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SCS ENGINEERS

December 17, 2018
File No. 04218001.02

Mr. Keith Johnston
Tacoma-Pierce County Health Department
3629 South D Street
Tacoma, Washington 98418-6813

Subject: Third Quarter 2018 Monitoring Report
LRI Landfill, Pierce County, Washington

Dear Keith:

Please find enclosed the Third Quarter 2018 Monitoring Report for the LRI Landfill. Activities this quarter included monitoring the volume and specific conductance of water pumped from the leak detection/collection system, quarterly groundwater monitoring, monthly landfill gas monitoring, and weekly surface water monitoring.

If you have any questions regarding the monitoring results, please call me at (425) 289-5447.

Sincerely,

Kevin Lakey, PE, LHG
Vice President / Project Director
SCS ENGINEERS

Samuel Graber
Staff Scientist
SCS ENGINEERS

Attachments: Attachment A: Groundwater Flow Map
Attachment B: Groundwater Data Summary Tables
Attachment C: Field Sampling Documentation
Attachment D: Statistical Calculations
Attachment E: Trilinear Diagrams
Attachment F: Analytical Data Validation Report
Attachment G: Groundwater and LDCS Time Trend Plots
Attachment H: LDCS Pumping Records and Conductivity Measurements
Attachment I: Surface Water Data
Attachment J: Landfill Gas Data

cc: Peter Lyon, Ecology (email)
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George Duvendack, LRI (email and hard copy)
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Third Quarter 2018 Monitoring Report

LRI Landfill
Pierce County, Washington

Presented to:

Pierce County Recycling, Composting & Disposal, LLC dba LRI
17925 Meridian Street East
Puyallup, WA 98375

Presented by:

SCS ENGINEERS
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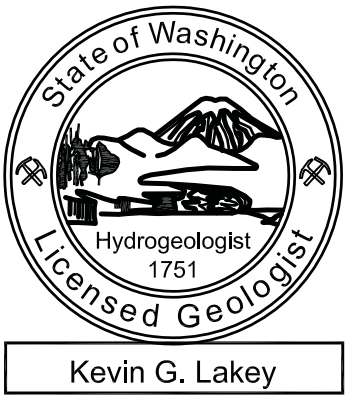

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GROUNDWATER MONITORING

Third Quarter 2018 groundwater samples were collected from September 17 through 21, 2018. Water level elevations were measured on September 19, 2018. Nine monitoring wells (MW-1A, MW-2A, MW-3, MW-4, MW-5A, MW-6, MW-7, MW-9, and MW-10) were sampled this monitoring period. Field quality control samples consisted of one field blank and one duplicate sample collected at MW-2A. Sampling procedures followed the LRI Landfill Groundwater Monitoring Plan (GWMP), dated March 10, 2014.

Groundwater samples were obtained using low-flow purging and sampling techniques with dedicated pumps at all monitoring wells with the exception of MW-4, where a non-dedicated QED Sample Pro pump was deployed. Samples for laboratory analyses were submitted to TestAmerica, Inc. of Denver, Colorado for the parameters listed in Appendix I and II of WAC 173-351-990. The groundwater sampling locations are shown on Figure 1.

A groundwater surface elevation map for the Third Quarter monitoring event is included as Figure 1 in Attachment A. The average groundwater gradients and flow directions calculated for the quarter remain similar to those previously reported at the facility, with a flow rate of about 45 feet per year towards the northwest for horizontal groundwater movement within the uppermost aquifer (assuming a horizontal hydraulic conductivity of 1×10^{-3} centimeters per second and an effective porosity of 30 percent).

Field measurements and analytical results for groundwater, leak detection/collection system (LDCS), and quality control samples are summarized on the following tables included in Attachment B: Groundwater Level Elevations, Field Parameters, Inorganic Parameters, Appendix I Metals, Appendix II Metals, Volatile Organic Compounds, Cation-Anion Balance, and Duplicate Sample Results.

Copies of the Field Sampling Data Sheets are included in Attachment C. Statistical calculations, including summary tables for indicator parameters, are included in Attachment D. Trilinear (Piper) plots of groundwater and LDCS sample results are included in Attachment E. Data validation results are summarized in Attachment F. Copies of the laboratory reports were submitted to the TPCHD under separate cover.

A nonparametric inter-well prediction limit approach was used to evaluate the water quality results for Appendix I parameters listed in WAC 173-351-990 (15 metals and nitrate). Prediction limits were generated using background data for nitrate and eight rounds of quarterly sampling conducted in 2014 and 2015 for the fifteen metals. Using this procedure, the highest concentration of each parameter in the data set was selected as the prediction limit for that parameter. In addition, the prediction limit data set includes ongoing water quality results from background (upgradient) wells MW-9 and MW-10. Appendix I total metal and nitrate concentrations measured at the downgradient monitoring wells were less than or equal to prediction limit values at all of the wells monitored this quarter.

Groundwater time-trend plots for inorganic parameters and metals are included in Attachment G. The following four plots are provided for each monitoring well:

- Plot 1 ─ ammonia, nitrate, chloride, TOC
- Plot 2 ─ alkalinity, sulfate, TDS
- Plot 3 ─ calcium, magnesium, sodium, potassium
- Plot 4 ─ iron, manganese, zinc, arsenic

Time trend plots show that concentrations of metals and inorganic parameters remained generally consistent with previously measured values during the Third Quarter. The highest concentrations of chloride and nitrate in the uppermost aquifer continue to be observed in background well MW-10. An increase in dissolved iron was measured at MW-3 this quarter. However, the concentration of dissolved iron measured at MW-3 (0.69 mg/L) is within the range of typical values measured at other wells in the monitoring network.

Reported detections of inorganic parameters and metals measured at downgradient monitoring wells were less than or equal to the ground water quality criteria listed in WAC 173-200-040, with the exceptions shown in Table 1.

Table 1. Groundwater Results Greater Than WAC 173-200-040 Criteria

Groundwater Results Greater Than WAC 173-200-040 Criteria (mg/L) LRI Landfill, Pierce County, Washington								
Parameter	**Groundwater Quality Criteria**	**MW-1A**	**MW-2A**	**MW-3**	**MW-4**	**MW-5A**	**MW-6**	**MW-7**
Arsenic, Total	0.00005	**	**	**	0.0088	**	0.0063	**
Iron, Dissolved	0.30	1.60	0.68	0.69	*	*	*	*
Manganese, Dissolved	0.05	0.25	0.30	0.26	0.22	0.17	0.17	0.24

Notes:
mg/L = milligrams per liter
** = Not detected above the method reporting limit (MRL), but the MRL exceeded WAC 173-200-040 GW Quality Criteria
* = Reported value was less than WAC 173-200-040 Groundwater Quality Criteria

The values listed in Table 1 are typical of previous results (see time-trend plots in Appendix G), are interpreted to be within natural background variation, and are less than or equal to the background levels used to establish prediction limits. The method reporting limit (MRL) for arsenic is 0.005 milligrams per liter (mg/L), which is greater than the WAC 173-200-040 criteria of 0.00005 mg/L. Therefore, arsenic results reported as non-detect are considered to be greater than the WAC 173-200-040 criterion.

Low-level detections of ammonia (<0.23 mg/L) were reported at monitoring wells MW-3, MW-4, MW-5, MW-6 and MW-7 during this monitoring event. Similar low-level ammonia detections have been reported during the previous several quarters, including at background well

MW-10 during the Second Quarter 2018 monitoring event. Therefore, the low-level ammonia concentrations appear to be due to site-wide aquifer chemistry.

The cation-anion balance evaluates the difference in the sum of cations and anions (in milliequivalents per liter [meq/L]) within a water sample to determine if it is electroneutral (balanced cation and anion charges). Consistent with WAC 173-350-430(5), a threshold of ten percent difference is used if the total cation-anion sum is less than 5.0 meq/L, and a threshold of five percent difference is used if the total cation-anion sum is greater than or equal to 5.0 meq/L. No monitoring well results exceeded the appropriate cation-anion balance threshold this quarter (see Table 7 in Attachment B).

Graphical plots of the monitoring well water quality results are presented on trilinear (piper) diagrams in Attachment E. These plots demonstrate the inherent water quality differences between groundwater from the monitoring wells, shallow groundwater from the LDCS, and leachate (collected annually in December).

No volatile organic compounds (VOCs) were detected in groundwater samples collected from monitoring wells this quarter.

LEAK DETECTION/COLLECTION SYSTEM (LDCS) MONITORING

LDCS Daily Monitoring. Daily monitoring of the LDCS sumps for volume of water pumped, liquid level, and specific conductance (conductivity) was performed by using a programmable logic controller (PLC) and through direct measurements by LRI site personnel. Rainfall data were recorded manually using an on-site rain gauge. The combined field and PLC data, as well as time series plots of the data, are included in Attachment H.

The flow meters at LDCS-1, LDCS-3A, and LDCS-4A operated intermittently this quarter. LRI is currently in the process of checking electrical connections and replacing flow meters and conductivity probes as needed.

A new conductivity probe was installed at LDCS-2A on September 3, 2018. Prior to the installation of the new probe, conductivity levels had been stable around 650 microsiemens per centimeter (µS/cm). Following installation of the new conductivity probe, conductivity levels increased to approximately 850 µS/cm. The increase in conductivity at LDCS-2 appears to be related to changing the conductivity probe. Additional probe calibration, or probe replacement, will be performed at this location.

The recording range of the conductivity probe at LDCS-6 was increased during the first week of May 2018. Since that time, conductivity levels at LDCS-6 have been in the range of approximately 1,000 to 1,200 µS/cm. See the LDCS Quarterly Monitoring section for additional discussion.

Conductivity data from the remaining LDCS sumps trended within typical historical levels during the Third Quarter of 2018.

LDCS Quarterly Monitoring. LDCS samples were collected from the leak detection sumps with disposable bailers at LDCS-1, LDCS-2A, and LDCS-2B, and with dedicated QED Sleeper Pumps at LDCS-3A, LDCS-4A, LDCS-4B, LDCS-5, and LDCS-6. Samples for laboratory testing were submitted to TestAmerica of Denver, Colorado. Field and laboratory data results are included on the groundwater summary tables (see Attachment B).

LDCS time trend plots for inorganic parameters and dissolved metals are included in Attachment G. The following four plots are provided for each leak detection sump:

- Plot 1 ─ ammonia, nitrate, chloride, TOC
- Plot 2 ─ alkalinity, sulfate, TDS
- Plot 3 ─ calcium, magnesium, sodium, potassium
- Plot 4 ─ iron, manganese, zinc, arsenic

Low-level detections of ammonia (<0.18 mg/L) were recorded at LDCS-1, LDCS-4A, and LDCS-4B. As previously discussed, low-level ammonia concentrations appear to be due to site-wide aquifer chemistry.

Apparent long-term increasing trends in chloride concentrations have occurred at LDCS-4A and LDCS-4B. In addition, total dissolved solids (TDS), calcium, and sodium have recently demonstrated slight upward trends at both LDCS-4A and LDCS-4B. These increases may be due to water levels within the LDCS that result in occasional contact of groundwater with the overlying clay liner. LRI personnel performed maintenance and made pump adjustments during the Third Quarter to lower water levels within the LDCS at cells 4A and 4B.

Prior to the Third Quarter monitoring event, concentrations of total dissolved solids (TDS), sulfate, calcium, magnesium, and sodium displayed upward trends at LDCS-6. However, concentrations for all of these parameters decreased during the Third Quarter of 2018.

Graphical plots of the LDCS water quality results are presented on trilinear (piper) diagrams in Attachment E. These plots demonstrate the inherent water quality differences between groundwater from the monitoring wells, shallow groundwater from the LDCS, and leachate (collected annually in December).

Acetone, a primary leachate indicator parameter, was reported in samples from LDCS-1 (17 µg/L) and LDCS-5 (24 µg/L) during the Third Quarter monitoring event. However, 2-butanone, which is also a primary leachate indicator parameter, was not detected in either sample. At LDCS-1, secondary leachate indicator parameter concentrations of ammonia and chloride remained low at 0.16 mg/L and 3.4 mg/L, respectively. At LDCS-5, an ammonia concentration of 1.0 mg/L was reported. The Third Quarter ammonia concentration decreased from 1.6 mg/L during the Second Quarter 2018 monitoring event. In addition, chloride concentrations reported at LDCS-5 decreased from 21 mg/L to 19 mg/L, compared to the Second Quarter monitoring event.

Acetone is a common laboratory contaminant and there have been several sporadic detections of acetone in leak detection samples, as well as in field blank samples in the past. Since the primary

leachate indicator parameter, 2-butanone, was non-detect, and the concentrations of ammonia and chloride have remained low, or decreased, the acetone detection is likely the result of laboratory contamination. However, groundwater withdrawn from LDCS-5 continues to be directed to the leachate collection system as a precautionary measure.

No other VOC detections were reported present in the LCDS samples this quarter.

SURFACE WATER MONITORING

No surface water discharges occurred during the third quarter of 2018. Surface water inspections were performed on a weekly and monthly basis consistent with LRI Landfill Surface Water Pollution Prevention Plan (SWPPP) documents. Surface water monitoring results were reported to Ecology on a monthly (Construction Permit) and quarterly (Industrial Permit) basis using Discharge Monitoring Reports (DMRs). Copies of the Third Quarter DMR's are included in Attachment I.

LEACHATE MONITORING

Leachate samples are collected for all Cells annually in December. In addition, a leachate sample was collected from Cell 6 during the current monitoring period. Field and laboratory data results for the Cell 6 leachate sample are included on the groundwater summary tables (see Attachment B).

Leachate volumes were monitored using the automated PLC system and through direct measurements by LRI site personnel. Collected leachate was truck-hauled to the pretreatment facility at the Hidden Valley Landfill where it was discharged to the Pierce County sewer system in accordance with Pierce County Utilities Department Industrial Discharge Permit Number PC03096, and to the City of Tacoma Wastewater Treatment Plant for proper disposal. A summary of year to date leachate volume data based on volumes truck-hauled off site is provided on Table 2.

Table 2. 2018 Leachate Volume Data

2018 Leachate Volume Data LRI Landfill, Pierce County, Washington		
Month	**Leachate Trucked Offsite for Proper Disposal (gallons)**	**Monthly Rainfall (inches)**
January	2,821,282	7.62
February	2,443,589	3.47
March	2,878,127	2.25
April	2,464,653	4.57
May	2,385,890	1.99
June	1,939,654	1.36
July	1,797,060	0.68
August	1,863,724	0.46
September	1,749,721	0.78
Totals:	**20,343,700**	**23.18**

LANDFILL GAS MONITORING

Monthly monitoring of the landfill gas performance probes was conducted on July 25, August 30, and September 27 using a Landtec GEM2000 portable gas monitor. Methane measurements were less than the lower explosive limit (LEL) of five percent by volume during the Third Quarter except at performance probes GP-1, GP-2, GP-10P, and GP-12 (see Table 3). Previous barhole monitoring surveys have shown that similar methane levels at these probes does not result in the migration of landfill gas to the property line.

Indoor air was tested for the presence of methane on August 30. The office, maintenance building, scale house, and work shed located next to the stormwater treatment ponds were tested with a portable flame ionization detector (MicroFID). No detectible methane was recorded.

Field records for gas probe and indoor air monitoring are included in Attachment J.

Table 3. 2018 Landfill Gas Probe Monitoring Summary

2018 Landfill Gas Probe Monitoring Summary (percent methane) LRI Landfill, Pierce County, Washington

Monitoring Date	GP-1	GP-2	GP-3	GP-4	GP-9	GP-10	GP-10P	GP-11	GP-12	GP-13	GP-14	GP-15
January 29	1.4	**14.4**	0.0	0.0	0.0	0.0	**19.6**	0.0	--	2.0	0.0	0.0
February 27	1.0	**16.2**	0.0	0.0	0.0	0.1	**21.9**	0.0	**34.0**	2.2	0.0	0.0
March 20	1.6	**16.4**	0.0	0.0	0.0	0.9	**16.1**	0.0	**35.9**	2.3	0.0	0.0
April 12	0.6	**15.3**	0.0	0.0	0.0	**7.8**	**20.6**	0.0	**35.8**	2.1	0.0	0.0
May 22	2.3	**14.9**	0.0	0.0	0.0	**12.1**	**24.3**	0.0	**34.6**	2.3	0.0	0.0
June 27	1.4	**14.4**	0.0	0.0	0.0	1.8	**14.7**	0.0	**33.3**	0.8	0.0	0.0
July 25	4.0	**15.1**	0.0	0.0	0.0	1.1	**12.2**	0.0	**18.3**	0.4	0.0	0.0
August 30	**8.2**	**15.7**	0.0	0.0	0.0	0.0	4.5	0.0	**25.1**	1.2	0.2	0.0
September 27	4.9	**14.4**	0.0	0.0	0.0	0.0	3.9	0.0	**21.0**	0.9	0.6	0.0

Notes: All values are reported as percent methane by volume.
-- : Unable to monitor GP-12 during January event due to presence of water and sediment in probe casing.
Methane measurements at or above the lower explosive limit of 5.0% by volume are shown in **bold**.

LANDFILL GAS EXTRACTION WELL CONSTRUCTION

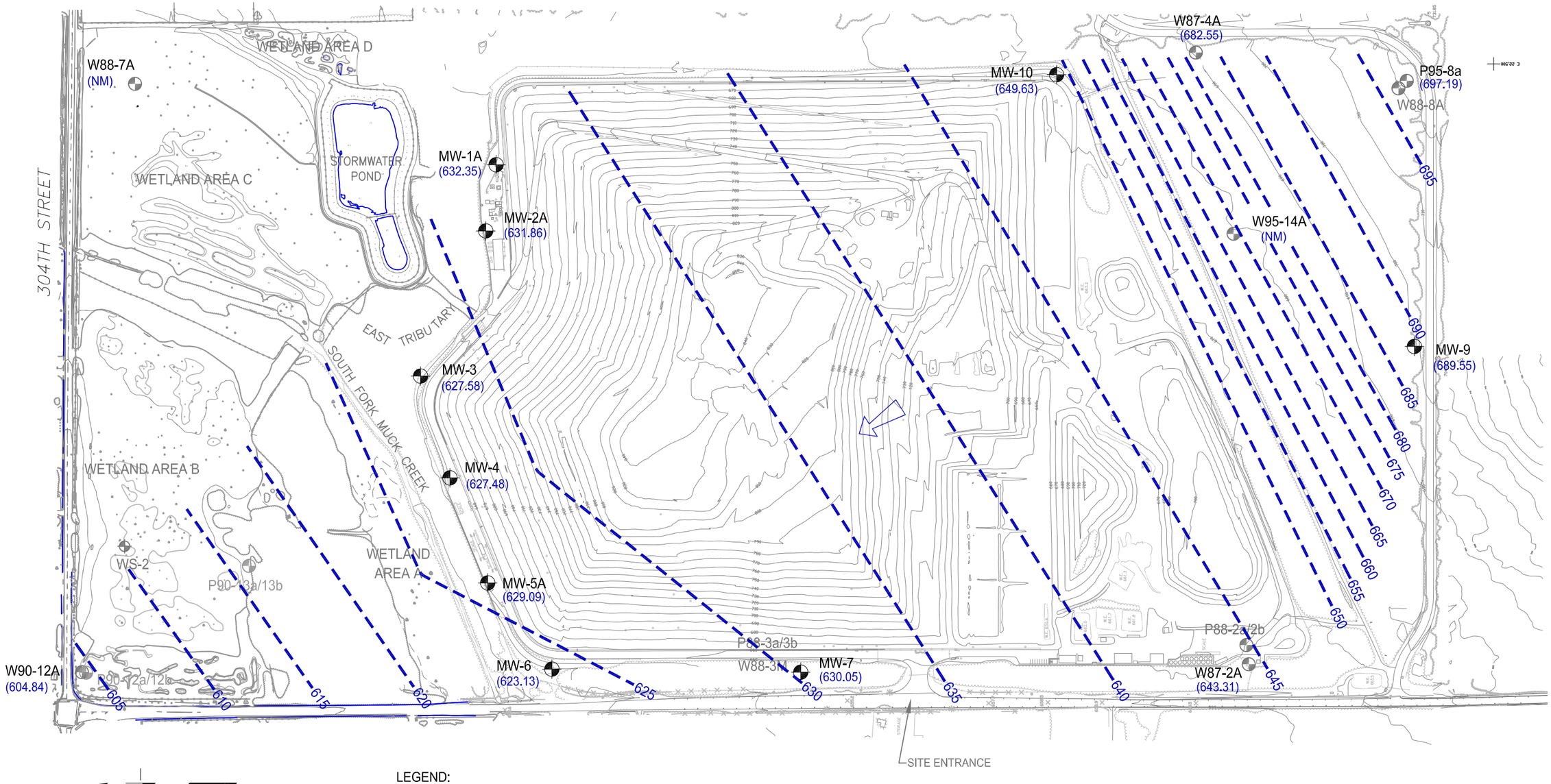
Fourteen new vertical landfill gas extraction wells were installed at the LRI Landfill between July 9 and July 19. A letter report summarizing the well installations was issued on August 8, 2018 (see Appendix J for a copy of the letter report). In addition to the vertical extraction wells, four horizontal landfill gas extraction wells (HE-40E, HE-41, HE-42, and HE-43) began operating this quarter.

GROUNDWATER MONITORING WELL CONSTRUCTION AND MAINTENANCE

No well construction or significant well maintenance activities were performed this quarter.

Appendix A

Groundwater Flow Map



LEGEND:

MW-1A	MONITORING WELL
W87-2A	CHARACTERIZATION WELL/ PIEZOMETER
(643.31)	GROUNDWATER ELEVATION (IN FEET ABOVE MSL)
	INFERRED GROUNDWATER FLOW DIRECTION
*	WATER LEVEL ELEVATION NOT USED IN CONTOURING

NOTES:

VERTICAL DATUM - BASED ON PIERCE COUNTY BENCH NO. 112-28, ELEVATION 660.29 NGVD29

0 400 800

SCALE (ft)

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PROJECT NO. 04218001.02	DES BY SG	POTENTIOMETRIC SURFACE CONTOUR MAP SEPTEMBER 19, 2018	DATE OCTOBER 2018
SCALE AS SHOWN	CHK BY KGL	LRI LANDFILL 30919 MERIDIAN STREET E. GRAHAM, WASHINGTON	FIGURE 1
CAD FILE FIGURE 1	APP BY KGL		

Appendix B
Groundwater Data Summary Tables

Table 1. Groundwater Level Elevations
September 19, 2018
LRI Landfill, Pierce County, Washington

Location	Well Casing Elevation (ft)	Depth to Water (ft)	Water Level Elevation (ft, NGVD29)
Wells			
W87-2A	664.01	20.70	643.31
W87-4A	693.29	10.74	682.55
W88-3M	658.11	15.70	642.41
W88-7A	632.51	NM	--
W88-8M	721.05	41.36	679.69
W90-12A	640.84	36.00	604.84
W95-14A	680.49	NM	--
MW-1A	652.57	20.22	632.35
MW-2A	651.93	20.07	631.86
MW-3	637.41	9.83	627.58
MW-4	652.37	24.89	627.48
MW-5A	655.55	26.46	629.09
MW-6	635.71	12.58	623.13
MW-7	656.03	25.98	630.05
MW-9	701.77	12.22	689.55
MW-10	673.87	24.24	649.63
Piezometers			
P13-14A	665.96	25.00	640.96
P88-2A	663.96	NM	--
P88-2B	663.48	NM	--
P88-3A	656.20	19.51	636.69
P88-3B	655.98	22.05	633.93
P95-8A	722.07	24.88	697.19
P90-12A	640.79	8.70	632.09
P90-12B	640.73	10.89	629.84
P90-13A	645.19	NM	--
P90-13B	643.63	NM	--
GP-1P[a]	652.00	19.78	632.22
GP-2P[a]	658.61	18.58	640.03
GP-3P[a]	658.51	13.44	645.07
GP-4P[a]	662.01	15.11	646.90
GP-9P[a]	674.03	15.84	658.19
South Creek			
SWSC-1	632.68	1.45	631.23
SWSC-2	629.98	Dry	--
Leak Detection System			
LDCS-1[b]	657.26	28.40	628.86
LDCS-2A[b]	659.24	24.70	634.54
LDCS-2B[c]	661.70	26.48	635.22

Notes:
NM= not measured
-- = not applicable
Measurements taken on 9/19/2018 unless otherwise noted
a = Measurement taken on 9/27/2018
b = Measurement taken on 9/18/2018
c = Measurement taken on 9/20/2018
Dry = Stream bed dry at measuring point

Table 2. Field Parameters
Third Quarter 2018
LRI Landfill, Pierce County, Washington

Location	Sample Number	Sample Date	Sampling Method	pH	Conductivity (µS/cm)	Temperature (°C)
Monitoring Wells						
MW-1A	304-091718-01	9/17/2018	DP	6.66	183	13.1
MW-2A	304-091718-02	9/17/2018	DP	6.84	249	13.3
MW-3	304-091718-04	9/17/2018	DP	7.18	327	10.5
MW-4	304-091918-11	9/19/2018	SP	7.33	312	13.2
MW-5A	304-091718-05	9/17/2018	DP	7.31	281	12.5
MW-6	304-091818-06	9/18/2018	DP	7.04	287	10.6
MW-7	304-091818-07	9/18/2018	DP	7.42	364	10.4
MW-9	304-091918-12	9/19/2018	DP	6.51	138	11.8
MW-10	304-091818-08	9/18/2018	DP	6.38	272	11.1
Leak Detection System						
LDCS-1	304-091818-10	9/18/2018	DB	6.11	543	21.9
LDCS-2A	304-091818-09	9/18/2018	DB	6.54	818	25.0
LDCS-2B	304-092018-17	9/20/2018	DB	6.74	736	22.2
LDCS-3A	304-092018-16	9/20/2018	DP	6.37	805	22.0
LDCS-4A	304-092018-15	9/20/2018	DP	6.25	858	23.5
LDCS-4B	304-092118-18	9/21/2018	DP	6.49	1,176	25.0
LDCS-5	304-092018-14	9/20/2018	DP	6.47	985	23.7
LDCS-6	304-092118-19	9/21/2018	DP	6.91	1,389	20.0
Leachate Collection System						
Leachate, Cell 6	304-092118-20	9/21/2018	GB	7.70	25,787	24.9

Notes:
DB = disposable bailer
DP = dedicated pump
GB = grab sample
SP = submersible pump
µS/cm = microsiemens per centimeter
°C = degrees celcius

Table 3. Inorganic Parameters
Third Quarter 2018
LRI Landfill, Pierce County, Washington

Parameter	Alkalinity, Total	Ammonia	Chloride	Nitrate	Nitrate-Nitrite as N	Sulfate	Total Dissolved Solids	Total Organic Carbon	Total Suspended Solids
MRL	5.0	0.1-11	0.2 - 120	0.50	0.50	0.2 - 2.5	10 - 470	1.0 - 7.8	4.0
WAC 173-200 Criteria	—	—	250	10	—	250	500	—	—
Prediction Limit	—	—	—	6.4	—	—	—	—	—
Monitoring Wells									
MW-1A	90	*	2.3	*	—	3.1	140	*	*
MW-2A	120	*	3.6	*	—	7.2	170	*	*
MW-3	130	0.10	3.8	*	—	28	210	*	*
MW-4	150	0.15	2.8	*	*	8.2	220	2.0	*
MW-5A	140	0.11	2.8	*	—	5.8	190	*	*
MW-6	130	0.11	5.1	*	—	7.6	170	*	*
MW-7	180	0.22	3.5	*	—	4.5	220	*	*
MW-9	68	*	1.7	*	*	1.8	150	1.5	*
MW-10	96	*	9.1	4.7	—	8.2	190	*	*
Leak Detection System									
LDCS-1	260	0.16	3.4	*	—	9.0	310	3.5	—
LDCS-2A	420	*	3.3	*	—	19	470	2.3	—
LDCS-2B	330	*	3.6	*	—	65	460	5.0	—
LDCS-3A	340	*	4.0	*	—	82	490	4.8	—
LDCS-4A	350	0.15	15	*	—	87	520	6.1	—
LDCS-4B	430	0.17	20	*	—	180	770	3.5	—
LDCS-5	400	1.0	19	*	—	69	570	7.6	—
LDCS-6	470	*	10	*	—	210	790	5.7	—
Leachate Collection System									
Leachate, Cell 6	10,000	1,300	2,900	5.0	—	3.0	15,000	1,900	—

Notes:
All sample units are milligrams per liter (mg/L).
Groundwater (monitoring well) concentrations greater than prediction limits or WAC 173-200 criteria are shown in **bold**.
Analyses performed by TestAmerica of Denver, Colorado.
Method Reporting Limit (MRL) is typical and may be elevated for some samples.
* indicates the sample result was not reported at or above the MRL
— = not applicable or not performed

Table 4. WAC 173-351 Appendix I Metals
Third Quarter 2018
LRI Landfill, Pierce County, Washington

Parameter	Antimony-D	Antimony-T	Arsenic-D	Arsenic-T	Barium-D	Barium-T	Beryllium-D	Beryllium-T	Cadmium-D	Cadmium-T	Chromium-D	Chromium-T	Cobalt-D	Cobalt-T	Copper-D	Copper-T	Lead-D	Lead-T	Nickel-D	Nickel-T	Selenium-D	Selenium-T	Silver-D	Silver-T	Thallium-D	Thallium-T	Vanadium-D	Vanadium-T	Zinc-D	Zinc-T
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL	0.05	0.05	0.005	0.005	0.005	0.005	0.001	0.001	0.001	0.001	0.005	0.005	0.001	0.001	0.01	0.01	0.002	0.002	0.02	0.02	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.01
WAC 173-200 Criteria	—	—	—	0.00005	—	1.0	—	—	—	0.01	—	0.05	—	—	—	1.0	—	0.05	—	—	—	0.01	—	0.05	—	—	—	—	—	5.0
Prediction Limit	—	0.05	—	0.011	—	0.091	—	0.005	—	0.005	—	0.011	—	0.01	—	0.063	—	0.042	—	0.020	—	0.005	—	0.01	—	0.005	—	0.016	—	0.290
Monitoring Wells																														
MW-1A	—	*	—	*	—	0.022	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*
MW-2A	—	*	—	*	—	0.014	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*
MW-3	—	*	—	*	—	0.010	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*
MW-4	—	*	—	**0.0088**	—	0.014	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	0.012
MW-5A	—	*	—	*	—	0.015	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*
MW-6	—	*	—	**0.0063**	—	0.011	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*
MW-7	—	*	—	*	—	0.014	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*
(BG) MW-9	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	0.013	—	*
(BG) MW-10	—	*	—	*	—	0.016	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*
Leak Detection System																														
LDCS-1	*	—	0.0110	—	0.024	—	—	—	—	—	*	—	*	—	*	—	*	—	*	—	—	—	—	—	—	—	*	—	*	—
LDCS-2A	*	—	0.0095	—	0.023	—	—	—	—	—	*	—	*	—	*	—	*	—	*	—	—	—	—	—	—	—	*	—	*	—
LDCS-2B	*	—	*	—	0.016	—	—	—	—	—	*	—	*	—	*	—	*	—	*	—	—	—	—	—	—	—	*	—	*	—
LDCS-3A	*	—	*	—	0.013	—	—	—	—	—	*	—	*	—	*	—	*	—	*	—	—	—	—	—	—	—	*	—	*	—
LDCS-4A	*	—	0.0068	—	0.030	—	—	—	—	—	*	—	0.0038	—	*	—	*	—	*	—	—	—	—	—	—	—	*	—	*	—
LDCS-4B	*	—	0.0120	—	0.032	—	—	—	—	—	*	—	0.0019	—	*	—	*	—	*	—	—	—	—	—	—	—	*	—	*	—
LDCS-5	*	—	0.0066	—	0.073	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—
LDCS-6	*	—	*	—	0.034	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	*	—	0.017	—
Leachate Collection System																														
Leachate, Cell 6	—	*	—	0.16	—	0.81	—	0.0017	—	0.0027	—	0.69	—	0.048	—	0.076	—	0.1	—	0.51	—	*	—	*	—	*	—	0.12	—	0.99

Notes:
All sample units are milligrams per liter (mg/L).
WAC 173-200-040 Table 1 Groundwater Quality Criteria are for total metals.
Groundwater (monitoring well) concentrations greater than prediction limits or WAC 173-200 criteria are shown in **bold**.
Parameter concentrations for monitoring wells are total (T) metals.
Parameter concentrations for LDCS sumps are dissolved (D) metals.
Analyses performed by TestAmerica of Denver, Colorado.
Method Reporting Limit (MRL) is typical and may be elevated for some samples.
* indicates result was not reported at or above the MRL
— = not applicable or not performed
BG = Background

Table 5. WAC 173-351 Appendix II Metals (Dissolved)
Third Quarter 2018
LRI Landfill, Pierce County, Washington

Parameter	Calcium	Iron	Magnesium	Manganese	Potassium	Sodium
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL	0.20	0.10	0.10	0.005	2.0	1.0
WAC 173-200 Criteria	—	0.30	—	0.050	—	—
Monitoring Wells						
MW-1A	14	**1.6**	9.0	**0.25**	3.2	11
MW-2A	19	**0.68**	10	**0.30**	2.6	15
MW-3	32	**0.69**	14	**0.26**	3.2	12
MW-4	27	*	14	**0.22**	5.2	12
MW-5A	26	*	11	**0.17**	3.3	15
MW-6	27	*	13	**0.17**	4.1	10
MW-7	27	0.17	21	**0.24**	4.6	12
(BG) MW-9	10	*	6.7	*	*	7.5
(BG) MW-10	22	*	10	*	*	14
Leak Detection System						
LDCS-1	51	0.63	22	2.4	5.6	20
LDCS-2A	84	*	33	1.6	8.6	33
LDCS-2B	92	*	31	0.036	7.6	22
LDCS-3A	87	*	39	0.27	6.3	24
LDCS-4A	90	1.1	40	1.5	6.8	30
LDCS-4B	140	0.42	46	1.5	6.9	44
LDCS-5	85	0.21	50	1.6	9.0	32
LDCS-6	120	*	62	0.86	4.6	46
Leachate Collection System^						
Leachate, Cell 6	120	7.0	200	1.1	960	1,800

Notes:
All sample units are milligrams per liter (mg/L).
WAC 173-200-040 Table 1 Groundwater Quality Criteria are for total metals.
Groundwater (monitoring well) concentrations greater than WAC 173-200 criteria are shown in **bold**.
Analyses performed by TestAmerica of Denver, Colorado.
Method Reporting Limit (MRL) is typical and may be elevated for some samples.
* indicates result was not reported at or above the MRL.
^ Leachate reported concentrations are total metals.
— = not applicable or not performed
BG = Background

Table 6. Volatile Organic Compounds (µg/L)
Third Quarter 2018
LRI Landfill, Pierce County, Washington

Parameter	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Acetone	Benzene	Ethylbenzene	Methylene Chloride	m-Xylene & p-Xylene	o-Xylene	Toluene
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MRL	80.0	39.0	76.0	6.4	6.4	13.0	14.0	7.6	6.8
WAC 173-200 Criteria	—	—	—	1.0	—	5.0	—	—	—
Monitoring Wells									
MW-1A	*	*	*	*	*	*	*	*	*
MW-2A	*	*	*	*	*	*	*	*	*
MW-3	*	*	*	*	*	*	*	*	*
MW-4	*	*	*	*	*	*	*	*	*
MW-5A	*	*	*	*	*	*	*	*	*
MW-6	*	*	*	*	*	*	*	*	*
MW-7	*	*	*	*	*	*	*	*	*
(BG) MW-9	*	*	*	*	*	*	*	*	*
(BG) MW-10	*	*	*	*	*	*	*	*	*
Leak Detection System									
LDCS-1	*	*	17	*	*	*	*	*	*
LDCS-2A	*	*	*	*	*	*	*	*	*
LDCS-2B	*	*	*	*	*	*	*	*	*
LDCS-3A	*	*	*	*	*	*	*	*	*
LDCS-4A	*	*	*	*	*	*	*	*	*
LDCS-4B	*	*	*	*	*	*	*	*	*
LDCS-5	*	*	24	*	*	*	*	*	*
LDCS-6	*	*	*	*	*	*	*	*	*
Field Blank	*	*	*	*	*	*	*	*	*
Leachate Collection System									
Leachate, Cell 6	2,300	170	1,600	17	20	19	34	16	170

Notes:
Analyses performed by TestAmerica of Denver, Colorado.
MRL displayed is value from leachate sample analysis with the exception of 1,4 Dichlorobenzene.
* = not reported at or above the MRL
— = not applicable or not performed
BG = Background

Table 7. Cation-Anion Balance
Third Quarter 2018
LRI Landfill, Pierce County, Washington

Cations	mg/L					meq/L					% of Total		
	Ca	Mg	K	Na	Total	Ca	Mg	K	Na	Total	Na+K	Ca	Mg
MW-1A	14	9	3.2	11	37.2	0.70	0.74	0.07	0.48	1.99	28	35	37
MW-2A	19	10	2.6	15	46.6	0.95	0.82	0.06	0.65	2.48	29	38	33
MW-3	32	14	3.2	12	61.2	1.60	1.15	0.07	0.52	3.34	18	48	34
MW-4	27	14	5.2	12	58.2	1.35	1.15	0.12	0.52	3.14	20	43	37
MW-5A	26	11	3.3	15	55.3	1.30	0.91	0.07	0.65	2.93	25	44	31
MW-6	27	13	4.1	10	54.1	1.35	1.07	0.09	0.44	2.94	18	46	36
MW-7	27	21	4.6	12	64.6	1.35	1.73	0.10	0.52	3.70	17	36	47
MW-9	10	6.7	2.0	7.5	26.2	0.50	0.55	0.05	0.33	1.42	26	35	39
MW-10	22	10	2.0	14	48.0	1.10	0.82	0.05	0.61	2.57	25	43	32
LDCS-1	51	22	5.6	20	98.6	2.54	1.81	0.13	0.87	5.35	19	48	34
LDCS-2A	84	33	8.6	33	158.6	4.19	2.72	0.19	1.44	8.54	19	49	32
LDCS-2B	92	31	7.6	22	152.6	4.59	2.55	0.17	0.96	8.27	14	56	31
LDCS-3A	87	39	6.3	24	156.3	4.34	3.21	0.14	1.04	8.74	14	50	37
LDCS-4A	90	40	6.8	30	166.8	4.49	3.29	0.15	1.31	9.24	16	49	36
LDCS-4B	140	46	6.9	44	236.9	6.99	3.79	0.16	1.91	12.84	16	54	29
LDCS-5	85	50	9.0	32	176.0	4.24	4.12	0.20	1.39	9.95	16	43	41
LDCS-6	120	62	4.6	46	232.6	5.99	5.10	0.10	2.00	13.20	16	45	39
Leachate Cell 6	120	200	960	1800	3080	5.99	16.46	21.68	78.30	122.42	82	5	13

Anions	mg/L					meq/L					% of Total			Total Ions (meq/L)	Cation - Anion Balance	Applicable Ratio (%)	Ratio Exceedance
	Alk	Cl	NO_3	SO_4	Total	Alk	Cl	NO_3	SO_4	Total	Cl	Alk	SO_4				
MW-1A	108	2.3	0.5	3.1	113.9	1.77	0.06	0.008	0.06	1.91	3	93	3	3.90	2.1	10	O
MW-2A	144	3.6	0.5	7.2	155.3	2.36	0.10	0.008	0.15	2.62	4	90	6	5.10	2.7	5	O
MW-3	156	3.8	0.5	28	188.3	2.56	0.11	0.008	0.58	3.26	3	79	18	6.60	1.3	5	O
MW-4	180	2.8	0.5	8.2	191.5	2.95	0.08	0.008	0.17	3.21	2	92	5	6.35	1.1	5	O
MW-5A	168	2.8	0.5	5.8	177.1	2.76	0.08	0.008	0.12	2.96	3	93	4	5.89	0.6	5	O
MW-6	156	5.1	0.5	7.6	169.2	2.56	0.14	0.008	0.16	2.87	5	89	6	5.81	1.3	5	O
MW-7	216	3.5	0.5	4.5	224.5	3.54	0.10	0.008	0.09	3.74	3	95	3	7.44	0.6	5	O
MW-9	81.6	1.7	0.5	1.8	85.6	1.34	0.05	0.008	0.04	1.43	3	93	3	2.85	0.3	10	O
MW-10	115.2	9.1	4.7	8.2	137.2	1.89	0.26	0.076	0.17	2.39	11	79	7	4.97	3.7	10	O
LDCS-1	312	3.4	0.5	9.0	324.9	5.12	0.10	0.008	0.19	5.41	2	95	3	10.76	0.5	5	O
LDCS-2A	504	3.3	0.5	19	526.8	8.27	0.09	0.008	0.40	8.76	1	94	5	17.30	1.3	5	O
LDCS-2B	396	3.6	0.5	65	465.1	6.49	0.10	0.008	1.35	7.96	1	82	17	16.23	1.9	5	O
LDCS-3A	408	4.0	0.5	82	494.5	6.69	0.11	0.008	1.71	8.52	1	79	20	17.25	1.3	5	O
LDCS-4A	420	15.0	0.5	87	522.5	6.89	0.42	0.008	1.81	9.13	5	75	20	18.37	0.6	5	O
LDCS-4B	516	20.0	0.5	180	716.5	8.46	0.56	0.008	3.74	12.78	4	66	29	25.62	0.2	5	O
LDCS-5	480	19.0	0.5	69	568.5	7.87	0.54	0.008	1.44	9.85	5	80	15	19.80	0.5	5	O
LDCS-6	564	10.0	0.5	210	785	9.25	0.28	0.008	4.37	13.91	2	67	31	27.10	2.6	5	O
Leachate, Cell 6	12,000	2,900	5.0	3.0	14908	196.80	81.78	0.081	0.06	278.72	29	71	0	401.15	39.0	5	Exceeds

Notes:

mg/L = milligrams per liter

meq/L = milliequivalents per liter

Total alkalinity concentration, reported as calcium carbonate ($CaCO_3$), is converted to the bicarbonate (HCO_3^-) ion by multiplying by a factor of 1.2.

Cation / anion balance equation is the equivalent percent difference in cations minus anions divided by the sum of cations and anions [(cations-anions)/(anions+cations)*100].

The MRL was used for analytes that were non-detect

A 10% difference threshold is used if the total cation-anion sums are < 5.0 meq/liter.

A 5% difference threshold is used if the total cation-anion sums are > or = to 5.0 meq/liter.

Table 8. Duplicate Sample Results
Third Quarter 2018 Monitoring Report
LRI Landfill, Pierce County, Washington

Parameter	MRL	MW-2A	MW-2A (Duplicate)	RPD (%)
Volatile Organic Compunds (µg/L)				
No Detections	-	-	-	-
Inorganic Parameters (mg/L)				
Alkalinity, Bicarbonate (as CaCO3)	5.0	120	120	0.0
Chloride	0.20	3.6	3.5	2.8
Sulfate	0.20	7.2	7.1	1.4
Total Dissolved Solids	10	170	170	0.0
Dissolved Metals (mg/L)				
Calcium	0.20	19	19	0.0
Iron	0.10	0.68	0.70	2.9
Magnesium	0.10	10	11	9.5
Manganese	0.005	0.30	0.28	6.9
Potassium	2.0	2.6	2.6	0.0
Sodium	1.0	15	15	0.0
Total Metals (mg/L)				
Barium	0.005	0.014	0.011	24.0

Notes:

Analyses performed by TestAmerica of Denver, Colorado.

VOCs not listed were not present at concentrations exceeding the Method Reporting Limit (MRL).

RPD = relative percent difference.

µg/L = micrograms per liter.

mg/L = milligrams per liter.

* = the sample results were not reported at or above the MRL

The MRL was used to calculate the RPD for analytes where one sample was non-detect.

Appendix C

Field Sampling Documentation

Environmental Consultants
and Contractors

2405 140th Avenue, NE
Suite 107
Bellevue, WA 98005-1877

425 746-4600
FAX 425 746-6747
www.scsengineers.com

SCS ENGINEERS

October 2, 2018
File No. 04218001.02

Subject: Third Quarter 2018 Groundwater Monitoring Event
LRI Landfill, Pierce County, Washington

NOTES/SAMPLE DECODING:

Event Dates: September 17-21, 2018
Field Staff: Sam Graber

- Dedicated pumps were used for purging and sampling wells MW-1A, MW-2A, MW-3, MW-5A, MW-6, MW-7, MW-9, MW-10, and leak detection/collection system points LDCS-3A, LDCS-4A, LDCS-4B, LDCS-5, and LDCS-6.
- Disposeable bailers were used to sample leak detection/collection system points LDCS-1, LDCS-2A, and LDCS-2B.
- A non-dedicated Sample Pro pump was used for purging and sampling well MW-4.
- A round of water level measurements was completed on September 19th, 2018.
- Multiparameter field meters were calibrated daily, prior to sampling.
- Source water for the field blank was lab-grade deionized water (VOC-free) provided by TestAmerica in Tacoma, Washington.

Sample Number	Well Number
304-091718-01	MW-1A
304-091718-02	MW-2A
304-091718-03	MW-2A (Duplicate)
304-091718-04	MW-3
304-091718-05	MW-5
304-091818-06	MW-6
304-091818-07	MW-7
304-091818-08	MW-10
304-091818-09	LDCS-2A
304-091818-10	LDCS-1
304-091918-11	MW-4
304-091918-12	MW-9
304-091918-13	Field Blank
304-092018-14	LDCS-5
304-092018-15	LDCS-4A
304-092018-16	LDCS-3A
304-092018-17	LDCS-2B
304-092118-18	LDCS-4B
304-092118-19	LDCS-6
304-092118-20	Leachate Cell 6

SCS ENGINEERS
2405 140th ave NE #107
Bellevue, WA 98005 (425) 746-4600

Groundwater Sampling Data Sheet

Project #: 042180501.02
Site: URI 304th
Well ID: MW-1A
Sample ID: 304-091713-01
Date: 9/17/13
Weather: overcast

20.21 DTW
TOS
Intake
BOS
59.90 Total Depth

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other

Meter: MP-20 YSI

CONTROL SETTINGS:
Refill 9.5
Discharge 5.5
Pressure 40
Flow 350 mL/min

1 ft water = 0.62L
1L = 0.24 gallons

One Well Volume (liters)
Total Volume Bailed (liters)
Other:
Flow Setting:

Filtered? (Y) N
Locked? Y (N)
Water in Protector? (Y) N
Damage? Y (N)

Sample Containers:
1000 ml Poly
500 ml Poly
250 ml Poly
125 ml Poly
500 ml HNO3 x2
500 ml H2SO4 x2
40 ml VOA x3 x6
1000 ml Amber
125 ml NaOH

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1132		13.45	197	1.87	5.86	255.8	3.16	
1137		13.27	161	0.51	6.29	196.1		
1140		13.19	163	0.70	6.39	117.6		
1143		13.13	170	0.68	6.45	59.0		
1146	24.95	13.18	173	0.67	6.51	36.0		
1149		13.13	178	0.64	6.59	16.7		
1152	25.21	13.10	183	0.58	6.66	-8.0	1.55	

Notes / Observations (color, odor, anomalies, etc):

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Graber
Printed Name

Signature

SCS ENGINEERS
2405 140th ave NE #107
Bellevue, WA 98005 (425) 746-4600

Groundwater Sampling Data Sheet

Project #: 04218001.02
Site: LI2 304th
Well ID: MW-2
Sample ID: 304-091718-02
Date: 9/17/18
Weather: Partly cloudy

20.11 DTW
TOS
Intake
BOS
Total Depth

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other

Meter: MP-20 YSI

CONTROL SETTINGS:
Refill 9
Discharge 6
Pressure 35
Flow 350 mL/min

1 ft water = 0.62L
1L = 0.24 gallons
One Well Volume (liters)
Total Volume Bailed (liters)
Other:
Flow Setting:

Filtered? Y (N)
Locked? Y (N)
Water in Protector? Y (N)
Damage? Y (N)

Sample Containers:

1000 ml Poly		500 ml Poly		250 ml Poly		125 ml Poly	
500 ml HNO3	x2	500 ml H2SO4	x2	40 ml VOA	x3 x6	1000 ml Amber	
125 ml NaOH							

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1240		16.50	239	6.65	6.95	126.7		
1245		13.37	251	0.40	6.84	7.2		
1248		13.19	249	0.33	6.83	-16.0		
1251		13.19	249	0.28	6.81	-29.7		
1254		13.25	248	0.26	6.79	-33.3		
1257		13.25	248	0.26	6.83	-41.0		
1300		13.27	249	0.23	6.84	-45.7	1.99	

Notes / Observations (color, odor, anomalies, etc):

Dup taken as 304-091718-03 @ 1315

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Gruber
Printed Name

Signature

SCS ENGINEERS
2405 140th ave NE #107
Bellevue, WA 98005 (425) 746-4600

Groundwater Sampling Data Sheet

Project #: 012180001.02
Site: CRI 304th
Well ID: MW-3
Sample ID: 304-091718-04
Date: 9/17/18
Weather: partly cloudy

9.85 DTW
TOS
Intake
BOS
Total Depth

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other
Meter: MP-20 YSI
CONTROL SETTINGS:
Refill 9
Discharge 6
Pressure 35
Flow 400 mL/min

1 ft water = 0.62L 1L = 0.24 gallons
One Well Volume (liters)
Total Volume Bailed (liters)
Other :
Flow Setting :

Filtered? (Y) N
Locked? Y (N)
Water in Protector? Y (N)
Damage? Y (N)

Sample Containers:

1000 ml Poly	500 ml Poly	250 ml Poly	125 ml Poly
500 ml HNO3 x2	500 ml H2SO4 x2	40 ml VOA x3 x6	1000 ml Amber
125 ml NaOH			

Notes / Observations (color, odor, anomalies, etc):

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1400		10.75	335	3.68	6.89	158.1		
1405		10.56	328	1.15	6.54	172.0		
1408		10.62	327	0.79	6.75	163.7		
1411		10.49	327	0.53	7.00	149.6		
1414	11.30	10.47	327	0.43	7.09	135.6		
1417		10.49	327	0.37	7.14	123.9		
1420	11.51	10.51	327	0.35	7.18	119.6	0.63	

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Graber
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Groundwater Sampling Data Sheet

Project #: 042800l.02
Site: LRI South
Well ID: MW-5
Sample ID: SM-041718-05
Date: 4/17/18
Weather: sunny

29.47 DTW
TOS
Intake
BOS
Total Depth

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other
Meter: YSI
MP-20

CONTROL SETTINGS:
Refill 9
Discharge 6
Pressure 40
Flow 500 ml/min

1 ft water = 0.62L
1L = 0.24 gallons
One Well Volume (liters)
Total Volume Bailed (liters)
Other:
Flow Setting:

Filtered? (Y) N
Locked? Y (N)
Water in Protector? Y (N)
Damage? Y (N)

Sample Containers:
1000 ml Poly
500 ml Poly
250 ml Poly
125 ml Poly
500 ml HNO3 x2
500 ml H2SO4 x2
40 ml VOA x3 x6
1000 ml Amber
125 ml NaOH

Notes / Observations (color, odor, anomalies, etc):

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1500		13.50	333	4.81	7.42	163.4		
1505		12.58	279	0.48	7.19	156.7		
1508		12.50	280	0.32	7.23	131.0		
1511		12.47	281	0.29	7.26	106.1		
1514		12.48	281	0.27	7.28	77.5		
1517	31.40	12.45	281	0.26	7.29	56.6		
1520	31.58	12.45	281	0.25	7.31	28.2	1.80	

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

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Groundwater Sampling Data Sheet

Project #: 042180061.02
Site: LRI 304th
Well ID: MW-6
Sample ID: 304-091818-06
Date: 9/18/18
Weather: Sunny

12.61 DTW
TOS
Intake
BOS
Total Depth

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other

Meter: MP-20 YSI

CONTROL SETTINGS:
Refill 10
Discharge 5
Pressure 30
Flow 300 mL/min

1 ft water = 0.62L
1L = 0.24 gallons
One Well Volume (liters)
Total Volume Bailed (liters)
Other:
Flow Setting:

Filtered? (Y) N
Locked? Y (N)
Water in Protector? (Y) N
Damage? Y (N)

Sample Containers:
1000 ml Poly
500 ml Poly
250 ml Poly
125 ml Poly
500 ml HNO3 x2
500 ml H2SO4 x2
40 ml VOA x3 x6
1000 ml Amber
125 ml NaOH

Notes / Observations (color, odor, anomalies, etc):

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1030		11.03	284	3.80	5.55	236.0		
1035		10.59	288	1.28	6.03	175.8		
1038		10.57	287	0.60	6.69	166.9		
1041		10.56	287	0.39	6.86	164.4		
1044		10.56	286	0.32	6.92	164.3		
1047		10.55	285	0.29	6.98	164.2		
1050		10.55	287	0.35	7.04	164.1	1.52	

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Graber
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Signature

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Groundwater Sampling Data Sheet

Project #: 0421B001.02
Site: LRI 304th
Well ID: MW-7
Sample ID: 304-091818-07
Date: 9/18/18
Weather: sunny

25.99 DTW
TOS
Intake
BOS
Total Depth

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other
Meter: MP-20 YSI

CONTROL SETTINGS: 1 ft water = 0.62L 1L = 0.24 gallons
Refill 10
Discharge 5
Pressure 40
Flow 300 mL/min
One Well Volume (liters)
Total Volume Bailed (liters)
Other:
Flow Setting:

Filtered? (Y) N
Locked? Y (N)
Water in Protector? (Y) N
Damage? Y (N)

Sample Containers:
1000 ml Poly
500 ml Poly
250 ml Poly
125 ml Poly
500 ml HNO3 x2
500 ml H2SO4 x2
40 ml VOA x3 x6
1000 ml Amber
125 ml NaOH

Notes / Observations (color, odor, anomalies, etc):

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1140		10.52	372	3.78	6.77	238.7		
1145		10.40	364	0.73	7.13	154.3		
1148		10.39	364	0.46	7.29	52.5		
1151		10.37	364	0.40	7.35	8.6		
1154	30.30	10.38	364	0.38	7.37	-2.6		
1157		10.38	364	0.36	7.40	-19.9		
1200	30.41	10.38	364	0.34	7.42	-35.1	1.43	

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Gratzer
Printed Name

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SCS ENGINEERS
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Bellevue, WA 98005 (425) 746-4600

Groundwater Sampling Data Sheet

Project #: 04218001.02
Site: LF 30/31n
Well ID: MW-10
Sample ID: 30/31-091313-08
Date: 9/13/13
Weather: Sunny

21.27 DTW
TOS
Intake
BOS
Total Depth

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other

Meter: MP-20 YSI

CONTROL SETTINGS:
Refill 9
Discharge 6
Pressure 35
Flow 300 mL/min

1 ft water = 0.62L
1L = 0.24 gallons

One Well Volume (liters)
Total Volume Bailed (liters)
Other:
Flow Setting:

Filtered? (Y) N
Locked? Y (N)
Water in Protector? Y (N)
Damage? Y (N)

Sample Containers:

1000 ml Poly	500 ml Poly	250 ml Poly	125 ml Poly
500 ml HNO3 x2	500 ml H2SO4 x2	40 ml VOA x3 x6	1000 ml Amber
125 ml NaOH			

Notes / Observations (color, odor, anomalies, etc):

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1240		13.42	275	4.45	7.19	166.9		
1245		12.36	276	2.99	6.75	169.2		
1248		11.27	279	1.95	6.48	170.1		
1251		11.27	274	1.64	6.45	167.5		
1254		11.21	274	1.47	6.42	165.2		
1257		10.95	273	1.40	6.41	166.6		
1300		11.08	272	1.31	6.38	165.7	1.48	

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Graber
Printed Name

Signature

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Groundwater Sampling Data Sheet

Project #: 04218001.02
Site: LFI 304th
Well ID: LOCS-2A
Sample ID: 304-091818-09
Date: 9/18/18
Weather: Sunny

24.70 DTW
TOS
Intake
BOS
Total Depth

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other
Meter: MP-20 YSI
CONTROL SETTINGS: Refill / Discharge / Pressure / Flow

1 ft water = 0.62L 1L = 0.24 gallons
One Well Volume (liters): Other:
Total Volume Bailed (liters): Flow Setting:

Filtered? Y N Locked? Y N NA Water in Protector? Y N NA Damage? Y N

Sample Containers:

1000 ml Poly	500 ml Poly	250 ml Poly	125 ml Poly
500 ml HNO3 x2	500 ml H2SO4 x2	40 ml VOA x3 x6	1000 ml Amber
125 ml NaOH			

Notes / Observations (color, odor, anomalies, etc):
small to moderate amount of string like particulates in sample

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1350		25.03	318	1.77	6.54	176.0	6.25	

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Graber
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Groundwater Sampling Data Sheet

Project #: 04218001.02
Site: LRI 304th
Well ID: LDCS-1
Sample ID: 304-091918-10
Date: 9/18/18
Weather: sunny

28.40 DTW
TOS
Intake
BOS
Total Depth

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other

Meter: MP-20 YSI

CONTROL SETTINGS:
Refill
Discharge
Pressure
Flow

1 ft water = 0.62L 1L = 0.24 gallons

One Well Volume (liters)
Total Volume Bailed (liters)
Other :
Flow Setting :

Filtered? Y N
Locked? Y N
Water in Protector? Y N
Damage? Y N

Sample Containers:

1000 ml Poly	500 ml Poly	250 ml Poly	125 ml Poly
500 ml HNO3 x2	500 ml H2SO4 x2	40 ml VOA x3 x6	1000 ml Amber
125 ml NaOH			

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1505		21.89	543	2.09	6.11	105.7	18.58	

Notes / Observations (color, odor, anomalies, etc):

moderate to heavy particulates
clearish to black

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Graber
Printed Name

Signature

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Bellevue, WA 98005 (425) 746-4600

Q

Groundwater Sampling Data Sheet

Project #: 042190001.02
Site: LRI 304th
Well ID: MW-4 041918
Sample ID: 304 - ~~041918~~ - 11
Date: 9/19/18
Weather: Sunny

24.89 DTW
TOS
Intake
BOS
77.90 Total Depth

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other

Meter: MP-20 YSI

CONTROL SETTINGS: 1 ft water = 0.62L 1L = 0.24 gallons

Refill 8
Discharge 7
Pressure 45
Flow 300 mL/min

One Well Volume (liters)
Total Volume Bailed (liters)
Other:
Flow Setting:

Filtered? (Y) N
Locked? Y (N)
Water in Protector? Y (N)
Damage? Y (N)

Sample Containers:

1000 ml Poly	500 ml Poly	250 ml Poly	125 ml Poly
500 ml HNO3 x2	500 ml H2SO4 x2	40 ml VOA x3 x6	1000 ml Amber
125 ml NaOH			

Notes / Observations (color, odor, anomalies, etc):

pump set - 7' above T.D.

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
0950							47.33	
1005							13.64	
1025		14.25	318	2.46	5.62	242.0	7.25	
1030		13.42	312	0.29	6.76	138.5	6.62	
1035		13.22	312	0.27	7.06	105.3		
1038		13.24	312	0.26	7.12	72.0		
1041		13.25	312	0.25	7.19	44.9		
1044		13.24	312	0.24	7.26	16.3		
1047		13.23	312	0.23	7.29	5.4	6.46	
1049		13.23	312	0.23	7.30	0.2		
1052		13.24	312	0.22	7.32	-4.0		
1055		13.24	312	0.21	7.33	-6.1	4.52	

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Gruber
Printed Name

Signature

SCS ENGINEERS
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Bellevue, WA 98005 (425) 746-4600

Groundwater Sampling Data Sheet

Project #: 0421900102
Site: LRI South
Well ID: MW-9
Sample ID: SCS-091918-12
Date: 9/19/18
Weather: Sunny

DTW: 12.22
TOS:
Intake:
BOS:
Total Depth:

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other
Meter: MP-20 / YSI
CONTROL SETTINGS:
Refill: 9
Discharge: 6
Pressure: 40
Flow: 300 ml/min

1 ft water = 0.62L
1L = 0.24 gallons
One Well Volume (liters):
Total Volume Bailed (liters):
Other:
Flow Setting:

Filtered? (Y) N
Locked? Y (N)
Water in Protector? Y (N)
Damage? Y (N)

Sample Containers:
1000 ml Poly
500 ml Poly
250 ml Poly
125 ml Poly
500 ml HNO3 x2
500 ml H2SO4 x2
40 ml VOA x3 x6
1000 ml Amber
125 ml NaOH

Notes / Observations (color, odor, anomalies, etc):
* Waited for water level to equilibrate for 10 min.

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1210		14.01	144	5.03	7.37	174.7	2.55	
1215		11.96	139	3.53	6.39	213.2		
1218		12.41	139	3.38	6.45	209.9		
1221		13.93	139	3.25	6.51	206.1		
~~1224~~		~~14.32~~	~~140~~	~~3.32~~	~~6.48~~	~~208.0~~		
1224		13.92	142	4.07	6.49	207.9	1.54	
~~1227~~		~~14.97~~	~~134~~	~~3.20~~	~~6.47~~	~~208.5~~		
1227		11.97	137	3.64	6.53	208.1		
1230		11.77	138	3.55	6.51	209.3	1.67	

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Graber
Printed Name

Signature

SCS ENGINEERS
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Groundwater Sampling Data Sheet

Project #: 04218001.02
Site: CRT 304th
Well ID: Field Blank
Sample ID: 304 - 091918 - 13
Date: 9/19/18
Weather: sunny

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | (Other)

DTW
TOS
Intake
BOS
Total Depth

Meter: MP-20 (YSI)

CONTROL SETTINGS:
Refill
Discharge
Pressure
Flow

1 ft water = 0.62L
1L = 0.24 gallons

One Well Volume (liters):
Total Volume Bailed (liters):
Other:
Flow Setting:

Filtered? (Y) N
Locked? Y N (NA)
Water in Protector? Y N (NA)
Damage? Y N (NA)

Sample Containers:
1000 ml Poly
500 ml Poly
250 ml Poly
125 ml Poly
500 ml HNO3 x2
500 ml H2SO4 x2
40 ml VOA x3 x6
1000 ml Amber
125 ml NaOH

Notes / Observations (color, odor, anomalies, etc):

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1530		23.71	13	5.12	8.36	132.0	1.72	

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Baber
Printed Name

Signature

SCS ENGINEERS
2405 140th ave NE #107
Bellevue, WA 98005 (425) 746-4600

Groundwater Sampling Data Sheet

Project #: 04218001.02
Site: LRI 304th
Well ID: LOCS-5
Sample ID: 304-092013-JH
Date: 9/20/13
Weather: partly cloudy

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other

Meter: MP-20 (YSI)

CONTROL SETTINGS:

DTW: ____
TOS: ____
Intake: ____
BOS: ____
Total Depth: ____

Refill: 12
Discharge: 3
Pressure: 40
Flow: 60 ml/min

1 ft water = 0.62L
1L = 0.24 gallons

One Well Volume (liters): ____
Total Volume Bailed (liters): ____
Other: ____
Flow Setting: ____

Filtered? (Y) N
Locked? Y (N)
Water in Protector? Y (N)
Damage? Y (N)

Sample Containers:

1000 ml Poly	500 ml Poly	250 ml Poly	125 ml Poly
500 ml HNO3 x2	500 ml H2SO4 x2	40 ml VOA x3 x6	1000 ml Amber
125 ml NaOH			

Notes / Observations (color, odor, anomalies, etc):

LDCS level upon sampling = 10.9

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1103		20.84	899	2.55	6.31	270.0		
1108		21.46	911	1.22	6.36	265.6		
1111		21.99	922	0.81	6.42	258.7		
1114		22.12	930	0.63	6.39	255.6		
1117		22.50	941	0.49	6.35	225.1		
1120		23.37	957	0.39	6.43	36.1		
1123		23.66	985	0.32	6.47	-21.3	1.95	

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Graber
Printed Name

Signature

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Bellevue, WA 98005 (425) 746-4600

Groundwater Sampling Data Sheet

Project #: 042180012.02
Site: LRI 304th
Well ID: LDCS-4A
Sample ID: 304-092018-15
Date: 9/20/18
Weather: partly cloudy

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other

DTW
TOS
Intake
BOS
Total Depth

Meter: MP-20 YSI

CONTROL SETTINGS: 1 ft water = 0.62L 1L = 0.24 gallons

Refill 12
Discharge 3
Pressure 35
Flow 200 mL/min

One Well Volume (liters)
Total Volume Bailed (liters)
Other:
Flow Setting:

Filtered? (Y) N
Locked? Y (N)
Water in Protector? Y (N)
Damage? Y (N)

Sample Containers:

1000 ml Poly	500 ml Poly	250 ml Poly	125 ml Poly
500 ml HNO3 x2	500 ml H2SO4 x2	40 ml VOA x3 x6	1000 ml Amber
125 ml NaOH			

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1243		21.12	929	3.57	6.70	126.5		
1248		21.31	931	1.36	6.30	145.9		
1251		21.79	941	0.82	6.23	79.5		
1254		22.23	879	0.73	6.32	27.3		
1257		22.89	854	0.68	6.27	32.2		
1300		23.62	856	0.63	6.26	35.4		
1303		23.50	858	0.60	6.25	35.7	3.77	

Notes / Observations (color, odor, anomalies, etc):

LDCRS level = 11.61

pumped down in the morning

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Gruber
Printed Name

Signature

SCS ENGINEERS
2405 140th ave NE #107
Bellevue, WA 98005 (425) 746-4600

Groundwater Sampling Data Sheet

Project #: 04218001.02
Site: LRE 304th
Well ID: 3M-092018-16
Sample ID: LDCS-3A
Date: ~~4/20/18~~ 9/20/18
Weather: Partly cloudy

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other

DTW
TOS
Intake
BOS
Total Depth

Meter: MP-20 YSI

CONTROL SETTINGS:
Refill: 12
Discharge: 3
Pressure: 40
Flow: 200 mL/min

1 ft water = 0.62L
1L = 0.24 gallons

One Well Volume (liters)
Total Volume Bailed (liters)
Other:
Flow Setting:

Filtered? Y (N)
Locked? Y (N)
Water in Protector? Y (N)
Damage? Y (N)

Sample Containers:

1000 ml Poly	500 ml Poly	250 ml Poly	125 ml Poly
500 ml HNO3 x2	500 ml H2SO4 x2	40 ml VOA x3 x6	1000 ml Amber
125 ml NaOH			

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1347		21.34	774	5.32	6.95	164.7		
1352		21.35	778	5.15	6.76	171.4		
1355		21.37	778	5.07	6.67	176.7		
1358		21.61	778	4.90	6.62	179.2		
1401		21.18	794	3.87	6.47	185.4		
1404		21.73	803	2.00	6.37	181.3		
1407		22.00	805	1.81	6.37	177.6	2.64	

Notes / Observations (color, odor, anomalies, etc):

level at 10.53. when sampling
Didn't produce enough water at ~7.5

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Graber
Printed Name

Signature

SCS ENGINEERS
2405 140th ave NE #107
Bellevue, WA 98005 (425) 746-4600

Groundwater Sampling Data Sheet

Project #: 04718001.02
Site: LRI 304th
Well ID: LDLS-2B
Sample ID: 304-~~0918~~-~~MW~~ 092018-17
Date: ~~9/18/18~~ 9/20/18
Weather: sunny

26.48
~~27.10~~ DTW
TOS
Intake
BOS
Total Depth

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other

Meter: MP-20 (YSI)

CONTROL SETTINGS: 1 ft water = 0.62L 1L = 0.24 gallons

Refill
Discharge
Pressure
Flow

One Well Volume (liters)
Total Volume Bailed (liters)
Other:
Flow Setting:

Filtered? (Y) N Locked? Y (N) Water in Protector? Y (N) Damage? Y (N)

Sample Containers:

1000 ml Poly	500 ml Poly	250 ml Poly	125 ml Poly
500 ml HNO3 x2	500 ml H2SO4 x2	40 ml VOA x3 x6	1000 ml Amber
125 ml NaOH			

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
~~1360~~								
1500		22.22	736	4.34	6.74	131.4	2.83	

Notes / Observations (color, odor, anomalies, etc):
9/18/18 ORW = 27.10 → Heavy particulates.
9/20/18 26.95
1035
minimal particulates in sample when collected.

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Baker
Printed Name

Signature

SCS ENGINEERS
2405 140th ave NE #107
Bellevue, WA 98005 (425) 746-4600

Groundwater Sampling Data Sheet

Project #: 04219001.02
Site: LRI 304th
Well ID: LWCS-4B
Sample ID: 304-092113-19
Date: 9/21/13
Weather: 9/21/13 cloudy

DTW
TOS
Intake
BOS
Total Depth

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other

Meter: MP-20 YSI

CONTROL SETTINGS:
Refill 16
Discharge 4
Pressure 40
Flow 225 mL/min

1 ft water = 0.62L 1L = 0.24 gallons
One Well Volume (liters)
Total Volume Bailed (liters)
Other:
Flow Setting:

Filtered? Y (N) Locked? Y (N) Water in Protector? Y (N) Damage? Y (N)

Sample Containers:

1000 ml Poly	500 ml Poly	250 ml Poly	125 ml Poly
500 ml HNO3 x2	500 ml H2SO4 x2	40 ml VOA x3 x6	1000 ml Amber
125 ml NaOH			

spc panel

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
902	pump on							
908	water to surface.							
920		24.68	1256	3.31	6.83	238.0		1121
925		24.56	1256	0.79	6.55	114.5		
928		24.61	1211	0.53	6.52	110.2		
931		24.69	1179	0.43	6.49	107.9		1130
934		24.60	1179	0.40	6.49	92.8		
937		24.93	1176	0.37	6.49	76.2		
940		25.03	1176	0.32	6.49	57.3	1.51	1132

Notes / Observations (color, odor, anomalies, etc):
LWCS pump on from 6:30 - 8:45 day of sampling.
turned pump on at 9:02 sampling
LWCS level = 4.
spc =

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Graber
Printed Name

Signature

SCS ENGINEERS
2405 140th ave NE #107
Bellevue, WA 98005 (425) 746-4600

Groundwater Sampling Data Sheet

Project #: 042180016.02
Site: LRI South
Well ID: LDCS-6
Sample ID: SOM-092113-19
Date: 9/21/13
Weather: Cloudy

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other

DTW: ____
TOS: ____
Intake: ____
BOS: ____
Total Depth: ____

Meter: MP-20 (YSI)

CONTROL SETTINGS: 1 ft water = 0.62L; 1L = 0.24 gallons

Refill: 17
Discharge: 3
Pressure: 50
Flow: 50 ml/min

One Well Volume (liters): ____
Total Volume Bailed (liters): ____
Other: ____
Flow Setting: ____

Filtered? (Y) N
Locked? Y (N)
Water in Protector? Y (N)
Damage? Y (N)

Sample Containers:
1000 ml Poly
500 ml Poly
250 ml Poly
125 ml Poly
500 ml HNO3 x2
500 ml H2SO4 x2
40 ml VOA x3 x6
1000 ml Amber
125 ml NaOH

Panel Spc

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1035	Water to surface.							
1055		19.19	1378	4.71	7.26	179.9		999 1001
1115		20.19	1389	4.21	6.97	182.5		
1119		20.04	1389	4.15	6.94	184.4		
1121		20.02	1389	4.13	6.91	186.6	1.32	1000

Notes / Observations (color, odor, anomalies, etc):

level at -1.0 upon sampling. (bottom of system at -11.0)

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Graber
Printed Name

Signature

SCS ENGINEERS
2405 140th ave NE #107
Bellevue, WA 98005 (425) 746-4600

Groundwater Sampling Data Sheet

Project #: 04218001.02
Site: LRI 304th
Well ID: Leachate Cell 6
Sample ID: 304-092118-20
Date: 9/21/18
Weather: cloudy

Sampling Method: Dedicated | 1.75" QED SamplePro | Bail | Peristaltic | Grab | Other

DTW
TOS
Intake
BOS
Total Depth

Meter: MP-20 YSI

CONTROL SETTINGS:
Refill
Discharge
Pressure
Flow

1 ft water = 0.62L 1L = 0.24 gallons

One Well Volume (liters)
Total Volume Bailed (liters)
Other :
Flow Setting :

Filtered? Y (N) Locked? Y (N) Water in Protector? Y N (NA) Damage? Y (N)

Sample Containers:
1000 ml Poly | 500 ml Poly | 250 ml Poly | 125 ml Poly
500 ml HNO3 x2 | 500 ml H2SO4 x2 | 40 ml VOA x3 x6 | 1000 ml Amber
125 ml NaOH

Notes / Observations (color, odor, anomalies, etc):

TIME	DTW	Temp.	Sp.Cond.	DO	pH	Eh	Turbidity	Q / Vol.
1200		21.96	25787	0.56	7.70	-118.9	190.5	

Stabilization Parameters: pH/DO ± 0.2, SpC ± 10%, Temp ± 0.5°C, Turb. ± 10% or ≤ 5

SAMPLER: Sam Graber
Printed Name

Signature

Appendix D
Statistical Calculations

Groundwater Prediction Limits (mg/L)
Appendix I Parameters, Third Quarter 2018
LRI Landfill, Pierce County, Washington

	MRL (typical)	Prediction Limit	MW-1/ MW-1A	MW-2/ MW-2A	MW-3	MW-4	MW-5/ MW-5A	MW-6	MW-7	MW-9	MW-10
Antimony	0.050	**0.050 L**	**0.050 L**	0.050 L	0.050 L	0.050 L	0.050 L	0.050 L	0.050 L	0.050 L	0.050 L
Arsenic	0.005	**0.011**	0.005 L	0.005 L	0.005 L	**0.011**	0.008	0.008	0.006	0.005 L	0.005 L
Barium	0.005	**0.091**	0.030	0.018	0.015	**0.091**	0.036	0.014	0.016	0.0057	0.016
Beryllium	0.005	**0.005 L**	**0.005 L**	0.005 L	0.005 L	0.005 L	0.005 L	0.001 L	0.005 L	0.001 L	0.005 L
Cadmium	0.005	**0.005 L**	**0.005 L**	0.005 L	0.005 L	0.005 L	0.005 L	0.005 L	0.005 L	0.005 L	0.005 L
Chromium	0.005	**0.011**	0.005 L	0.005 L	0.005 L	**0.011**	0.005	0.005 L	0.005 L	0.005 L	0.005 L
Cobalt	0.010	**0.010 L**	**0.010 L**	0.010 L	0.010 L	0.004	0.010 L	0.010 L	0.010 L	0.010 L	0.010 L
Copper	0.010	**0.063**	0.010 L	0.010 L	0.010 L	**0.063**	0.010 L	0.010 L	0.010 L	0.010 L	0.010 L
Lead	0.002	**0.042**	0.002 L	0.002 L	0.002 L	**0.042**	0.002 L	0.002 L	0.002 L	0.002 L	0.002 L
Nickel	0.020	**0.020 L**	**0.020 L**	0.020 L	0.020 L	0.020 L	0.020 L	0.020 L	0.020 L	0.020 L	0.020 L
Selenium	0.005	**0.005 L**	**0.005 L**	0.005 L	0.005 L	0.005 L	0.005 L	0.005 L	0.005 L	0.005 L	0.005 L
Silver	0.010	**0.010 L**	**0.010 L**	0.010 L	0.010 L	0.010 L	0.010 L	0.010 L	0.010 L	0.010 L	0.010 L
Thallium	0.005	**0.005 L**	**0.005 L**	0.005 L	0.005 L	0.005 L	0.005 L	0.005 L	0.005 L	0.005 L	0.005 L
Vanadium	0.010	**0.016**	0.010 L	0.010 L	0.010 L	0.014	0.010 L	0.010 L	0.010 L	**0.016**	0.010 L
Zinc	0.01	**0.290**	0.032	0.010 L	0.010 L	**0.290**	0.010	0.010 L	0.010 L	0.043	0.011
Nitrate as Nitrogen	0.50	**6.40**	0.500 L	0.500 L	0.500 L	0.500 L	0.500 L	0.500 L	0.500 L	0.500 L	**6.40**

Notes:

Prediction Limits are shown in bold.

Prediction Limits for metals are for total metals.

L = not reported at or above the MRL (Method Reporting Limit).

mg/L = milligrams per liter.

Statistical Summary of Total Metals Groundwater Data
Appendix I Parameters, Third Quarter 2018
LRI Landfill, Pierce County, Washington

Location ID	Antimony (Sb)		Arsenic (As)		Barium (Ba)		Beryllium (Be)		Cadmium (Cd)		Chromium (Cr)		Cobalt (Co)		Copper (Cu)		Lead (Pb)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		Thallium (Tl)		Vanadium (V)		Zinc (Zn)		Nitrate (NO_3)	
Monitoring Date	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-1																																
3/24/2014	0.002	L 0.001	0.005	L 0.0025	0.022	0.022	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.001	0.01	L 0.005	0.002	L 0.001	0.001	L 0.0005	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
6/24/2014	0.002	L 0.001	0.005	L 0.0025	0.02	0.02	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.001	0.01	L 0.005	0.002	L 0.001	0.001	L 0.0005	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
9/17/2014	0.05	L 0.025	0.005	L 0.0025	0.024	0.024	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.02	0.02	0.5	L 0.25
12/16/2014	0.05	L 0.025	0.005	L 0.0025	0.03	0.03	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.032	0.032	0.5	L 0.25
3/23/2015	0.05	L 0.025	0.005	L 0.0025	0.02	0.02	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
6/8/2015	0.05	L 0.025	0.005	L 0.0025	0.022	0.022	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
9/16/2015	0.05	L 0.025	0.005	L 0.0025	0.021	0.021	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
12/14/2015	0.05	L 0.025	0.005	L 0.0025	0.024	0.024	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
Number Analyzed	8		8		8		8		8		8		8		8		8		8		8		8		8		8		8		8	
Number Detected	0		0		8		0		0		0		0		0		0		0		0		0		0		0		2		0	
Minimum Concentration		0.001		0.0025		0.02		0.0005		0.0005		0.001		0.0005		0.001		0.0005		0.001		0.0025		0.0025		0.0005		0.0025		0.005		0.25
Maximum Concentration		0.025		0.0025		0.03		0.0025		0.0025		0.0025		0.005		0.005		0.001		0.01		0.0025		0.005		0.0025		0.005		0.032		0.25
Average Concentration		NC		NC		0.022875		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Variance		NC		NC		1.07E-05		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Deviation		NC		NC		0.003271		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Coefficient of Variation (%)		NC		NC		14.29744		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Error		NC		NC		0.001156		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
MW-2																																
3/24/2014	0.002	L 0.001	0.005	L 0.0025	0.014	0.014	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.001	0.01	L 0.005	0.002	L 0.001	0.001	L 0.0005	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
6/26/2014	0.002	L 0.001	0.005	L 0.0025	0.015	0.015	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.001	0.01	L 0.005	0.002	L 0.001	0.001	L 0.0005	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
9/16/2014	0.05	L 0.025	0.005	L 0.0025	0.018	0.018	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
12/16/2014	0.05	L 0.025	0.005	L 0.0025	0.014	0.014	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
3/23/2015	0.05	L 0.025	0.005	L 0.0025	0.012	0.012	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
6/8/2015	0.05	L 0.025	0.005	L 0.0025	0.013	0.013	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
9/16/2015	0.05	L 0.025	0.005	L 0.0025	0.013	0.013	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
12/14/2015	0.05	L 0.025	0.005	L 0.0025	0.014	0.014	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
Number Analyzed	8		8		8		8		8		8		8		8		8		8		8		8		8		8		8		8	
Number Detected	0		0		8		0		0		0		0		0		0		0		0		0		0		0		0		0	
Minimum Concentration		0.001		0.0025		0.012		0.0005		0.0005		0.001		0.0005		0.001		0.0005		0.001		0.0025		0.0025		0.0005		0.0025		0.005		0.25
Maximum Concentration		0.025		0.0025		0.018		0.0025		0.0025		0.0025		0.005		0.005		0.001		0.01		0.0025		0.005		0.0025		0.005		0.005		0.25
Average Concentration		NC		NC		0.014125		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Variance		NC		NC		3.27E-06		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Deviation		NC		NC		0.001808		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Coefficient of Variation (%)		NC		NC		12.79803		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Error		NC		NC		0.000639		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
MW-3																																
3/26/2014	0.002	L 0.001	0.005	L 0.0025	0.014	0.014	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.001	0.01	L 0.005	0.002	L 0.001	0.001	L 0.0005	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
6/25/2014	0.002	L 0.001	0.005	L 0.0025	0.011	0.011	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.001	0.01	L 0.005	0.002	L 0.001	0.001	L 0.0005	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
9/17/2014	0.05	L 0.025	0.005	L 0.0025	0.01	0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
12/16/2014	0.05	L 0.025	0.005	L 0.0025	0.012	0.012	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
3/26/2015	0.05	L 0.025	0.005	L 0.0025	0.013	0.013	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
6/9/2015	0.05	L 0.025	0.005	L 0.0025	0.011	0.011	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
9/16/2015	0.05	L 0.025	0.005	L 0.0025	0.01	0.01	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
12/14/2015	0.05	L 0.025	0.005	L 0.0025	0.015	0.015	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
Number Analyzed	8		8		8		8		8		8		8		8		8		8		8		8		8		8		8		8	
Number Detected	0		0		8		0		0		0		0		0		0		0		0		0		0		0		0		0	
Minimum Concentration		0.001		0.0025		0.01		0.0005		0.0005		0.001		0.0005		0.001		0.0005		0.001		0.0025		0.0025		0.0005		0.0025		0.005		0.25
Maximum Concentration		0.025		0.0025		0.015		0.0025		0.0025		0.0025		0.005		0.005		0.001		0.01		0.0025		0.005		0.0025		0.005		0.005		0.25
Average Concentration		NC		NC		0.012		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Variance		NC		NC		3.43E-06		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Deviation		NC		NC		0.001852		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Coefficient of Variation (%)		NC		NC		15.43033		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Error		NC		NC		0.000655		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC

Statistical Summary of Total Metals Groundwater Data
Appendix I Parameters, Third Quarter 2018
LRI Landfill, Pierce County, Washington

Location ID	Antimony (Sb)		Arsenic (As)		Barium (Ba)		Beryllium (Be)		Cadmium (Cd)		Chromium (Cr)		Cobalt (Co)		Copper (Cu)		Lead (Pb)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		Thallium (Tl)		Vanadium (V)		Zinc (Zn)		Nitrate (NO_3)	
Monitoring Date	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-4																																
3/24/2014	0.002	L 0.001	0.0074	0.0074	0.012	0.012	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.001	0.01	L 0.005	0.002	L 0.001	0.001	L 0.0005	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
6/25/2014	0.002	L 0.001	0.0086	0.0086	0.012	0.012	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.001	0.01	L 0.005	0.002	L 0.001	0.001	L 0.0005	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
9/17/2014	0.05	L 0.025	0.0099	0.0099	0.013	0.013	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
12/16/2014	0.05	L 0.025	0.0076	0.0076	0.011	0.011	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
3/24/2015	0.05	L 0.025	0.0079	0.0079	0.013	0.013	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
6/9/2015	0.05	L 0.025	0.0094	0.0094	0.013	0.013	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
9/18/2015	0.05	L 0.025	0.0094	0.0094	0.017	0.017	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.014	0.014	0.5	L 0.25
12/15/2015	0.05	L 0.025	0.011	0.011	0.091	0.091	0.001	L 0.0005	0.001	L 0.0005	0.011	0.011	0.0039	0.0039	0.063	0.063	0.042	0.042	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.014	0.014	0.29	0.29	0.5	L 0.25
Number Analyzed	8		8		8		8		8		8		8		8		8		8		8		8		8		8		8		8	
Number Detected	0		8		8		0		0		1		1		1		1		0		0		0		0		1		2		0	
Minimum Concentration		0.001		0.0074		0.011		0.0005		0.0005		0.001		0.0005		0.001		0.0005		0.001		0.0025		0.0025		0.0005		0.0025		0.005		0.25
Maximum Concentration		0.025		0.011		0.091		0.0025		0.0025		0.011		0.005		0.063		0.042		0.01		0.0025		0.005		0.0025		0.014		0.29		0.25
Average Concentration		NC		0.0089		0.02275		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Variance		NC		1.56E-06		0.000764		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Deviation		NC		0.00125		0.027634		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Coefficient of Variation (%)		NC		14.04655		121.4685		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Error		NC		0.000442		0.00977		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
MW-5																																
3/24/2014	0.002	L 0.001	0.0072	0.0072	0.032	0.032	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.001	0.01	L 0.005	0.002	L 0.001	0.001	L 0.0005	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
6/25/2014	0.002	L 0.001	0.0067	0.0067	0.033	0.033	0.001	L 0.0005	0.005	L 0.0025	0.0036	0.0036	0.01	L 0.005	0.0061	0.0061	0.001	L 0.0005	0.0043	0.0043	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
9/16/2014	0.05	L 0.025	0.0059	0.0059	0.036	0.036	0.005	L 0.0025	0.005	L 0.0025	0.0051	0.0051	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	0.01	0.5	L 0.25
12/16/2014	0.05	L 0.025	0.0055	0.0055	0.022	0.022	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
3/23/2015	0.05	L 0.025	0.008	0.008	0.03	0.03	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
6/8/2015	0.05	L 0.025	0.0075	0.0075	0.02	0.02	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
9/18/2015	0.05	L 0.025	0.005	L 0.0025	0.014	0.014	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
12/14/2015	0.05	L 0.025	0.0072	0.0072	0.021	0.021	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
Number Analyzed	8		8		8		8		8		8		8		8		8		8		8		8		8		8		8		8	
Number Detected	0		7		8		0		0		2		0		1		0		1		0		0		0		0		1		0	
Minimum Concentration		0.001		0.0025		0.014		0.0005		0.0005		0.001		0.0005		0.001		0.0005		0.001		0.0025		0.0025		0.0005		0.0025		0.005		0.25
Maximum Concentration		0.025		0.008		0.036		0.0025		0.0025		0.0051		0.005		0.0061		0.001		0.01		0.0025		0.005		0.0025		0.005		0.01		0.25
Average Concentration		NC		0.006313		0.026		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Variance		NC		3.05E-06		6.03E-05		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Deviation		NC		0.001746		0.007764		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Coefficient of Variation (%)		NC		27.66533		29.86303		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Error		NC		0.000617		0.002745		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
MW-6																																
3/26/2014	0.002	L 0.001	0.0075	0.0075	0.014	0.014	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.001	0.01	L 0.005	0.002	L 0.001	0.001	L 0.0005	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
6/25/2014	0.002	L 0.001	0.0065	0.0065	0.011	0.011	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.001	0.01	L 0.005	0.002	L 0.001	0.001	L 0.0005	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
9/18/2014	0.002	L 0.001	0.0078	0.0078	0.01	0.01	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.001	0.01	L 0.005	0.002	L 0.001	0.001	L 0.0005	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005	0.5	L 0.25
12/17/2014	0.05	L 0.025	0.0068	0.0068	0.012	0.012	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
3/26/2015	0.05	L 0.025	0.0068	0.0068	0.01	0.01	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
6/8/2015	0.05	L 0.025	0.0075	0.0075	0.01	0.01	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
9/17/2015	0.05	L 0.025	0.0069	0.0069	0.011	0.011	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
12/14/2015	0.05	L 0.025	0.0074	0.0074	0.011	0.011	0.001	L 0.0005	0.001	L 0.0005	0.005	L 0.0025	0.001	L 0.0005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.01	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.5	L 0.25
Number Analyzed	8		8		8		8		8		8		8		8		8		8		8		8		8		8		8		8	
Number Detected	0		8		8		0		0		0		0		0		0		0		0		0		0		0		0		0	
Minimum Concentration		0.001		0.0065		0.01		0.0005		0.0005		0.001		0.0005		0.001		0.0005		0.001		0.0025		0.0025		0.0005		0.0025		0.005		0.25
Maximum Concentration		0.025		0.0078		0.014		0.0005		0.0025		0.0025		0.005		0.005		0.001		0.01		0.0025		0.005		0.0025		0.005		0.005		0.25
Average Concentration		NC		0.00715		0.011125		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Variance		NC		2.09E-07		1.84E-06		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Deviation		NC		0.000457		0.001356		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Coefficient of Variation (%)		NC		6.38736		12.19059		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Error		NC		0.000161		0.000479		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC

Statistical Summary of Total Metals Groundwater Data
Appendix I Parameters, Third Quarter 2018
LRI Landfill, Pierce County, Washington

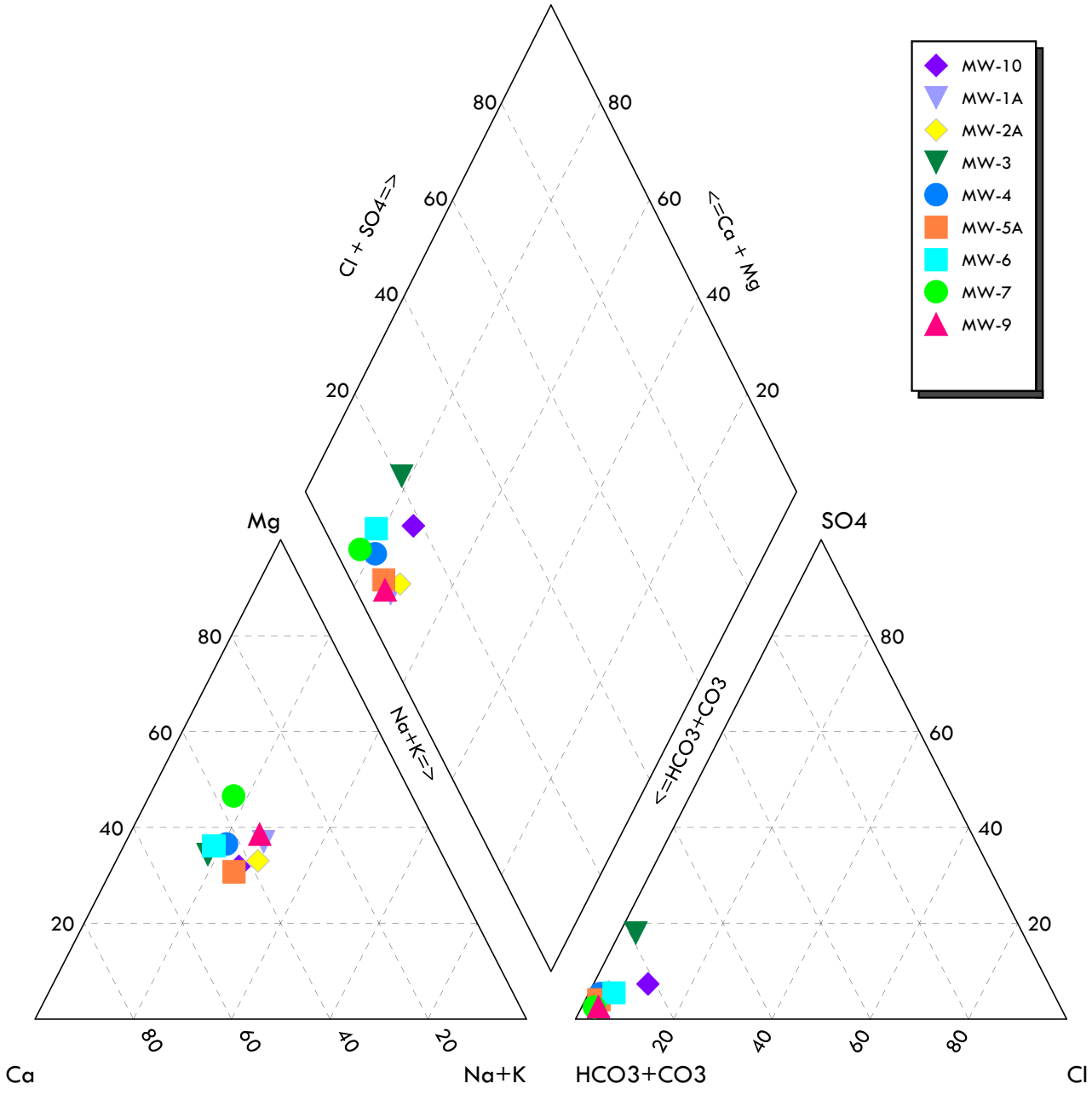
Location ID	Antimony (Sb)		Arsenic (As)		Barium (Ba)		Beryllium (Be)		Cadmium (Cd)		Chromium (Cr)		Cobalt (Co)		Copper (Cu)		Lead (Pb)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		Thallium (Tl)		Vanadium (V)		Zinc (Zn)		Nitrate (NO_3)	
Monitoring Date	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-7																																
3/26/2014	0.002 L	0.001	0.0054	0.0054	0.016	0.016	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.001	0.01 L	0.005	0.002 L	0.001	0.001 L	0.0005	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.01 L	0.005	0.5 L	0.25
6/26/2014	0.002 L	0.001	0.0053	0.0053	0.016	0.016	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.001	0.01 L	0.005	0.002 L	0.001	0.001 L	0.0005	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.01 L	0.005	0.5 L	0.25
9/17/2014	0.05 L	0.025	0.0052	0.0052	0.015	0.015	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.5 L	0.25
12/16/2014	0.05 L	0.025	0.005	0.005	0.014	0.014	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.5 L	0.25
3/24/2015	0.05 L	0.025	0.005 L	0.0025	0.015	0.015	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.5 L	0.25
6/9/2015	0.05 L	0.025	0.0054	0.0054	0.015	0.015	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.5 L	0.25
9/17/2015	0.05 L	0.025	0.005 L	0.0025	0.012	0.012	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.5 L	0.25
12/15/2015	0.05 L	0.025	0.0055	0.0055	0.016	0.016	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.5 L	0.25
Number Analyzed	8		8		8		8		8		8		8		8		8		8		8		8		8		8		8		8	
Number Detected	0		6		8		0		0		0		0		0		0		0		0		0		0		0		0		0	
Minimum Concentration		0.001		0.0025		0.012		0.0005		0.0005		0.001		0.0005		0.001		0.0005		0.001		0.0025		0.0025		0.0005		0.0025		0.005		0.25
Maximum Concentration		0.025		0.0055		0.016		0.0025		0.0025		0.0025		0.005		0.005		0.001		0.01		0.0025		0.005		0.0025		0.005		0.005		0.25
Average Concentration		NC		0.0046		0.014875		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Variance		NC		1.7E-06		1.84E-06		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Deviation		NC		0.001305		0.001356		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Coefficient of Variation (%)		NC		28.36817		9.117329		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
Standard Error		NC		0.000461		0.000479		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
MW-9																																
3/25/2014	0.002 L	0.001	0.005 L	0.0025	0.0047	0.0047	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.001	0.01 L	0.005	0.002 L	0.001	0.001 L	0.0005	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.016	0.016	0.01	0.01	0.5 L	0.25
6/24/2014	0.002 L	0.001	0.005 L	0.0025	0.0045	0.0045	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.001	0.01 L	0.005	0.002 L	0.001	0.001 L	0.0005	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.016	0.016	0.01 L	0.005	0.5 L	0.25
9/18/2014	0.002 L	0.001	0.005 L	0.0025	0.0057	0.0057	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.001	0.01 L	0.005	0.002 L	0.001	0.001 L	0.0005	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.014	0.014	0.014	0.014	0.5 L	0.25
12/17/2014	0.05 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.014	0.014	0.01 L	0.005	0.5 L	0.25
3/24/2015	0.05 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.013	0.013	0.01 L	0.005	0.5 L	0.25
6/9/2015	0.05 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.014	0.014	0.01 L	0.005	0.5 L	0.25
9/18/2015	0.05 L	0.025	0.005 L	0.0025	0.005	0.005	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.014	0.014	0.01 L	0.005	0.5 L	0.25
12/16/2015	0.05 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.014	0.014	0.042	0.042	0.5 L	0.25
3/22/2016	0.05 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.014	0.014	0.028	0.028	0.5 L	0.25
6/8/2016	0.05 L	0.025	0.005 L	0.0025	0.005	0.005	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.014	0.014	0.023	0.023	0.5 L	0.25
9/16/2016	0.05 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.015	0.015	0.043	0.043	0.5 L	0.25
12/6/2016	0.05 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.014	0.014	0.01 L	0.005	0.5 L	0.25
3/29/2017	0.05 L	0.025	0.005 L	0.0025	0.0056	0.0056	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.014	0.014	0.01 L	0.005	0.5 L	0.25
6/22/2017	0.05 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.014	0.014	0.01 L	0.005	0.5 L	0.25
9/26/2017	0.05 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.012	0.012	0.01 L	0.005	0.5 L	0.25
12/13/2017	0.05 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.013	0.013	0.01 L	0.005	0.5 L	0.25
3/21/2018	0.05 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.016	0.016	0.01 L	0.005	0.5 L	0.25
6/19/2018	0.05 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.013	0.013	0.01 L	0.005	0.5 L	0.25
9/19/2018	0.05 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.013	0.013	0.01 L	0.005	0.5 L	0.25
Number Analyzed	19		19		19		19		19		19		19		19		19		19		19		19		19		19		19		19	
Number Detected	0		0		6		0		0		0		0		0		0		0		0		0		0		19		6		0	
Minimum Concentration		0.001		0.0025		0.0025		0.0005		0.0005		0.001		0.0005		0.001		0.0005		0.001		0.0025		0.0025		0.0005		0.012		0.005		0.25
Maximum Concentration		0.025		0.0025		0.0057		0.0005		0.0025		0.0025		0.005		0.005		0.001		0.01		0.0025		0.005		0.0025		0.016		0.043		0.25
Average Concentration		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		0.014053		NC		NC
Variance		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		1.16E-06		NC		NC
Standard Deviation		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		0.001079		NC		NC
Coefficient of Variation (%)		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		7.676634		NC		NC
Standard Error		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		0.000247		NC		NC
MW-10																																
3/25/2014	0.002 L	0.001	0.005 L	0.0025	0.014	0.014	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.001	0.01 L	0.005	0.002 L	0.001	0.001 L	0.0005	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.01 L	0.005	6.4	6.4
6/25/2014	0.002 L	0.001	0.005 L	0.0025	0.014	0.014	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.001	0.01 L	0.005	0.002 L	0.001	0.001 L	0.0005	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.01	0.01	5.8	5.8
9/16/2014	0.05 L	0.025	0.005 L	0.0025	0.015	0.015	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.011	0.011	5.4	5.4
12/17/2014	0.05 L	0.025	0.005 L	0.0025	0.013	0.013	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	5.3	5.3
3/25/2015	0.05 L	0.025	0.005 L	0.0025	0.013	0.013	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	5.9	5.9
6/8/2015	0.05 L	0.025	0.005 L	0.0025	0.014	0.014	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	5.7	5.7
9/15/2015	0.05 L	0.025	0.005 L	0.0025	0.013	0.013	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	5.1	5.1
12/16/2015	0.05 L	0.025	0.005 L	0.0025	0.013	0.013	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	4.9	4.9
3/21/2016	0.05 L	0.025	0.005 L	0.0025	0.013	0.013	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	5.9	5.9
6/6/2016	0.05 L	0.025	0.005 L	0.0025	0.012	0.012	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	5.9	5.9
9/15/2016	0.05 L	0.025	0.005 L	0.0025	0.014	0.014	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	5.4	5.4
12/6/2016	0.05 L	0.025	0.005 L	0.0025	0.013	0.013	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	5.2	5.2
3/29/2017	0.05 L	0.025	0.005 L	0.0025	0.013	0.013	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	5.8	5.8
6/19/2017	0.05 L	0.025	0.005 L	0.0025	0.013	0.013	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	5.5	5.5
9/26/2017	0.05 L	0.025	0.005 L	0.0025	0.012	0.012	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	5.2	5.2
12/12/2017	0.05 L	0.025	0.005 L	0.0025	0.013	0.013	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	4.9	4.9
3/20/2018	0.05 L	0.025	0.005 L	0.0025	0.013	0.013	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	5.3	5.3
6/18/2018	0.05 L	0.025	0.005 L	0.0025	0.013	0.013	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	5.0	5.0
9/18/2018	0.05 L	0.025	0.005 L	0.0025	0.016	0.016	0.001 L	0.0005	0.001 L	0.0005	0.005 L	0.0025	0.001 L	0.0005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.01	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	4.7	4.7
Number Analyzed	19		19		19		19		19		19		19		19		19		19		19		19		19		19		19		19	
Number Detected	0		0		19		0		0		0		0		0		0		0		0		0		0		2		19			
Minimum Concentration		0.001		0.0025		0.012		0.0005		0.0005		0.001		0.0005		0.001		0.0005		0.001		0.0025		0.0025		0.0005		0.0025		0.005		4.7
Maximum Concentration		0.025		0.0025		0.016		0.0025		0.0025		0.0025		0.005		0.005		0.001		0.01		0.0025		0.005		0.0025		0.005		0.011		6.4
Average Concentration		NC		NC		0.013368		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		5.4368421
Variance		NC		NC		9.12E-07		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		0.1935673
Standard Deviation		NC		NC		0.000955		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		0.4399628
Coefficient of Variation (%)		NC		NC		7.144702		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		8.0922487
Standard Error		NC		NC		0.000219		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		0.1009344

Notes: Metals results are for total metals.
mg/L = milligrams per liter.
L = not reported at or above the MRL (Method Reporting Limit).
One-half the MRL value used for statistical calculations when concentrations not reported at or above the MRL.
NC = not calculated due to insufficient number of reported detections.

Appendix E

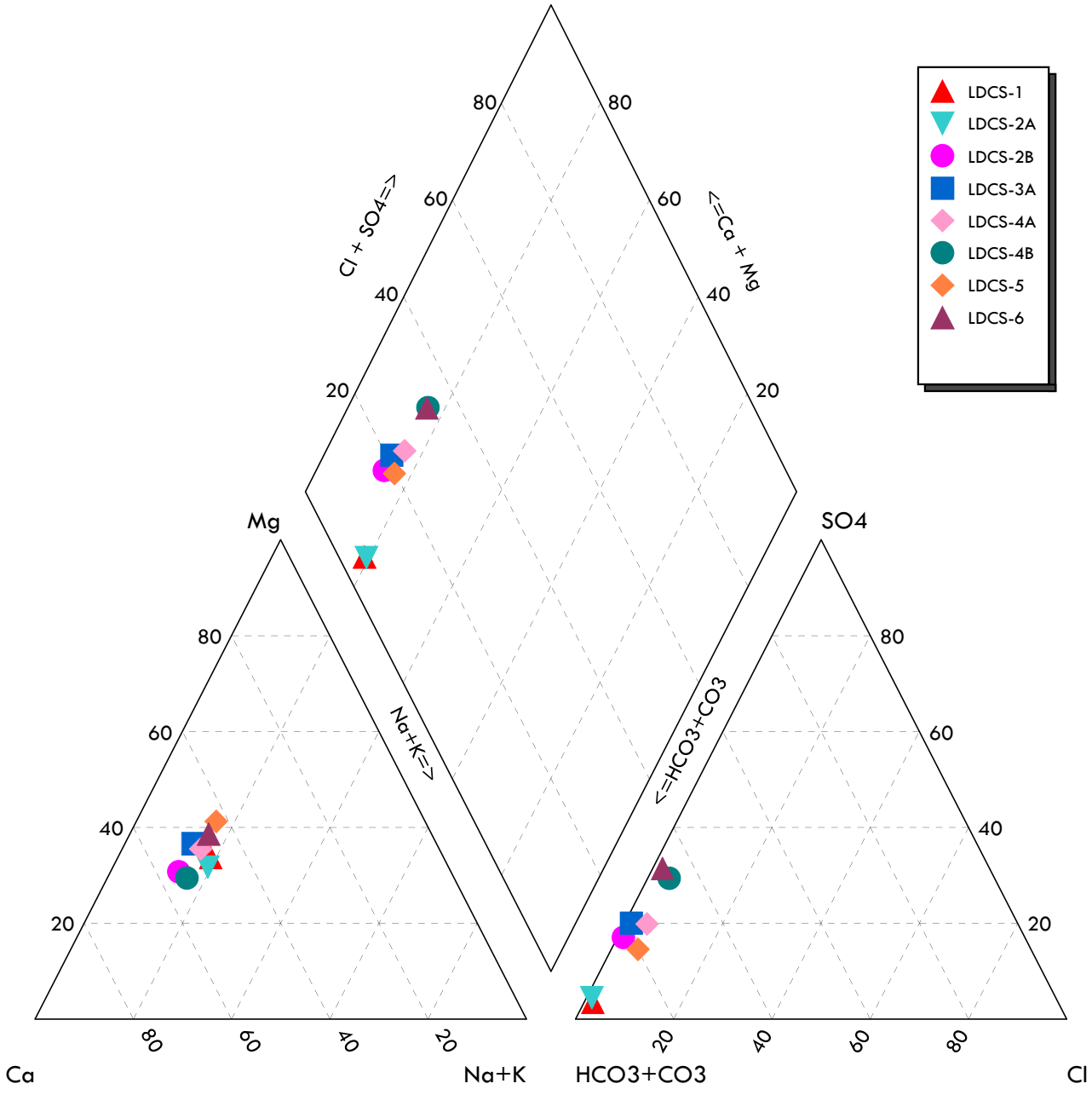
Trilinear Diagrams

LRI Landfill Third Quarter 2018, Groundwater



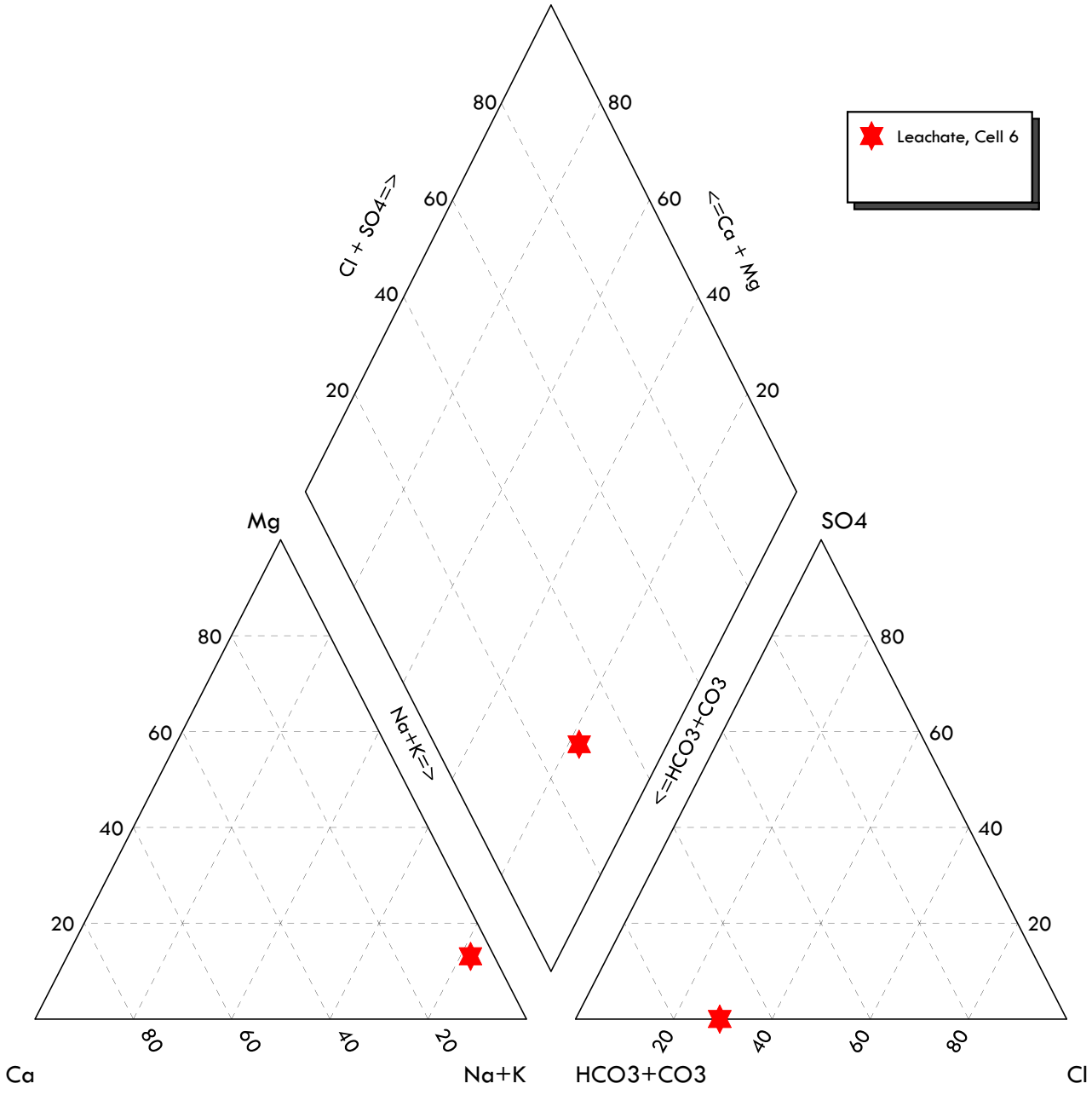
DESCRIPTION: LRILF 3Q18 Groundwater Trilinear Diagram		
	PROJECT: LRI Landfill	PROJECT NO: 04218001.02
	CLIENT: LRI, Inc.	DATE: October 2018

LRI Landfill Third Quarter 2018, Leak Detection Collection Recovery System



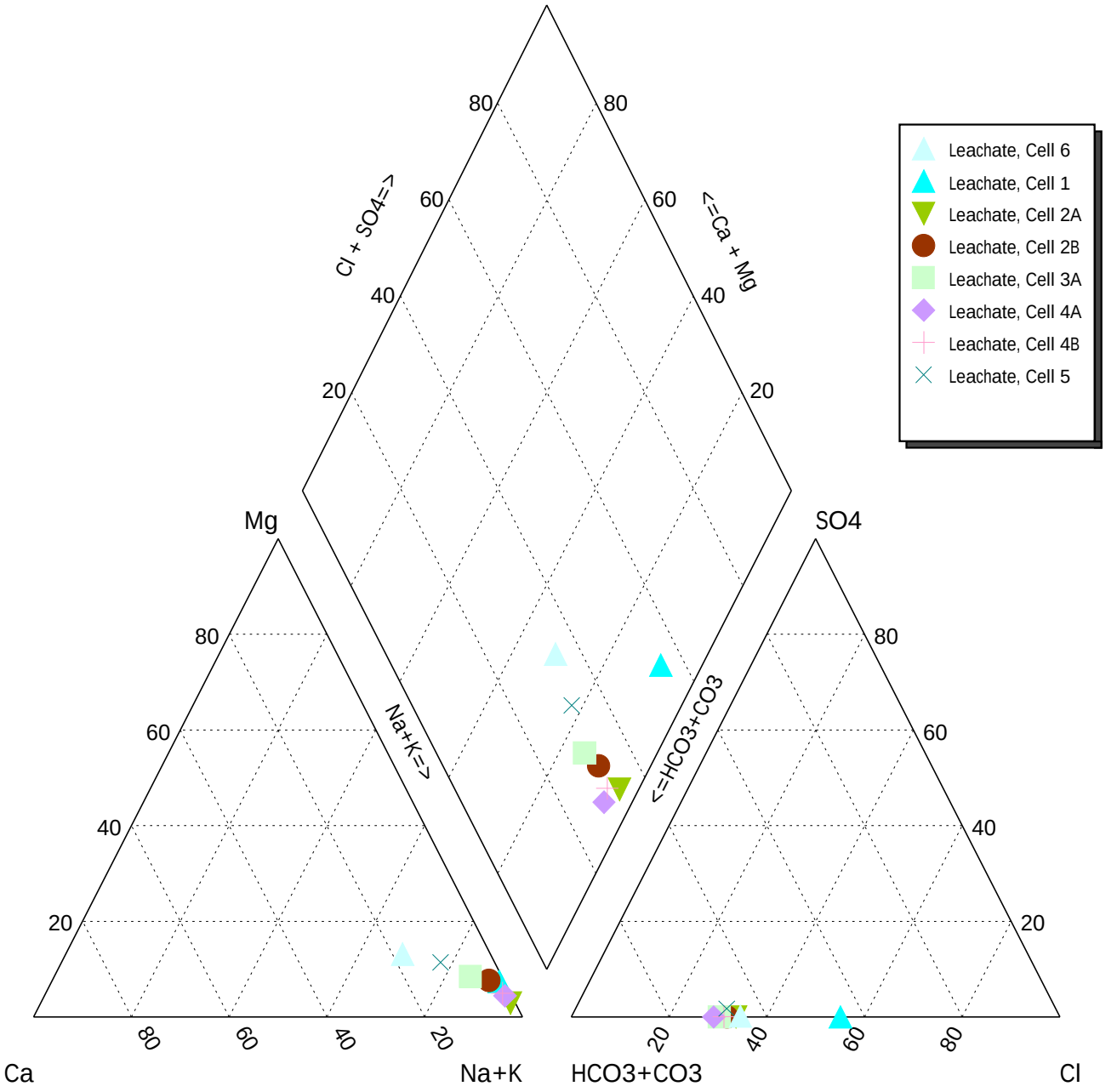
DESCRIPTION: LRILF LDCRS 3Q18 Piper Plot		
	PROJECT: LRI Landfill	PROJECT NO: 04218001.02
	CLIENT: LRI, Inc.	DATE: October 2018

LRI Landfill Third Quarter 2018, Leachate



DESCRIPTION: LRILF 3Q18 Leachate Trilinear Diagram		
	PROJECT: LRI Landfill	PROJECT NO: 04218001.02
	CLIENT: LRI, Inc.	DATE: October 2018

LRI Landfill Fourth Quarter 2017 Leachate



DESCRIPTION: LRILF Leachate Fourth Quarter 2017 Trilinear Diagram		
	PROJECT: LRI Landfill	PROJECT NO: 04218001.02
	CLIENT: LRI, Inc.	DATE: March 2018

Appendix F

Analytical Data Validation Report

THIRD QTR. 2018 DATA VALIDATION REPORT – LRI LANDFILL

Project Details

Project No.	04218001.02	**Site Name**	LRI 304th Street LF
Data Validator	Alexa Deep	**Data Level**	Level 2
Date	10/24/2018	**DV Tier**	Tier 1
QA Document	LRI Landfill Groundwater Monitoring Plan, March 10, 2014		

Sample Login Summary

Sample Group	Sample Login Comments	Analytical Lab (Primary)
280-114420-1	No comments.	TestAmerica, Denver, CO
280-114479-1	No comments.	TestAmerica, Denver, CO
280-114481-1	No comments.	TestAmerica, Denver, CO
280-114611-1	No comments.	TestAmerica, Denver, CO
280-114672-1	The analysis for nitrate method 300.0 was performed outside of the 48-hour hold time on samples "-11", "-12", and "-13" due to a shipping delay. Nitrate-nitrite analysis method 353.2 was added. Client was notified.	TestAmerica, Denver, CO
280-114673-1	No comments.	TestAmerica, Denver, CO
280-114674-1	Sample "-20" arrived with insufficient preservation for metals and TOC analyses. Client was notified. The lab added additional preservative for metals analysis. The lab continued with the analysis for TOC as-is. See case narrative.	TestAmerica, Denver, CO

Analytical Summary

Sample Group	Analyses					
	TDS/Alk/NO3	Metals	NH4/TOC	VOCs	Anions	TSS
280-114420-1	X	X[2]	X	X	X	X
280-114479-1	X	X[2]	X	X	X	X
280-114481-1	X	X[1]	X	X	X	--
280-114611-1	X	X[1]	X	X	X	--
280-114672-1	X	X[2]	X	X	X	X
280-114673-1	X	X[1]	X	X	X	--
280-114674-1	X	X[3]	X	X	X	--

Notes:

1. Dissolved metals analysis performed (field filtered)
2. Dissolved and Total metals analysis performed
3. Total Metals analysis performed

Laboratory Quality Assurance Samples

Lab QA Samples	Results	Comments
Method Blank	Acceptable.	See case narrative (280-114672-1)
LCS/LCSD	Acceptable.	None
MS/MSD	Possible matrix interferences. Data acceptable.	See case narrative (280-114420-1, 280-114479-1, 280-114481-1, 280-114611-1, 280-114672-1, 280-114673-1, 280-114674-1)
Duplicates	Acceptable.	See case narrative (280-114420-1, 280-114479-1, 280-114672-1)
Organics	Acceptable.	See case narrative (280-11474-1)
General Chemistry	Acceptable.	See case narrative (280-11474-1)
General Comments	Acceptable.	See case narrative (280-114420-1, 280-114479-1, 280-114481-1, 280-114611-1, 280-11472-1, 280-114673-1, 280-114674-1)
Metals	Acceptable.	See case narrative (280-114479-1, 280-114481-1, 280-114674-1)

Field Quality Assurance Samples

Field QA Samples	Sample Group	Analytes	Notes
QC-FB	280-114672-1	Alkalinity (6 mg/L) Total Dissolved Solids (23 mg/L) Dissolved Calcium (1.2 mg/L) Dissolved Magnesium (0.38 mg/L) Dissolved Sodium (1.5 mg/L)	
QC-TB	280-114420-1	None.	
QC-TB	280-114611-1	None.	
QC-TB	280-114672-1	None.	
QC-TB	280-114673-1	None.	
QC-TB	280-114674-1	None.	

Lab Quality Flags

Flag	Sample Groups	Comments
J	280-114420-1, 280-114479-1, 280-114481-1, 280-114611-1, 280-114672-1, 280-114673-1, 280-114674-1	Result is <RL, >MDL and concentration is approximate value.
B	280-114672-1	Compound was found in the blank and sample.
F1	280-114420-1, 280-114479-1, 280-114481-1, 280-114611-1, 280-114672-1, 280-114673-1, 280-114674-1	MS and/or MSD recovery exceeds the control limits.
F3	280-114420-1, 280-114672-1	Duplicate RPD exceeds the control limit.
4	280-114420-1, 280-114479-1, 280-114481-1, 280-114611-1, 280-114672-1, 280-114673-1	MD, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration. Therefore the control limits are not applicable.
H	280-114672-1	Sample was prepped or analyzed beyond the specified holding time.
^	280-114479-1, 280-114481-1	ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK, or MRL standard: instrument related QC is outside acceptance limits.
F5	280-114479-1	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times the RL. Data considered valid because the absolute difference is less than the RL.
F2	280-114611-1, 280-114672-1, 280-114673-1, 280-114674-1	MS/MSD RPD exceeds control limits.

Duplicate Evaluation

Analyte	Units	MW-2A (304-091718-02)	MW-2A DUP (304-091718-03)	RPD (%)
Alkalinity, Total	mg/L	120	120	0.0
Barium, Total	mg/L	0.014	0.011	24.0
Calcium, Dissolved	mg/L	19	19	0.0
Chloride	mg/L	3.6	3.5	2.8
Iron, Dissolved	mg/L	0.68	0.7	2.9
Magnesium, Dissolved	mg/L	10	11	9.5
Manganese, Dissolved	mg/L	0.3	0.28	6.9
Potassium, Dissolved	mg/L	2.6	2.6	0.0
Sodium, Dissolved	mg/L	15	15	0.0
Sulfate	mg/L	7.2	7.1	1.4
Total Dissolved Solids	mg/L	170	170	0.0

U = Non-detection. Reporting limit (RL) used for calculation of RPD.

Additional Data Flags

Flag	Description
U	Not detected above the method reporting limit.
B	Compound was found in a laboratory or field blank and the sample.
H	Sample was prepped or analyzed beyond the specified holding time.

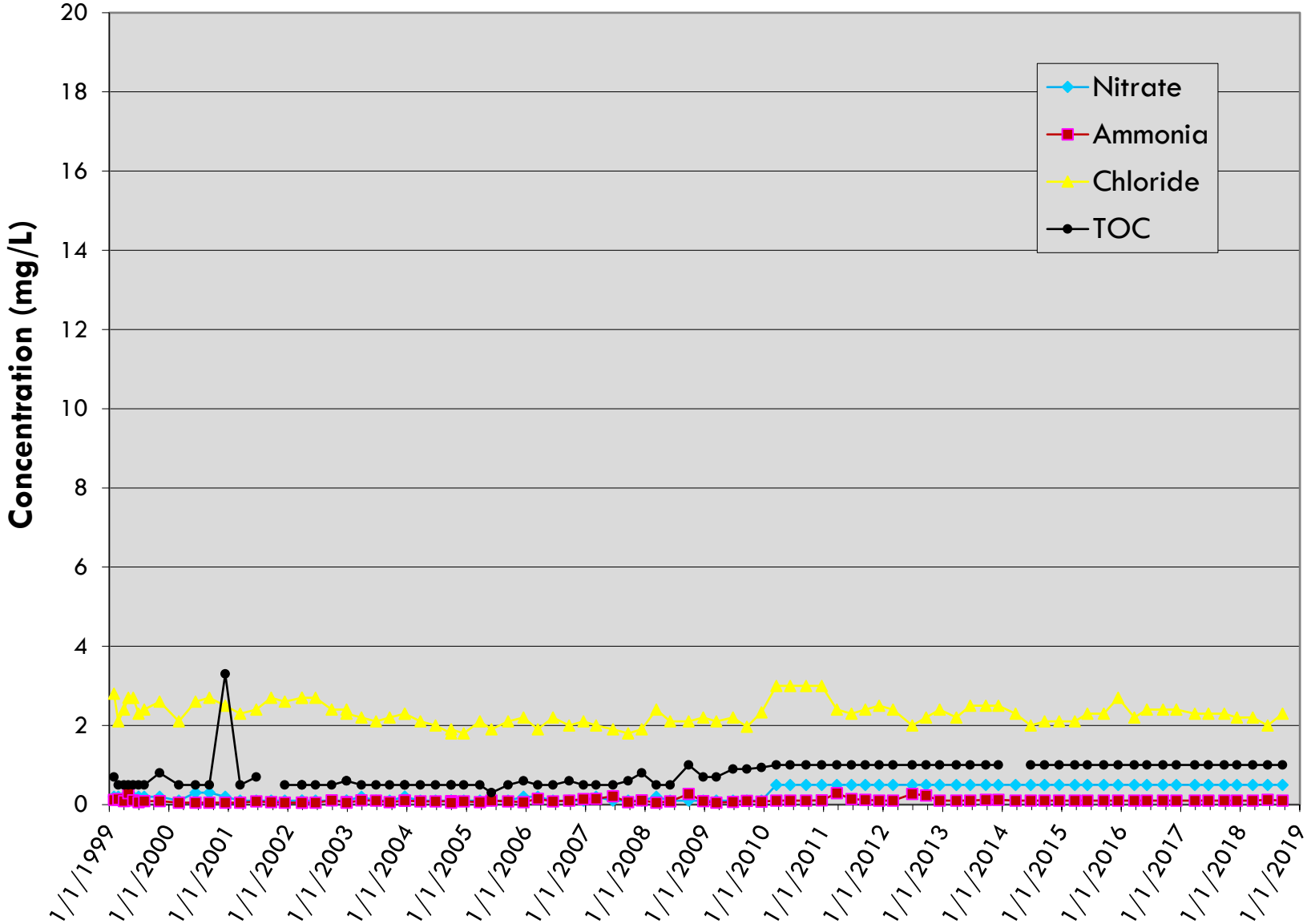
Qualified Data and Usability

Lab qualifiers are noted. All data, as qualified, are acceptable for use.

Appendix G
Groundwater and LDCS Time Trend Plots

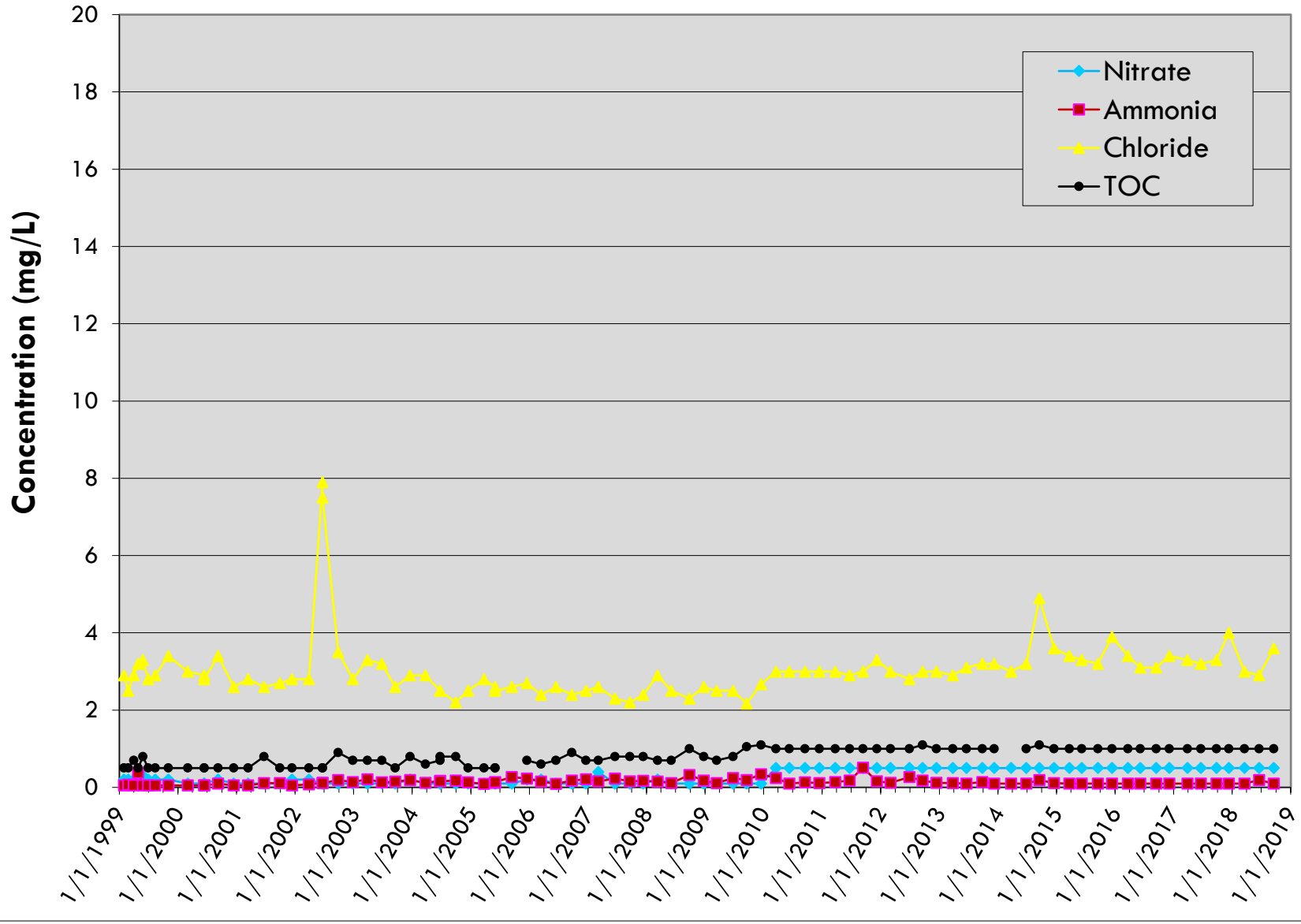
MW-1A

LRI Landfill, Pierce County, Washington



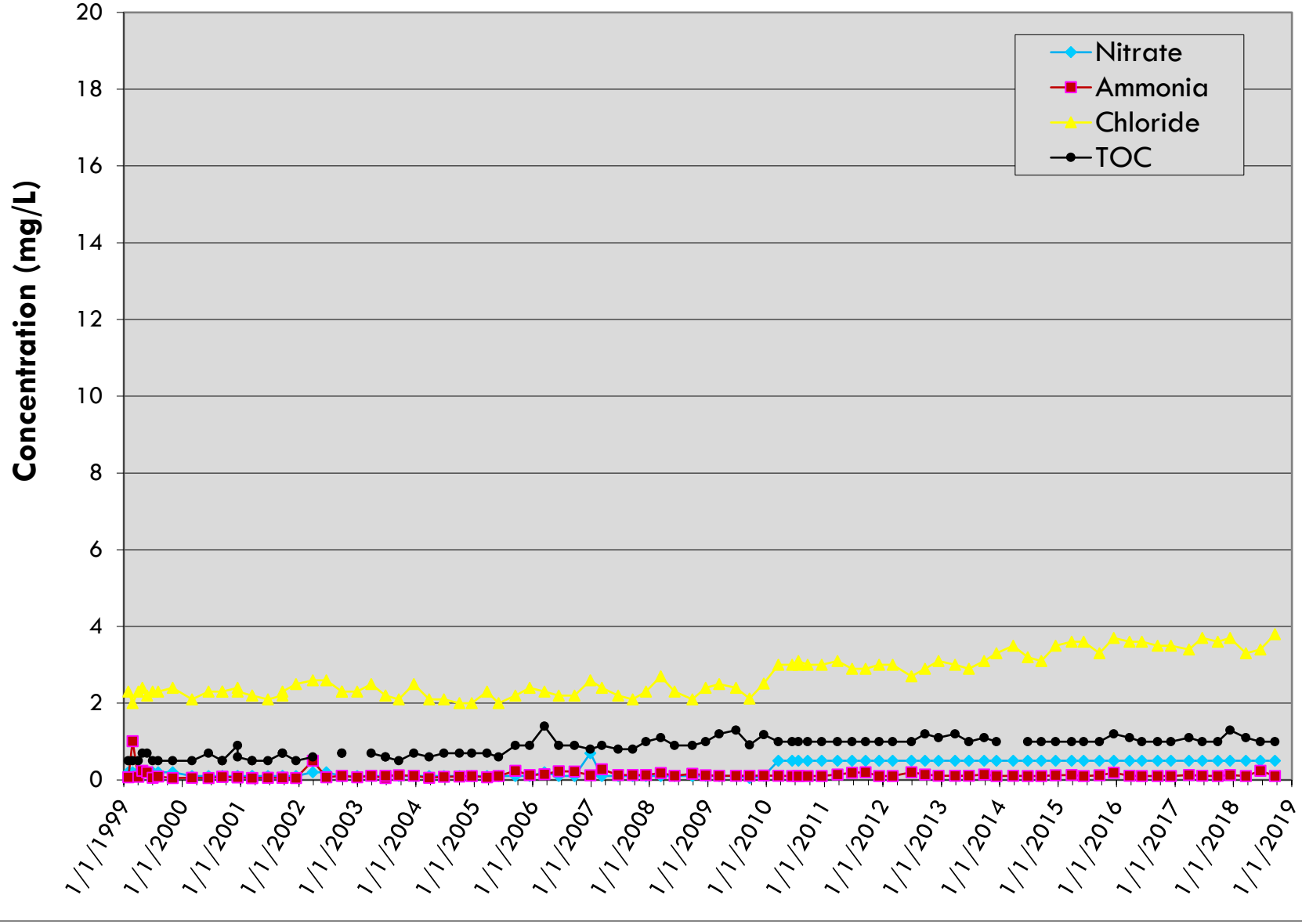
MW-2A

LRI Landfill, Pierce County, Washington



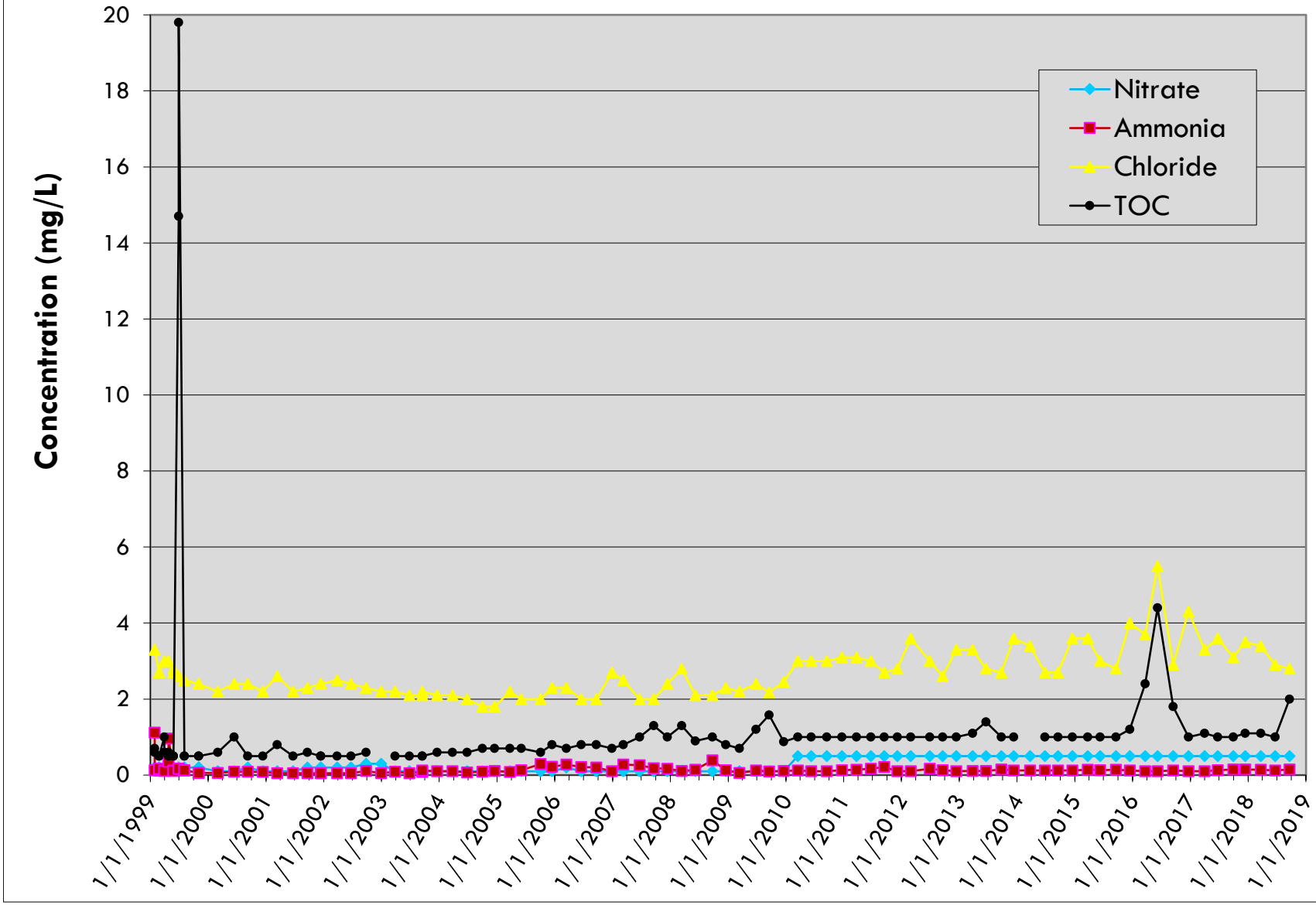
MW-3

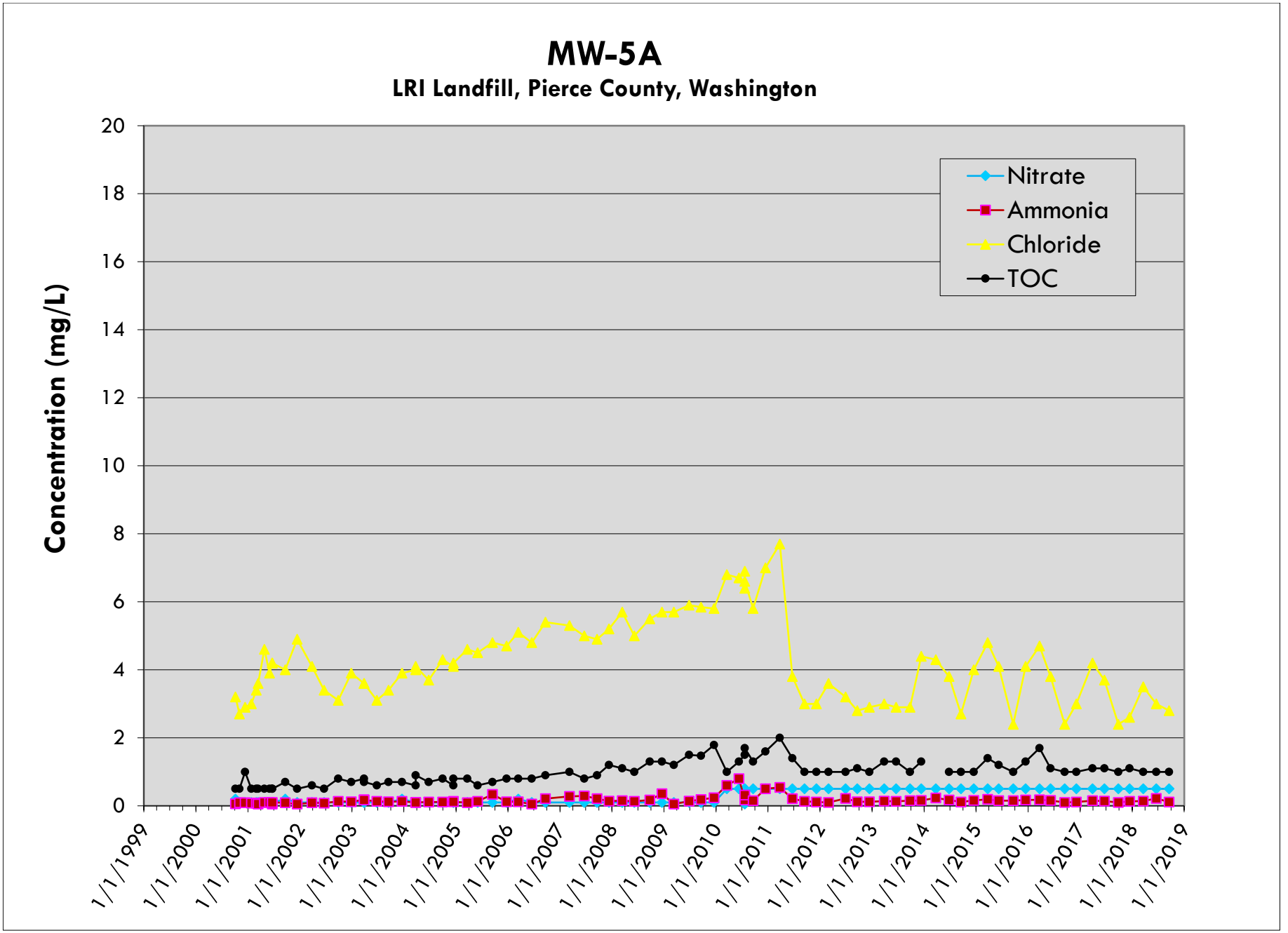
LRI Landfill, Pierce County, Washington



MW-4

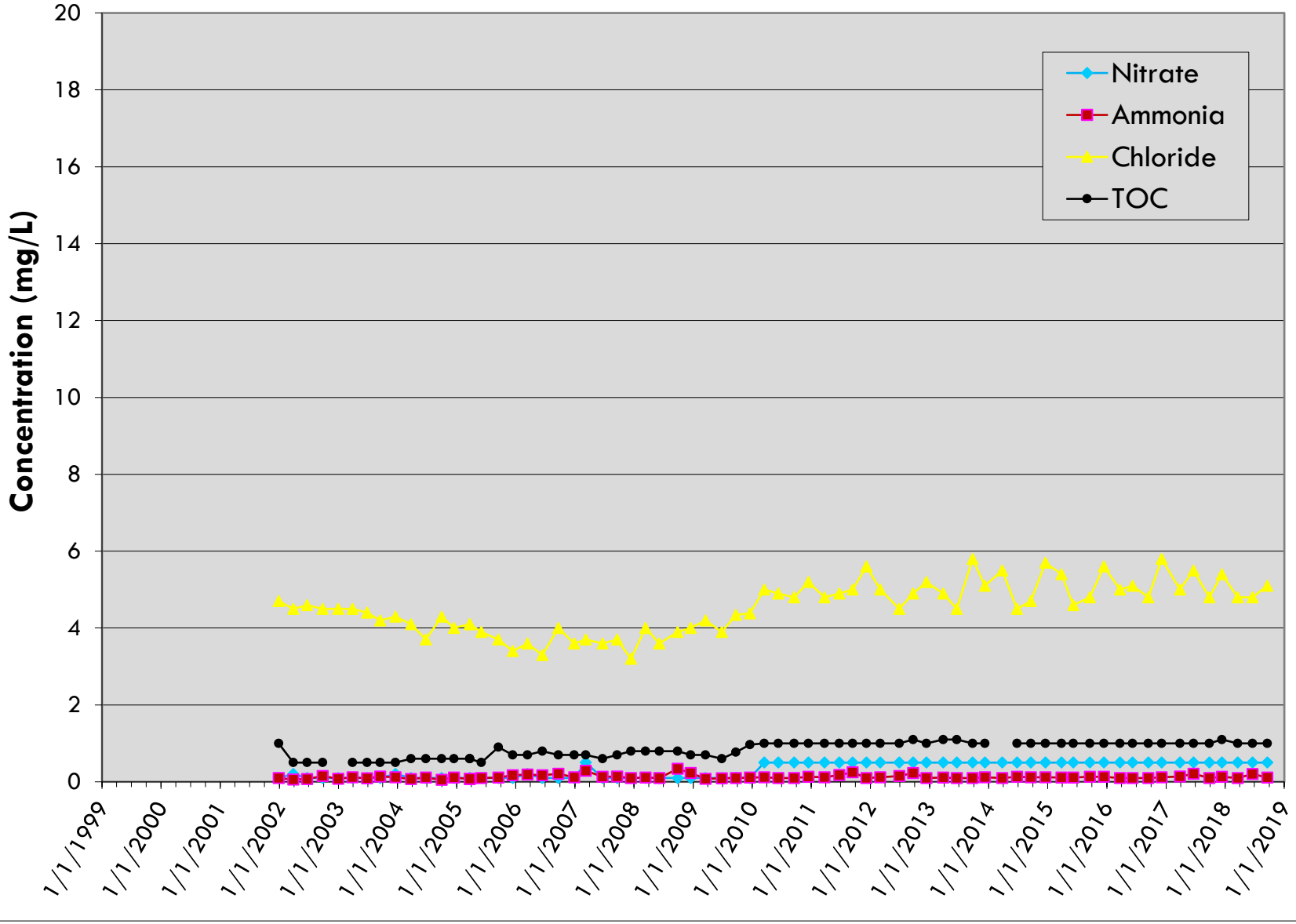
LRI Landfill, Pierce County, Washington




MW-5A
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
Nitrate
Ammonia
Chloride
TOC
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019

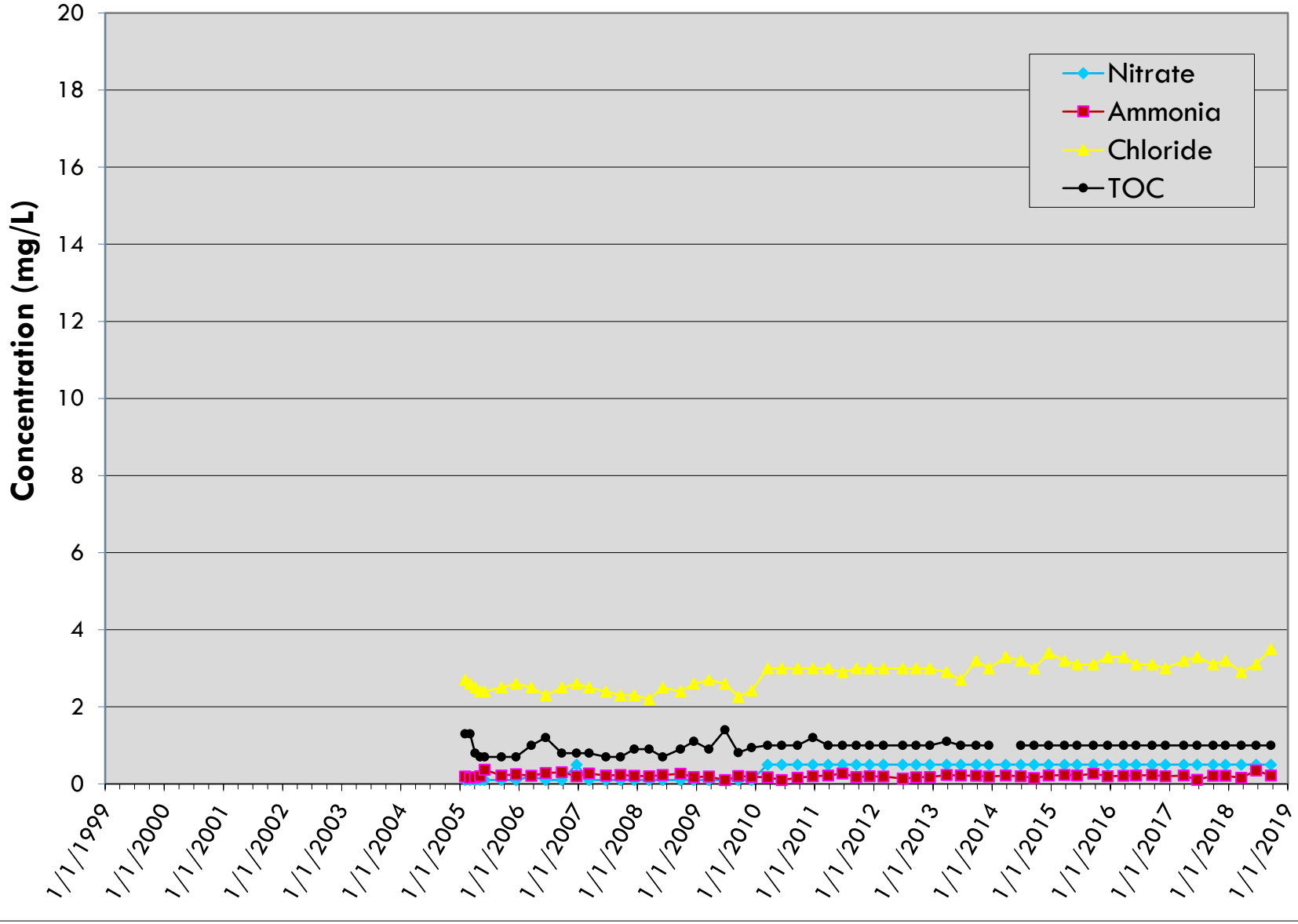
MW-6

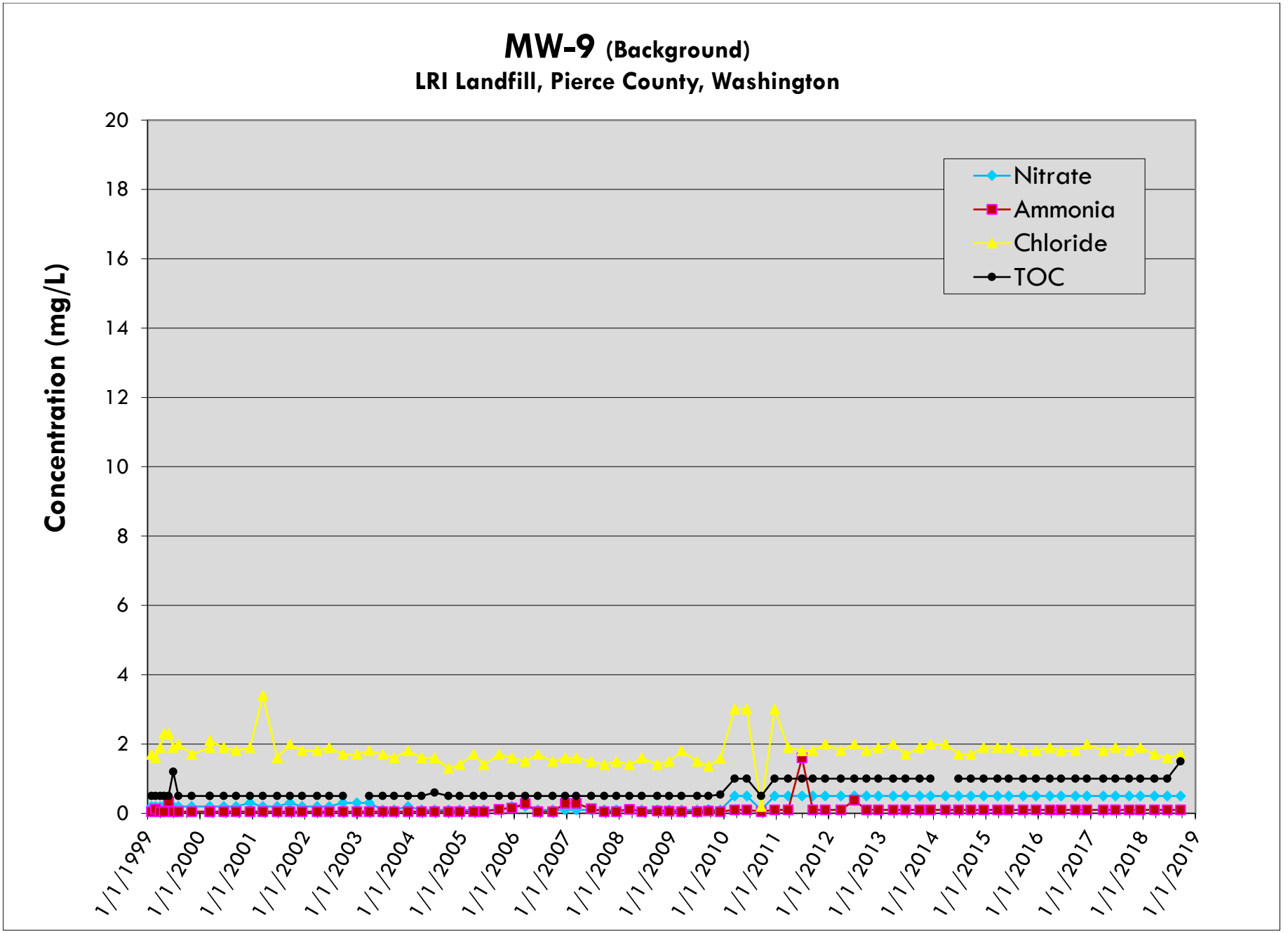
LRI Landfill, Pierce County, Washington

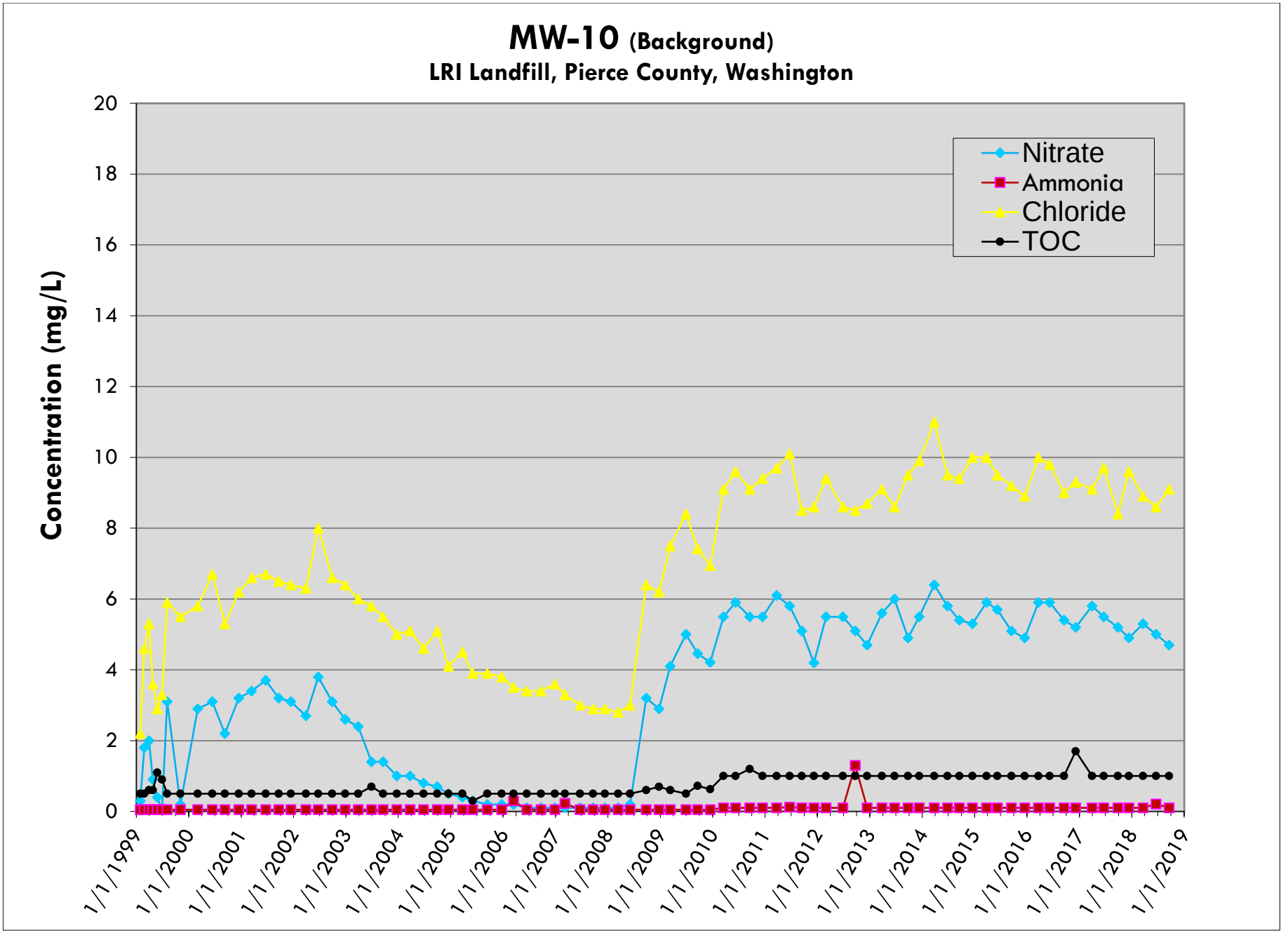


MW-7

LRI Landfill, Pierce County, Washington

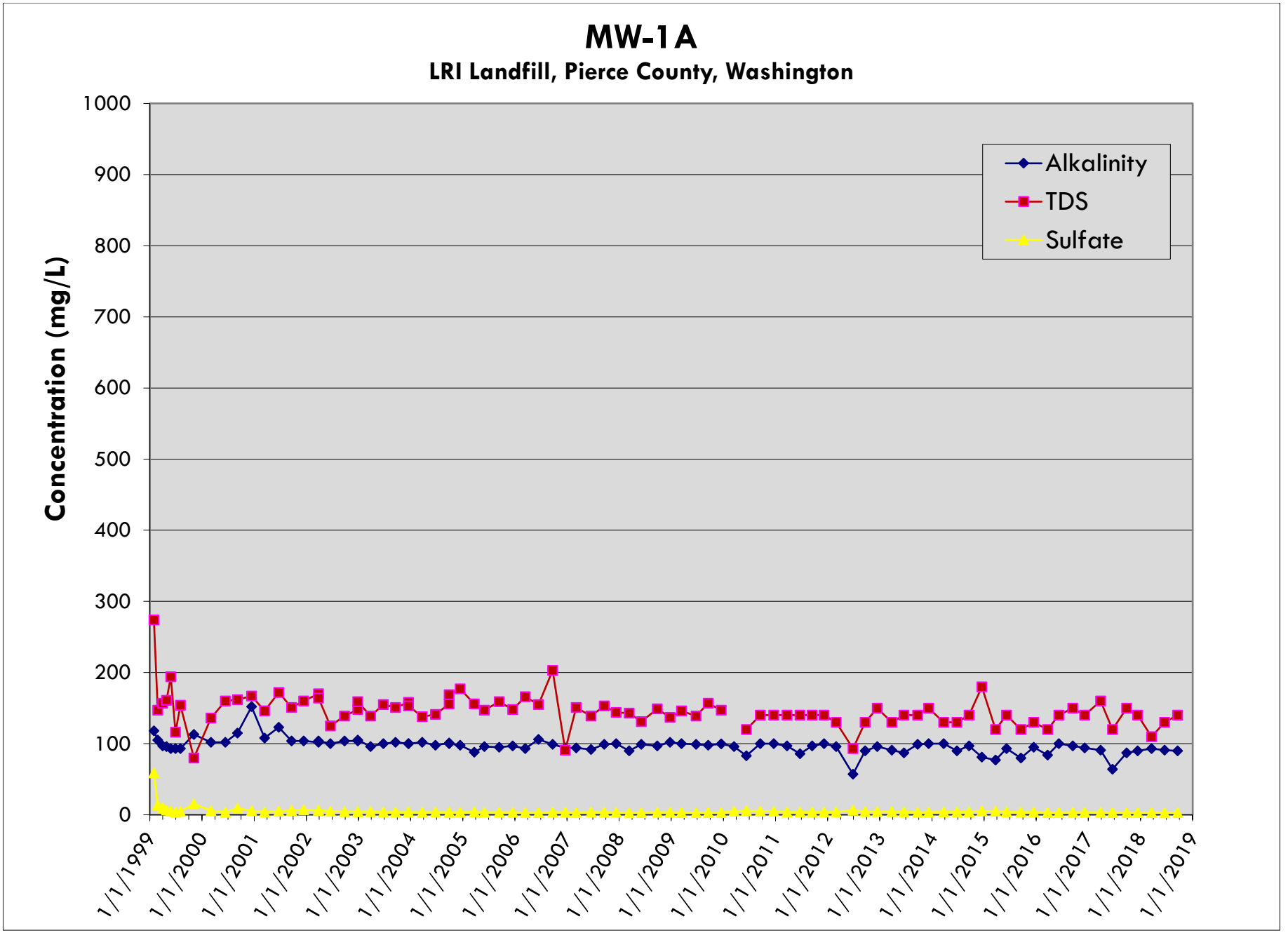


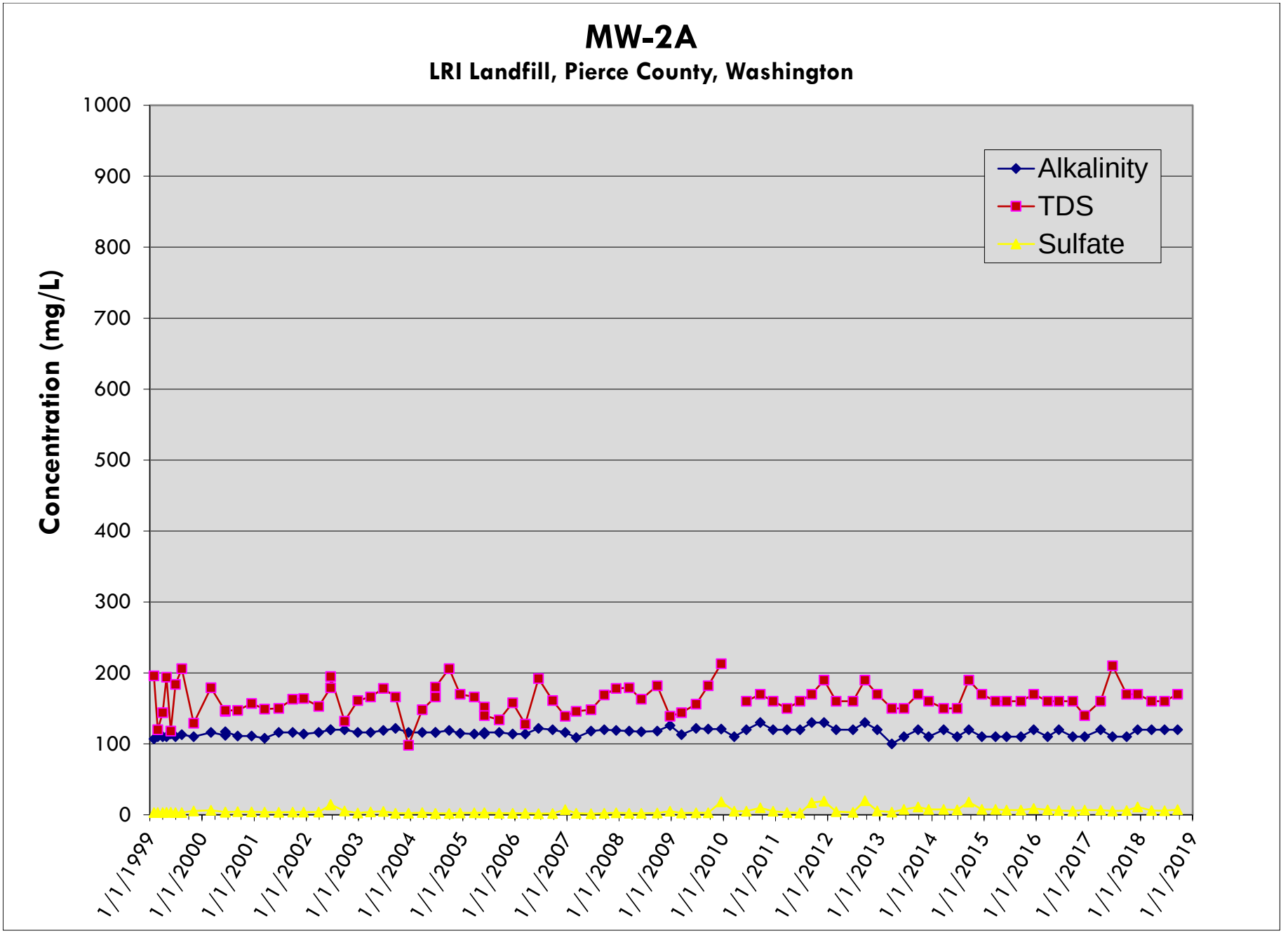

MW-9 (Background)
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019
Nitrate
Ammonia
Chloride
TOC

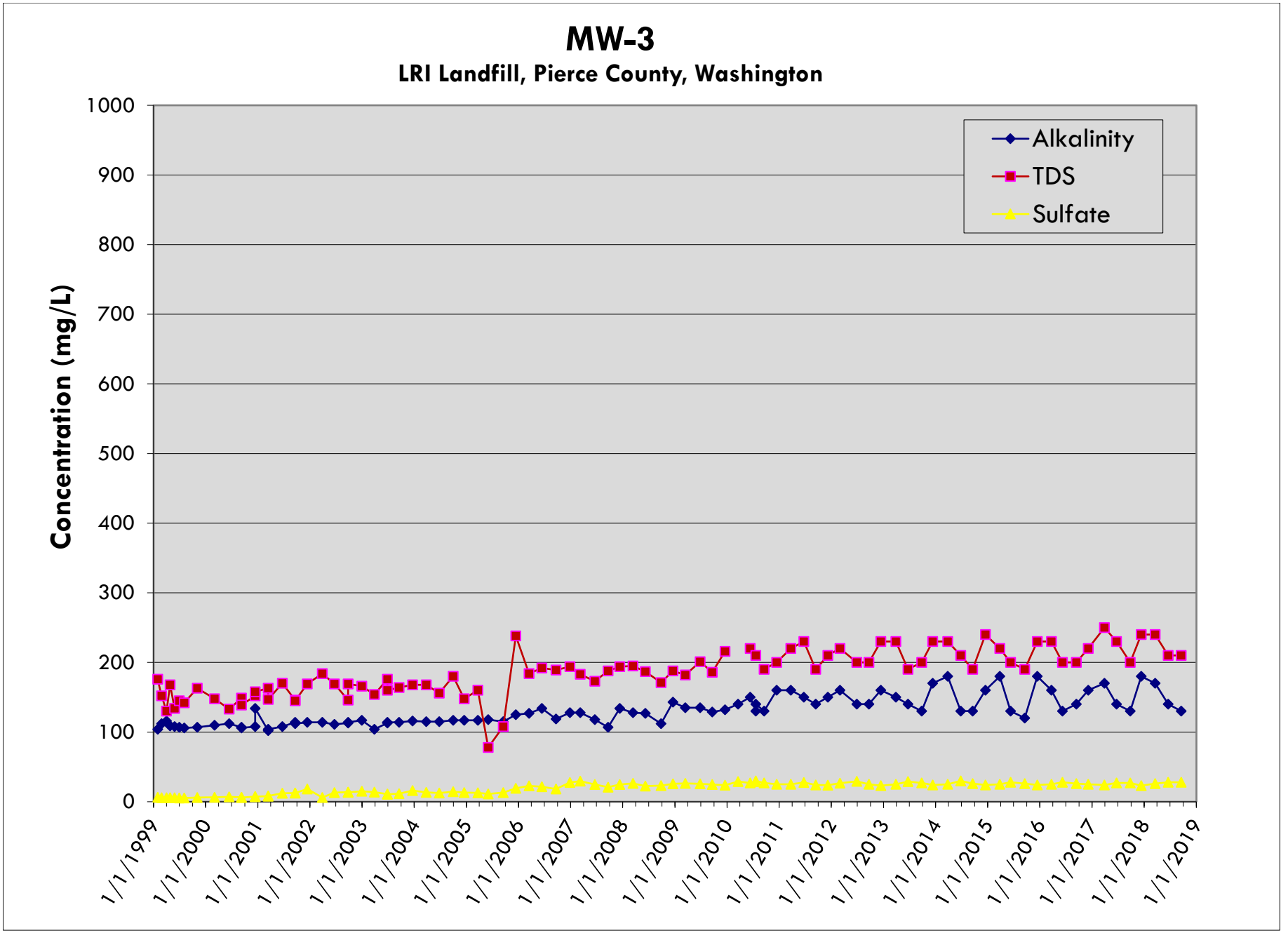

MW-10 (Background)
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
Nitrate
Ammonia
Chloride
TOC
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019

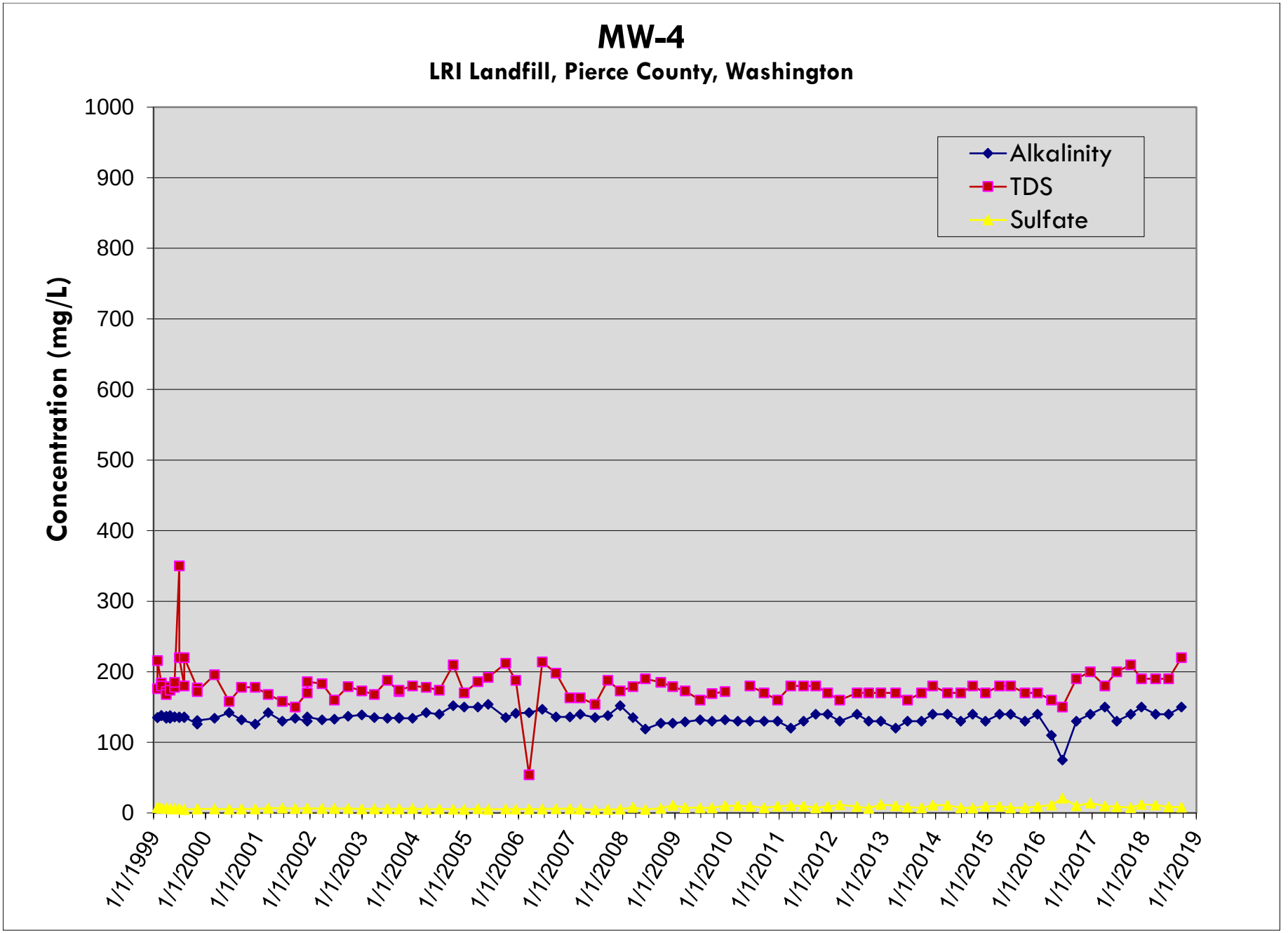
MW-1A

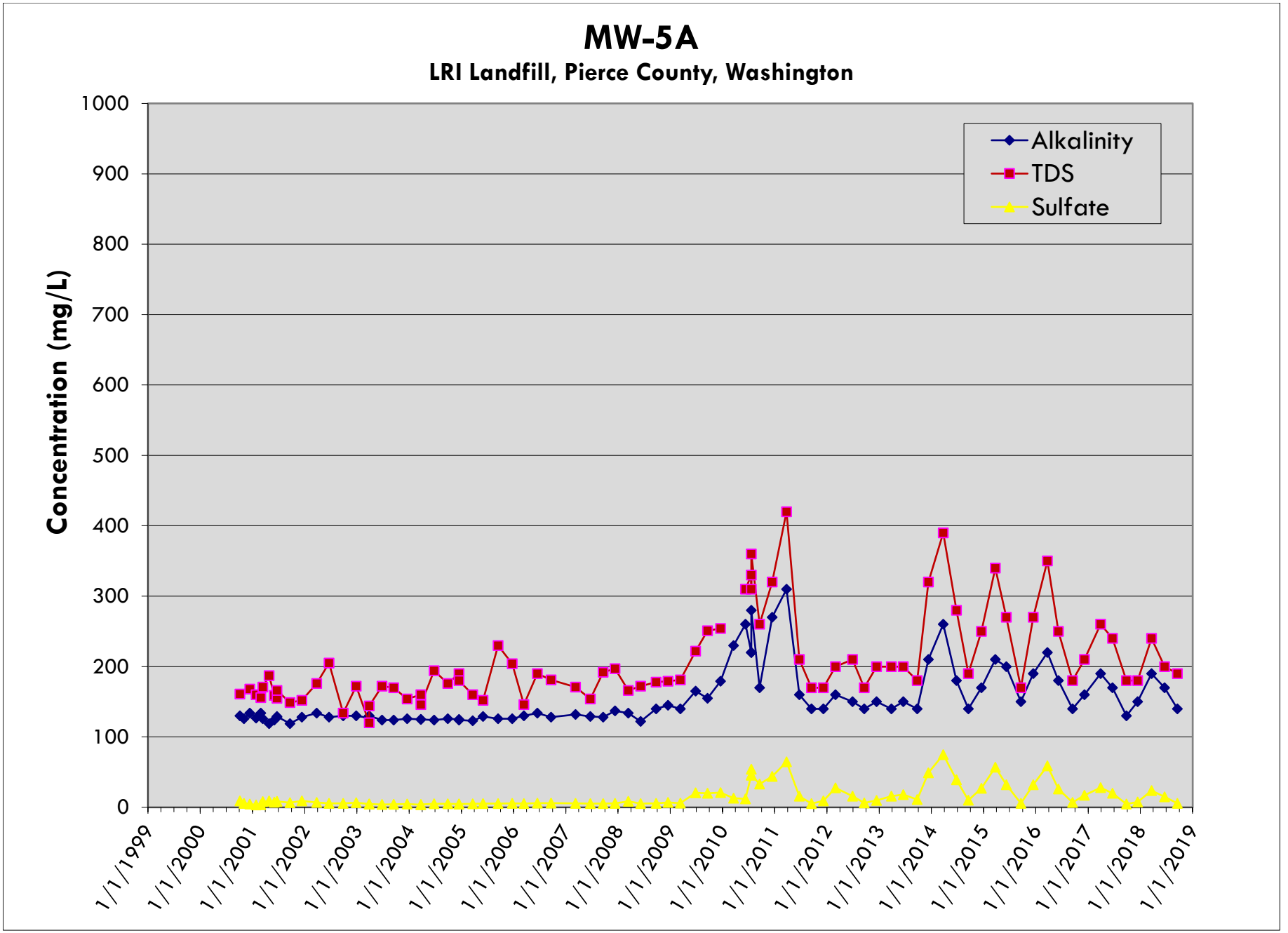
LRI Landfill, Pierce County, Washington




MW-2A
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
Alkalinity
TDS
Sulfate
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019

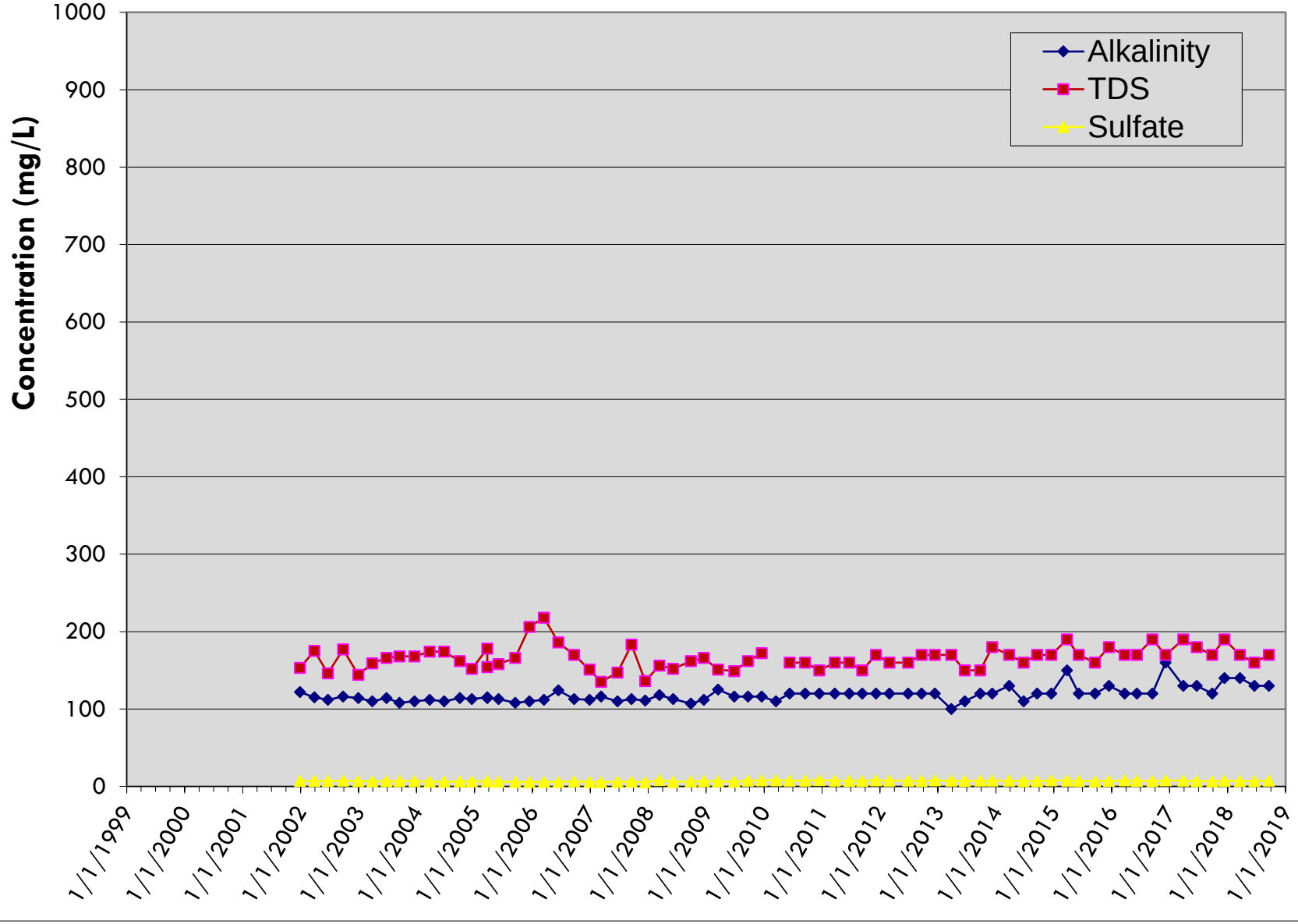

MW-3
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
Alkalinity
TDS
Sulfate
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019

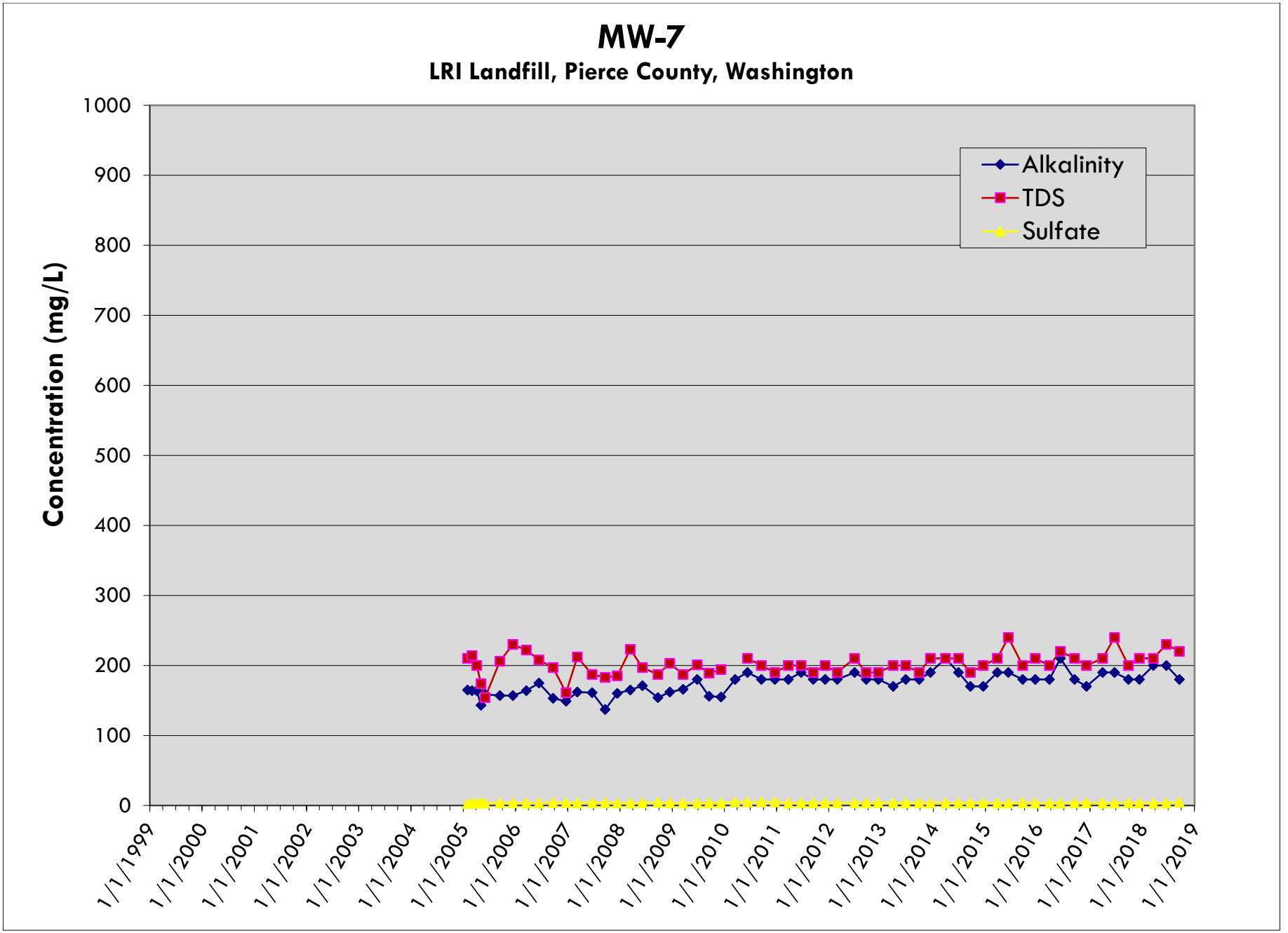

MW-4
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
Alkalinity
TDS
Sulfate
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019

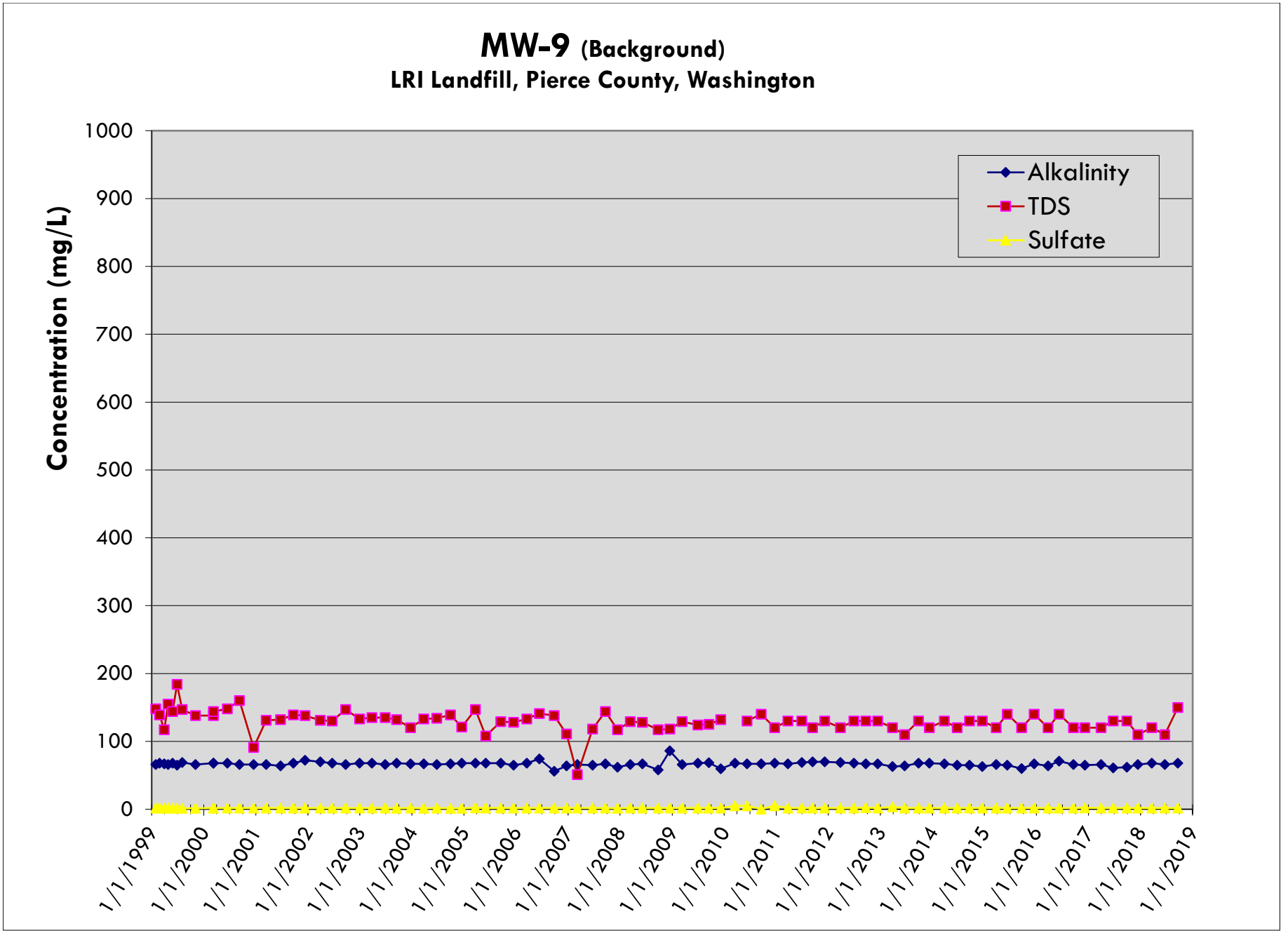

MW-5A
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
Alkalinity
TDS
Sulfate
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019

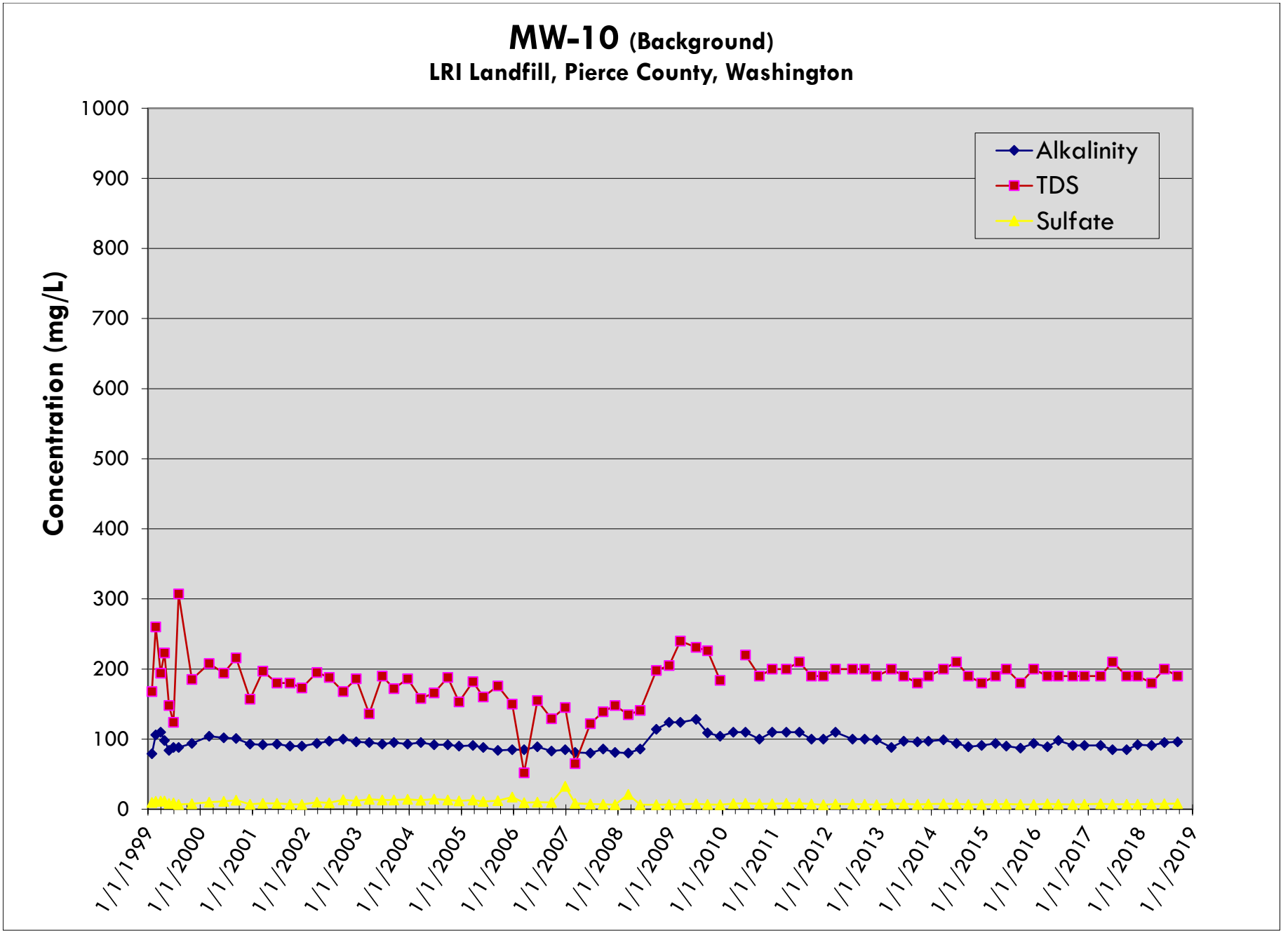
MW-6

LRI Landfill, Pierce County, Washington



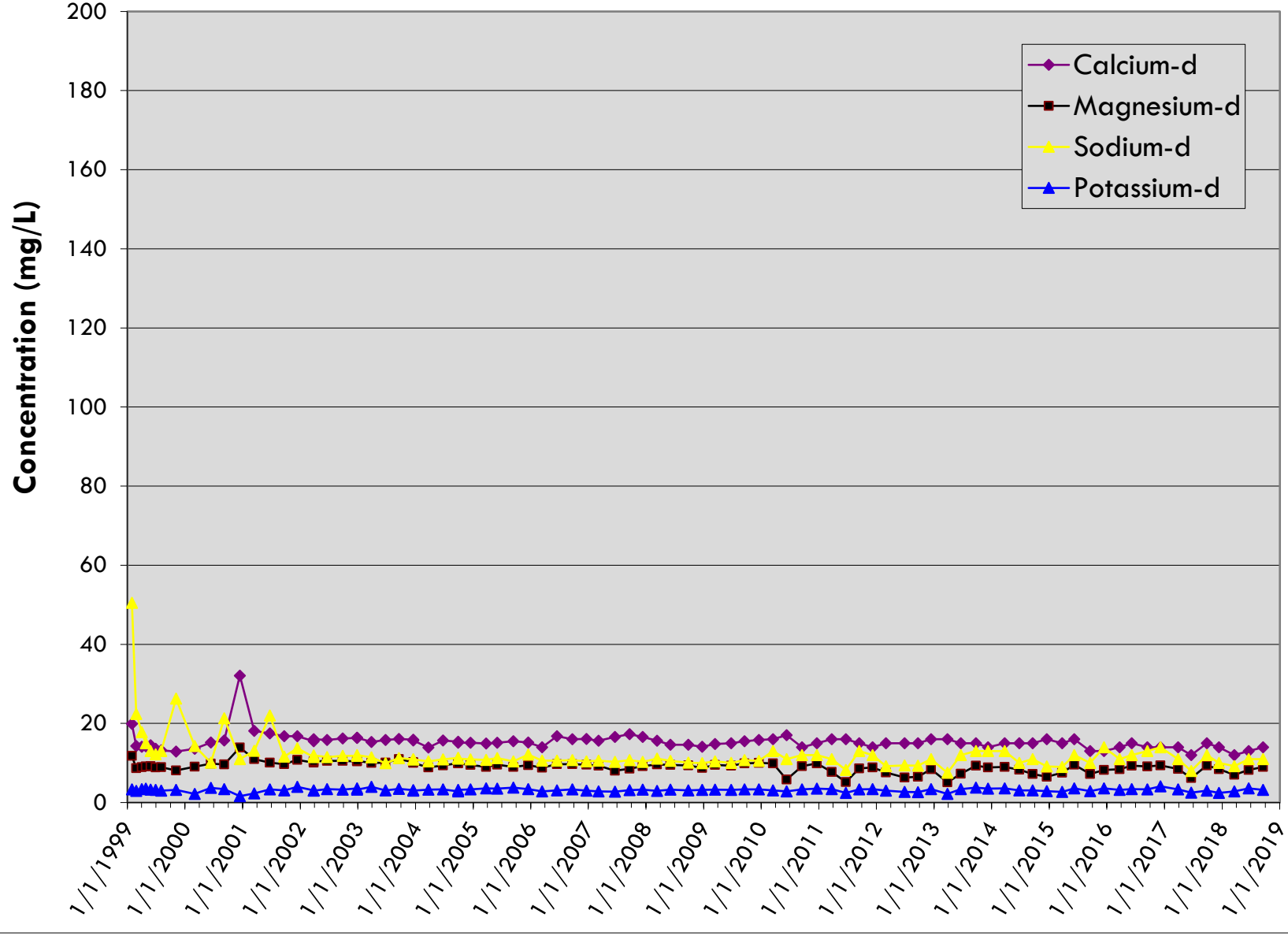

MW-7
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
Alkalinity
TDS
Sulfate
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019


MW-9 (Background)
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
Alkalinity
TDS
Sulfate
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019


MW-10 (Background)
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
Alkalinity
TDS
Sulfate
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019

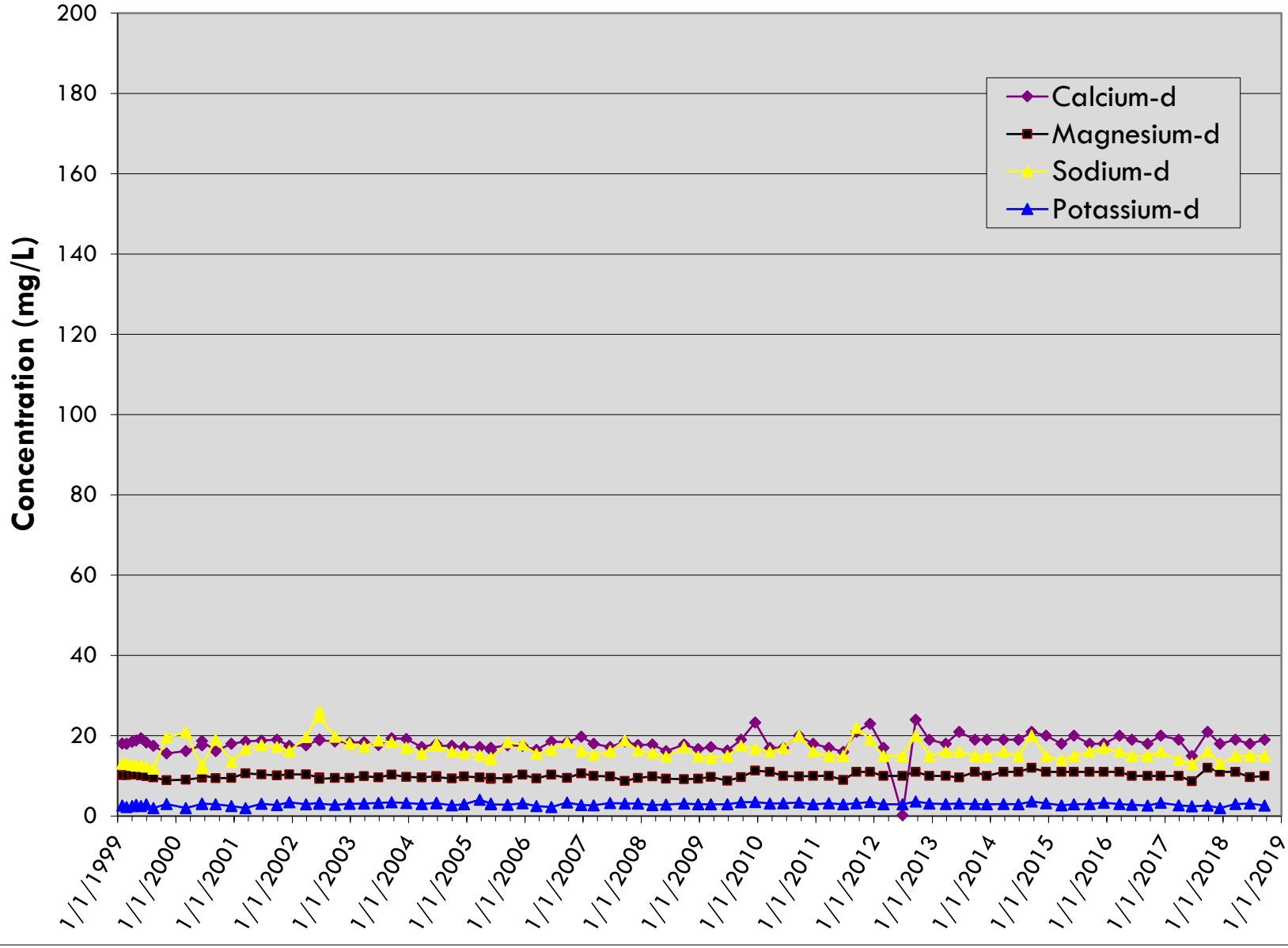
MW-1A

LRI Landfill, Pierce County, Washington



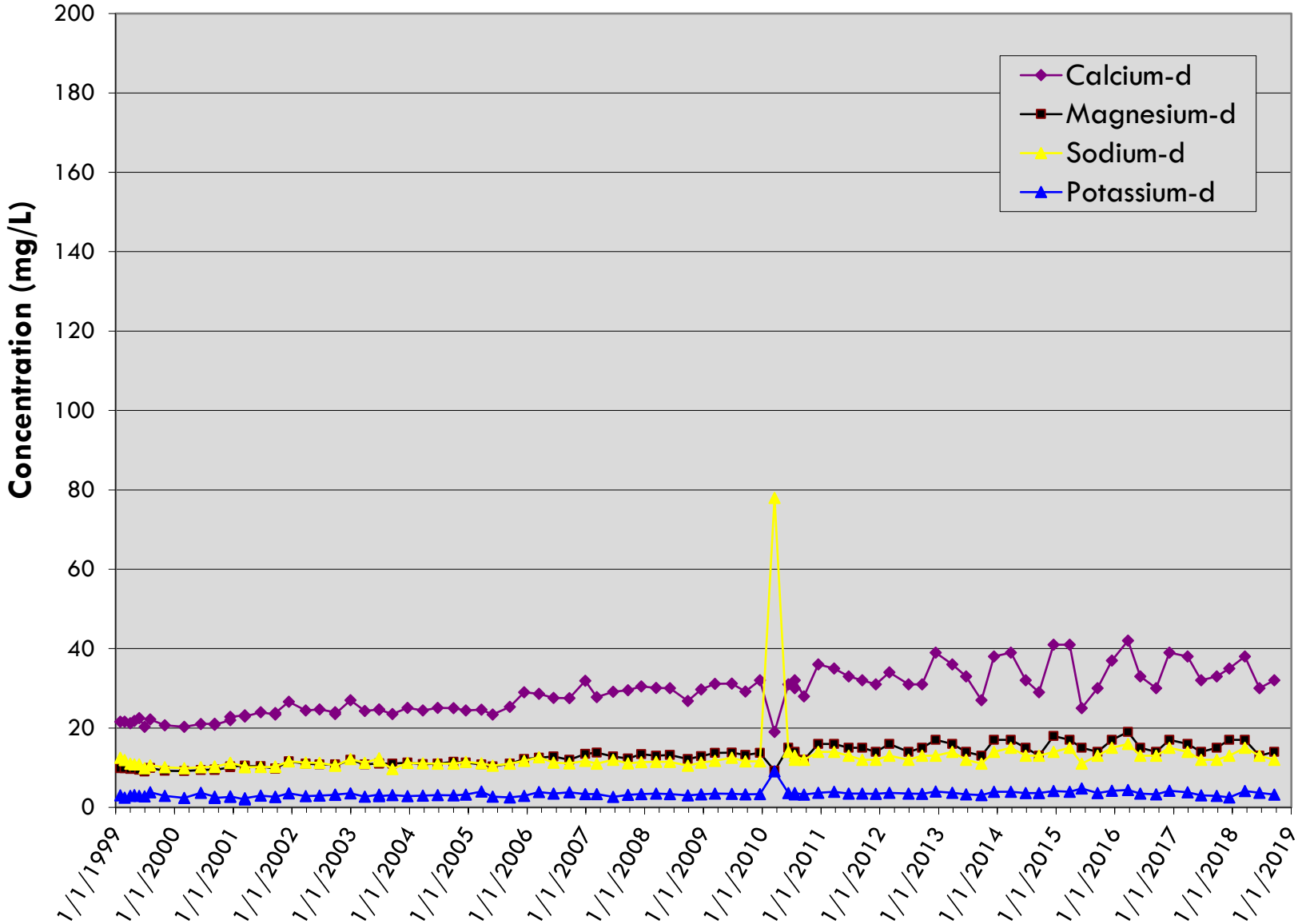
MW-2A

LRI Landfill, Pierce County, Washington



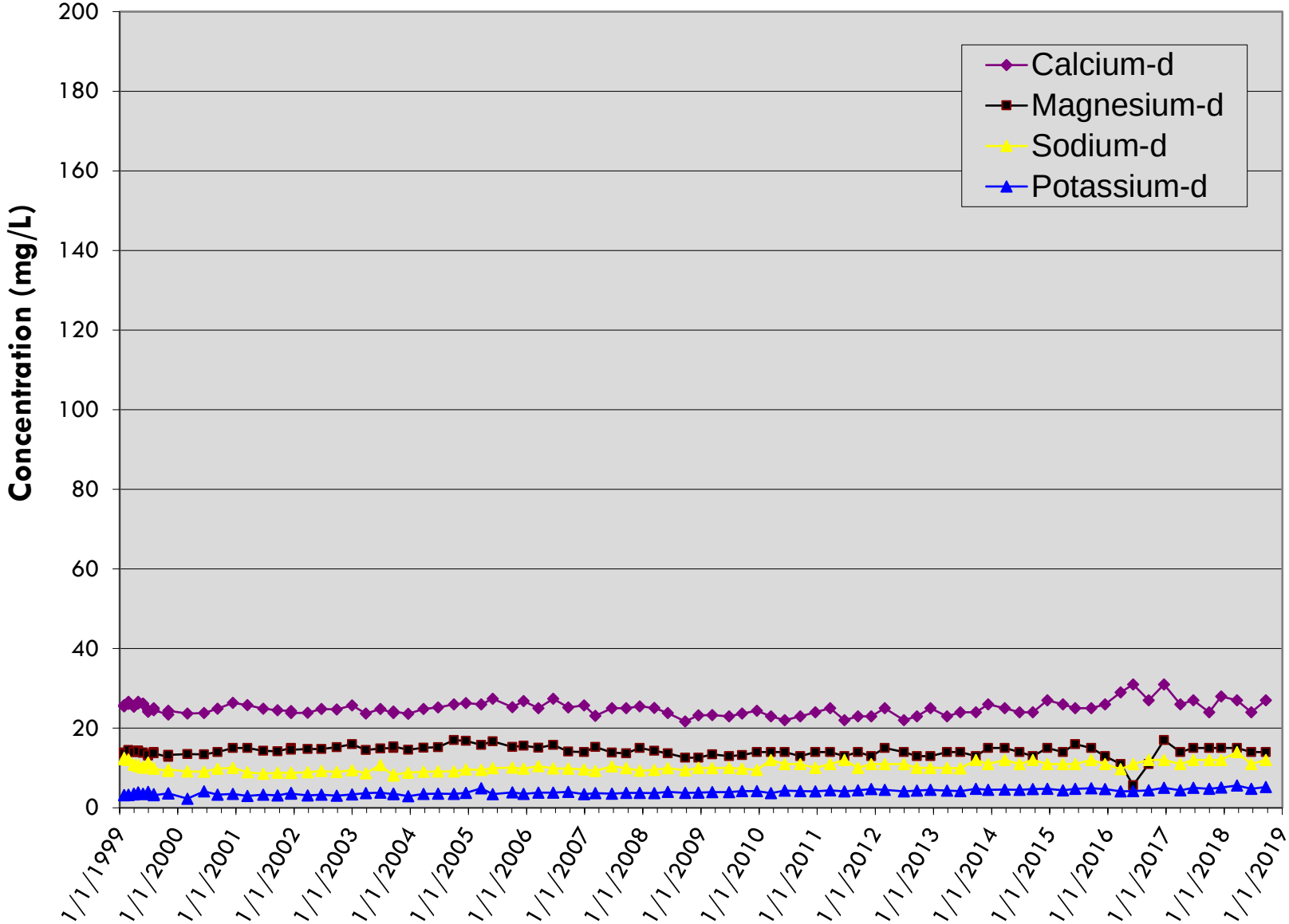
MW-3

LRI Landfill, Pierce County, Washington



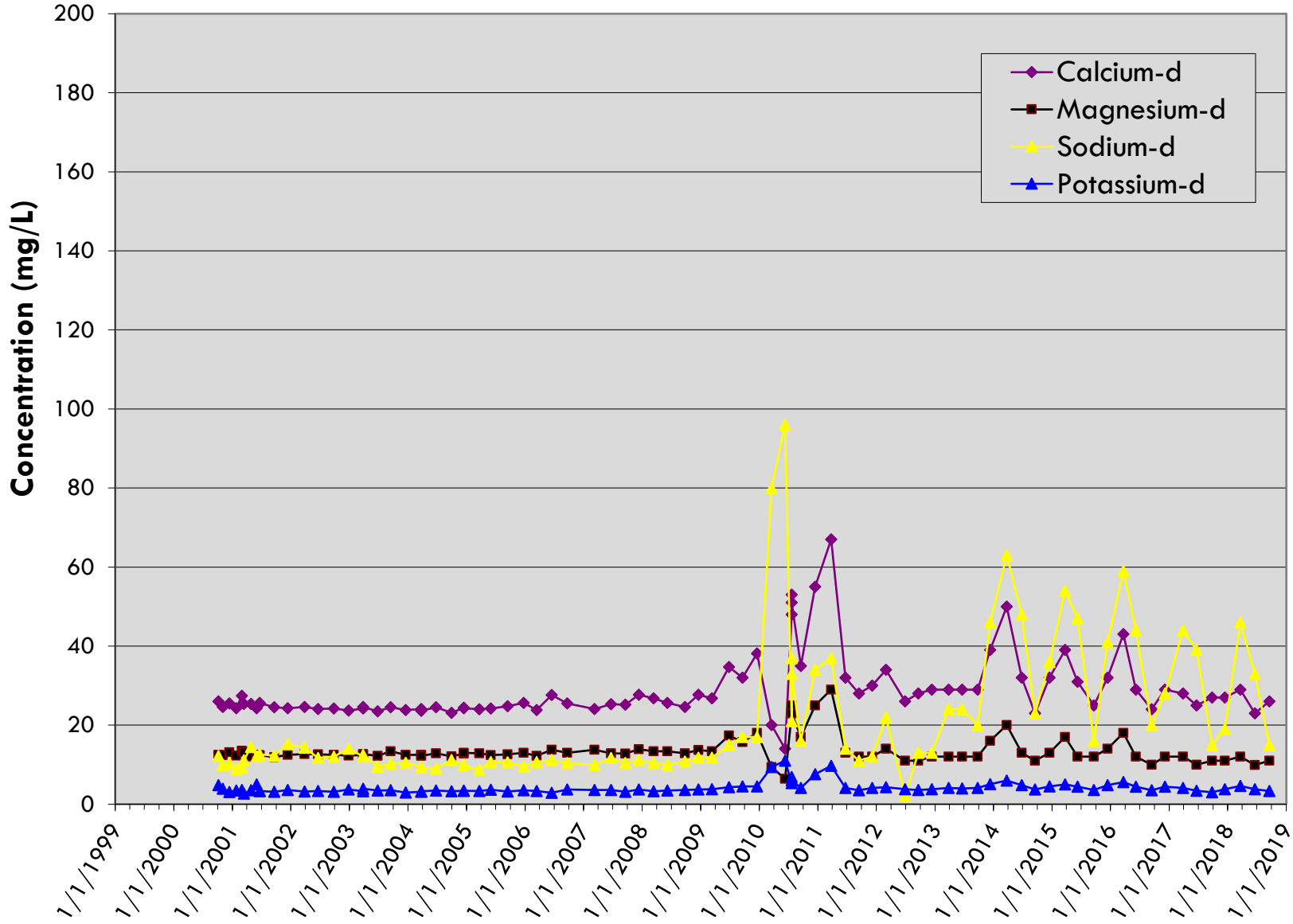
MW-4

LRI Landfill, Pierce County, Washington



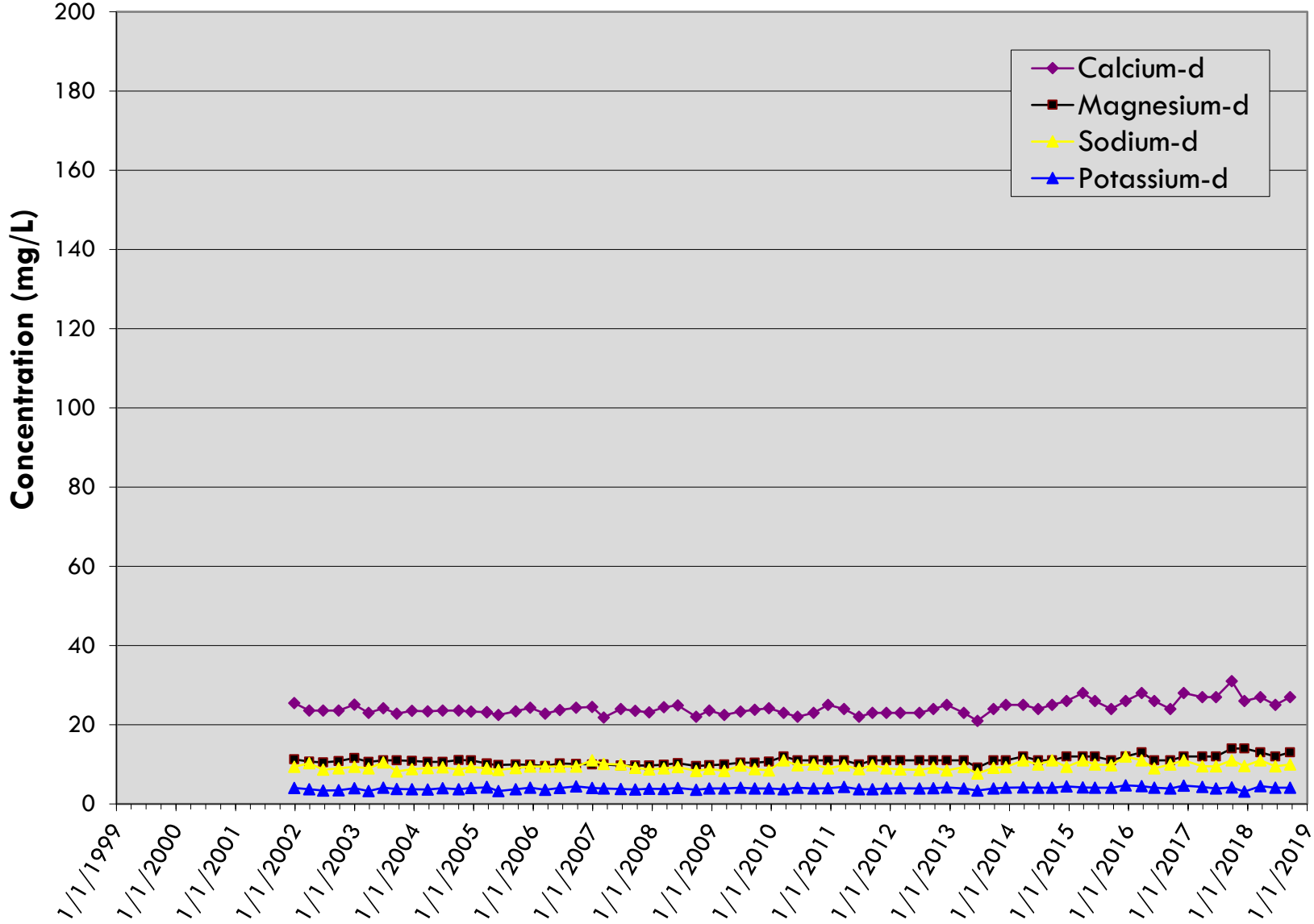
MW-5A

LRI Landfill, Pierce County, Washington



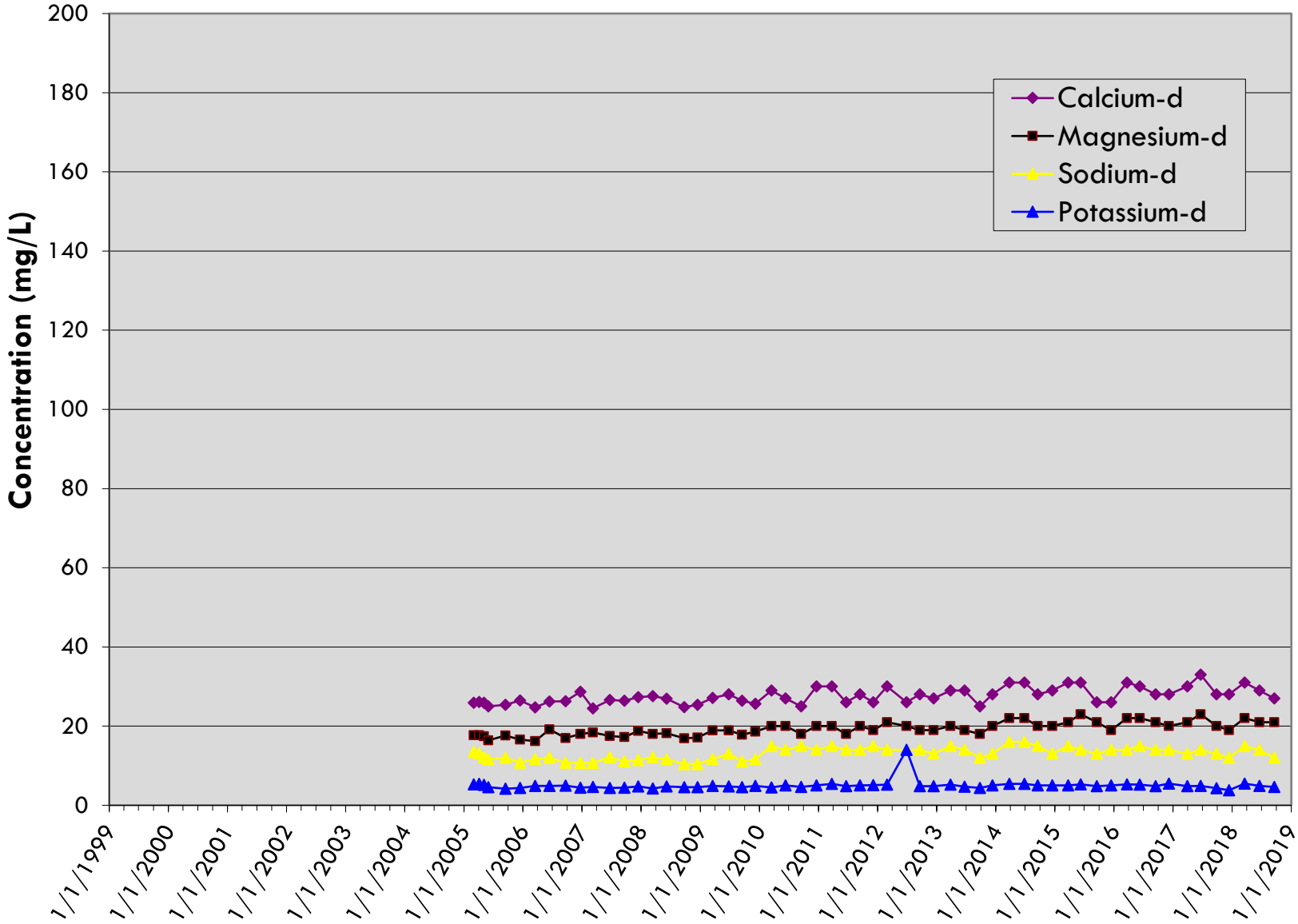
MW-6

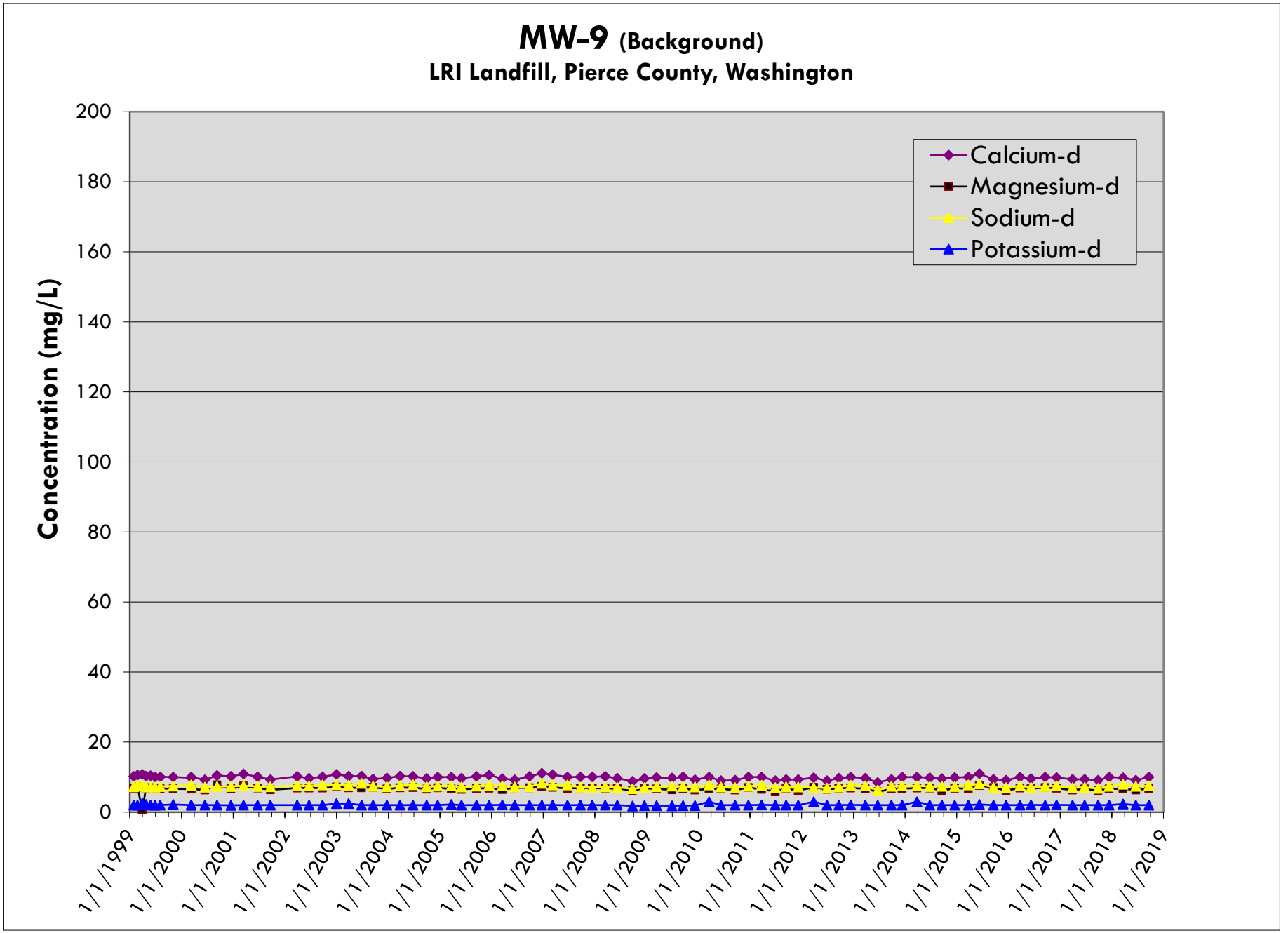
LRI Landfill, Pierce County, Washington



MW-7

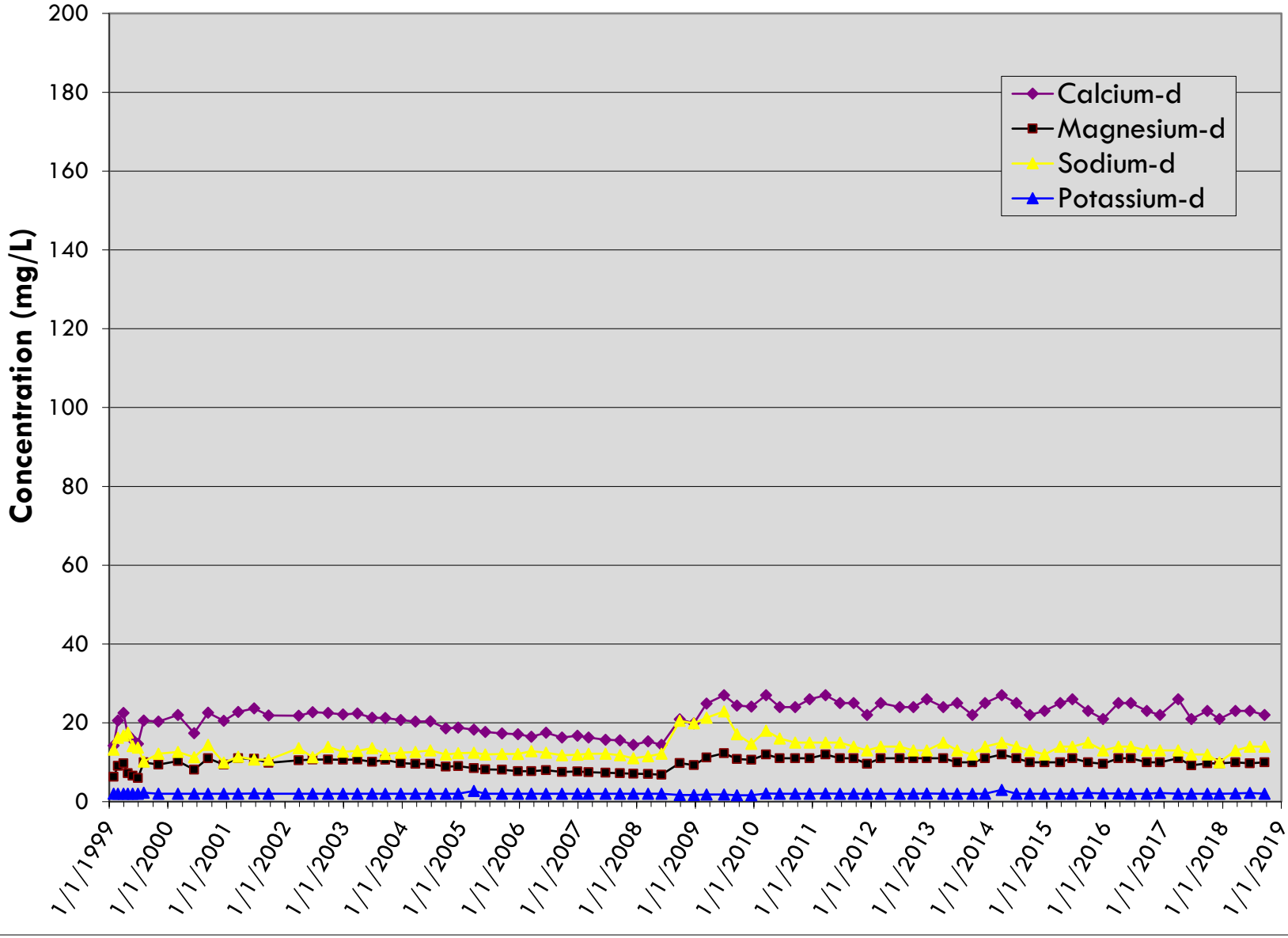
LRI Landfill, Pierce County, Washington




MW-9 (Background)
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
200
180
160
140
120
100
80
60
40
20
0
Calcium-d
Magnesium-d
Sodium-d
Potassium-d
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019

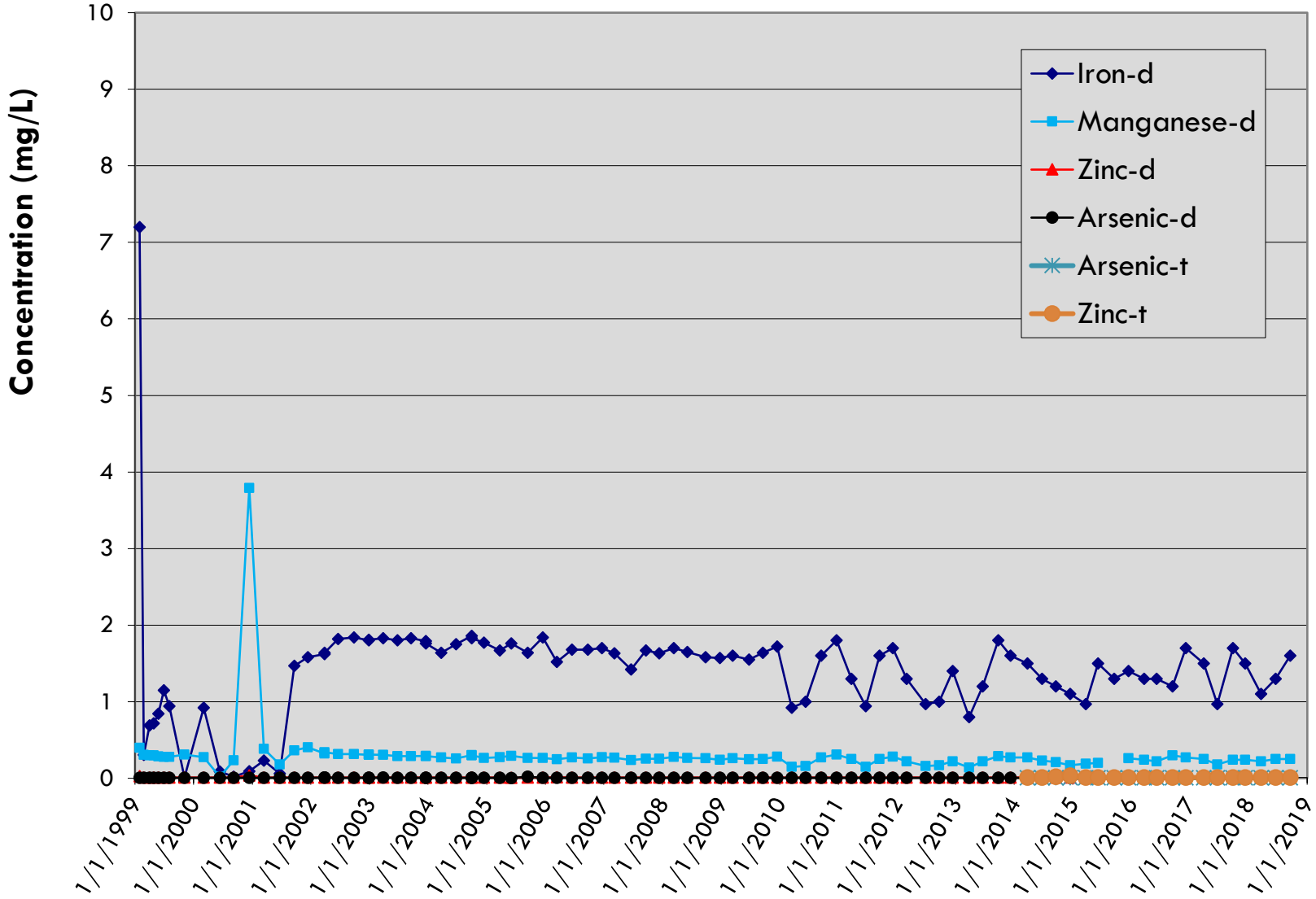
MW-10 (Background)

LRI Landfill, Pierce County, Washington



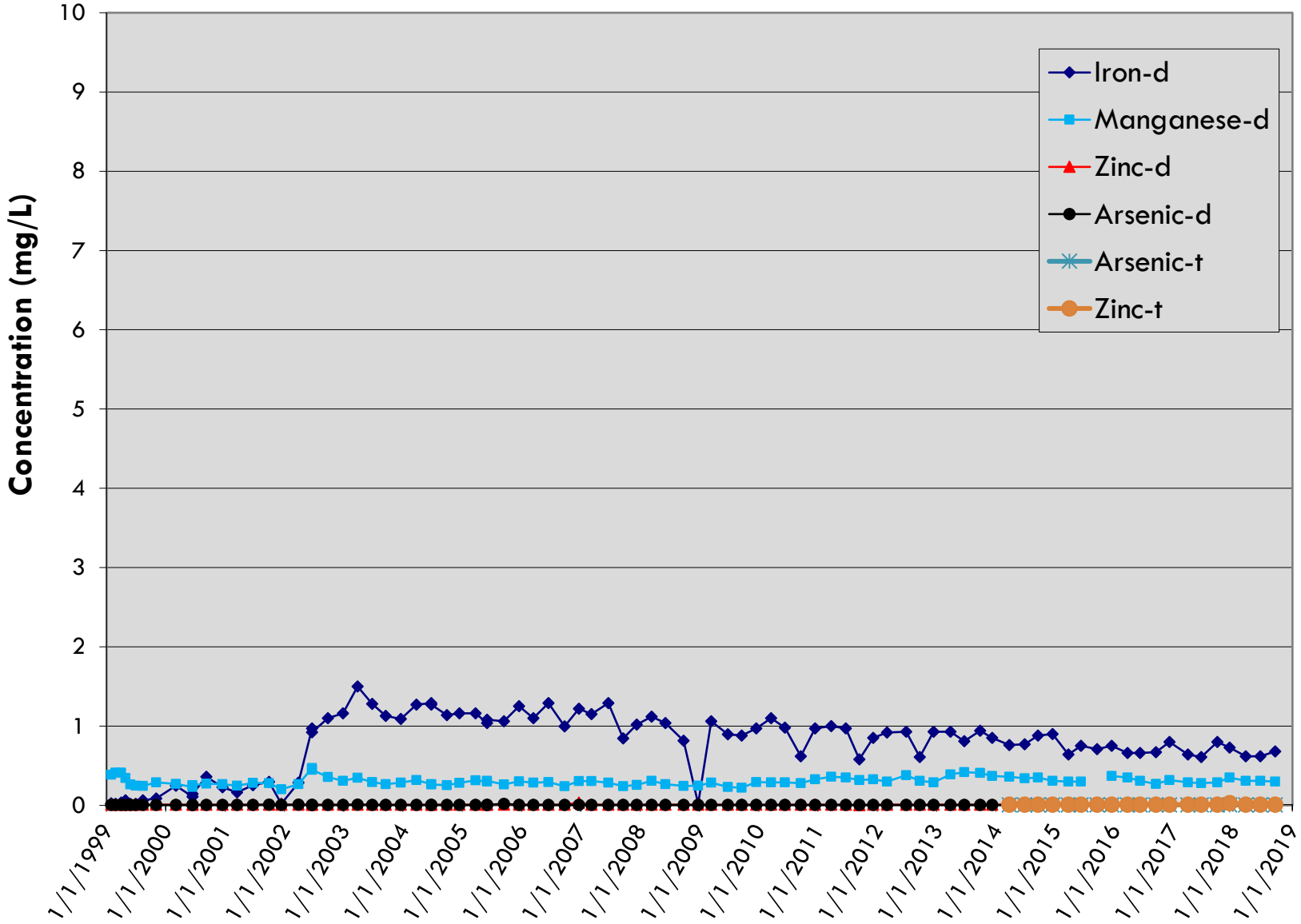
MW-1A

LRI Landfill, Pierce County, Washington



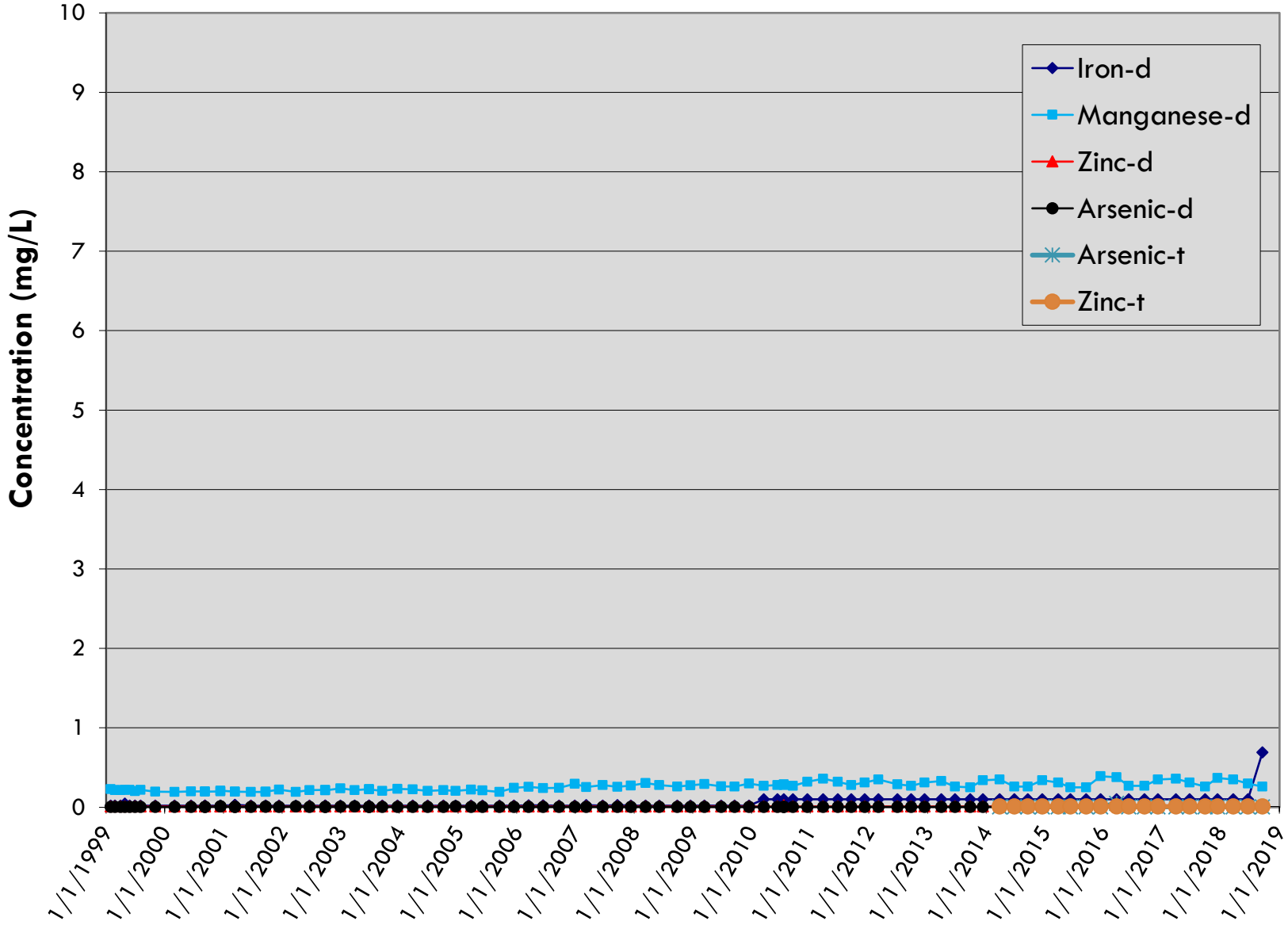
MW-2A

LRI Landfill, Pierce County, Washington



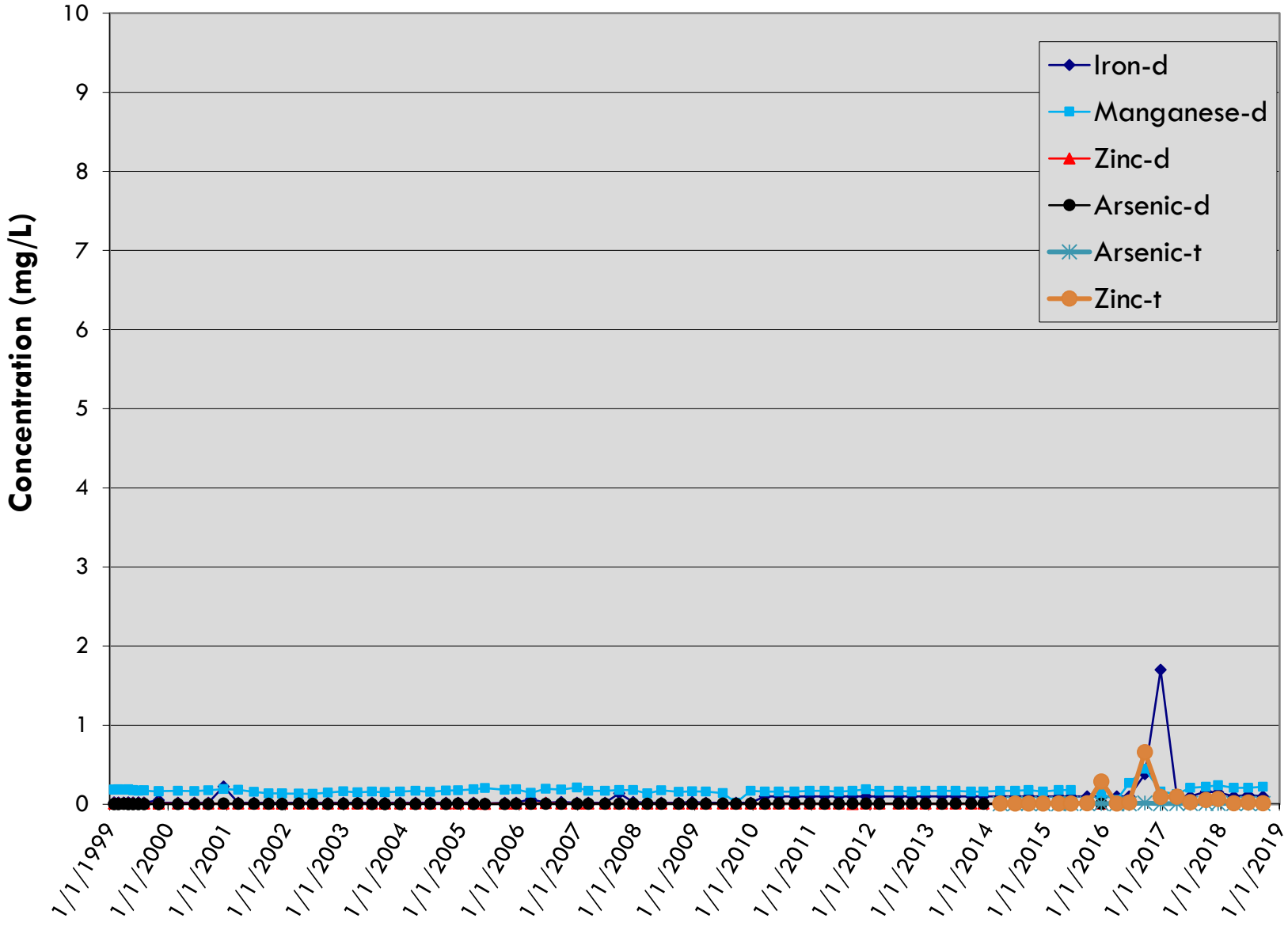
MW-3

LRI Landfill, Pierce County, Washington



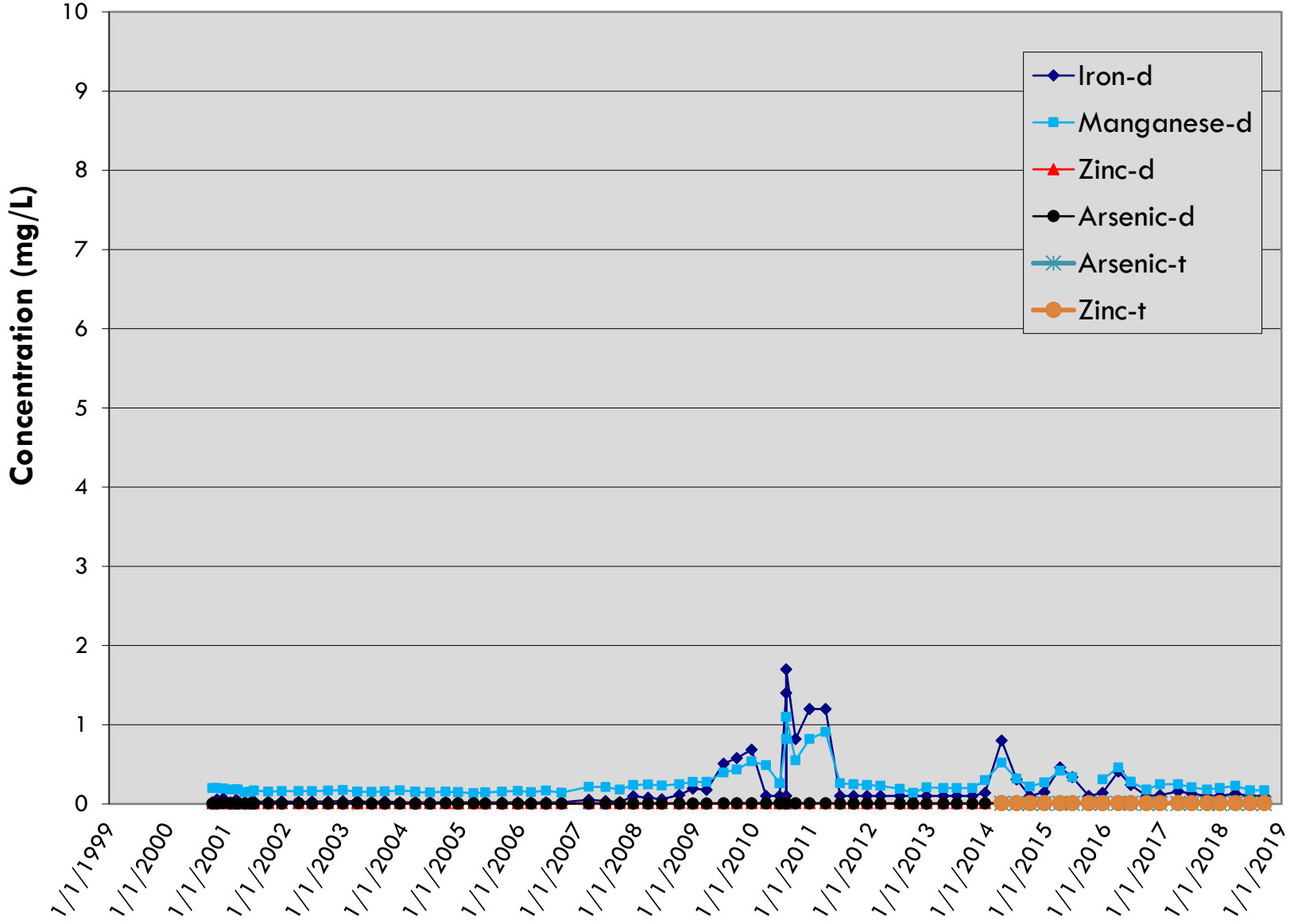
MW-4

LRI Landfill, Pierce County, Washington



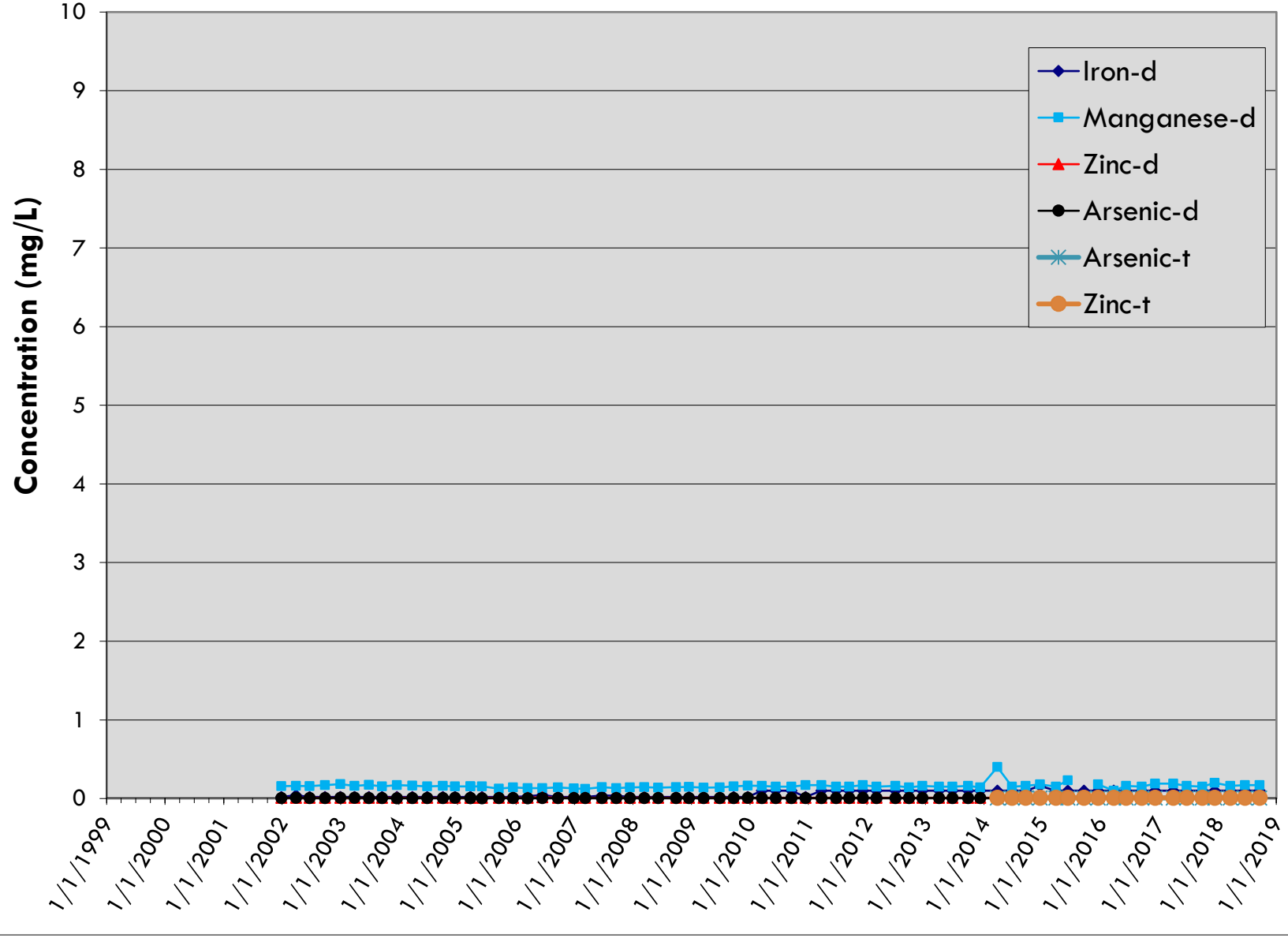
MW-5A

LRI Landfill, Pierce County, Washington



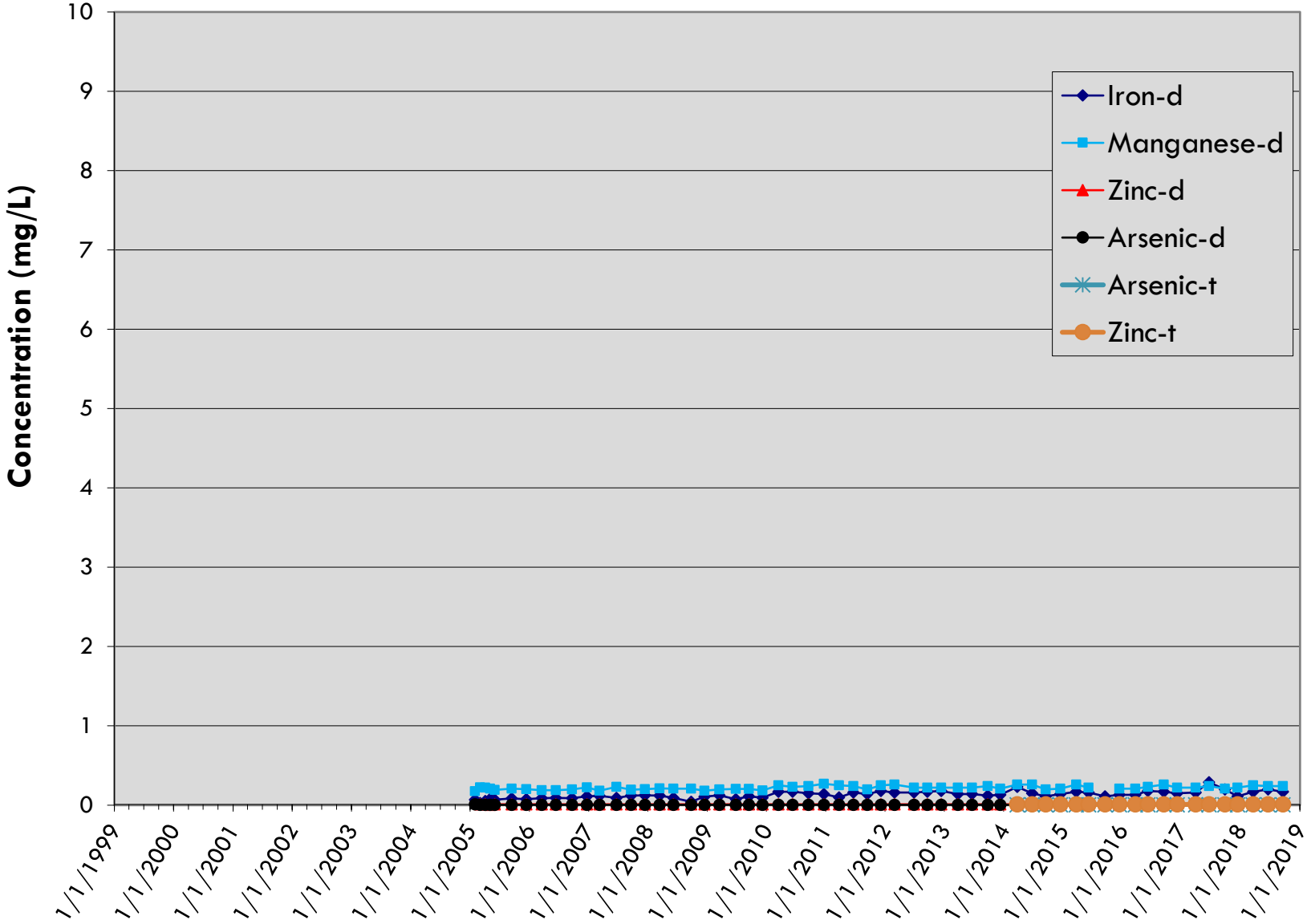
MW-6

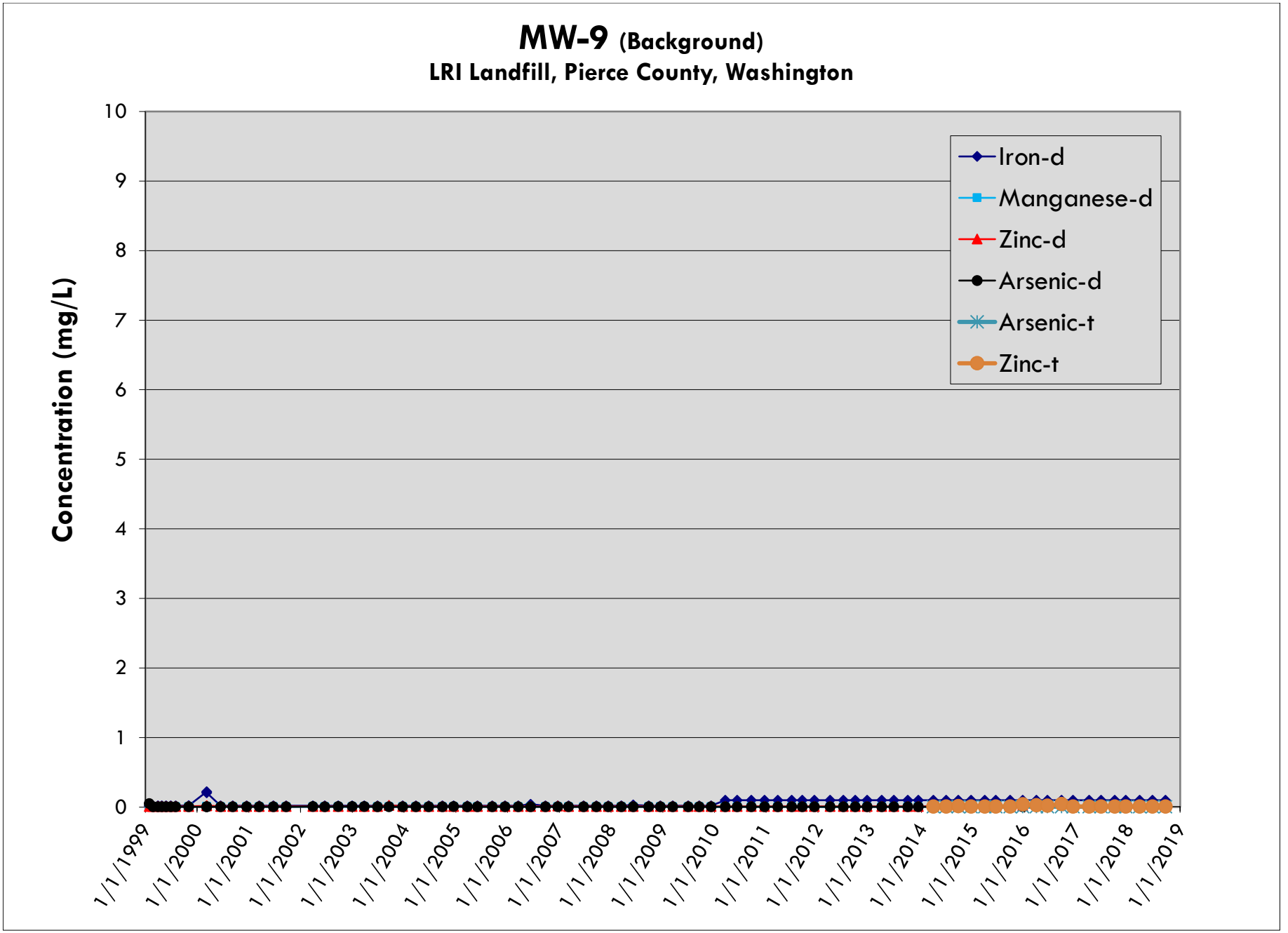
LRI Landfill, Pierce County, Washington

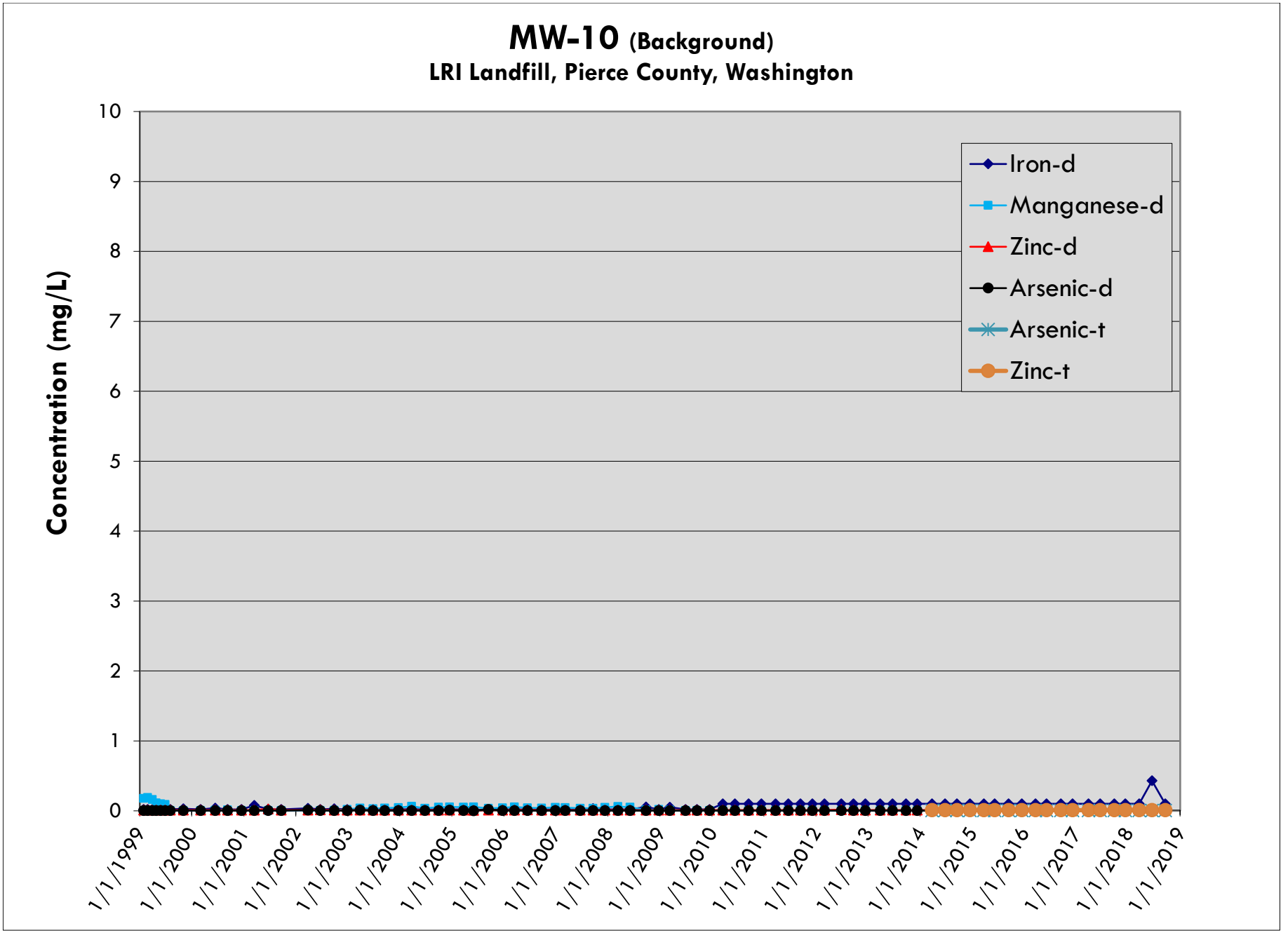


MW-7

LRI Landfill, Pierce County, Washington

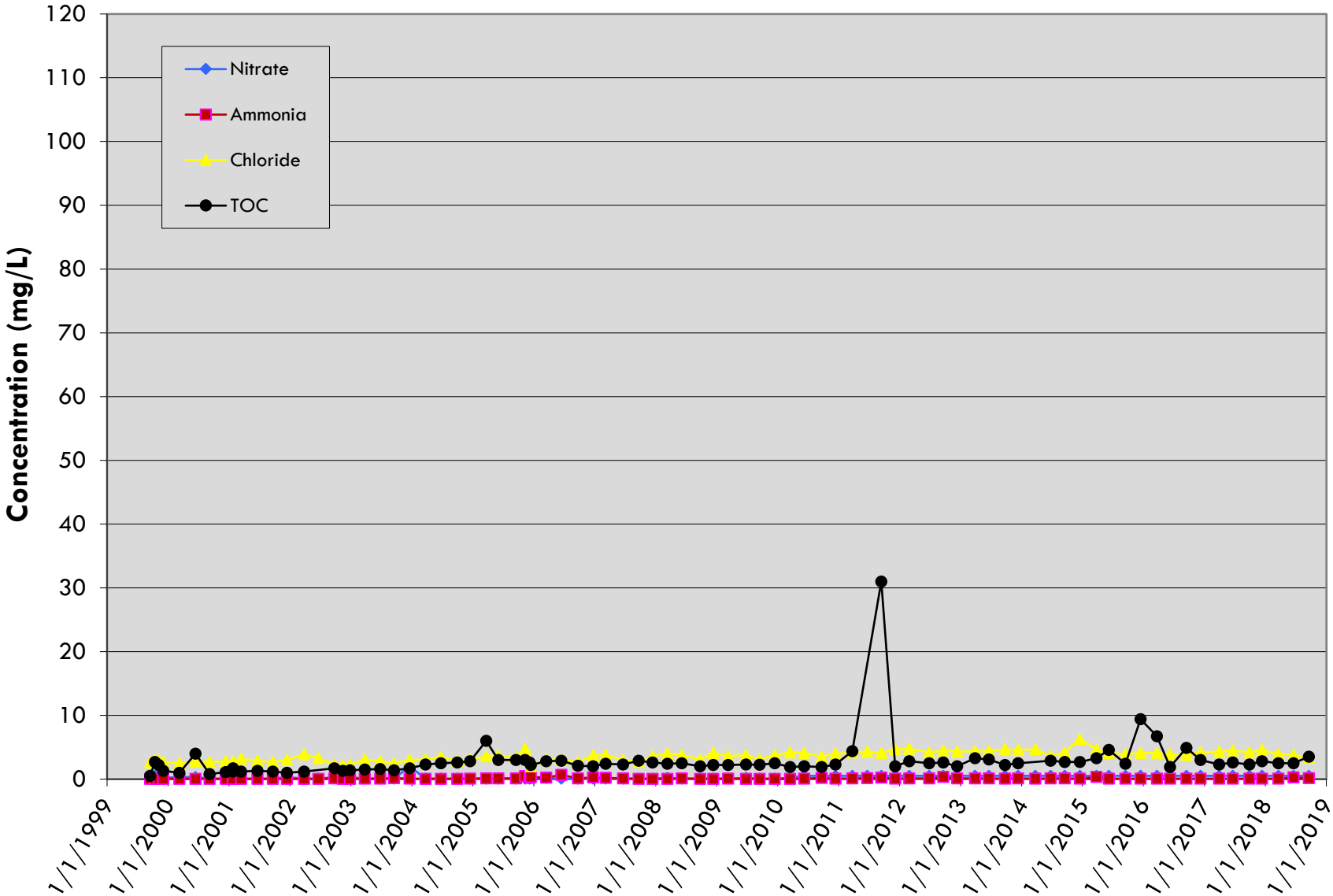



MW-9 (Background)
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019
Iron-d
Manganese-d
Zinc-d
Arsenic-d
Arsenic-t
Zinc-t


MW-10 (Background)
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019
Iron-d
Manganese-d
Zinc-d
Arsenic-d
Arsenic-t
Zinc-t

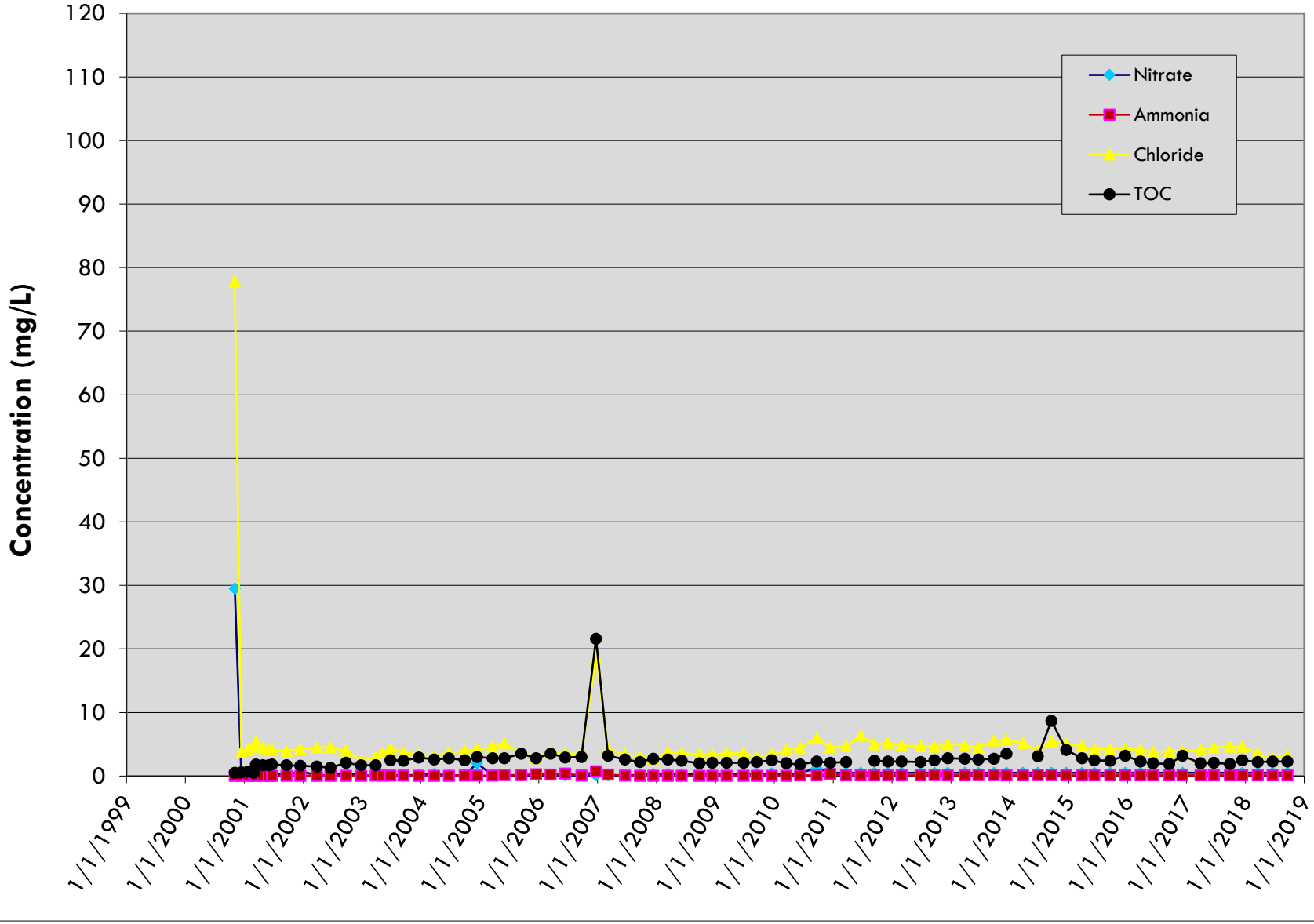
LDCS-1

LRI Landfill, Pierce County, Washington



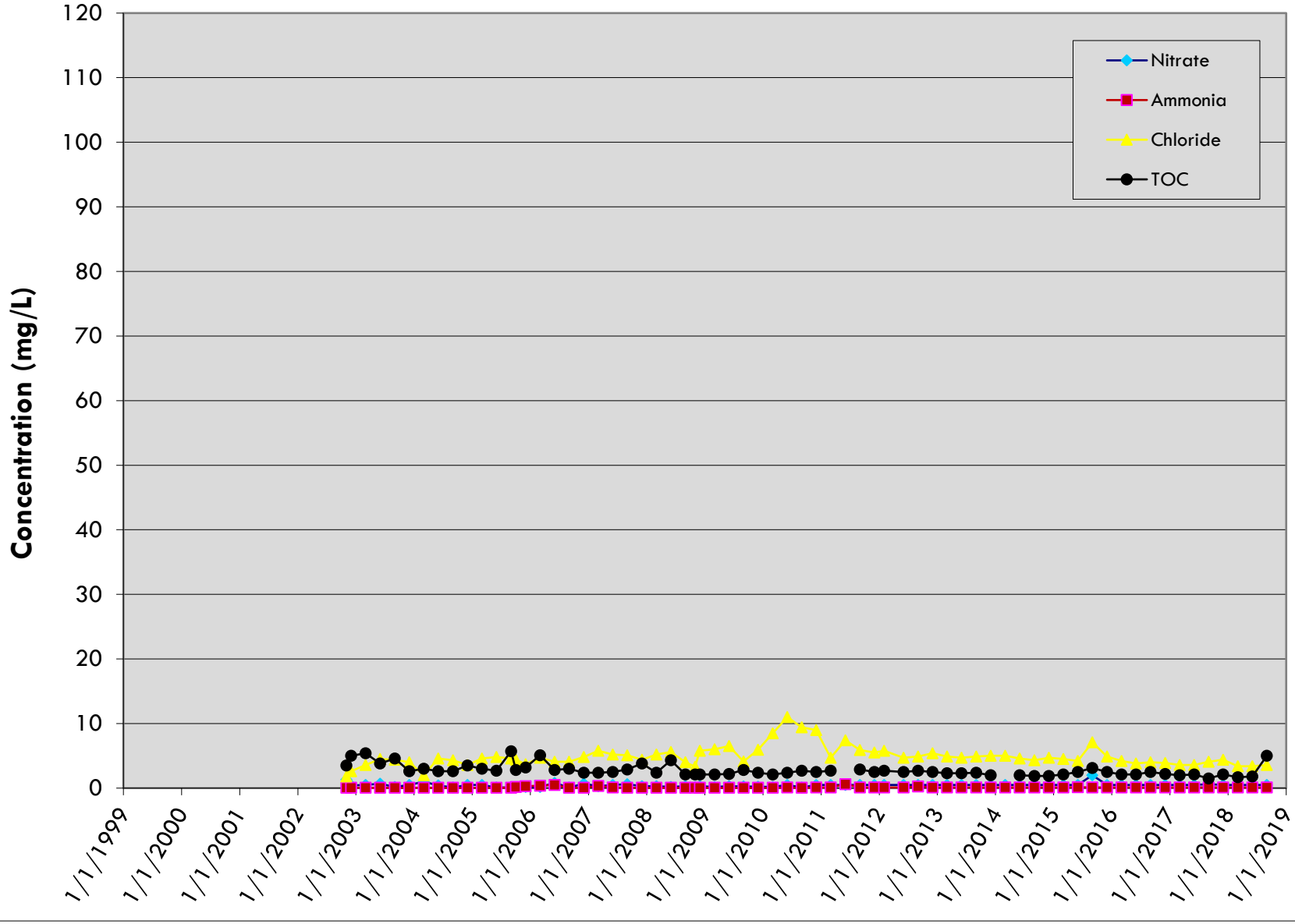
LDCS-2A

LRI Landfill, Pierce County, Washington



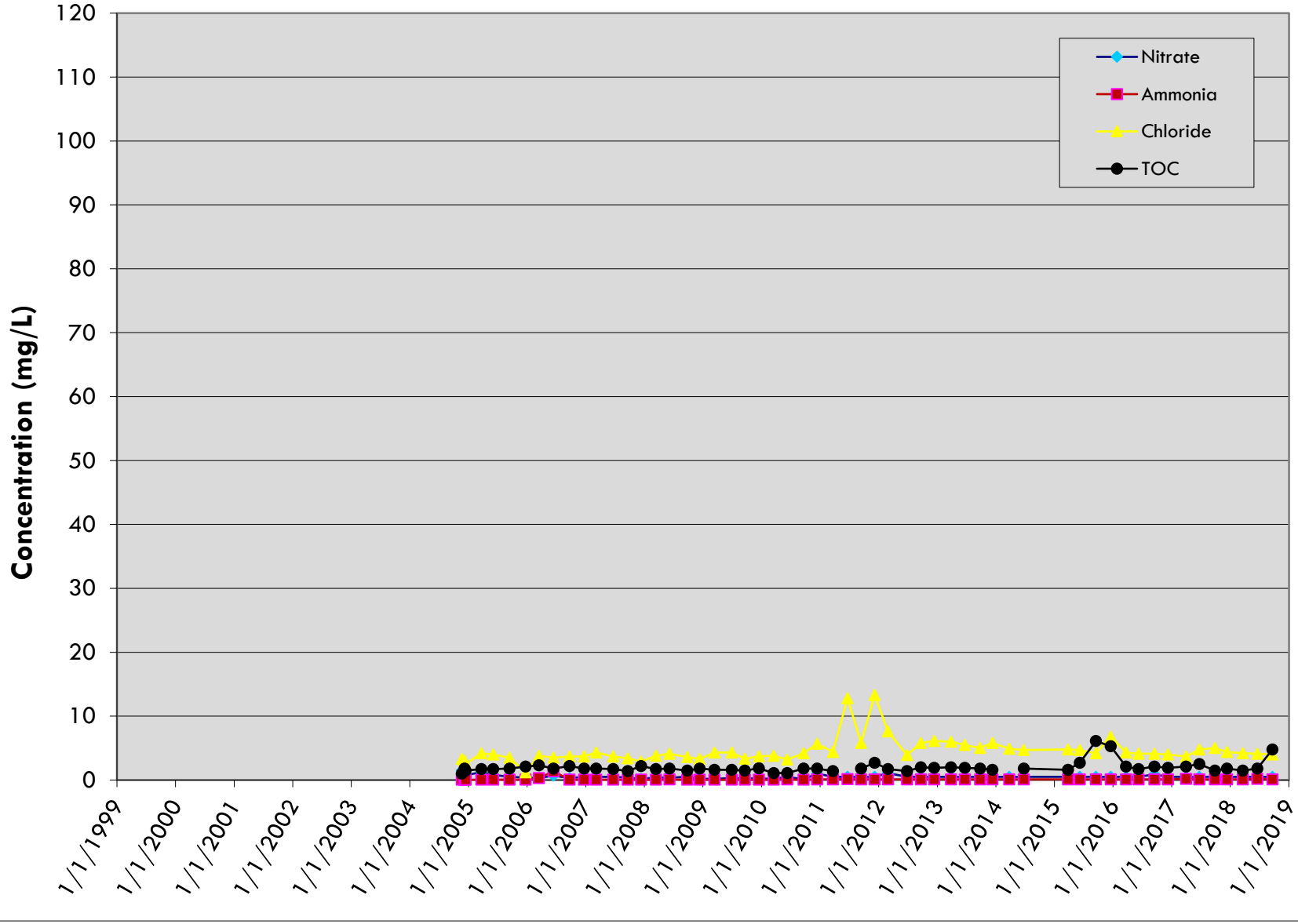
LDCS-2B

LRI Landfill, Pierce County, Washington



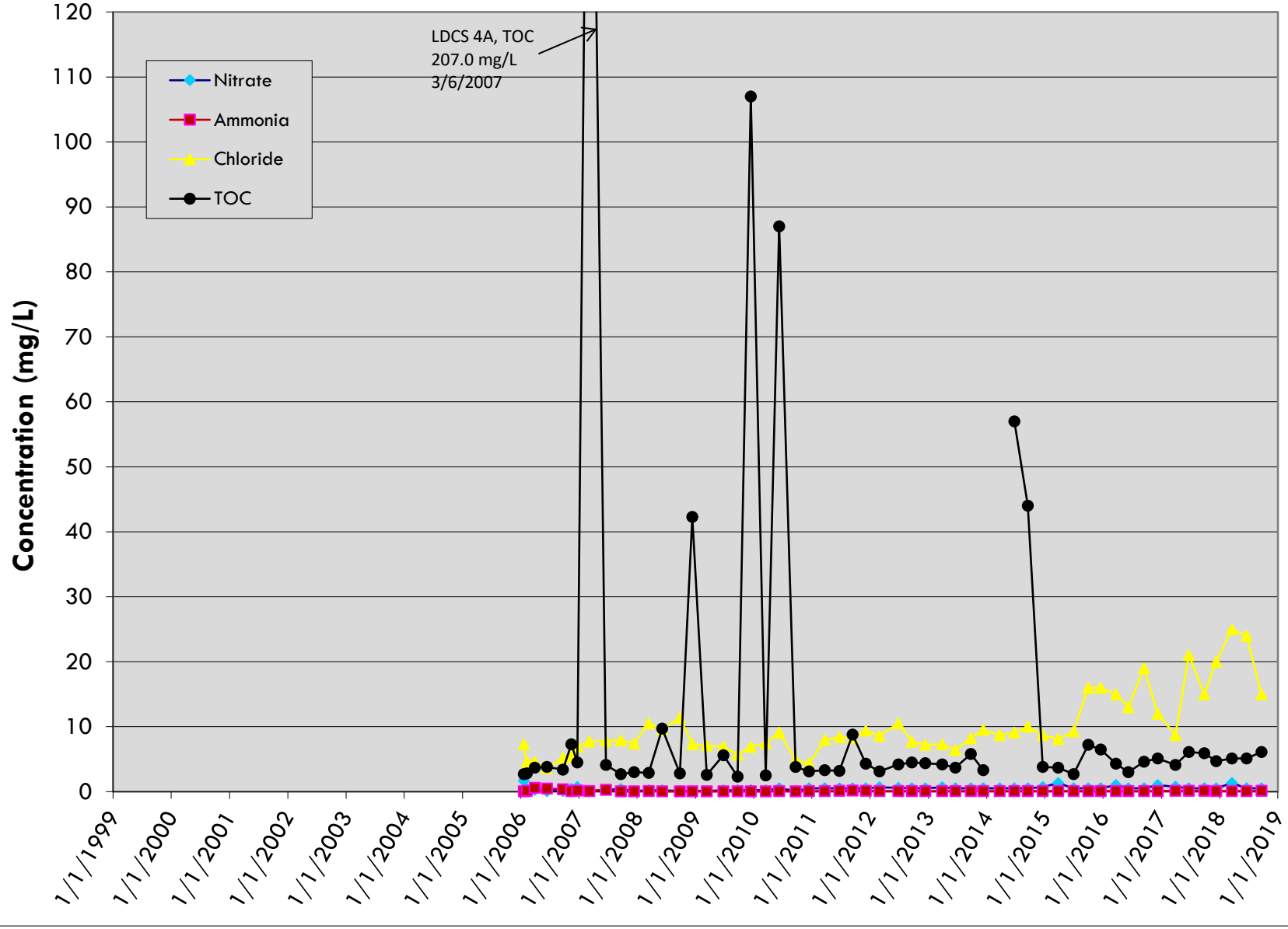
LDCS-3A

LRI Landfill, Pierce County, Washington



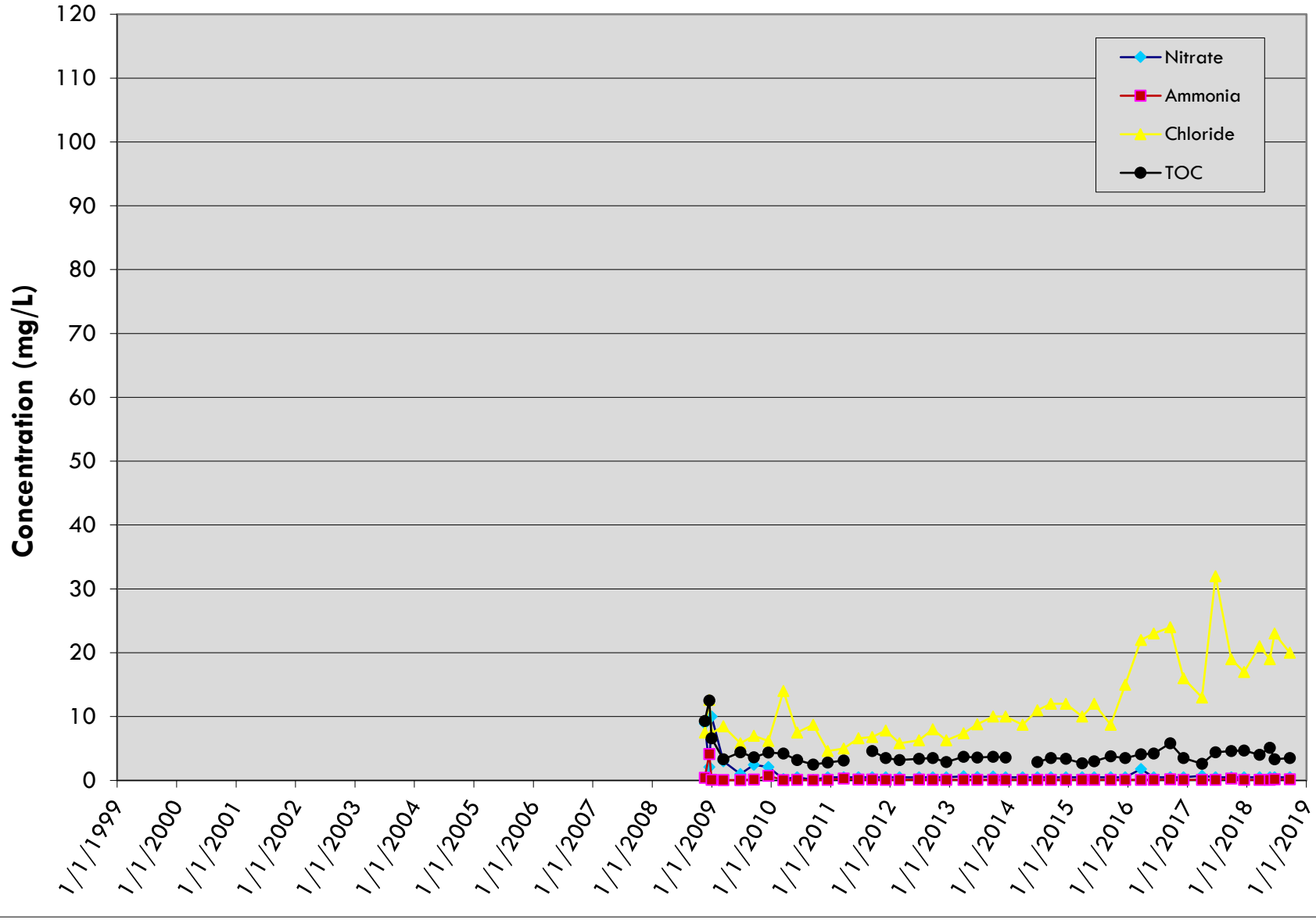
LDCS-4A

LRI Landfill, Pierce County, Washington



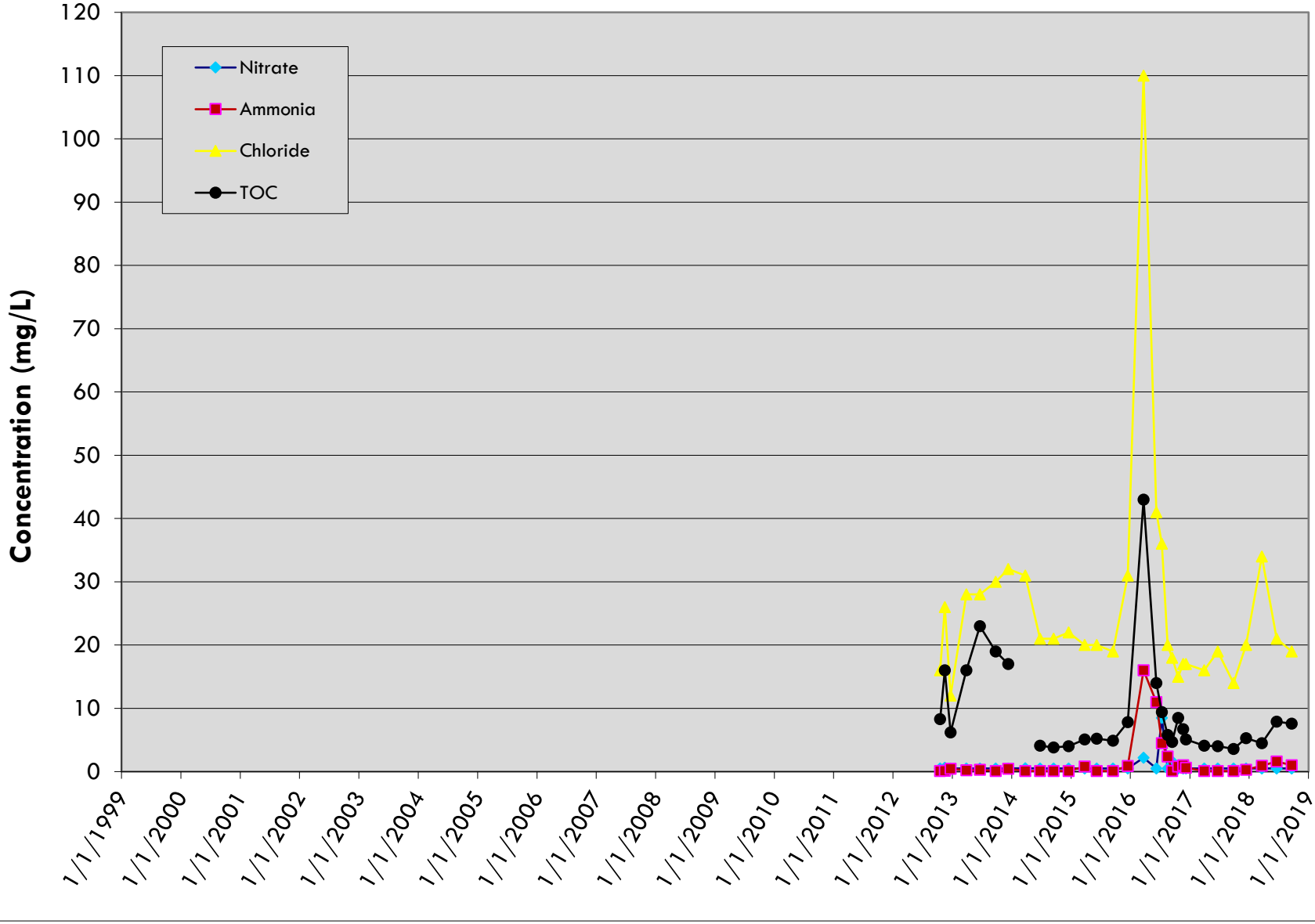
LDCS-4B

LRI Landfill, Pierce County, Washington



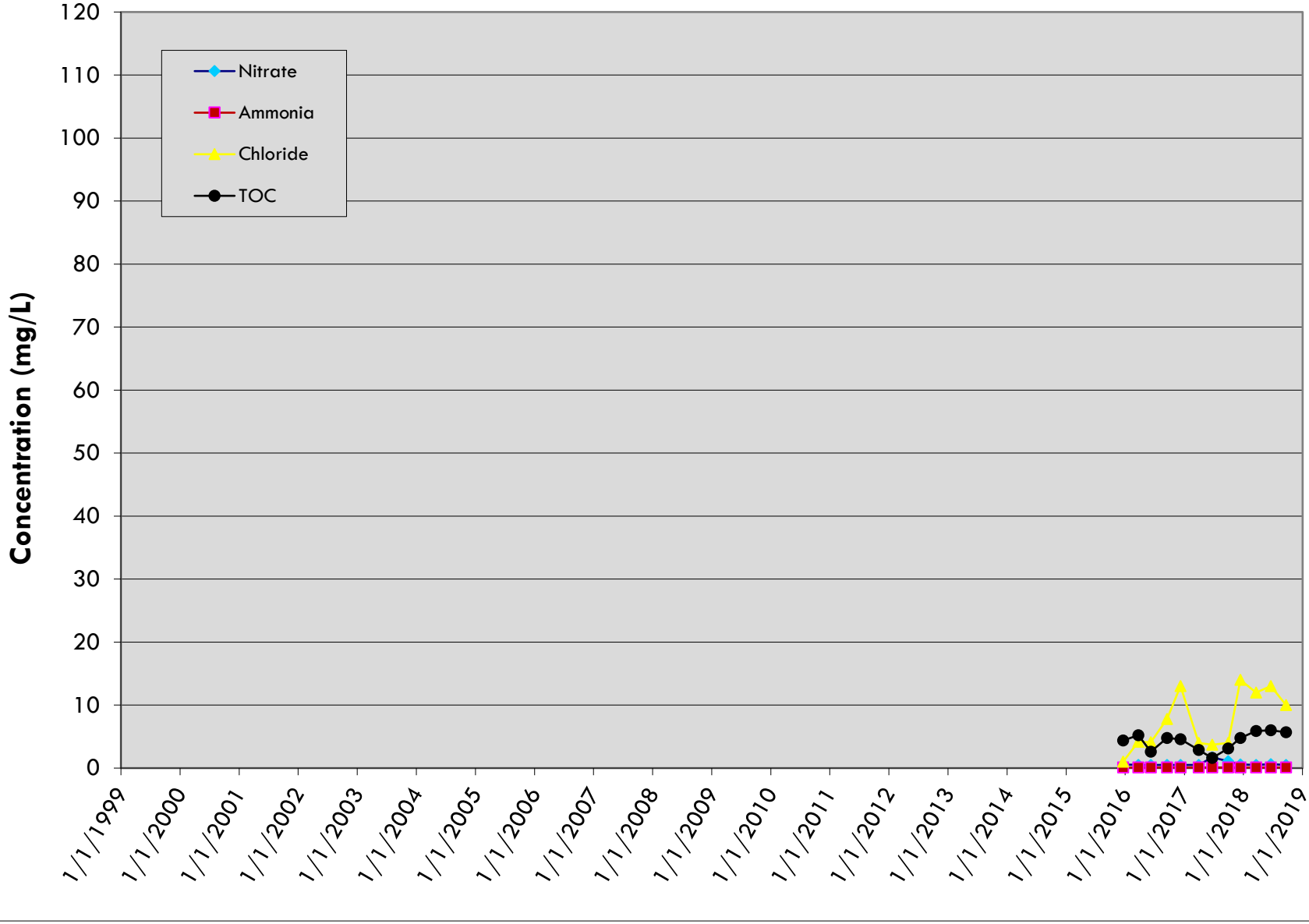
LDCS-5

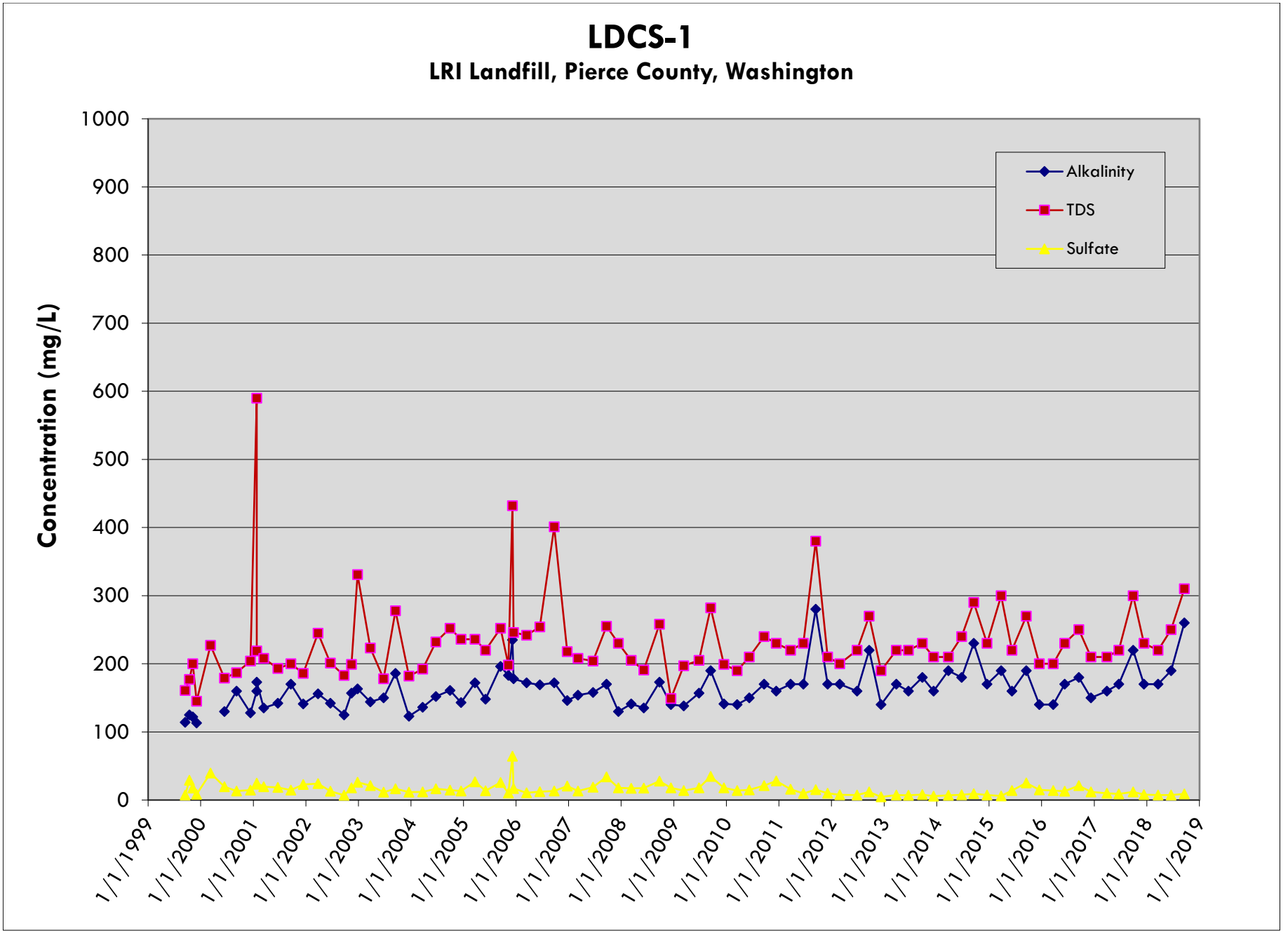
LRI Landfill, Pierce County, Washington



LDCS-6A

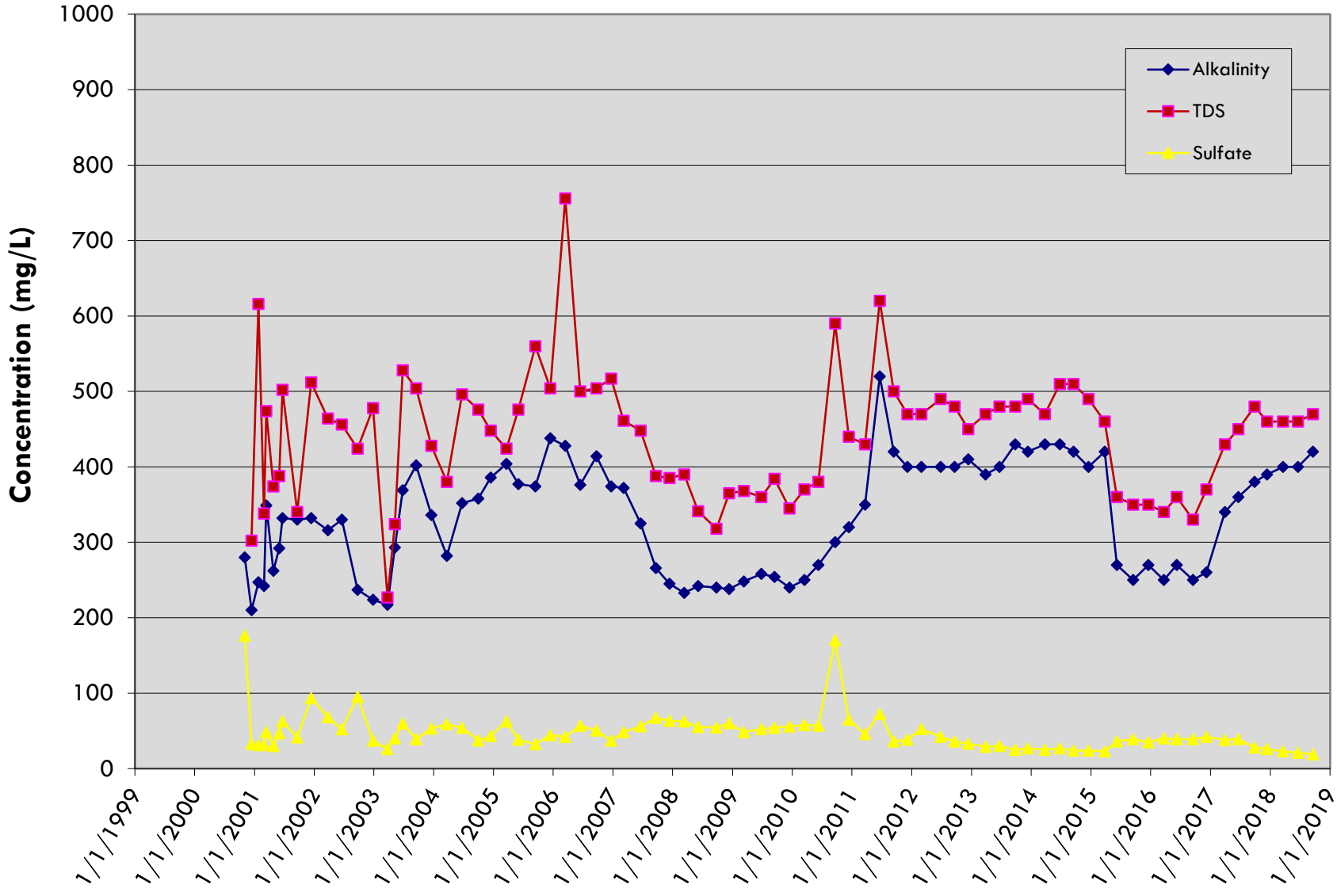
LRI Landfill, Pierce County, Washington




LDCS-1
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
Alkalinity
TDS
Sulfate
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019

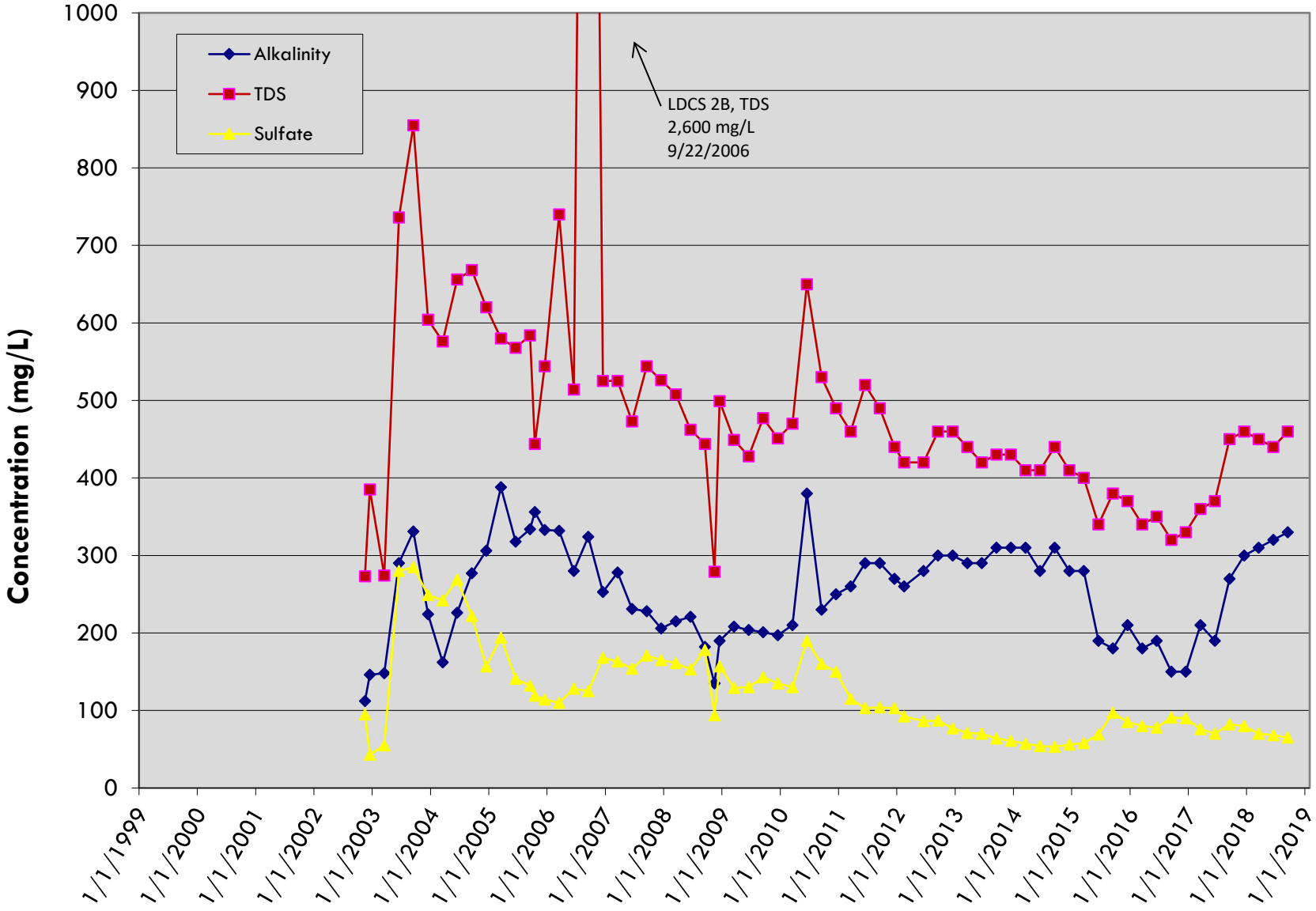
LDCS-2A

LRI Landfill, Pierce County, Washington



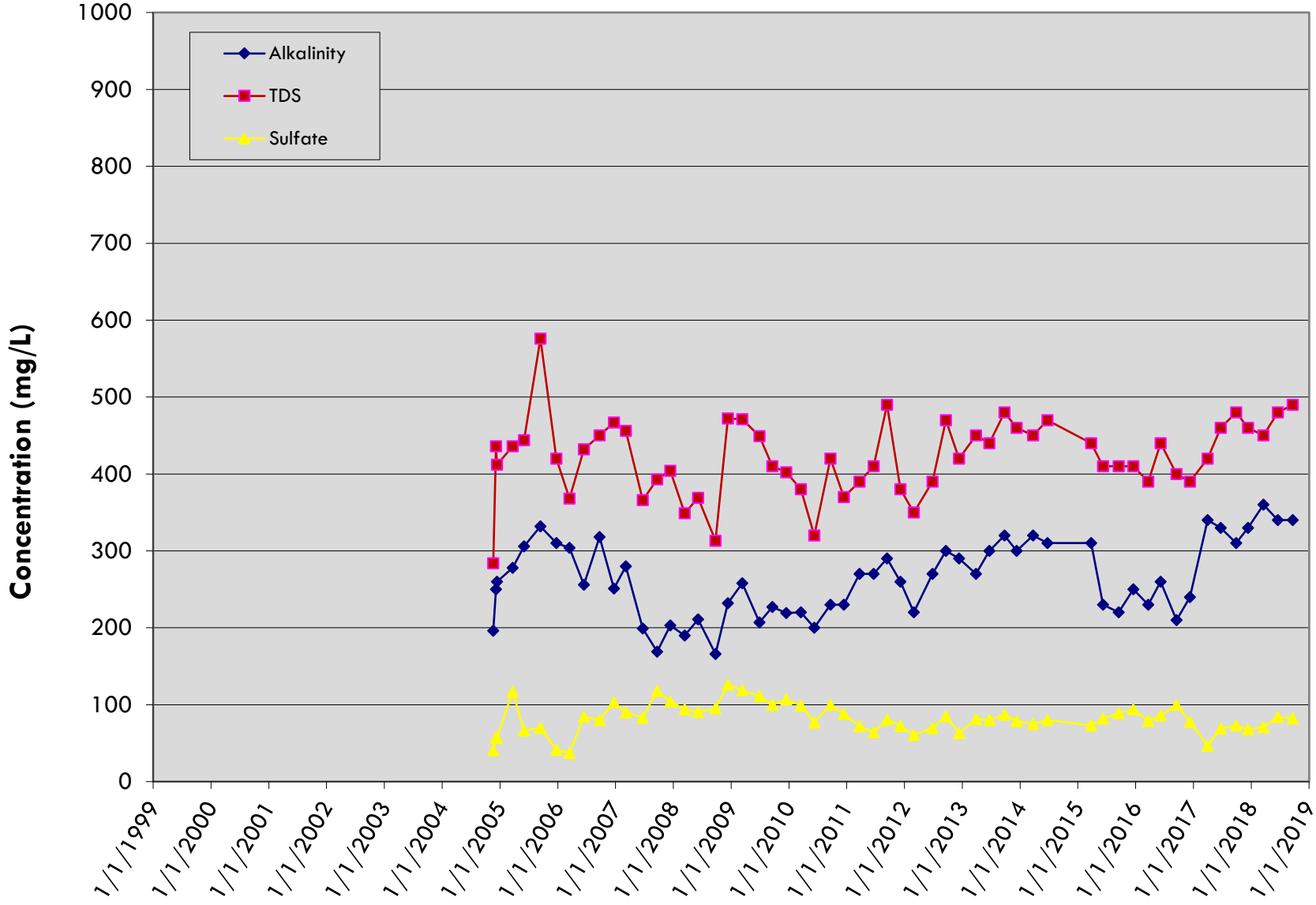
LDCS-2B

LRI Landfill, Pierce County, Washington



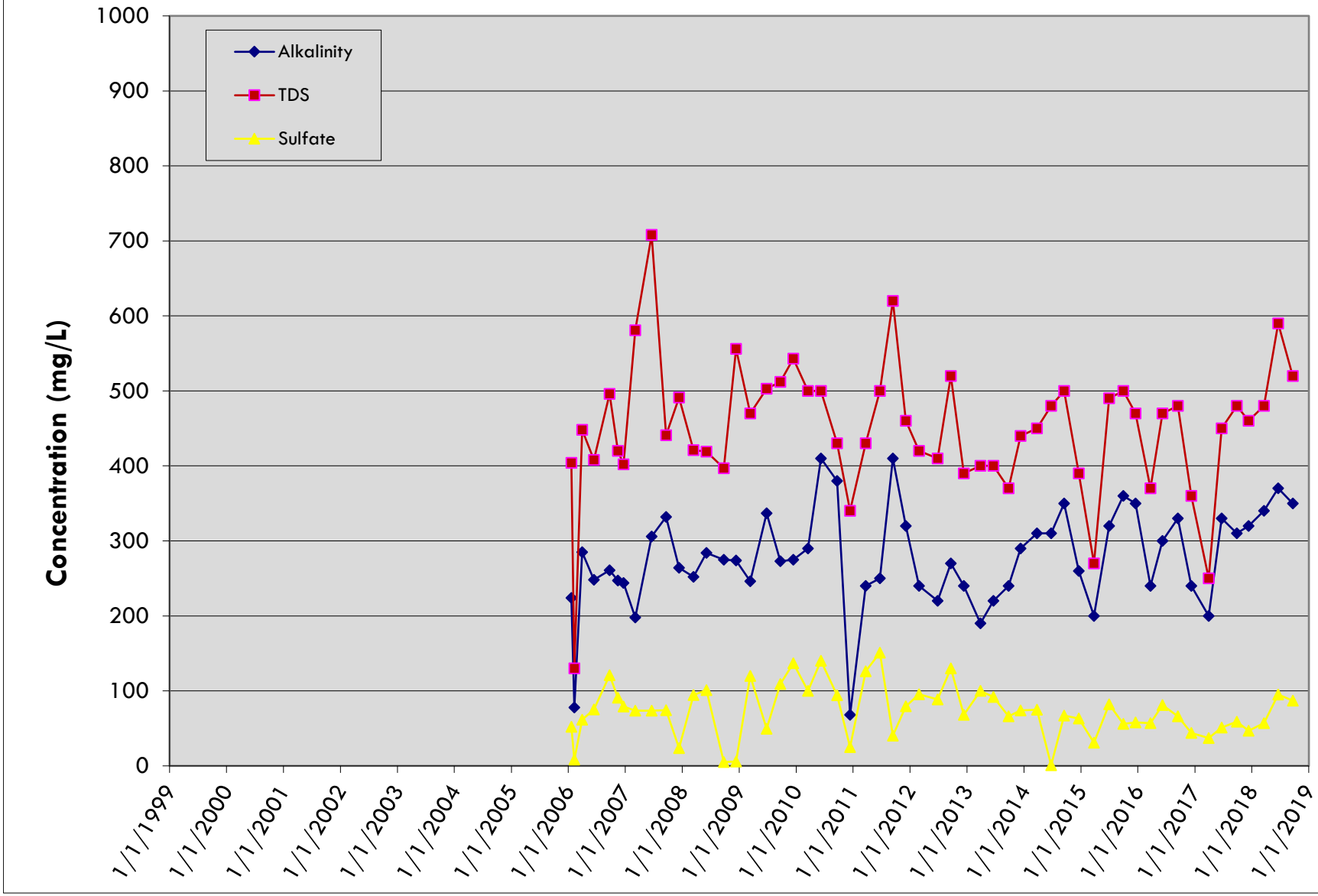
LDCS-3A

LRI Landfill, Pierce County, Washington



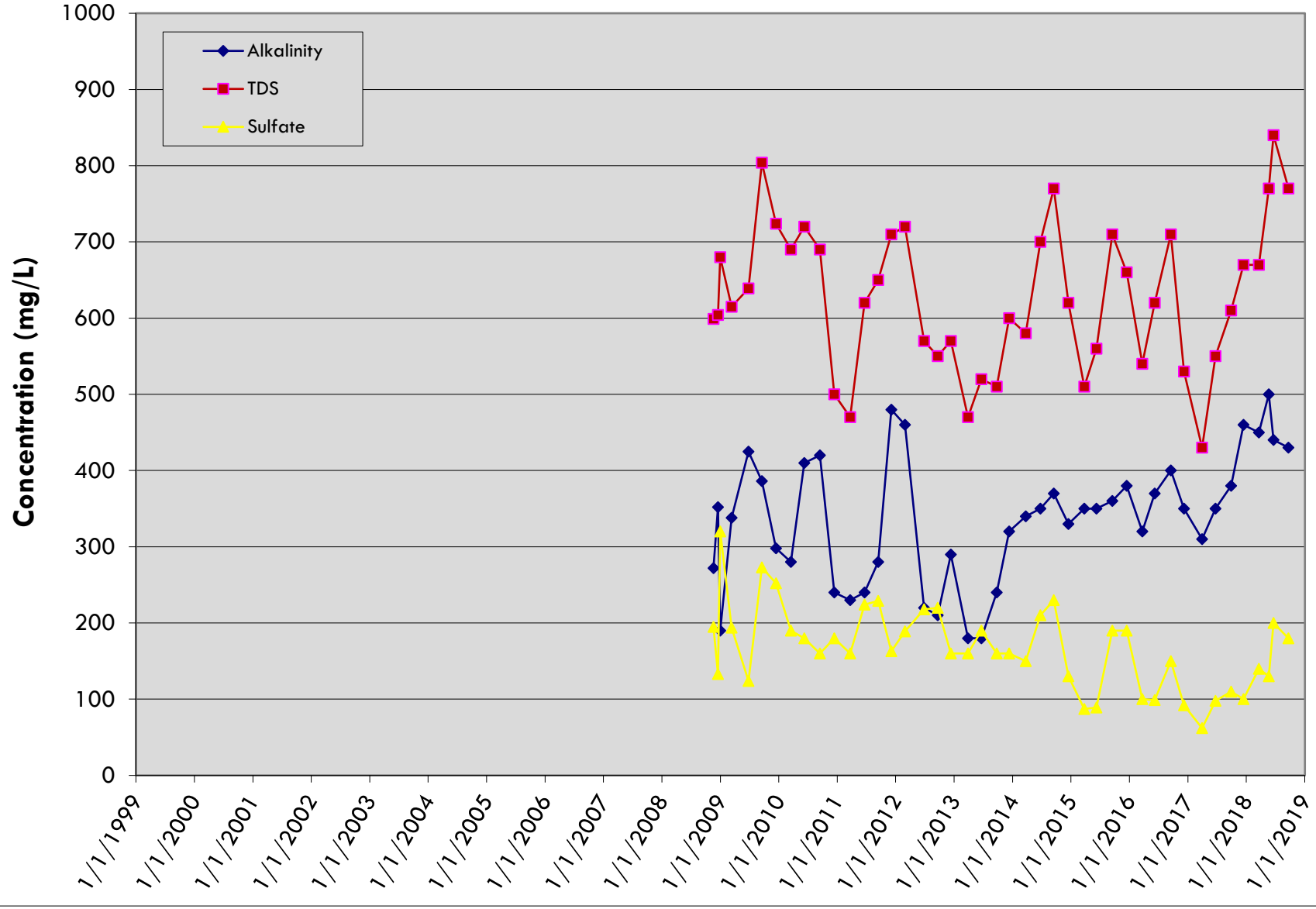
LDCS-4A

LRI Landfill, Pierce County, Washington



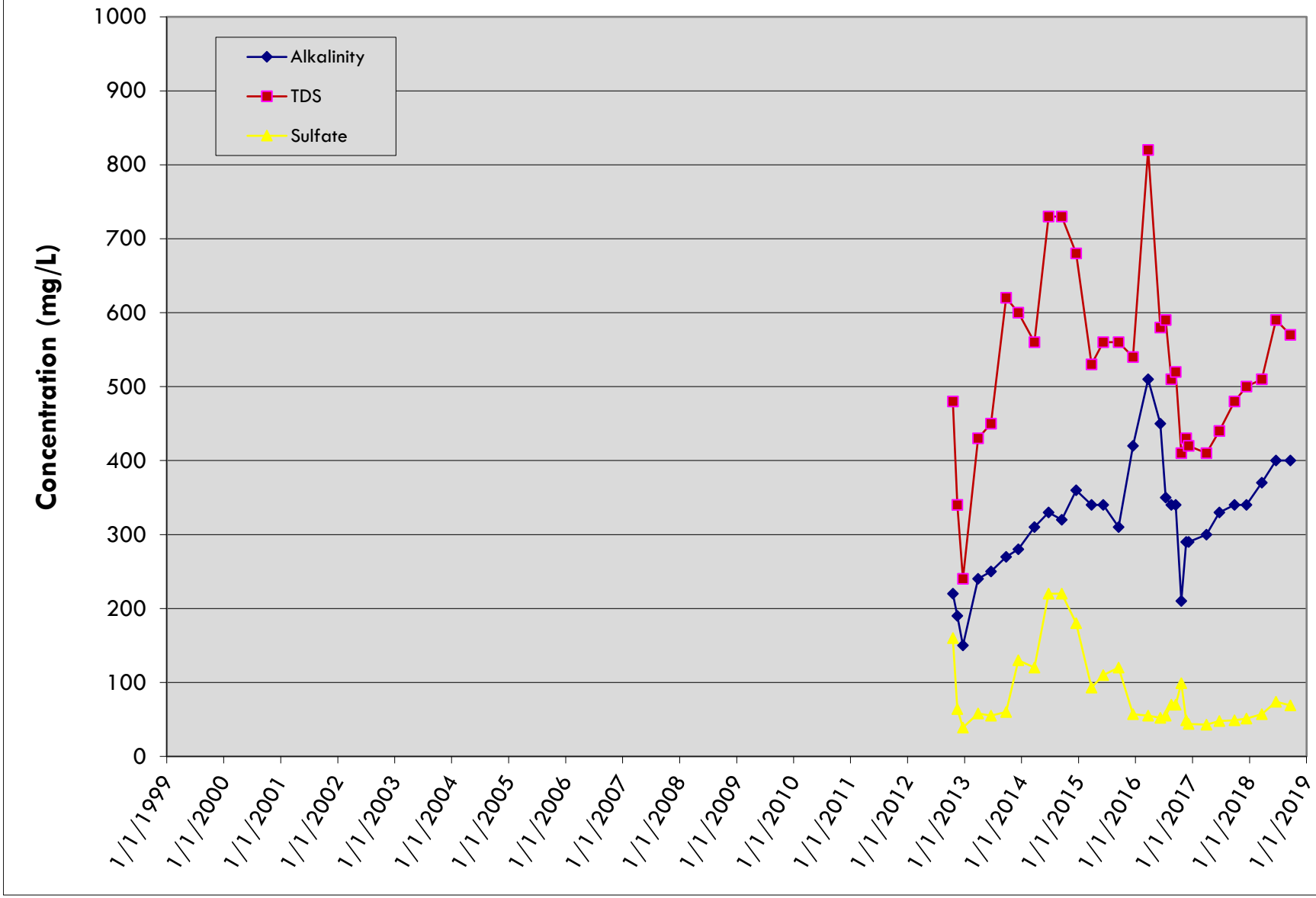
LDCS-4B

LRI Landfill, Pierce County, Washington



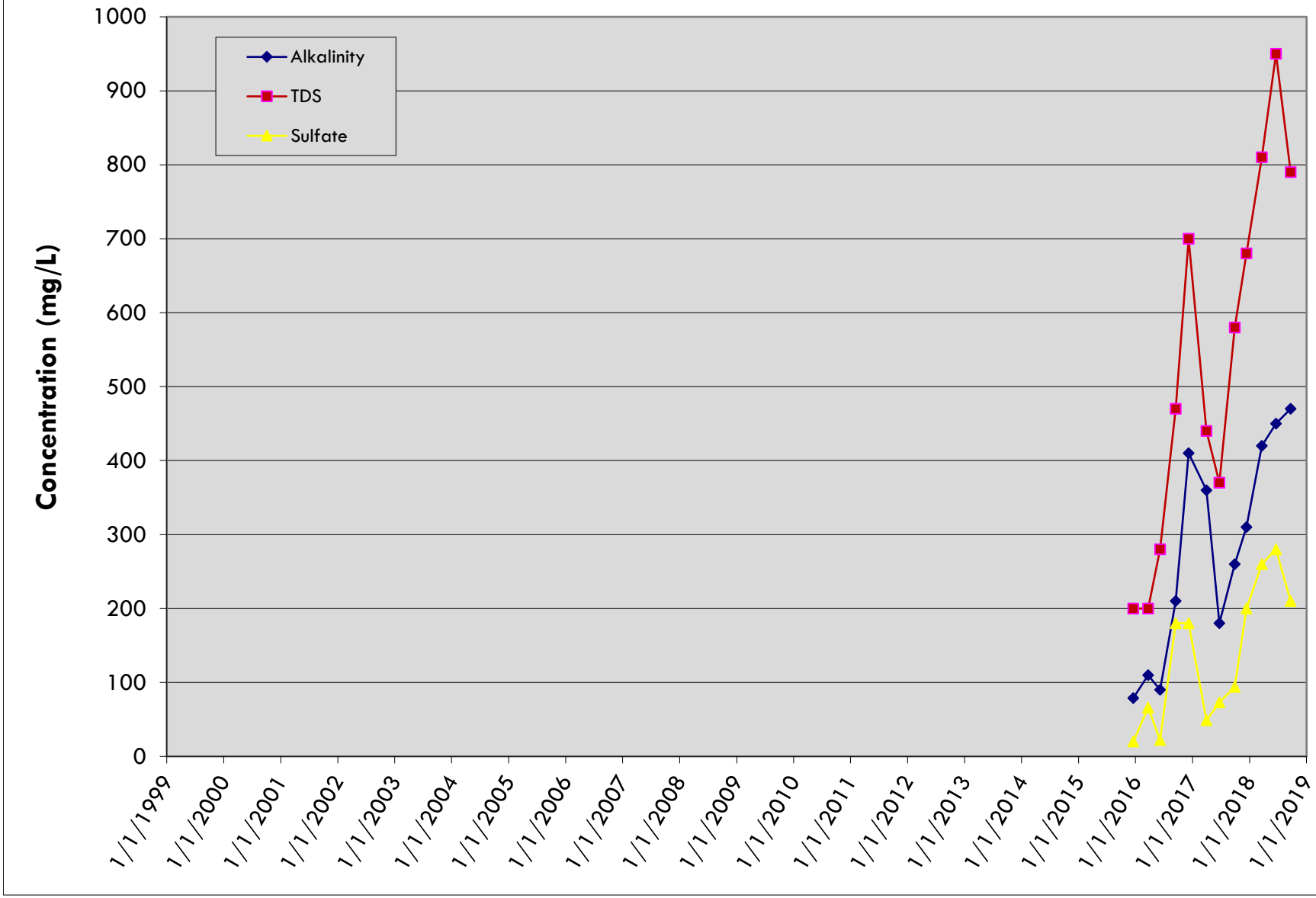
LDCS-5

LRI Landfill, Pierce County, Washington



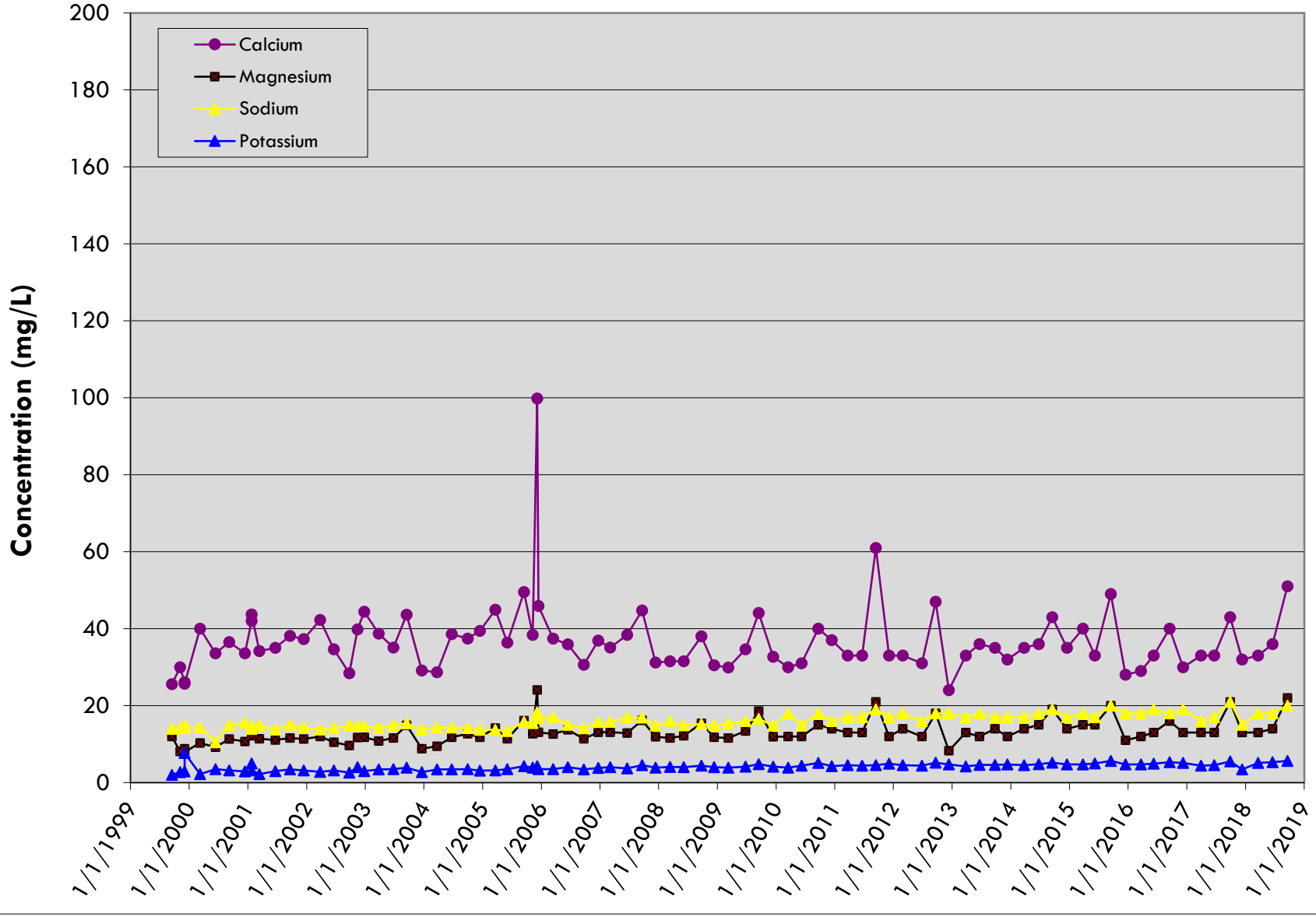
LDCS-6A

LRI Landfill, Pierce County, Washington



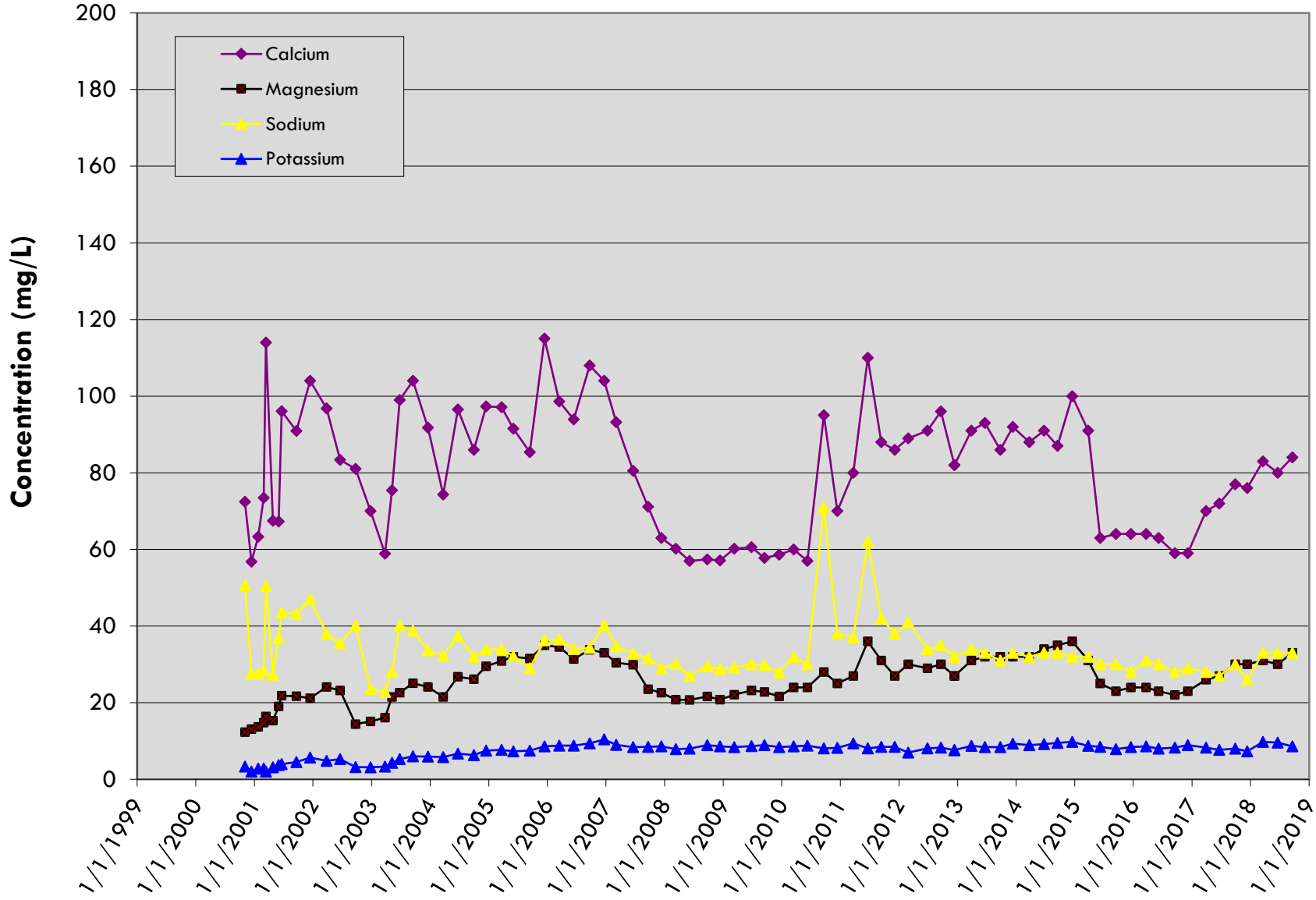
LDCS-1

LRI Landfill, Pierce County, Washington



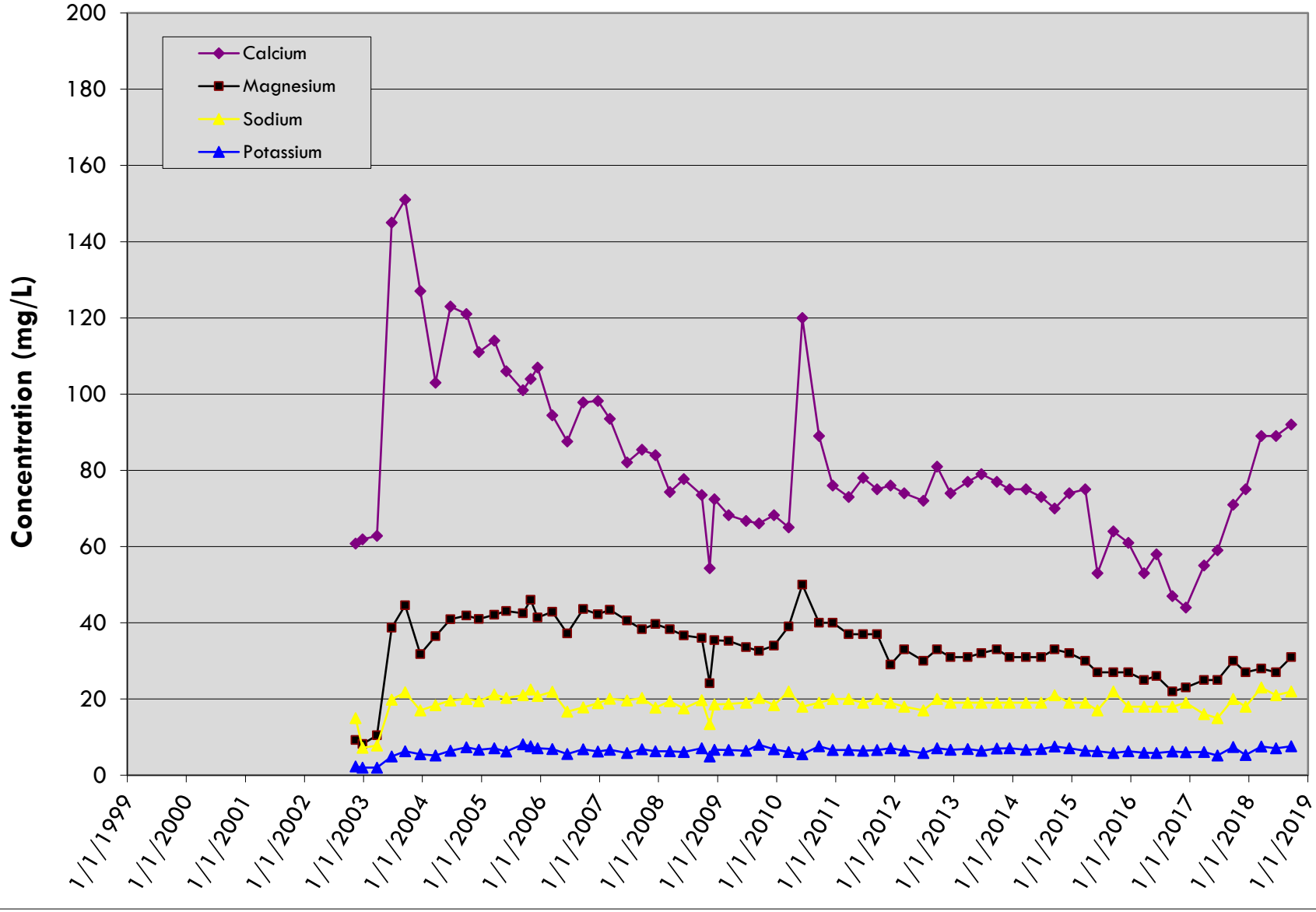
LDCS-2A

LRI Landfill, Pierce County, Washington



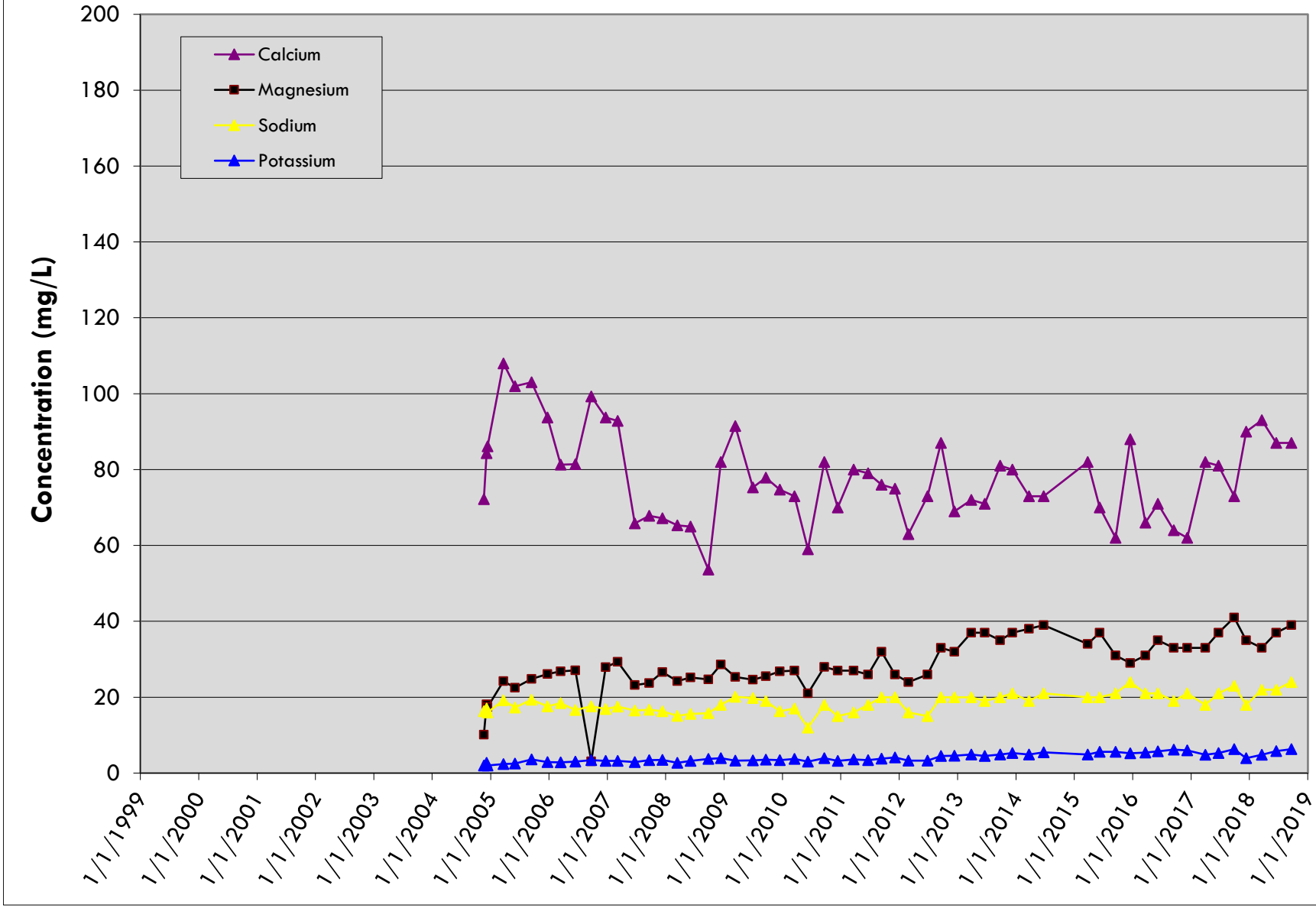
LDCS-2B

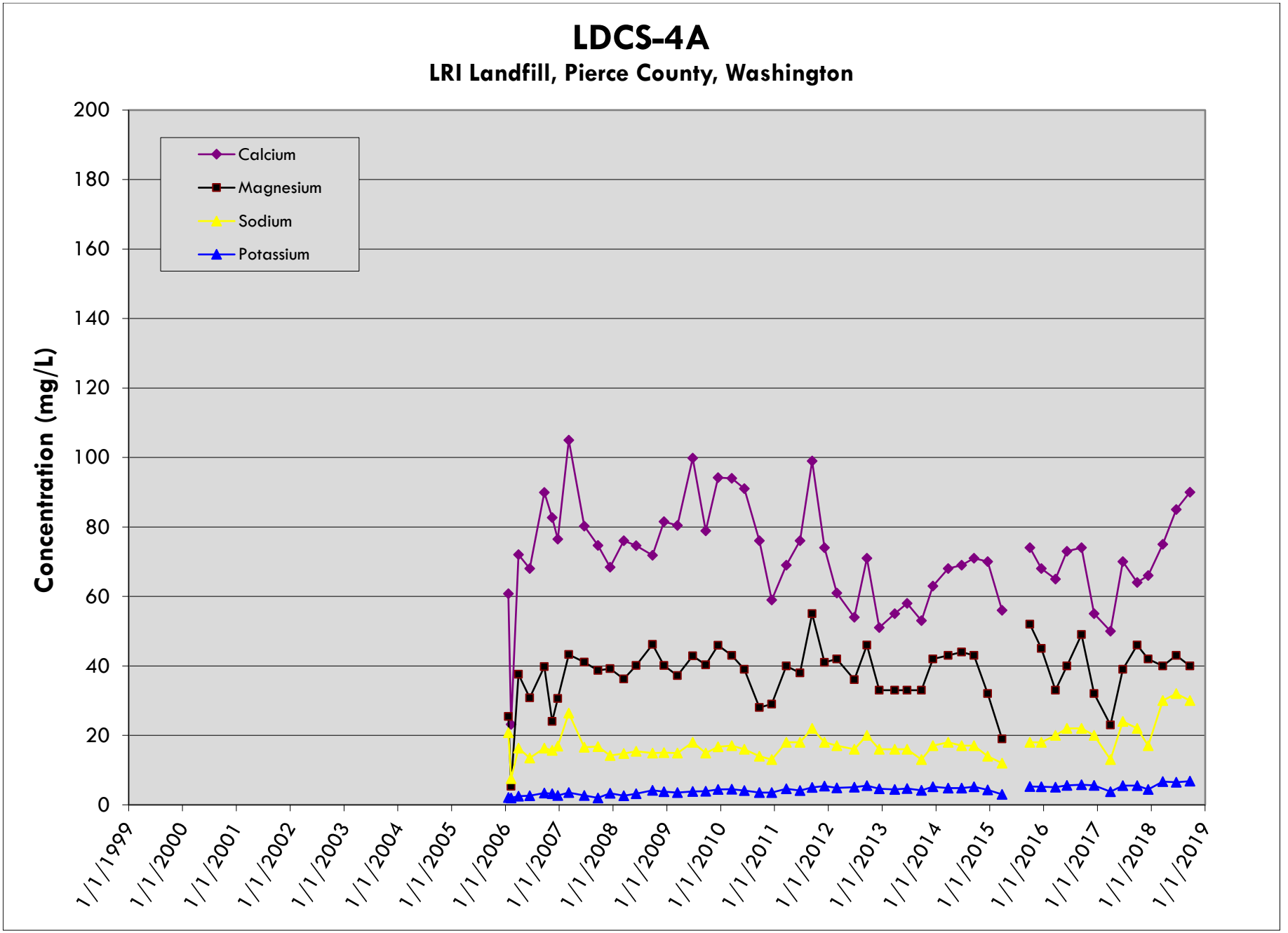
LRI Landfill, Pierce County, Washington



LDCS-3A

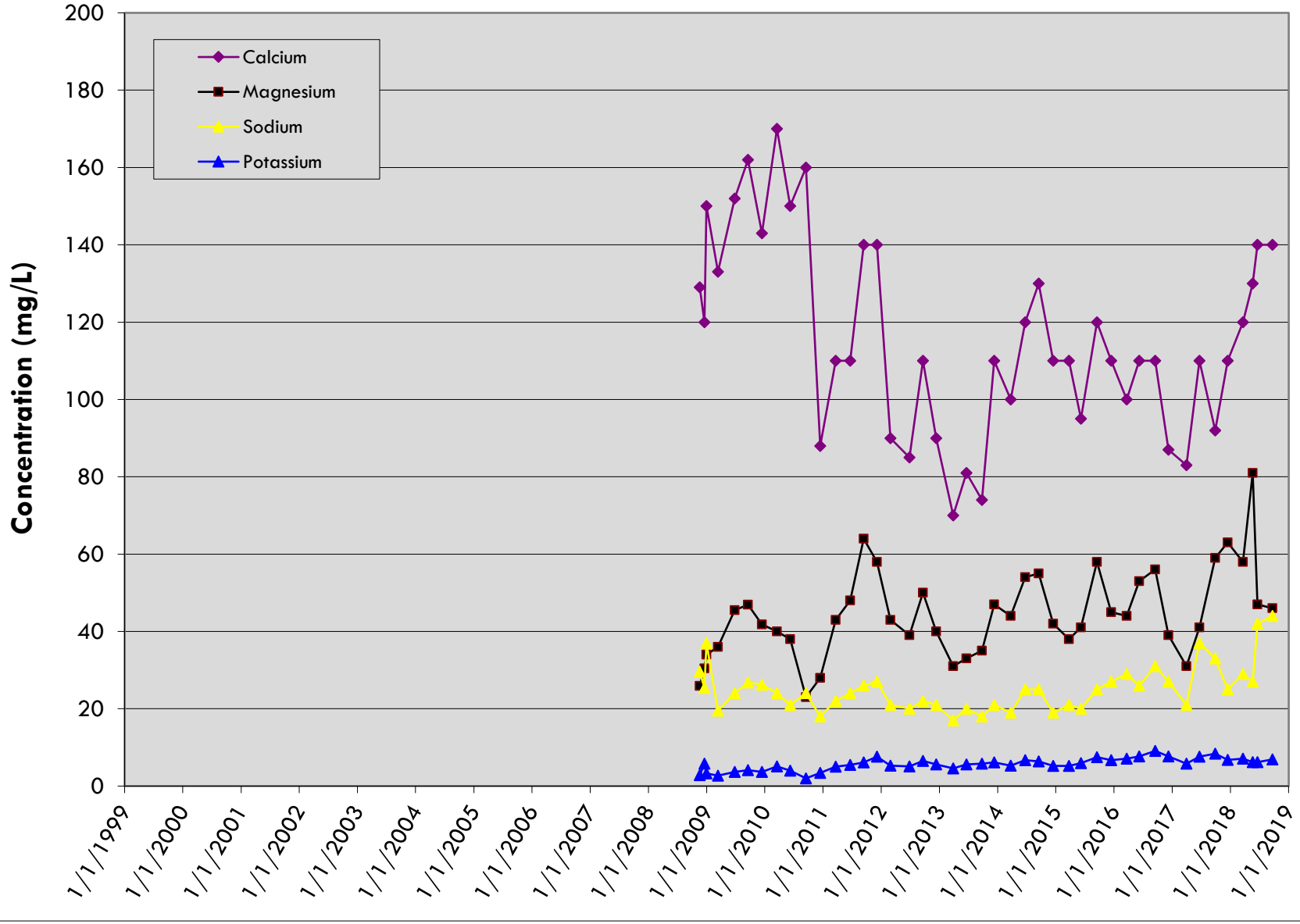
LRI Landfill, Pierce County, Washington




LDCS-4A
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
Calcium
Magnesium
Sodium
Potassium
200
180
160
140
120
100
80
60
40
20
0
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019

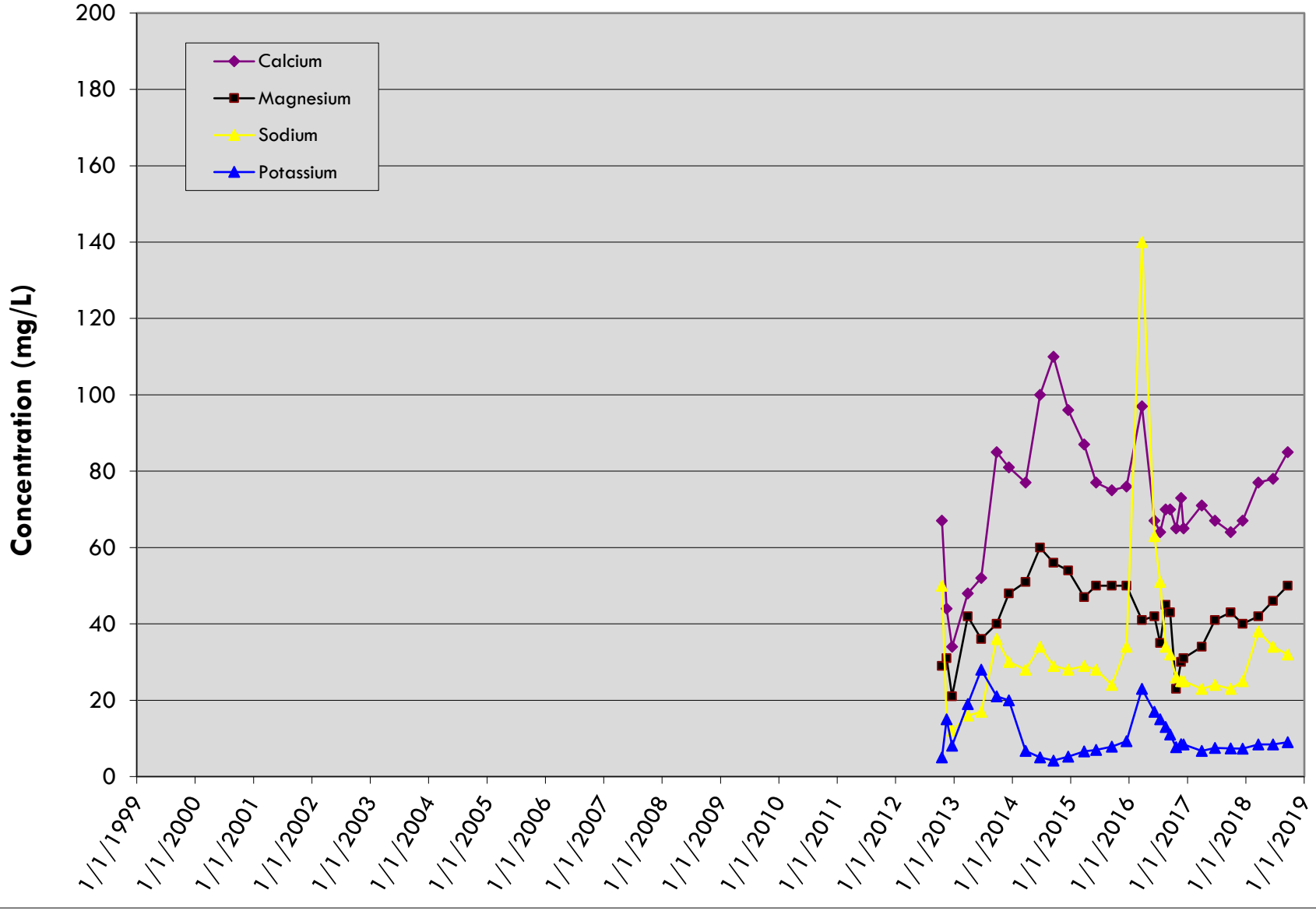
LDCS-4B

LRI Landfill, Pierce County, Washington



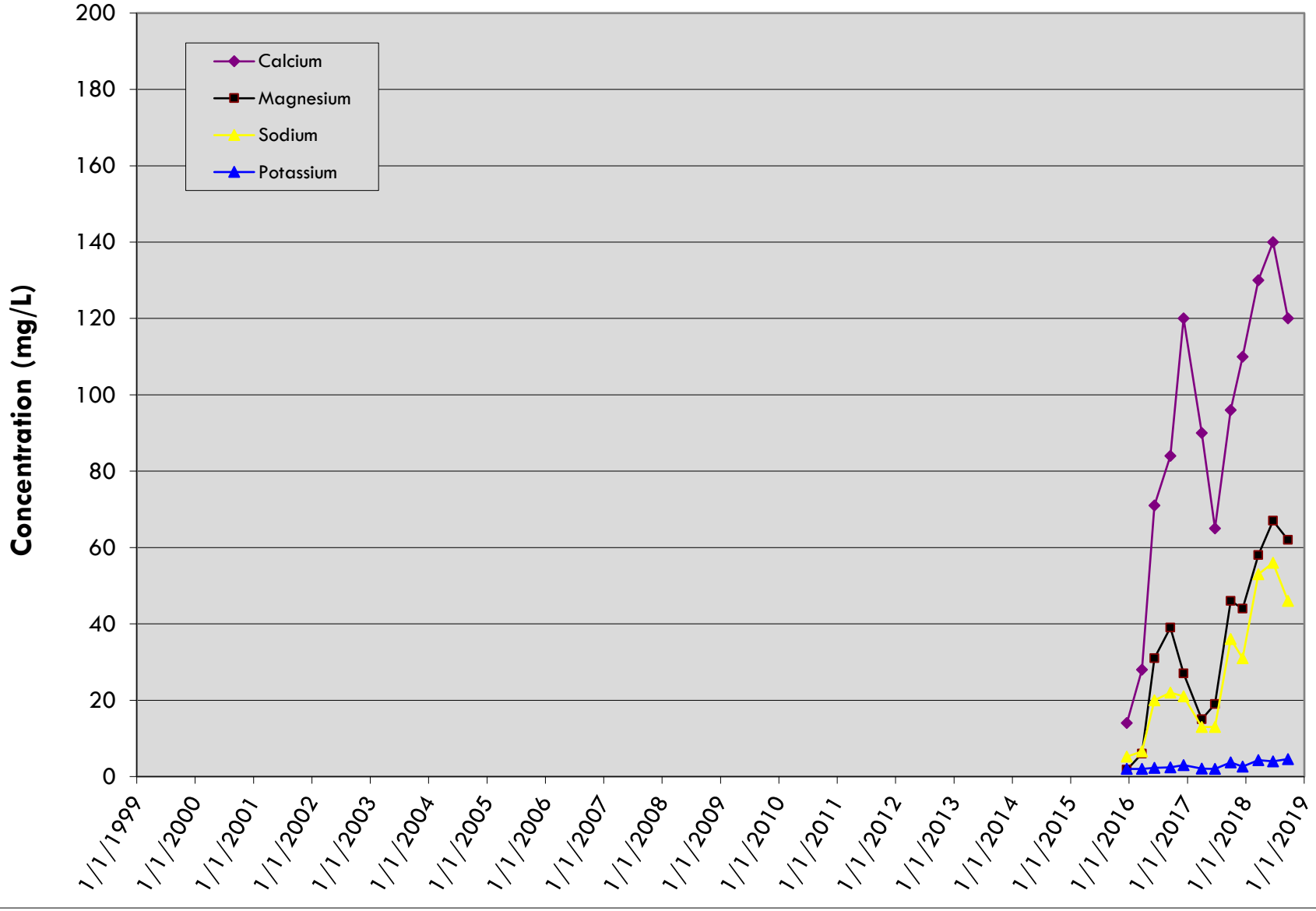
LDCS-5

LRI Landfill, Pierce County, Washington



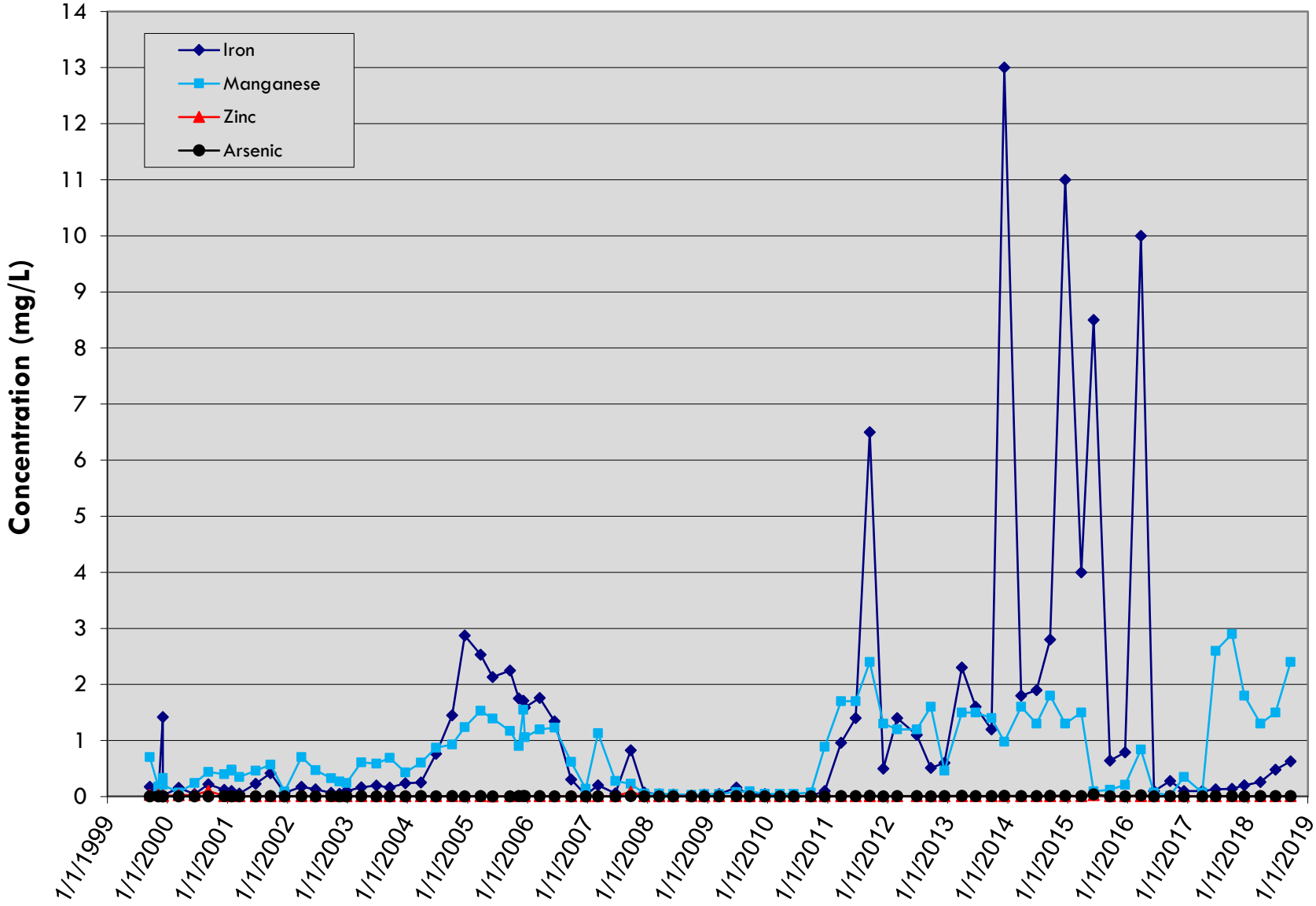
LDCS-6A

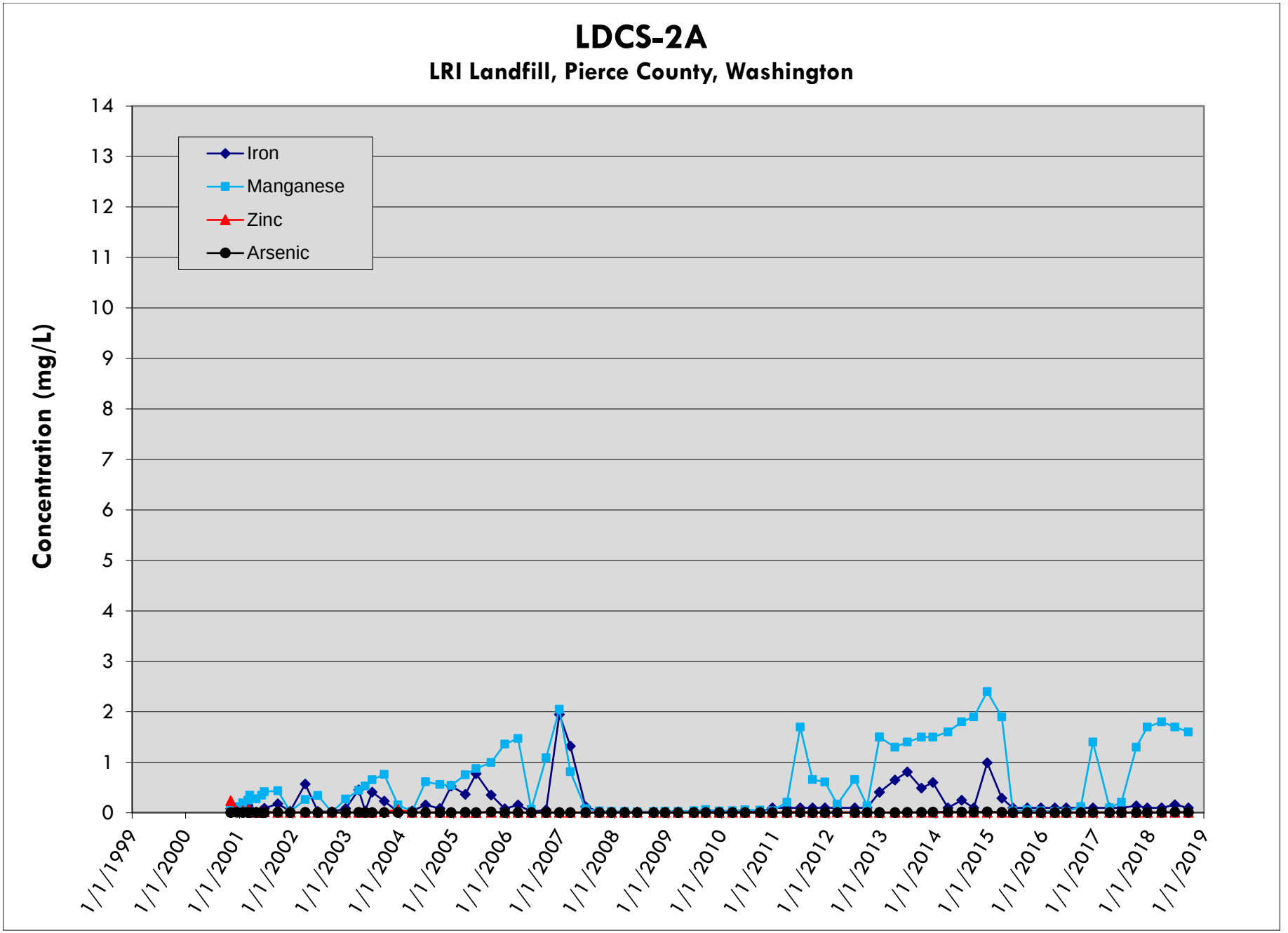
LRI Landfill, Pierce County, Washington



LDCS-1

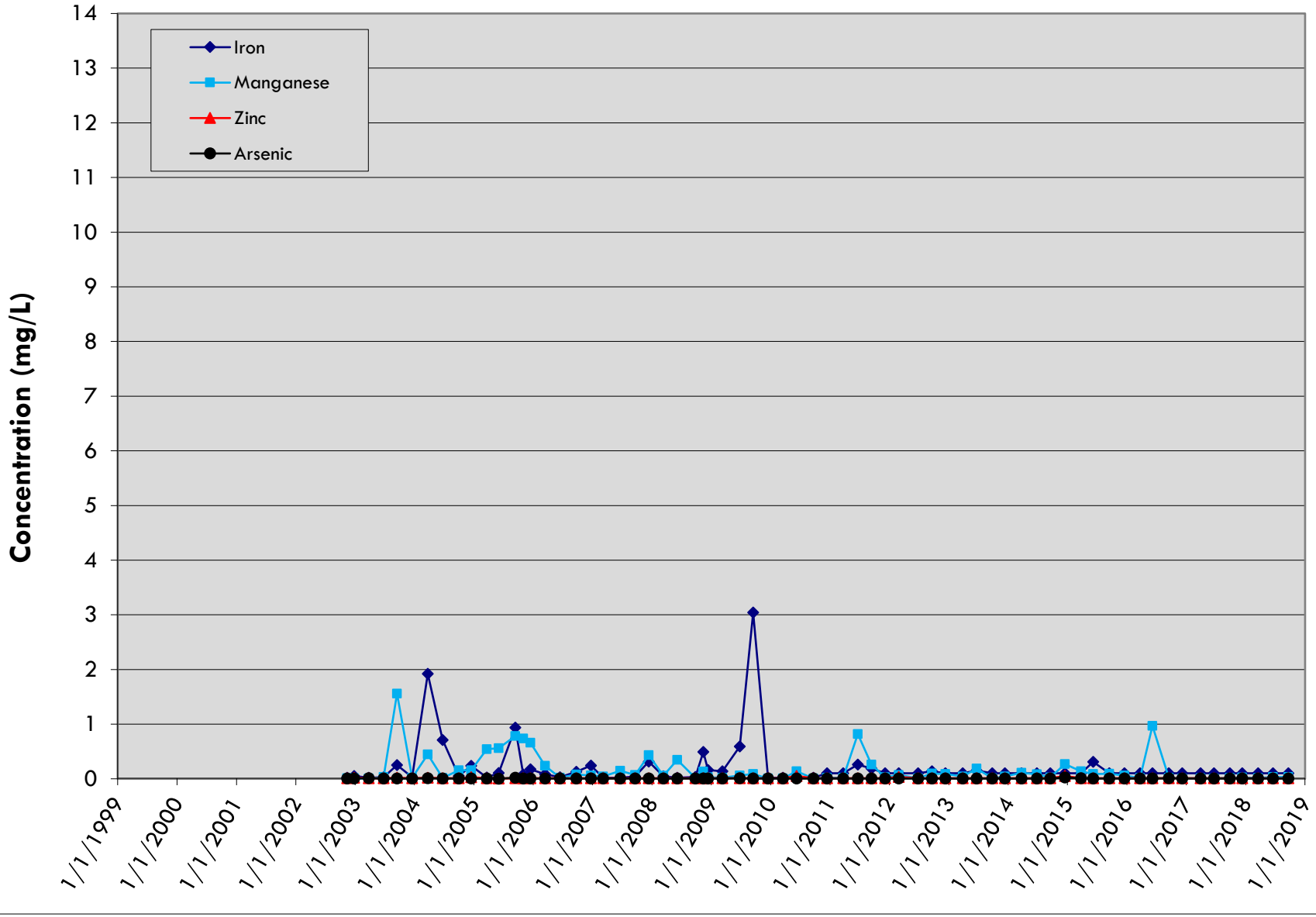
LRI Landfill, Pierce County, Washington




LDCS-2A
LRI Landfill, Pierce County, Washington
Concentration (mg/L)
Iron
Manganese
Zinc
Arsenic
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1/1/1999
1/1/2000
1/1/2001
1/1/2002
1/1/2003
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
1/1/2011
1/1/2012
1/1/2013
1/1/2014
1/1/2015
1/1/2016
1/1/2017
1/1/2018
1/1/2019

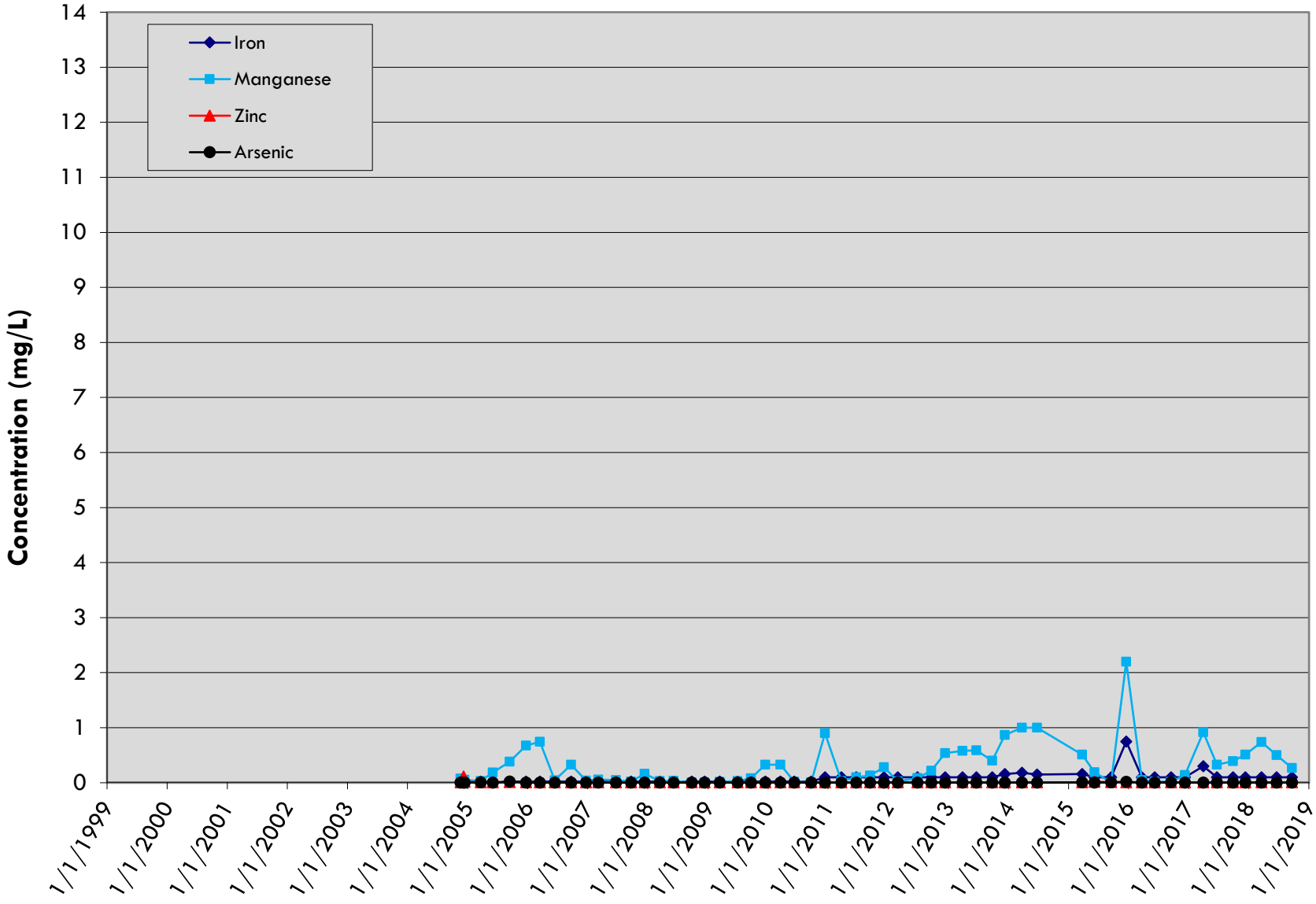
LDCS-2B

LRI Landfill, Pierce County, Washington



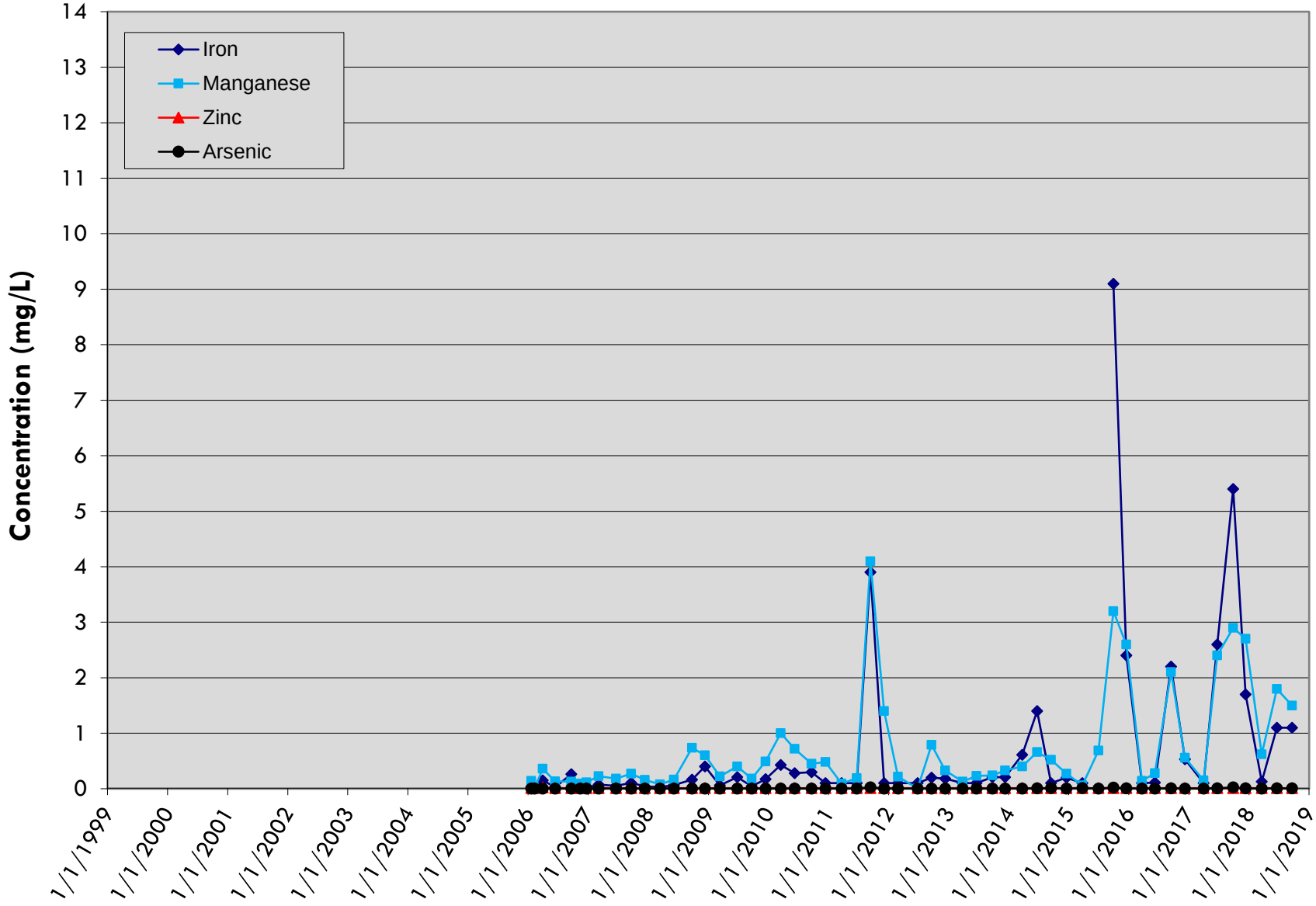
LDCS-3A

LRI Landfill, Pierce County, Washington



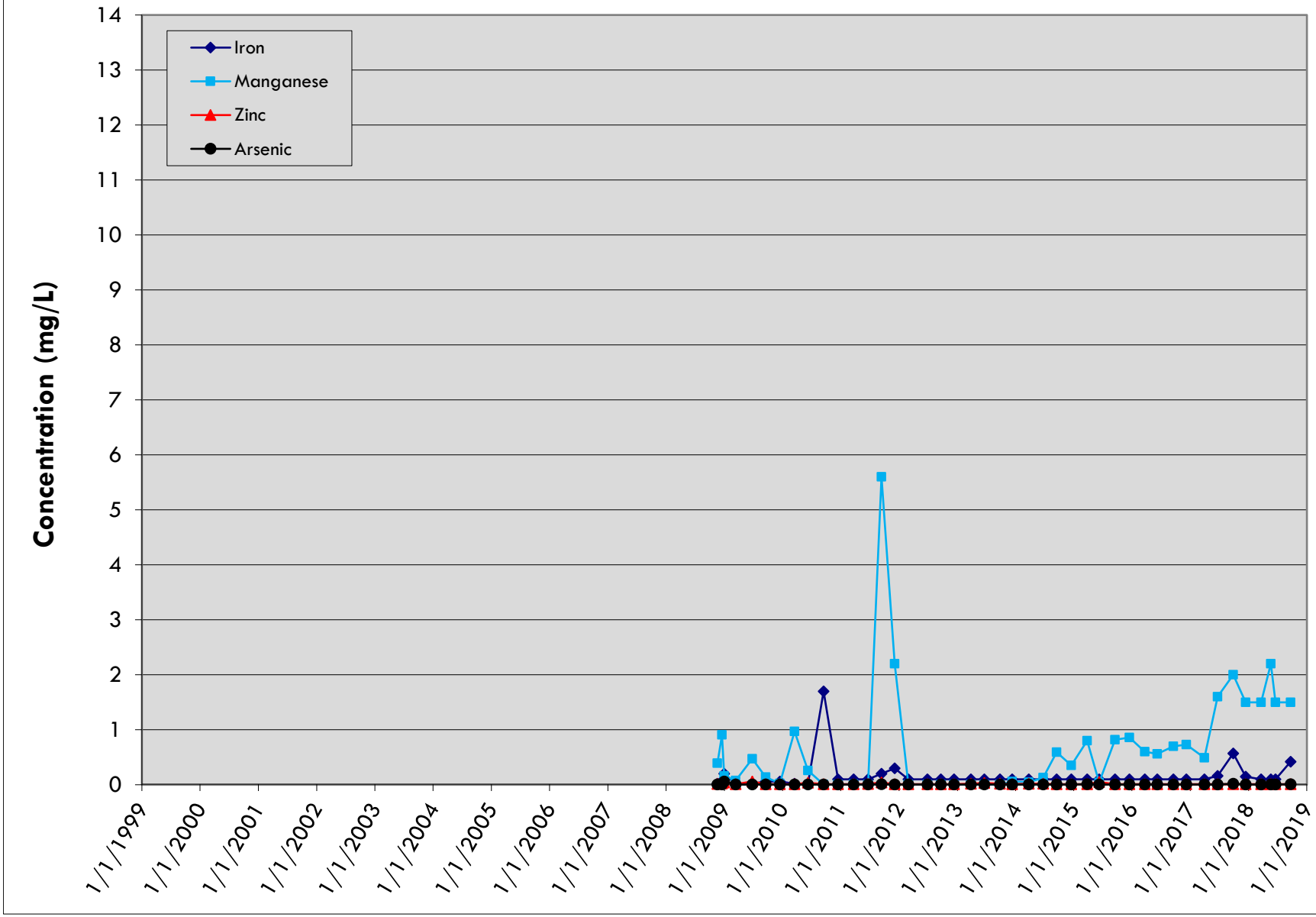
LDCS-4A

LRI Landfill, Pierce County, Washington



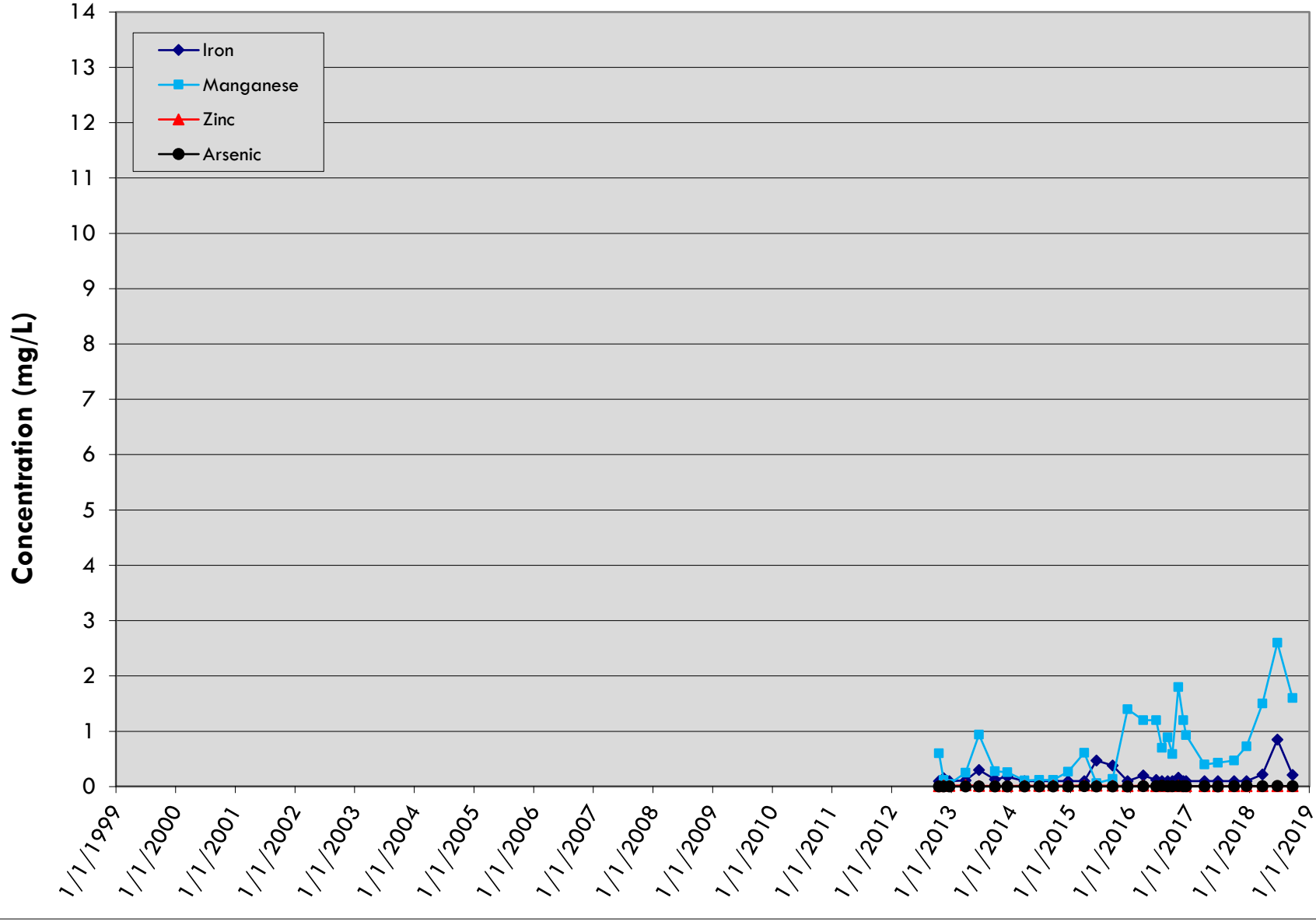
LDCS-4B

LRI Landfill, Pierce County, Washington



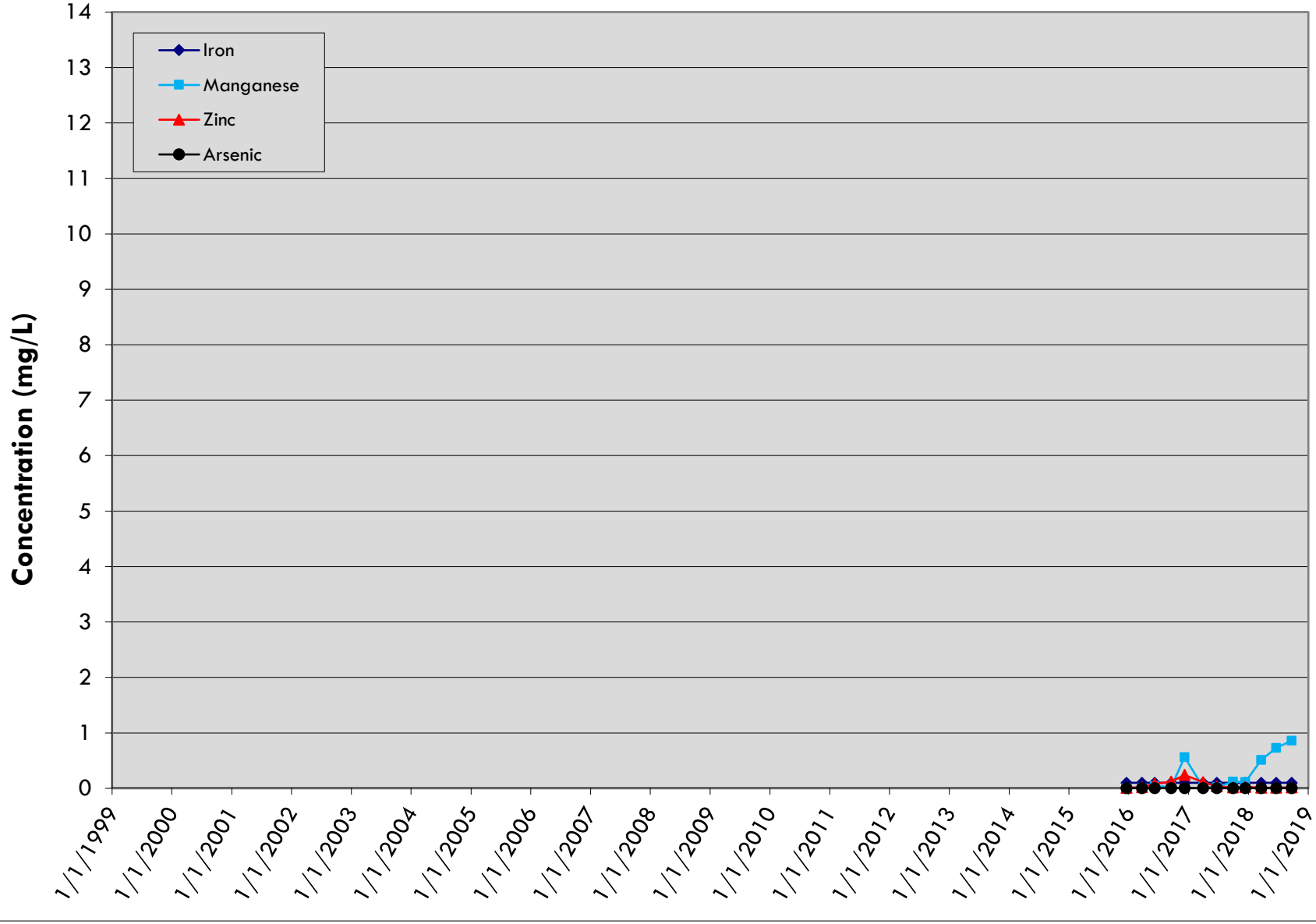
LDCS-5

LRI Landfill, Pierce County, Washington



LDCS-6A

LRI Landfill, Pierce County, Washington



Appendix H
LDCS Pumping Records and Conductivity Measurements

Summary of LDCS Volumes Pumped and Conductivity Data
Third Quarter 2018
LRI Landfill, Pierce County, Washington

Date	Rainfall	LDCS-1 Vol. (Gal.)	LDCS-1 Cond. (µS/cm)	LDCS-2A Vol. (Gal)	LDCS-2A Cond. (µS/cm)	LDCS-2B Vol. (Gal)	LDCS-2B Cond. (µS/cm)	LDCS-3A Vol. (Gal)	LDCS-3A Cond. (µS/cm)	LDCS-4A Vol. (Gal)	LDCS-4A Cond. (µS/cm)	LDCS-4B Vol. (Gal)	LDCS-4B Cond. (µS/cm)	LDCS-5 Vol. (Gal)	LDCS-5 Cond. (µS/cm)	LDCS-6 Vol. (Gal)	LDCS-6 Cond. (µS/cm)
7/1/2018	0.00	-	549	0	639	900	232	1170	479	-	903	66	1,153	333	922	1157	1223
7/2/2018	0.00	-	553	1000	648	900	233	1180	527	-	898	48	1,160	331	922	1148	1220
7/3/2018	0.00	-	521	0	650	900	234	1200	591	-	890	36	1,167	331	922	1157	1220
7/4/2018	0.00	-	459	1000	654	1000	239	1190	599	-	884	7	1,173	321	923	1268	1218
7/5/2018	0.00	-	456	0	651	950	240	600	391	660	885	0	1,178	333	923	1259	1220
7/6/2018	0.58	-	438	1010	652	750	236	-	203	1,630	897	8	1,183	501	924	1211	1224
7/7/2018	0.00	-	513	0	647	800	233	-	-	1,800	901	0	1,186	522	924	1267	1216
7/8/2018	0.00	-	482	1010	651	800	236	-	-	1,810	897	0	1,190	423	924	1257	1211
7/9/2018	0.00	-	502	0	652	750	239	-	107	1,790	893	113	1,190	378	924	1202	1210
7/10/2018	0.10	-	543	1000	644	800	236	-	284	1,630	892	0	1,184	358	925	1196	1205
7/11/2018	0.00	-	474	0	651	850	236	-	484	1,630	894	3,331	1,188	325	925	1151	1201
7/12/2018	0.00	-	433	1010	657	800	241	-	427	1,790	897	5,871	1,161	306	925	1144	1199
7/13/2018	0.00	-	427	0	660	800	241	-	393	1,970	894	4,235	1,142	305	925	1162	1199
7/14/2018	0.00	-	421	1010	661	700	238	-	436	2,030	892	0	1,133	313	924	1153	1200
7/15/2018	0.00	-	413	0	662	700	239	-	451	1,840	895	0	1,146	316	923	1099	1200
7/16/2018	0.00	-	413	1010	662	750	241	-	409	1,630	896	0	1,164	327	922	1158	1197
7/17/2018	0.00	-	422	0	662	800	239	-	442	1,620	897	4,674	1,174	337	921	1105	1194
7/18/2018	0.00	-	430	1000	661	800	236	-	460	1,600	899	5,952	1,164	351	921	1054	1190
7/19/2018	0.00	-	428	0	660	650	234	-	525	1,620	900	0	1,147	360	921	1044	1184
7/20/2018	0.00	-	478	1010	659	700	234	-	517	1,620	902	8,938	1,149	360	921	989	1178
7/21/2018	0.00	-	456	0	658	700	237	-	518	1,700	905	0	1,144	364	920	991	1172
7/22/2018	0.00	-	442	0	659	700	238	-	478	1,600	905	4,314	1,149	364	921	983	1168
7/23/2018	0.00	-	433	1000	662	650	240	-	518	1,620	903	6,481	1,147	364	921	993	1164
7/24/2018	0.00	-	435	0	665	700	241	-	546	1,620	901	0	1,141	367	922	941	1160
7/25/2018	0.00	-	437	1010	322	650	240	-	583	1,610	901	0	1,154	369	923	890	1157
7/26/2018	0.00	-	-	0	463	700	240	-	606	1,600	901	0	1,167	361	925	887	1154
7/27/2018	0.00	-	-	1010	591	600	242	-	615	1,440	898	0	1,175	354	925	899	1150
7/28/2018	0.00	-	-	0	637	650	243	-	619	1,500	533	6,371	1,188	356	928	883	1147
7/29/2018	0.00	-	-	0	655	600	242	-	622	1,450	548	0	1,172	360	928	877	1145
7/30/2018	0.00	-	-	1050	663	600	243	-	623	1,450	762	4	1,167	366	929	889	1144
7/31/2018	0.00	-	-	0	666	650	242	-	-	1,430	841	0	1,172	366	930	832	1141
8/1/2018	0.00	-	-	1010	666	600	242	-	622	1,440	869	0	1,175	365	932	801	1137
8/2/2018	0.00	-	-	0	664	600	241	-	615	1,290	877	0	1,178	353	933	784	1134
8/3/2018	0.00	-	-	0	658	500	240	-	569	1,280	880	0	1,180	351	934	819	1130
8/4/2018	0.00	-	-	1010	660	550	240	-	518	1,290	884	13,358	1,179	353	936	750	1126
8/5/2018	0.00	-	-	0	665	600	244	-	410	1,450	885	0	1,153	346	938	754	1124
8/6/2018	0.00	-	-	930	667	600	244	-	519	1,480	504	7,318	1,154	335	938	772	1125
8/7/2018	0.00	-	-	0	667	450	243	-	580	1,460	509	95	1,138	325	939	780	1121
8/8/2018	0.00	-	-	1010	667	600	245	-	566	1,460	747	0	1,144	327	941	838	1115
8/9/2018	0.00	-	-	0	668	500	245	-	573	1,290	837	0	1,166	334	944	837	1110
8/10/2018	0.00	-	-	0	669	500	244	-	526	1,290	871	0	1,179	321	945	779	1108
8/11/2018	0.19	-	-	970	667	450	243	-	533	1,270	884	3,599	1,181	334	947	782	1106
8/12/2018	0.00	-	-	0	661	600	241	-	589	1,270	890	0	1,167	351	949	777	1103
8/13/2018	0.00	-	-	0	659	400	240	-	612	1,290	891	7	1,173	308	950	723	284
8/14/2018	0.00	-	-	0	664	500	243	-	619	1,290	890	0	1,181	282	951	734	600
8/15/2018	0.00	-	-	0	669	550	245	-	622	1,290	886	0	1,189	262	952	825	917
8/16/2018	0.00	-	-	0	671	400	245	-	624	1,120	882	0	1,192	233	953	779	1036
8/17/2018	0.00	-	-	0	668	500	242	-	626	1,120	879	0	1,193	221	953	725	334
8/18/2018	0.00	-	-	0	667	500	239	-	626	1,140	878	9,128	1,191	210	953	678	525
8/19/2018	0.00	-	-	0	668	450	241	-	610	1,170	875	0	1,168	209	953	728	885
8/20/2018	0.00	-	-	990	666	400	243	-	528	1,120	873	6	1,168	199	952	679	1015
8/21/2018	0.00	-	-	0	667	500	244	-	586	1,120	873	5,360	1,175	196	950	672	1063
8/22/2018	0.00	-	-	0	668	350	243	-	591	1,290	875	10,478	1,162	190	949	674	1081
8/23/2018	0.00	-	-	1010	669	500	243	-	609	1,290	876	0	1,141	178	948	620	1086
8/24/2018	0.00	-	-	0	666	400	240	-	618	1,120	878	0	1,139	160	948	611	1087
8/25/2018	0.27	-	-	0	663	350	238	-	620	1,290	880	0	1,148	159	947	625	1085
8/26/2018	0.00	-	-	1010	649	500	239	-	621	1,120	881	0	1,158	165	945	618	1083
8/27/2018	0.00	-	476	0	641	400	242	-	620	1,280	883	0	1,166	215	944	565	1082
8/28/2018	0.00	-	480	0	656	350	243	-	620	1,280	883	0	1,171	233	943	621	1079
8/29/2018	0.00	-	319	1000	664	400	243	-	619	1,130	881	4,475	1,174	217	942	616	1076
8/30/2018	0.00	-	125	0	661	400	243	-	620	1,290	878	2,585	1,156	198	941	622	1075
8/31/2018	0.00	-	585	0	-	400	241	-	623	1,290	880	0	1,143	190	939	572	1076

Summary of LDCS Volumes Pumped and Conductivity Data
Third Quarter 2018
LRI Landfill, Pierce County, Washington

Date	Rainfall	LDCS-1 Vol. (Gal.)	LDCS-1 Cond. (µS/cm)	LDCS-2A Vol. (Gal)	LDCS-2A Cond. (µS/cm)	LDCS-2B Vol. (Gal)	LDCS-2B Cond. (µS/cm)	LDCS-3A Vol. (Gal)	LDCS-3A Cond. (µS/cm)	LDCS-4A Vol. (Gal)	LDCS-4A Cond. (µS/cm)	LDCS-4B Vol. (Gal)	LDCS-4B Cond. (µS/cm)	LDCS-5 Vol. (Gal)	LDCS-5 Cond. (µS/cm)	LDCS-6 Vol. (Gal)	LDCS-6 Cond. (µS/cm)
9/1/2018	0.00	-	-	1010	-	250	238	-	623	1,120	881	0	1,148	189	938	572	1073
9/2/2018	0.00	-	-	0	-	400	239	-	623	1,290	883	0	1,160	189	936	571	1070
9/3/2018	0.00	-	495	0	671	400	241	-	623	1,120	887	0	1,169	181	935	568	1067
9/4/2018	0.00	-	509	1030	681	300	241	-	623	1,120	886	0	1,174	181	933	565	1065
9/5/2018	0.00	-	508	0	790	350	241	-	622	1,100	880	0	1,180	188	932	568	1063
9/6/2018	0.00	-	495	0	848	400	242	-	622	480	876	0	1,186	180	931	567	1061
9/7/2018	0.00	-	506	10	825	300	241	-	623	-	876	2,173	1,187	179	931	520	1060
9/8/2018	0.00	-	-	1040	-	350	239	-	624	-	877	0	1,167	180	931	520	1058
9/9/2018	0.00	-	-	0	-	300	240	-	624	-	878	0	1,169	180	931	518	1055
9/10/2018	0.22	-	510	20	851	400	243	-	624	-	883	9	1,178	368	932	568	1052
9/11/2018	0.13	-	512	1010	833	300	244	-	625	-	894	0	1,179	385	933	570	1051
9/12/2018	0.06	-	509	0	836	350	245	-	625	-	905	0	1,182	297	935	616	1053
9/13/2018	0.07	-	505	0	851	300	245	-	626	-	895	0	1,187	265	936	670	1059
9/14/2018	0.11	-	-	0	-	300	244	-	627	-	883	87	1,187	240	936	682	1067
9/15/2018	0.10	-	-	1020	-	350	243	-	627	-	872	12	1,166	238	937	729	1071
9/16/2018	0.00	-	-	0	-	300	243	-	626	-	850	940	1,166	307	938	731	1070
9/17/2018	0.00	-	506	0	849	300	243	-	627	-	819	7,249	1,134	325	938	474	1050
9/18/2018	0.00	-	508	970	862	350	241	-	629	-	818	10,911	1,104	251	938	735	1042
9/19/2018	0.00	-	515	0	836	300	240	-	629	-	826	10,937	1,099	220	938	998	1030
9/20/2018	0.02	-	505	0	835	300	239	-	629	-	845	3,961	1,109	216	936	738	1021
9/21/2018	0.02	-	516	0	844	300	240	-	628	-	861	3,101	1,117	185	935	705	1006
9/22/2018	0.00	-	-	1010	-	350	244	-	626	-	872	417	1,111	184	934	728	1004
9/23/2018	0.00	-	-	0	-	300	246	-	627	-	880	0	1,115	185	934	678	1005
9/24/2018	0.00	-	-	0	845	250	244	-	628	-	884	0	1,143	186	933	621	1008
9/25/2018	0.00	-	-	1010	807	300	241	-	627	-	881	0	1,171	184	933	609	1013
9/26/2018	0.00	-	-	0	822	300	240	-	591	-	875	0	1,190	154	932	613	1019
9/27/2018	0.00	-	-	0	836	350	240	-	612	-	870	0	1,201	183	930	618	1025
9/28/2018	0.05	-	-	0	834	300	242	-	357	-	865	0	1,207	185	930	732	1034
9/29/2018	0.00	-	-	1020	-	250	243	-	386	-	861	0	1,209	154	929	729	1052
9/30/2018	0.00	-	-	0	-	400	244	-	534	-	861	0	1,209	185	930	681	1081

- = No data collected, meter not functioning properly

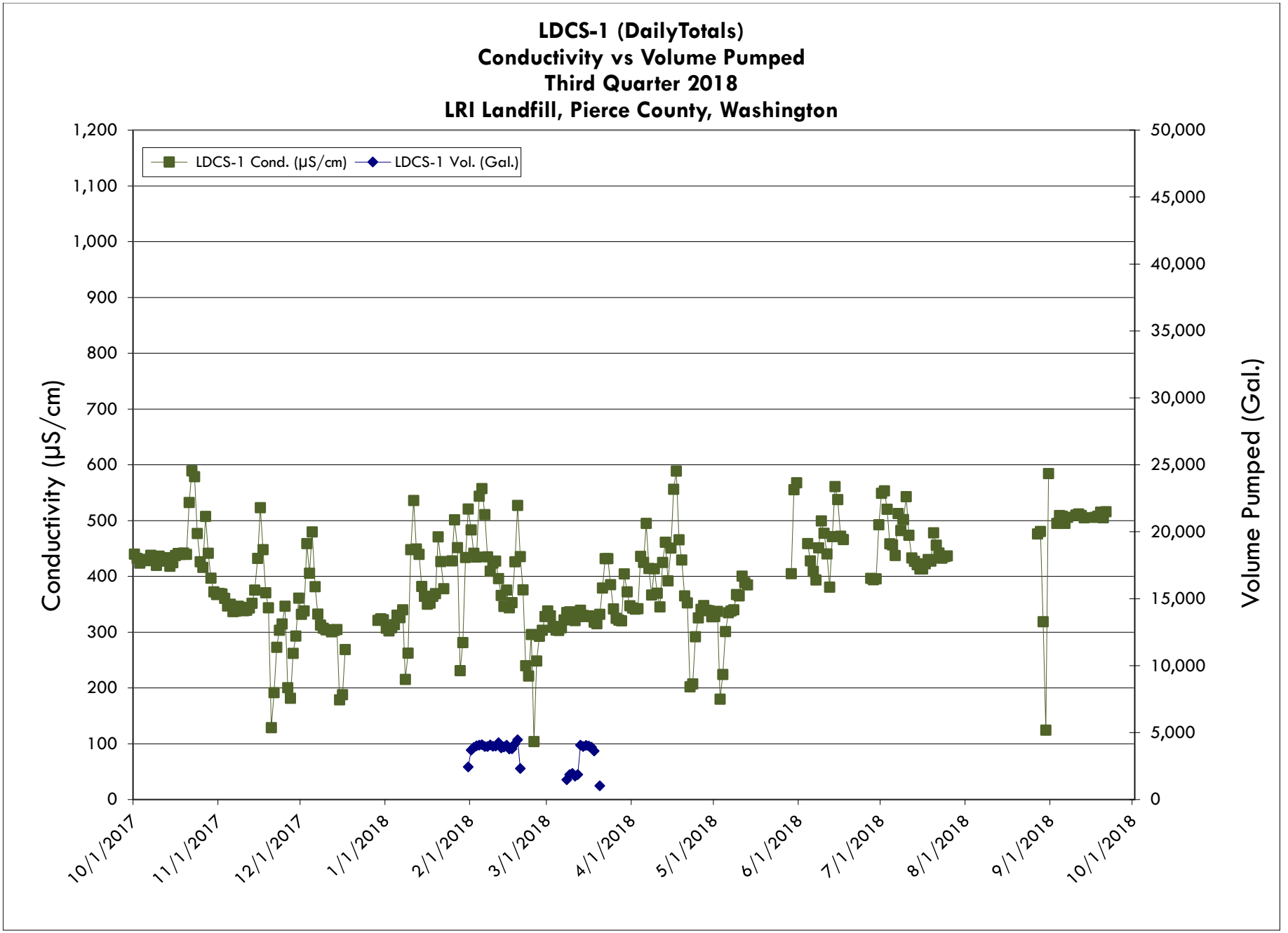
Summary of Leachate Volume and Depth Data
Third Quarter 2018
LRI Landfill, Pierce County, Washington

Date	Cell 1 Leachate Volume (GPD)	Cell 1 Leachate Level (in.)	Cell 2A Leachate Volume (GPD)	Cell 2A Leachate Level (in.)	Cell 2B Leachate Volume (GPD)	Cell 2B Leachate Level (in.)	Cell 3A Leachate Volume (GPD)	Cell 3A Leachate Level (in.)	Cell 4A Leachate Volume (GPD)	Cell 4A Leachate Level (in.)	Cell 4B Leachate Volume (GPD)	Cell 4B Leachate Level (in.)	Cell 5 Leachate Volume (GPD)	Cell 5 Leachate Level (in.)	Cell 6 Leachate Volume (GPD)	Cell 6 Leachate Level (in.)
7/1/2018	3,575	12.3	3,926	7.8	3,866	15.1	246	11.8	3	7.0	25,248	10.2	742	4.8	7,144	11.0
7/2/2018	0	13.5	0	9.2	4,982	12.8	34	9.4	0	7.0	24,216	10.2	25,552	5.5	5,667	11.1
7/3/2018	4,588	13.4	5,041	10.4	3,681	13.3	383	12.7	0	7.0	22,044	11.3	27,016	4.4	7,133	11.0
7/4/2018	2,196	12.3	2,553	6.6	7,393	13.6	4,597	11.3	1	7.0	21,978	10.3	5,294	5.5	7,757	10.9
7/5/2018	0	13.7	0	8.2	3,845	14.0	5,623	11.4	0	7.0	29,130	10.9	21,730	6.6	7,131	11.4
7/6/2018	4,970	13.3	4,779	9.4	6,112	15.6	2,242	11.9	0	7.0	7,070	11.9	24,162	6.1	11,086	11.3
7/7/2018	2,904	12.0	2,635	5.6	7,347	11.6	0	10.0	0	7.0	12,138	16.2	19,882	5.7	9,841	10.8
7/8/2018	8,675	12.5	5	7.5	3,438	13.1	0	11.4	0	7.0	14,942	18.3	8,886	6.5	6,999	11.0
7/9/2018	10,949	9.2	0	8.8	4,038	15.8	0	11.2	5	7.0	27,120	19.4	29,078	6.9	9,065	11.0
7/10/2018	8,557	9.8	4,986	10.2	17	13.0	1	12.9	0	7.0	27,266	18.8	32,082	6.5	6,689	11.0
7/11/2018	2,624	10.7	3,222	5.7	4,152	12.9	0	11.6	0	7.0	30,714	18.1	27,640	5.1	8,256	10.9
7/12/2018	-	12.0	0	7.5	4,080	13.9	391	11.4	0	7.0	39,326	15.6	18,980	4.8	7,219	11.0
7/13/2018	-	12.6	0	9.1	3,644	13.9	0	11.7	0	7.0	33,642	13.2	24,656	4.0	7,606	11.6
7/14/2018	-	13.0	0	10.5	0	14.7	4	11.4	0	7.0	34,534	10.1	12,800	4.3	9,048	10.8
7/15/2018	-	13.2	0	12.1	8,017	13.5	633	11.2	10	7.0	19,554	10.1	7,354	5.2	6,827	11.0
7/16/2018	-	13.6	0	13.4	4,017	12.8	298	10.0	5,734	10.1	26,684	10.4	22,708	5.9	9,669	10.9
7/17/2018	-	14.0	0	14.5	6,444	15.5	164	11.2	3,812	10.5	9,350	12.0	25,322	4.6	7,892	11.1
7/18/2018	-	14.0	0	15.6	6	17.6	13	11.5	44	7.0	24,916	13.3	27,726	2.5	7,981	11.1
7/19/2018	-	14.0	0	16.8	4	18.1	0	11.5	0	7.0	32,858	10.3	21,592	1.4	8,139	11.2
7/20/2018	-	14.0	17,852	14.0	7,734	14.7	0	11.4	5,032	7.2	21,754	10.9	10,992	1.6	7,577	11.3
7/21/2018	-	14.0	1	7.4	8,636	13.2	597	11.5	22,291	18.4	19,522	10.8	14,488	2.6	8,544	11.0
7/22/2018	-	14.3	0	9.2	3,537	14.4	196	9.2	3,489	6.5	13,080	9.9	4	4.7	7,337	11.0
7/23/2018	-	14.6	0	10.8	7,956	14.0	210	12.8	2	6.0	22,610	11.1	27,978	4.8	9,285	11.1
7/24/2018	-	15.0	0	12.9	4,222	13.3	694	11.1	0	6.0	19,266	11.0	30,250	2.7	6,886	11.3
7/25/2018	-	15.0	1	13.5	4,015	14.2	509	11.4	34	6.0	20,884	10.9	16,858	2.1	8,498	11.1
7/26/2018	-	-	0	14.6	0	16.5	2	11.7	685	6.0	20,978	10.8	14,490	2.1	7,999	11.1
7/27/2018	-	-	5	16.3	0	18.3	7	8.3	0	6.0	22,408	11.3	12,442	3.4	7,953	11.2
7/28/2018	-	-	857	17.4	0	19.0	0	11.6	6,577	19.9	20,750	10.7	13,378	4.0	7,890	11.2
7/29/2018	-	-	16,834	13.2	0	19.0	1	20.3	14	35.4	18,140	10.4	7,618	5.1	8,587	11.0
7/30/2018	-	-	1,527	6.7	10,671	18.0	0	23.5	69	36.5	28,066	11.2	17,578	6.0	7,939	11.2
7/31/2018	-	-	1	8.5	3,557	11.2	81	15.0	16,642	31.5	13,656	11.4	12,946	6.4	6,774	11.4
8/1/2018	-	-	1	10.2	3,539	12.7	580	11.8	20,420	27.7	23,036	11.7	9,870	7.2	9,460	11.4
8/2/2018	-	-	12	11.5	3,740	13.7	621	12.0	25,947	22.6	12,668	10.8	10,774	8.0	6,072	11.3
8/3/2018	-	-	1	12.8	3,336	14.8	1,520	10.9	1,927	28.7	14,940	10.8	8,838	8.3	10,138	11.7
8/4/2018	-	-	0	14.4	300	13.1	45	11.3	0	31.7	15,066	10.5	10,562	8.9	125	13.7
8/5/2018	18	-	0	15.6	8,297	11.8	894	11.3	0	32.9	13,348	10.4	10,160	9.4	3	18.0
8/6/2018	10	-	15	16.5	3,751	13.6	203	12.3	14,418	29.9	23,018	11.0	17,516	9.3	23,631	17.5
8/7/2018	-	-	15,296	16.2	3,386	14.5	119	11.8	23,132	23.9	12,790	10.3	13,198	9.5	8,678	11.5
8/8/2018	-	-	2,617	6.9	6,963	13.0	0	9.6	31,595	21.2	14,378	10.1	12,160	10.0	8,018	11.1
8/9/2018	13	-	20	8.7	2,749	16.7	778	11.4	16,533	21.2	11,828	10.2	25,816	9.4	8,364	11.6
8/10/2018	-	-	0	10.6	0	17.7	1,384	11.5	36,258	15.9	11,242	10.1	82	10.0	9,242	10.9
8/11/2018	-	-	0	12.0	0	18.0	18	11.7	19,879	7.7	17,916	10.5	6,792	10.9	10,831	10.8
8/12/2018	3	-	0	13.8	0	18.5	7	9.0	18,740	8.4	32,388	11.6	16,526	11.0	8,524	11.0
8/13/2018	4	-	10	14.5	7,989	13.5	421	11.3	15,810	7.7	16,258	10.2	5,664	11.0	7,474	10.9
8/14/2018	-	-	2	15.6	7,474	13.1	64	13.8	17,063	9.0	16,170	10.6	20,044	11.3	13,423	8.8
8/15/2018	-	-	21	16.8	3,323	14.3	140	11.6	15,880	7.5	14,038	9.8	9,092	11.6	4,598	10.6
8/16/2018	-	-	17,571	15.3	9,689	12.0	84	11.2	5,411	9.7	13,994	10.8	8,942	11.0	7,249	11.0
8/17/2018	-	-	0	7.5	1	15.4	447	11.4	20,576	10.6	10,940	10.6	16,044	12.2	7,886	11.0
8/18/2018	-	-	0	8.8	8,675	12.2	17	10.8	11,801	7.2	15,790	10.0	8,064	11.9	8,031	11.0
8/19/2018	15,563	-	0	10.2	3,550	14.7	420	10.8	16,045	8.6	11,648	10.1	3,500	11.7	8,603	11.0
8/20/2018	3	-	2	11.5	9,485	12.6	759	11.5	14,824	7.5	12,080	10.3	34	11.1	8,215	11.1
8/21/2018	3	-	0	12.9	3,486	13.6	78	8.9	12,946	7.7	16,696	10.5	15,112	13.1	7,962	11.1
8/22/2018	5	-	0	14.4	3,211	14.9	2	12.7	12,019	7.4	16,928	10.6	10,316	13.6	7,071	11.1
8/23/2018	3	-	0	15.3	4,849	12.3	946	11.8	6,490	9.7	14,180	10.4	9,970	13.0	10,519	9.5
8/24/2018	-	-	0	16.5	4,140	13.5	1,174	11.2	19,074	11.5	12,706	10.1	17,558	13.1	7,934	8.4
8/25/2018	-	-	15,733	15.9	3,867	16.0	685	10.7	16,074	12.8	12,048	10.9	18,092	12.5	7,064	9.7
8/26/2018	6	-	2,926	7.1	4,205	13.6	1,662	11.0	12,888	11.5	15,280	10.1	0	13.0	7,728	11.1
8/27/2018	2	17.0	3	8.5	9,430	11.9	73	10.8	18,638	10.0	20,150	10.4	14,470	13.2	8,426	10.9
8/28/2018	16,535	14.2	0	10.4	3,854	15.0	139	12.4	14,067	10.5	12,446	11.5	15,650	13.1	8,396	10.3
8/29/2018	218	14.2	0	11.7	4,459	13.2	328	10.9	15,090	7.3	20,366	10.1	20	10.5	6,988	11.2
8/30/2018	3	15.4	0	12.9	4,244	13.7	15	10.4	13,153	7.3	15,036	10.6	1,998	14.3	10,554	9.2
8/31/2018	0	16.0	1	14.4	0	15.8	3	10.9	11,951	6.6	14,422	10.3	64	15.0	5,642	10.2

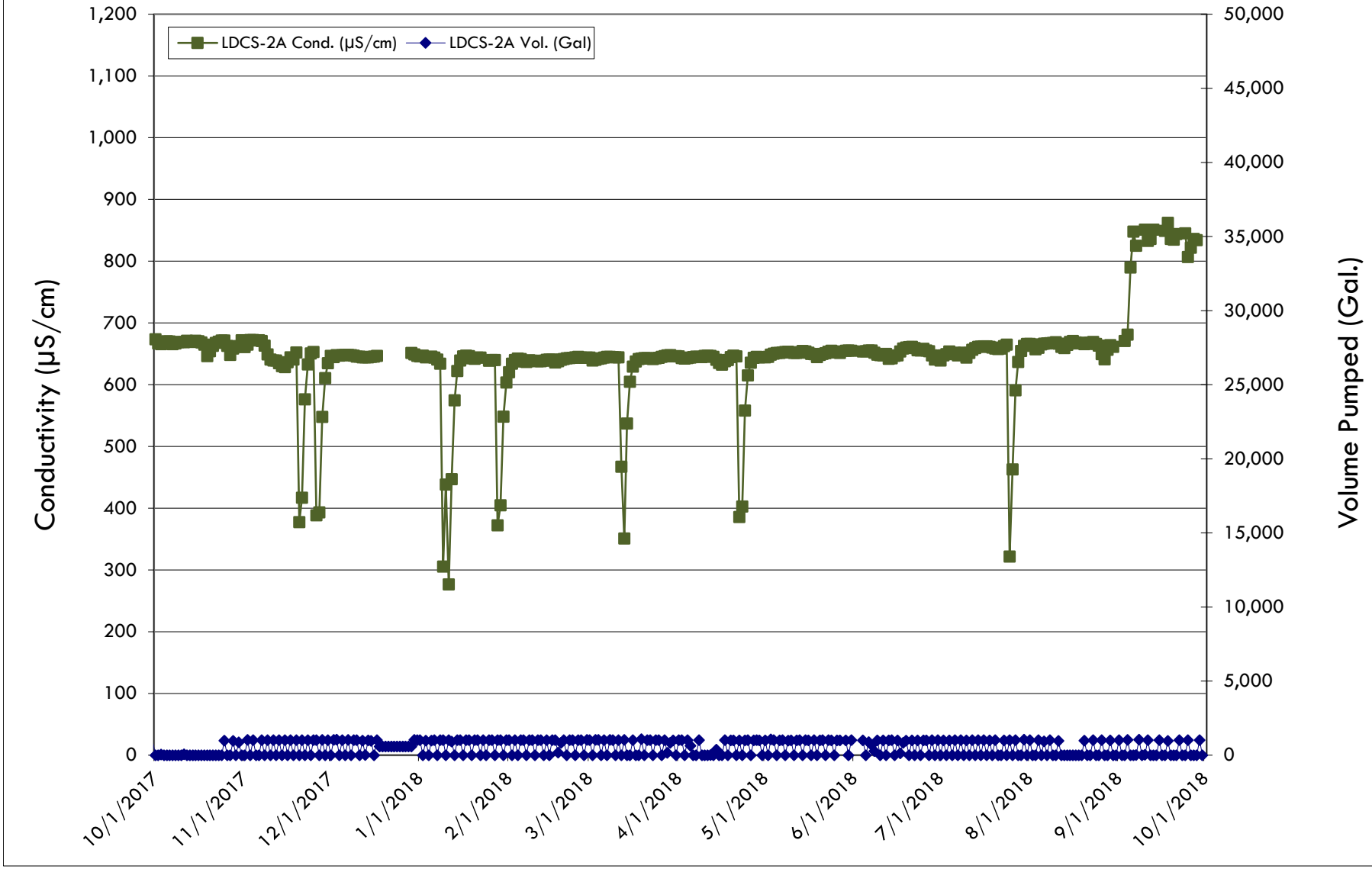
Summary of Leachate Volume and Depth Data
Third Quarter 2018
LRI Landfill, Pierce County, Washington

Date	Cell 1 Leachate Volume (GPD)	Cell 1 Leachate Level (in.)	Cell 2A Leachate Volume (GPD)	Cell 2A Leachate Level (in.)	Cell 2B Leachate Volume (GPD)	Cell 2B Leachate Level (in.)	Cell 3A Leachate Volume (GPD)	Cell 3A Leachate Level (in.)	Cell 4A Leachate Volume (GPD)	Cell 4A Leachate Level (in.)	Cell 4B Leachate Volume (GPD)	Cell 4B Leachate Level (in.)	Cell 5 Leachate Volume (GPD)	Cell 5 Leachate Level (in.)	Cell 6 Leachate Volume (GPD)	Cell 6 Leachate Level (in.)
9/1/2018	-	16.0	0	15.5	4,338	12.6	540	11.9	17,064	8.9	15,002	10.6	0	14.9	10,730	8.3
9/2/2018	0	16.5	14,938	15.5	4,327	13.0	980	12.3	11,187	6.9	13,612	10.1	4,864	14.6	3,298	11.0
9/3/2018	30	17.0	2,200	6.3	24	16.2	1,498	10.3	11,728	7.0	15,382	10.4	0	15.0	8,351	10.4
9/4/2018	0	17.0	2	7.9	9,368	13.8	351	10.4	12,458	7.5	15,112	10.4	0	14.9	7,877	10.3
9/5/2018	6,352	15.8	0	9.5	4,742	14.3	153	14.1	12,913	7.7	12,316	10.8	0	14.8	6,908	10.9
9/6/2018	16,722	-	0	10.7	5,014	12.8	1,325	11.7	11,607	11.9	15,826	10.1	0	14.5	12,009	8.3
9/7/2018	-	-	4	12.4	4,557	13.4	1,335	10.5	13,183	12.8	13,416	10.5	504	14.1	4,838	9.3
9/8/2018	-	-	0	13.6	3	16.0	1,759	10.7	14,146	11.5	14,392	10.5	388	14.2	8,531	9.4
9/9/2018	2	-	1	14.8	8,587	13.4	1,333	10.8	12,702	11.3	11,746	10.3	492	14.4	4,980	11.2
9/10/2018	109	-	182	15.9	4,243	12.7	159	12.3	10,864	11.2	29,162	11.0	528	14.6	18,045	8.8
9/11/2018	0	-	0	17.0	4,050	13.0	351	10.8	18,960	9.5	18,232	10.2	0	14.7	5,690	10.6
9/12/2018	0	-	17,213	9.3	4,096	15.2	33	10.8	11,885	6.3	20,202	10.6	0	15.0	10,791	9.6
9/13/2018	-	-	0	7.8	4,891	12.5	11	11.7	12,505	6.1	18,404	10.2	2	15.0	5,221	10.8
9/14/2018	-	-	0	9.5	4,102	15.1	23	10.7	12,229	6.2	17,196	10.4	4	15.7	9,560	11.1
9/15/2018		-	0	10.9	4,720	12.8	15	11.0	12,634	6.2	16,076	10.3	0	16.0	10,472	11.0
9/16/2018	16,882	-	0	12.1	641	17.4	59	11.4	12,483	6.0	16,708	10.3	0	16.6	11,059	11.0
9/17/2018	0	-	0	13.5	4,338	12.7	487	11.5	12,078	6.6	22,836	10.2	0	16.8	7,908	11.3
9/18/2018	0	-	0	14.7	3,940	12.9	135	10.8	1,676	12.8	10,526	10.1	2	17.0	7,843	10.7
9/19/2018	0	-	13	16.0	3,898	17.1	339	10.7	20,265	7.7	13,306	10.6	2	16.7	13,940	7.3
9/20/2018	0	-	17,284	14.2	768	12.7	509	12.0	2,385	9.8	14,124	10.4	6	16.9	5,381	8.4
9/21/2018	-	-	0	6.7	4,736	13.5	10	11.0	16,477	12.1	10,230	10.1	0	16.4	4,810	10.3
9/22/2018	-	-	0	7.7	0	16.3	8	10.4	18,502	7.3	15,702	10.5	2	16.5	9,647	9.8
9/23/2018	1	-	0	9.4	5,536	15.0	255	11.1	17,178	8.7	11,788	10.2	0	16.9	6,412	11.2
9/24/2018	19,271	-	6	10.7	5,933	12.4	96	13.1	13,857	9.7	12,896	11.4	0	16.4	9,806	10.1
9/25/2018	6,078	-	0	12.9	14	16.7	1,182	9.1	15,205	8.1	13,776	10.0	664	16.6	6,055	11.3
9/26/2018	0	-	0	14.3	11,773	14.8	1,272	11.4	14,842	7.8	13,932	10.5	0	16.8	12,241	9.1
9/27/2018	0	-	0	14.9	5,165	12.8	53	12.0	13,158	6.6	12,722	10.0	0	16.5	6,267	8.9
9/28/2018	-	-	0	16.5	8,555	14.2	182	11.9	12,678	7.0	14,470	10.6	0	16.5	6,136	11.4
9/29/2018	-	-	9,501	16.7	2,535	16.0	1	11.3	14,353	7.1	15,594	10.2	0	16.1	9,510	9.9
9/30/2018	0	-	7,550	7.0	11,567	12.0	396	9.5	12,588	6.2	13,046	10.0	0	16.1	7,776	11.2

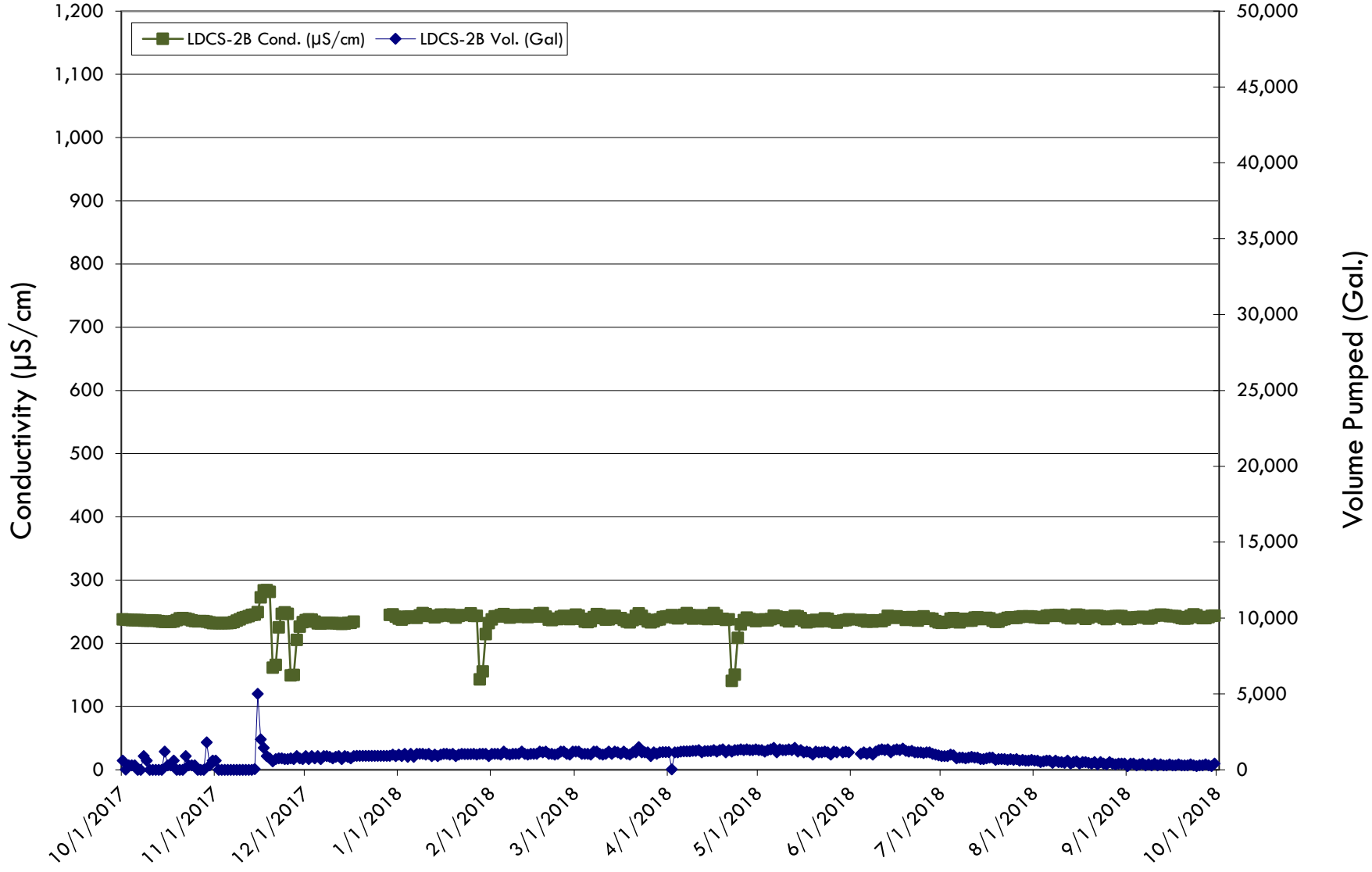
- = No data collected, meter not functioning properly

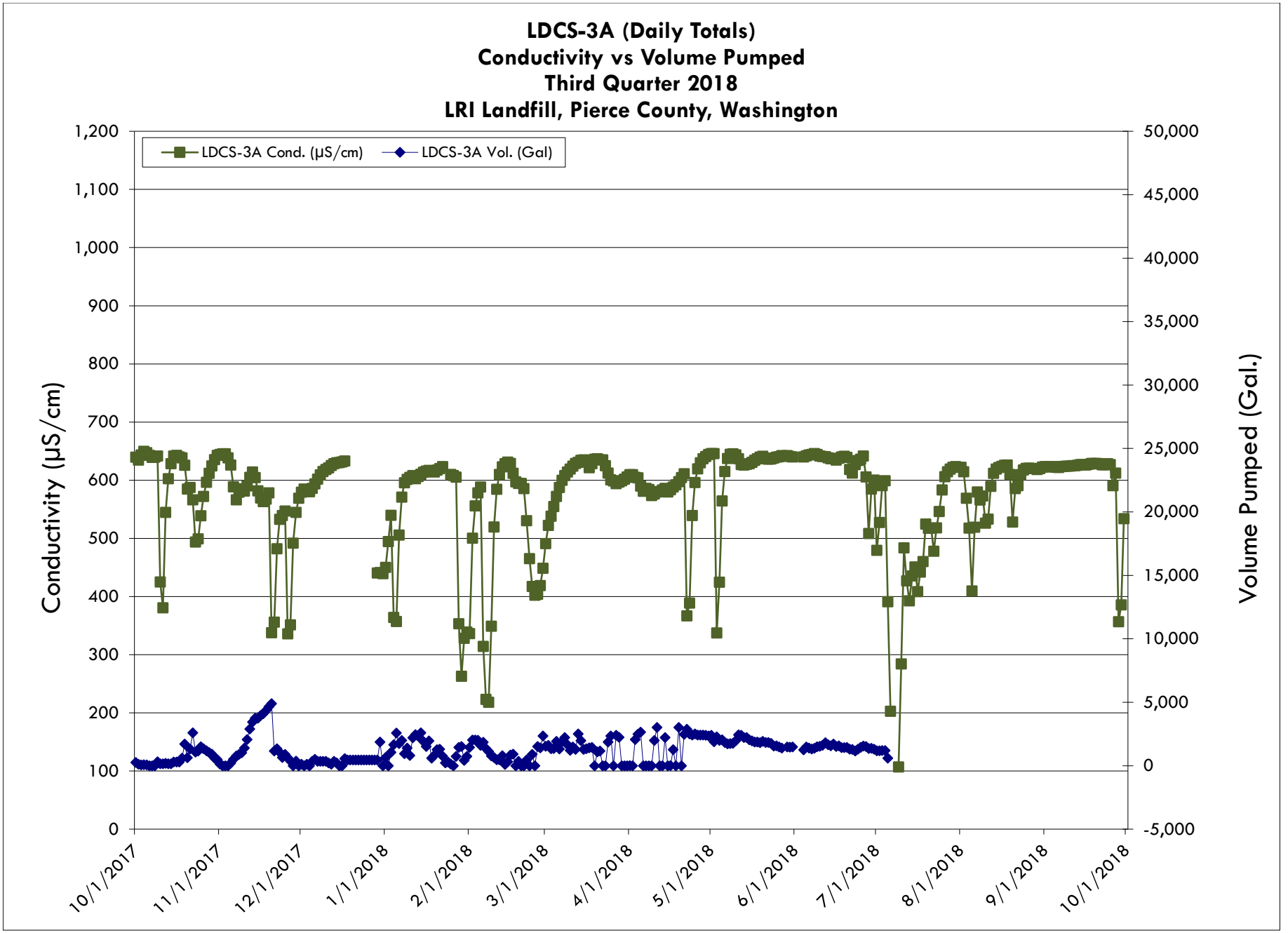

LDCS-1 (DailyTotals)
Conductivity vs Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington
LDCS-1 Cond. (µS/cm)
LDCS-1 Vol. (Gal.)
Conductivity (µS/cm)
Volume Pumped (Gal.)
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
10/1/2017
11/1/2017
12/1/2017
1/1/2018
2/1/2018
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018

LDCS-2A (Daily Totals)
Conductivity vs Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington

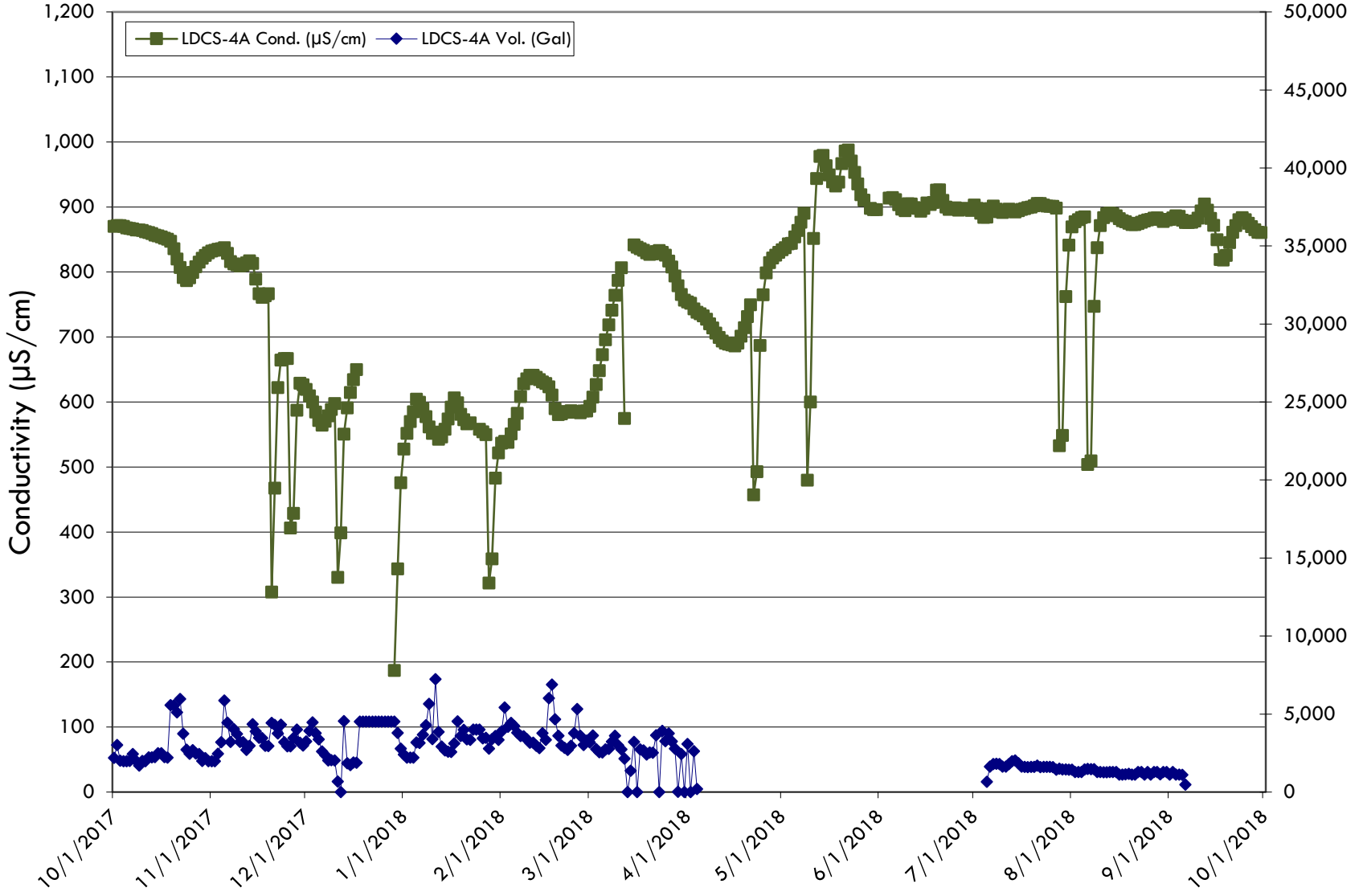


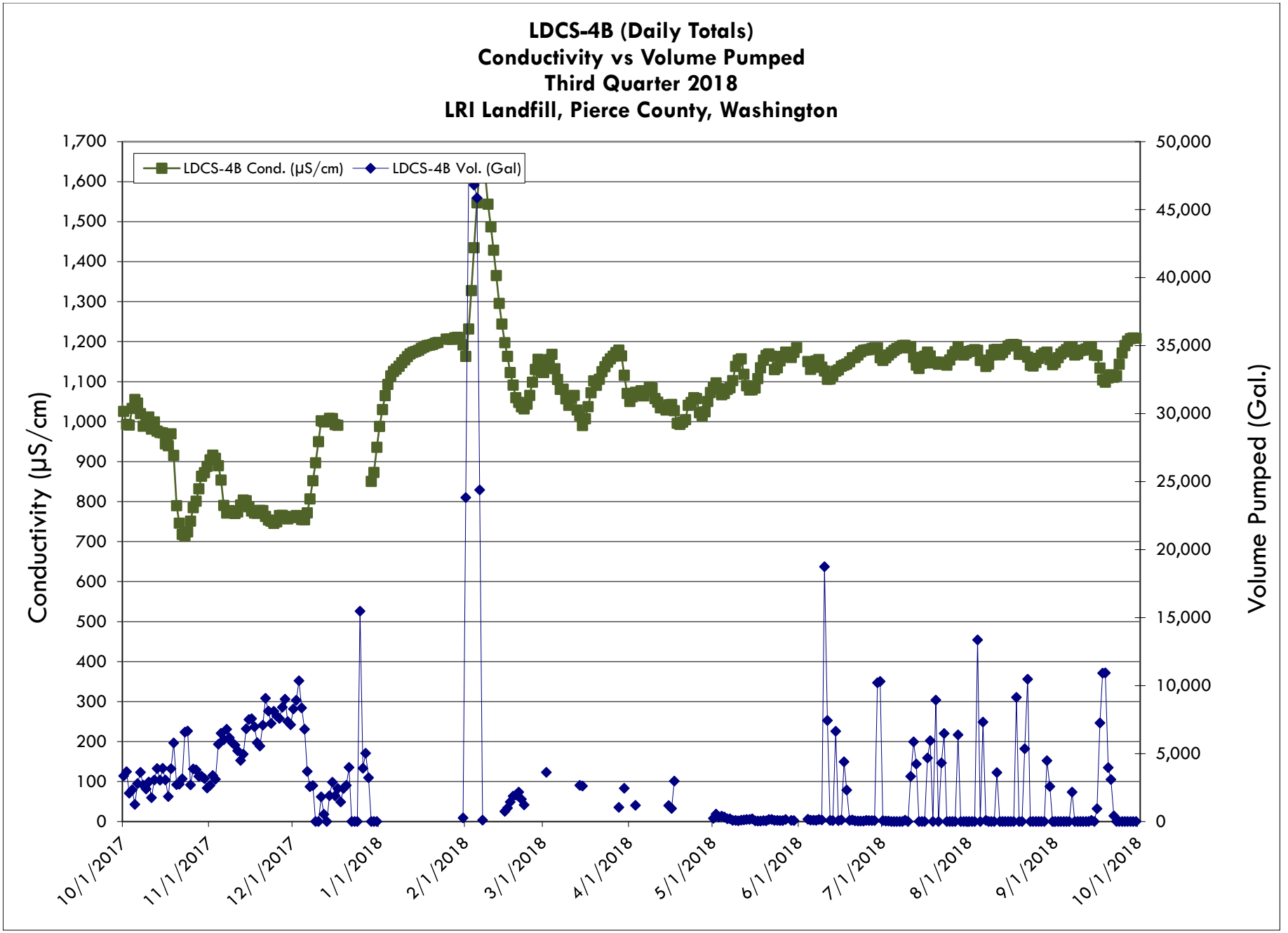
LDCS-2B (Daily Totals)
Conductivity vs Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington

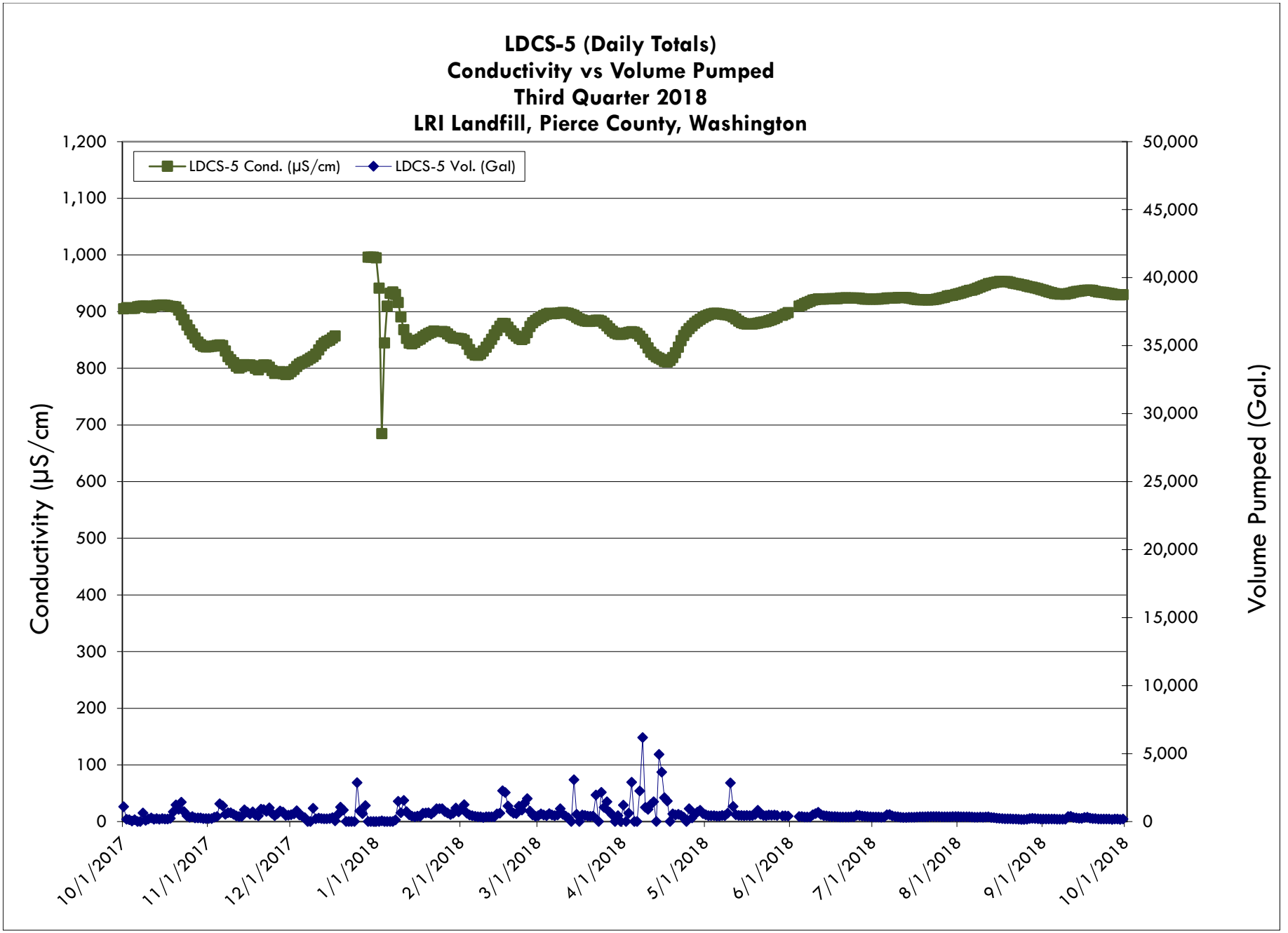


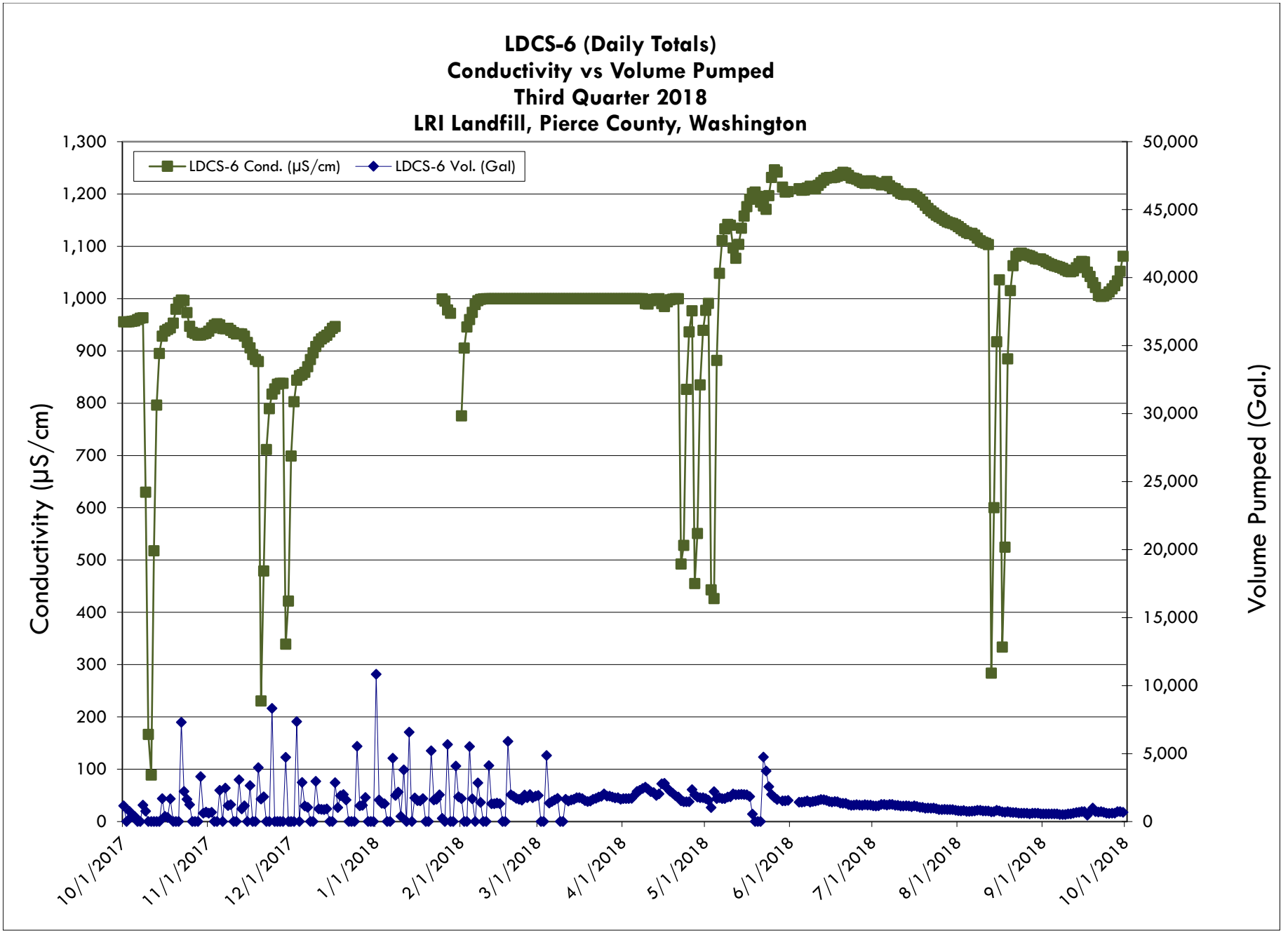

LDCS-3A (Daily Totals)
Conductivity vs Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington
LDCS-3A Cond. (µS/cm)
LDCS-3A Vol. (Gal)
Conductivity (µS/cm)
Volume Pumped (Gal.)
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
-5,000
10/1/2017
11/1/2017
12/1/2017
1/1/2018
2/1/2018
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018

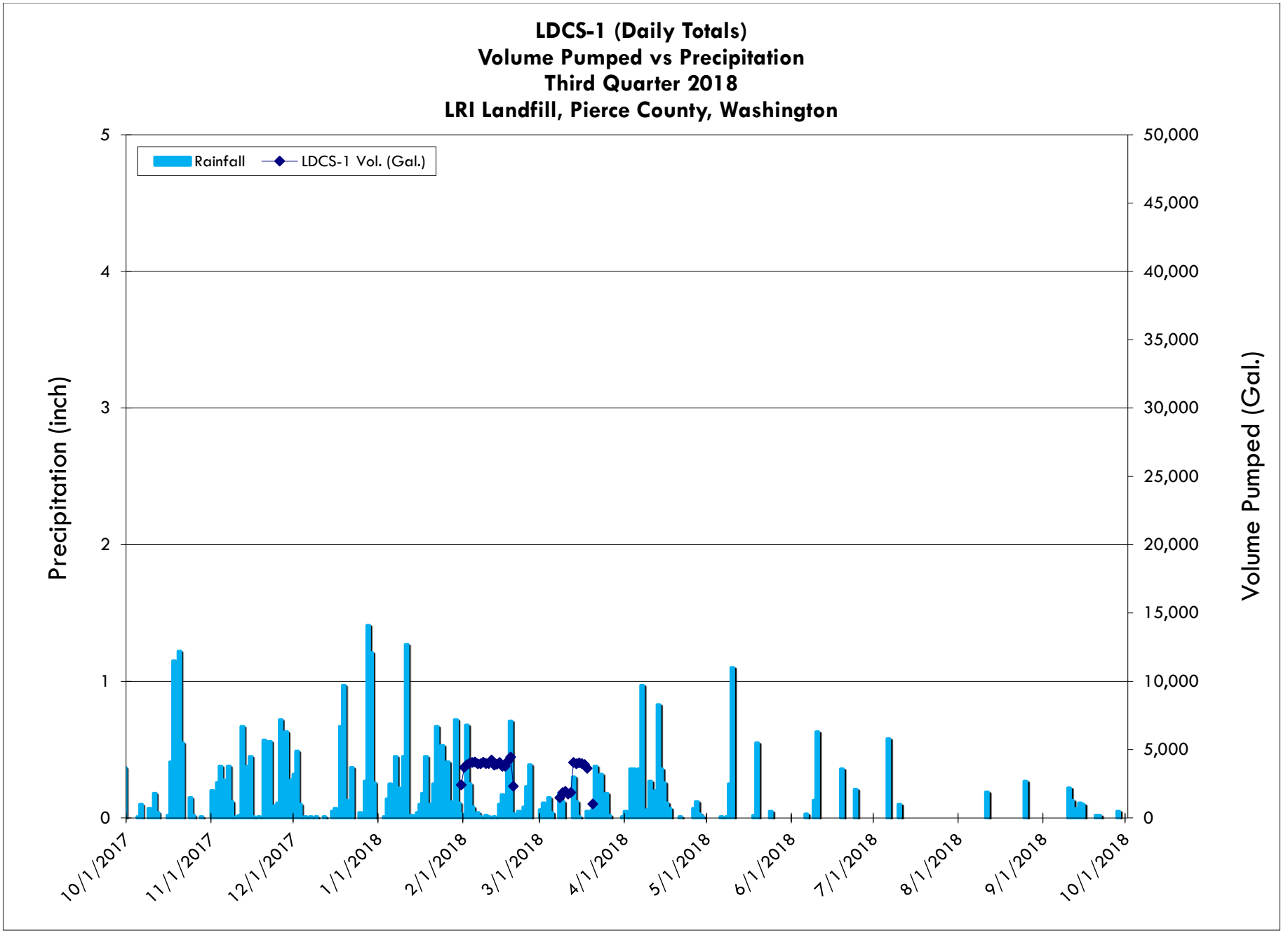
LDCS-4A (Daily Totals)
Conductivity vs Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington

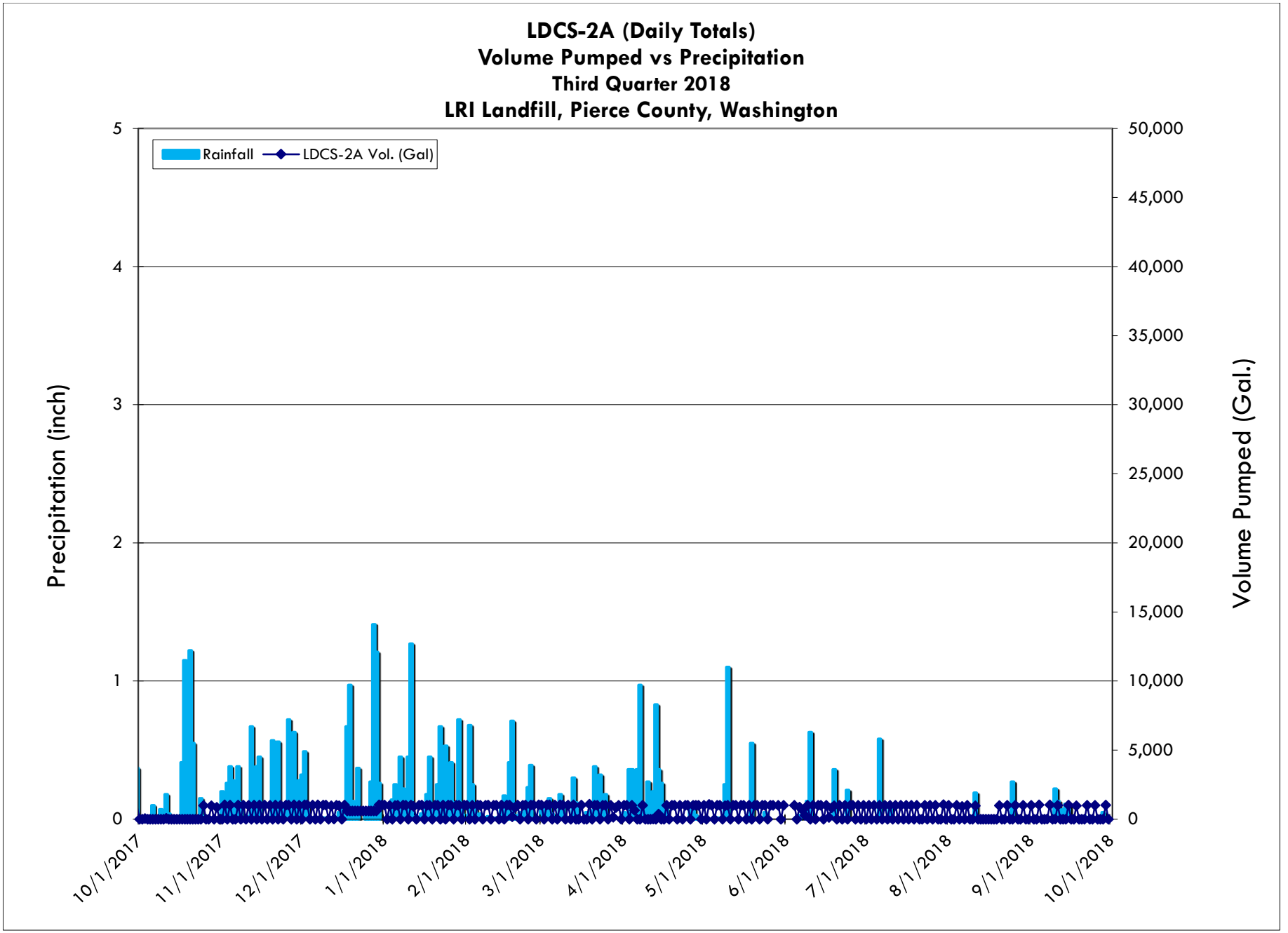


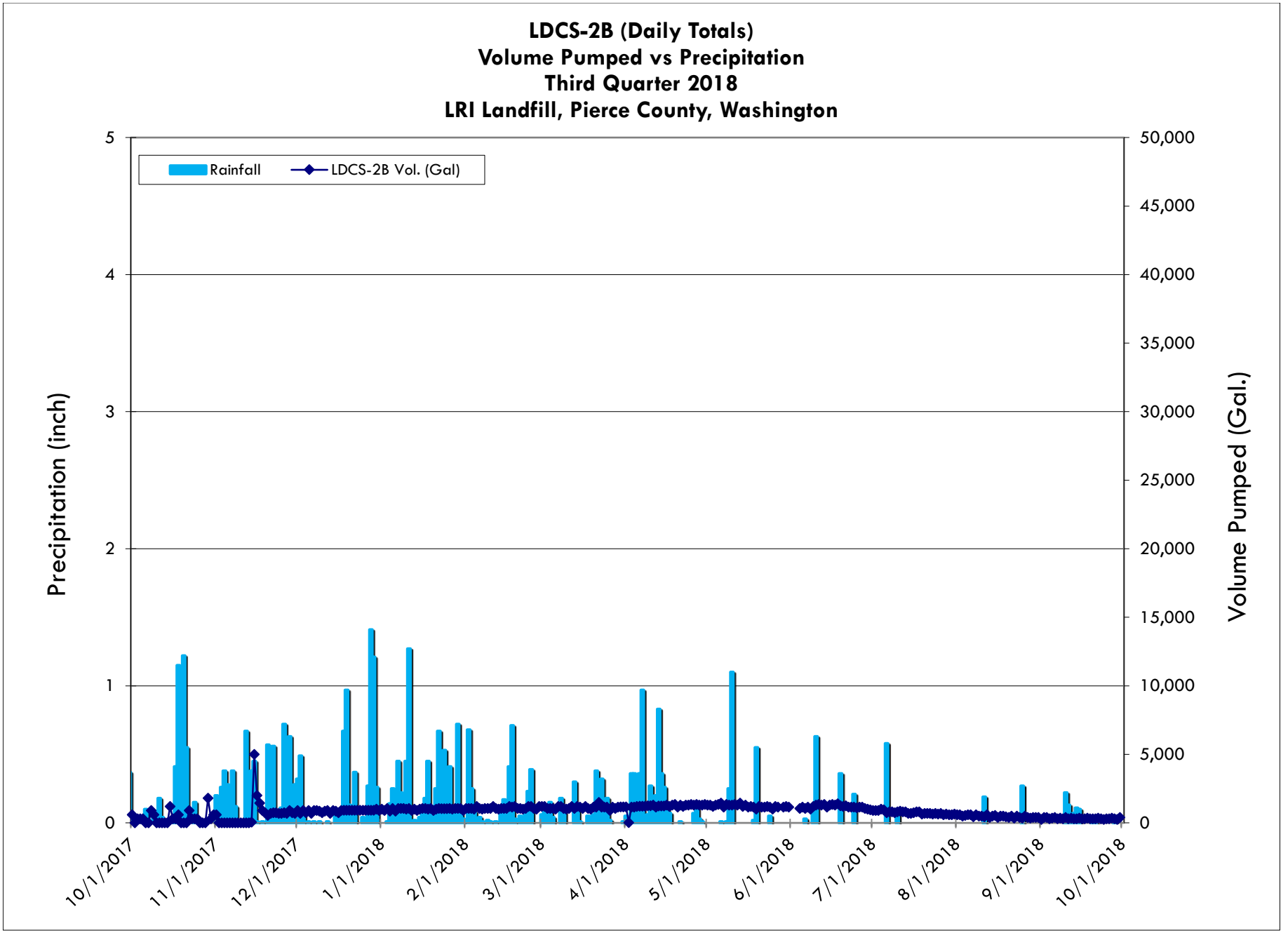

LDCS-4B (Daily Totals)
Conductivity vs Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington
LDCS-4B Cond. (µS/cm)
LDCS-4B Vol. (Gal)
Conductivity (µS/cm)
Volume Pumped (Gal.)
1,700
1,600
1,500
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
10/1/2017
11/1/2017
12/1/2017
1/1/2018
2/1/2018
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018

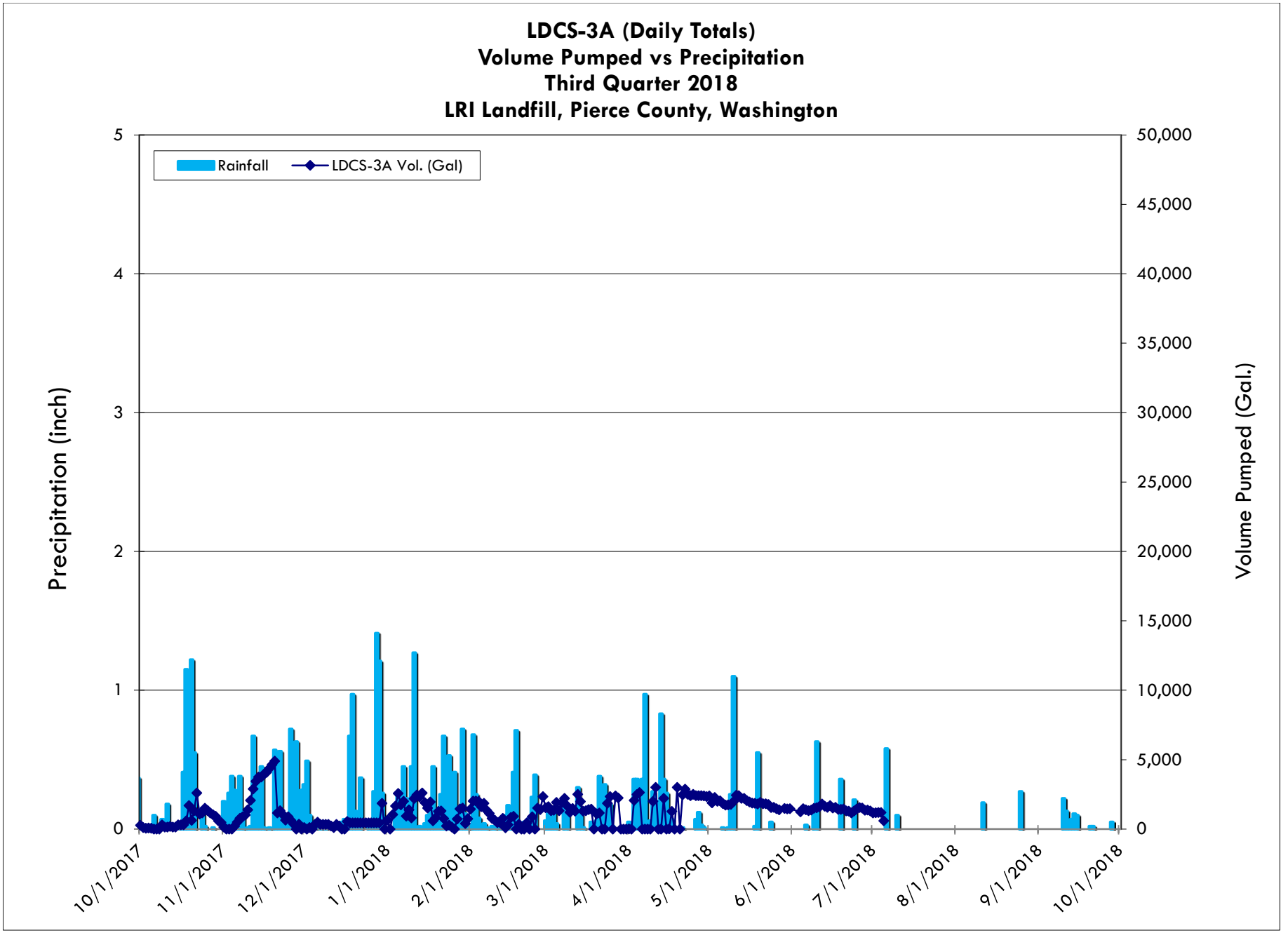

LDCS-5 (Daily Totals)
Conductivity vs Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington
LDCS-5 Cond. (µS/cm)
LDCS-5 Vol. (Gal)
Conductivity (µS/cm)
Volume Pumped (Gal.)
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
10/1/2017
11/1/2017
12/1/2017
1/1/2018
2/1/2018
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018

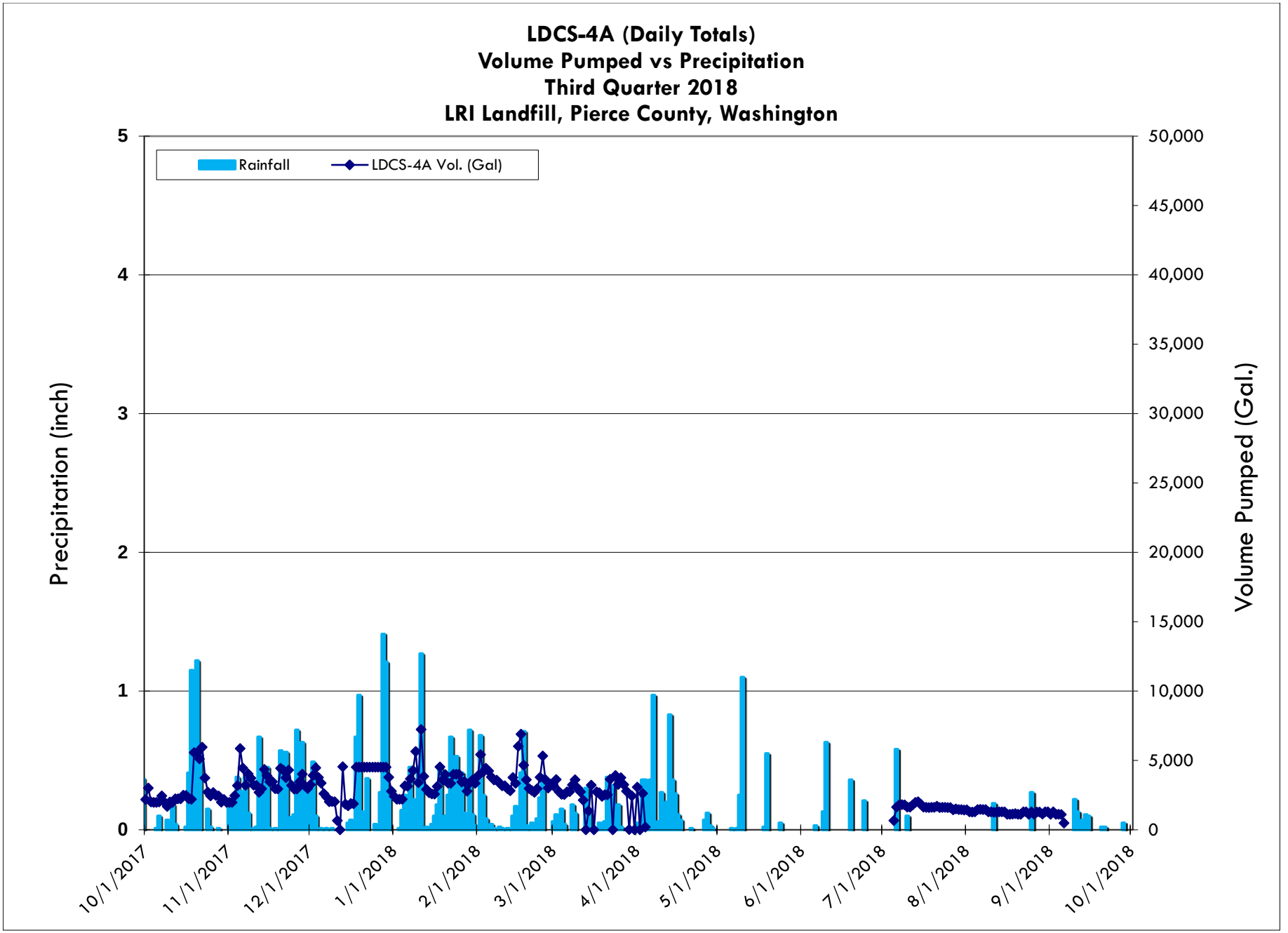

LDCS-6 (Daily Totals)
Conductivity vs Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington
LDCS-6 Cond. (µS/cm)
LDCS-6 Vol. (Gal)
Conductivity (µS/cm)
Volume Pumped (Gal.)
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
10/1/2017
11/1/2017
12/1/2017
1/1/2018
2/1/2018
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018

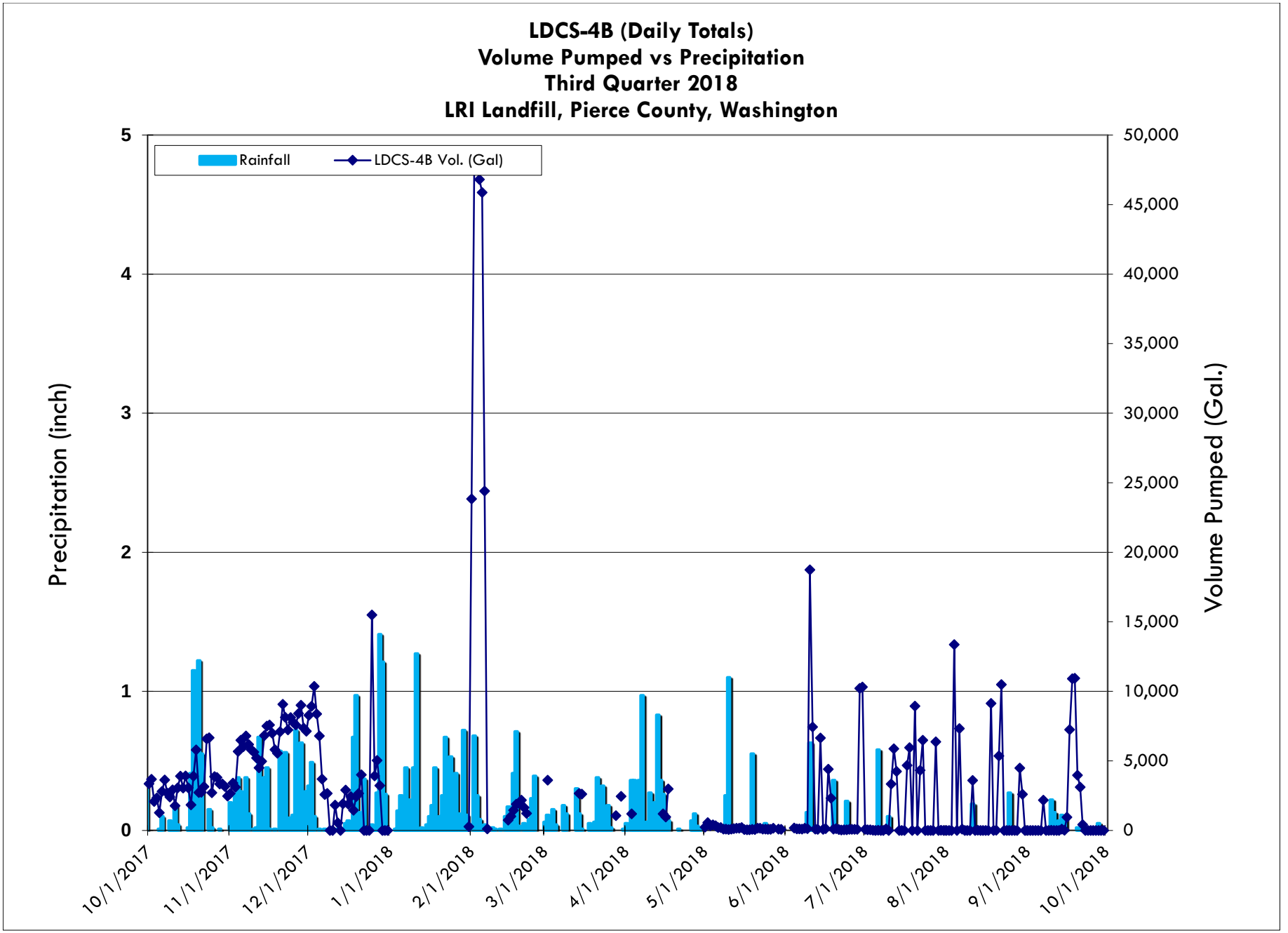

LDCS-1 (Daily Totals)
Volume Pumped vs Precipitation
Third Quarter 2018
LRI Landfill, Pierce County, Washington
Rainfall
LDCS-1 Vol. (Gal.)
Precipitation (inch)
Volume Pumped (Gal.)
0
1
2
3
4
5
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
10/1/2017
11/1/2017
12/1/2017
1/1/2018
2/1/2018
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018

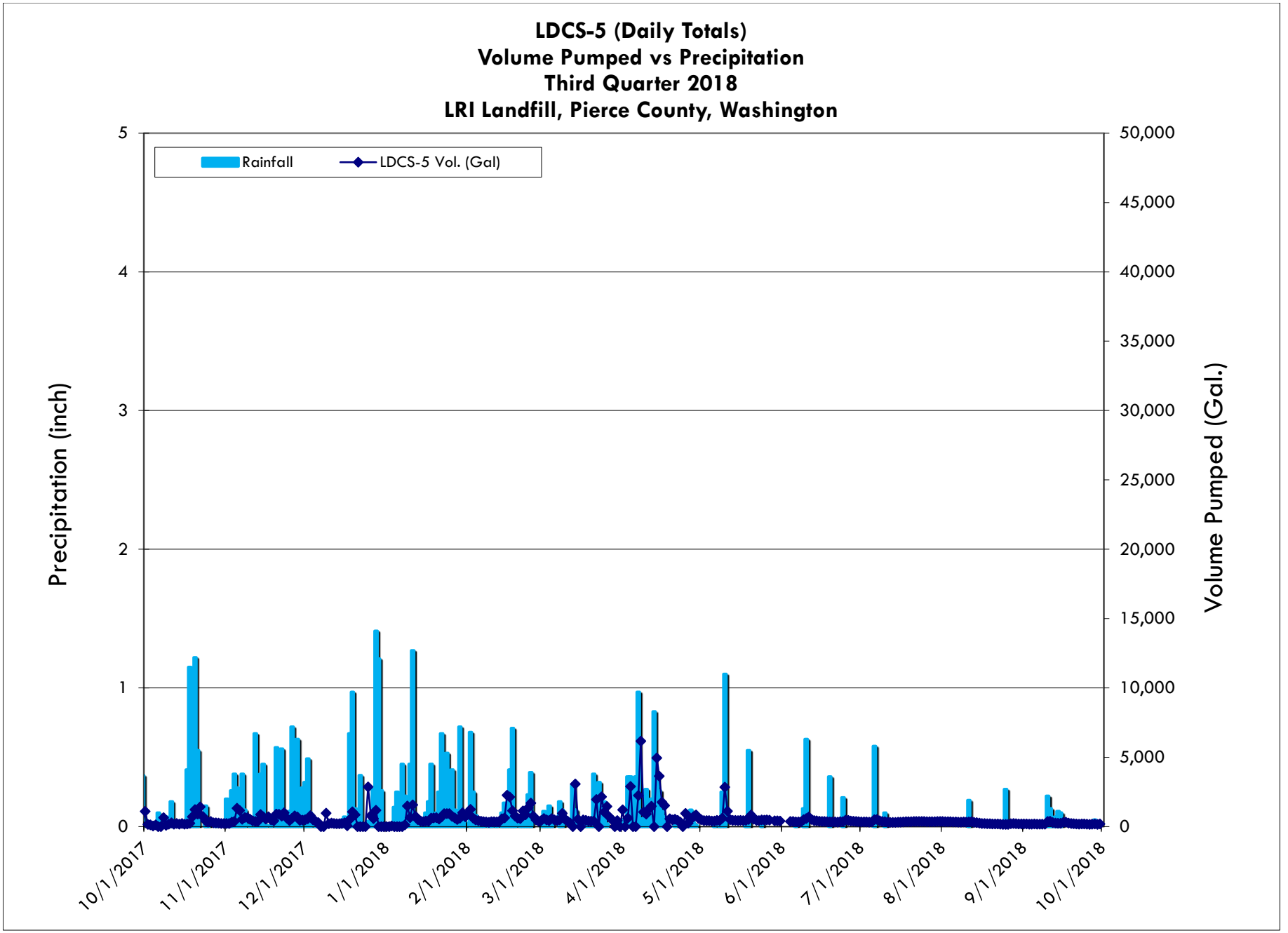

LDCS-2A (Daily Totals)
Volume Pumped vs Precipitation
Third Quarter 2018
LRI Landfill, Pierce County, Washington
Rainfall
LDCS-2A Vol. (Gal)
Precipitation (inch)
Volume Pumped (Gal.)
0
1
2
3
4
5
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
10/1/2017
11/1/2017
12/1/2017
1/1/2018
2/1/2018
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018

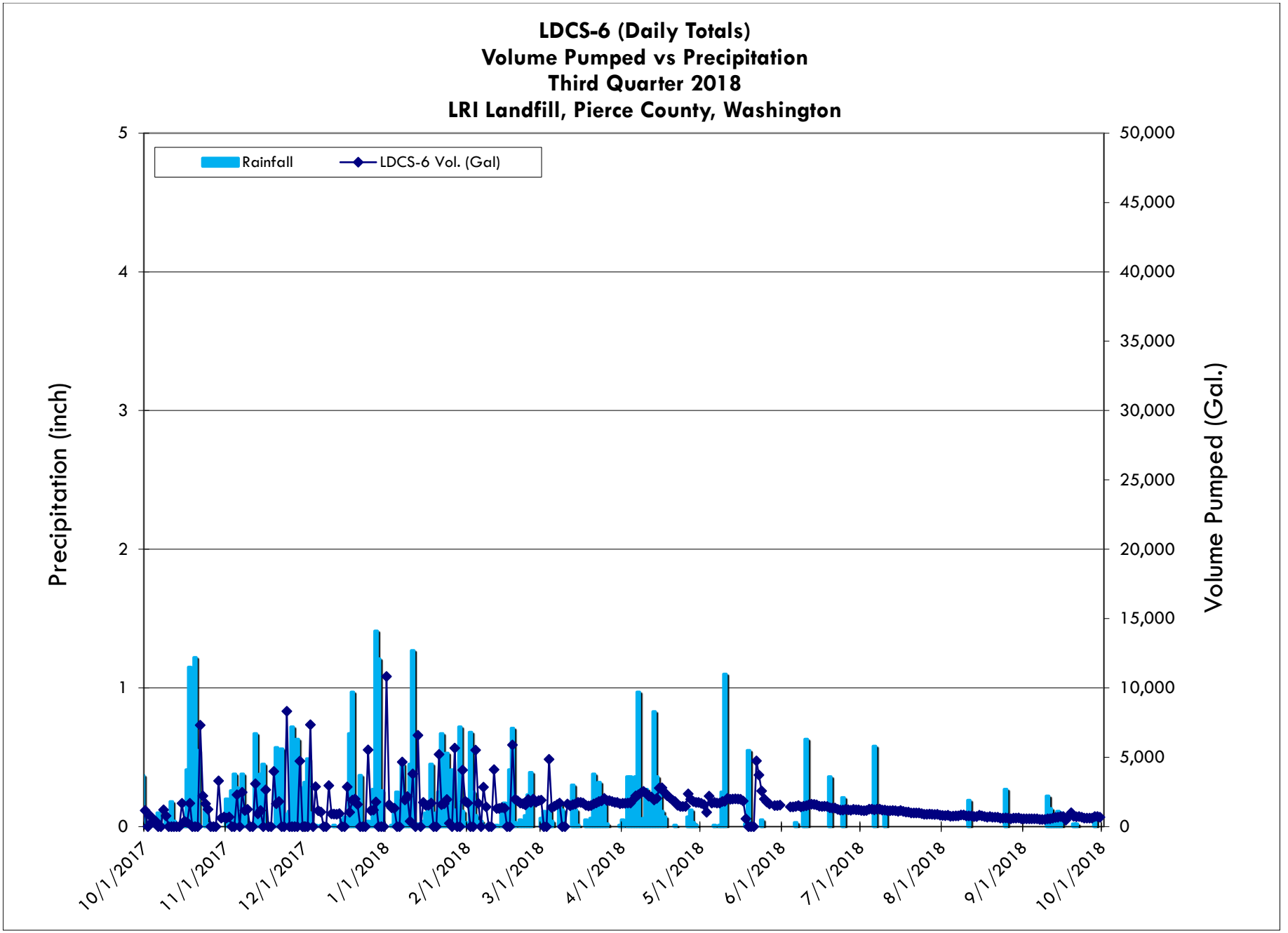

LDCS-2B (Daily Totals)
Volume Pumped vs Precipitation
Third Quarter 2018
LRI Landfill, Pierce County, Washington
Rainfall
LDCS-2B Vol. (Gal)
Precipitation (inch)
Volume Pumped (Gal.)
0
1
2
3
4
5
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
10/1/2017
11/1/2017
12/1/2017
1/1/2018
2/1/2018
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018

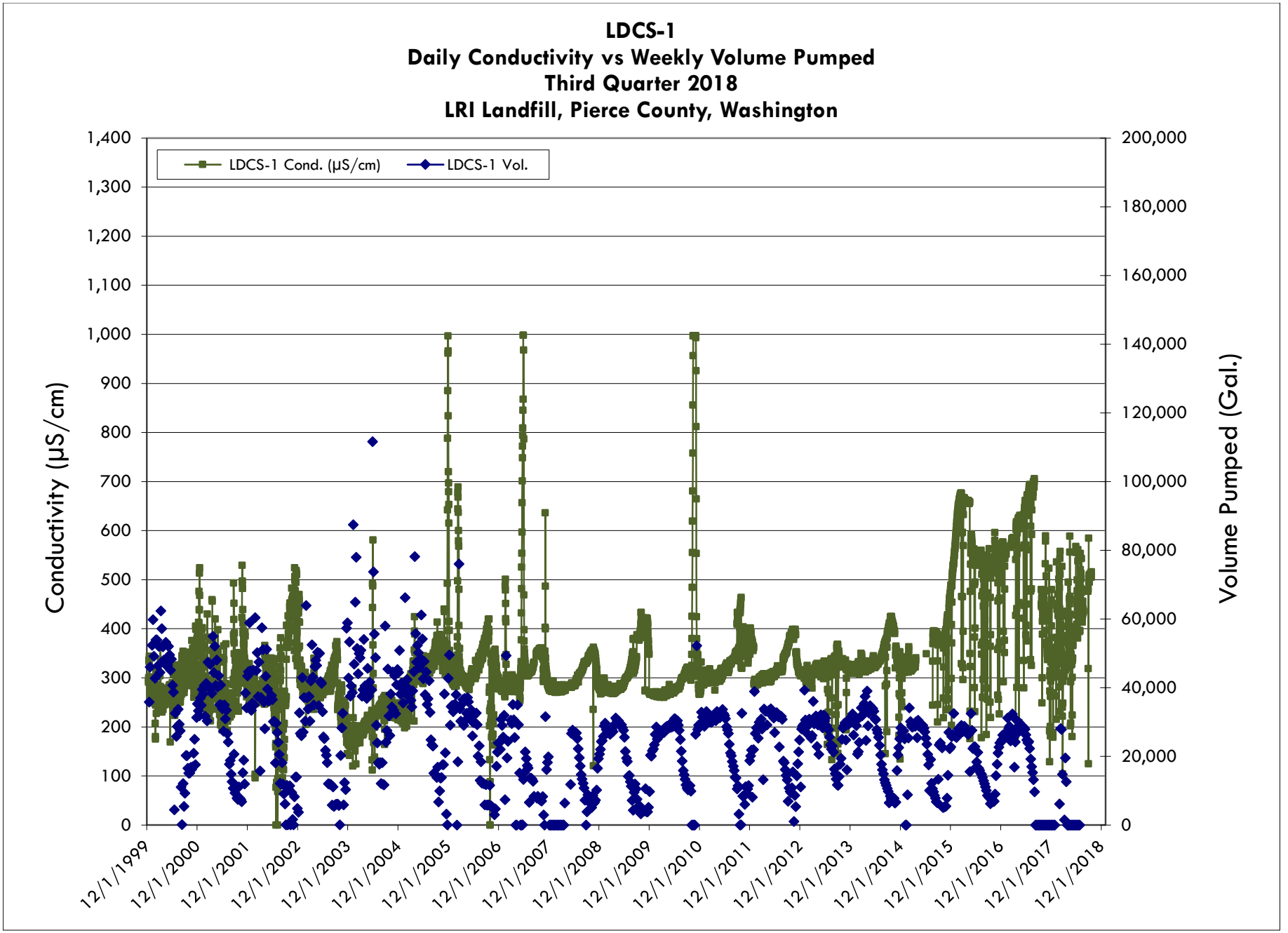

LDCS-3A (Daily Totals)
Volume Pumped vs Precipitation
Third Quarter 2018
LRI Landfill, Pierce County, Washington
Rainfall
LDCS-3A Vol. (Gal)
Precipitation (inch)
Volume Pumped (Gal.)
0
1
2
3
4
5
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
10/1/2017
11/1/2017
12/1/2017
1/1/2018
2/1/2018
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018

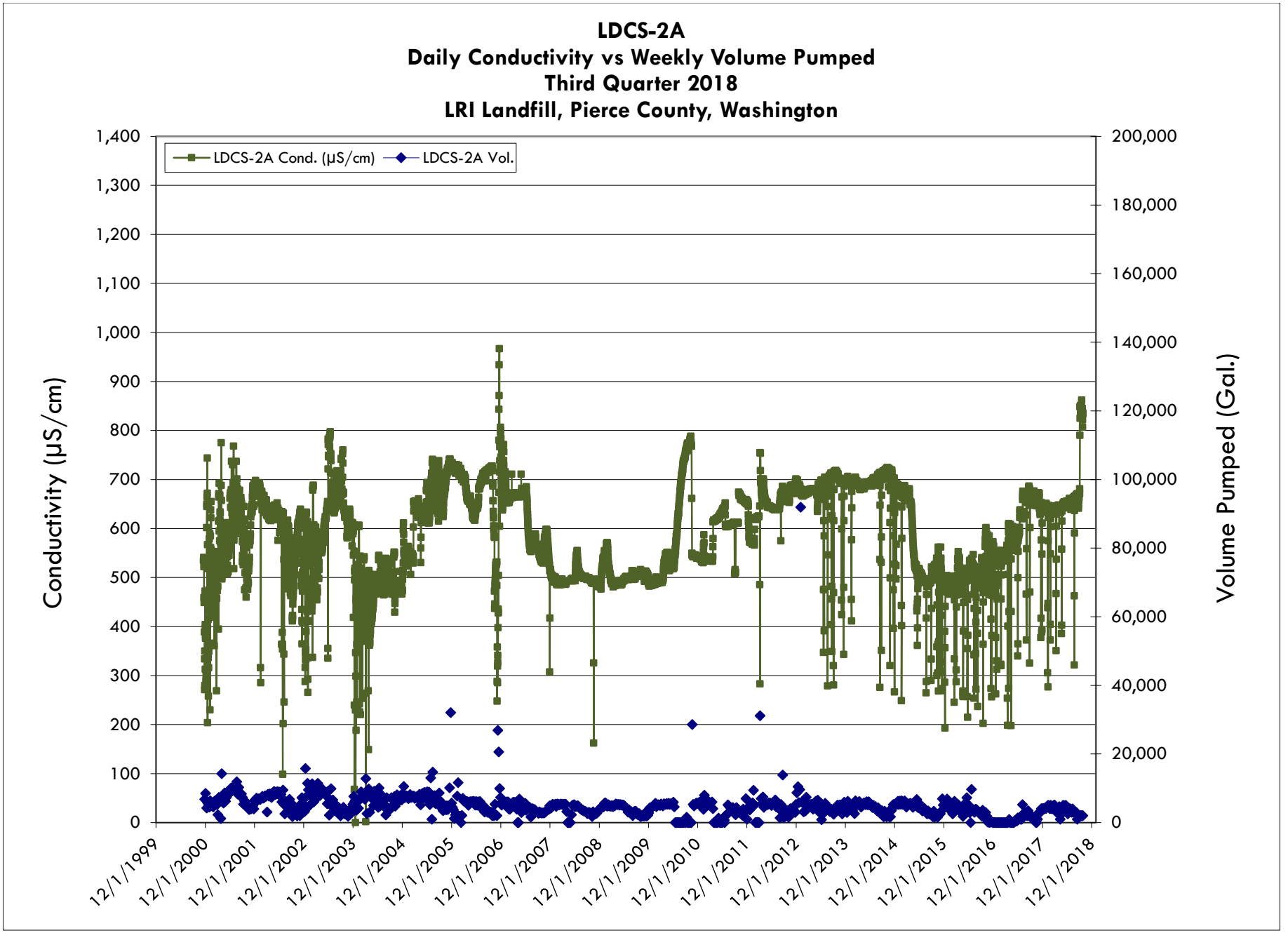

LDCS-4A (Daily Totals)
Volume Pumped vs Precipitation
Third Quarter 2018
LRI Landfill, Pierce County, Washington
Rainfall
LDCS-4A Vol. (Gal)
Precipitation (inch)
Volume Pumped (Gal.)
0
1
2
3
4
5
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
10/1/2017
11/1/2017
12/1/2017
1/1/2018
2/1/2018
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018


LDCS-4B (Daily Totals)
Volume Pumped vs Precipitation
Third Quarter 2018
LRI Landfill, Pierce County, Washington
Rainfall
LDCS-4B Vol. (Gal)
Precipitation (inch)
Volume Pumped (Gal.)
0
1
2
3
4
5
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
10/1/2017
11/1/2017
12/1/2017
1/1/2018
2/1/2018
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018

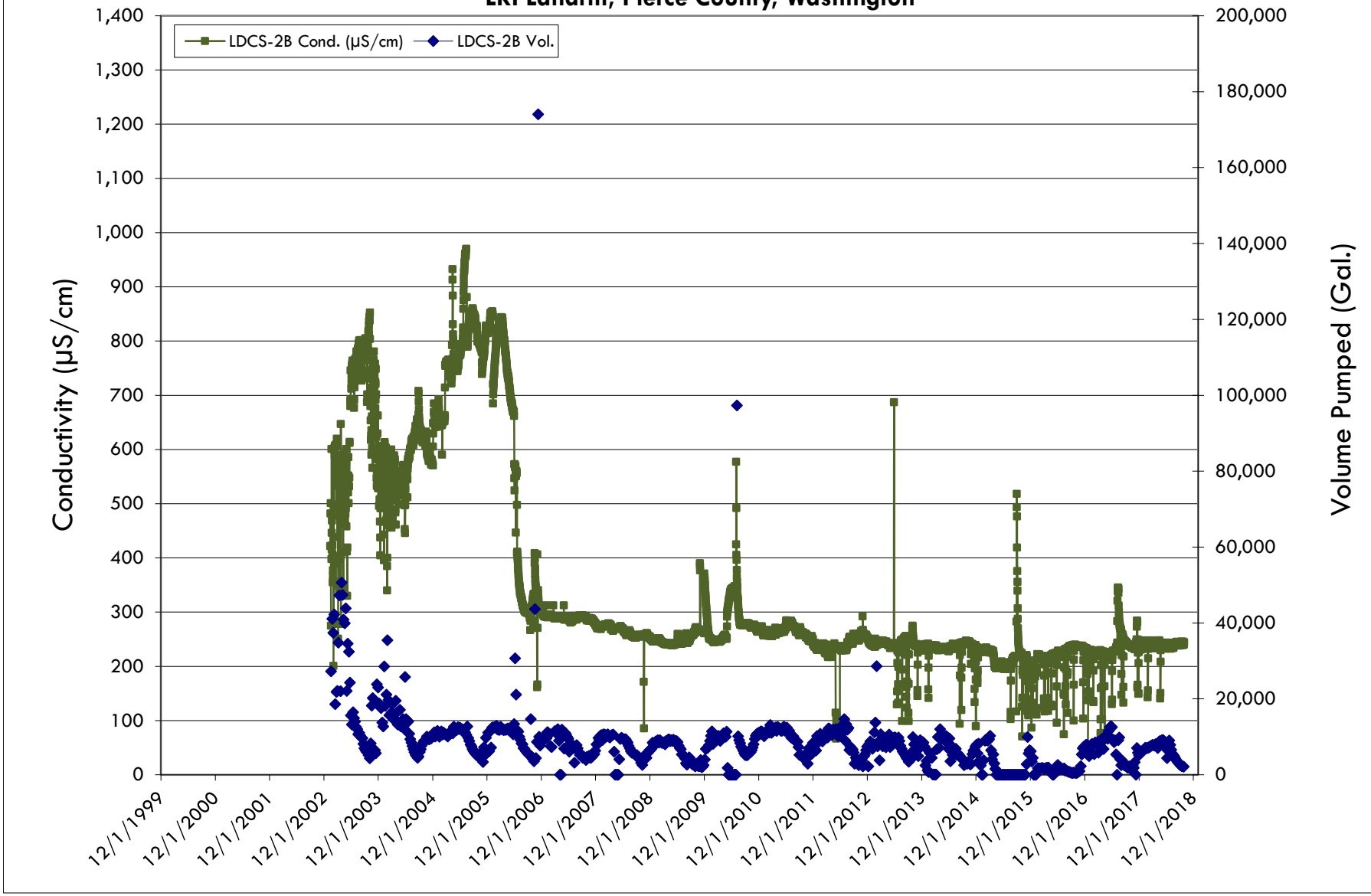

LDCS-5 (Daily Totals)
Volume Pumped vs Precipitation
Third Quarter 2018
LRI Landfill, Pierce County, Washington
Rainfall
LDCS-5 Vol. (Gal)
Precipitation (inch)
Volume Pumped (Gal.)
0
1
2
3
4
5
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
10/1/2017
11/1/2017
12/1/2017
1/1/2018
2/1/2018
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018


LDCS-6 (Daily Totals)
Volume Pumped vs Precipitation
Third Quarter 2018
LRI Landfill, Pierce County, Washington
Rainfall
LDCS-6 Vol. (Gal)
Precipitation (inch)
Volume Pumped (Gal.)
0
1
2
3
4
5
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
10/1/2017
11/1/2017
12/1/2017
1/1/2018
2/1/2018
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018

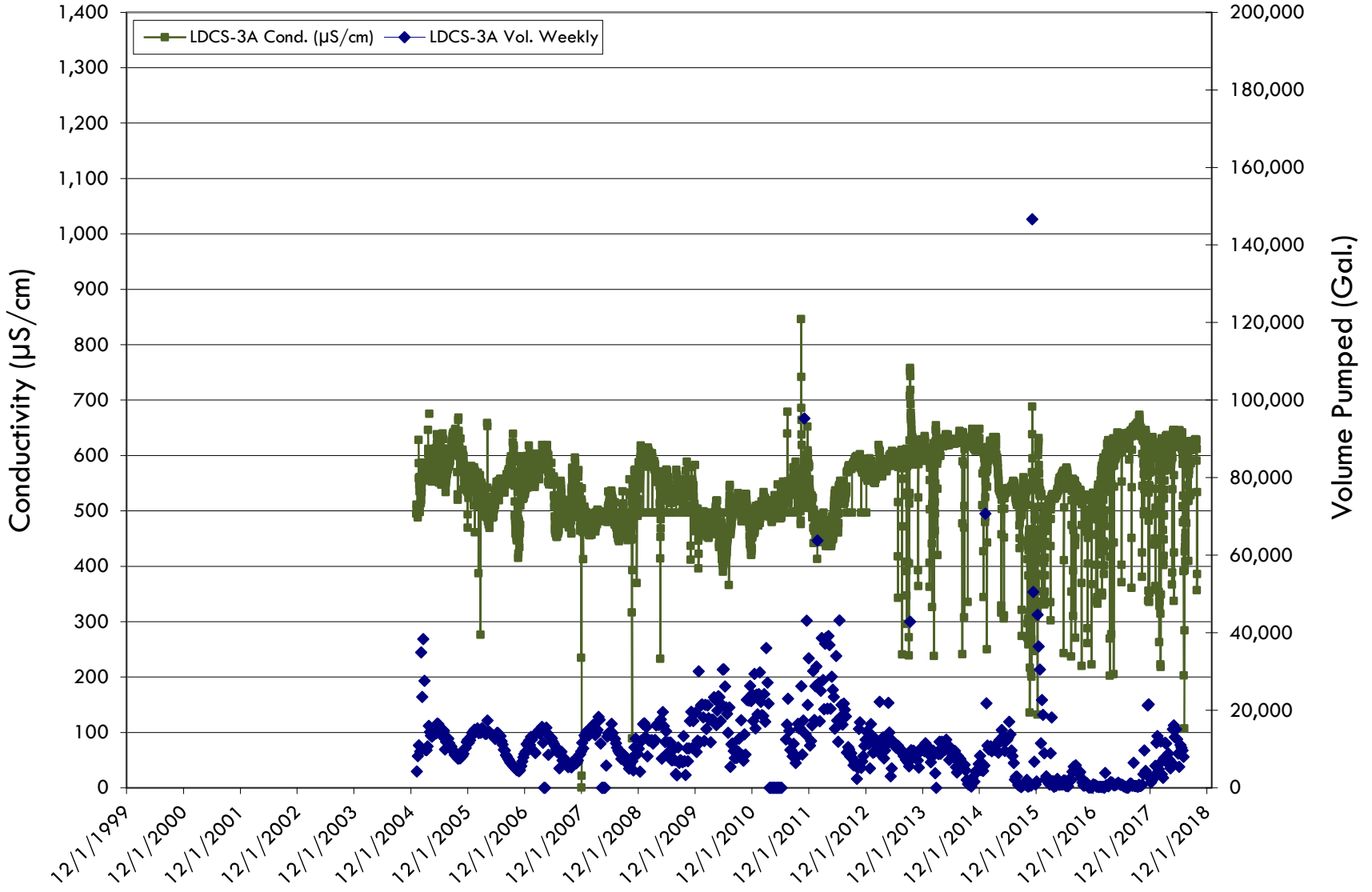

LDCS-1
Daily Conductivity vs Weekly Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington
LDCS-1 Cond. (µS/cm)
LDCS-1 Vol.
Conductivity (µS/cm)
Volume Pumped (Gal.)
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
12/1/1999
12/1/2000
12/1/2001
12/1/2002
12/1/2003
12/1/2004
12/1/2005
12/1/2006
12/1/2007
12/1/2008
12/1/2009
12/1/2010
12/1/2011
12/1/2012
12/1/2013
12/1/2014
12/1/2015
12/1/2016
12/1/2017
12/1/2018


LDCS-2A
Daily Conductivity vs Weekly Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington
LDCS-2A Cond. (µS/cm)
LDCS-2A Vol.
Conductivity (µS/cm)
Volume Pumped (Gal.)
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
12/1/1999
12/1/2000
12/1/2001
12/1/2002
12/1/2003
12/1/2004
12/1/2005
12/1/2006
12/1/2007
12/1/2008
12/1/2009
12/1/2010
12/1/2011
12/1/2012
12/1/2013
12/1/2014
12/1/2015
12/1/2016
12/1/2017
12/1/2018

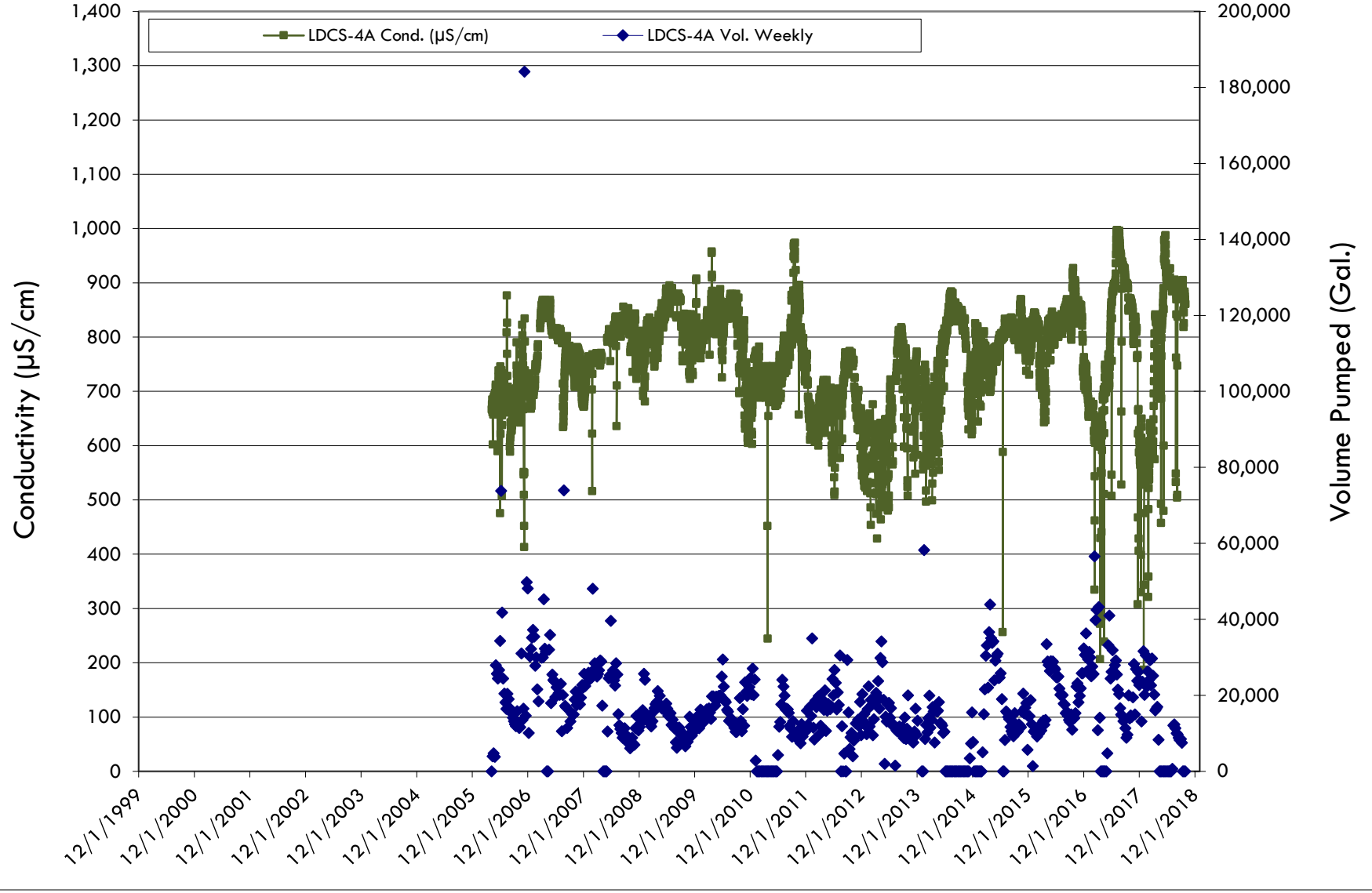
LDCS-2B
Daily Conductivity vs Weekly Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington

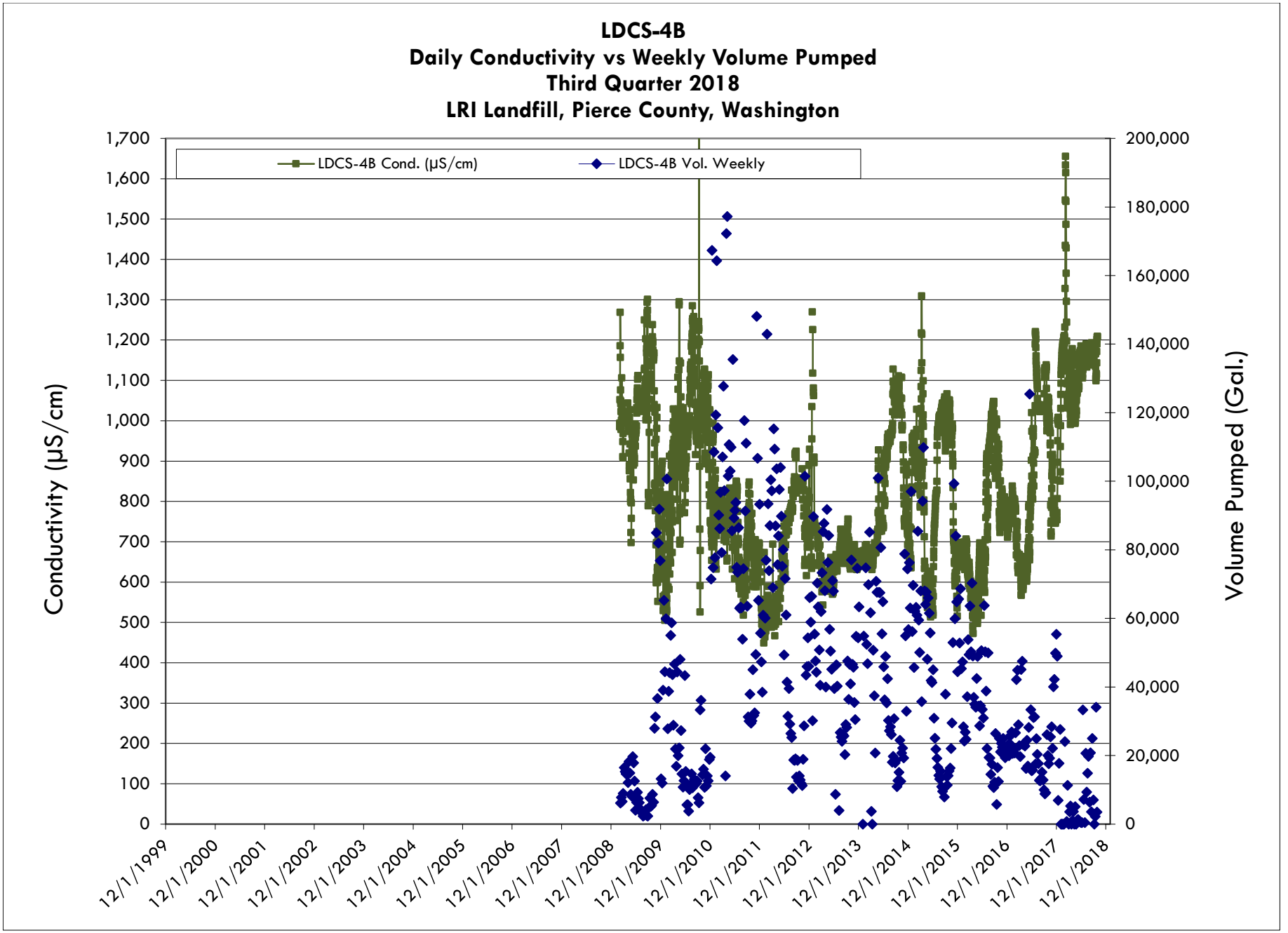


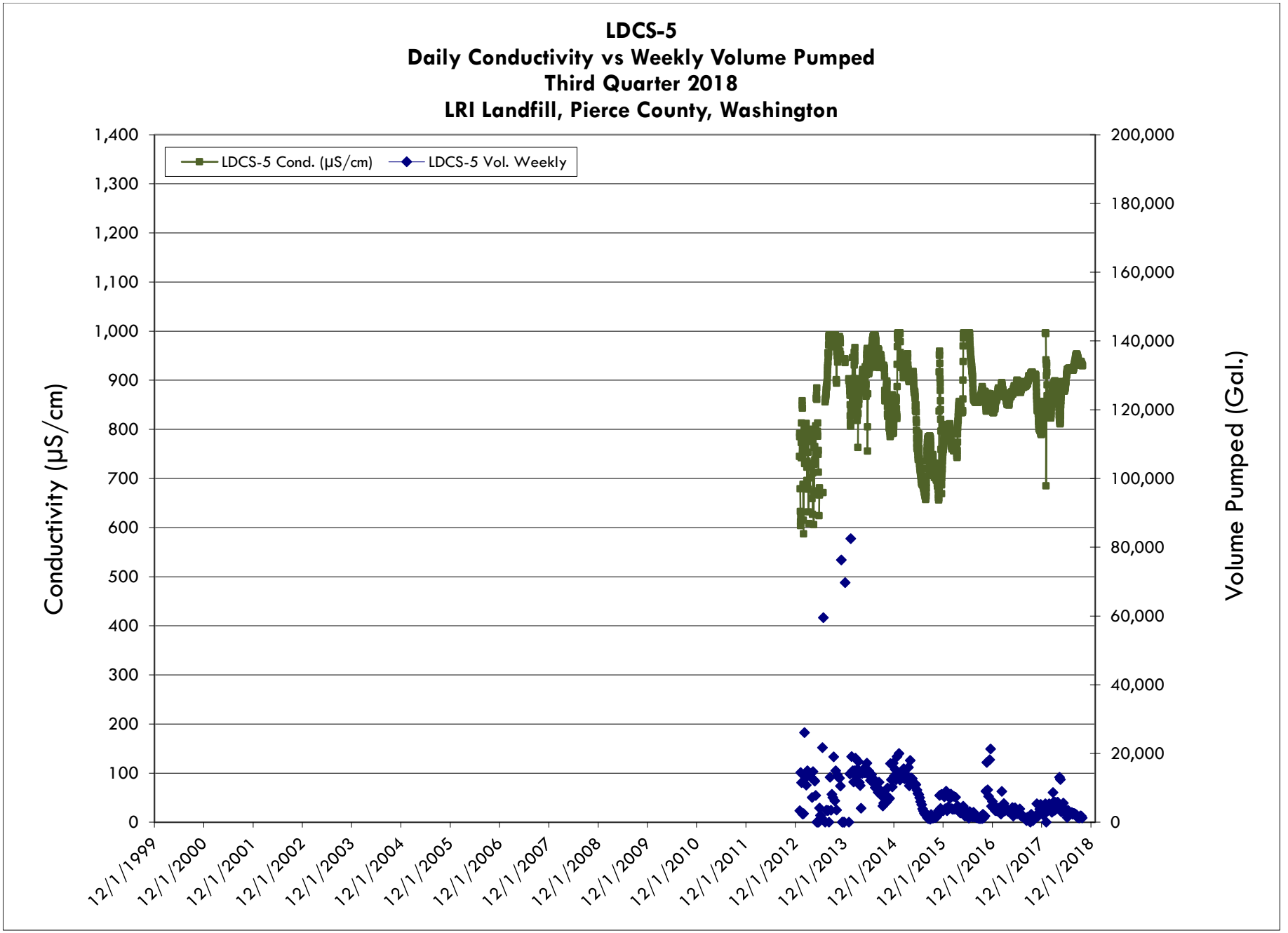
LDCS-3A
Daily Conductivity vs Weekly Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington



LDCS-4A
Daily Conductivity vs Weekly Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington




LDCS-4B
Daily Conductivity vs Weekly Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington
LDCS-4B Cond. (µS/cm)
LDCS-4B Vol. Weekly
Conductivity (µS/cm)
Volume Pumped (Gal.)
1,700
1,600
1,500
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
12/1/1999
12/1/2000
12/1/2001
12/1/2002
12/1/2003
12/1/2004
12/1/2005
12/1/2006
12/1/2007
12/1/2008
12/1/2009
12/1/2010
12/1/2011
12/1/2012
12/1/2013
12/1/2014
12/1/2015
12/1/2016
12/1/2017
12/1/2018


LDCS-5
Daily Conductivity vs Weekly Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington
LDCS-5 Cond. (µS/cm)
LDCS-5 Vol. Weekly
Conductivity (µS/cm)
Volume Pumped (Gal.)
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
12/1/1999
12/1/2000
12/1/2001
12/1/2002
12/1/2003
12/1/2004
12/1/2005
12/1/2006
12/1/2007
12/1/2008
12/1/2009
12/1/2010
12/1/2011
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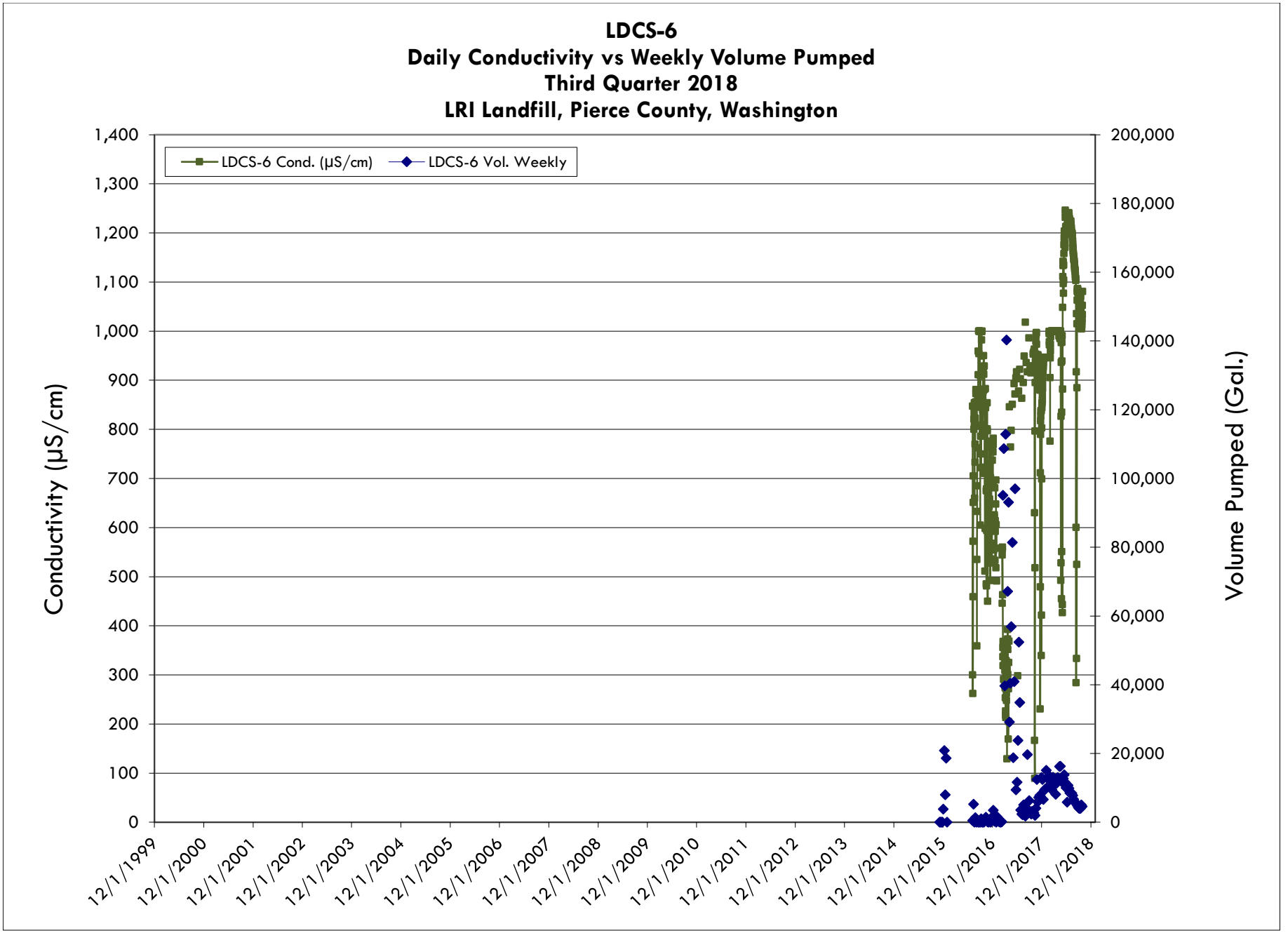
12/1/2015
12/1/2016
12/1/2017
12/1/2018


LDCS-6
Daily Conductivity vs Weekly Volume Pumped
Third Quarter 2018
LRI Landfill, Pierce County, Washington
LDCS-6 Cond. (µS/cm)
LDCS-6 Vol. Weekly
Conductivity (µS/cm)
Volume Pumped (Gal.)
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
12/1/1999
12/1/2000
12/1/2001
12/1/2002
12/1/2003
12/1/2004
12/1/2005
12/1/2006
12/1/2007
12/1/2008
12/1/2009
12/1/2010
12/1/2011
12/1/2012
12/1/2013
12/1/2014
12/1/2015
12/1/2016
12/1/2017
12/1/2018

Appendix I

Surface Water Monitoring Data

Washington State Department of Ecology **Discharge Monitoring Report (DMR)**

Permit Number: WAR002557 **Permittee:** Pierce County Recycling - 304th Street L

Facility County: Pierce **Receiving Waterbody:** South Creek

Monitoring Period: 07/01/2018 - 09/30/2018 **Outfall:** NEWB - NEWB 2 **Version:** 1

Week	Monitoring Point	Turbidity (NTU) Measured NTU Quarterly Grab	pH Standard Units Quarterly Grab	Oil & Grease Yes/No Quarterly Visual Observation	Copper Total Micrograms/L (ug/L) Quarterly Grab	Zinc Total Micrograms/L (ug/L) Quarterly Grab	Total BOD5 Total Milligrams/L (mg/L) Quarterly Grab	Solids (Residue) Total suspended (TSS) Milligrams/L (mg/L) Quarterly Grab	Ammonia Total Milligrams/L (mg/L) Quarterly Grab	Alpha-terpineol (3-Cyclohexene-1-methanol,.alpha.,alpha.,trimethyl-) Micrograms/L (ug/L) Quarterly Grab	Benzoic Acid Micrograms/L (ug/L) Quarterly Grab	p-Cresol (4-methylphenol) Micrograms/L (ug/L) Quarterly Grab
		NEWB	NEWB	NEWB	NEWB	NEWB	NEWB	NEWB	NEWB	NEWB	NEWB	NEWB
Limit Set		ISGP Western WA - 2015 Permit	ISGP Western WA - 2015 Permit	ISGP Western WA - 2015 Permit	ISGP Western WA - 2015 Permit	ISGP Western WA - 2015 Permit	ISGP Non-Haz Waste Landfill (40CFR part 445 subpart B)- 2015 permit	ISGP Non-Haz Waste Landfill (40CFR part 445 subpart B)- 2015 permit	ISGP Non-Haz Waste Landfill (40CFR part 445 subpart B)- 2015 permit	ISGP Non-Haz Waste Landfill (40CFR part 445 subpart B)- 2015 permit	ISGP Non-Haz Waste Landfill (40CFR part 445 subpart B)- 2015 permit	ISGP Non-Haz Waste Landfill (40CFR part 445 subpart B)- 2015 permit
Minimum												
			BM: >= 5.0 (RO)									
Average												
		BM: <= 25			BM: <= 14	BM: <= 117						
Maximum												
			BM: <= 9.0 (RO)									
Month 1 Average												
							<= 37	<= 27	<= 4.9	<= 16	<= 71	<= 14
Month 2 Average												
							<= 37	<= 27	<= 4.9	<= 16	<= 71	<= 14
Month 3 Average												
							<= 37	<= 27	<= 4.9	<= 16	<= 71	<= 14

Reporting Codes Used: C - No Discharge

Overall DMR Notes/Comment

Reporting Code: C - No Discharge

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 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.

George Duvendack

Signature

11/14/2018 6:10:33 AM

Date

Week	Monitoring Point	Phenol Micrograms/L (ug/L) Quarterly Grab	Zinc Total Micrograms/L (ug/L) Quarterly Grab	pH Standard Units Quarterly Grab
		NEWB	NEWB	NEWB
Limit Set		ISGP Non-Haz Waste Landfill (40CFR part 445 subpart B)- 2015 permit	ISGP Non-Haz Waste Landfill (40CFR part 445 subpart B)- 2015 permit	ISGP Non-Haz Waste Landfill (40CFR part 445 subpart B)- 2015 permit
Minimum				
				>= 6.0 (RO)
Average				
Maximum				
				<= 9.0 (RO)
Month 1 Average				
		<= 15	<= 110	
Month 2 Average				
		<= 15	<= 110	
Month 3 Average				
		<= 15	<= 110	

Washington State Department of Ecology **Discharge Monitoring Report (DMR)**

Permit Number: WAR002603 **Permittee:** LRI 304th Street Landfill

Facility County: Pierce **Receiving Waterbody:**

Monitoring Period: 07/01/2018 - 07/31/2018 **Outfall:** 001 - NEWB 2 **Version:** 1

Week	Monitoring Point	Turbidity (NTU) Measured NTU Optional Grab	Turbidity (cm) Measured Centimeters Optional Grab	pH Standard Units Optional Grab
		001	001	001
Minimum				
			BM: >= 33 (RO)	BM: >= 6.5 (RO)
Maximum				
		BM: <= 25 (RO)		BM: <= 8.5 (RO)

Reporting Codes Used: C - No Discharge

Overall DMR Notes/Comment

Reporting Code: C - No Discharge

Listed BMP's were in operation for the entire month.

Outfall: 001 - NEWB 2

Monitoring Point	Parameter	Sample Date/ Statistical Base	Value	Notes/Comment
001	All Parameters		C	

BMPs

Monitoring Point	Week	BMP
001		Check Dams
001		Other
001		Sediment Trap
001		Silt Fence
001		Straw Wattles

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 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.

George Duvendack — **Signature**

8/13/2018 11:47:58 AM — **Date**

Washington State Department of Ecology **Discharge Monitoring Report (DMR)**

Permit Number: WAR002603 **Permittee:** LRI 304th Street Landfill

Facility County: Pierce **Receiving Waterbody:**

Monitoring Period: 08/01/2018 - 08/31/2018 **Outfall:** 001 - NEWB 2 **Version:** 1

Week	Monitoring Point	Turbidity (NTU) Measured NTU Optional Grab	Turbidity (cm) Measured Centimeters Optional Grab	pH Standard Units Optional Grab
		001	001	001
Minimum				
			BM: >= 33 (RO)	BM: >= 6.5 (RO)
Maximum				
		BM: <= 25 (RO)		BM: <= 8.5 (RO)

Reporting Codes Used: C - No Discharge

Overall DMR Notes/Comment

Reporting Code: C - No Discharge

Listed BMP's were in operation for the entire month.

Outfall: 001 - NEWB 2

Monitoring Point	Parameter	Sample Date/ Statistical Base	Value	Notes/Comment
001	All Parameters		C	

BMPs

Monitoring Point	Week	BMP
001		Check Dams
001		Other
001		Sediment Trap
001		Silt Fence
001		Straw Wattles

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 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.

George Duvendack — **Signature**

9/14/2018 4:46:14 PM — **Date**

Washington State Department of Ecology **Discharge Monitoring Report (DMR)**

Permit Number: WAR002603 **Permittee:** LRI 304th Street Landfill

Facility County: Pierce **Receiving Waterbody:**

Monitoring Period: 09/01/2018 - 09/30/2018 **Outfall:** 001 - NEWB 2 **Version:** 1

Week	Monitoring Point	Turbidity (NTU) Measured NTU Optional Grab	Turbidity (cm) Measured Centimeters Optional Grab	pH Standard Units Optional Grab
		001	001	001
Minimum				
			BM: >= 33 (RO)	BM: >= 6.5 (RO)
Maximum				
		BM: <= 25 (RO)		BM: <= 8.5 (RO)

Reporting Codes Used: C - No Discharge

Overall DMR Notes/Comment

Reporting Code: C - No Discharge

Listed BMP's were in operation for the entire month.

Outfall: 001 - NEWB 2

Monitoring Point	Parameter	Sample Date/ Statistical Base	Value	Notes/Comment
001	All Parameters		C	

BMPs

Monitoring Point	Week	BMP
001		Check Dams
001		Other
001		Sediment Trap
001		Silt Fence
001		Straw Wattles

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 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.

George Duvendack — **Signature**

10/15/2018 8:37:02 AM — **Date**

Appendix J

Landfill Gas Data

Landfill Gas Probe Monitoring

SCS Engineers

304th Street Landfill

04218001.04

PCRCD dba LRI

July 25, 2018

Location Reference Designation *Note 1*	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Spike CH4 *Note 2* (% vol.)	Spike CO2 *Note 2* (% vol.)	Depth to Water (ft)	Other
GP-1	7/25/2018	8:32	1.77	4.0	3.8	13.9	6.2	-	18.37	
GP-2	7/25/2018	8:40	0.00	15.1	20.3	0.0	15.8	-	16.8	
GP-3	7/25/2018	8:49	-0.01	0.0	11.2	9.9	-	-	12.26	
GP-4	7/25/2018	8:57	0.04	0.0	8.9	8.8	-	-	Dry	
GP-9	7/25/2018	9:04	0.00	0.0	9.5	6.8	-	-	Dry	
GP-10	7/25/2018	8:16	-0.01	1.1	21.3	0.8	1.1			
GP-10P	7/25/2018	8:12	-0.03	12.2	25.9	0.0	6.1			
GP-11	7/25/2018	8:01	-0.02	0.0	14.8	7.3	-	-		
GP-12	7/25/2018	7:54	0.00	18.3	38.7	9.0	29.5			
GP-13	7/25/2018	7:47	-0.01	0.4	26.5	1.3	0.5	-		
GP-14	7/25/2018	9:26	0.00	0.0	0.0	20.2	-	-	15.38	
GP-15	7/25/2018	9:18	0.02	0.0	0.3	20.5	-	-	12.59	

General Data

Date:	25-Jul-18	Weather Conditions	
Monitored by:	T. Berndahl	Sky Cover:	Sunny
Instruments:	GEM 2000	Wind / Rain / Snow:	-
Calibration Date:	Daily	Temperature (^{0}F):	73

Notes

1. Gas Probes GP-5, GP-6, GP-7, and GP-8 were temporary gas probes and no longer exist.
2. Measurement for spike concentrations of CH4 and CO2 are recorded if observed during sampling.

GP = Gas Probe

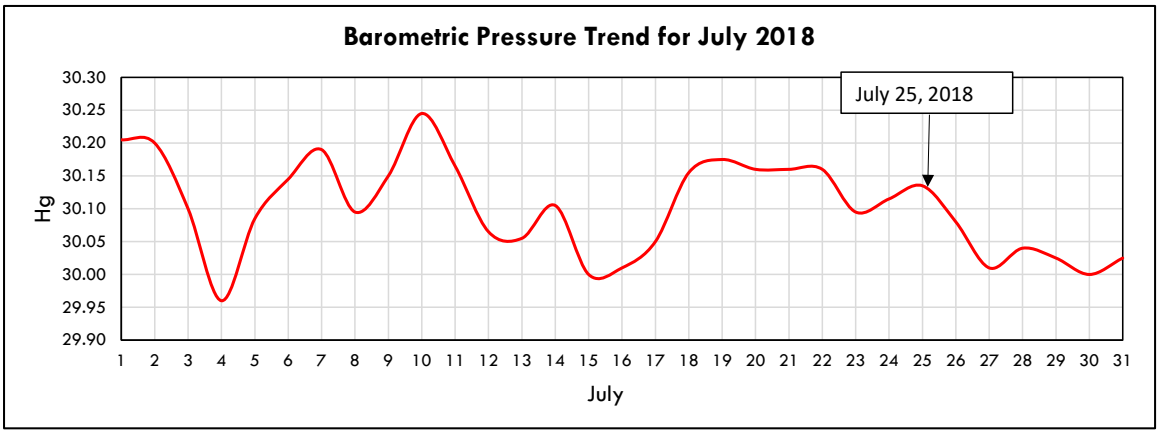
NM = Not measured

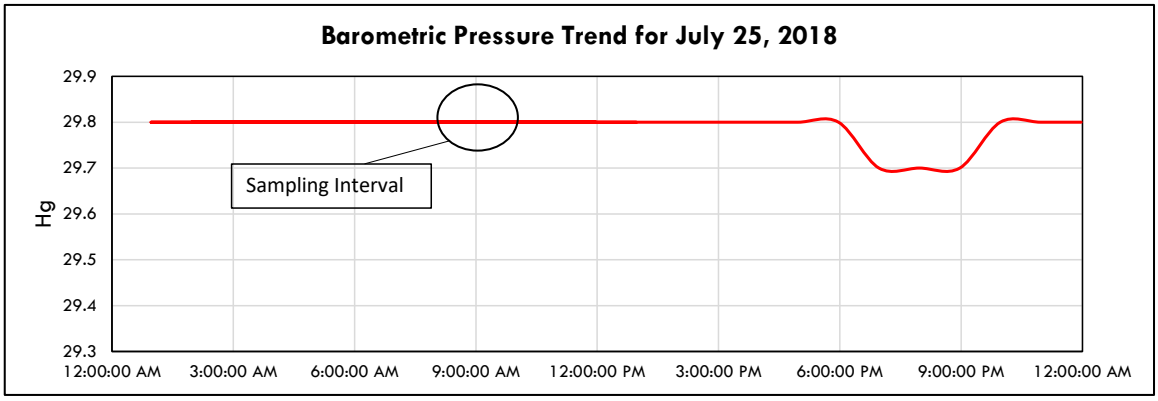
CH_4 = Methane

CO_2 = Carbon Dioxide

O_2 = Oxygen

Barometric Pressure Trend - July 2018
LRI Landfill, Pierce County, Washington





Source: Pierce County - Thun Field Station
Lat: 47.1 Long: 122.29 Elev: 538 ft-AMSL

Data Source: https://www.wunderground.com/history/daily/us/wa/puyallup/KPLU/date/2018-7-25

Landfill Gas Probe Monitoring

SCS Engineers

304th Street Landfill

04218001.04

PCRCD dba LRI

August 30, 2018

Location Reference Designation *Note 1*	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Spike CH4 *Note 2* (% vol.)	Spike CO2 *Note 2* (% vol.)	Depth to Water (ft)	Other
GP-1	8/30/2018	8:52	0.91	8.2	7.3	12.6	11.8	-	19.61	
GP-2	8/30/2018	9:02	0.55	15.7	21.7	0.0	16.5	-	17.85	
GP-3	8/30/2018	9:12	-0.02	0.0	12.0	11.0	-	-	12.97	
GP-4	8/30/2018	9:21	0.17	0.0	8.6	13.8	-	-	13.79	
GP-9	8/30/2018	9:28	0.22	0.0	10.2	8.6	-	-	15.20	
GP-10	8/30/2018	8:39	0.00	0.0	16.3	5.5	-	-	-	
GP-10P	8/30/2018	8:36	0.00	4.5	25.9	0.0	3.5	-	-	
GP-11	8/30/2018	9:41	0.00	0.0	14.8	7.7	-	-	-	
GP-12	8/30/2018	9:48	0.06	25.1	74.8	0.0	22.5	-	-	
GP-13	8/30/2018	8:25	0.00	1.2	28.9	0.7	0.6	-	-	
GP-14	8/30/2018	9:57	0.00	0.2	8.7	5.1	-	-	16.81	
GP-15	8/30/2018	10:07	0.03	0.0	0.5	20.8	-	-	14.01	

General Data

Date:	30-Aug-18	Weather Conditions	
Monitored by:	A. Deep	Sky Cover:	Overcast
Instruments:	GEM 2000	Wind / Rain / Snow:	-
Calibration Date:	Daily	Temperature (^oF):	62

Notes

1. Gas Probes GP-5, GP-6, GP-7, and GP-8 were temporary gas probes and no longer exist.
2. Measurement for spike concentrations of CH4 and CO2 are recorded if observed during sampling.

GP = Gas Probe

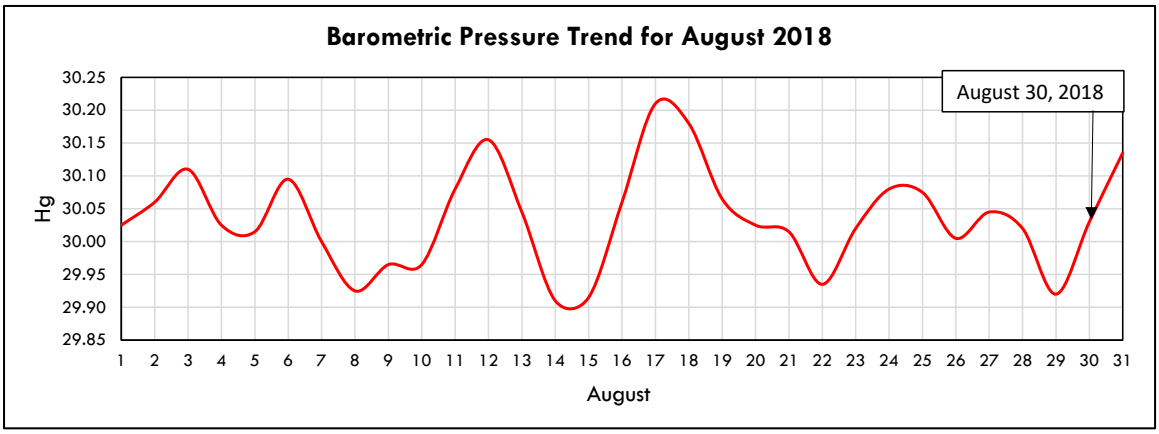
NM = Not measured

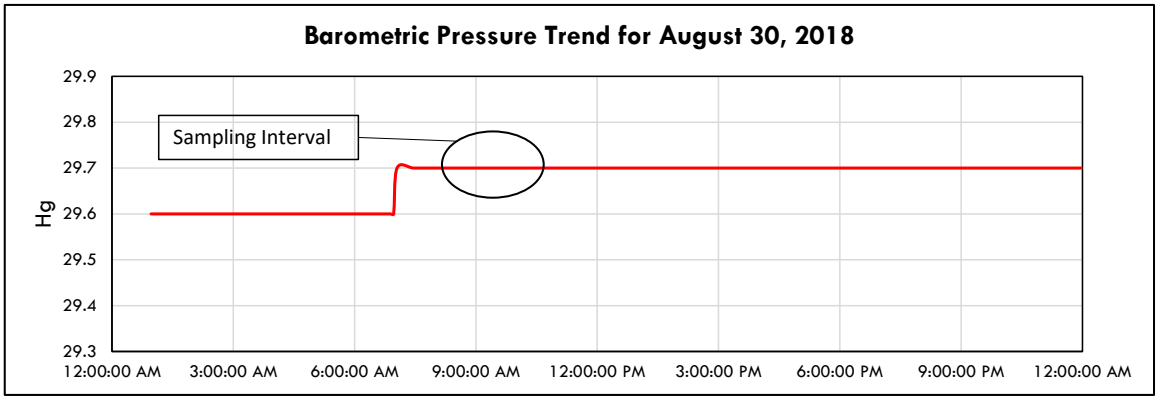
CH_4 = Methane

CO_2 = Carbon Dioxide

O_2 = Oxygen

Barometric Pressure Trend - August 2018
LRI Landfill, Pierce County, Washington





Source: Pierce County - Thun Field Station
Lat: 47.1 Long: 122.29 Elev: 538 ft-AMSL

Data Source: https://www.wunderground.com/history/daily/us/wa/puyallup/KPLU/date/2018-8-30

Landfill Gas Probe Monitoring

SCS Engineers

304th Street Landfill

04218001.04

PCRCD dba LRI

September 27, 2018

Location Reference Designation *Note 1*	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Spike CH4 *Note 2* (% vol.)	Spike CO2 *Note 2* (% vol.)	Depth to Water (ft)	Other
GP-1	9/27/2018	8:50	0.00	4.9	3.7	16.1	16.3	-	19.78	
GP-2	9/27/2018	9:03	0.02	14.4	18.8	0.1	17.0	-	18.58	
GP-3	9/27/2018	9:09	0.04	0.0	12.9	6.9	-	-	13.44	
GP-4	9/27/2018	9:19	-0.03	0.0	9.0	13.2	-	-	15.11	
GP-9	9/27/2018	9:28	0.00	0.0	9.9	6.2	-	-	15.84	
GP-10	9/27/2018	8:37	-0.08	0.0	16.0	3.7	-	-	-	
GP-10P	9/27/2018	8:33	-0.02	3.9	26.5	0.0	3.9	-	-	
GP-11	9/27/2018	8:23	0.00	0.0	19.6	3.0	-	-	-	
GP-12	9/27/2018	8:12	0.00	21.0	68.0	0.3	21.1	-	-	
GP-13	9/27/2018	8:03	-0.06	0.9	31.9	0.0	1.0	-	-	
GP-14	9/27/2018	9:49	0.03	0.6	12.0	0.5	0.6	-	17.66	
GP-15	9/27/2018	9:40	-0.09	0.0	0.0	21.4	-	-	14.91	

General Data

Date:	27-Sep-18	Weather Conditions	
Monitored by:	T. Berndahl	Sky Cover:	Sunny
Instruments:	GEM 2000	Wind / Rain / Snow:	-
Calibration Date:	Daily	Temperature (^oF):	53

Notes

1. Gas Probes GP-5, GP-6, GP-7, and GP-8 were temporary gas probes and no longer exist.
2. Measurement for spike concentrations of CH4 and CO2 are recorded if observed during sampling.

GP = Gas Probe

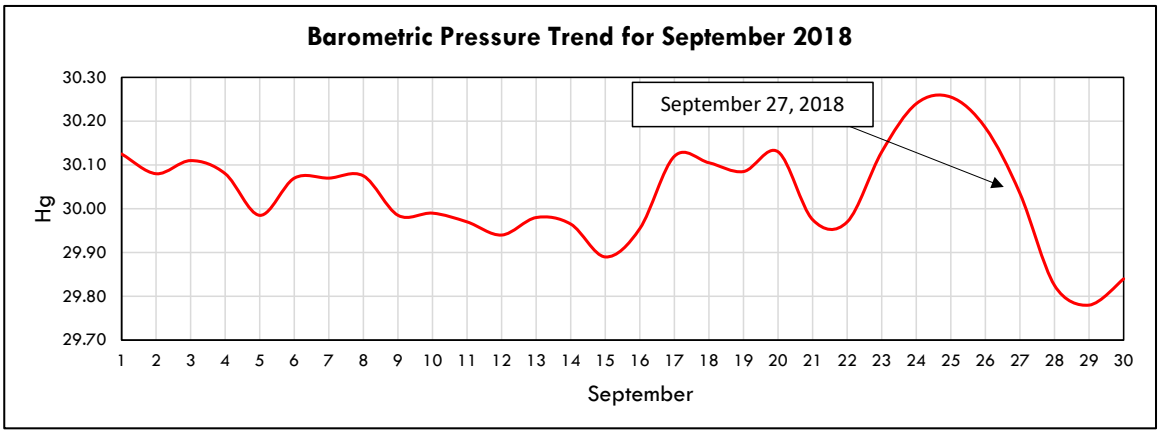
NM = Not measured

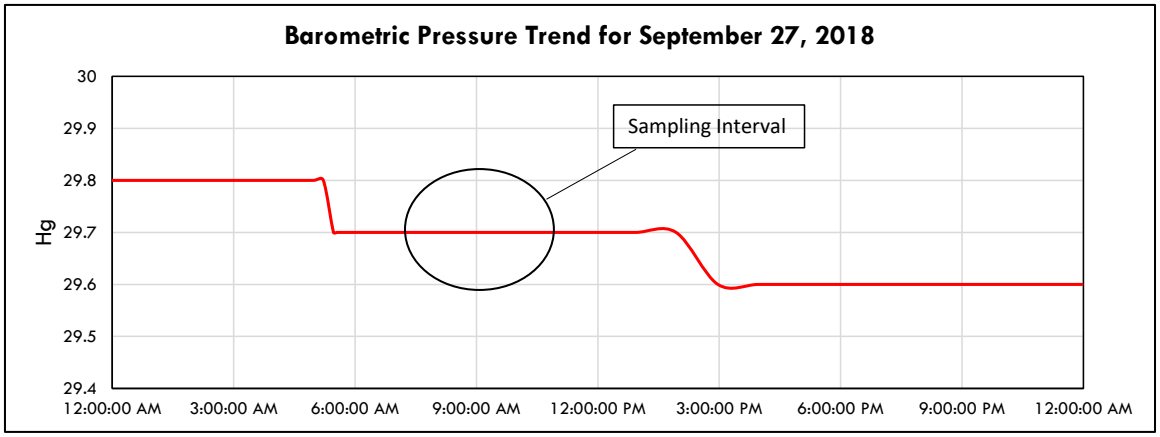
CH_4 = Methane

CO_2 = Carbon Dioxide

O_2 = Oxygen

Barometric Pressure Trend - September 2018
LRI Landfill, Pierce County, Washington





Source: Pierce County - Thun Field Station
Lat: 47.1 Long: 122.29 Elev: 538 ft-AMSL

Data Sources: https://www.wunderground.com/history/daily/us/wa/puyallup/KPLU/date/2018-9-27

LRI 304th Street Landfill
Landfill Gas Monitoring of On-site Buildings

Project Number: 04218001.04

Date: 8/30/18
Weather Conditions: OVERCAST
Instrument: MICRO FID
Measured By: A. Deep

The atmosphere inside buildings at the landfill were monitored for possible intrusion of methane gas. Per WAC 173-351, concentrations of methane in on-site structures must not exceed 25% of the lower explosive limit (LEL). If off-site gas migration is suspected, concentrations of methane in off-site structures must not exceed 100 ppm methane.

The areas monitored included:

- The general overall work area
- Floor drains
- Underground conduit protrusions
- Closed areas where landfill gas could collect, such as under cupboards and inside closets

The gas detection instrument must be calibrated using calibration gas containing methane equal to 50 % LEL. Calibration must be performed before and after the survey is completed.

Checked boxes indicate that the survey revealed **no detectable methane**.

- [x] Main Office - individual office spaces, storage areas and within open crawl-space area.
- [x] Repair Shop – survey atmosphere conditions throughout (lower height levels).
- [x] Pay/Scale Booth – interior of building.
- [x] Work Shop - interior of shed adjacent to stormwater ponds.

Background (main office)
upwind → 0.00 ppm
downwind → 0.00 ppm

Signature