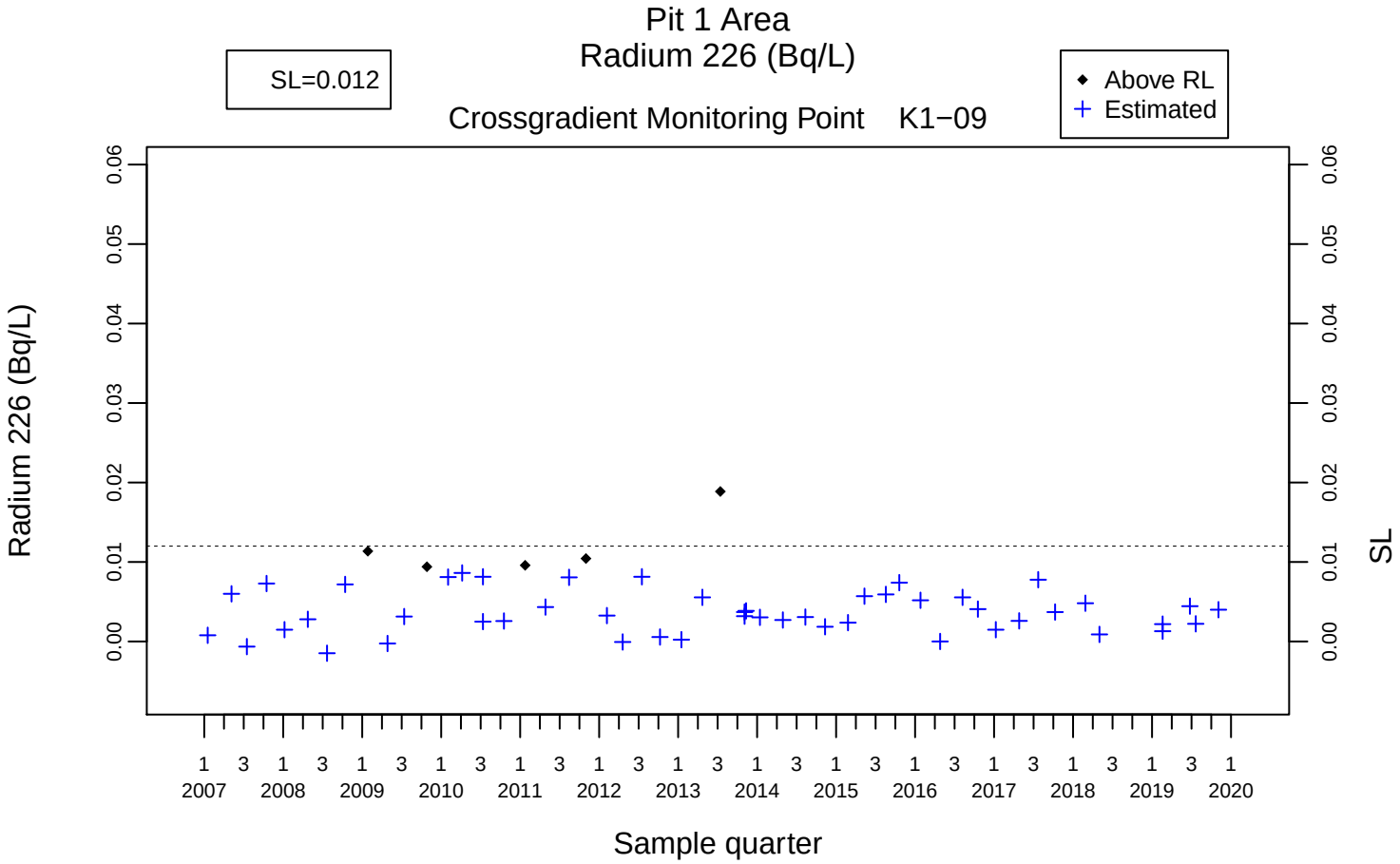

Background Monitoring Point K1−07
Radium 226 (Bq/L)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

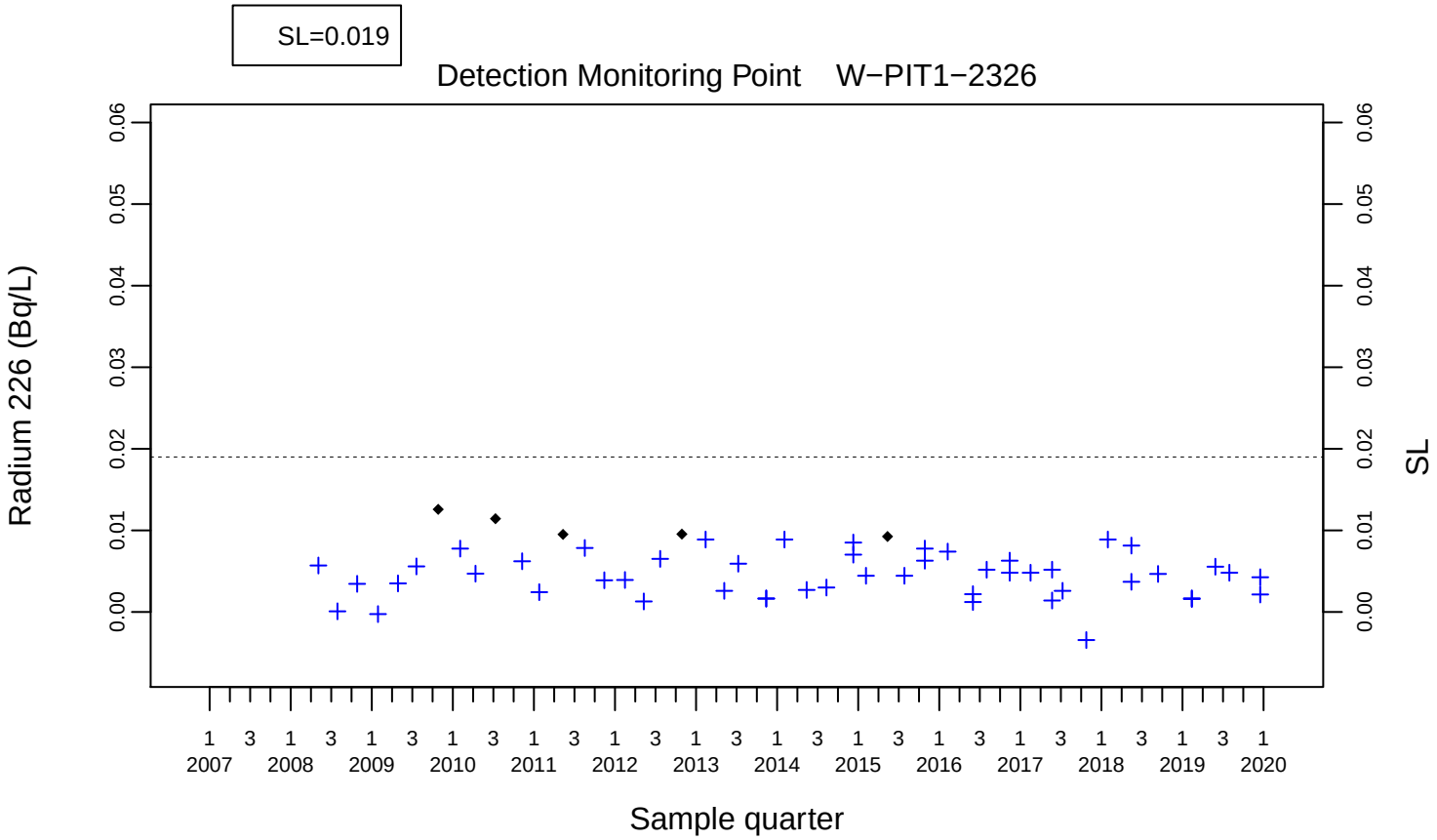

Pit 1 Area
Radium 226 (Bq/L)
SL=0.012
Above RL
Estimated
Detection Monitoring Point K1−02B
Radium 226 (Bq/L)
SL
Sample quarter


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

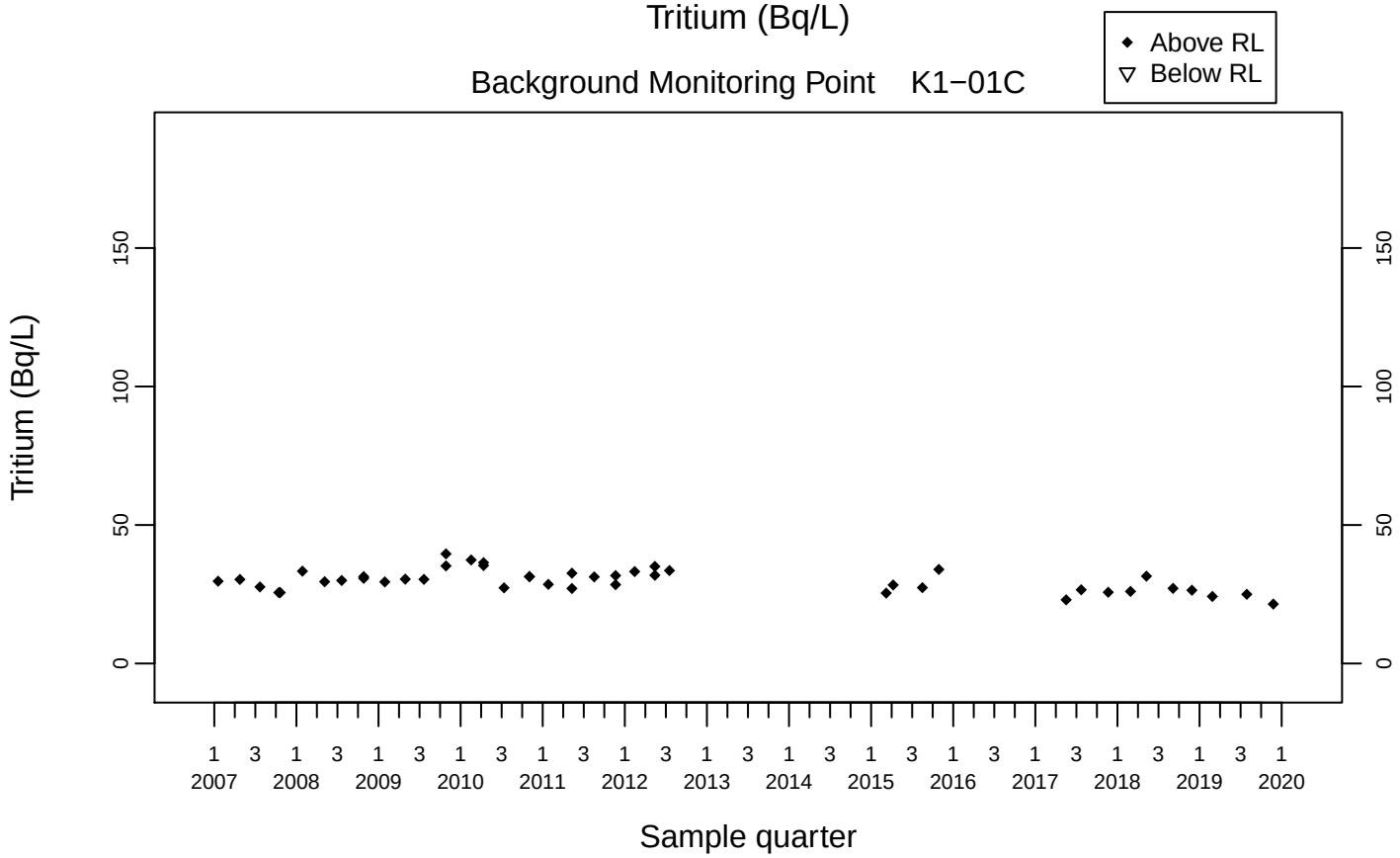

Pit 1 Area
Radium 226 (Bq/L)
SL=0.012
Above RL
Estimated
Detection Monitoring Point K1−05
Radium 226 (Bq/L)
SL
Sample quarter

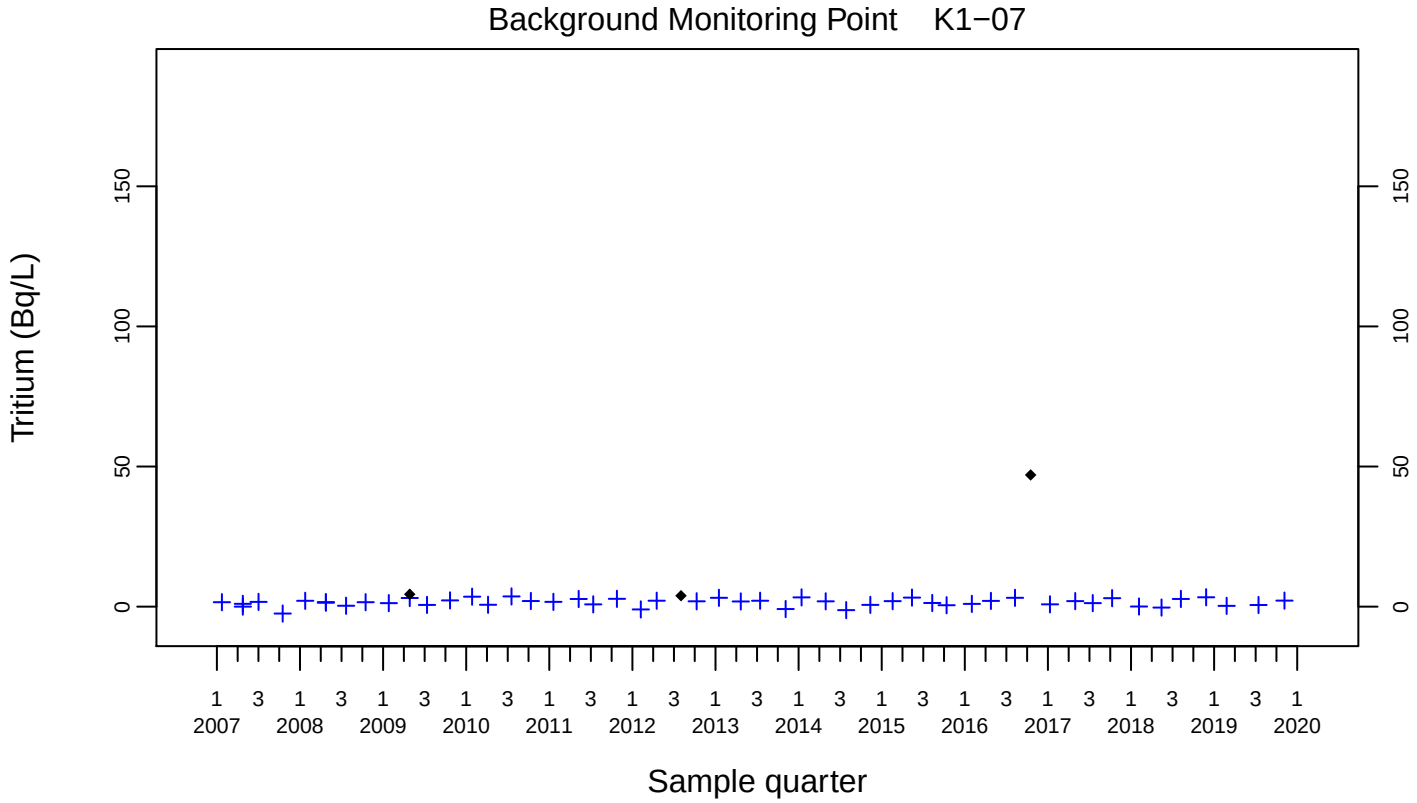

SL=0.009
Crossgradient Monitoring Point K1−08
Radium 226 (Bq/L)
SL
Sample quarter

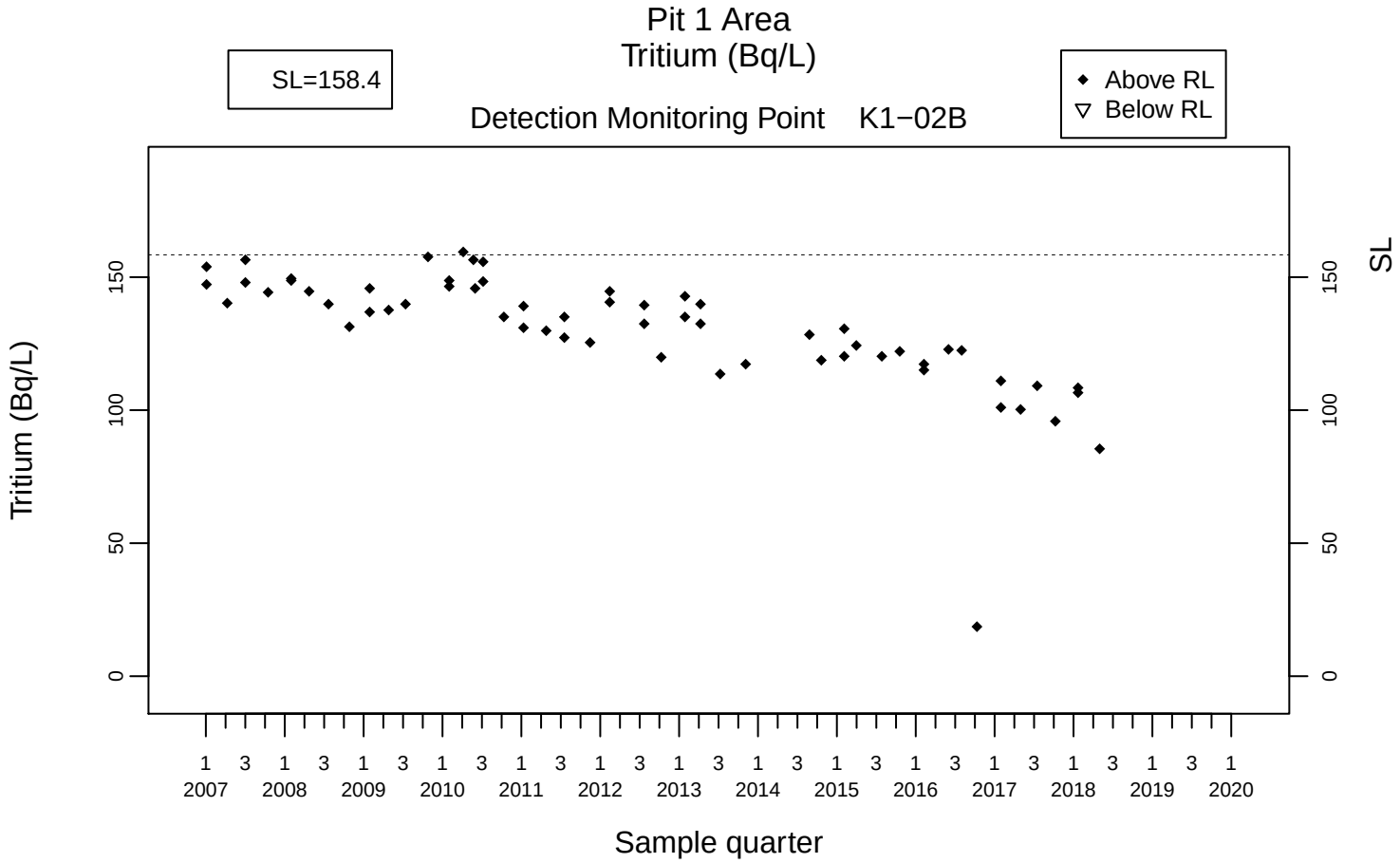

Pit 1 Area
Radium 226 (Bq/L)
SL=0.012
Crossgradient Monitoring Point K1−09
Above RL
Estimated
Radium 226 (Bq/L)
SL
Sample quarter

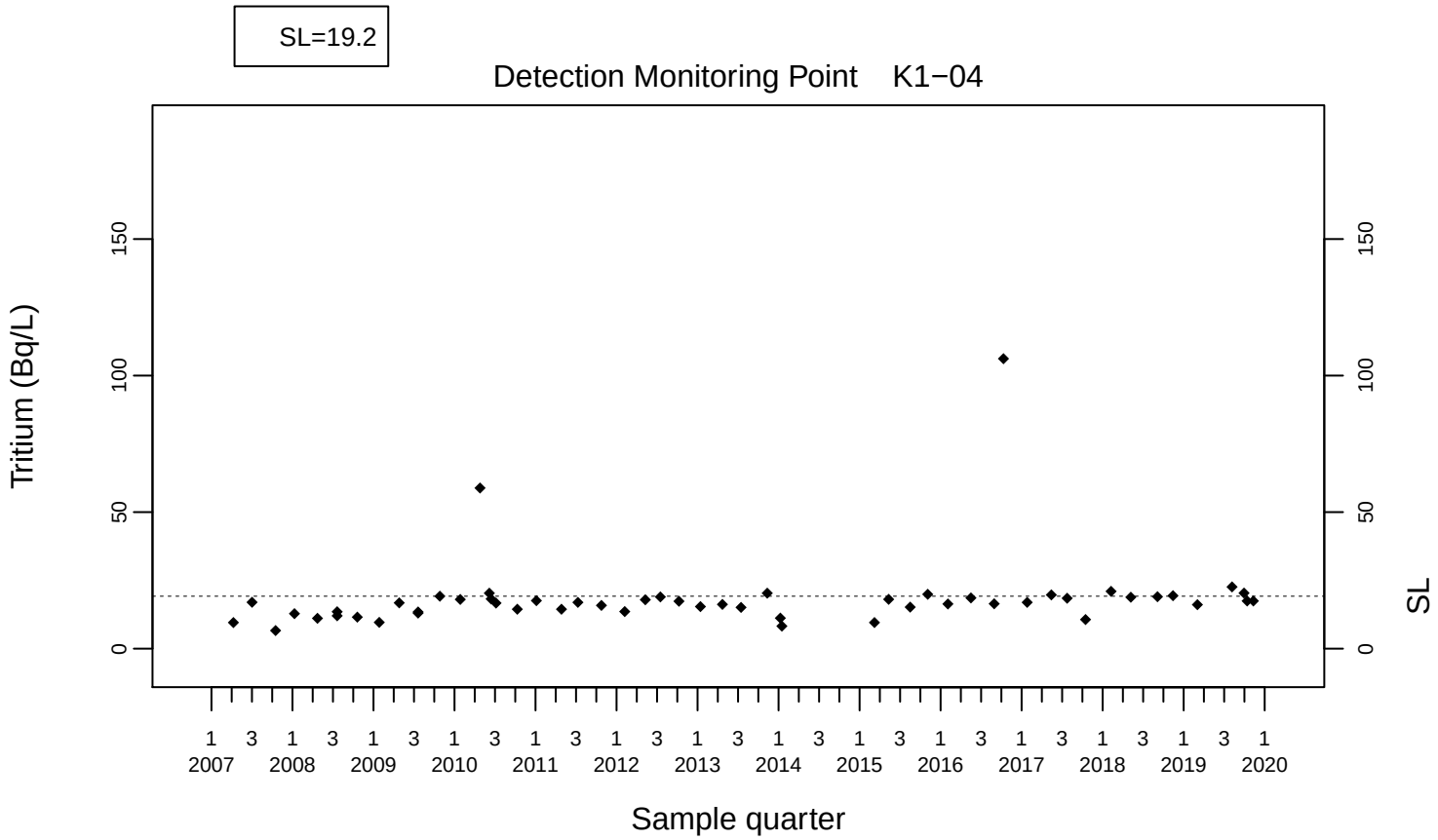

SL=0.019
Detection Monitoring Point W−PIT1−2326
Radium 226 (Bq/L)
SL
Sample quarter

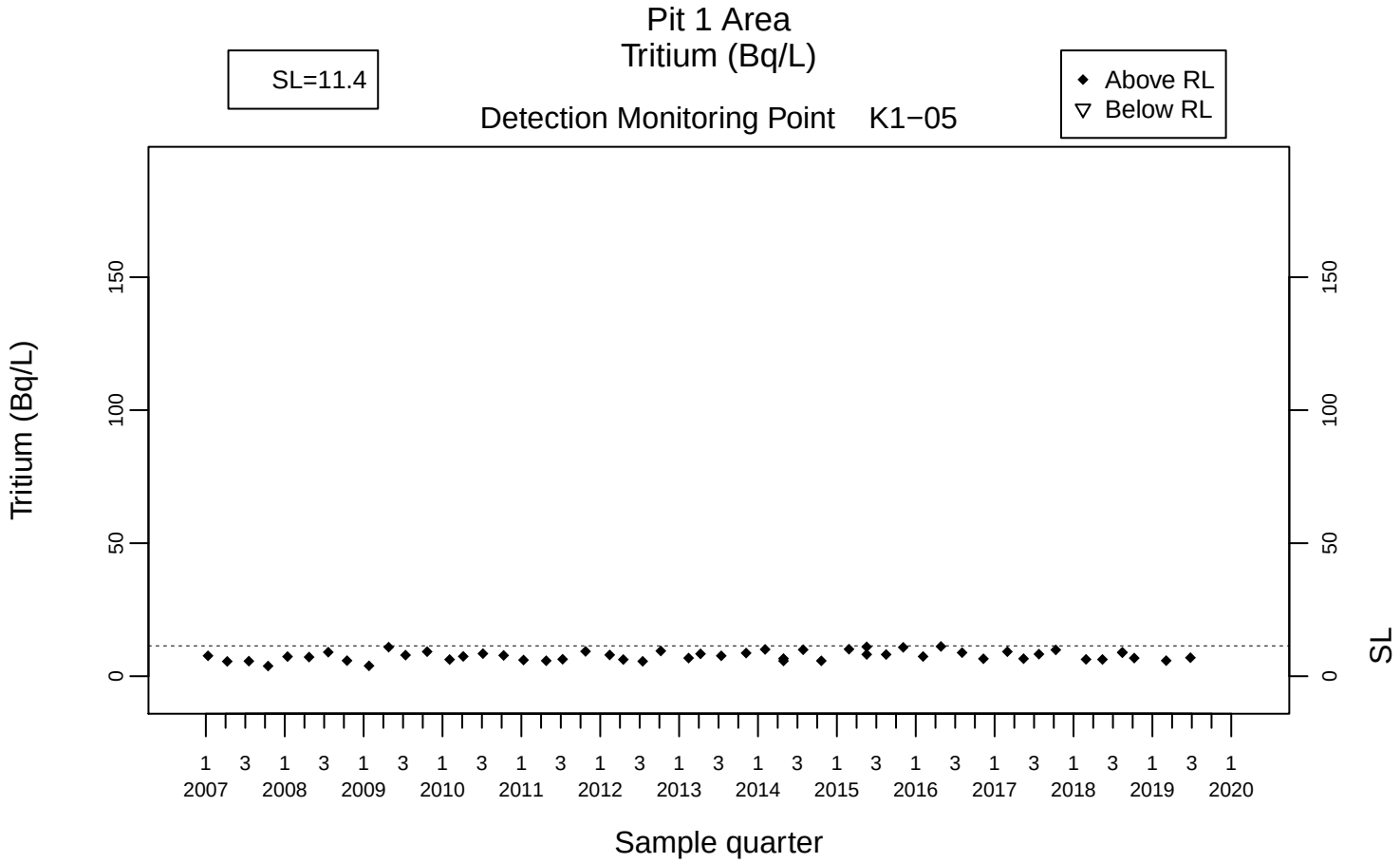
Pit 1 Area
Tritium (Bq/L)

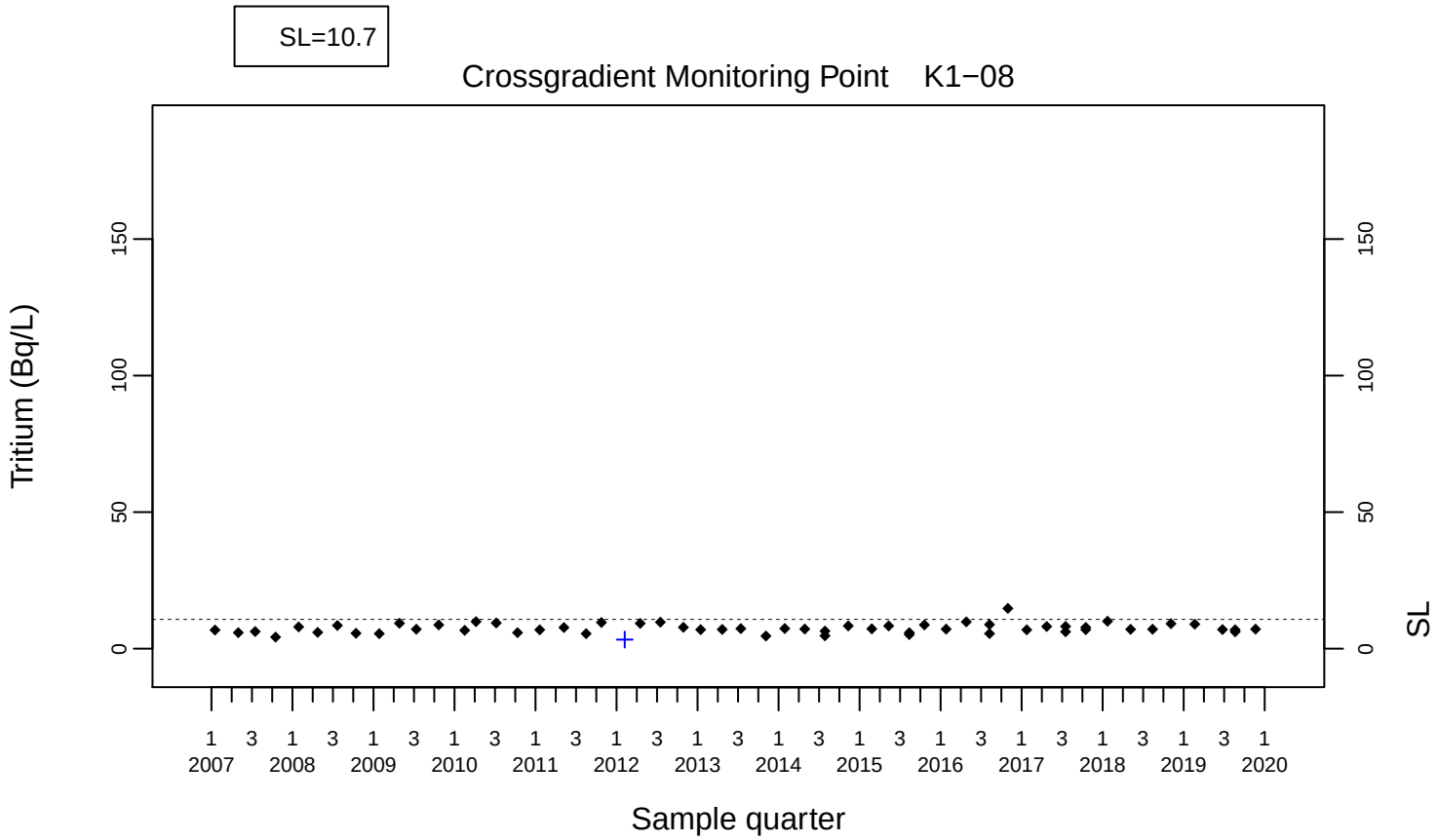


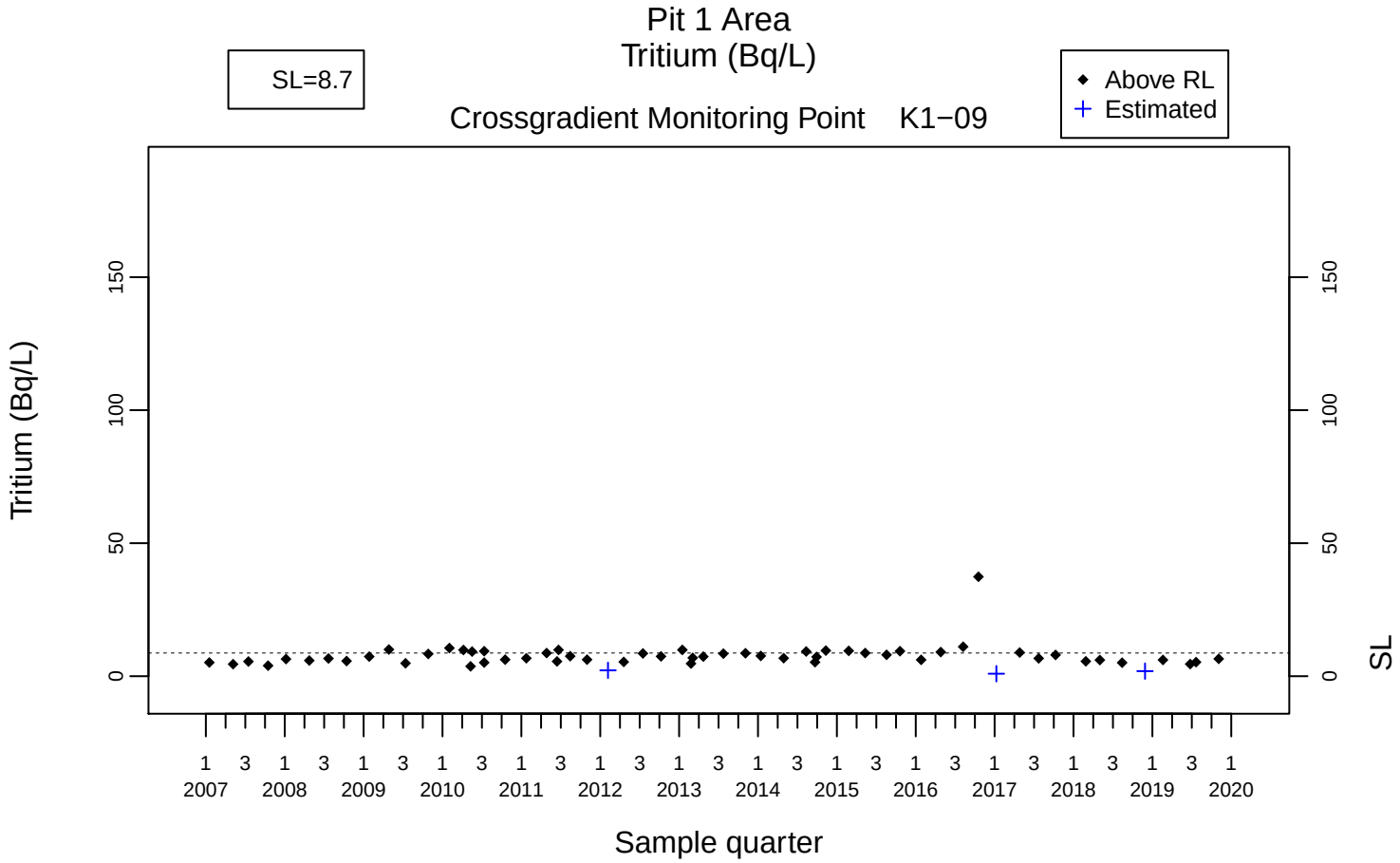


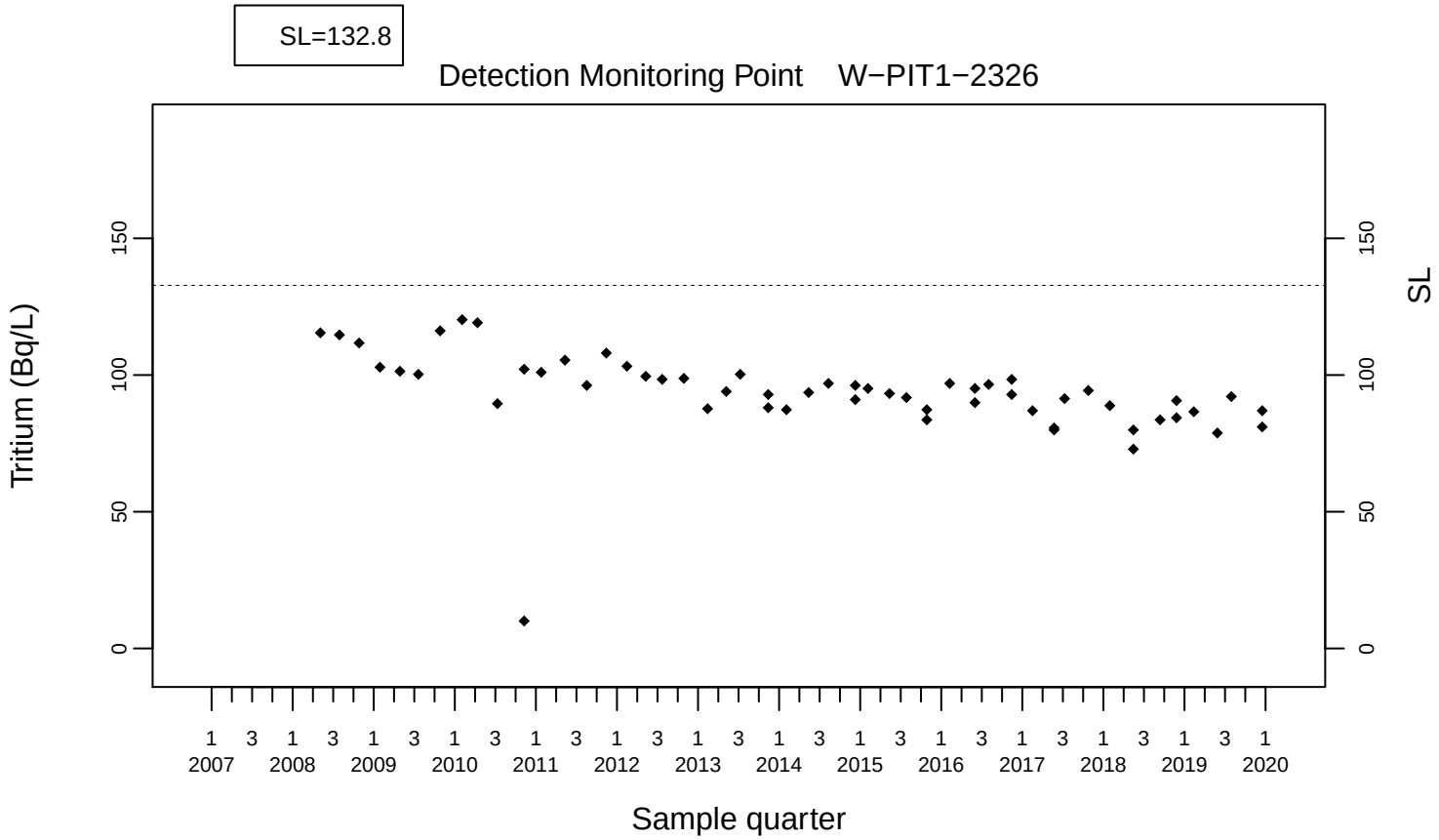

Pit 1 Area
Tritium (Bq/L)
SL=158.4
Above RL
Below RL
Detection Monitoring Point K1−02B
Tritium (Bq/L)
SL
0
50
100
150
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter


SL=19.2
Detection Monitoring Point K1−04
Tritium (Bq/L)
SL
0
50
100
150
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

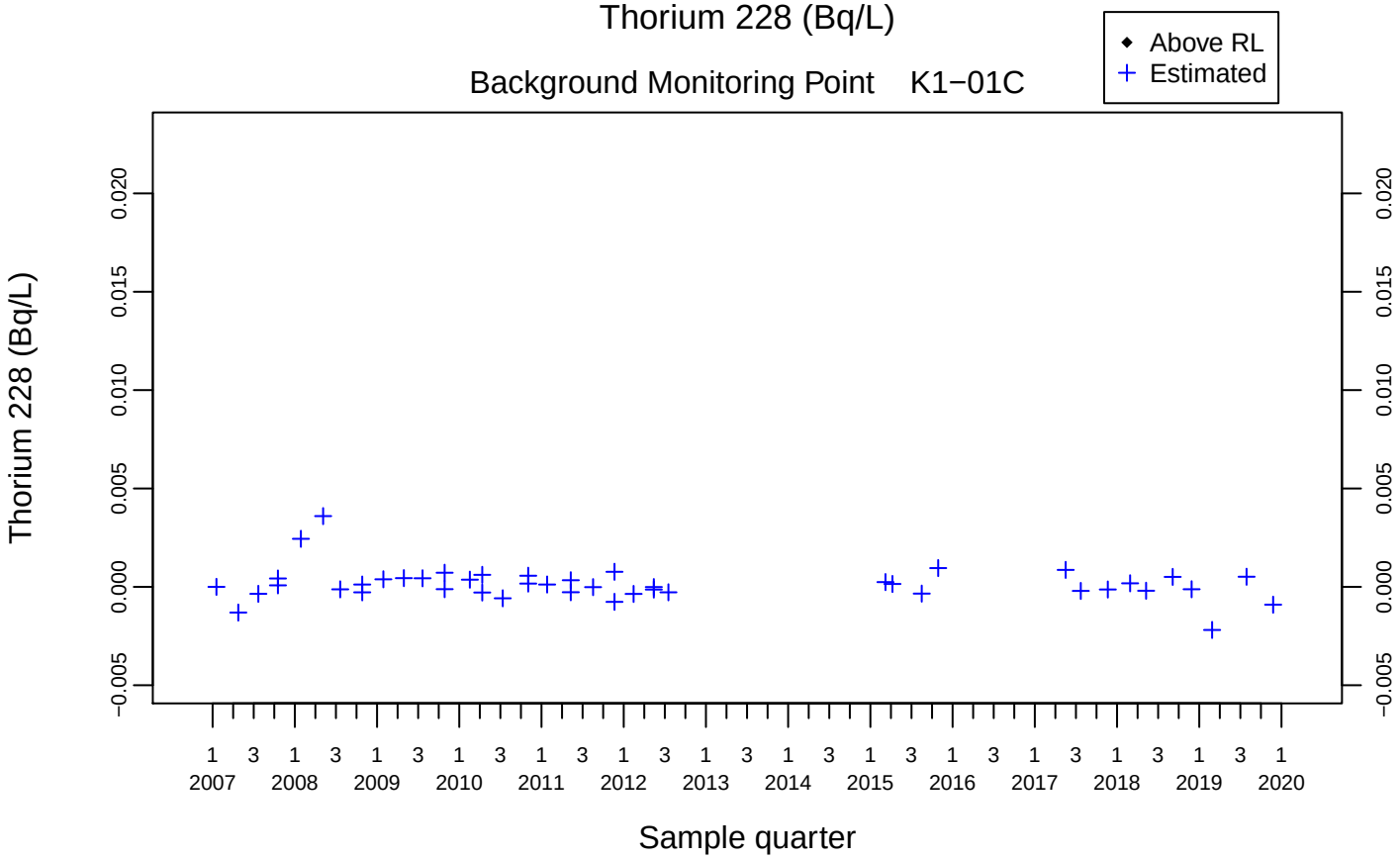

Pit 1 Area
Tritium (Bq/L)
SL=11.4
Above RL
Below RL
Detection Monitoring Point K1−05
Tritium (Bq/L)
SL
Sample quarter

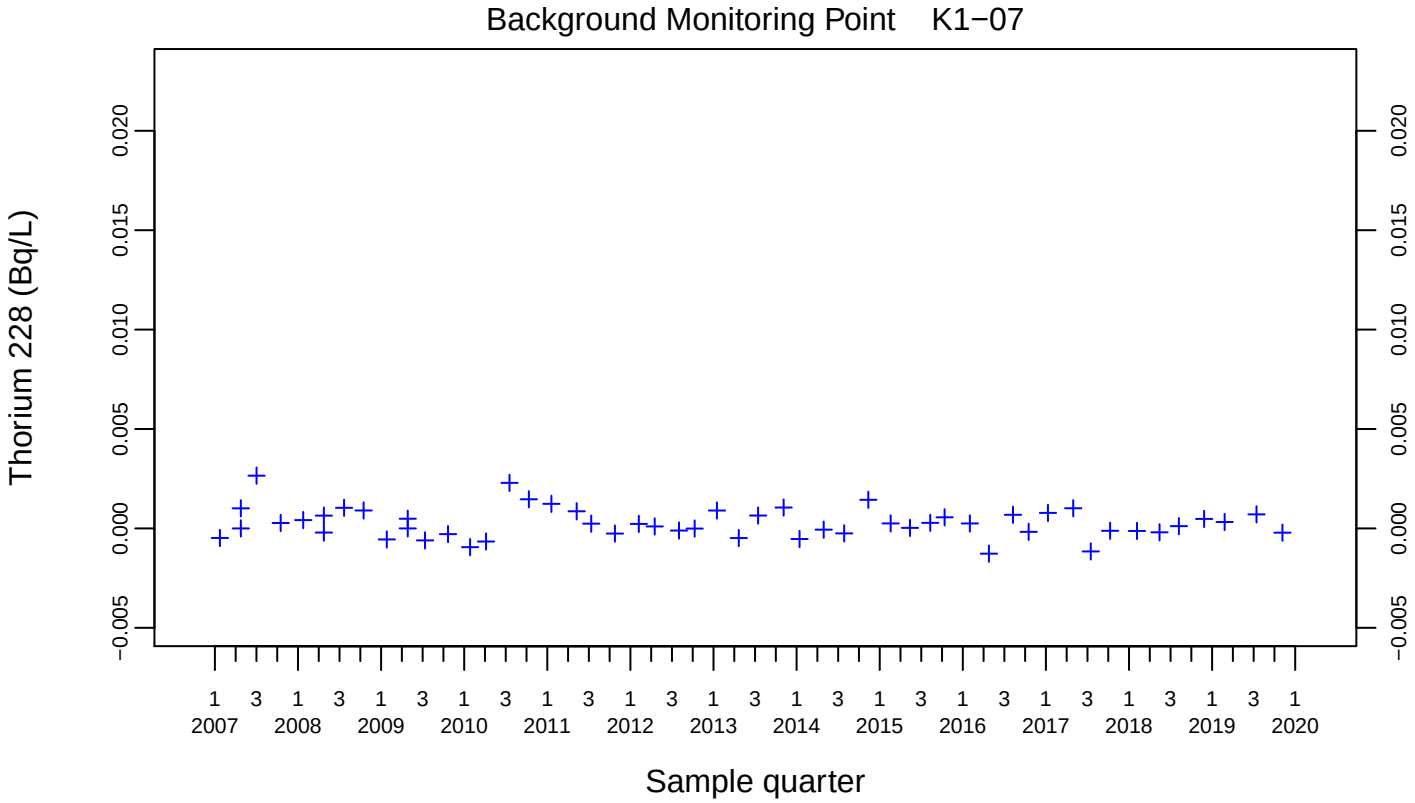

SL=10.7
Crossgradient Monitoring Point K1−08
Tritium (Bq/L)
SL
Sample quarter

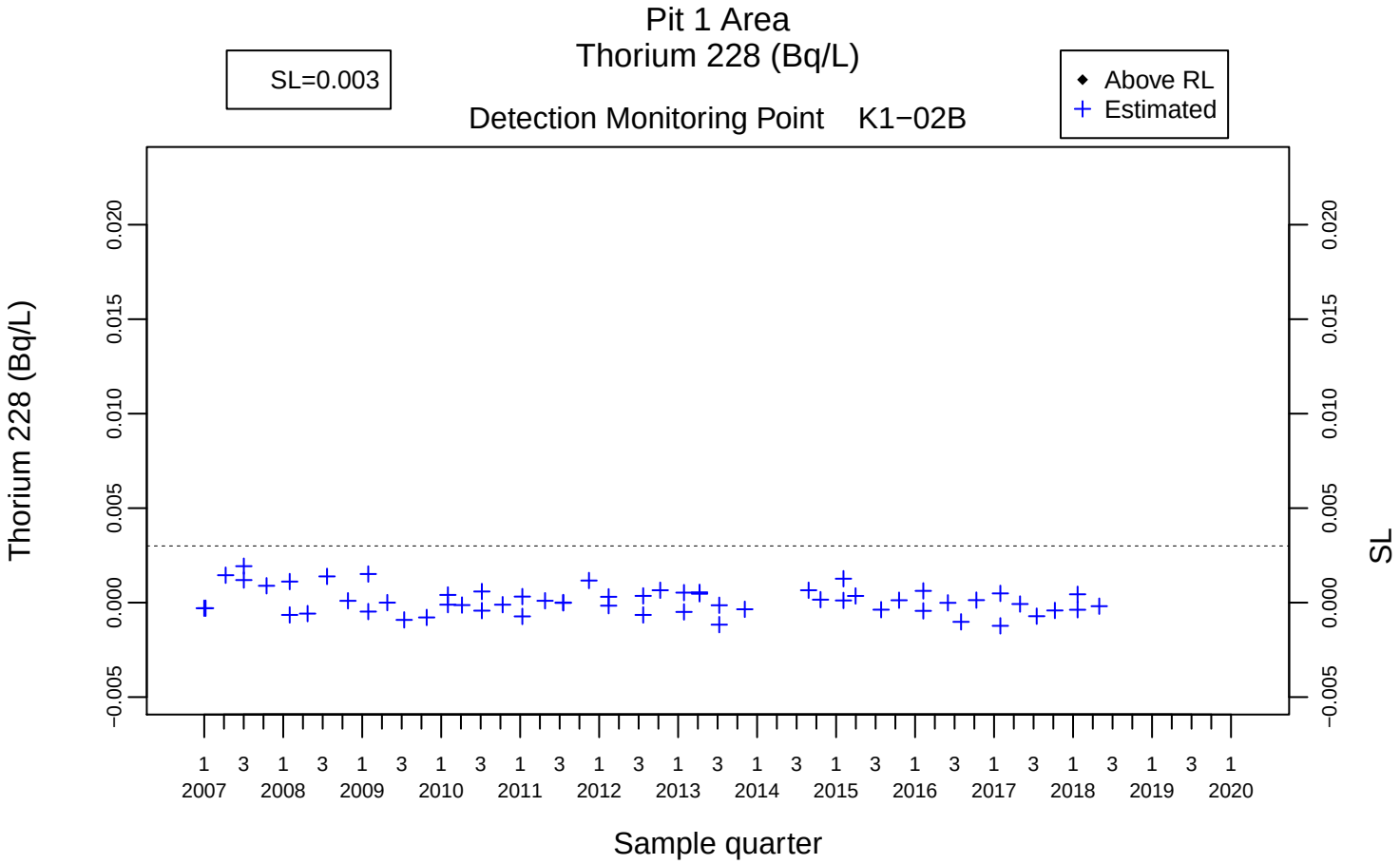

Pit 1 Area
Tritium (Bq/L)
SL=8.7
Crossgradient Monitoring Point K1−09
Above RL
Estimated
Tritium (Bq/L)
SL
Sample quarter

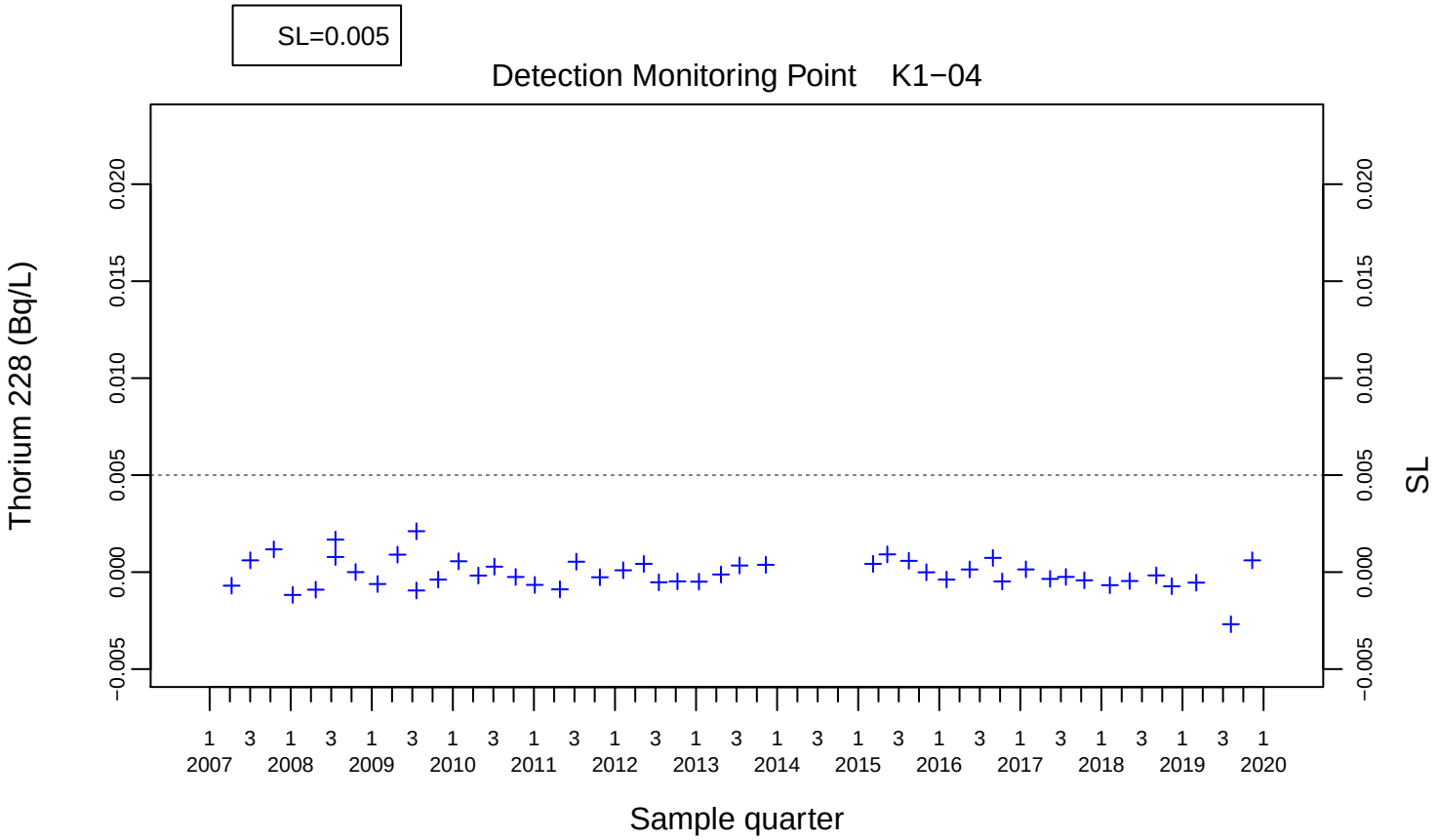

SL=132.8
Detection Monitoring Point W−PIT1−2326
Tritium (Bq/L)
SL
Sample quarter

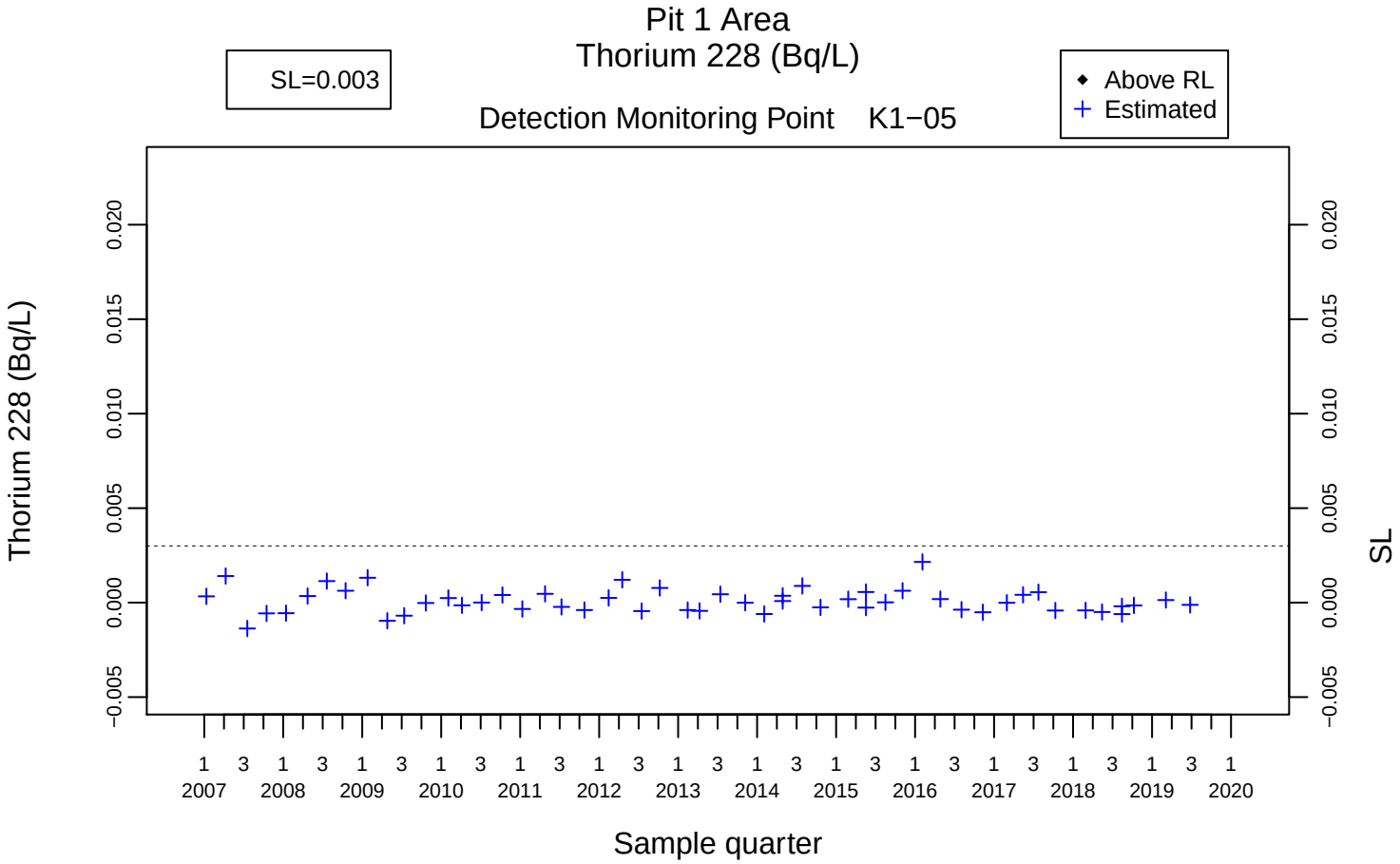
Pit 1 Area
Thorium 228 (Bq/L)

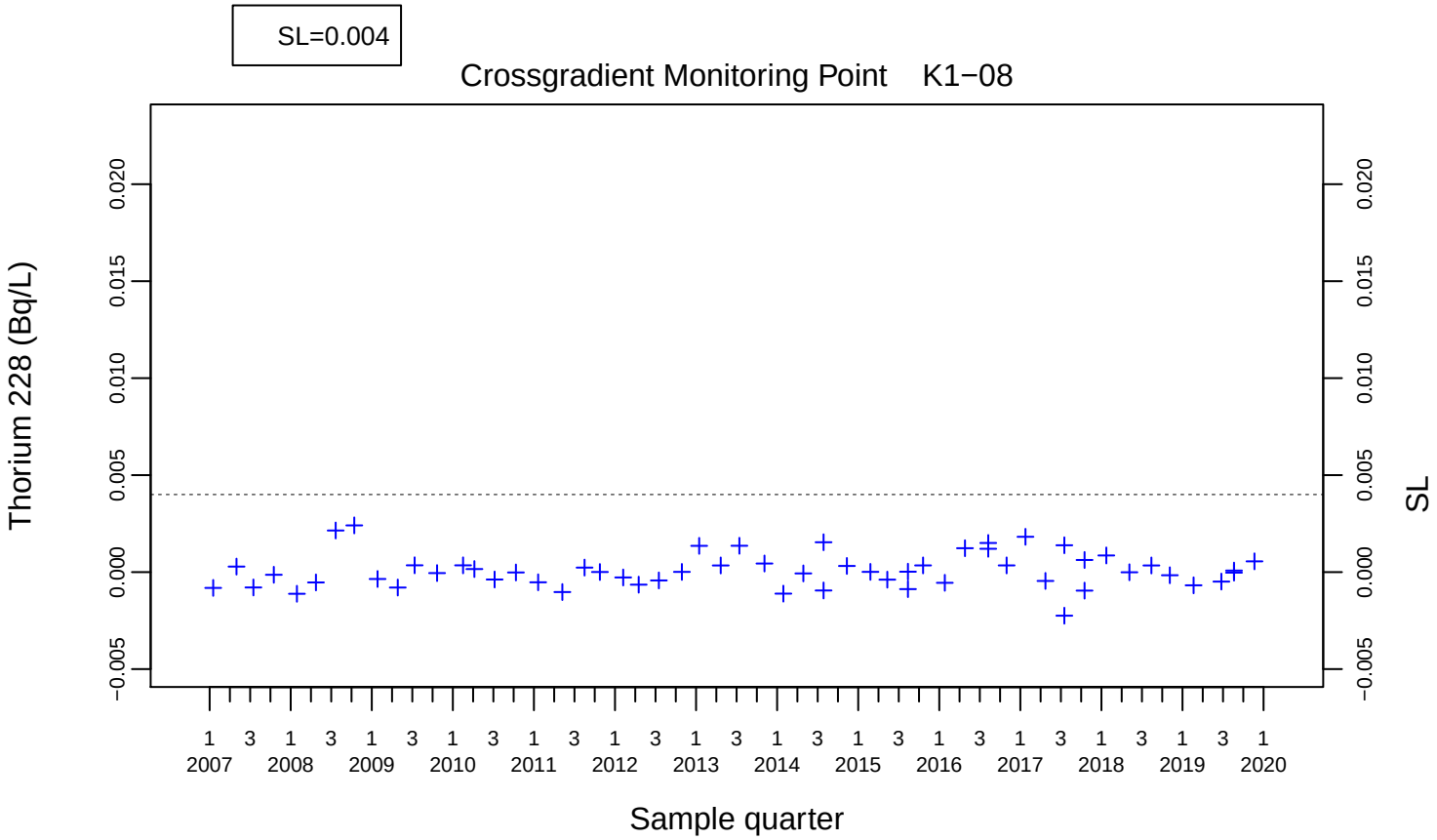


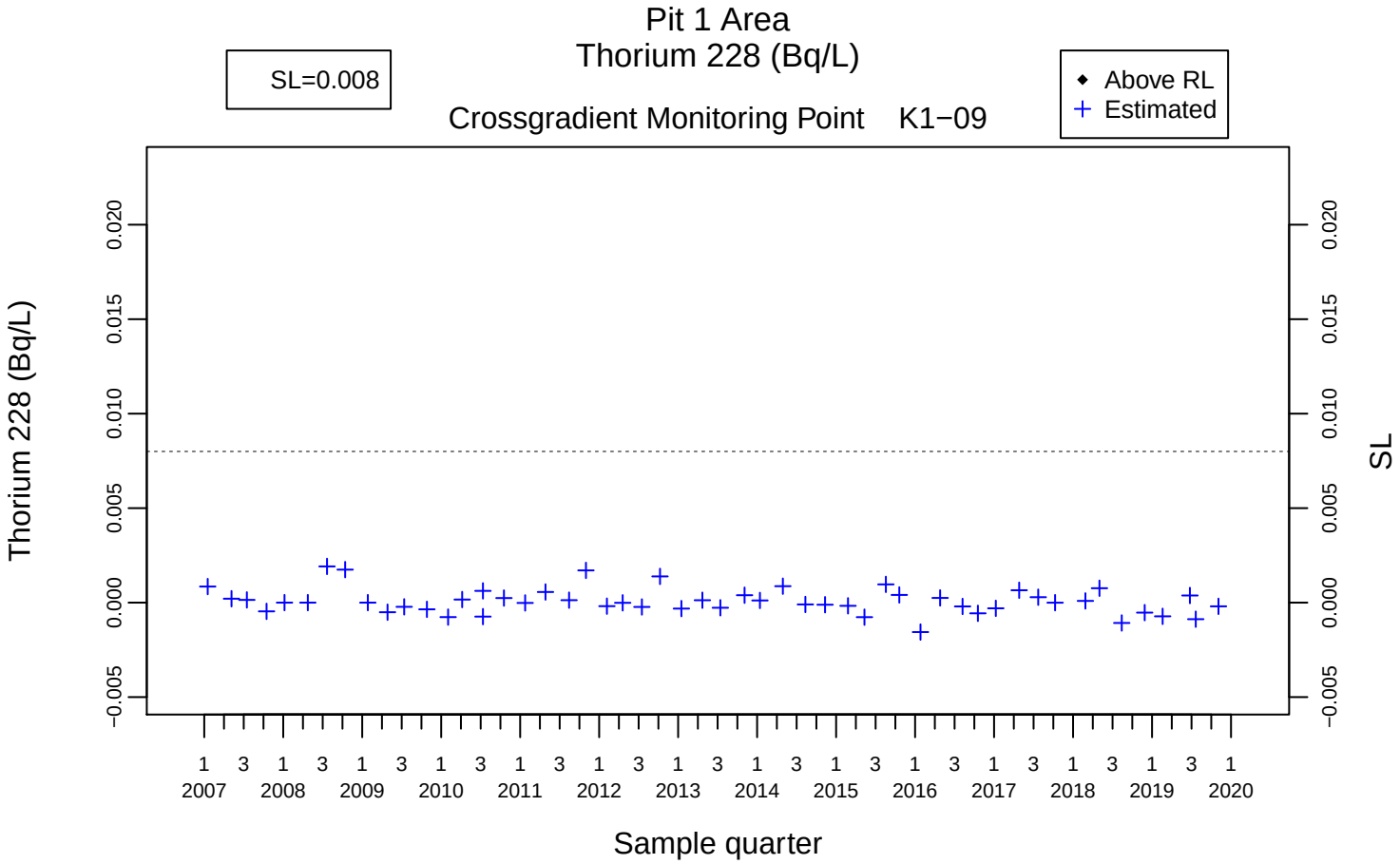


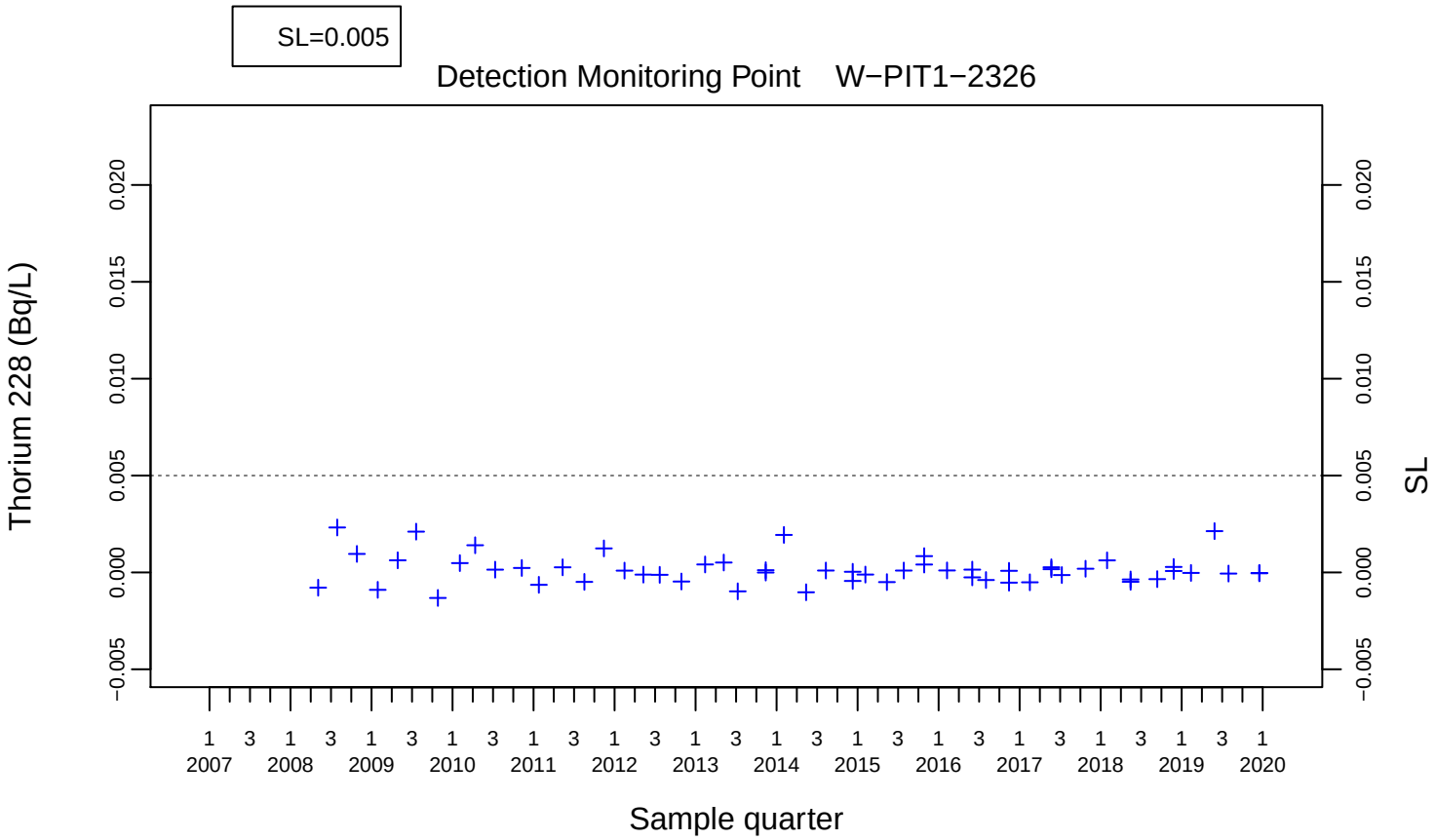

Pit 1 Area
Thorium 228 (Bq/L)
SL=0.003
Detection Monitoring Point K1−02B
Above RL
Estimated
Thorium 228 (Bq/L)
SL
Sample quarter

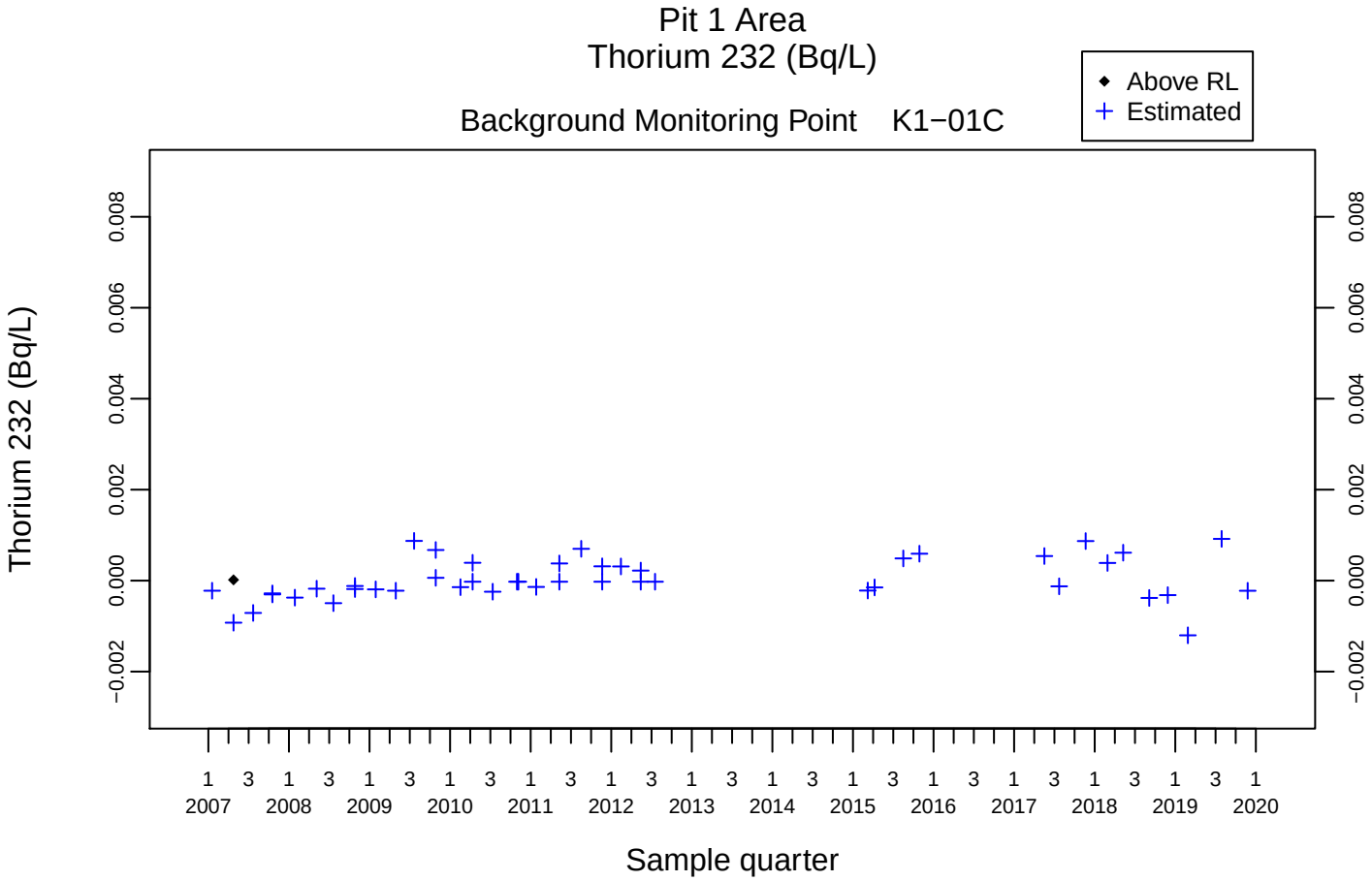

SL=0.005
Detection Monitoring Point K1−04
Thorium 228 (Bq/L)
SL
Sample quarter

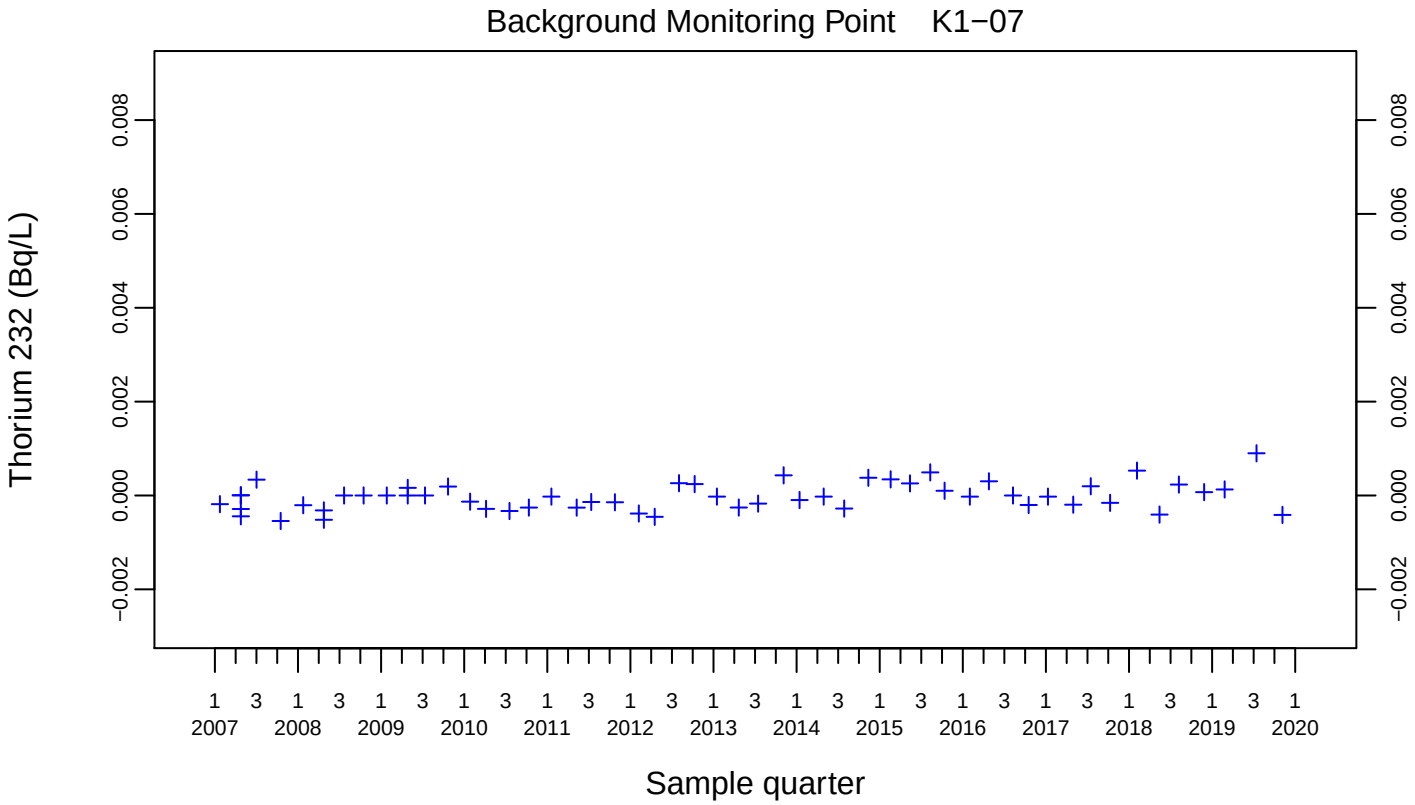

Pit 1 Area
Thorium 228 (Bq/L)
SL=0.003
Above RL
Estimated
Detection Monitoring Point K1−05
Thorium 228 (Bq/L)
SL
Sample quarter

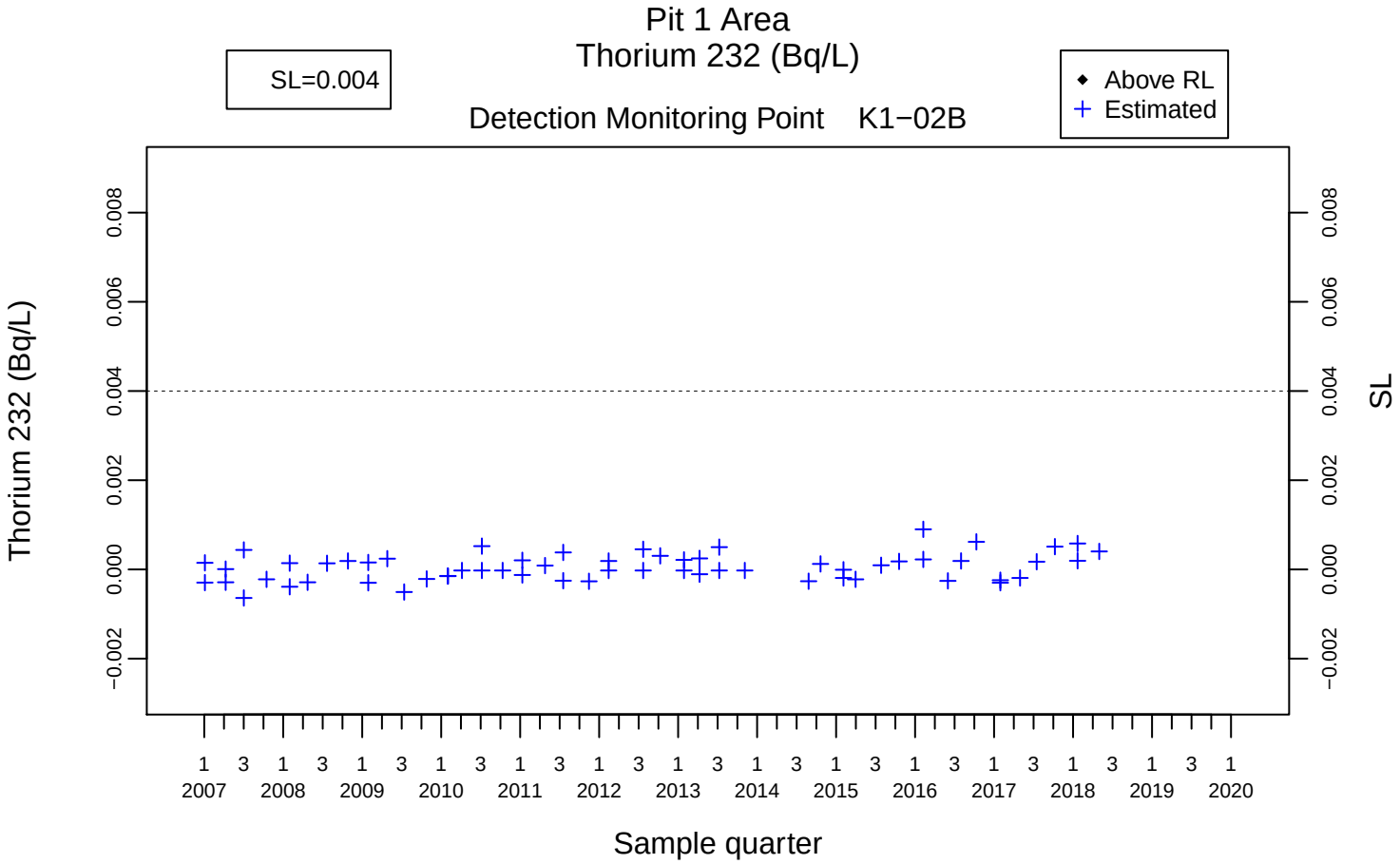

SL=0.004
Crossgradient Monitoring Point K1−08
Thorium 228 (Bq/L)
SL
Sample quarter

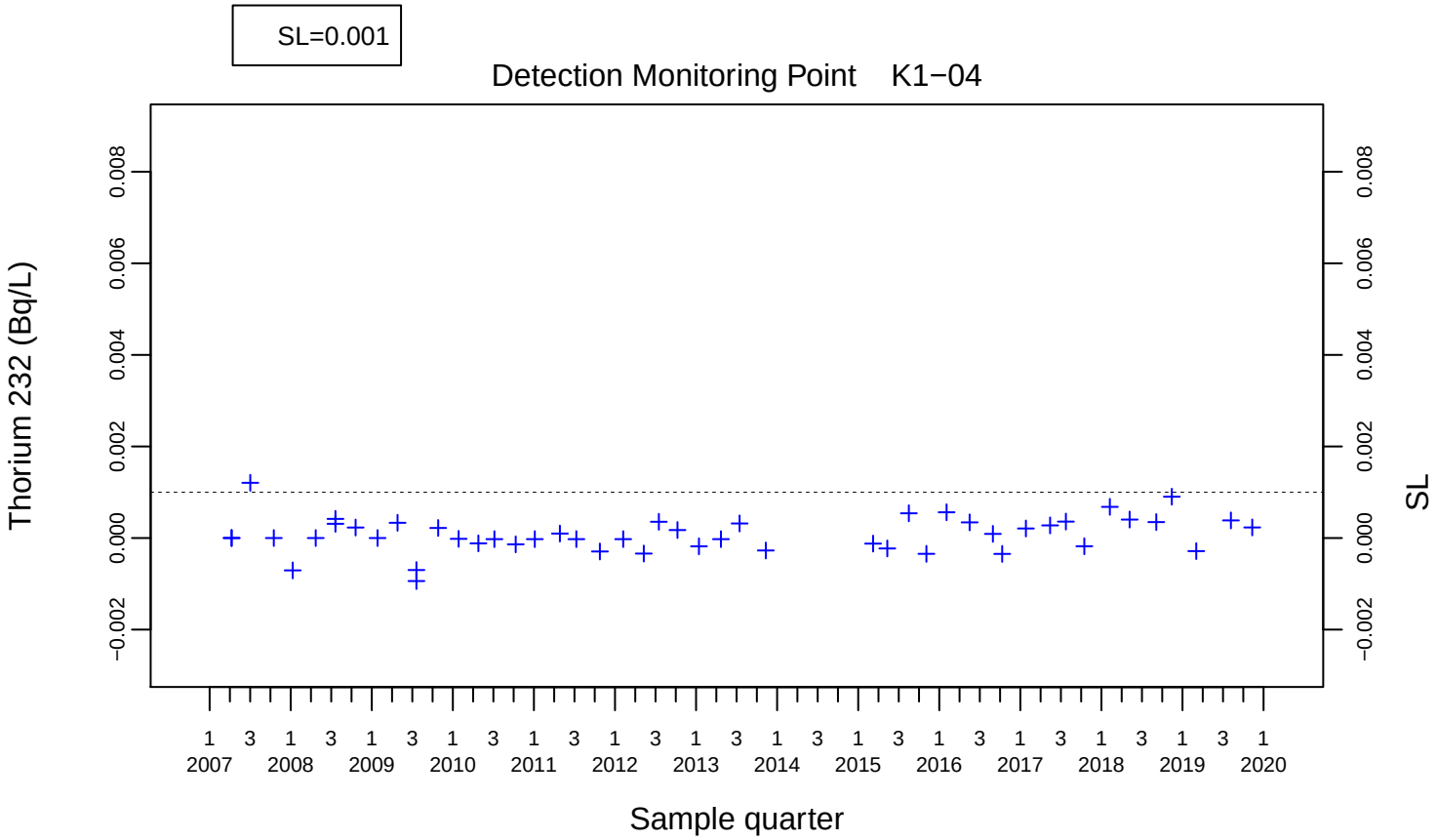

Pit 1 Area
Thorium 228 (Bq/L)
SL=0.008
Crossgradient Monitoring Point K1−09
Above RL
Estimated
Thorium 228 (Bq/L)
SL
Sample quarter

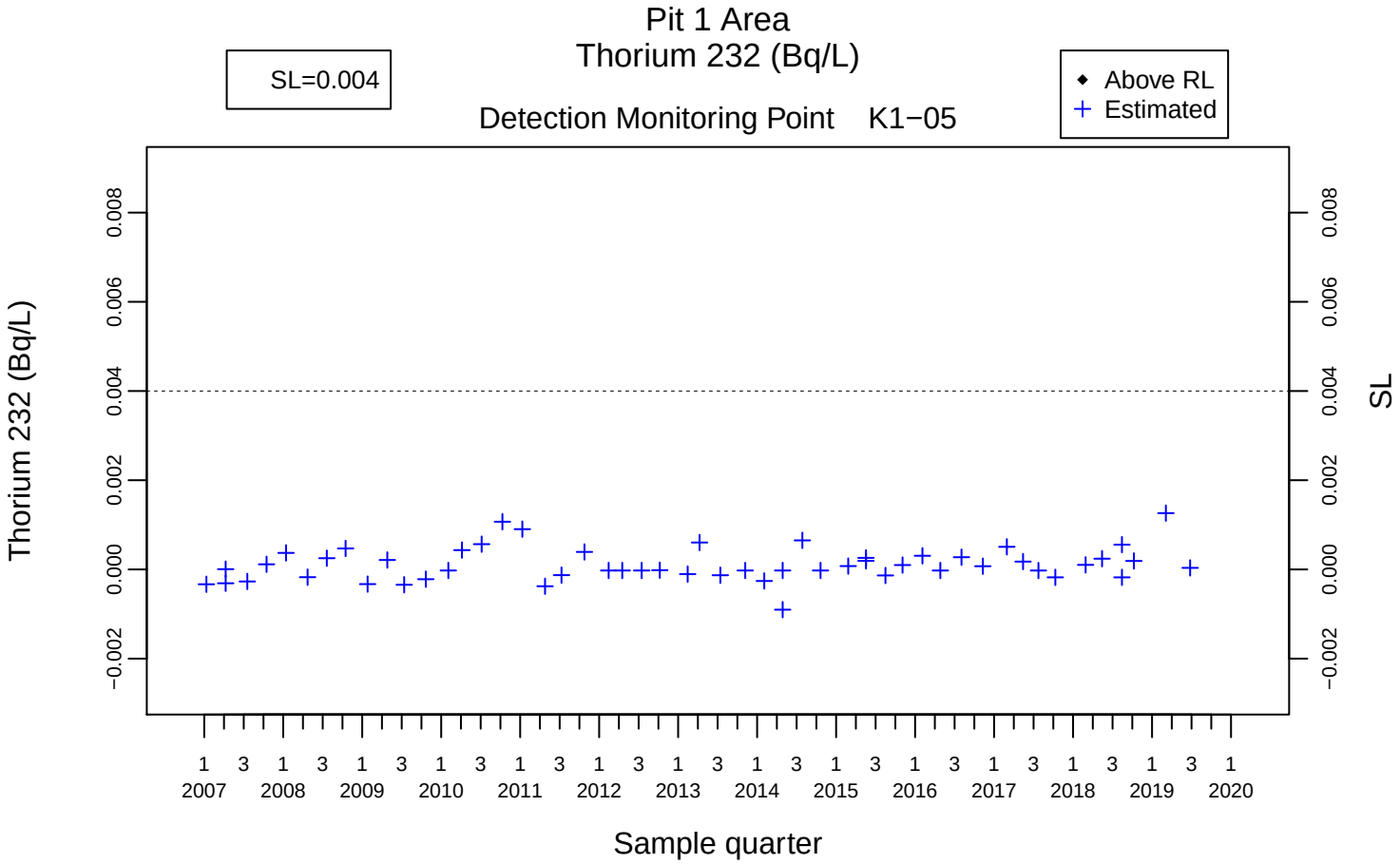

SL=0.005
Detection Monitoring Point W−PIT1−2326
Thorium 228 (Bq/L)
SL
Sample quarter

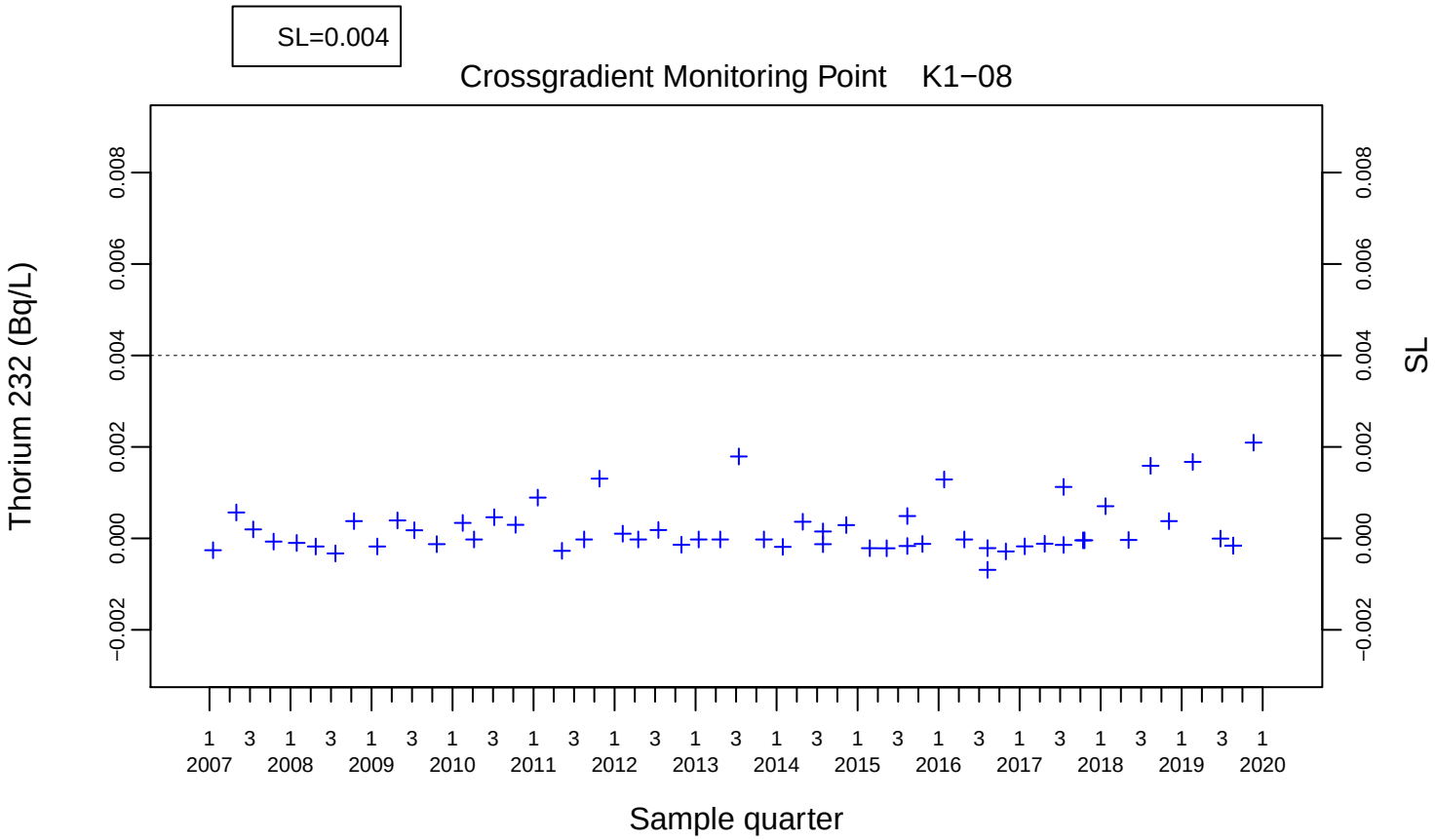

Pit 1 Area
Thorium 232 (Bq/L)
Background Monitoring Point K1−01C
Above RL
Estimated
Thorium 232 (Bq/L)
0.008
0.006
0.004
0.002
0.000
−0.002
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

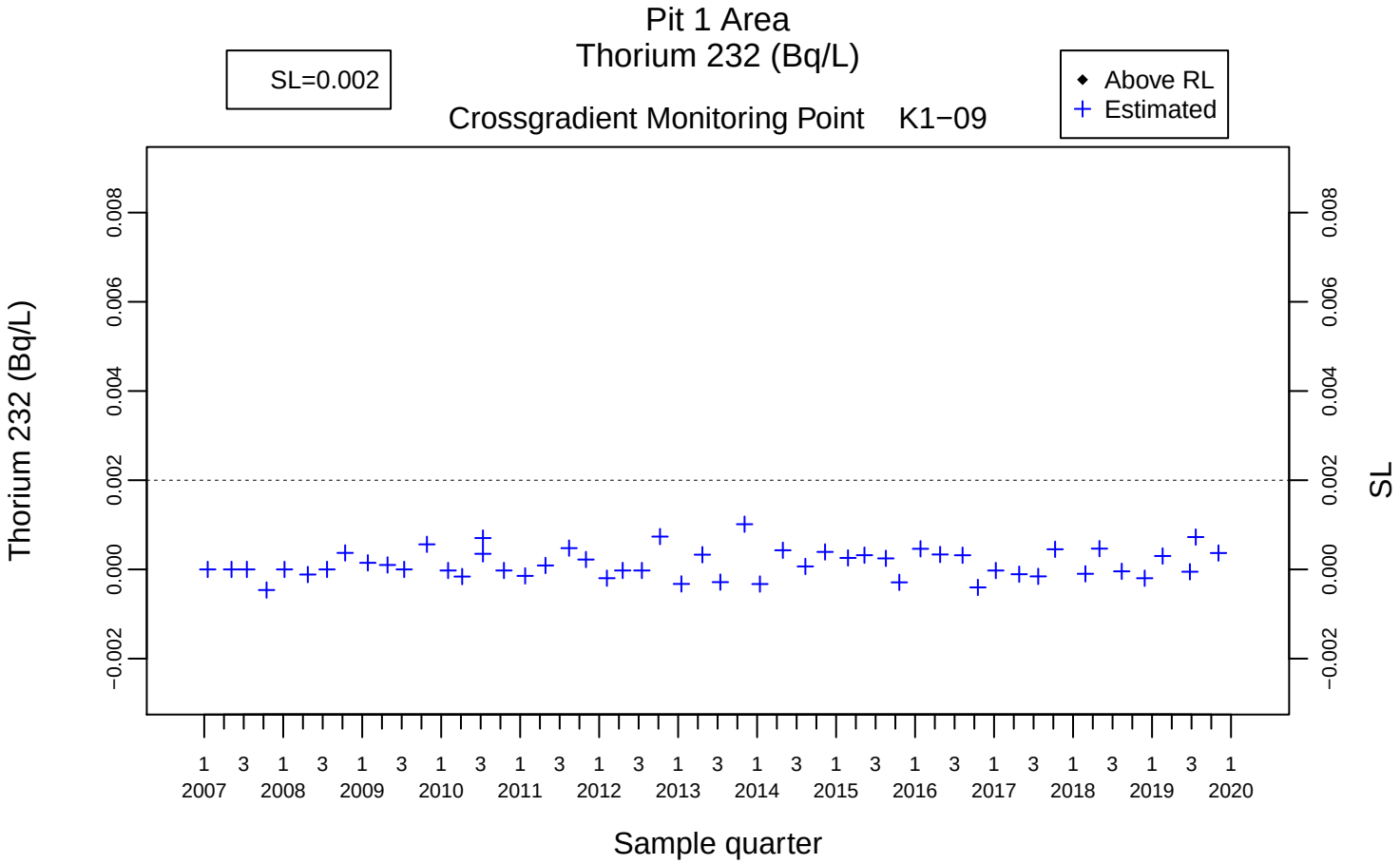

Background Monitoring Point K1−07
Thorium 232 (Bq/L)
0.008
0.006
0.004
0.002
0.000
−0.002
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

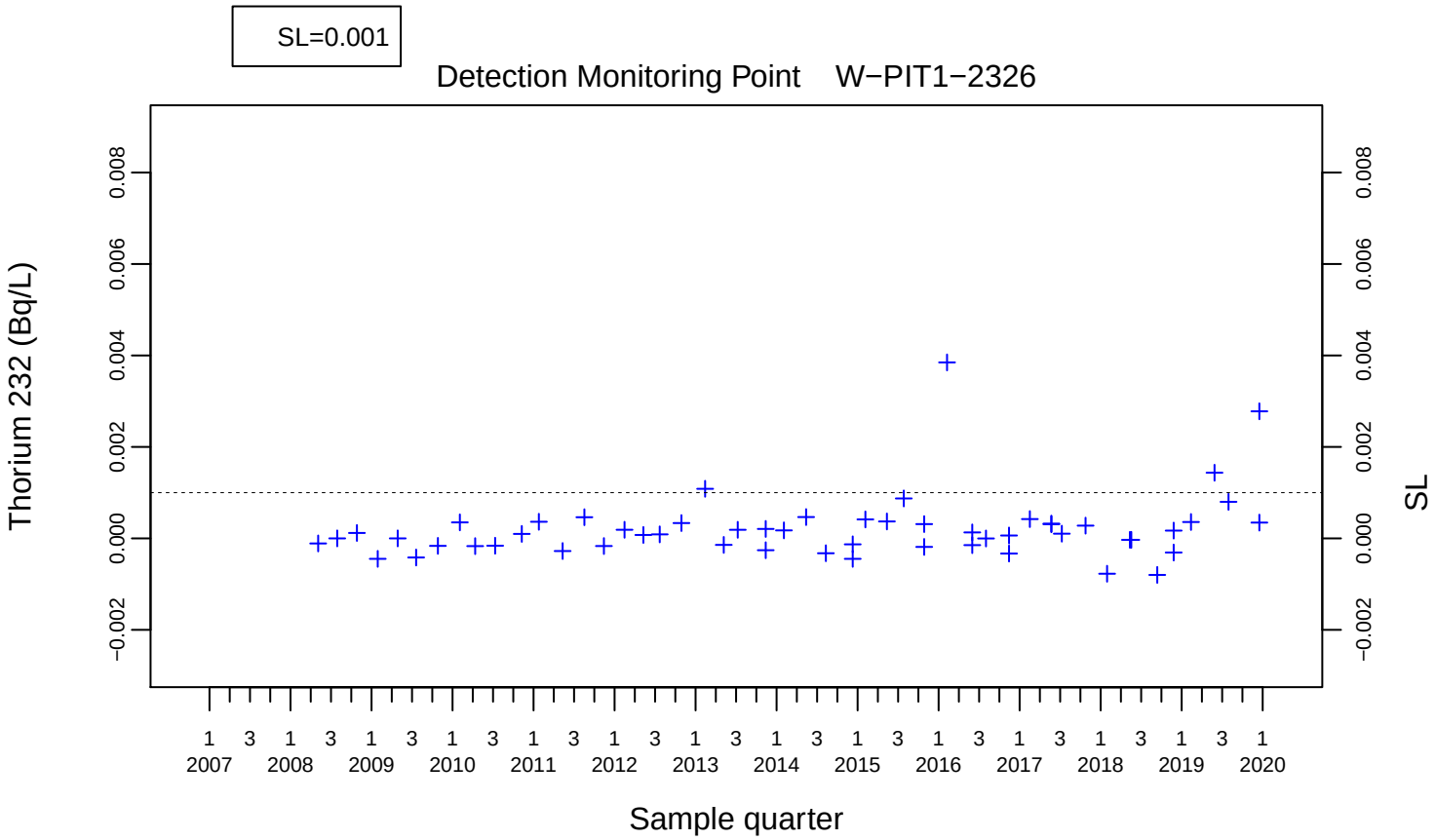

Pit 1 Area
Thorium 232 (Bq/L)
SL=0.004
Detection Monitoring Point K1−02B
Above RL
Estimated
Thorium 232 (Bq/L)
SL
Sample quarter

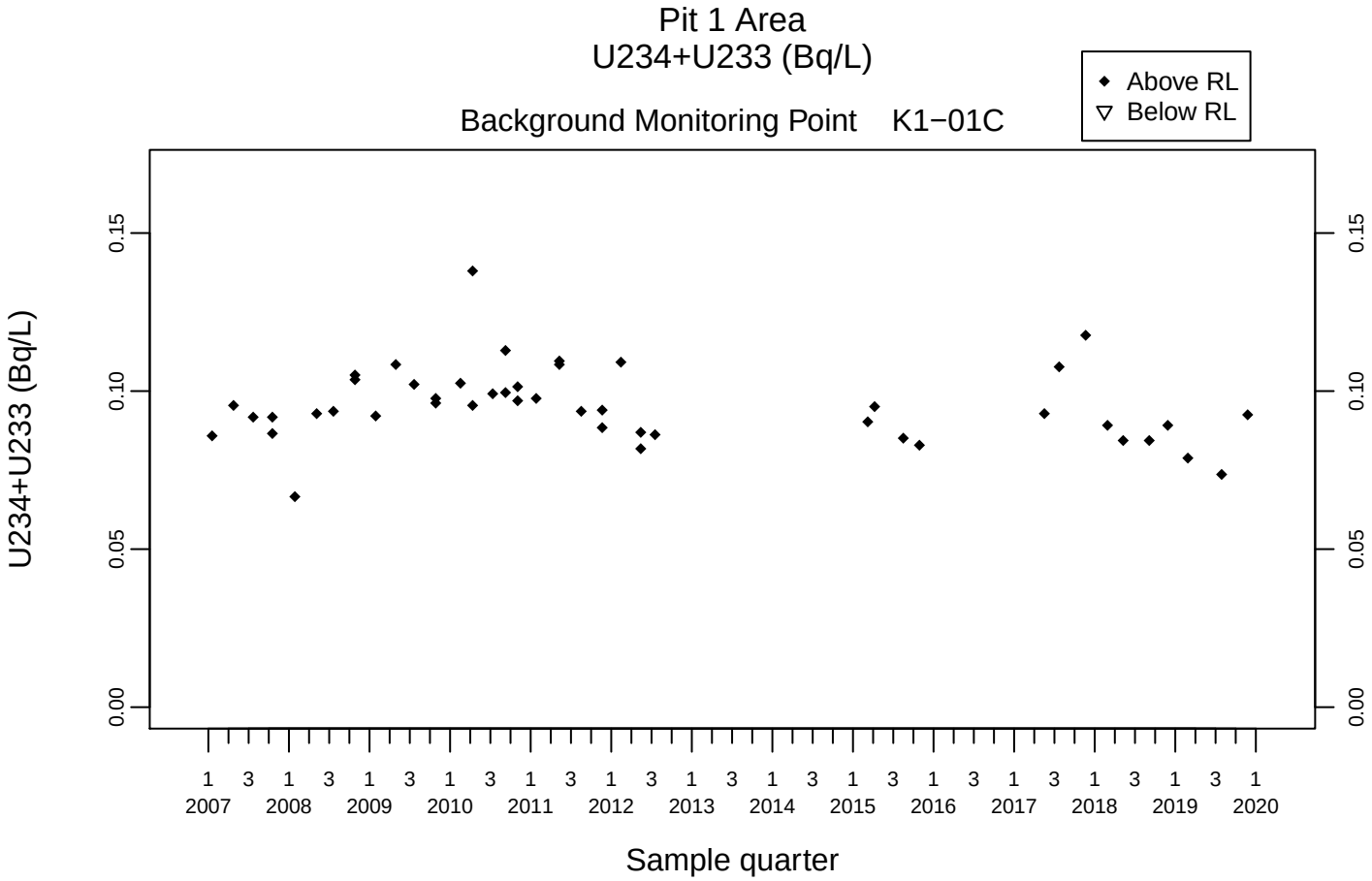

SL=0.001
Detection Monitoring Point K1−04
Thorium 232 (Bq/L)
SL
Sample quarter

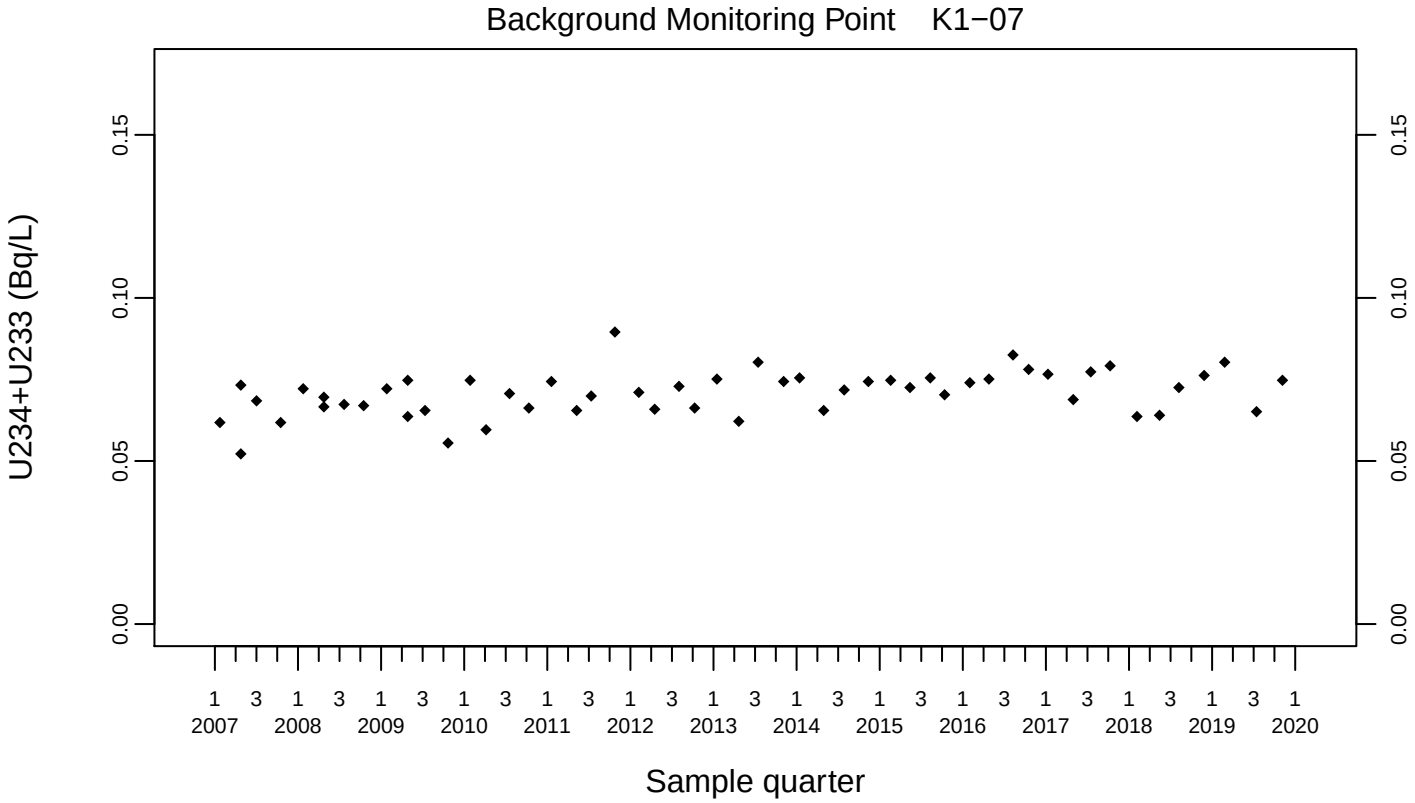

Pit 1 Area
Thorium 232 (Bq/L)
SL=0.004
Above RL
Estimated
Detection Monitoring Point K1−05
Thorium 232 (Bq/L)
SL
Sample quarter

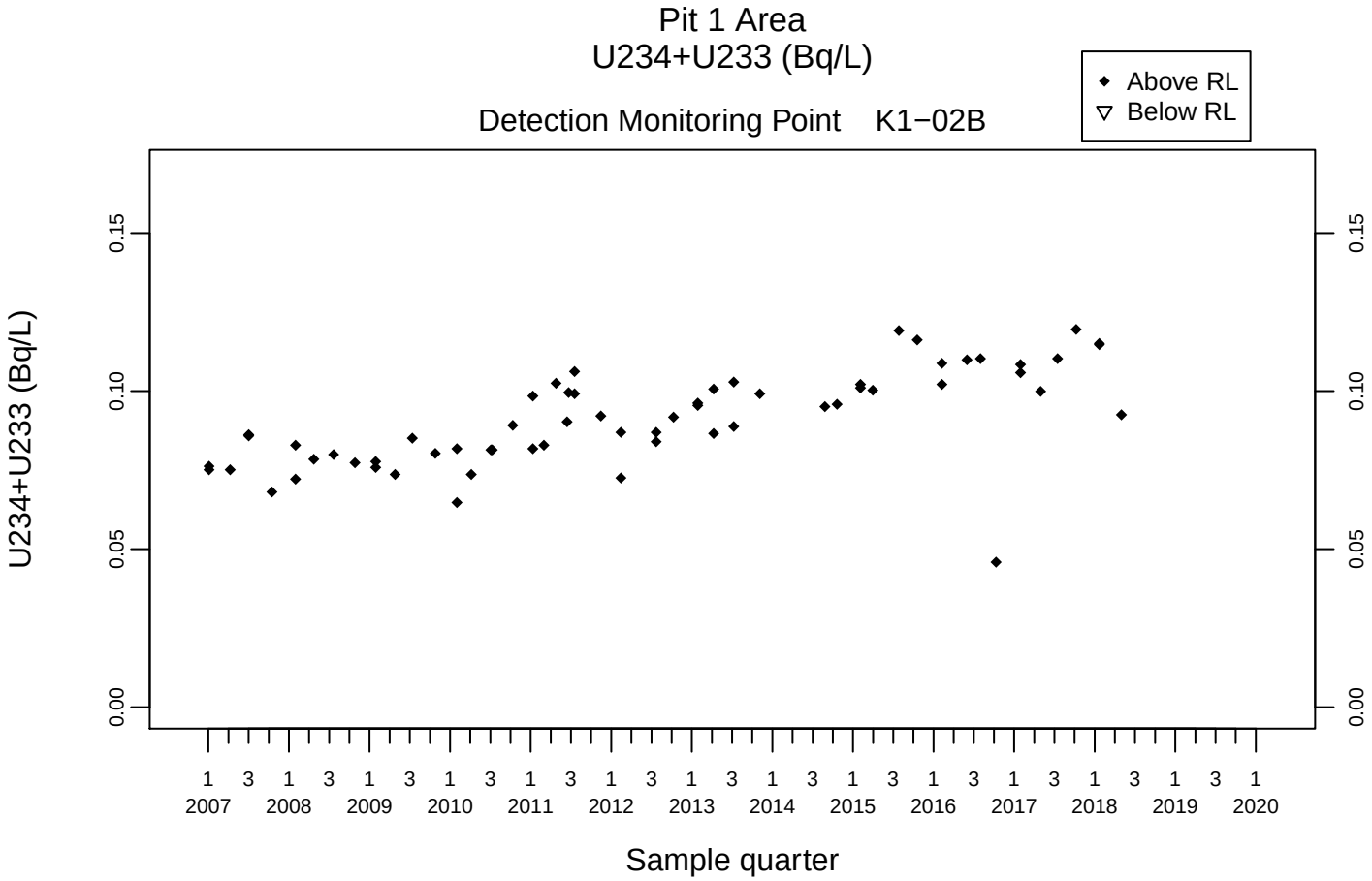

SL=0.004
Crossgradient Monitoring Point K1−08
Thorium 232 (Bq/L)
SL
Sample quarter

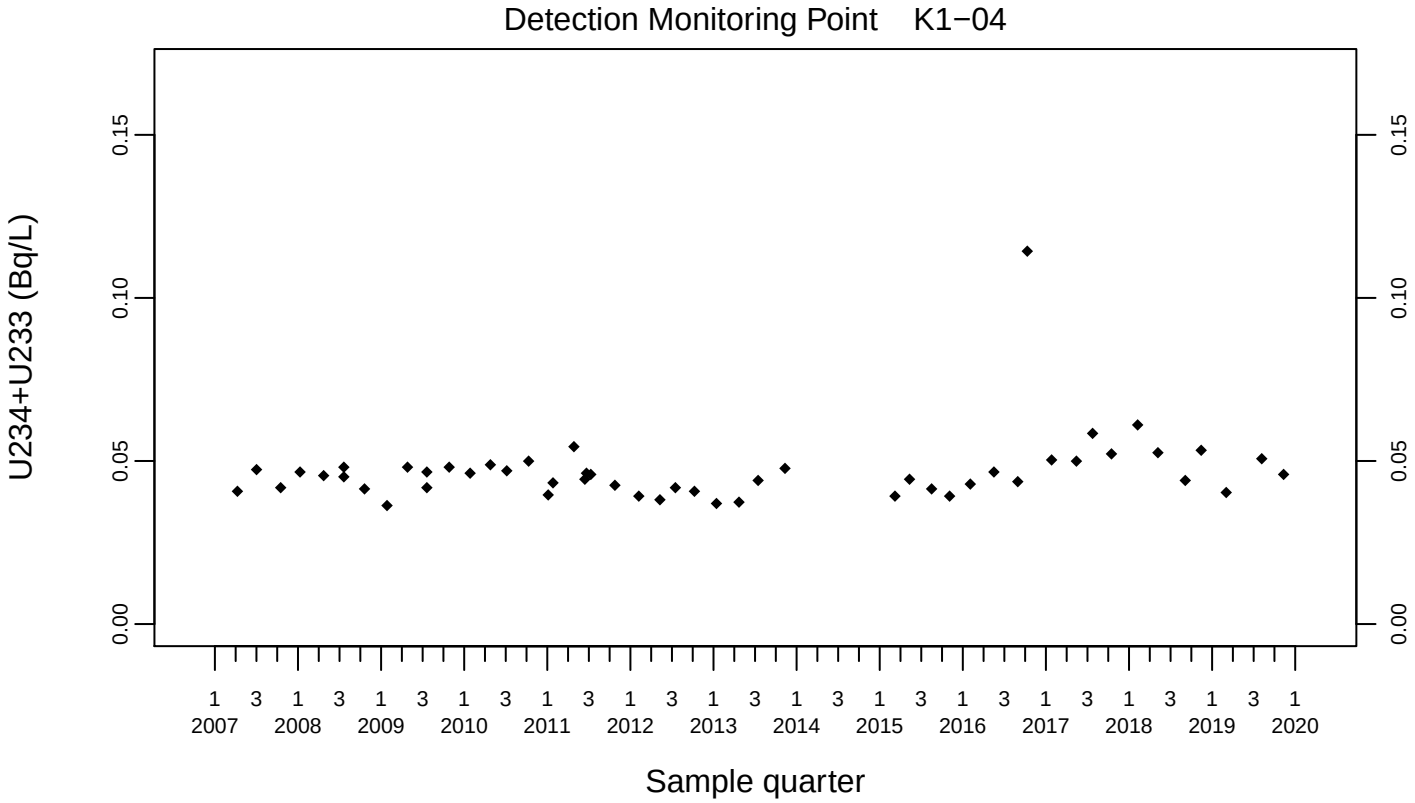

Pit 1 Area
Thorium 232 (Bq/L)
SL=0.002
Crossgradient Monitoring Point K1−09
Above RL
Estimated
Thorium 232 (Bq/L)
SL
Sample quarter

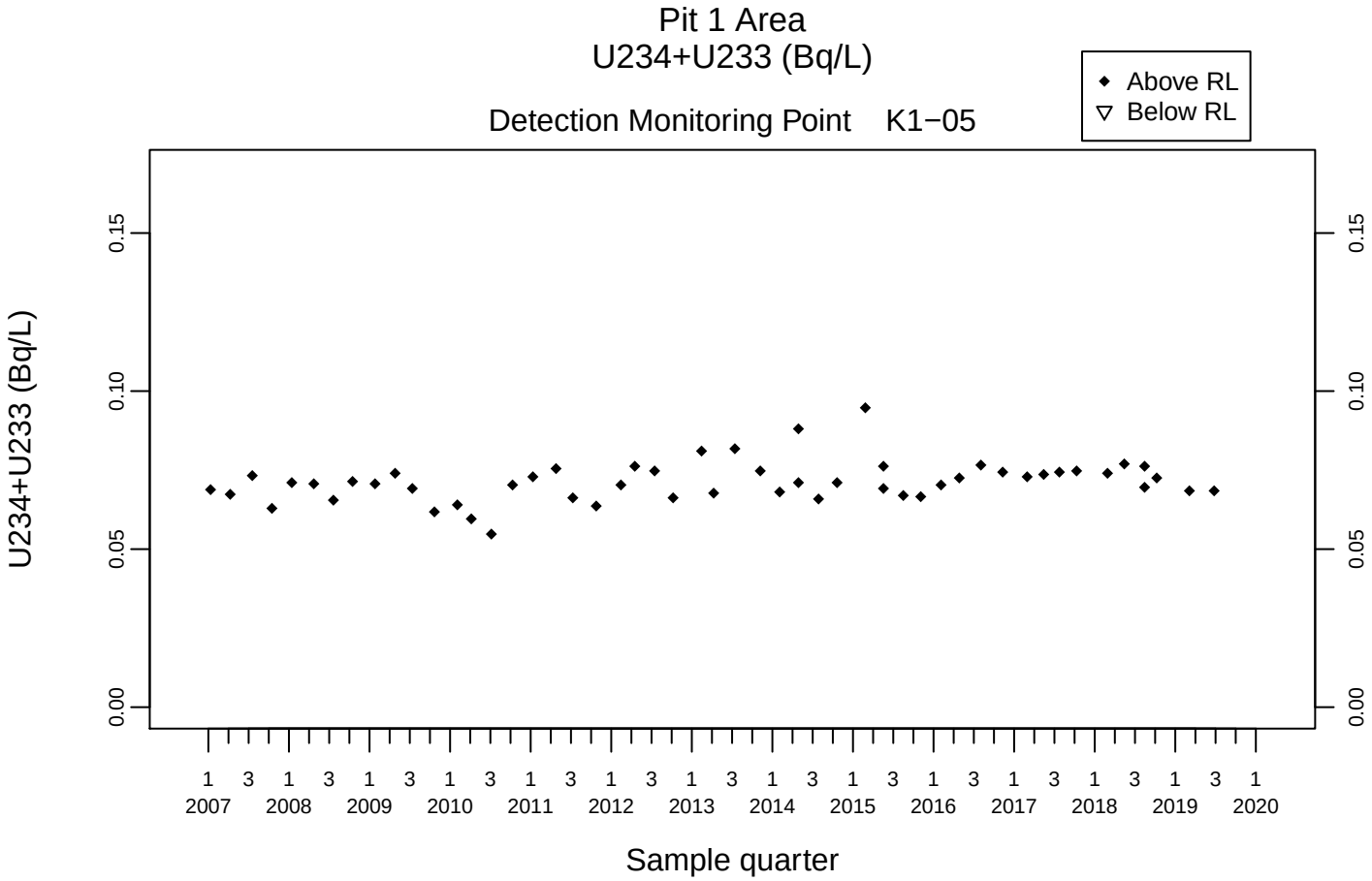

SL=0.001
Detection Monitoring Point W−PIT1−2326
Thorium 232 (Bq/L)
SL
Sample quarter

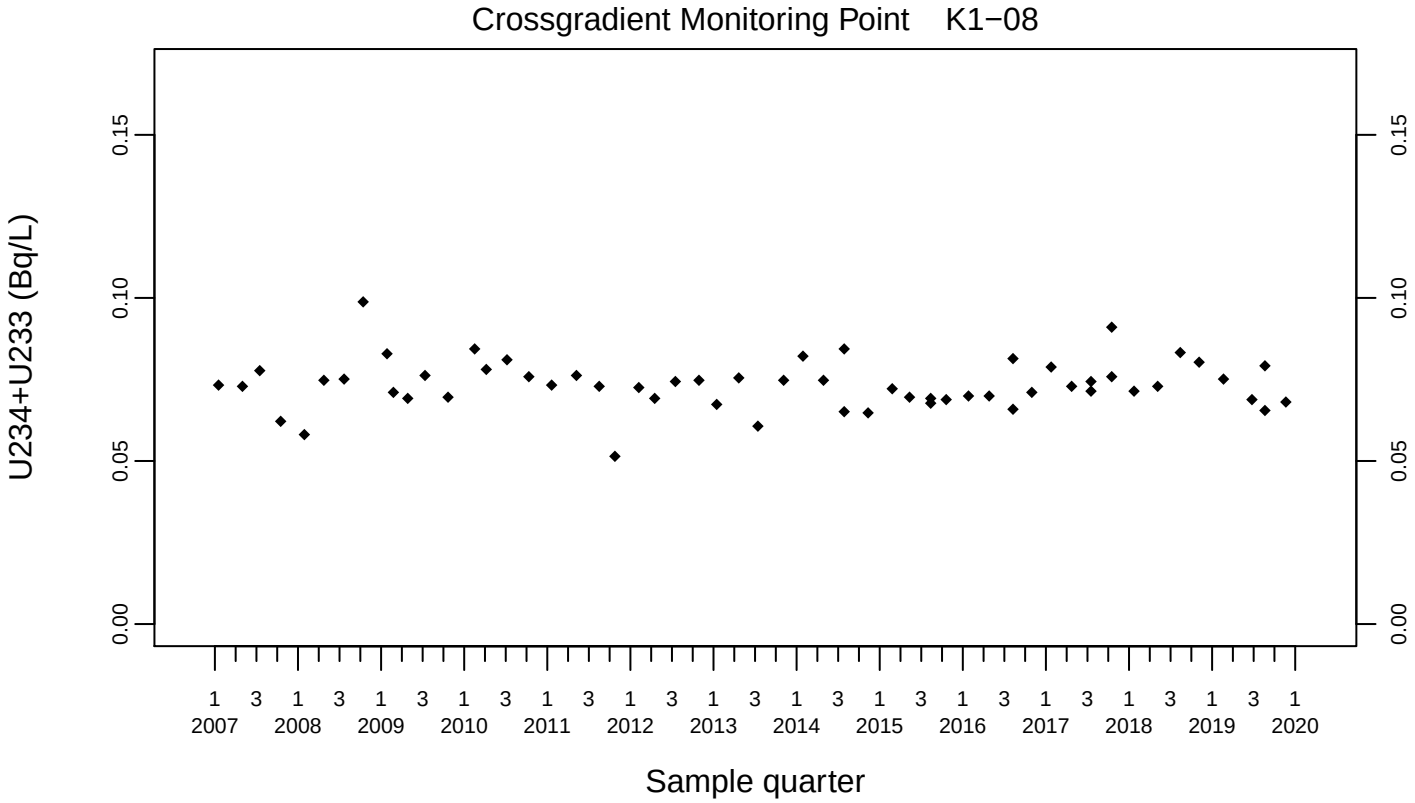

Pit 1 Area
U234+U233 (Bq/L)
Above RL
Below RL
Background Monitoring Point K1−01C
U234+U233 (Bq/L)
0.00
0.05
0.10
0.15
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter


Background Monitoring Point K1−07
U234+U233 (Bq/L)
0.00
0.05
0.10
0.15
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

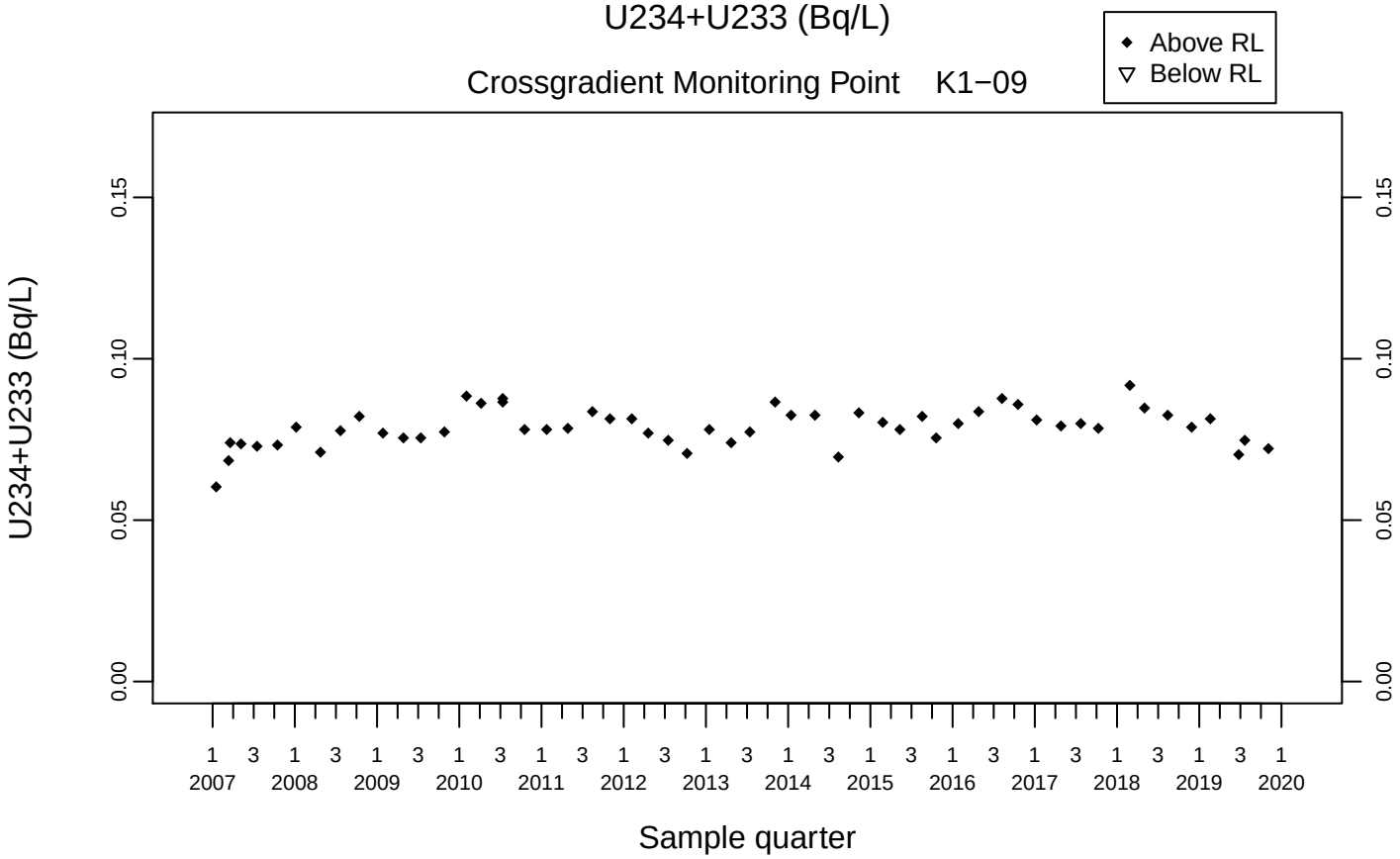

Pit 1 Area
U234+U233 (Bq/L)
Above RL
Below RL
Detection Monitoring Point K1−02B
U234+U233 (Bq/L)
0.00
0.05
0.10
0.15
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

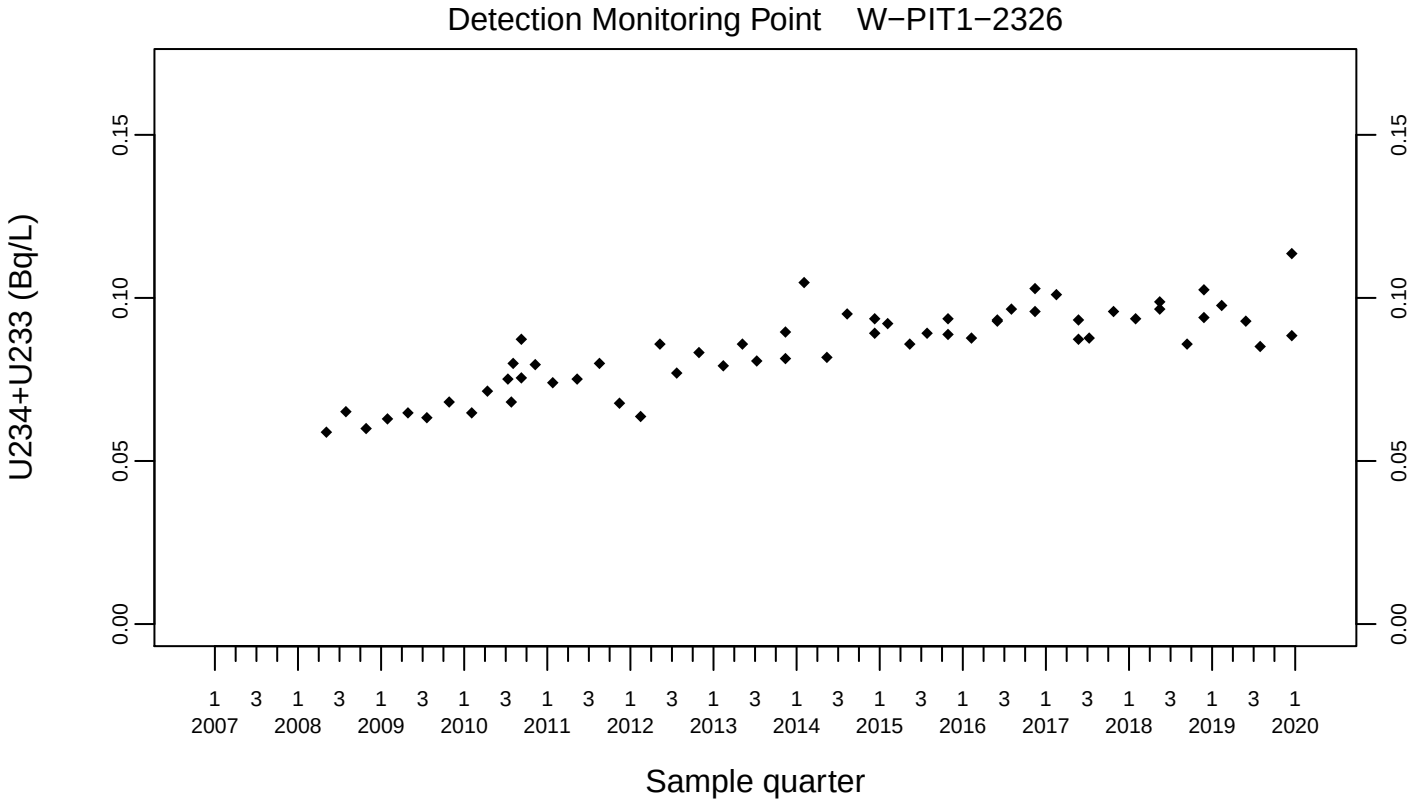

Detection Monitoring Point K1−04
U234+U233 (Bq/L)
0.00
0.05
0.10
0.15
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter


Pit 1 Area
U234+U233 (Bq/L)
Detection Monitoring Point K1−05
Above RL
Below RL
U234+U233 (Bq/L)
0.00
0.05
0.10
0.15
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

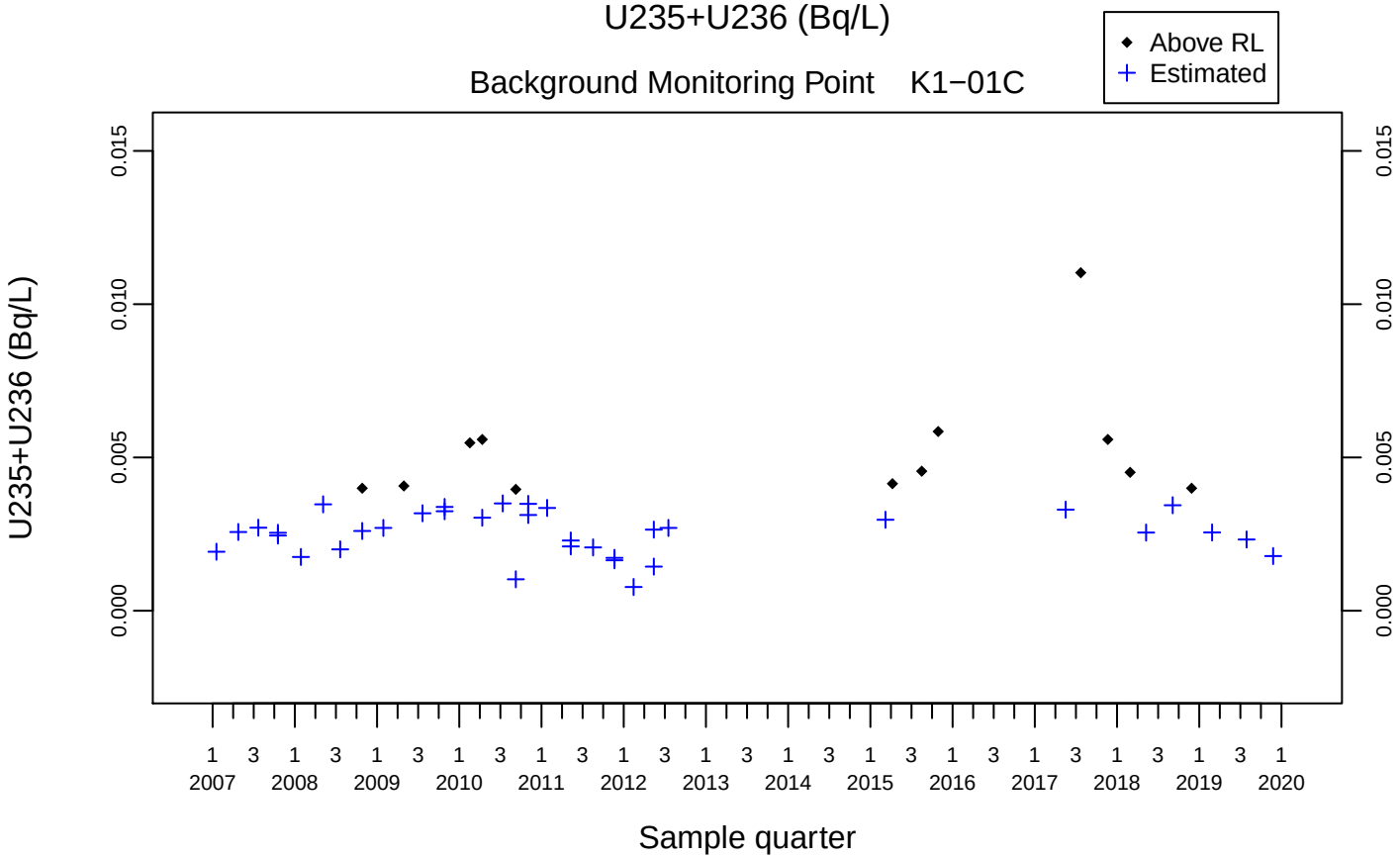

Crossgradient Monitoring Point K1−08
U234+U233 (Bq/L)
0.00
0.05
0.10
0.15
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

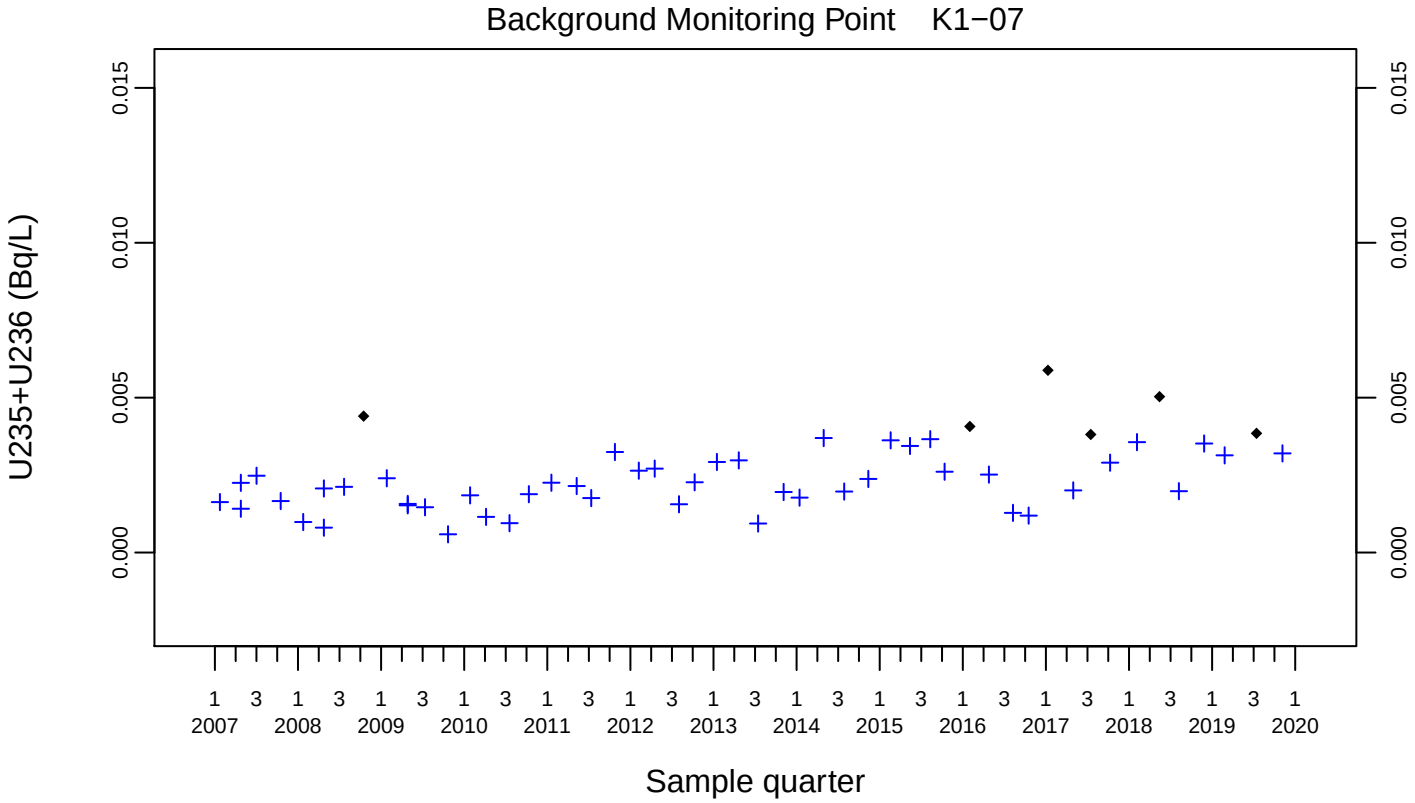
Pit 1 Area
U234+U233 (Bq/L)

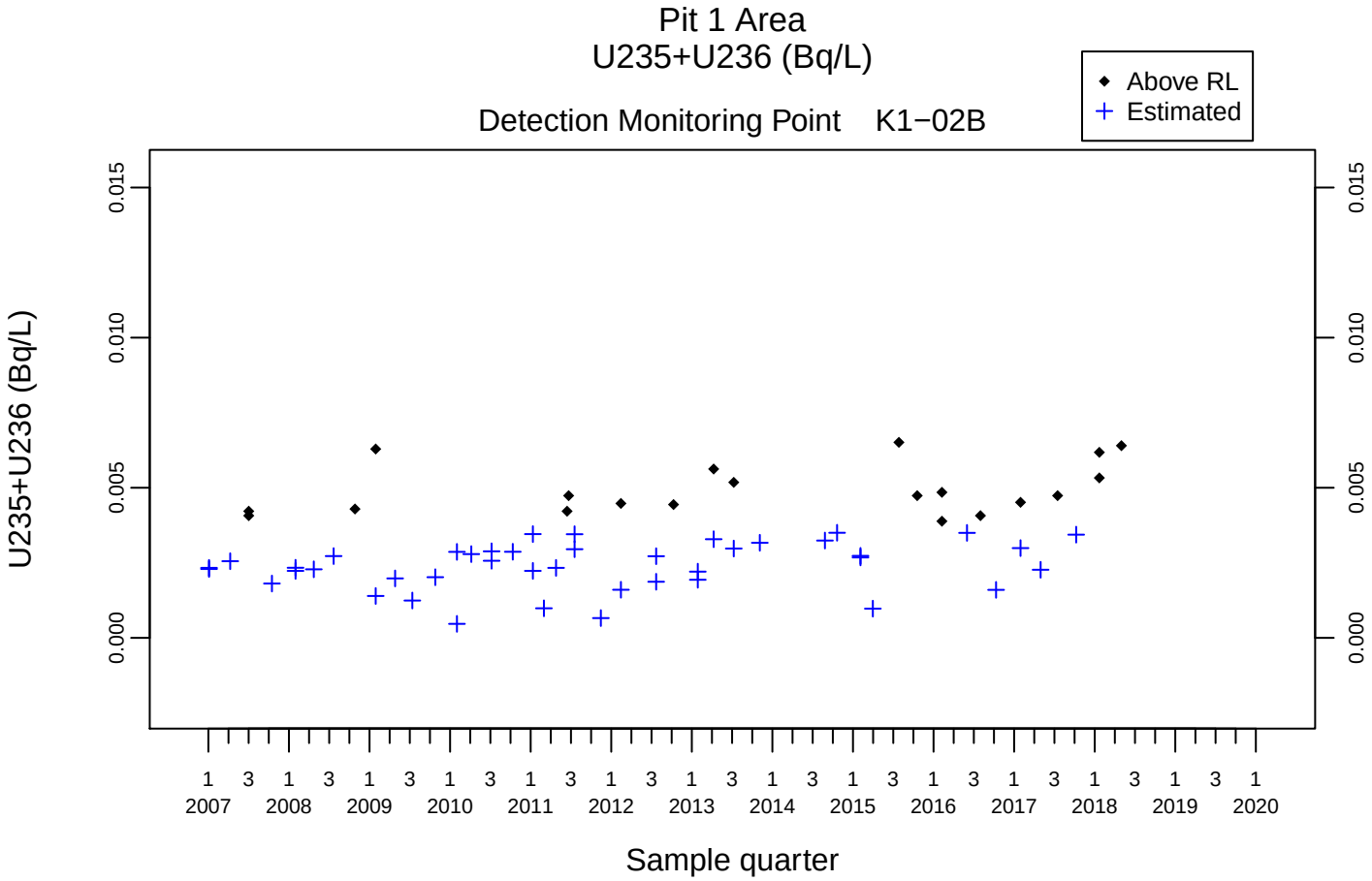


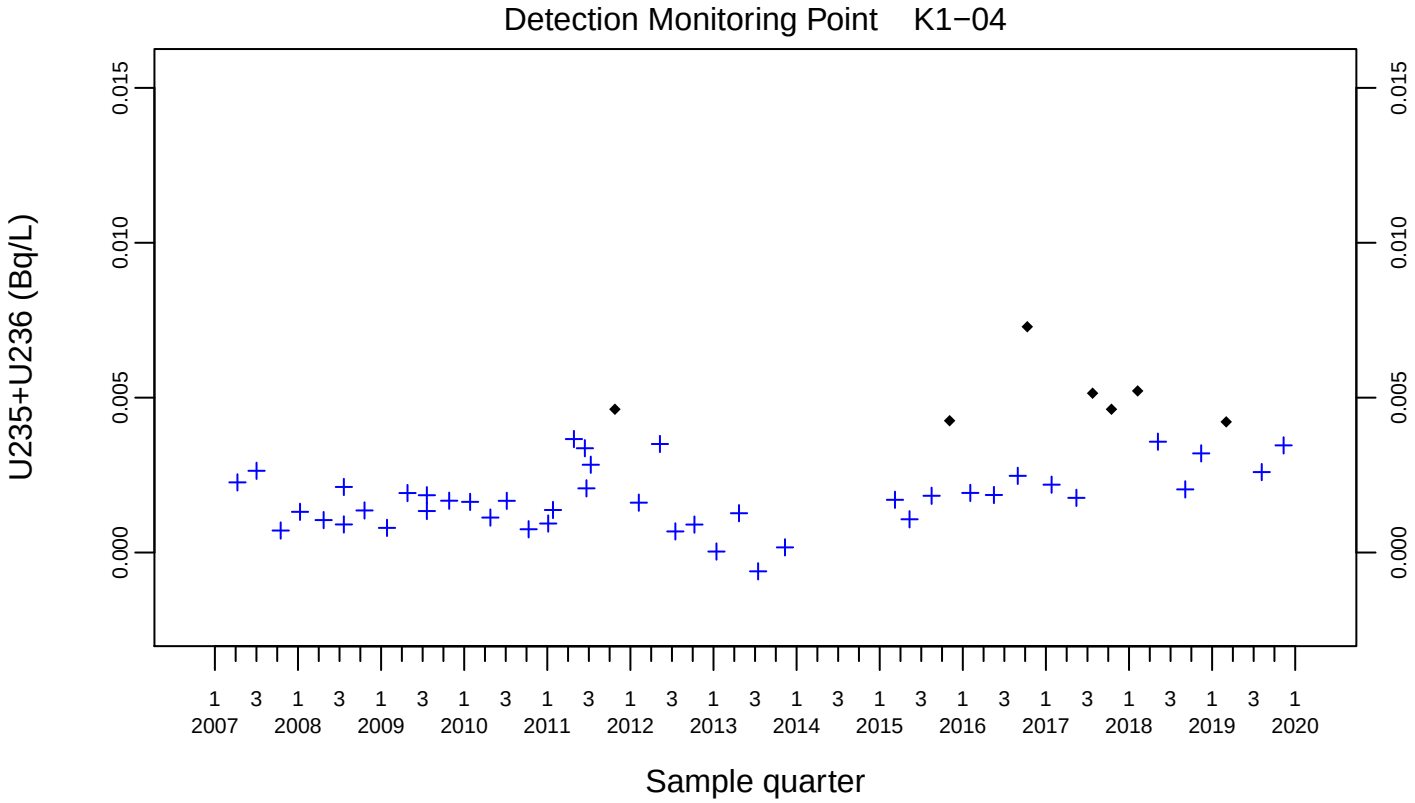


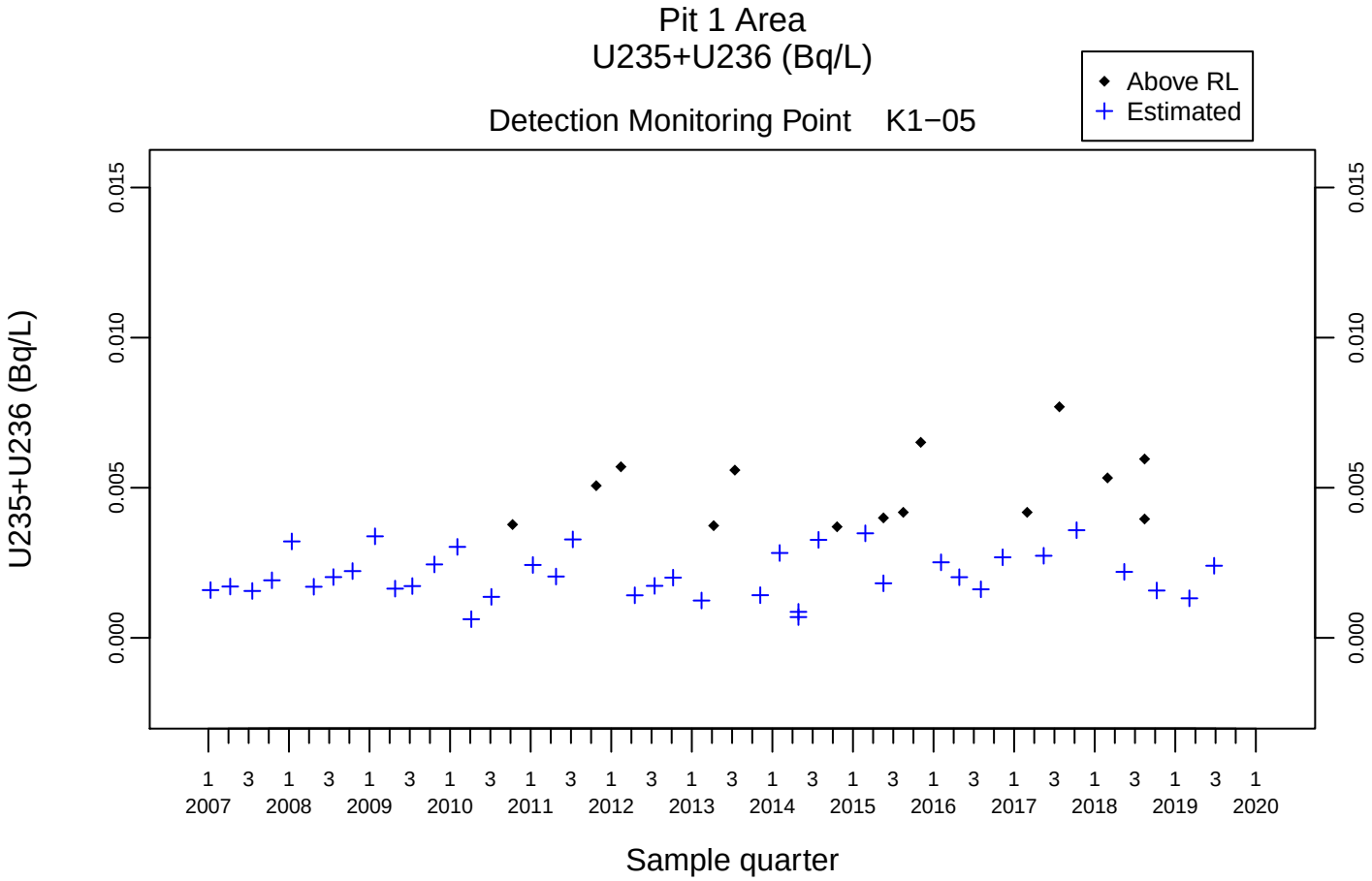
Pit 1 Area
U235+U236 (Bq/L)

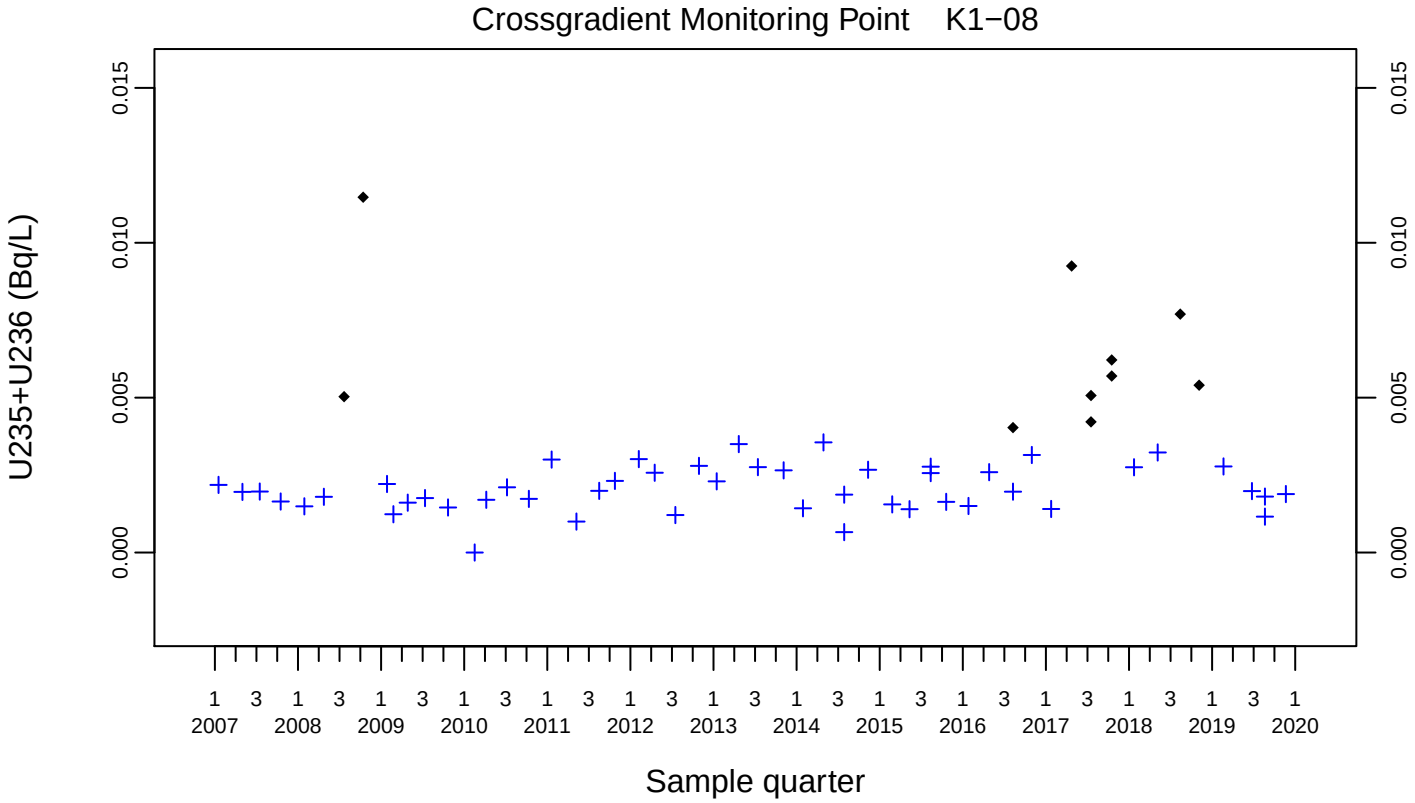


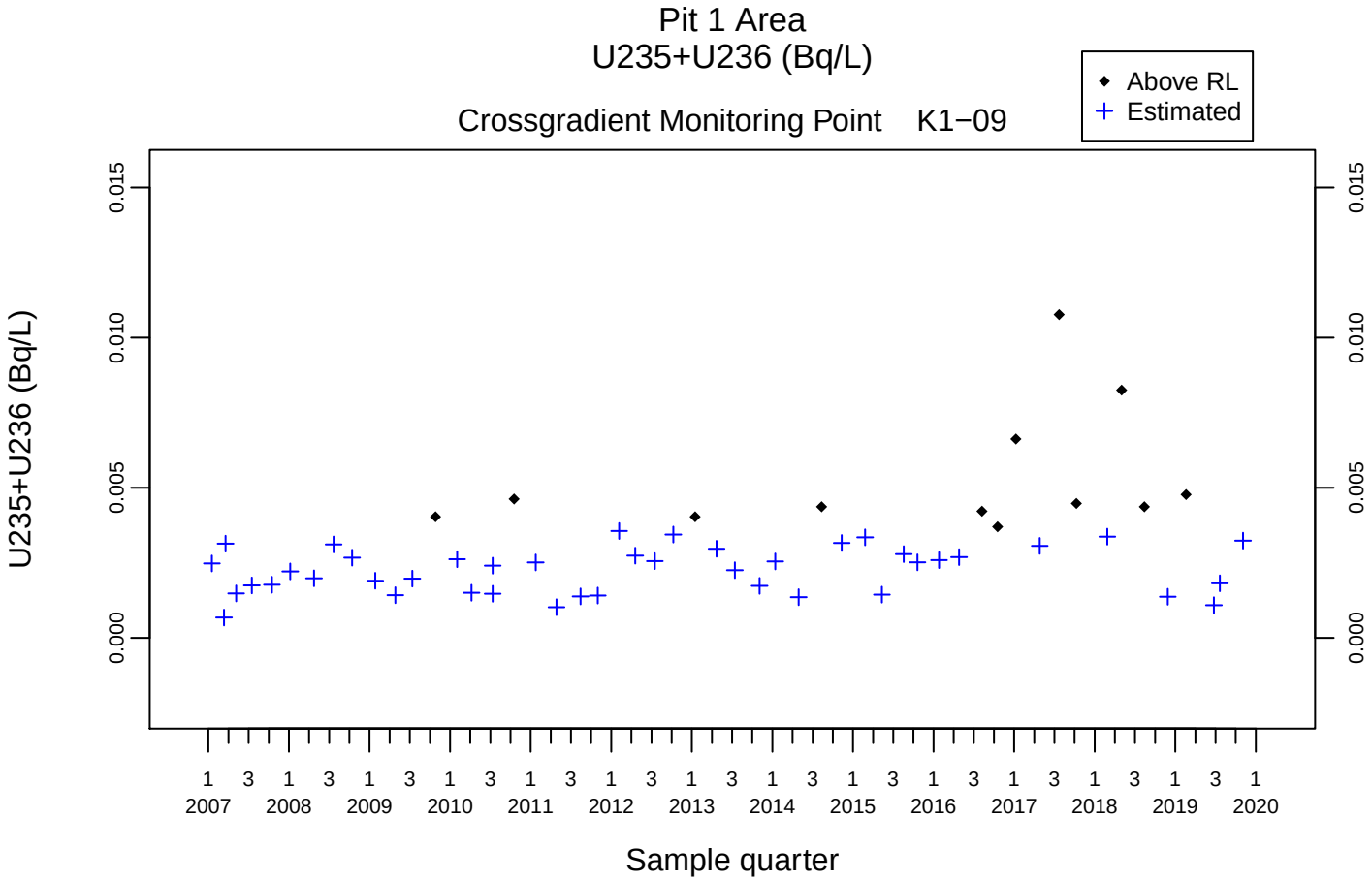


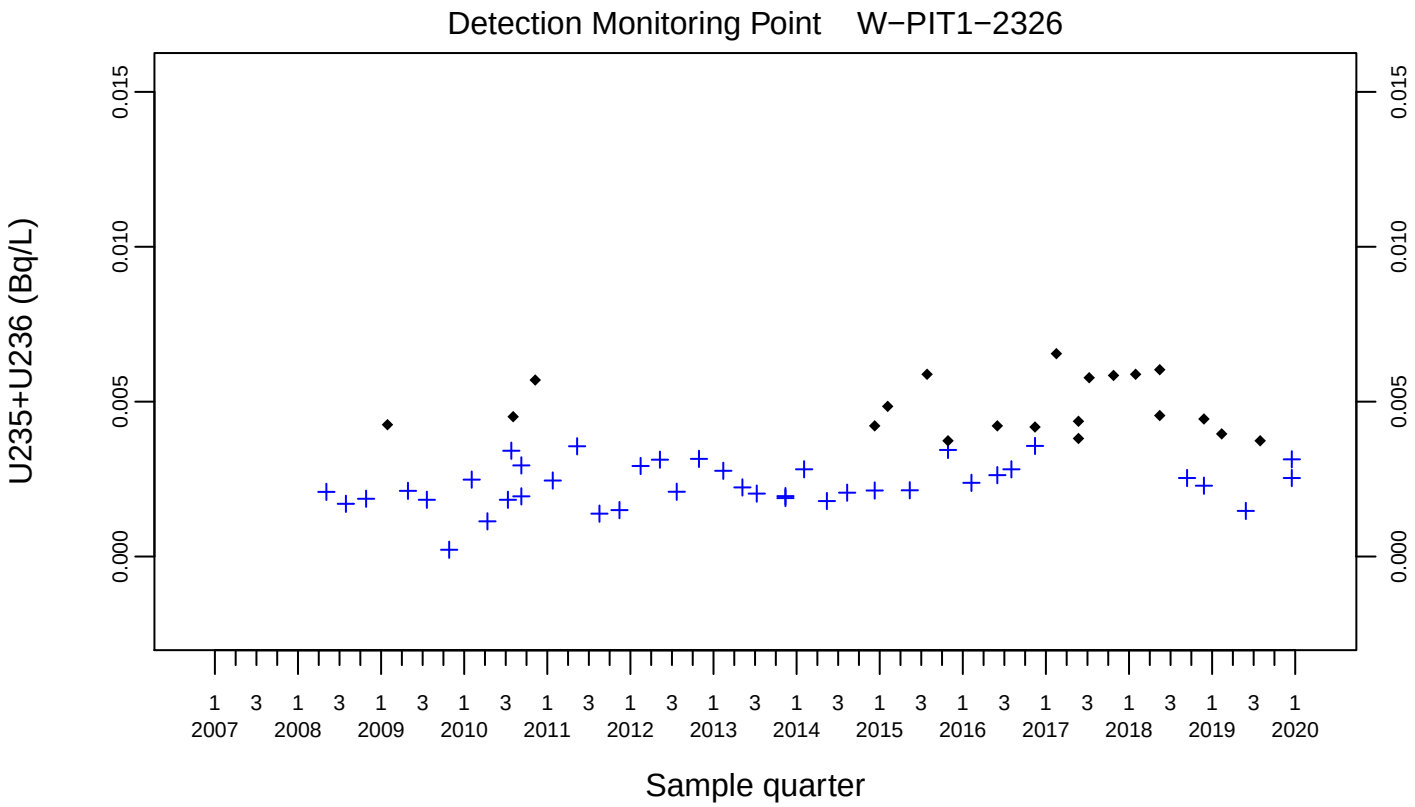

Pit 1 Area
U235+U236 (Bq/L)
Above RL
Estimated
Detection Monitoring Point K1−02B
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

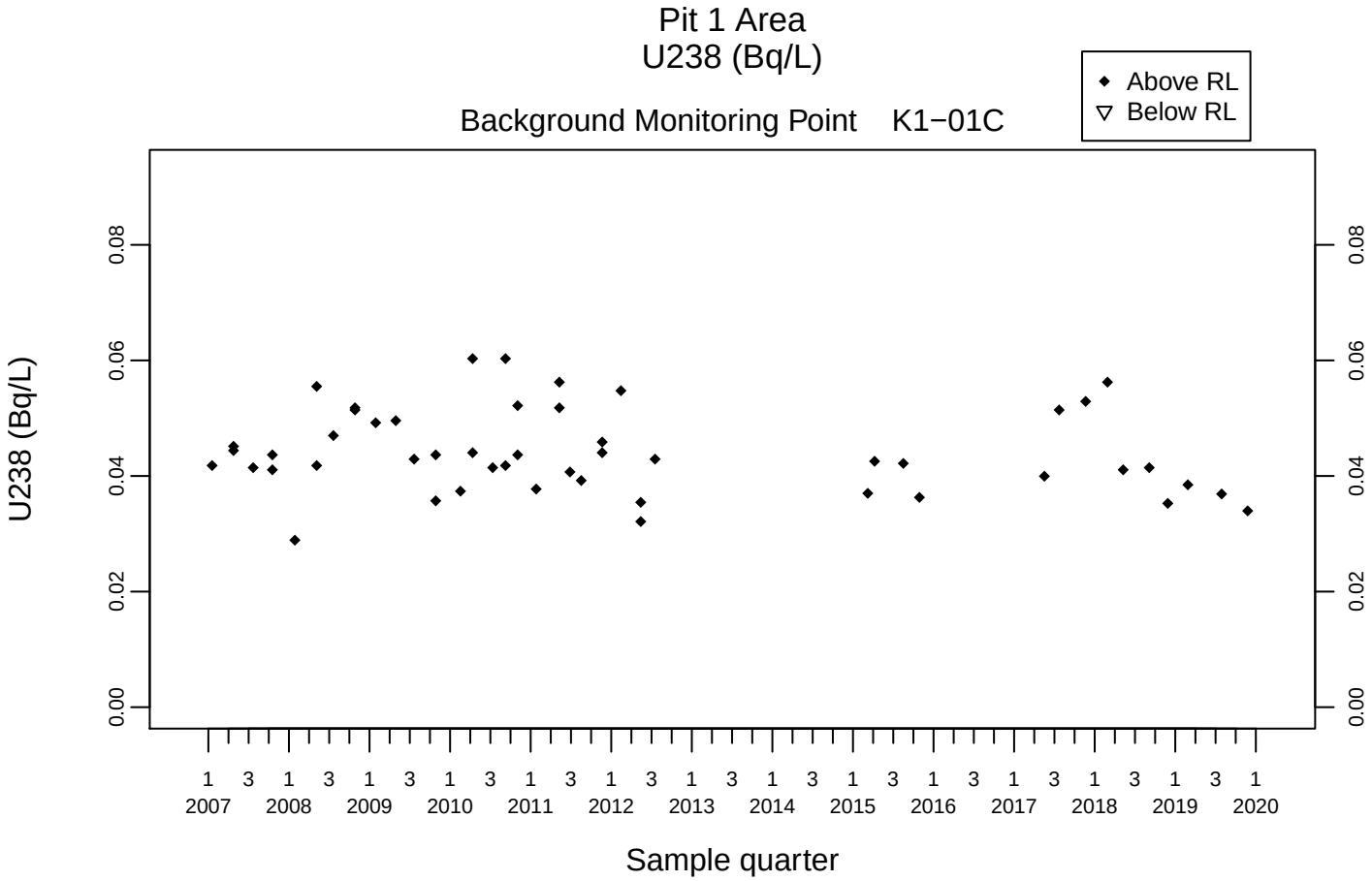

Detection Monitoring Point K1−04
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

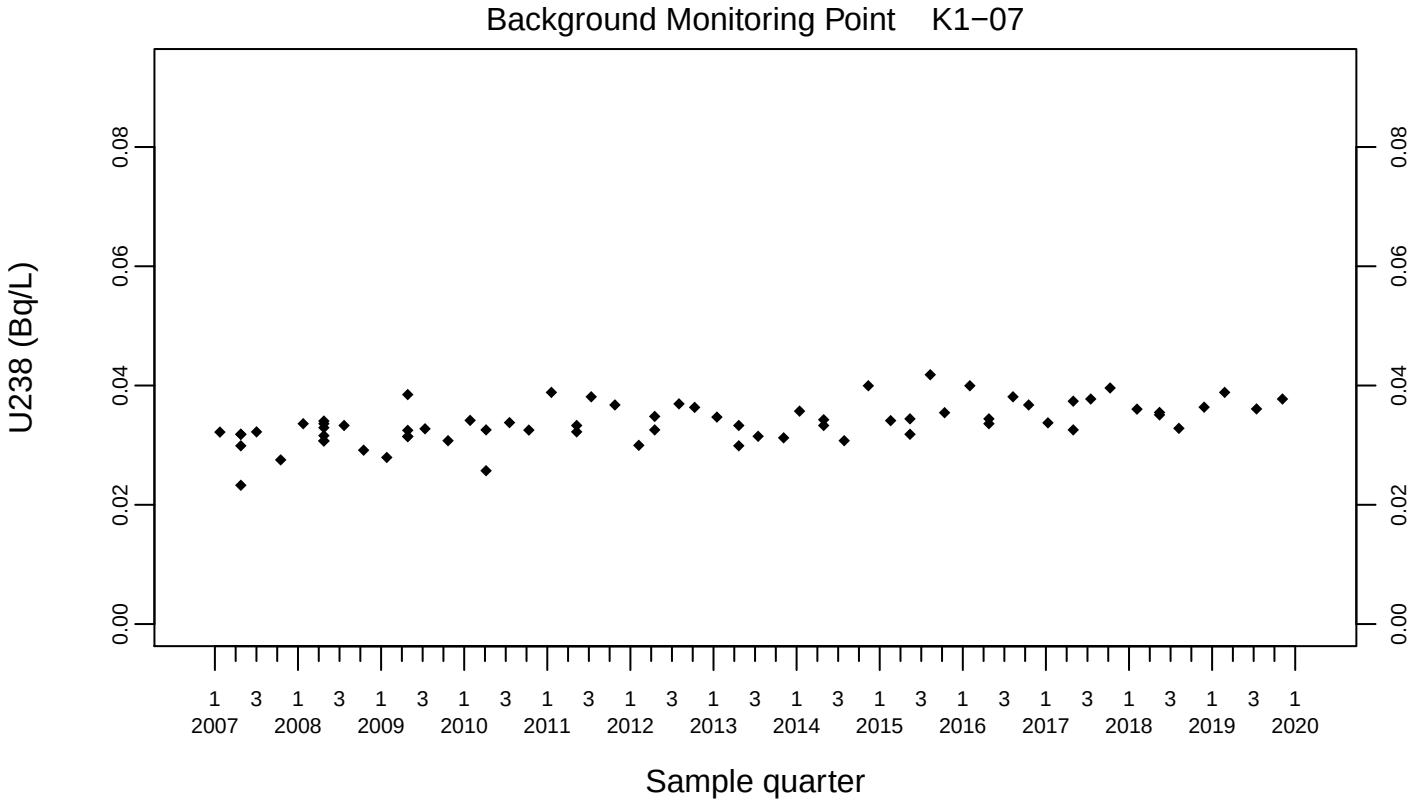

Pit 1 Area
U235+U236 (Bq/L)
Detection Monitoring Point K1−05
Above RL
Estimated
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

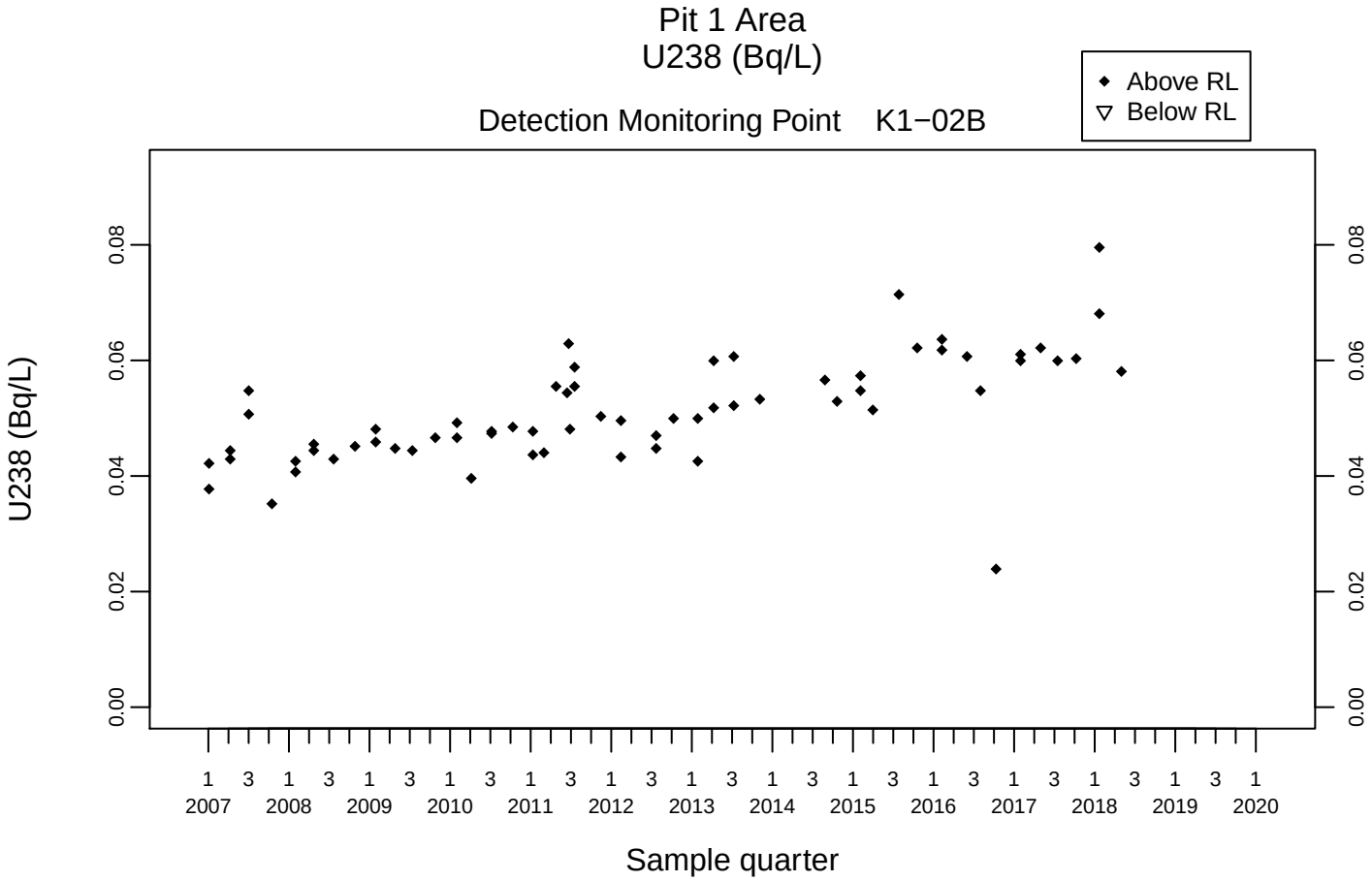

Crossgradient Monitoring Point K1−08
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

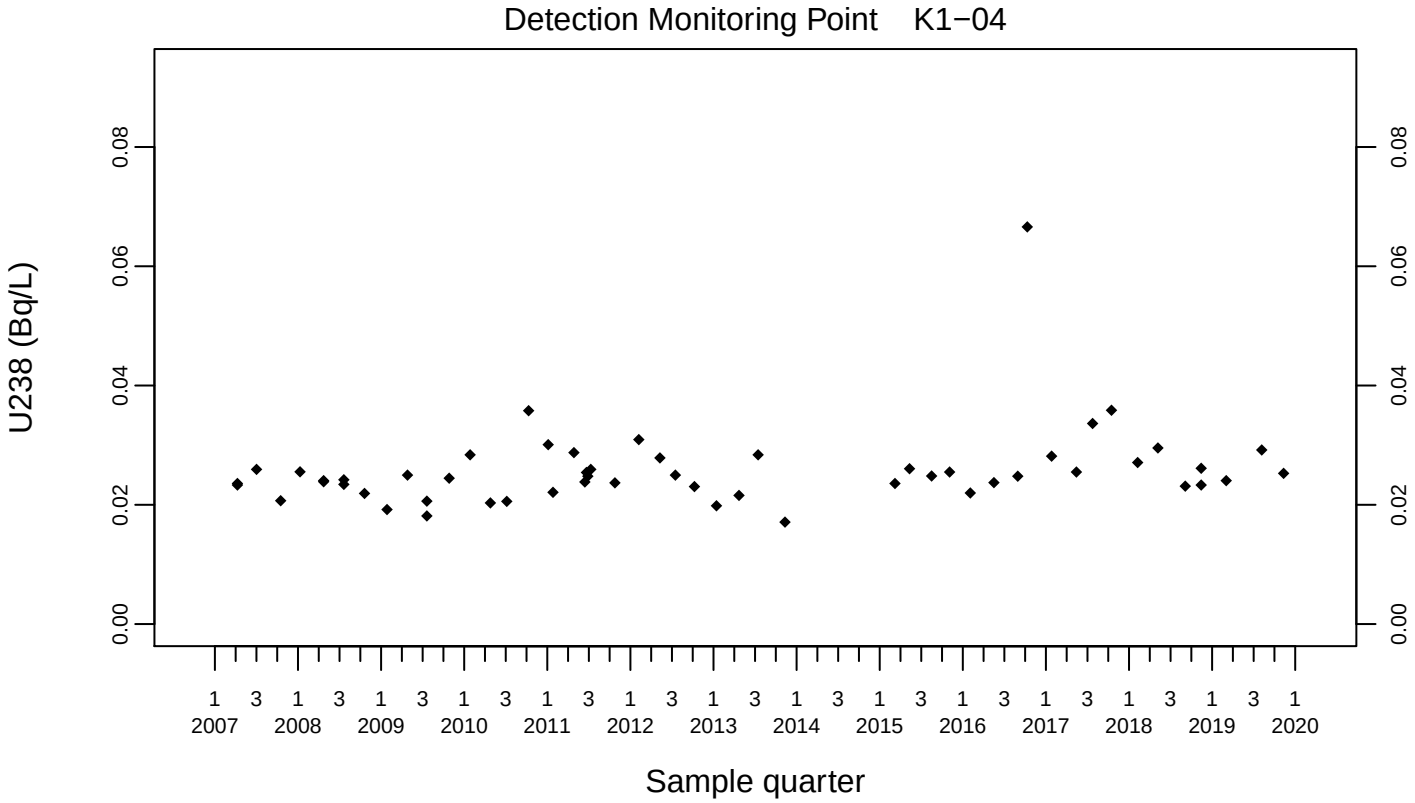

Pit 1 Area
U235+U236 (Bq/L)
Crossgradient Monitoring Point K1−09
Above RL
Estimated
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

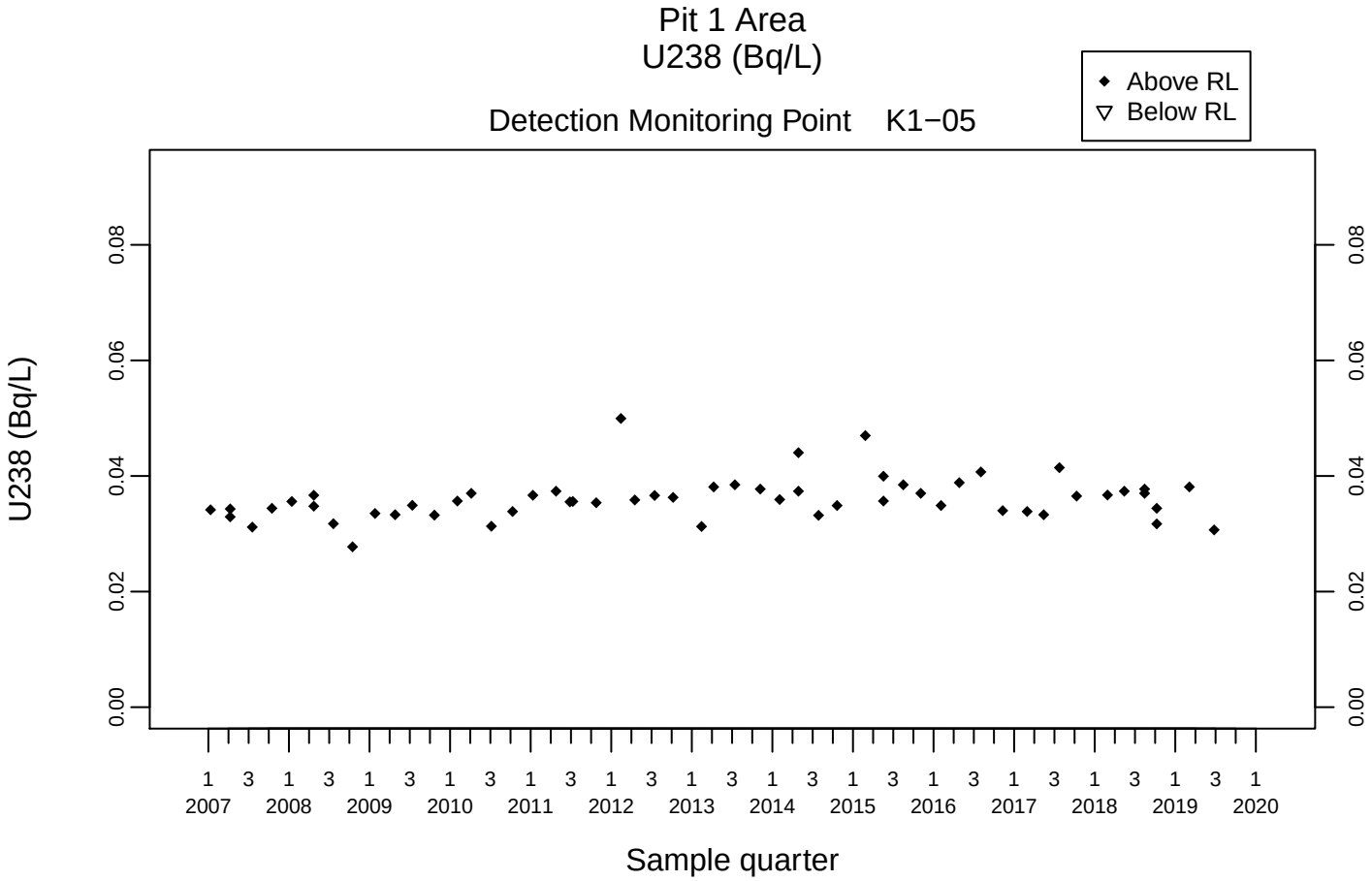

Detection Monitoring Point W−PIT1−2326
U235+U236 (Bq/L)
0.000
0.005
0.010
0.015
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

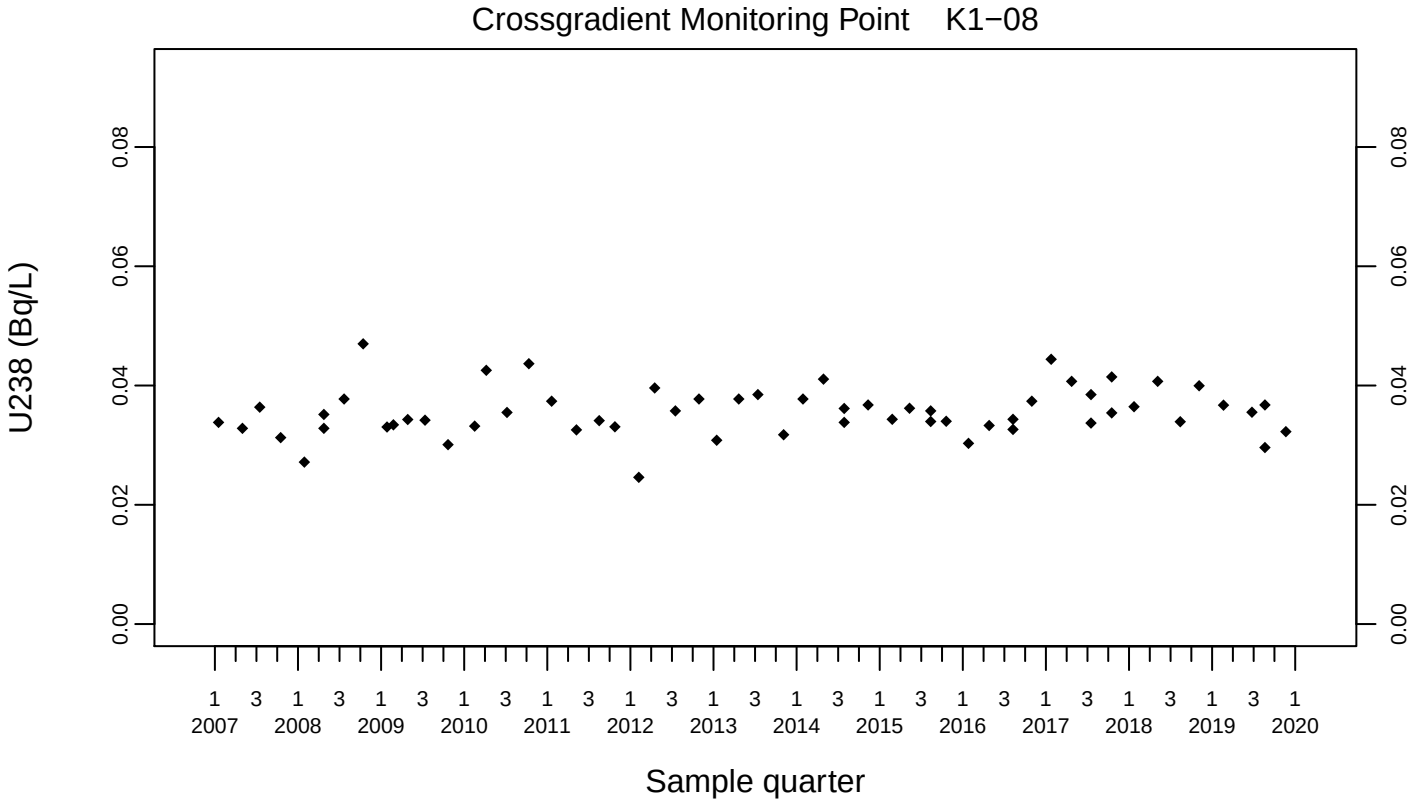

Pit 1 Area
U238 (Bq/L)
Background Monitoring Point K1−01C
Above RL
Below RL
U238 (Bq/L)
0.00
0.02
0.04
0.06
0.08
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

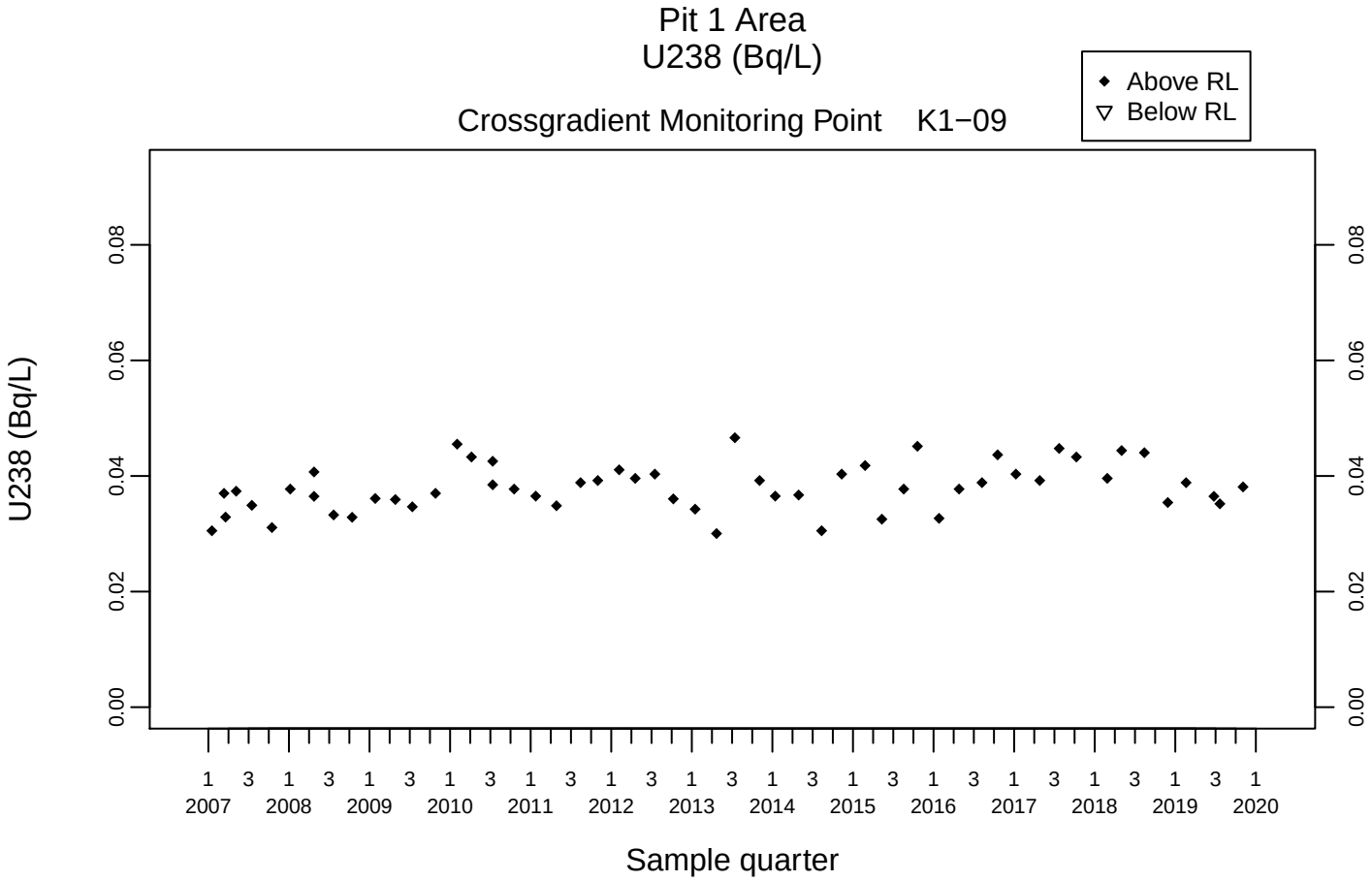

Background Monitoring Point K1−07
U238 (Bq/L)
0.00
0.02
0.04
0.06
0.08
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

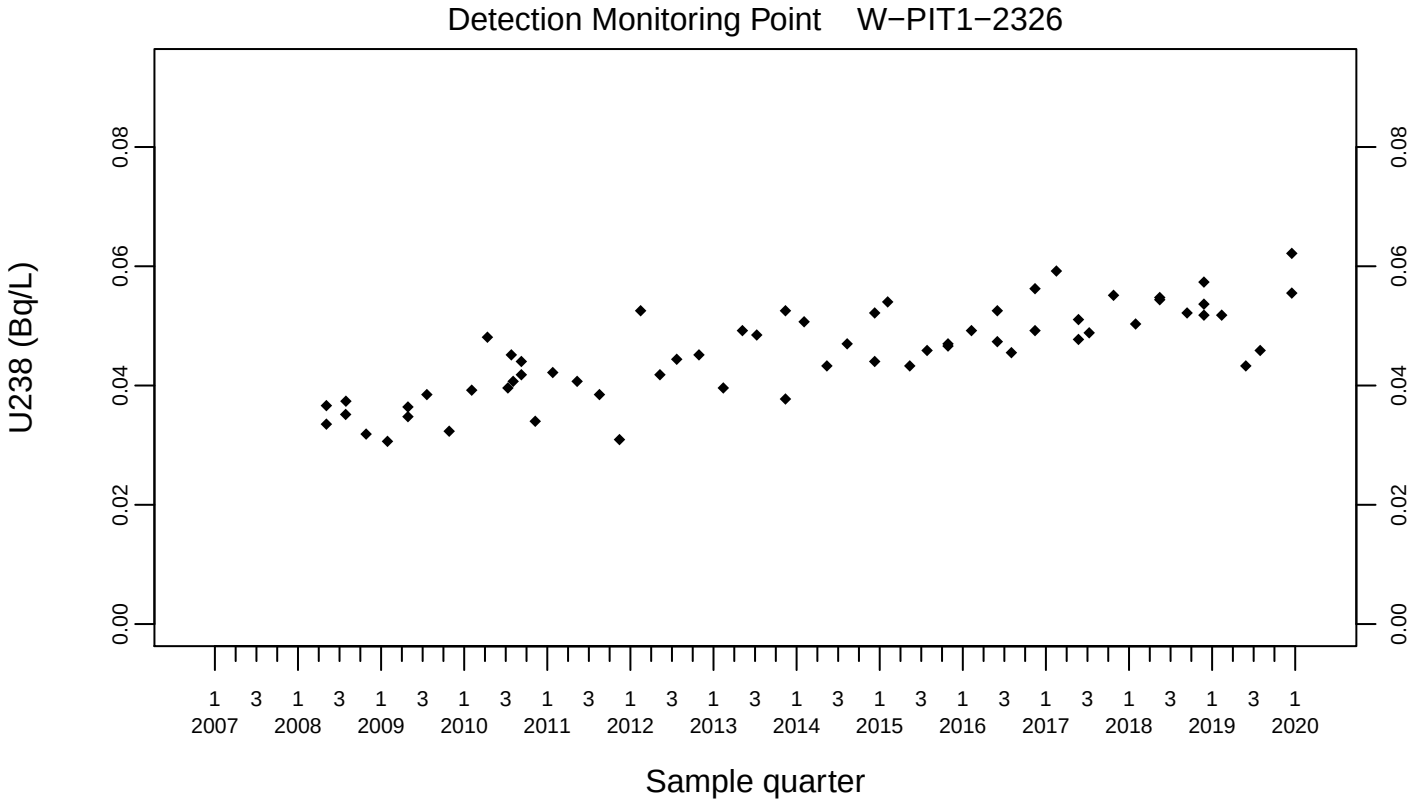

Pit 1 Area
U238 (Bq/L)
Above RL
Below RL
Detection Monitoring Point K1−02B
U238 (Bq/L)
0.00
0.02
0.04
0.06
0.08
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

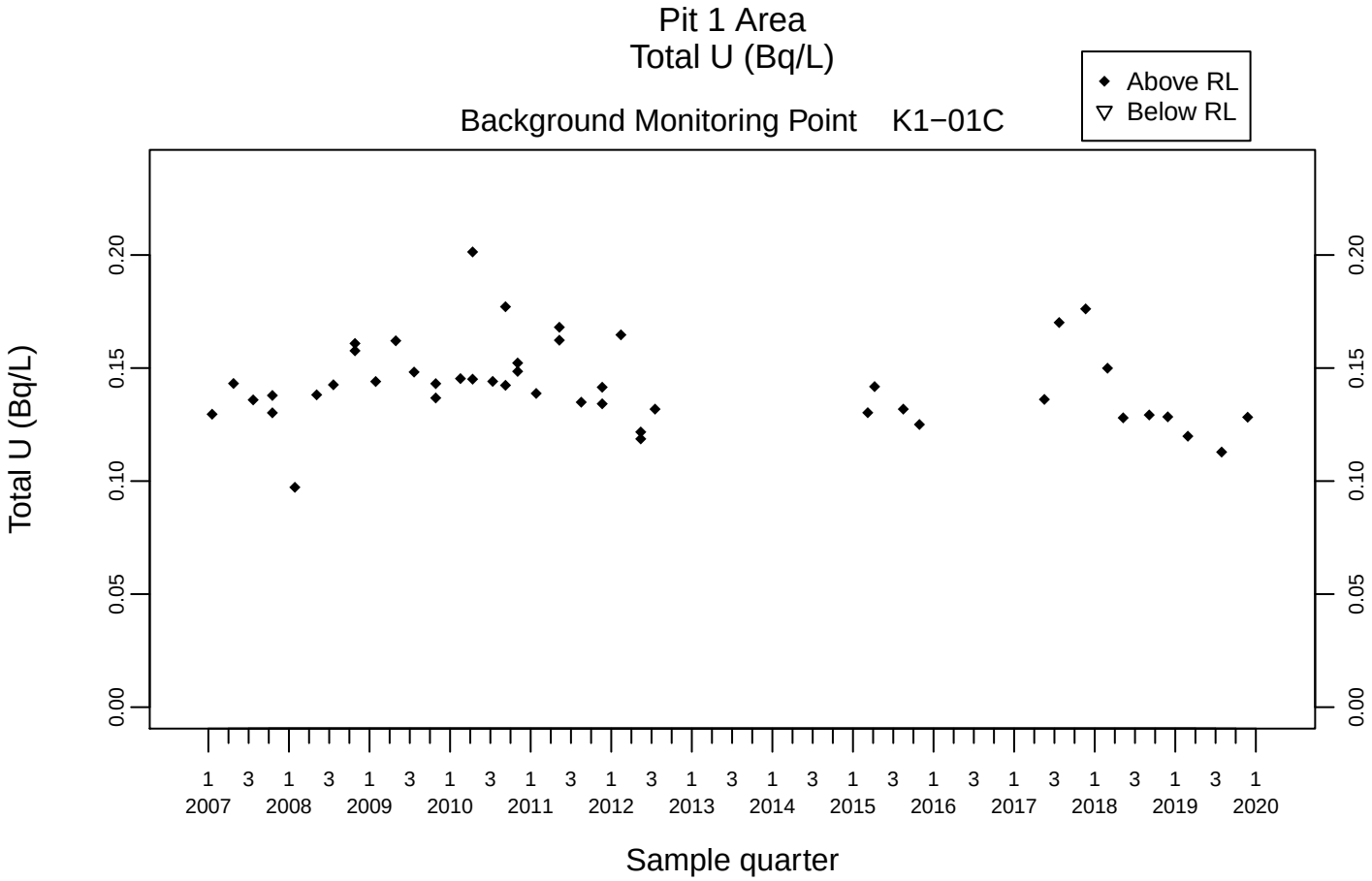

Detection Monitoring Point K1−04
U238 (Bq/L)
0.00
0.02
0.04
0.06
0.08
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

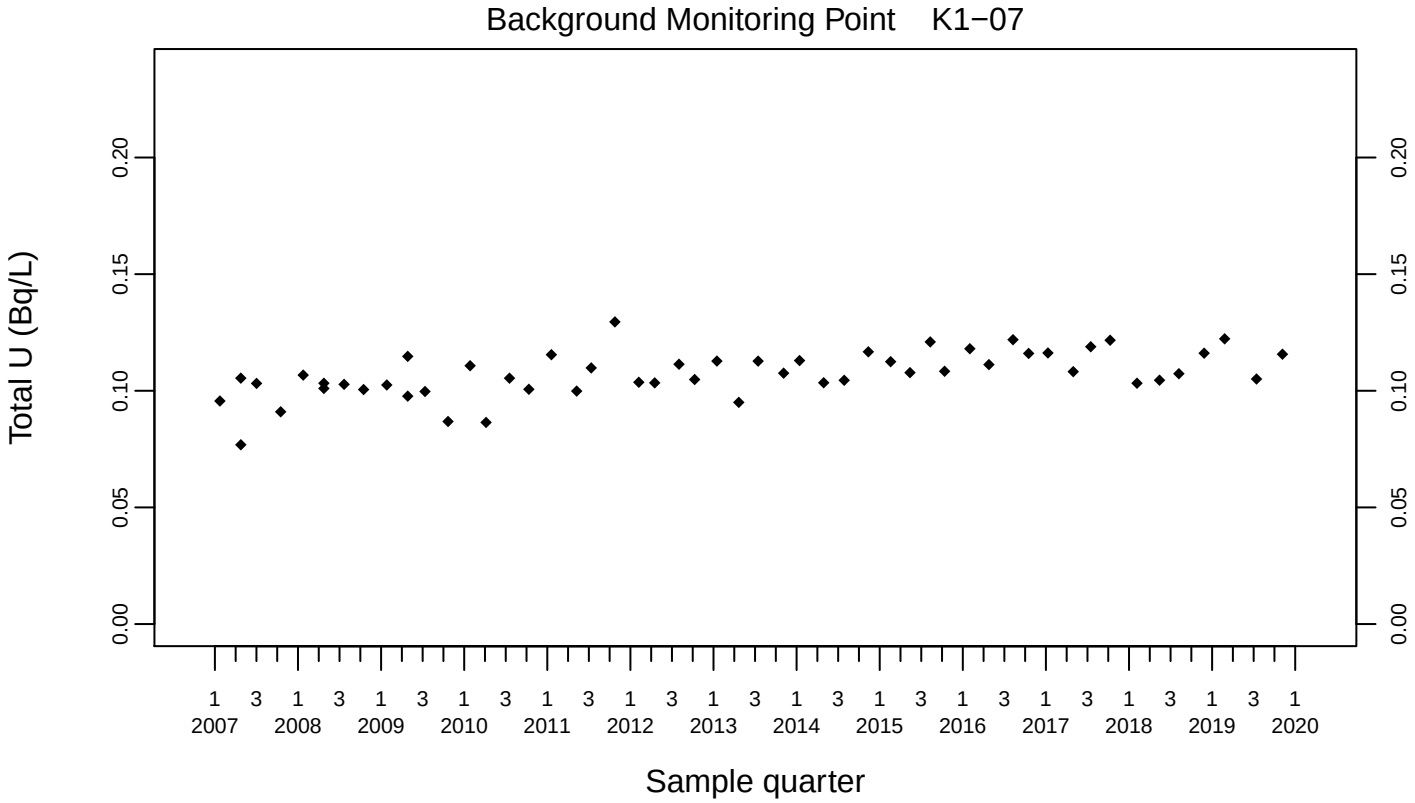

Pit 1 Area
U238 (Bq/L)
Detection Monitoring Point K1−05
Above RL
Below RL
U238 (Bq/L)
0.00
0.02
0.04
0.06
0.08
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

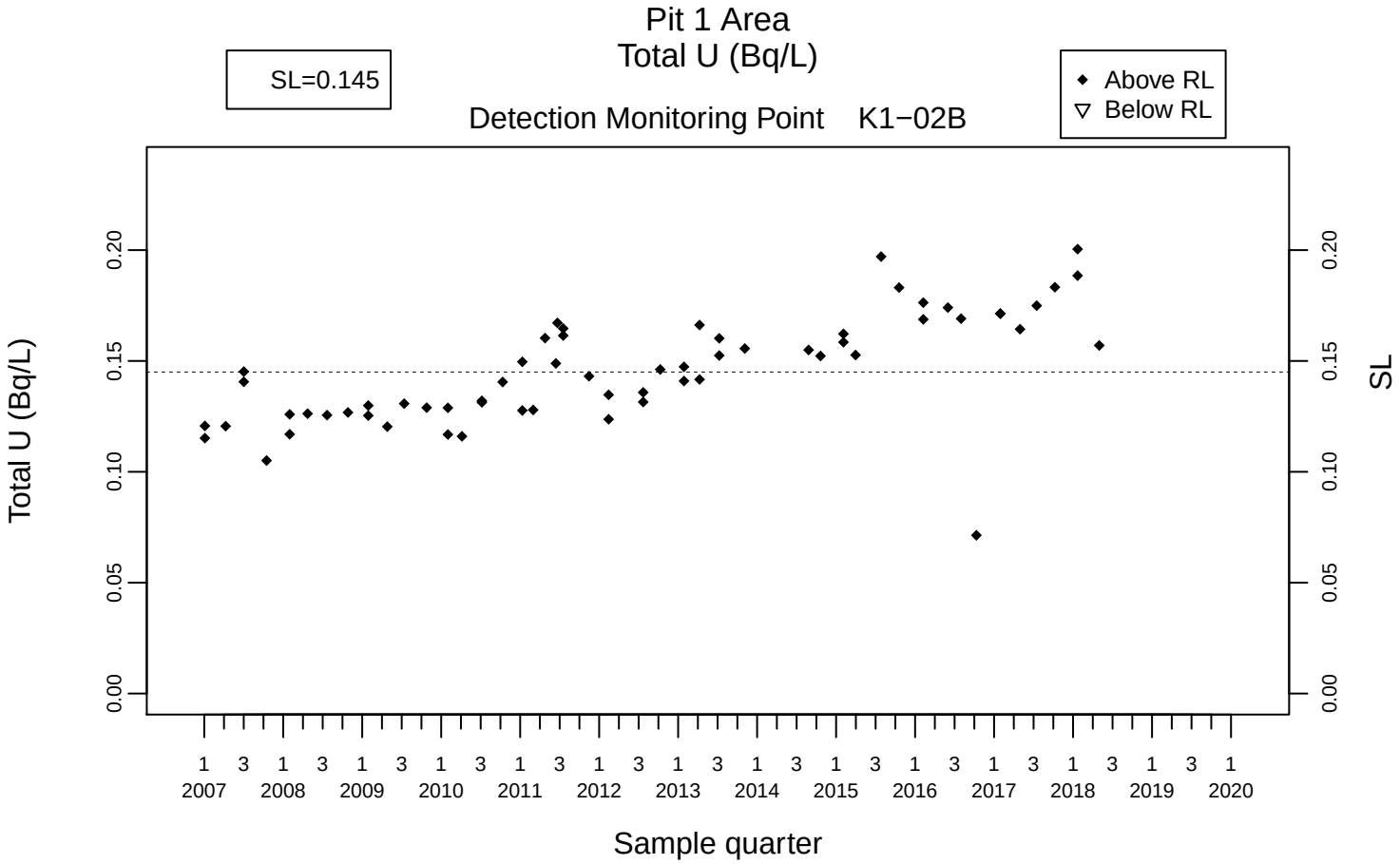

Crossgradient Monitoring Point K1−08
U238 (Bq/L)
0.00
0.02
0.04
0.06
0.08
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

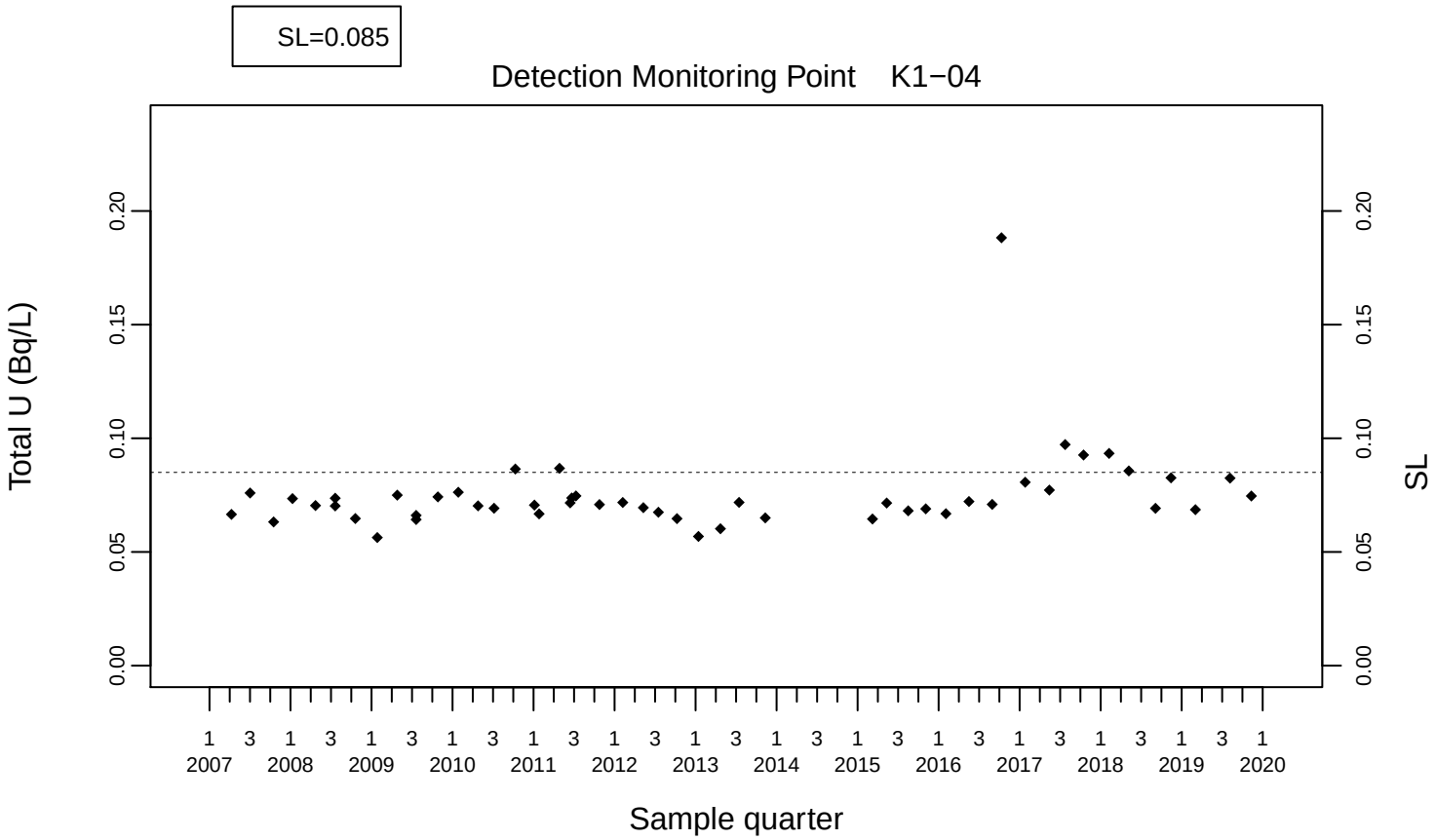

Pit 1 Area
U238 (Bq/L)
Crossgradient Monitoring Point K1−09
Above RL
Below RL
U238 (Bq/L)
0.00
0.02
0.04
0.06
0.08
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

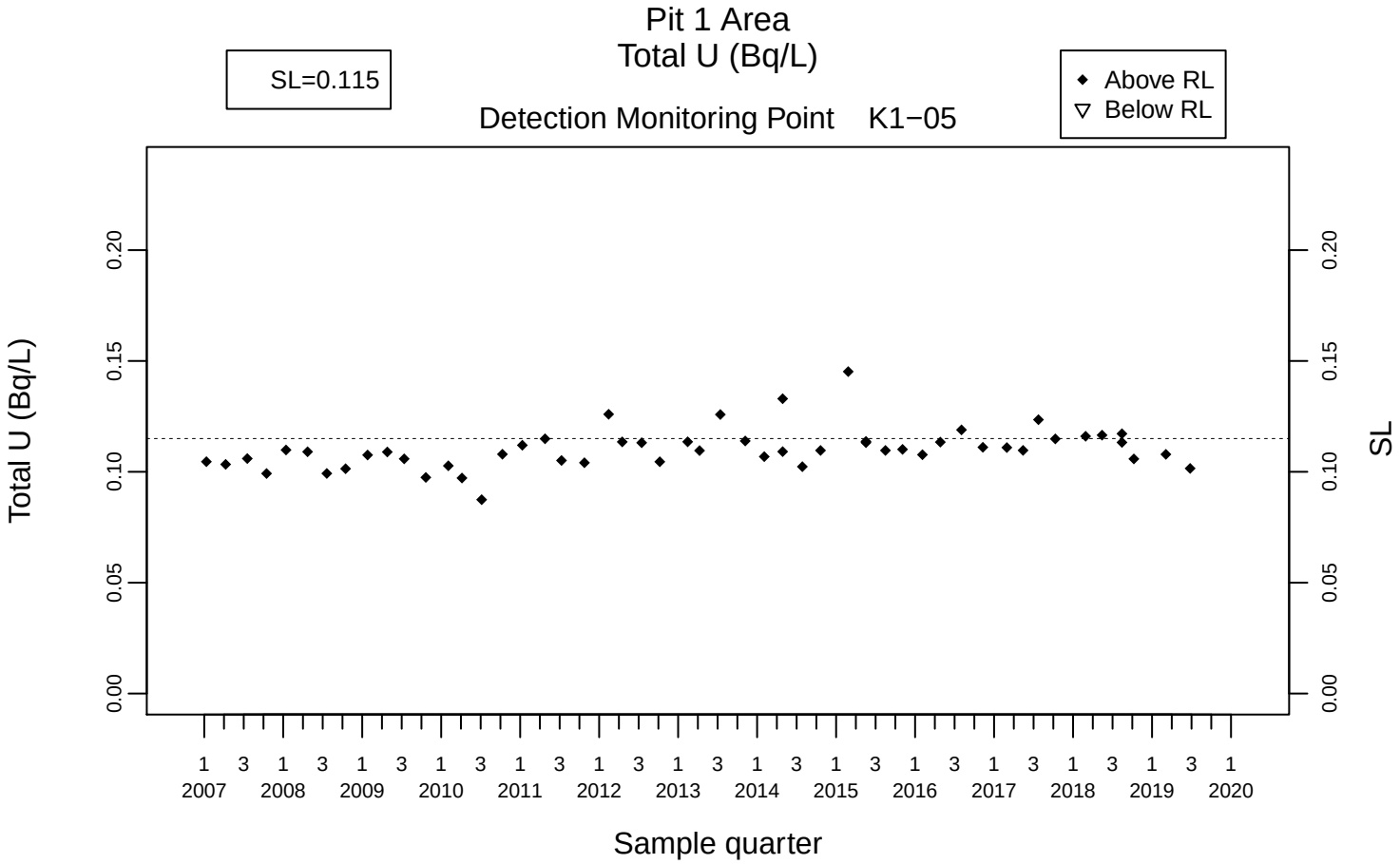

Detection Monitoring Point W−PIT1−2326
U238 (Bq/L)
0.00
0.02
0.04
0.06
0.08
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

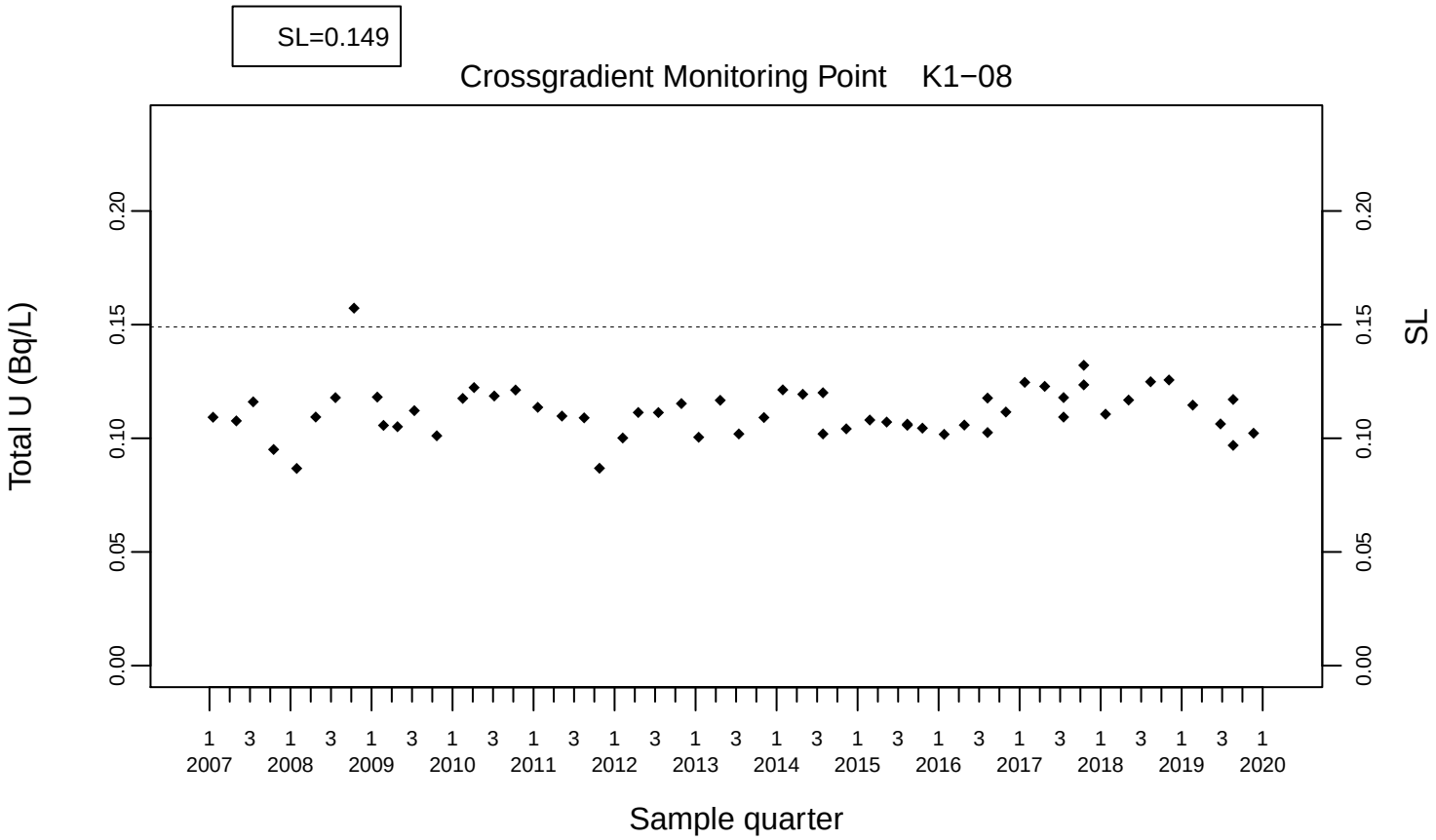

Pit 1 Area
Total U (Bq/L)
Background Monitoring Point K1−01C
Above RL
Below RL
Total U (Bq/L)
0.00
0.05
0.10
0.15
0.20
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

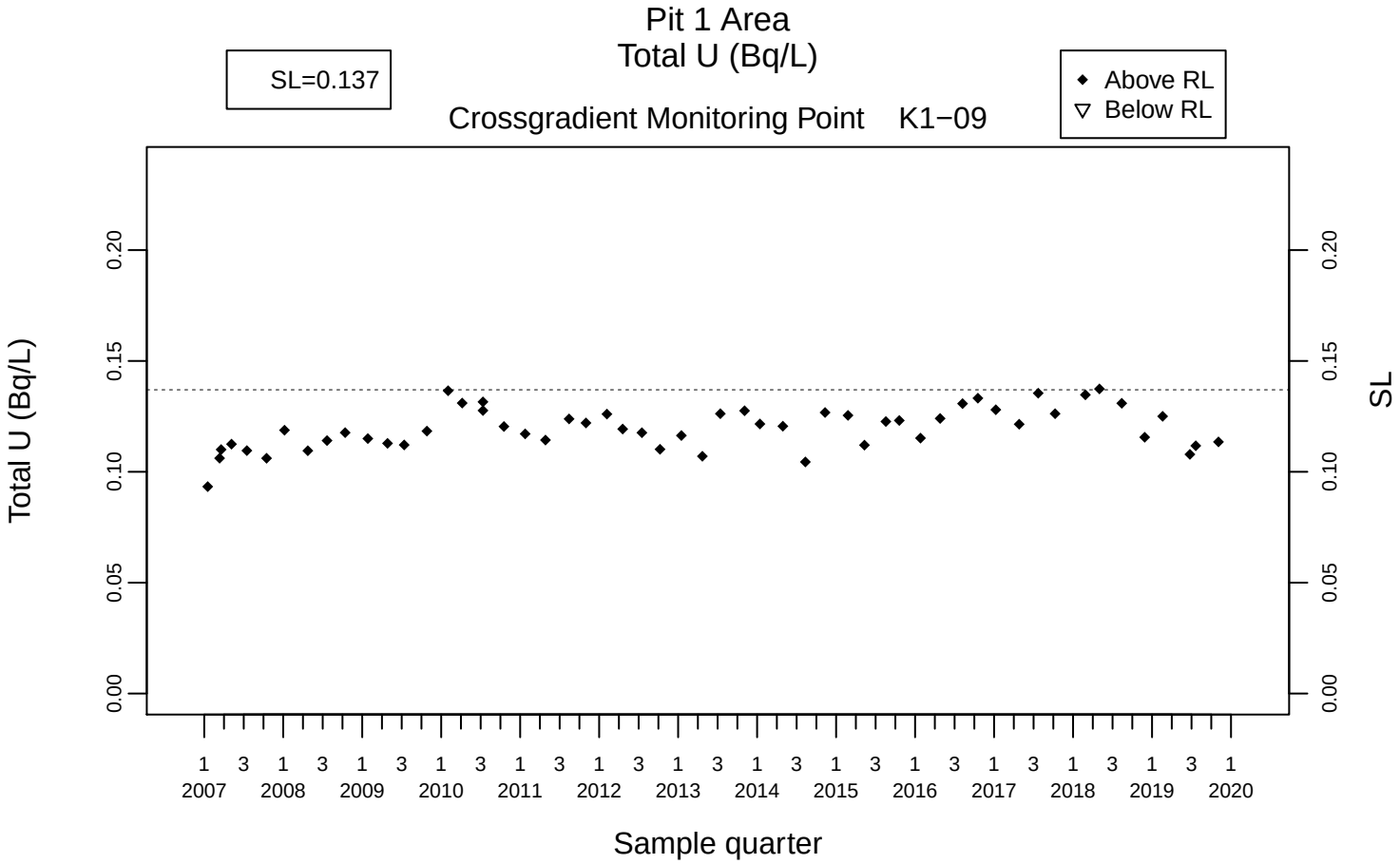

Background Monitoring Point K1−07
Total U (Bq/L)
0.00
0.05
0.10
0.15
0.20
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

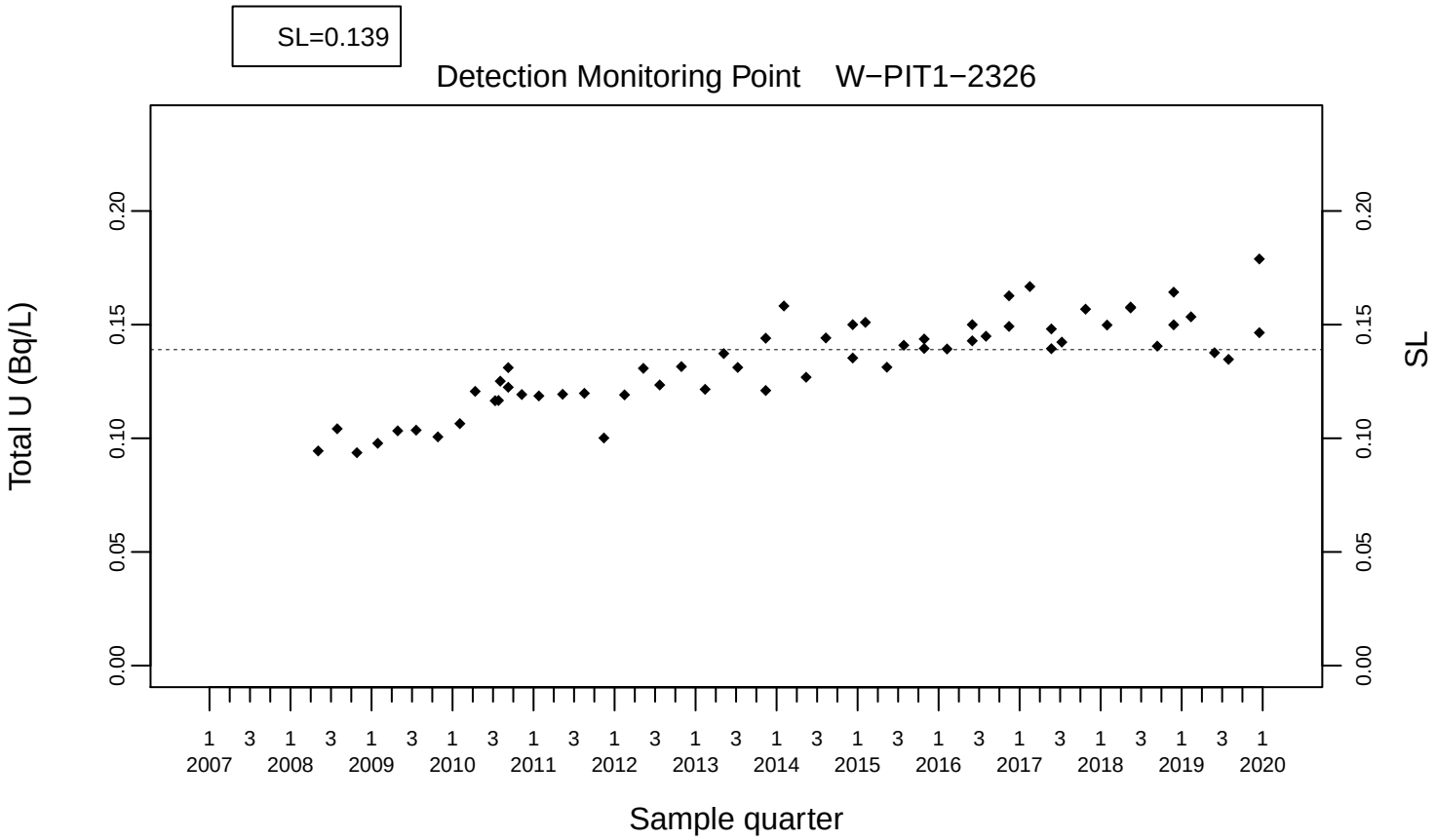

Pit 1 Area
Total U (Bq/L)
SL=0.145
Above RL
Below RL
Detection Monitoring Point K1−02B
Total U (Bq/L)
SL
0.00
0.05
0.10
0.15
0.20
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

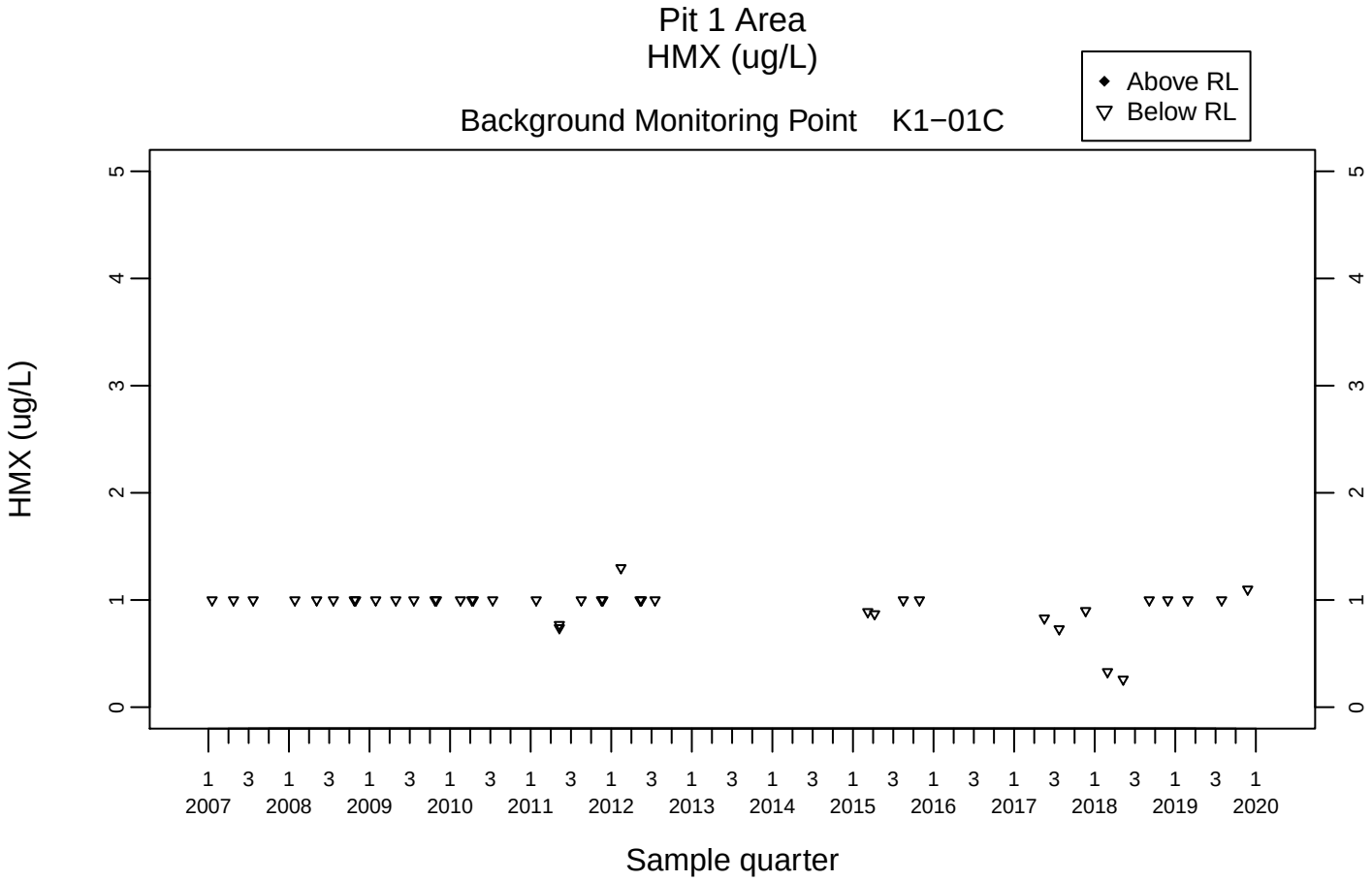

SL=0.085
Detection Monitoring Point K1−04
Total U (Bq/L)
SL
0.00
0.05
0.10
0.15
0.20
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

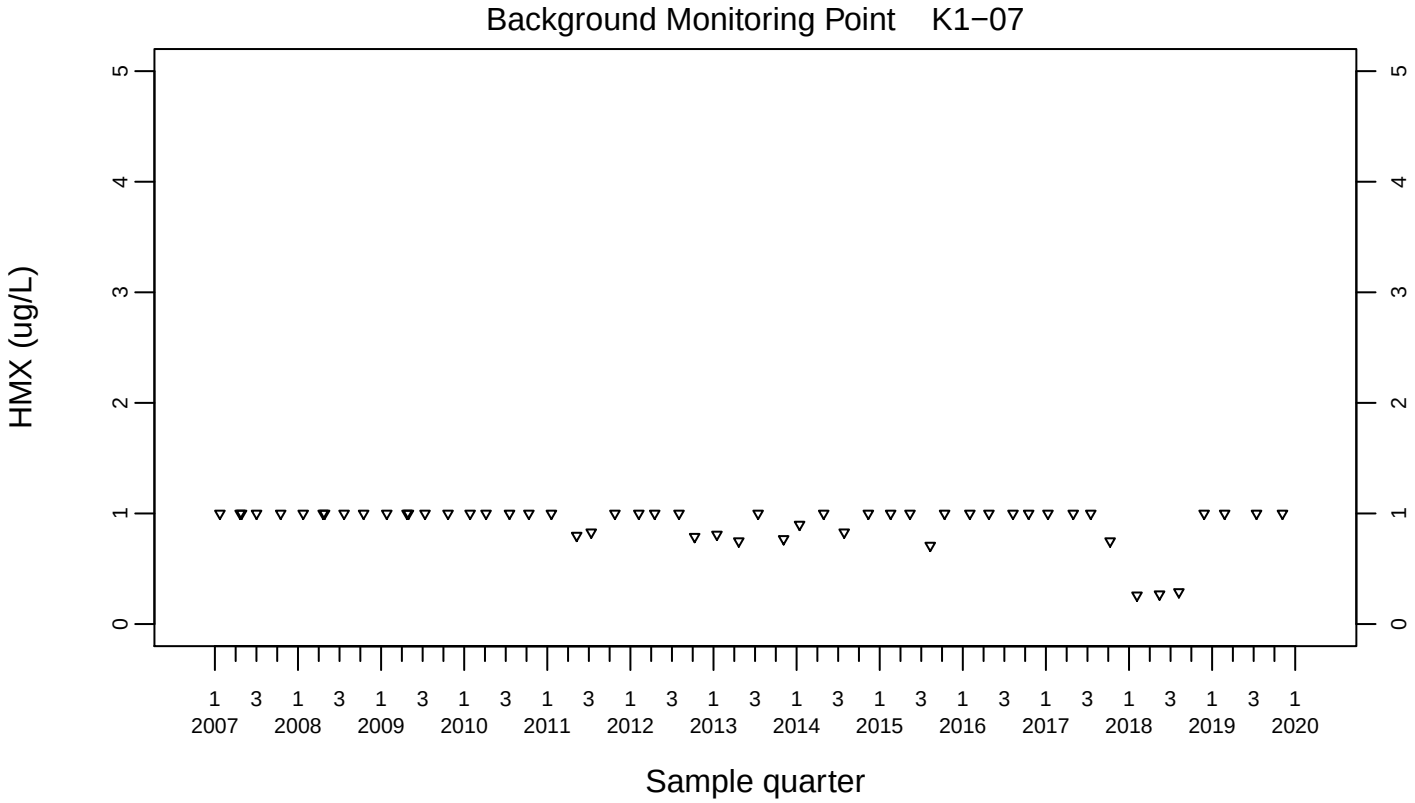

Pit 1 Area
Total U (Bq/L)
SL=0.115
Above RL
Below RL
Detection Monitoring Point K1−05
Total U (Bq/L)
SL
0.00
0.05
0.10
0.15
0.20
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

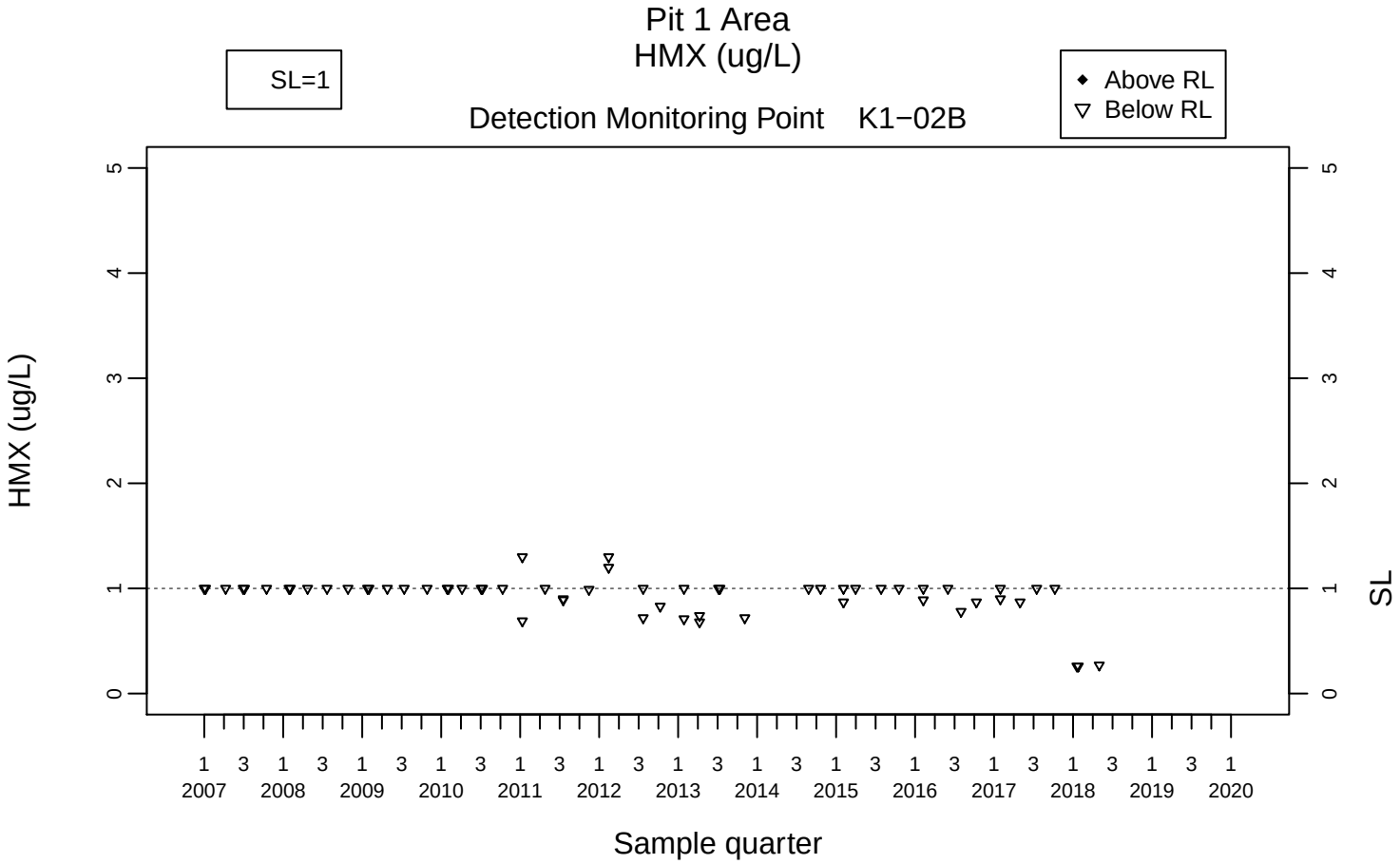

SL=0.149
Crossgradient Monitoring Point K1−08
Total U (Bq/L)
SL
0.00
0.05
0.10
0.15
0.20
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

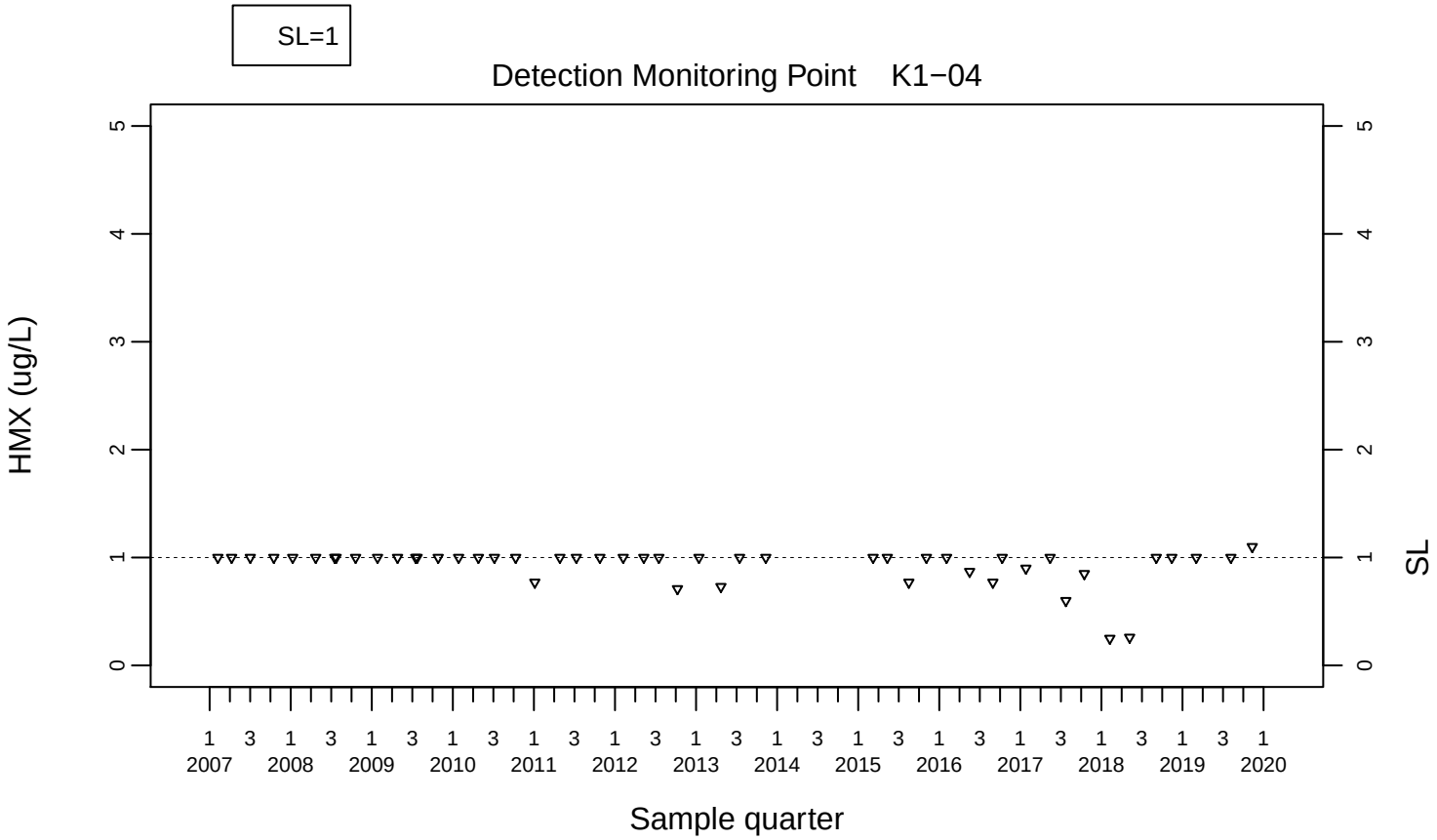

Pit 1 Area
Total U (Bq/L)
SL=0.137
Crossgradient Monitoring Point K1−09
Above RL
Below RL
Total U (Bq/L)
SL
0.00
0.05
0.10
0.15
0.20
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

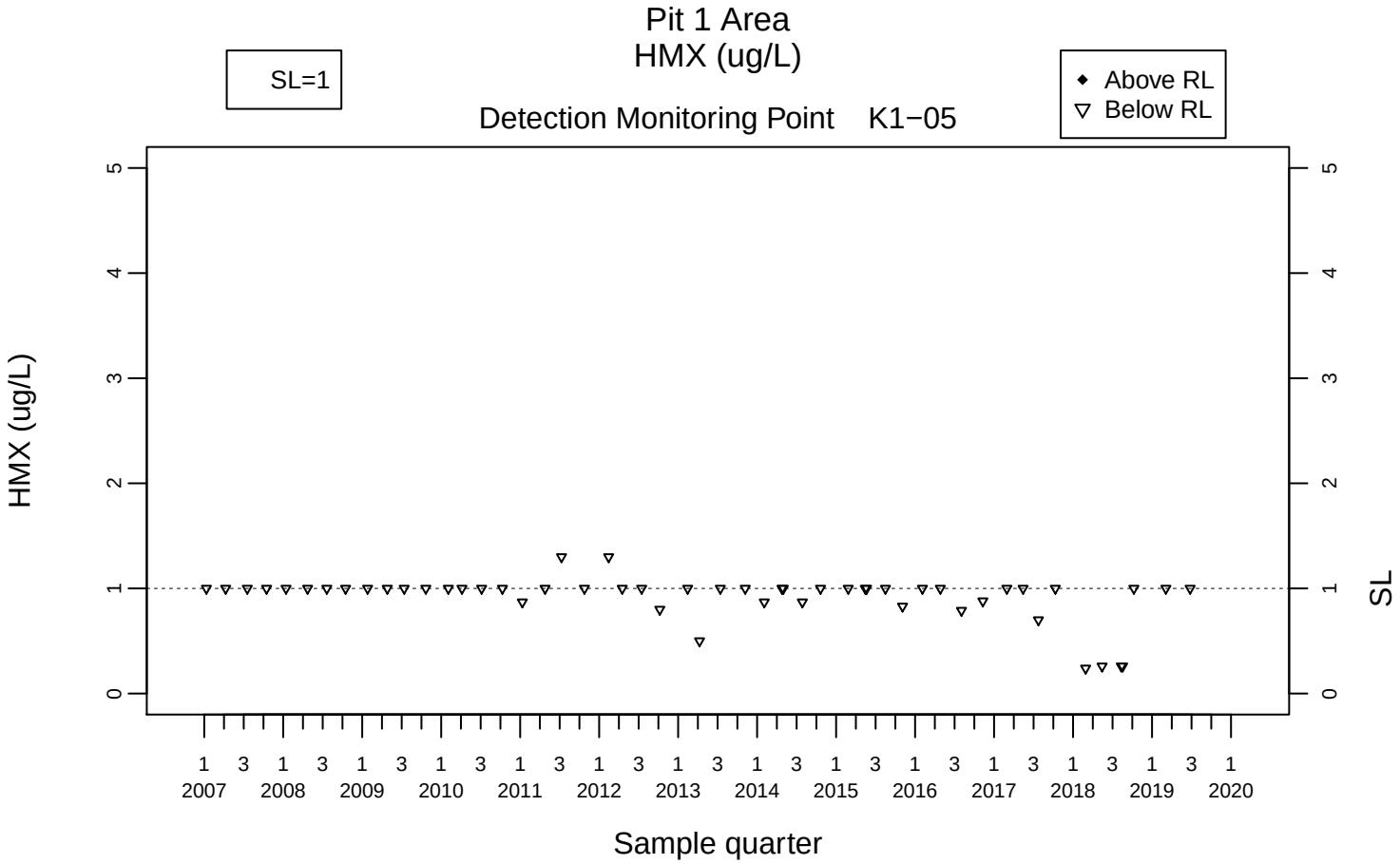

SL=0.139
Detection Monitoring Point W−PIT1−2326
Total U (Bq/L)
SL
0.00
0.05
0.10
0.15
0.20
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter

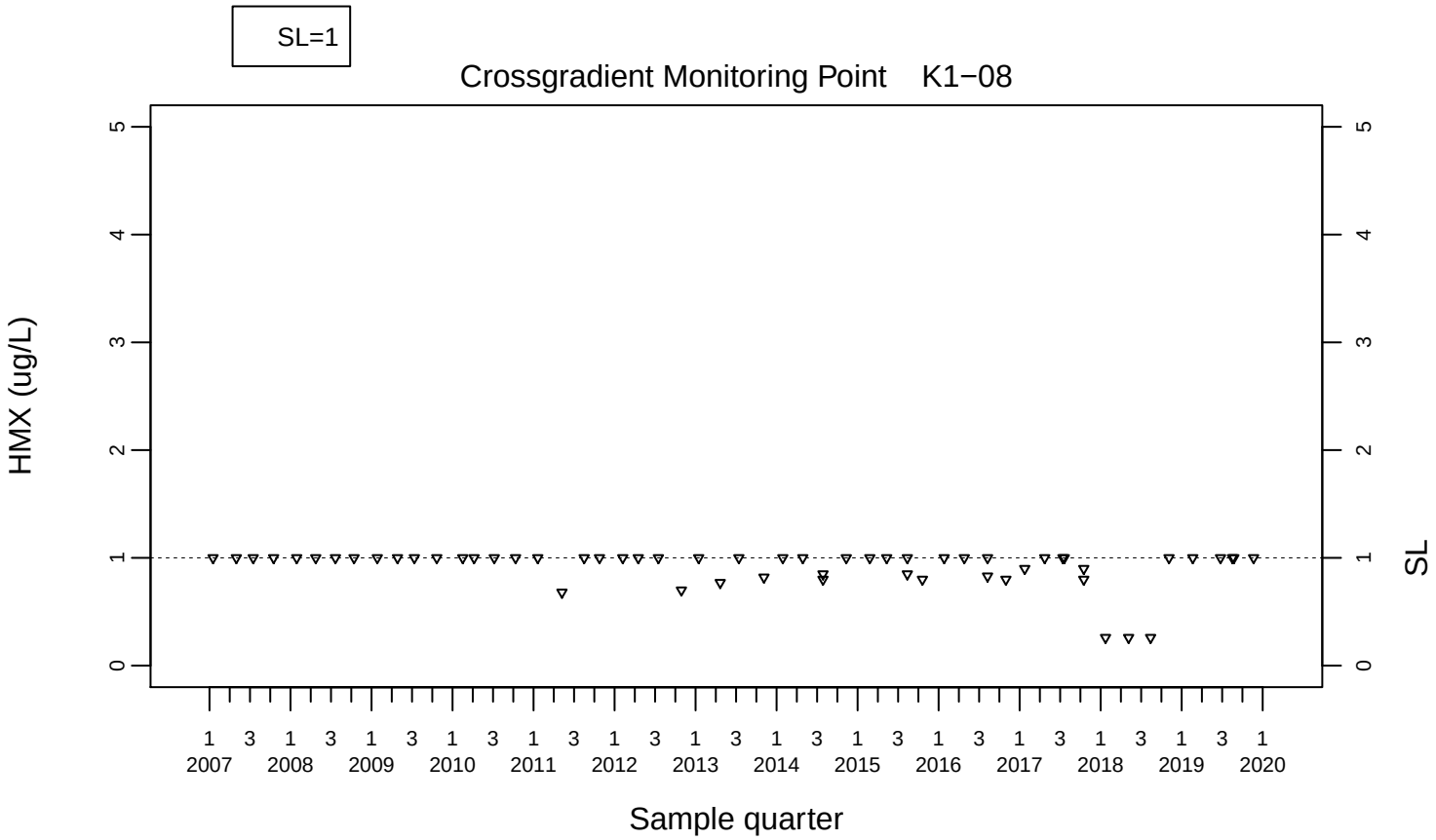

Pit 1 Area
HMX (ug/L)
Background Monitoring Point K1−01C
Above RL
Below RL
HMX (ug/L)
Sample quarter

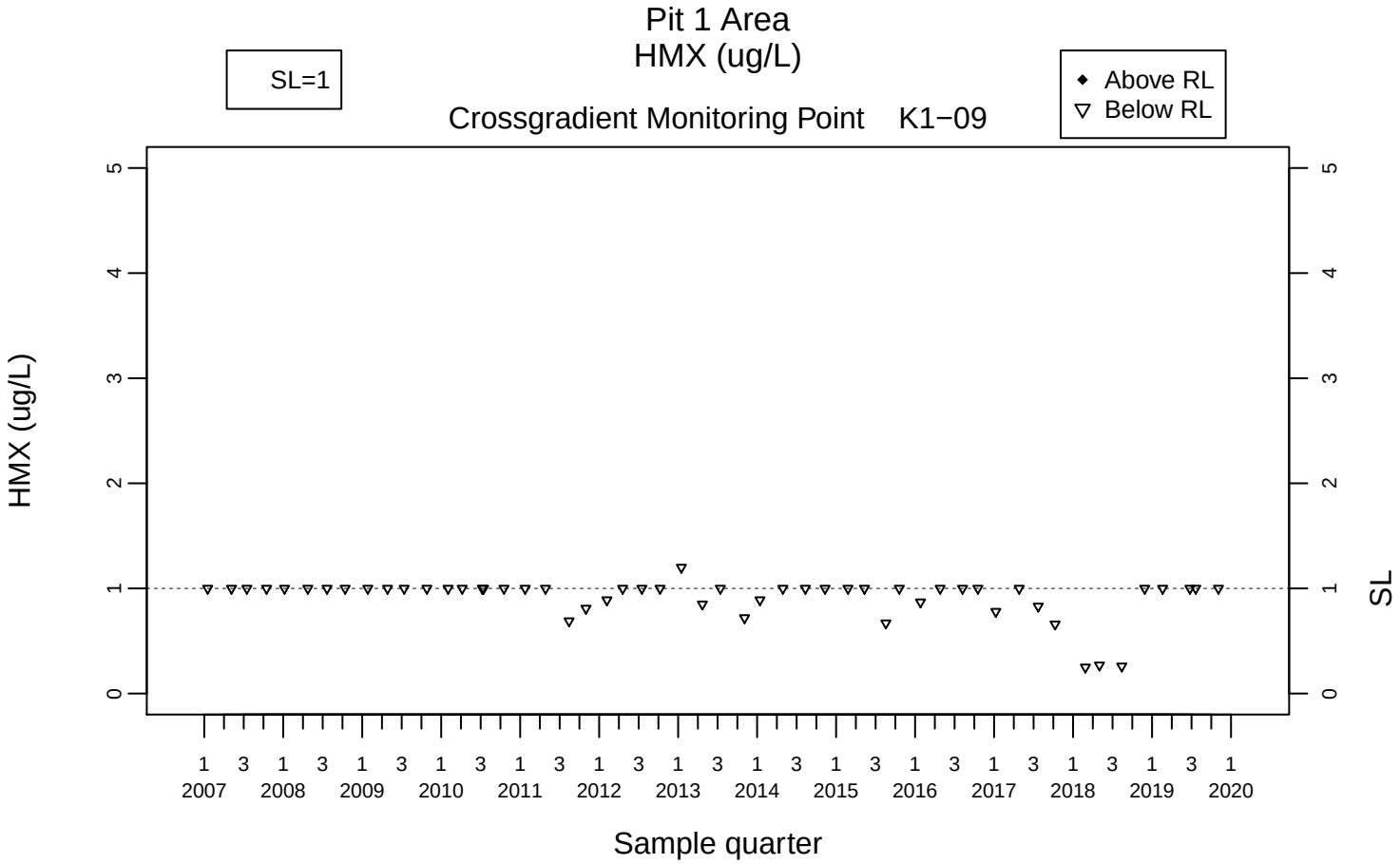

Background Monitoring Point K1−07
HMX (ug/L)
Sample quarter

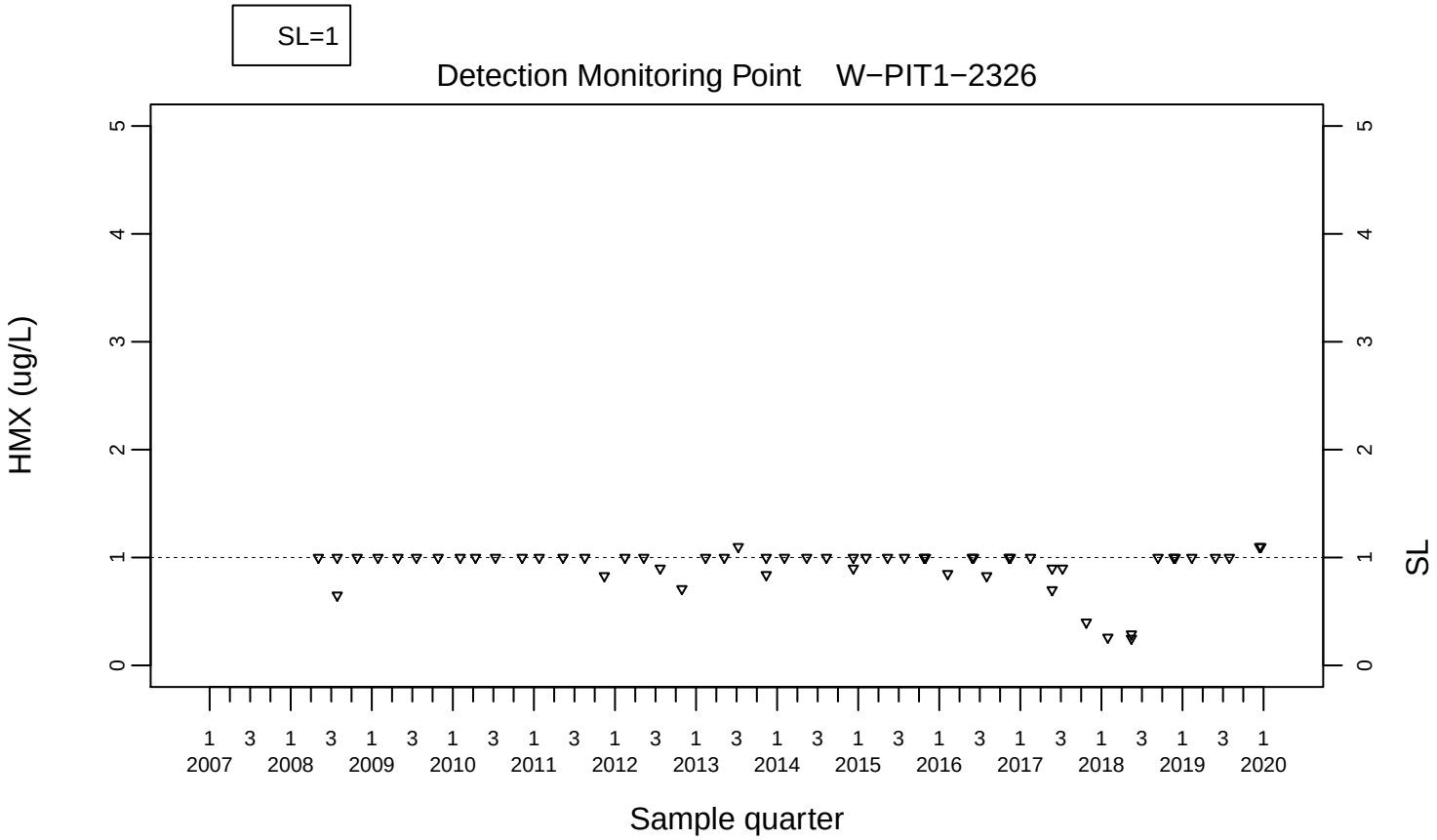

Pit 1 Area
HMX (ug/L)
SL=1
Above RL
Below RL
Detection Monitoring Point K1−02B
HMX (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

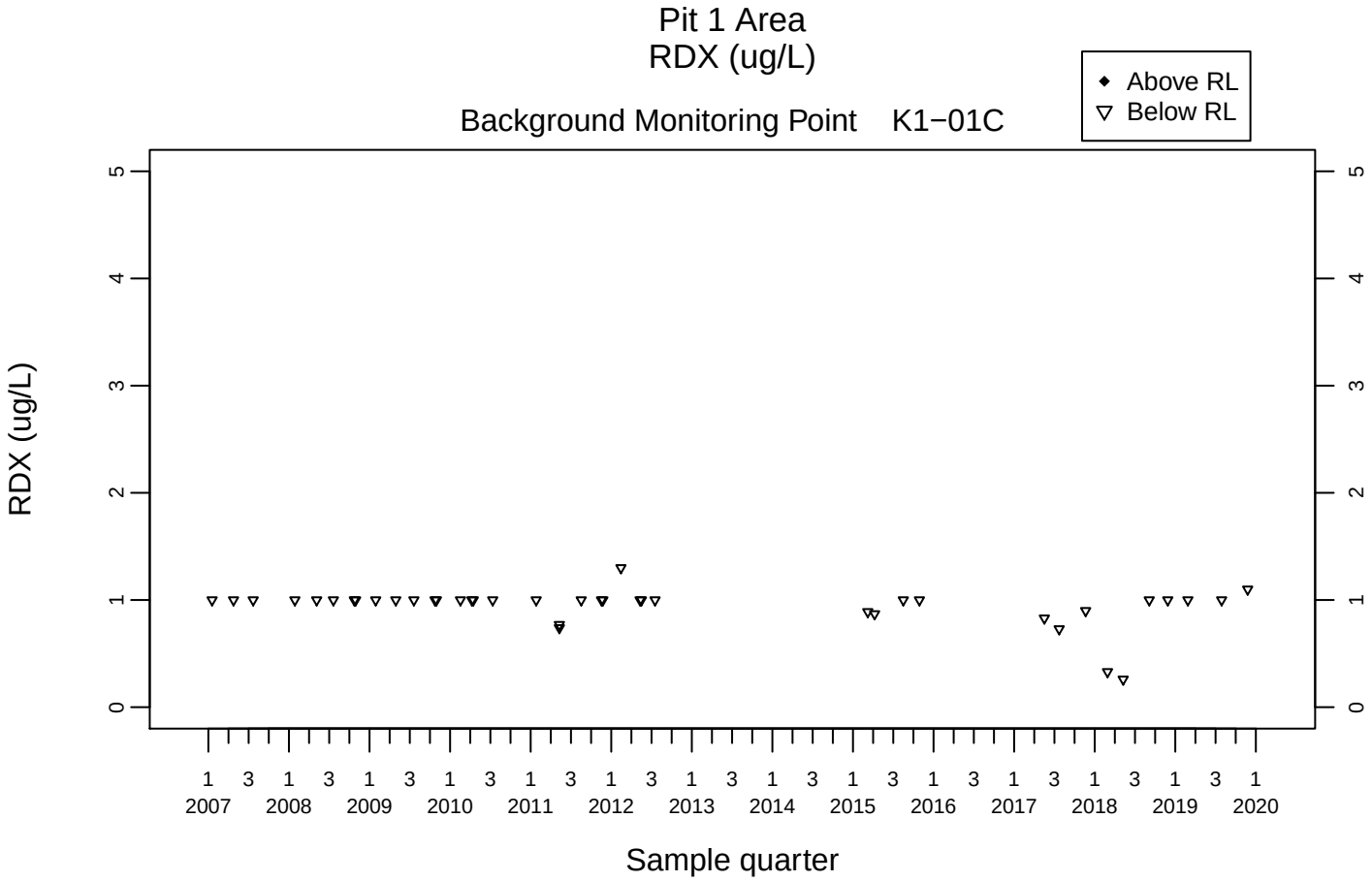

SL=1
Detection Monitoring Point K1−04
HMX (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

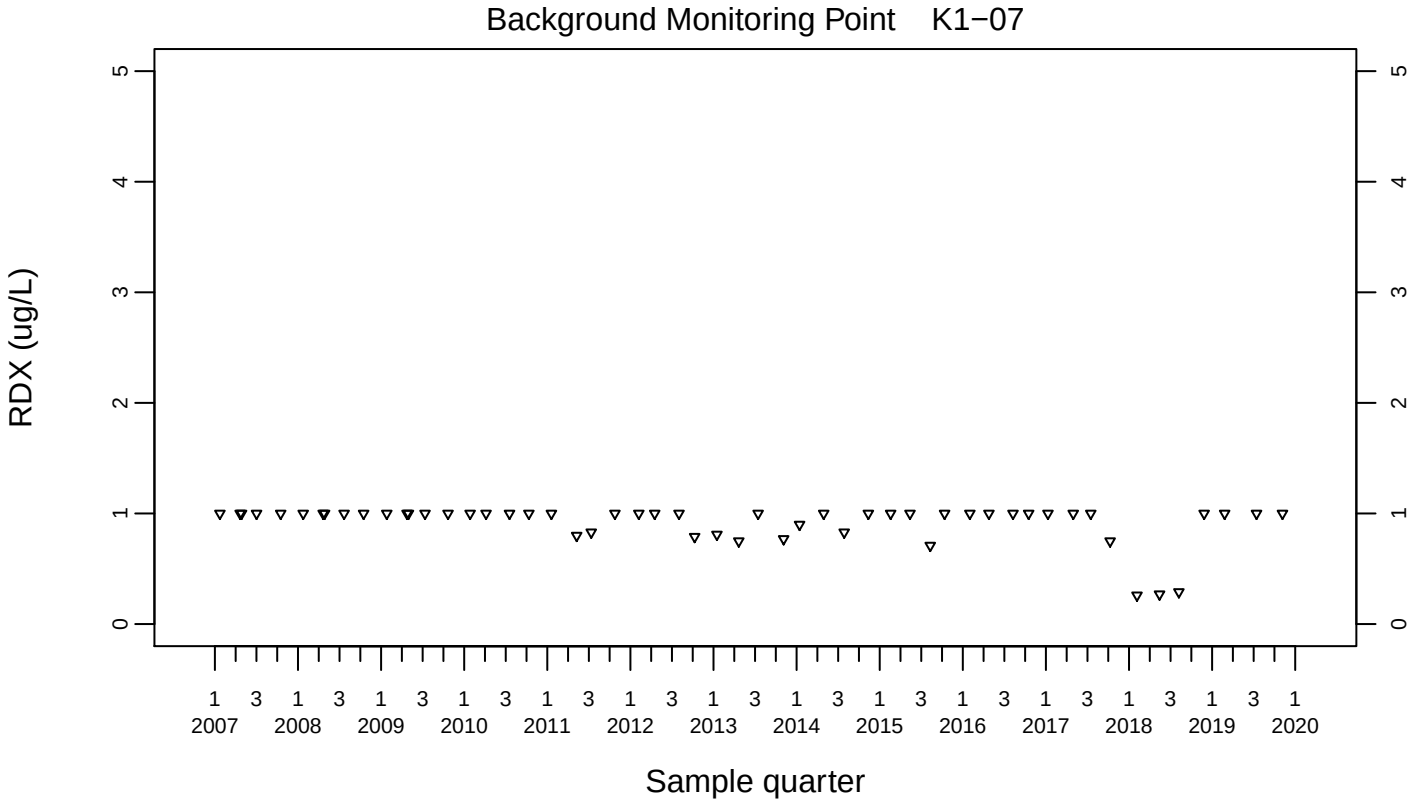

Pit 1 Area
HMX (ug/L)
SL=1
Above RL
Below RL
Detection Monitoring Point K1−05
HMX (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

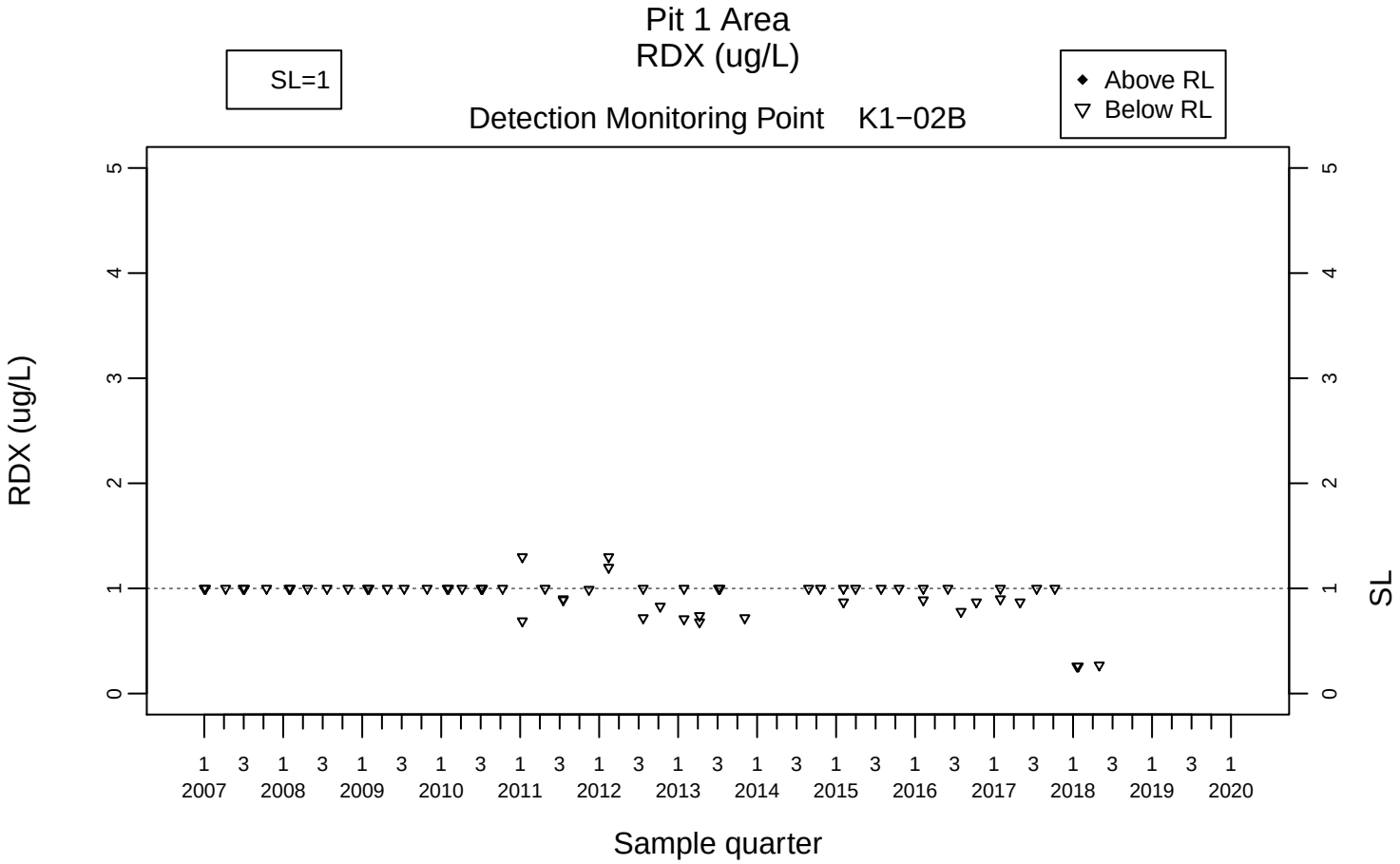

SL=1
Crossgradient Monitoring Point K1−08
HMX (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020


Pit 1 Area
HMX (ug/L)
SL=1
Above RL
Below RL
Crossgradient Monitoring Point K1−09
HMX (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020


SL=1
Detection Monitoring Point W−PIT1−2326
HMX (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020


Pit 1 Area
RDX (ug/L)
Above RL
Below RL
Background Monitoring Point K1−01C
RDX (ug/L)
0
1
2
3
4
5
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
Sample quarter


Background Monitoring Point K1−07
RDX (ug/L)
0
1
2
3
4
5
1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
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
2007
2008
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2013
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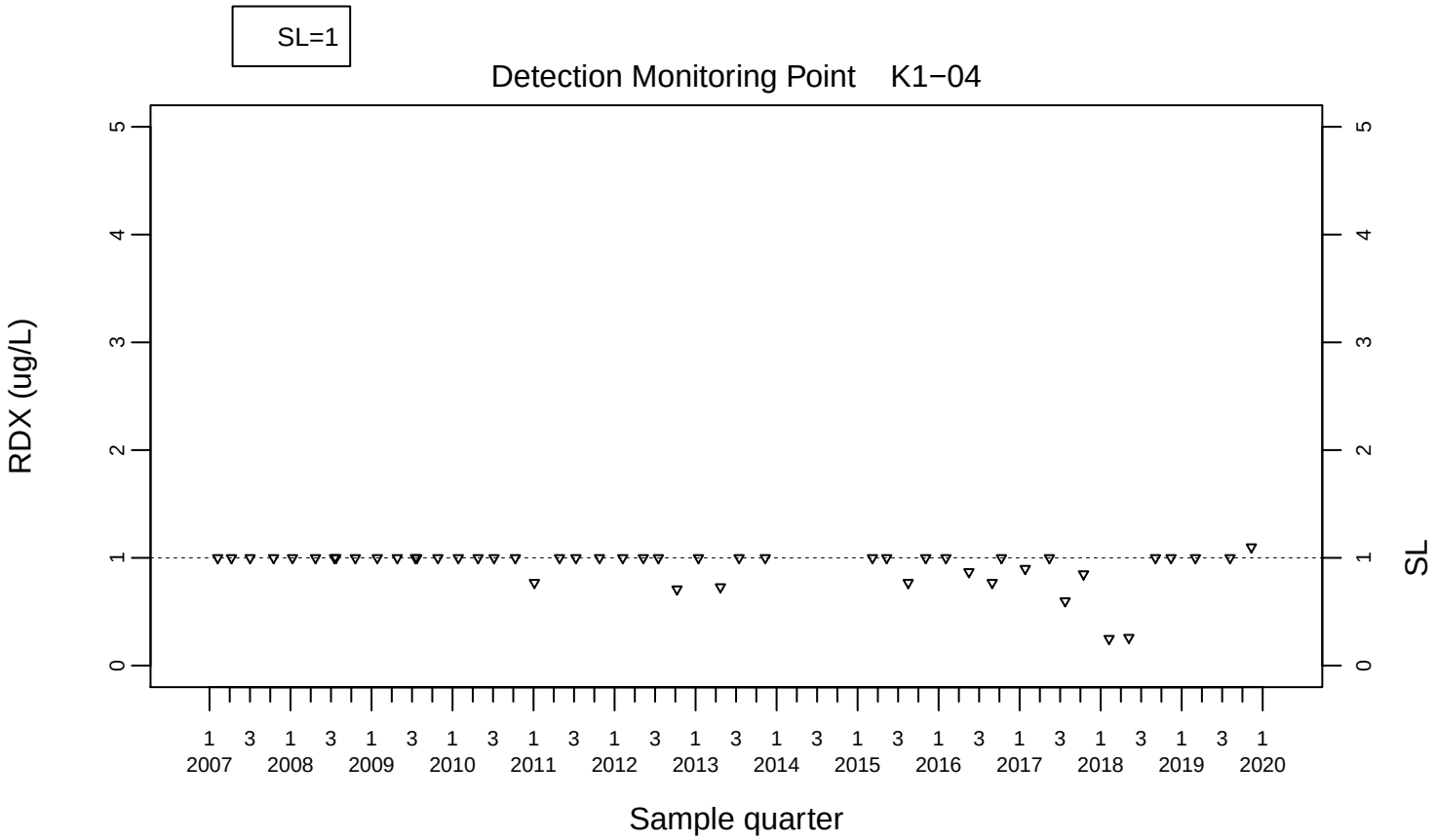
2017
2018
2019
2020


SL=1
Detection Monitoring Point K1−04
RDX (ug/L)
SL
Sample quarter
2007
2008
2009
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2011
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2013
2014
2015
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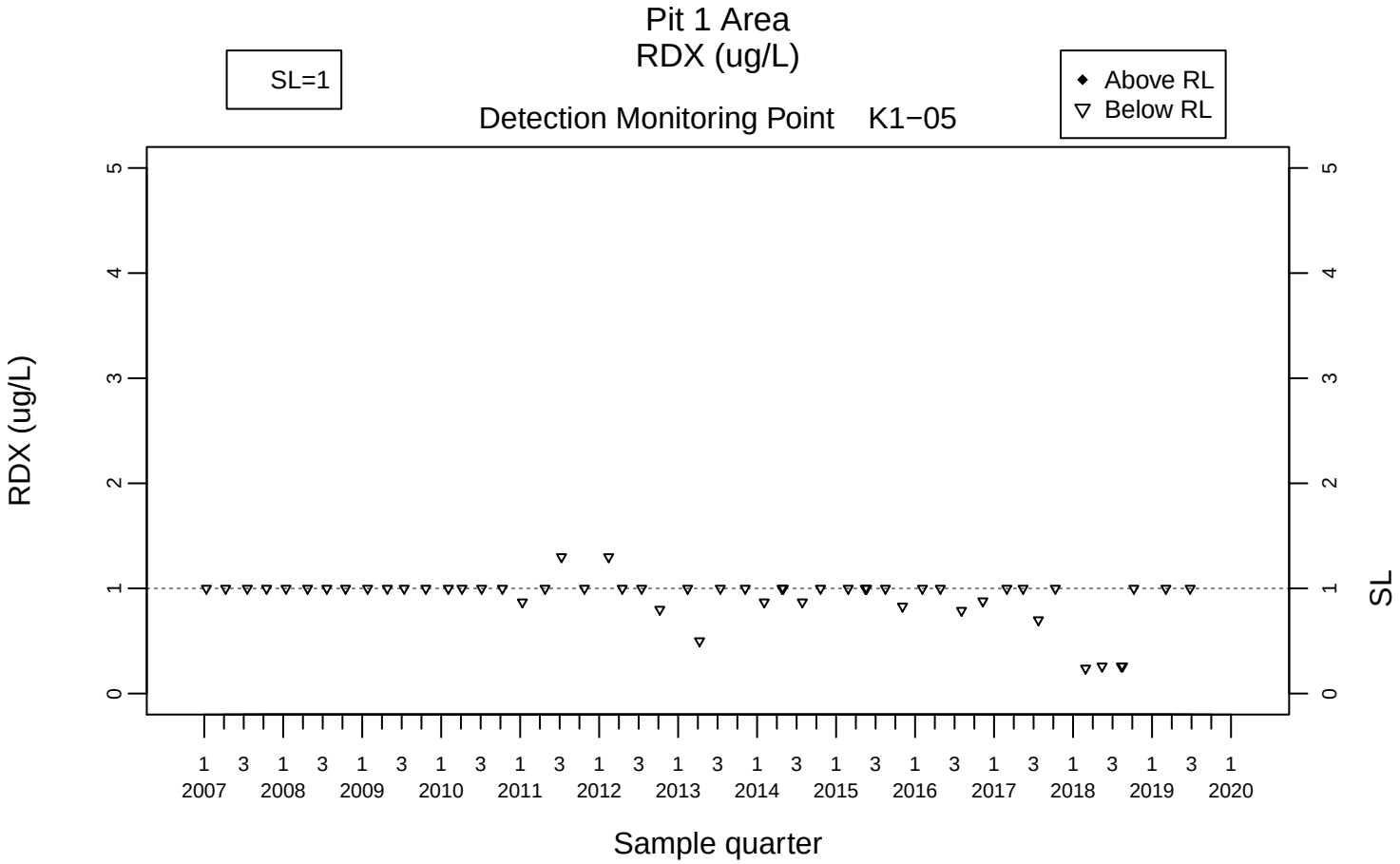
2019
2020


Pit 1 Area
RDX (ug/L)
SL=1
Above RL
Below RL
Detection Monitoring Point K1−05
RDX (ug/L)
SL
Sample quarter
2007
2008
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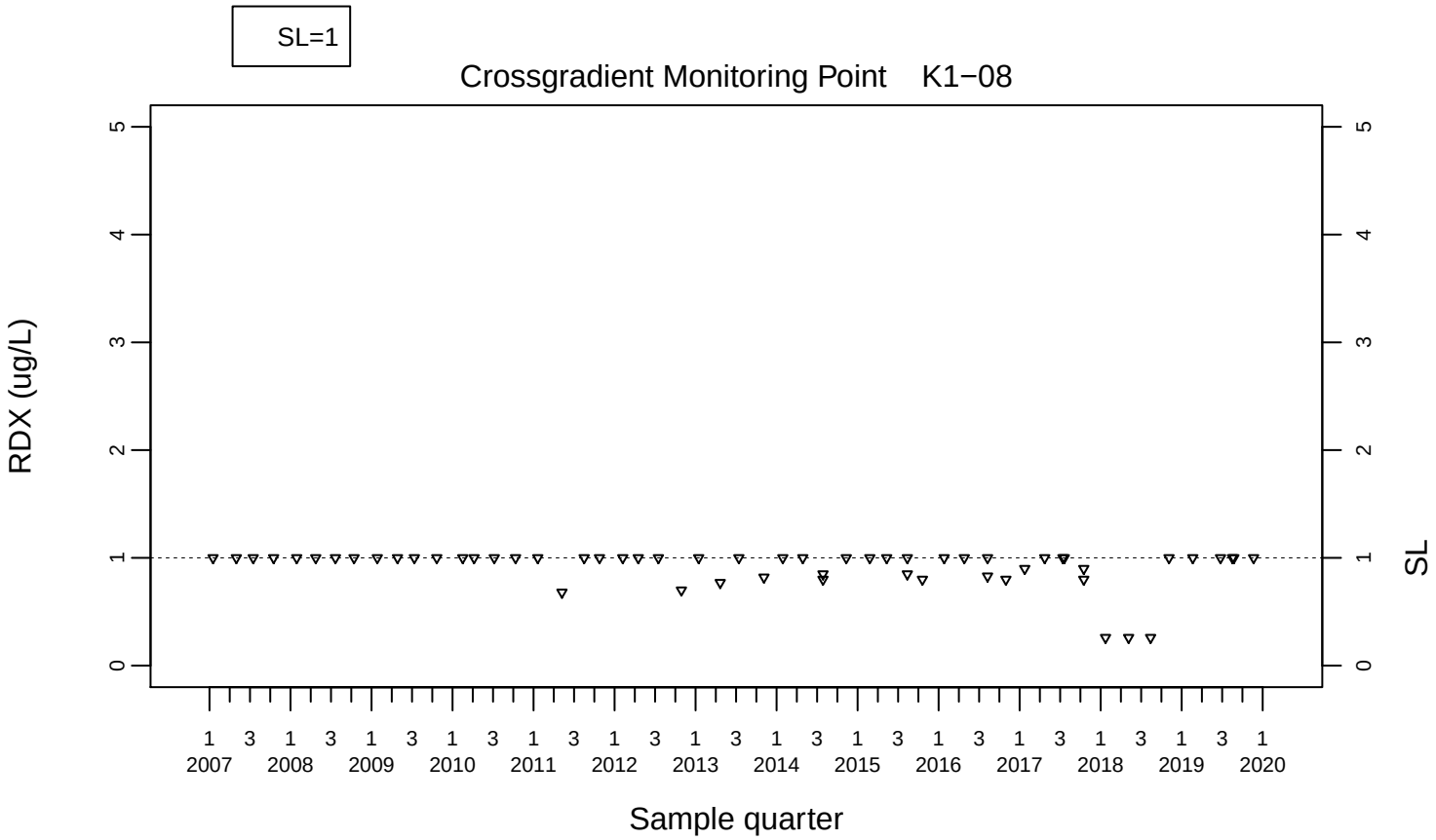
2019
2020


SL=1
Crossgradient Monitoring Point K1−08
RDX (ug/L)
SL
Sample quarter
2007
2008
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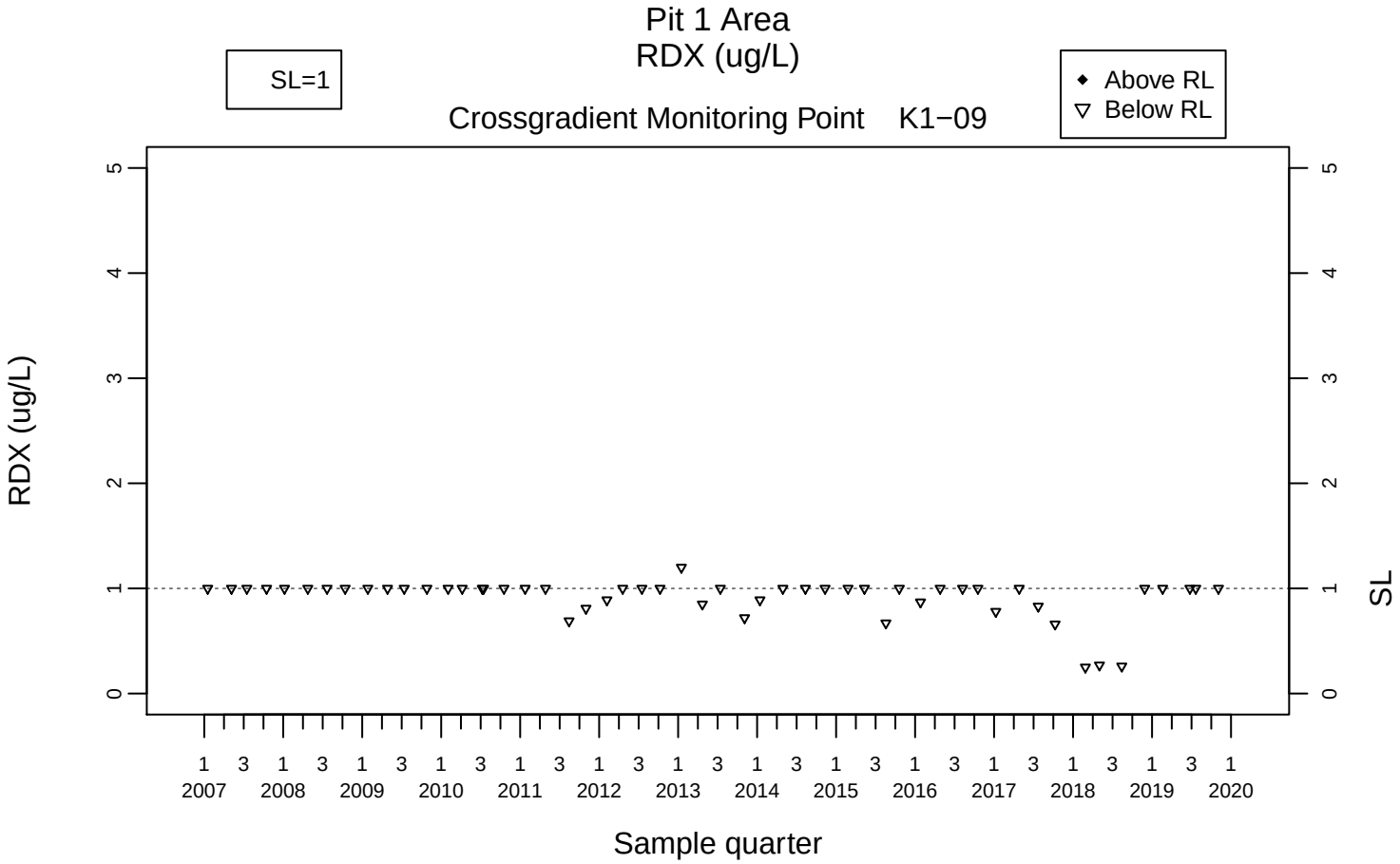
2019
2020


Pit 1 Area
RDX (ug/L)
SL=1
Above RL
Below RL
Crossgradient Monitoring Point K1−09
RDX (ug/L)
SL
Sample quarter
2007
2008
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2014
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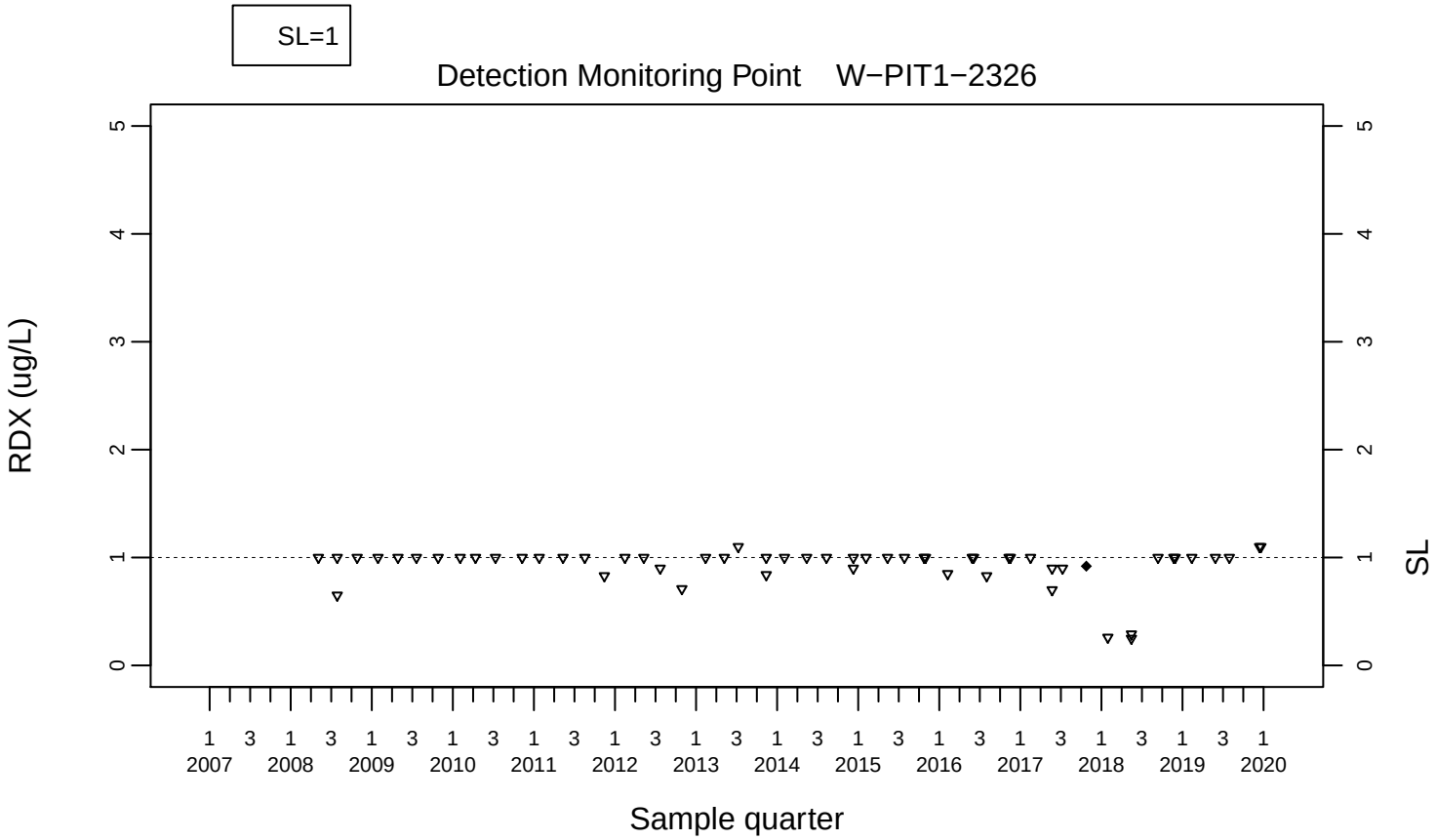
2019
2020


SL=1
Detection Monitoring Point W−PIT1−2326
RDX (ug/L)
SL
Sample quarter
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

Environmental Functional Area, Lawrence Livermore National Laboratory
P.O. Box 808, L-627, Livermore, California 94551