

West Des Moines, IA

PROJECT: GRRWA, FY25-27 On-Call Support, IA 27224317.00 DATE: 11/20/2024

SUBJECT: GRRWA Sanitary Landfill - 56-SDP-07-80P - Leachate Collection Status Report TRANSMITTAL ID: 00002

PURPOSE: For your approval VIA: Info Exchange

FROM

NAME	COMPANY	EMAIL	PHONE
Sean Marczewski West Des Moines, IA	SCS Engineers	SMarczewski@scsengineers.com	+1-515-631-6152

TO

NAME	COMPANY	EMAIL	PHONE
Mike Smith 502 East 9th Street Des Moines IA 50319-0034 United States	Iowa, State of	mike.smith@dnr.iowa.gov	515-725-8200

REMARKS: Mike -

Please find for your download the GRRWA Sanitary Landfill Leachate Collection Status report. Let us know if you have any questions or comments.

Thanks,

Sean A. Marczewski
Project Professional
SCS Engineers
1690 All-State Court, Suite 100
West Des Moines, Iowa 50265
712-661-9682 (C)
515-631-6152 (O)
smarczewski@scsengineers.com

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QTY	DATED	TITLE	NOTES
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COPIES:

Transmittal

DATE: 11/20/2024
TRANSMITTAL ID: 00002

Becky Jolly	
Austin Banks	(Great River Regional Waste Authority, IA)
Nathan Ohrt	(SCS Engineers)
Tim Buelow	(SCS Engineers)
Sean Marczewski	(SCS Engineers)

November 20, 2024
File No. 27224317.00

Mr. Mike Smith, P.E.
Iowa Department of Natural Resources
Land Quality Bureau
6200 Park Avenue
Des Moines, Iowa 50321

Subject Leachate Collection Status
 Great River Regional Waste Authority Sanitary Landfill
 Phase 1 MSWLF Unit
 Permit No. 56-SDP-07-80P

Dear Mike:

In correspondence dated January 23, 2024 (Doc #108880), the Iowa Department of Natural Resources (DNR) required an evaluation of the impact of shutting down the leachate collection system before continuing with the partial shutdown of leachate extraction from the Phase 1 municipal solid waste landfill unit (Phase 1 MSWLF unit) at the Great River Regional Waste Authority (GRRWA) Sanitary Landfill. A schedule for completing this evaluation was requested by April 22, 2024. An extension to May 31, 2024, for the evaluation schedule submittal was approved on April 23, 2024 (Doc #109880). The schedule, including anticipated tasks for completing the leachate collection shut-down evaluation, was submitted on May 30, 2024 (Doc #110177) and approved in correspondence dated June 14, 2024 (Doc #110253). The schedule included a completion date of December 31, 2025.

Waste disposal occurred in the Phase 1 MSWLF unit from 1984 - March 1993. The Phase 1 MSWLF unit was constructed prior to the Subtitle D design requirements and therefore was not constructed with an engineered bottom liner or a leachate collection system. In accordance with the 2002 Iowa Administrative Code (IAC) 567-113.26(12)"b"(2) effective control for the Phase 1 MSWLF unit is considered as achieving "the lowest possible leachate head above the landfill liner." A map that includes the leachate control system of the Phase 1 MSWLF unit is included in Figure 1.

The *Phase I Leachate Extraction System Design*, submitted on February 22, 2005 by Barker Lemar Engineering Consultants (Doc #51712), provided the following summary of historical leachate management for the Phase 1 MSWLF unit.

Due to the groundwater levels measured near the Phase I area, and because the original surface of Phase I consisted of deep ravines, which have been filled with waste, it was suspected that groundwater may be infiltrating into the closed facility. In response, in 1987, a groundwater interception system was installed around the north and west perimeter of the Phase I area in an attempt to lower the water table and limit potential leachate formation. As indicated in the Leachate Control Plan prepared by James M. Montgomery Consulting Engineers, Inc. dated January 1992, installation of this system had resulted in the lowering of the water table approximately 10 feet in the vicinity of the trench, and may have reduced leachate generation in the Phase I area.



In May 7, 2001, the GRRWA was issued a Notice of Violation from the Iowa Department of Natural Resources (IDNR) because the existing leachate control system was not effectively removing leachate from the Phase I area.

In response to the Notice of Violation, Barker Lemar inspected the groundwater interceptor system located west of the Phase I area and found that the groundwater sump pump was inoperative. The pump was replaced. Prior to this, GRWWA began an aggressive program of pumping each leachate well and recording pre-and post-pumping levels in the leachate wells from April 1999 through November 2000. Since the wells did not have dedicated pumps, the maintenance costs on the pumps and daily operational needs overextended landfill staff. It was determined that a more permanent solution was needed

In October 2003, a 36-inch leachate extraction well was installed, which was connected by a 2-inch force main to the existing manhole west of the leachate lagoon. This extraction well is located in the southeast end of Phase I and is labeled as LW-5, and is shown on Sheet 1 [not included].

Subsequently, Barker Lemar proposed a plan to increase the steepness of the landfill slopes, which would reduce the volume of infiltrating precipitation, thus reducing potential leachate formation. This plan was not approved by IDNR because it called for adding new solid waste over an unlined area to increase the slopes.

Other options had been suggested to control leachate accumulations. Installing additional wells was considered; however, these would also have to be pumped. Boring into the waste to install lateral leachate collection lines was also considered, but the uneven terrain of the base of the landfill is not well documented, and the risk of creating additional conduits to the groundwater would be significant.

In March 2004, Barker Lemar proposed that GRWWA install a leachate collection header pipe with lateral pipes extending to each existing leachate piezometer, into which dedicated pumps would be installed. This type of system would effectively remove accumulated leachate and reduce build up of leachate in the landfill.

The *Phase 1 Leachate Extraction System Design* discussed an evaluation of historical leachate level measurements that began in 2000, drawdown rates during pumping, and recovery rates between pumping events. The evaluation concluded that the historical data demonstrated that leachate was accumulating in the Phase 1 MSWLF unit and would continue until action was taken. The pumping data indicated that the accumulated leachate could be efficiently removed using submersible pumps and that the pumps would be adequate to lower the leachate levels. The design described the components, layout, and operation of the leachate extraction system. The design was approved by the DNR in Amendment #2, issued March 2, 2005 (Doc #51711). The *Construction Certification Report, Phase 1 Leachate Extraction System*, dated November 14, 2006 (Doc #51669), prepared by Barker Lemar, was approved in Amendment #11, dated November 21, 2006 (Doc #51668). It was reported in the *2006 Leachate Control System Performance Evaluation* report, dated November 28, 2006 (Doc #14914), prepared by Barker Lemar, that the leachate extraction system began operation in August 2006. Extraction pumps were installed in seven leachate piezometers (PZ-1, PZ-2, PZ-6R, PZ-7R, PZ-8, PZ-9, and PZ-10R) and extraction well LW-5.

The tables and graphs presented in the 2018 Leachate Control System Performance Report, submitted as an appendix to the *2018 Annual Water Quality Report*, dated November 28, 2018 (Doc #93844), show the reduction in leachate thickness in multiple extraction wells and piezometers following the start-up of the leachate extraction system.

In correspondence from Barker Lemar dated October 9, 2015 (Doc #84657), a permit amendment was requested for cessation of leachate extraction from the Phase 1 MSWLF unit. The request stated the following:

GRRWA is actively pursuing data collection activities beneficial to an eventual request to end/reduce postclosure care of the Phase 1 MSWLF unit. Groundwater data collected from the Phase 1 MSWLF unit Hydrologic Monitoring System Plan (HMSP) monitoring network has been conducted while active leachate extraction was occurring from the MSWLF unit, meaning that the groundwater analytical data is predicated on the condition of on-going leachate extraction. It is the desire of GRRWA to collect groundwater analytical data under the conditions of no leachate extraction from the Phase 1 MSWLF unit so that when a determination is eventually made to end/reduce postclosure care for the Phase 1 MSWLF unit, continuous and on-going leachate extraction will not be a permanent condition.

The request to cease leachate extraction in the Phase 1 MSWLF unit for a trial period was approved in Permit Amendment #3, issued December 1, 2015 (Doc #84769). The trial period intended to demonstrate that leachate would not adversely impact groundwater quality in the absence of leachate extraction. The leachate extraction pumps were shut off on December 2, 2015. The trial period was extended by Permit Amendment #5 issued March 31, 2017 (Doc #88888). Appendix I sampling of the Phase 1 MSWLF unit began in 2014 for the eight monitoring points in the HMSP monitoring network. A recommendation to reduce sampling frequency from semi-annual to annual was included in the *2018 Annual Water Quality Report*, dated November 28, 2018 (Doc #93844) and approved in Permit Revision #4, issued January 25, 2018 (Doc #94248). Groundwater sampling was deferred until further notice in correspondence dated March 19, 2019 (Doc #94668).

The *Leachate Extraction Cessation Trial Period Report*, dated February 28, 2019 (Doc #94524), prepared by Barker Lemar, discussed the leachate levels measured since extraction ceased, results of groundwater and leachate sampling during the trial period, the results of leachate seep inspections, and a geochemical review of the leachate analytical data. The report concluded that it appeared likely that the cessation of leachate extraction in the Phase 1 MSWLF unit did not have an adverse effect on groundwater based on the groundwater quality data, the mature leachate characteristics, the absence of leachate seeps, and the stabilized leachate column thicknesses that indicated that leachate levels were not likely to increase appreciably over time. Based on these observations, the report recommended to permanently discontinue leachate extraction in the Phase 1 MSWLF unit including the discharge and sampling of the Phase 1 Wet Well. A DNR comment letter regarding the trial period report dated March 19, 2019 (Doc #94668) generally agreed with the findings of the trial period and recommended continuing management of the compliance requirements for the Phase 1 MSWLF unit with significantly reduced sampling and reporting requirements. A request to reduce sampling was submitted in correspondence dated February 14, 2020 (Doc #97021); the requested sampling was biennial sampling of selenium in monitoring well MW-4 and cobalt in monitoring wells MW-21 and MW-25. The biennial sampling was approved in the renewed permit dated September 11, 2020 (Doc #98443).

As stated in correspondence dated August 5, 2019 (Doc #95656), based on the head levels and the isolated small soggy area noted in the eastern portion of the southernmost terrace during the Spring

2019 inspection, the DNR requested that a toe-drain be installed along the southern portion of the Phase 1 MSWLF unit to passively convey leachate from the waste mass. The toe drain was installed in June 2019 and construction documentation was included in the August 5, 2019 correspondence (Doc #95656). The construction documentation was approved in Permit Revision #5, issued August 19, 2019 (Doc #95738). The permit revision required that monthly leachate level measurements be continued until a stable or declining leachate column thickness trend could be demonstrated. In addition, it was directed to inspect the leachate toe drain performance on the same monthly schedule as the thickness measurements and report any changes to the soft areas near the landfill toe.

Leachate thicknesses generally increased following the pumps being turned off, but have generally stabilized, in numerous cases to near pre-pumping levels. The toe-drain has been effective in controlling leachate as indicated by leachate thickness stability, the lack of seeps, and no observations of wet/soft areas in the southern area of the Phase 1 MSWLF unit. The leachate thicknesses since the toe-drain was installed in June 2019 have stabilized as shown in the table and graphs included in Attachment A.

Mann-Kendall trend evaluation for Appendix I constituents was presented in the Phase 1 MSWLF unit's *2018 Annual Water Quality Report*, dated November 28, 2018 (Doc #93844). 21 of 36 analyzed trends (58.3%) were zero or less, indicating a generally decreasing concentration trend (or stable trend in the case of zero). Specifically, monitoring wells MW-21 and MW-25, located on the east and west edge, respectively, of the base of the ravine filled by the Phase 1 MSWLF unit, had primarily decreasing trends, with six of nine concentration trends decreasing for MW-21 and six of six concentration trends decreasing or stable for MW-25.

Monitoring well MW-26, which is part of the Phase 2 MSWLF unit monitoring network, is located between monitoring wells MW-21 and MW-25 at the base of the ravine filled by the Phase 1 MSWLF unit. Monitoring well MW-26 has been monitored semi-annually for the Appendix I list since 2008. The only quantified volatile organic compound (VOC) detected since the toe-drain was installed in 2019 was acetone, which had two detections slightly above the reporting limit in 2022. These detections can likely be discounted as acetone is a common laboratory contaminant (United States Environmental Protection Agency, 1999). Since the toe-drain was installed, five metals have had quantified concentrations measured in monitoring well MW-26: barium, cadmium, cobalt, nickel, and thallium. Cadmium had two detections and thallium had one. A visual review of the other metals concentrations indicated barium was generally stable and cobalt and nickel were generally decreasing.

Since 2020, groundwater sampling for the Phase 1 MSWLF unit has consisted of biennial sampling of selenium in monitoring well MW-4 and cobalt in monitoring wells MW-21 and MW-25. As last presented in the *2023 Annual Water Quality Report* for the Phase 1 MSWLF unit, dated October 16, 2023 (Doc #107955), Mann-Kendall trending analysis indicated concentrations for cobalt in monitoring wells MW-21 and MW-25 and selenium in monitoring well MW-4 are stable or trending downward, although not at statistically significant rates at 99% confidence ($\alpha = 0.01$). The selenium concentration measured in monitoring well MW-4 during the August 2023 sampling event was the lowest recorded concentration in the monitoring well since low-flow sampling began in 2016.

The Phase 1 MSWLF unit was a ravine fill oriented generally north to south. The placement of the toe-drain on the downgradient/south end of the ravine fill is expected to continue to intercept and collect leachate that previously was being collected by the extraction wells further upgradient in the ravine fill. In addition, based on the likely convergent influence on leachate flow provided by the


Mike Smith
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typical ravine geometry, the toe-drain is expected to provide a more complete intercept of leachate from the Phase 1 MSWLF unit than the extraction wells.

The January 23, 2024, DNR correspondence stated that the required evaluation should indicate that either the leachate collection system should resume operation, be downsized/modified, or continue shut down as is. Based on the observations discussed herein, leachate interception improvement by the toe-drain over the extraction wells, and GRRWA's intention to continue operation of the toe-drain leachate collection system, it is recommended that the already implemented modification of the leachate collection system from extraction wells to a toe-drain installed at the downgradient end of the Phase 1 MSWLF unit be accepted and that the leachate extraction wells continue in their shutdown status and be removed from consideration as part of the leachate extraction system of the Phase 1 MSWLF unit. Additionally, it is recommended that an environmental covenant be pursued for the Phase 1 MSWLF unit to end post-closure care subject to the continuing requirements and restrictions specified in the environmental covenant.

If you have any questions regarding this submittal, please contact Nathan Ohrt at (319) 331-9613.

Sincerely,



FOR: NATHAN OHRT

Nathan Ohrt
Senior Project Professional
SCS Engineers

NPO/TCB

Copies: Mr. Austin Banks, Great River Regional Waste Authority



Timothy C. Buelow, P.E.
Senior Project Advisor
SCS Engineers



Figure 1

GRRWA Sanitary Landfill
 Fort Madison, Iowa
 Project No: 27224317.00
 Drawing Date: November 2024

Leachate Control System

Leachate Receiver and/or Extraction Well Location	Cleanout	Underdrain Monitoring Point	Located Waste Boundary
Leachate Monitoring Point	SolleachatePipePh1	Landfill Gas Well	Approximate GRWA Property Boundary
Lift Station	Leachate Pipe - Solid	Approximate Location Of Boundary - Phase 2	Existing Cell Boundaries
Manhole	Leachate Pipe - Perforated	Approximate Waste Boundary - Phase 2	Approximate Location of Future Cell Boundary
	Monitoring Well	Cell Boundary	

SCS ENGINEERS
 environmental consultants and contractors



Attachment A

Historical Leachate Levels

Attachment A
Phase 1 Leachate Level Measurements
Great River Regional Waste Authority Sanitary Landfill
Fort Madison, Iowa
Project No. 27223130.00

CONSTRUCTED WELL DEPTH (ft)	LEACHATE PIEZOMETER											
	PZ-1	PZ-2	PZ-3	PZ-6R	PZ-7	PZ-7R	PZ-8	PZ-9	PZ-10	PZ-10R	PZ-11	LW-5
	40.0	45.8	39.9	57.0	42.0	41.0	45.1	38.3	63.8	64.0	47.8	46.8
DATE	MEASURED LEACHATE COLUMN (ft)											
1/27/2000	17.27	24.99	3.94	NI	8.16	NI	11.45	9.69	40.84	NI	NI	NA
2/28/2000	15.48	25.34	4.07	NI	8.66	NI	11.71	9.34	40.31	NI	NI	NA
3/29/2000	15.42	9.26	3.90	NI	8.73	NI	7.29	10.09	39.53	NI	NI	NA
4/25/2000	10.48	21.24	3.39	NI	8.64	NI	6.56	9.66	39.58	NI	NI	NA
5/30/2000	10.55	15.26	3.73	NI	8.76	NI	11.52	10.55	40.68	NI	NI	NA
6/28/2000	14.14	17.04	3.77	NI	8.95	NI	11.72	6.55	40.62	NI	NI	NA
7/25/2000	12.58	17.09	3.75	NI	8.86	NI	12.12	7.25	40.82	NI	NI	NA
8/28/2000	15.55	10.49	3.55	NI	8.71	NI	12.09	6.85	40.65	NI	NI	NA
9/27/2000	10.99	16.99	2.75	NI	9.16	NI	12.14	6.90	40.59	NI	NI	NA
10/30/2000	14.09	15.25	3.05	NI	9.22	NI	12.18	6.92	39.55	NI	NI	NA
11/27/2000	15.40	19.80	3.75	NI	9.55	NI	12.85	8.30	41.10	NI	NI	NA
12/26/2000	15.38	20.29	2.75	NI	9.14	NI	12.77	8.85	39.99	NI	NI	NA
1/30/2001	17.25	21.47	4.79	NI	9.55	NI	10.52	9.39	41.05	NI	NI	NA
2/28/2001	17.20	21.38	2.92	NI	9.64	NI	11.71	9.39	40.28	NI	NI	NA
3/29/2001	15.46	23.70	2.72	NI	9.42	NI	10.62	9.15	40.41	NI	NI	NA
4/30/2001	10.50	21.31	3.63	NI	12.06	NI	9.41	9.85	40.28	NI	NI	NA
5/18/2001	16.25	26.75	3.80	NI	15.10	NI	13.65	11.00	40.50	NI	NI	NA
6/29/2001	16.90	26.44	3.92	NI	13.23	NI	13.73	10.05	40.68	NI	NI	NA
7/30/2001	16.35	26.30	3.90	NI	12.50	NI	14.08	11.11	40.75	NI	NI	NA
8/29/2001	16.40	26.05	3.90	NI	12.10	NI	14.32	11.20	40.68	NI	NI	NA
9/28/2001	16.32	25.80	3.87	NI	11.73	NI	14.43	11.04	40.53	NI	NI	NA
10/31/2001	16.46	26.35	3.70	NI	12.79	NI	14.90	11.40	40.65	NI	NI	NA
11/29/2001	16.55	25.80	3.52	NI	11.97	NI	15.09	11.39	40.60	NI	NI	NA
12/26/2001	16.70	25.82	3.59	NI	12.16	NI	15.27	11.77	40.89	NI	NI	NA
1/31/2002	20.02	22.09	3.37	NI	11.48	NI	14.46	11.05	40.35	NI	NI	NA
2/28/2002	16.45	26.03	3.78	NI	12.85	NI	15.30	11.80	40.78	NI	NI	NA
3/28/2002	16.76	26.35	3.72	NI	13.02	NI	15.40	12.06	40.86	NI	NI	NA
4/30/2002	16.75	26.51	4.06	NI	12.61	NI	15.33	11.92	40.62	NI	NI	NA
5/28/2002	16.80	26.63	3.98	NI	12.28	NI	15.45	12.12	40.70	NI	NI	NA
6/27/2002	14.81	26.25	4.04	NI	12.00	NI	15.34	12.06	40.61	NI	NI	NA
7/31/2002	16.85	26.25	4.65	NI	11.58	NI	15.37	12.06	41.45	NI	9.55	NA
8/30/2002	20.50	22.20	3.91	NI	11.96	NI	15.37	11.97	40.36	NI	9.75	NA
9/30/2002	16.80	26.60	3.91	NI	11.55	NI	15.52	12.19	40.40	NI	5.70	NA
10/28/2002	16.94	26.83	4.98	NI	11.46	NI	15.60	12.22	40.54	NI	2.89	NA
11/27/2002	16.84	26.48	4.00	NI	11.14	NI	15.36	11.91	40.20	NI	2.92	NA
12/30/2002	17.15	27.05	4.10	NI	10.70	NI	14.00	11.20	40.72	NI	1.15	NA
1/28/2003	16.90	26.69	4.03	NI	11.07	NI	15.43	12.06	40.27	NI	2.96	NA
2/27/2003	16.92	26.70	4.00	NI	11.44	NI	15.64	12.27	40.36	NI	5.47	NA
3/31/2003	16.90	26.60	3.97	NI	11.30	NI	15.69	12.32	40.22	NI	6.42	NA
4/30/2003	20.80	22.68	4.03	NI	11.27	NI	15.57	12.24	40.16	NI	7.36	NA
5/30/2003	20.90	18.88	4.06	NI	11.21	NI	15.85	12.64	40.53	NI	9.00	NA
6/30/2003	16.85	26.38	4.05	NI	10.97	NI	15.46	12.01	40.00	NI	9.36	NA
7/31/2003	16.98	26.41	4.05	NI	11.07	NI	15.66	12.37	40.18	NI	27.32	NA
8/28/2003	20.51	22.17	3.07	NI	10.95	NI	15.60	12.40	40.20	NI	28.50	NA
11/26/2003	20.89	22.88	4.10	NI	11.49	NI	15.60	12.51	40.30	NI	15.80	NA
12/23/2003	17.23	26.73	4.16	NI	14.15	NI	15.71	12.58	40.34	NI	8.44	NA
1/29/2004	20.77	22.90	4.02	NI	12.65	NI	15.85	12.65	40.16	NI	8.34	NA
2/27/2004	20.90	22.91	4.00	NI	13.80	NI	15.70	12.50	37.95	NI	8.00	NA
3/30/2004	17.33	27.00	4.11	NI	14.04	NI	15.85	12.66	40.17	NI	8.15	NA
4/29/2004	17.21	27.10	4.10	NI	12.85	NI	15.85	12.60	40.10	NI	7.57	NA
5/25/2004	17.23	26.73	4.16	NI	14.15	NI	15.71	12.58	40.34	NI	8.44	NA
6/29/2004	17.00	33.65	4.08	NI	11.00	NI	15.78	12.40	39.85	NI	5.30	NA
7/26/2004	17.08	26.75	3.99	NI	11.80	NI	15.74	12.48	39.86	NI	7.46	NA
8/31/2004	17.05	26.72	4.01	NI	13.16	NI	15.70	12.49	39.88	NI	NA	NA
9/30/2004	17.13	26.83	4.00	NI	12.66	NI	15.82	12.61	39.88	NI	7.90	NA
10/26/2004	17.10	27.05	4.05	NI	12.95	NI	15.71	12.57	39.90	NI	7.62	NA
11/30/2004	17.14	27.10	4.04	NI	13.99	NI	15.80	12.59	39.96	NI	8.06	NA
12/31/2004	17.35	27.45	4.20	NI	13.10	NI	15.90	12.60	39.90	NI	7.45	NA

Attachment A
Phase 1 Leachate Level Measurements
Great River Regional Waste Authority Sanitary Landfill
Fort Madison, Iowa
Project No. 27223130.00

CONSTRUCTED WELL DEPTH (ft)	LEACHATE PIEZOMETER											
	PZ-1	PZ-2	PZ-3	PZ-6R	PZ-7	PZ-7R	PZ-8	PZ-9	PZ-10	PZ-10R	PZ-11	LW-5
	40.0	45.8	39.9	57.0	42.0	41.0	45.1	38.3	63.8	64.0	47.8	46.8
DATE	MEASURED LEACHATE COLUMN (ft)											
1/31/2005	17.35	27.47	4.06	NI	13.20	NI	15.90	12.55	39.85	NI	7.70	NA
2/28/2005	17.55	27.79	4.11	NI	13.92	NI	16.24	12.99	40.22	NI	8.31	NA
3/29/2005	17.55	27.96	4.30	NI	13.25	NI	16.60	13.00	40.30	NI	7.45	NA
4/28/2005	17.36	27.91	4.18	NI	12.98	NI	16.03	12.65	39.85	NI	7.86	NA
5/31/2005	17.31	27.88	4.20	NI	12.36	NI	15.98	12.63	39.76	NI	7.44	NA
6/29/2005	17.28	27.80	4.20	NI	12.15	NI	16.05	12.65	38.85	NI	7.40	NA
7/25/2005	15.26	27.65	4.18	NI	12.00	NI	16.00	12.67	39.73	NI	7.21	NA
10/24/2005	17.19	27.38	4.09	NI	11.47	NI	15.86	12.60	39.50	NI	16.36	NA
1/23/2006	17.20	27.13	4.16	NI	11.25	NI	15.95	12.56	38.46	NI	17.58	NA
4/14/2006	17.63	27.83	4.20	NI	14.47	NI	16.25	13.09	39.90	NI	29.47	NA
7/27/2006	17.42	27.49	4.30	NI	12.43	NI	16.14	12.88	39.50	NI	27.20	NA
10/20/2006	1.51	19.30	NA	NI	3.48	NI	2.09	1.18	36.57	NI	7.80	NA
1/31/2007	0.02	19.60	0.02	NI	10.19	NI	0.10	1.10	0.25	NI	0.77	NA
4/27/2007	1.70	19.77	4.21	NI	12.58	NI	2.02	1.09	36.40	NI	7.90	NA
7/20/2007	0.86	19.61	4.14	NI	11.67	NI	2.10	0.99	36.44	NI	7.89	NA
10/26/2007	40.00	45.80	3.97	NI	11.27	NI	4.88	0.68	NA	NI	7.88	NA
1/31/2008	1.56	32.20	4.00	NI	11.25	NI	1.85	0.68	NA	NI	7.80	NA
4/29/2008	7.82	33.20	NA	NI	12.60	NI	1.83	0.82	NA	NI	8.12	NA
7/31/2008	13.98	30.99	NA	NI	10.72	NI	1.92	1.08	NA	NI	7.94	NA
10/13/2008	15.00	31.34	4.12	NI	10.90	NI	1.99	1.17	NA	NI	7.98	NA
1/19/2009	16.59	32.69	3.97	NI	11.91	NI	3.62	1.13	36.30	NI	7.99	NA
2/24/2009	16.78	32.68	4.12	NI	5.28	NI	2.05	6.28	13.18	NI	16.95	NA
3/25/2009	16.82	33.56	4.12	NI	5.58	NI	1.92	0.61	4.84	NI	47.80	NA
4/30/2009	16.92	33.79	4.20	NI	5.29	NI	1.98	2.79	4.47	NI	8.77	NA
6/25/2009	16.89	32.75	4.08	NI	12.00	NI	3.86	1.76	36.65	NI	8.10	NA
8/27/2009	16.83	32.57	4.22	NI	5.36	NI	2.10	8.76	3.58	NI	7.82	NA
9/29/2009	16.80	31.89	4.17	NI	5.26	NI	2.01	9.18	3.86	NI	7.97	NA
10/29/2009	17.10	33.40	4.21	NI	7.04	NI	2.12	10.07	10.35	NI	8.34	NA
11/30/2009	17.10	33.76	4.19	NI	5.48	NI	1.95	9.27	4.15	NI	8.35	NA
12/1/2009	17.15	33.50	4.02	NI	5.37	NI	1.96	10.30	3.84	NI	8.02	NA
1/29/2010	17.26	33.92	4.16	NI	5.67	NI	1.97	1.32	4.20	NI	7.99	NA
2/26/2010	17.31	33.15	4.10	31.70	5.58	4.48	1.66	1.63	3.65	5.17	8.03	NA
3/30/2010	17.10	33.67	4.20	33.58	5.97	4.45	8.35	NA	4.21	5.96	8.56	NA
4/22/2010	16.09	33.13	4.21	32.71	5.75	4.41	1.72	1.55	4.01	5.80	8.17	NA
5/27/2010	16.93	32.91	4.18	34.19	5.85	4.56	1.85	2.75	3.90	5.69	15.07	NA
6/27/2010	16.58	31.28	4.18	34.25	6.28	4.68	1.78	2.55	3.84	5.58	16.38	NA
7/21/2010	17.17	32.80	4.22	33.88	5.80	4.47	1.78	8.16	4.00	5.77	28.78	NA
8/23/2010	26.06	22.65	4.30	32.45	5.84	4.60	1.80	9.37	3.77	5.55	30.55	NA
9/28/2010	17.03	32.55	4.30	32.46	5.98	4.48	1.90	10.63	4.01	5.81	31.20	NA
10/26/2010	17.08	32.24	4.45	31.38	6.15	4.52	1.90	10.73	4.10	5.90	31.32	NA
11/30/2010	17.10	31.32	4.44	29.40	5.77	4.48	1.86	1.56	3.70	5.52	30.65	NA
12/22/2010	17.02	30.39	4.19	28.55	5.82	4.28	1.92	1.30	2.00	5.40	29.36	NA
1/27/2011	15.85	31.10	4.34	27.35	5.86	3.88	1.95	10.20	4.29	5.76	27.95	NA
2/23/2011	14.69	30.28	3.78	31.58	5.95	4.45	2.92	NA	3.49	4.85	30.37	NA
3/1/2011	11.15	31.68	3.29	31.32	5.90	4.28	7.18	6.72	3.70	4.16	29.22	NA
4/29/2011	17.86	31.72	3.90	34.19	5.85	4.56	1.85	2.75	3.90	5.69	15.07	NA
5/23/2011	16.69	32.78	4.48	31.25	7.09	5.02	1.95	10.80	4.15	5.85	31.28	NA
6/29/2011	17.92	31.62	3.80	32.38	5.68	4.86	2.00	0.00	4.33	5.86	31.35	NA
7/25/2011	16.88	32.08	3.75	30.59	4.62	3.92	1.86	9.50	3.49	5.38	29.35	NA
8/30/2011	16.79	32.02	3.66	30.60	4.72	3.90	1.89	9.55	3.45	5.47	29.38	NA
9/27/2011	12.82	30.40	3.22	28.19	3.97	3.51	1.88	9.27	3.51	5.28	30.72	NA
10/24/2011	11.95	27.95	2.96	27.96	3.75	3.18	1.90	9.21	3.56	4.99	29.75	NA
11/28/2011	16.86	28.91	4.34	27.86	3.68	3.11	2.12	9.12	3.32	5.02	29.60	NA
12/21/2011	1.59	31.68	3.06	28.35	4.78	3.26	1.92	7.26	3.49	5.06	29.79	NA
1/30/2012	1.48	31.00	4.05	27.96	4.10	3.20	1.89	6.32	3.42	5.24	29.56	NA
2/29/2012	1.52	31.02	4.18	27.92	3.99	3.55	2.00	6.41	3.40	5.30	29.60	NA
3/28/2012	1.60	31.12	4.10	27.82	3.86	3.44	1.97	6.40	3.39	5.28	29.58	NA
4/29/2012	1.60	31.90	4.66	28.77	NA	4.16	1.46	0.82	NA	5.40	20.72	NA
5/31/2012	7.02	11.84	4.12	22.57	5.02	3.90	1.90	8.56	3.56	5.27	10.38	NA
6/27/2012	7.04	10.85	4.12	27.55	4.55	3.88	3.90	8.56	3.56	5.27	12.38	NA
7/30/2012	7.05	10.85	4.28	26.48	4.42	3.90	3.95	8.60	3.60	5.30	12.22	NA
8/28/2012	7.01	10.86	4.25	19.86	4.75	3.00	1.89	0.00	4.82	5.06	17.18	NA
9/27/2012	6.84	10.86	4.38	19.91	4.80	2.58	2.10	9.40	4.88	5.09	17.29	NA
10/23/2012	6.63	10.85	4.18	19.80	4.80	2.18	1.89	0.96	5.06	5.32	17.22	NA
11/27/2012	6.56	10.87	3.86	19.80	4.85	2.10	1.90	0.98	5.07	5.36	17.20	NA
12/18/2012	7.36	10.84	3.82	19.72	4.88	2.15	1.90	1.00	5.05	5.31	17.19	NA

Attachment A
Phase 1 Leachate Level Measurements
Great River Regional Waste Authority Sanitary Landfill
Fort Madison, Iowa
Project No. 27223130.00

CONSTRUCTED WELL DEPTH (ft)	LEACHATE PIEZOMETER											
	PZ-1	PZ-2	PZ-3	PZ-6R	PZ-7	PZ-7R	PZ-8	PZ-9	PZ-10	PZ-10R	PZ-11	LW-5
	40.0	45.8	39.9	57.0	42.0	41.0	45.1	38.3	63.8	64.0	47.8	46.8
DATE	MEASURED LEACHATE COLUMN (ft)											
1/28/2013	7.50	10.83	3.85	19.70	4.85	2.17	1.90	0.98	5.00	5.32	17.22	NA
2/28/2013	7.47	10.85	4.65	19.69	5.58	2.19	1.09	0.41	5.02	5.49	11.38	NA
3/25/2013	7.51	11.16	3.90	31.75	5.11	4.38	4.02	2.87	5.88	6.15	11.40	NA
4/23/2013	7.49	NA	3.75	32.86	5.10	4.60	4.05	2.90	5.98	6.16	10.91	NA
5/29/2013	7.52	80.69	4.10	34.40	4.60	3.85	4.05	8.60	3.60	6.61	12.30	NA
6/25/2013	7.49	80.70	4.16	33.55	4.52	3.82	6.65	8.00	3.59	6.00	21.95	NA
7/23/2013	7.36	26.71	4.12	30.90	4.50	3.90	11.95	9.25	11.50	13.58	22.00	NA
8/27/2013	7.31	7.50	4.34	29.55	4.15	3.80	10.65	8.40	18.76	20.06	25.89	NA
9/25/2013	7.11	9.42	3.89	28.89	5.05	4.28	12.72	11.90	3.55	5.30	15.85	NA
10/28/2013	6.79	10.80	4.09	28.05	5.00	4.11	11.70	11.40	3.48	5.00	14.75	NA
11/24/2013	6.77	10.65	4.10	28.06	4.99	4.18	11.10	12.36	3.42	5.00	14.70	NA
12/16/2013	6.92	10.86	4.20	26.55	5.00	4.10	9.96	12.40	3.60	5.06	14.30	NA
1/24/2014	44.33	10.88	4.10	28.10	5.00	4.15	11.10	12.34	3.40	5.00	14.66	NA
2/24/2014	35.89	10.83	0.99	18.28	5.40	4.32	4.00	11.41	3.80	6.25	14.75	NA
3/27/2014	7.39	10.85	4.48	18.20	4.99	4.35	NM	10.85	3.56	5.04	14.62	NA
4/26/2014	7.44	10.87	0.99	18.28	5.40	4.32	4.00	11.41	3.80	6.25	14.75	NA
5/29/2014	8.97	10.84	1.06	18.30	5.40	4.30	3.96	11.30	3.80	6.40	14.70	NA
6/30/2014	6.92	10.87	4.36	14.86	5.88	4.19	3.70	11.32	3.85	6.46	14.80	NA
7/28/2014	8.64	10.85	4.28	18.30	5.32	4.28	3.10	11.48	3.75	6.60	11.20	NA
8/27/2014	7.66	10.86	4.30	17.99	5.41	4.30	3.95	11.50	3.79	6.22	14.70	NA
9/29/2014	7.53	10.88	4.20	16.28	5.72	4.26	14.50	Dry	3.80	6.32	13.91	NA
10/22/2014	7.59	10.85	4.26	16.29	5.70	4.25	14.36	Dry	3.82	6.28	13.89	NA
11/26/2014	7.58	10.80	4.16	16.22	5.62	4.25	12.52	Dry	3.86	6.80	13.90	NA
12/17/2014	7.58	10.78	4.06	16.20	4.58	4.30	12.67	Dry	3.84	6.30	9.80	NA
1/26/2015	7.62	10.71	3.98	16.18	4.60	4.40	12.95	Dry	3.85	6.25	13.40	NA
2/28/2015	7.51	10.75	4.30	16.15	5.52	4.30	14.28	Dry	3.80	6.09	7.79	NA
3/30/2015	7.61	11.60	4.42	16.38	5.68	4.18	14.30	5.95	3.80	6.10	7.67	NA
4/27/2015	7.60	11.32	4.50	16.42	4.40	4.20	3.90	11.50	3.79	6.22	14.70	NA
5/27/2015	7.61	11.36	4.40	18.02	4.12	4.52	9.10	11.15	3.83	6.37	14.65	NA
6/24/2015	7.53	11.32	3.18	18.06	4.08	4.50	9.10	11.15	3.95	6.30	13.71	NA
7/27/2015	7.54	11.30	4.30	18.55	4.10	4.55	9.10	11.50	4.00	6.22	14.62	NA
8/27/2015	7.48	NA	3.82	28.96	5.98	4.28	2.69	2.43	10.99	7.18	22.09	NA
9/24/2015	1.92	22.29	3.45	29.58	4.85	4.28	10.95	8.01	11.37	5.28	13.26	NA
10/26/2015	1.96	24.52	4.36	27.42	4.35	4.58	1.69	0.89	9.29	4.18	27.89	NA
11/20/2015	2.00	25.62	4.42	26.96	4.31	4.60	2.09	0.90	9.40	4.52	28.60	NA
12/18/2015	6.99	29.84	4.40	27.00	4.58	4.86	2.95	1.82	9.43	6.08	29.31	29.79
1/28/2016	14.20	32.65	4.70	31.39	6.88	6.85	4.95	3.41	18.79	21.16	32.62	NA
2/29/2016	14.20	32.65	4.40	31.39	8.29	8.59	5.52	9.30	27.10	28.90	32.62	30.65
3/29/2016	13.18	34.15	4.75	31.48	7.00	8.85	5.15	4.25	18.72	31.15	32.66	30.70
4/28/2016	13.20	34.20	4.60	32.00	6.42	9.02	4.95	3.65	18.82	30.10	32.79	30.80
5/28/2016	13.50	33.98	4.60	28.70	6.40	9.29	5.10	11.42	19.95	30.13	32.55	30.80
6/28/2016	12.92	34.30	4.42	28.60	6.20	9.52	6.20	11.50	18.80	31.15	32.55	30.85
7/27/2016	15.39	32.26	3.95	26.80	8.69	9.22	8.76	11.49	19.98	30.26	32.08	30.50
8/24/2016	15.42	32.30	3.89	26.82	8.72	9.91	8.28	11.55	34.64	36.57	32.10	30.88
9/28/2016	7.80	32.24	4.45	25.76	9.80	10.13	19.75	11.29	34.64	36.38	31.35	30.00
10/20/2016	8.42	32.30	4.34	25.42	9.95	10.25	19.80	11.30	34.91	37.28	31.40	31.05
11/29/2016	8.33	32.45	4.18	25.32	9.85	10.44	19.70	11.25	34.79	37.42	31.35	30.91
12/21/2016	7.80	32.30	4.45	25.76	9.75	10.20	19.80	11.20	34.60	36.38	31.40	30.80
1/23/2017	13.90	32.20	4.50	28.92	10.39	10.50	8.68	10.30	36.69	38.62	30.90	29.15
2/23/2017	13.95	32.35	4.49	29.10	10.36	10.72	12.38	14.04	36.75	38.40	30.90	29.20
3/21/2017	14.40	32.75	4.58	28.76	9.95	10.50	9.20	8.85	36.80	37.99	30.90	29.20
4/19/2017	14.18	34.42	4.50	28.99	10.00	11.10	12.68	9.40	39.40	41.30	31.35	29.26
5/22/2017	14.20	34.60	4.71	29.05	9.90	11.15	12.62	9.29	39.00	41.15	31.72	29.35
6/27/2017	15.08	33.35	4.39	29.60	10.18	10.48	12.85	9.06	38.29	40.08	32.36	31.00
7/13/2017	15.99	32.40	3.89	26.70	10.55	10.20	13.60	8.90	38.16	39.99	32.59	31.79
8/17/2017	15.55	32.62	3.90	26.82	10.60	10.25	13.30	8.82	38.20	39.99	32.60	31.70
9/19/2017	15.39	32.79	4.19	27.59	10.28	10.65	14.02	14.02	37.19	39.03	31.62	29.75
10/19/2017	15.46	32.65	3.89	27.72	10.30	9.60	14.06	14.15	37.30	39.15	31.75	29.80
11/15/2017	15.36	31.79	4.62	27.70	10.60	9.75	15.09	14.05	37.91	39.30	30.65	29.70
12/18/2017	15.70	32.40	4.70	26.99	10.55	9.72	13.60	13.65	38.16	39.37	30.79	29.95

Attachment A
Phase 1 Leachate Level Measurements
Great River Regional Waste Authority Sanitary Landfill
Fort Madison, Iowa
Project No. 27223130.00

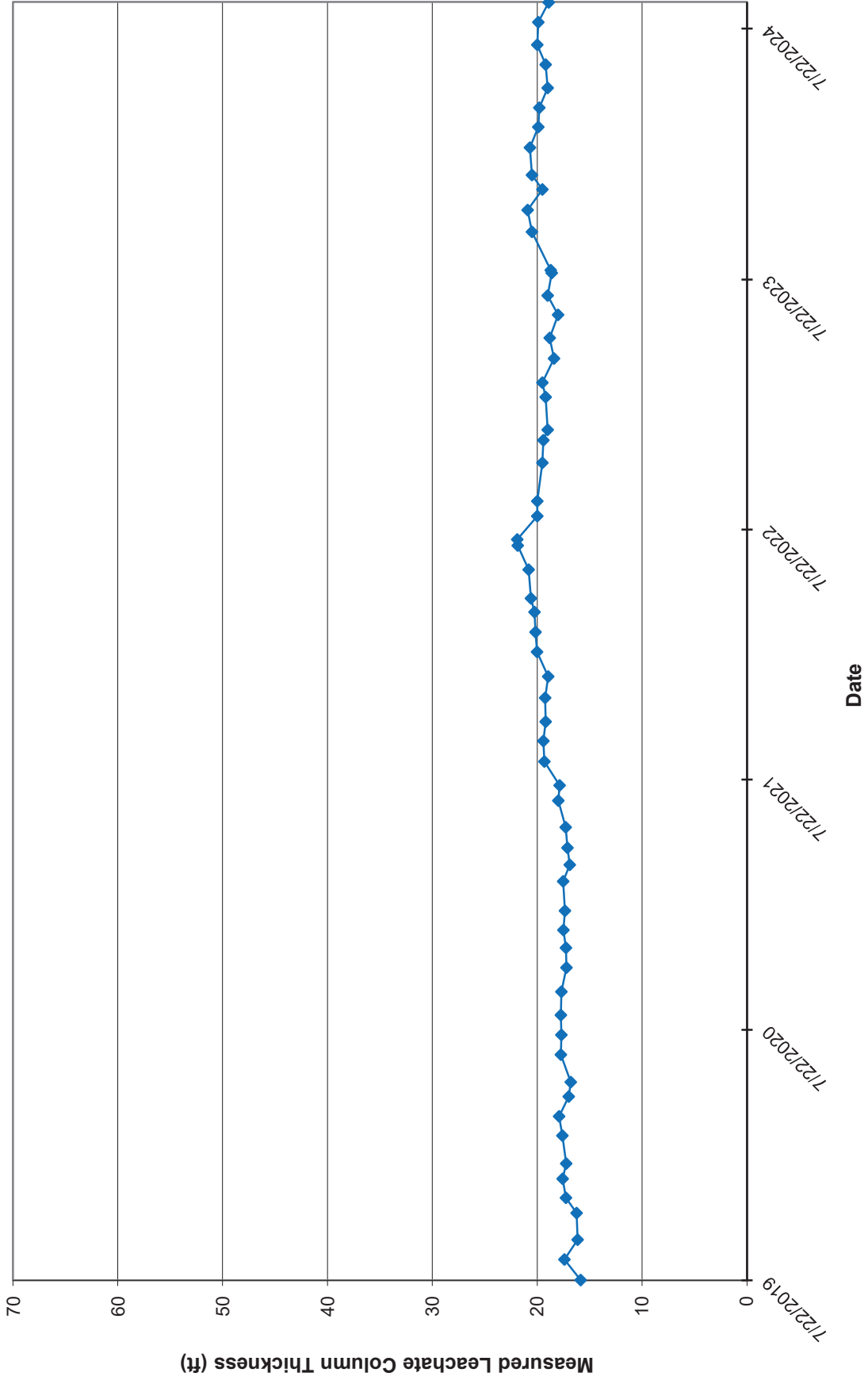
CONSTRUCTED WELL DEPTH (ft)	LEACHATE PIEZOMETER											
	PZ-1	PZ-2	PZ-3	PZ-6R	PZ-7	PZ-7R	PZ-8	PZ-9	PZ-10	PZ-10R	PZ-11	LW-5
	40.0	45.8	39.9	57.0	42.0	41.0	45.1	38.3	63.8	64.0	47.8	46.8
DATE	MEASURED LEACHATE COLUMN (ft)											
1/23/2018	15.10	31.35	4.44	26.90	10.28	9.92	13.20	13.29	38.10	39.22	29.96	28.18
2/21/2018	14.99	31.05	4.45	26.80	9.96	9.88	13.26	13.20	38.10	39.00	29.79	28.10
3/26/2018	15.40	34.71	4.39	26.94	10.15	10.10	14.12	14.07	41.55	43.66	32.22	30.39
4/24/2018	15.50	34.70	4.40	27.00	10.42	9.85	14.10	13.65	41.45	43.60	31.79	29.79
5/30/2018	15.10	31.40	4.44	26.90	10.25	10.02	13.26	13.80	41.34	43.60	31.90	29.80
6/27/2018	15.20	33.30	3.90	23.90	9.60	7.95	13.40	13.29	39.20	41.47	31.70	29.71
7/28/2018	15.25	32.72	3.89	28.90	9.80	11.42	15.32	14.08	38.79	40.88	31.71	29.89
8/15/2018	15.45	31.75	4.60	28.12	11.90	11.20	19.41	13.90	38.72	40.95	31.50	29.55
9/11/2018	16.02	25.29	4.50	28.20	10.64	11.14	15.28	13.95	38.69	41.05	31.40	29.72
10/15/2018	15.60	25.85	4.18	32.60	11.02	11.92	15.68	14.40	41.82	43.79	NA	29.80
11/14/2018	15.75	25.75	4.30	31.55	11.15	11.82	15.42	14.90	41.75	43.94	31.00	29.82
12/12/2018	15.80	25.80	4.10	31.58	11.20	11.99	15.10	14.80	41.65	44.00	31.10	29.85
1/7/2019	15.80	25.80	5.10	31.60	11.95	11.15	15.05	14.85	41.72	44.00	30.80	30.00
2/18/2019	16.39	34.57	6.20	30.99	11.90	11.00	15.22	15.40	41.40	43.82	30.79	30.62
3/19/2019	16.50	34.75	6.40	31.00	11.99	11.15	15.09	15.35	41.37	43.80	30.70	30.60
4/17/2019	15.95	34.80	5.82	30.75	12.00	12.10	15.20	15.29	41.60	43.85	30.82	NA
5/14/2019	15.15	34.20	5.62	31.30	11.90	12.20	15.09	15.21	41.32	43.55	31.40	30.80
6/12/2019	15.40	34.72	5.55	31.60	11.79	12.19	15.20	15.20	41.53	43.90	30.79	30.72
7/22/2019	15.86	34.72	5.85	32.20	9.25	12.60	19.60	14.78	41.40	43.20	31.48	29.80
8/21/2019	17.40	29.88	4.79	30.50	8.80	12.46	15.78	12.50	41.75	43.79	31.10	29.79
9/19/2019	16.15	31.30	5.00	29.68	12.33	12.89	15.40	14.70	41.32	43.82	30.79	29.10
10/28/2019	16.25	31.00	5.15	29.65	12.40	12.81	15.39	14.76	39.23	43.79	30.85	28.96
11/19/2019	17.25	31.35	5.10	30.50	13.85	12.46	15.40	14.41	39.79	43.79	31.05	29.68
12/17/2019	17.57	31.38	5.00	30.52	13.90	13.02	15.48	14.45	NA	NA	31.95	29.72
1/8/2020	17.22	31.42	5.15	30.50	13.90	12.59	15.39	14.55	39.85	43.76	31.90	29.71
2/18/2020	17.60	31.30	5.00	29.99	12.40	12.89	16.10	14.55	41.32	43.82	31.72	29.66
3/17/2020	17.92	33.00	5.40	30.52	13.85	13.10	16.65	14.55	40.08	43.52	31.65	29.68
4/15/2020	16.99	32.70	5.20	30.50	12.90	12.88	16.35	14.45	40.85	43.85	31.85	29.82
5/6/2020	16.79	35.65	9.57	30.82	12.60	12.65	16.40	14.95	42.62	44.77	31.95	29.90
6/15/2020	17.75	37.65	5.09	30.80	10.10	12.86	15.60	14.80	42.56	44.84	31.62	30.05
7/14/2020	17.70	37.55	5.58	30.65	11.02	12.79	15.65	14.88	42.52	44.90	31.40	30.08
8/12/2020	17.74	34.20	5.50	30.55	13.75	11.55	15.70	14.38	41.80	45.15	31.40	30.05
9/15/2020	17.70	34.16	5.20	30.55	13.79	12.20	15.70	14.55	41.75	44.20	31.40	30.35
10/20/2020	17.20	34.00	4.81	30.76	13.20	12.55	15.68	14.20	41.65	43.90	30.95	29.79
11/18/2020	17.25	33.95	4.80	30.80	13.10	12.35	15.52	14.10	41.55	44.00	30.88	29.89
12/14/2020	17.50	32.50	5.18	36.79	12.26	12.65	15.60	13.79	40.20	42.60	29.48	28.05
1/11/2021	17.35	32.60	5.05	36.76	12.32	12.55	15.62	14.10	40.28	43.02	29.85	28.65
2/23/2021	17.52	32.75	5.08	36.76	12.25	12.60	15.60	14.15	40.32	43.15	29.82	28.68
3/19/2021	16.90	37.95	4.57	33.20	16.28	12.53	16.23	15.49	42.95	46.60	31.45	28.95
4/13/2021	17.10	36.20	4.75	33.58	13.90	13.10	16.12	15.46	43.82	47.02	31.75	29.79
5/13/2021	17.28	36.35	4.80	33.06	12.95	12.66	16.80	15.55	43.95	46.95	32.48	30.79
6/21/2021	17.99	35.80	4.95	33.40	13.25	12.00	16.85	15.50	43.85	46.42	32.40	30.85
7/13/2021	17.85	37.05	5.65	33.15	16.20	12.60	16.30	16.40	43.65	46.60	32.05	30.65
8/17/2021	19.30	35.01	5.70	31.40	16.08	12.50	16.89	14.71	44.00	45.70	32.60	30.72
9/16/2021	19.40	35.10	5.10	31.40	15.99	12.22	16.90	14.68	44.05	45.65	32.80	30.70
10/14/2021	19.20	34.75	5.30	31.30	15.22	12.35	16.68	14.10	44.10	45.60	32.76	29.89
11/18/2021	19.25	34.80	5.25	31.35	14.85	12.40	16.85	14.30	43.95	45.70	32.66	29.90
12/19/2021	18.96	34.72	5.25	31.30	14.82	12.30	16.70	14.22	43.79	44.95	31.76	29.70

Attachment A
Phase 1 Leachate Level Measurements
Great River Regional Waste Authority Sanitary Landfill
Fort Madison, Iowa
Project No. 27223130.00

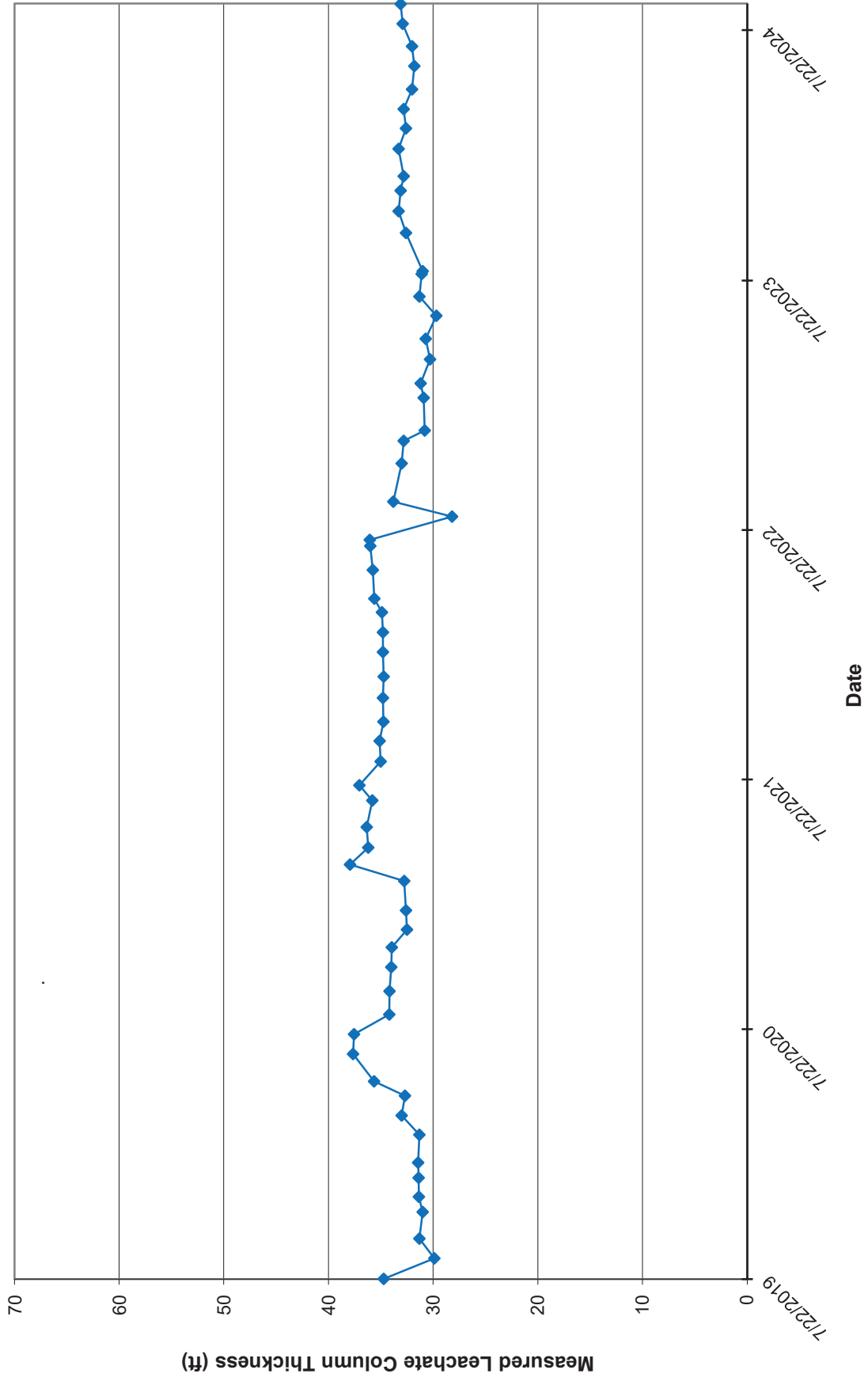
CONSTRUCTED WELL DEPTH (ft)	LEACHATE PIEZOMETER											
	PZ-1	PZ-2	PZ-3	PZ-6R	PZ-7	PZ-7R	PZ-8	PZ-9	PZ-10	PZ-10R	PZ-11	LW-5
	40.0	45.8	39.9	57.0	42.0	41.0	45.1	38.3	63.8	64.0	47.8	46.8
DATE	MEASURED LEACHATE COLUMN (ft)											
1/24/2022	20.02	34.79	6.00	33.20	14.90	12.15	17.20	14.29	43.80	45.05	31.80	29.75
2/22/2022	20.16	34.80	6.80	34.86	15.02	12.52	17.23	14.15	43.70	44.80	31.62	29.69
3/23/2022	20.26	34.90	7.06	33.80	15.05	12.88	17.76	14.40	43.65	45.12	31.85	29.80
4/12/2022	20.60	35.62	7.15	33.55	15.86	13.86	18.20	15.29	43.82	45.55	31.90	29.90
5/24/2022	20.82	35.75	7.89	33.66	16.06	13.35	18.09	15.32	43.86	45.60	31.98	29.79
6/28/2022	21.85	36.00	5.12	30.60	12.50	12.63	16.28	16.45	44.35	45.50	31.86	29.90
7/7/2022	21.90	36.05	5.18	30.59	12.50	12.68	16.30	16.50	44.30	45.48	31.79	29.80
8/10/2022	20.00	28.20	NA	30.00	13.10	11.10	16.90	16.80	42.70	44.90	31.80	30.00
9/1/2022	20.00	33.80	5.40	29.00	14.50	11.50	16.60	16.80	42.80	45.00	31.40	29.80
10/27/2022	19.50	33.00	6.60	35.50	12.40	13.50	16.60	17.70	41.90	44.20	30.60	28.30
11/29/2022	19.40	32.80	6.40	35.30	12.20	13.20	16.20	17.60	42.30	44.50	30.30	27.90
12/14/2022	19.00	30.80	6.30	35.00	11.90	13.40	16.10	17.50	41.80	44.50	30.00	27.70
1/31/2023	19.20	30.90	6.60	34.80	12.00	13.70	17.00	16.70	42.30	44.40	30.50	28.10
2/21/2023	19.50	31.20	6.80	35.00	13.20	13.70	17.10	16.90	42.60	44.70	30.80	28.60
3/28/2023	18.40	30.30	5.70	34.30	13.00	12.90	16.80	16.60	42.30	44.20	30.50	28.20
4/27/2023	18.80	30.70	6.60	34.80	13.00	13.50	17.10	16.70	42.40	44.70	30.80	28.50
5/31/2023	18.00	29.70	4.90	34.10	12.50	12.50	16.50	16.30	42.00	43.90	30.30	27.80
6/28/2023	19.00	31.30	5.90	34.00	12.40	12.30	16.10	16.10	42.20	43.00	30.00	27.60
7/31/2023	18.60	31.10	5.80	33.80	12.00	12.10	16.10	15.80	42.40	42.50	29.80	27.40
8/4/2023	18.70	31.00	8.60	33.70	11.90	12.00	15.90	16.00	42.50	42.90	29.60	27.60
9/29/2023	20.50	32.60	7.90	33.50	11.50	12.40	15.60	16.60	41.70	43.50	29.80	27.80
10/31/2023	20.90	33.30	8.20	33.90	11.60	12.80	16.00	17.00	41.90	43.60	30.00	27.80
11/30/2023	19.50	33.10	6.90	31.70	11.10	13.00	16.20	17.30	42.90	43.00	29.60	27.10
12/21/2023	20.50	32.80	7.10	31.90	11.40	12.50	15.90	16.80	41.70	43.00	29.20	26.90
1/30/2024	20.70	33.30	8.10	31.70	11.80	12.50	16.10	17.50	42.00	43.50	29.90	27.60
2/29/2024	19.90	32.60	7.10	31.50	11.00	12.20	15.80	17.40	41.80	43.00	29.80	27.30
3/28/2024	19.80	32.80	6.80	32.00	11.50	12.20	16.50	18.30	41.20	42.50	28.80	26.70
4/26/2024	19.00	32.00	6.80	34.50	12.60	13.80	16.80	16.50	42.60	44.40	30.60	28.30
5/30/2024	19.20	31.80	6.50	33.40	12.20	13.20	16.20	17.60	41.80	43.80	28.00	27.80
6/28/2024	20.00	32.00	7.40	33.20	11.10	12.00	15.10	16.20	41.20	43.20	30.00	27.70
7/31/2024	19.90	32.90	5.90	31.80	12.10	13.00	17.00	15.10	41.10	44.10	NA	24.80
8/29/2024	18.90	33.10	5.20	31.50	12.00	13.50	16.50	14.80	41.90	43.80	NA	24.60

- 1) Monthly leachate level data provided by landfill personnel.
- 2) NI = Not Installed
- 3) NA = Not Available
- 4) From May 2012 - November 2015, monthly averages from data collected by telemetry systems.

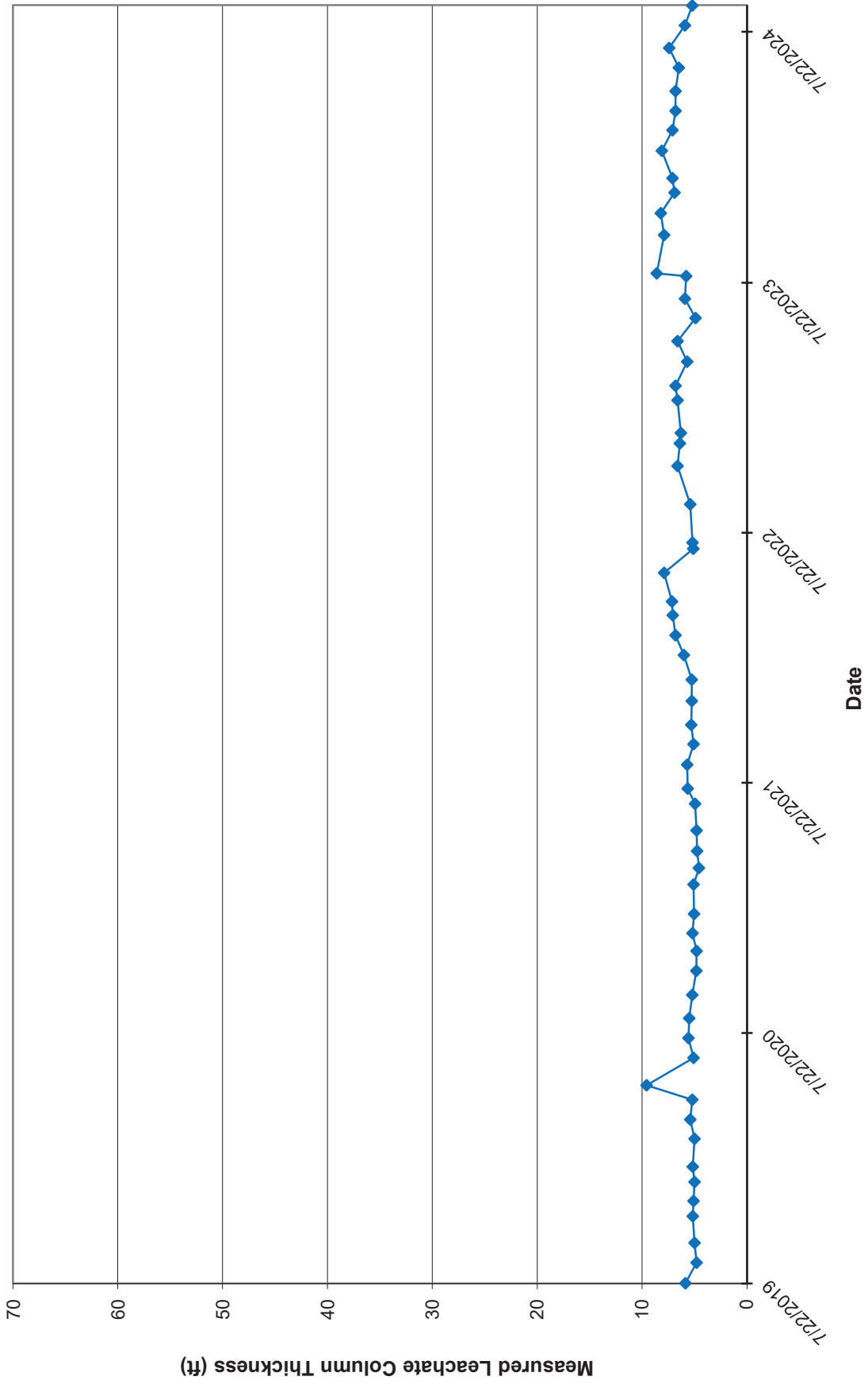
**PZ-1
Phase 1**



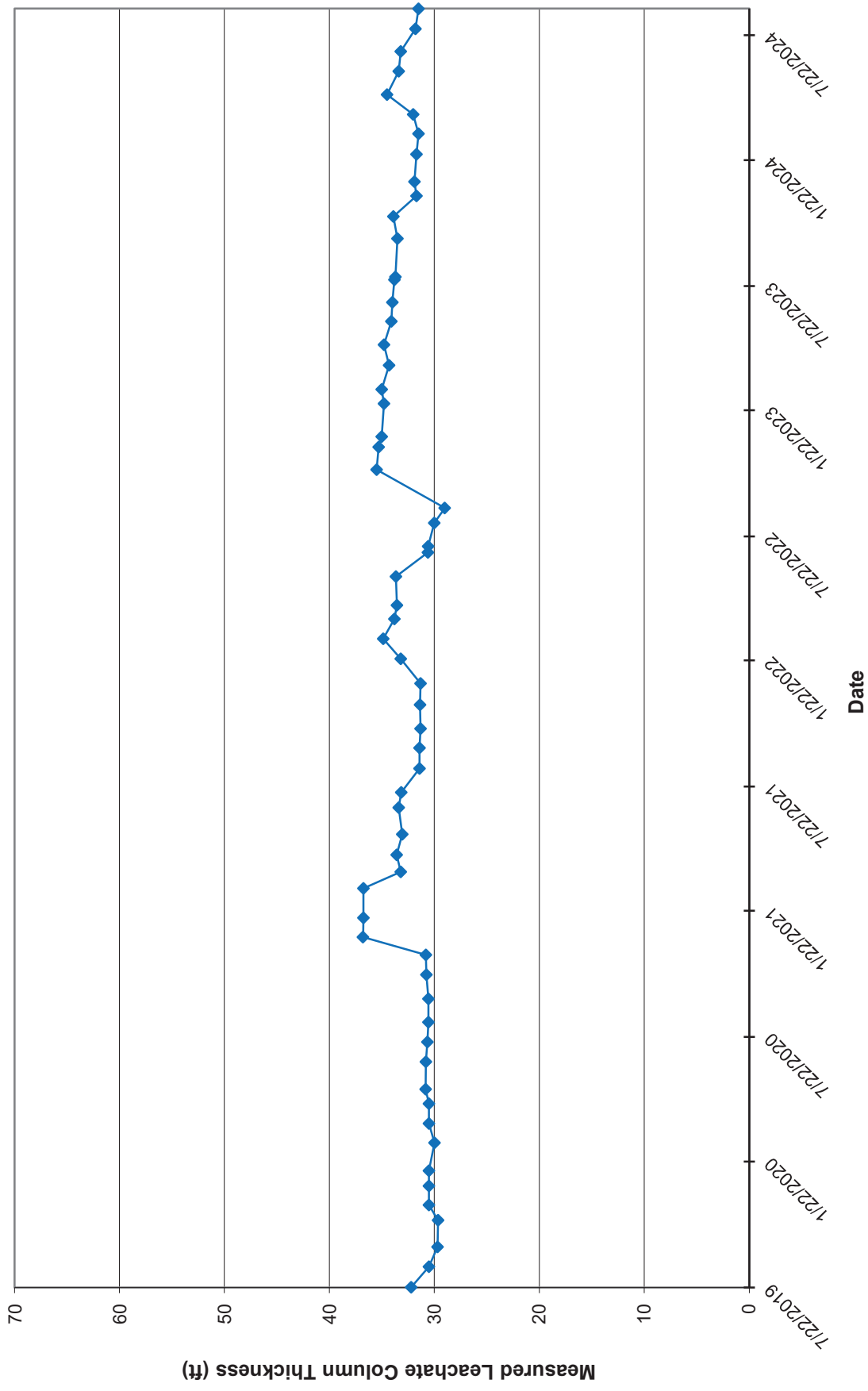
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Phase 1**



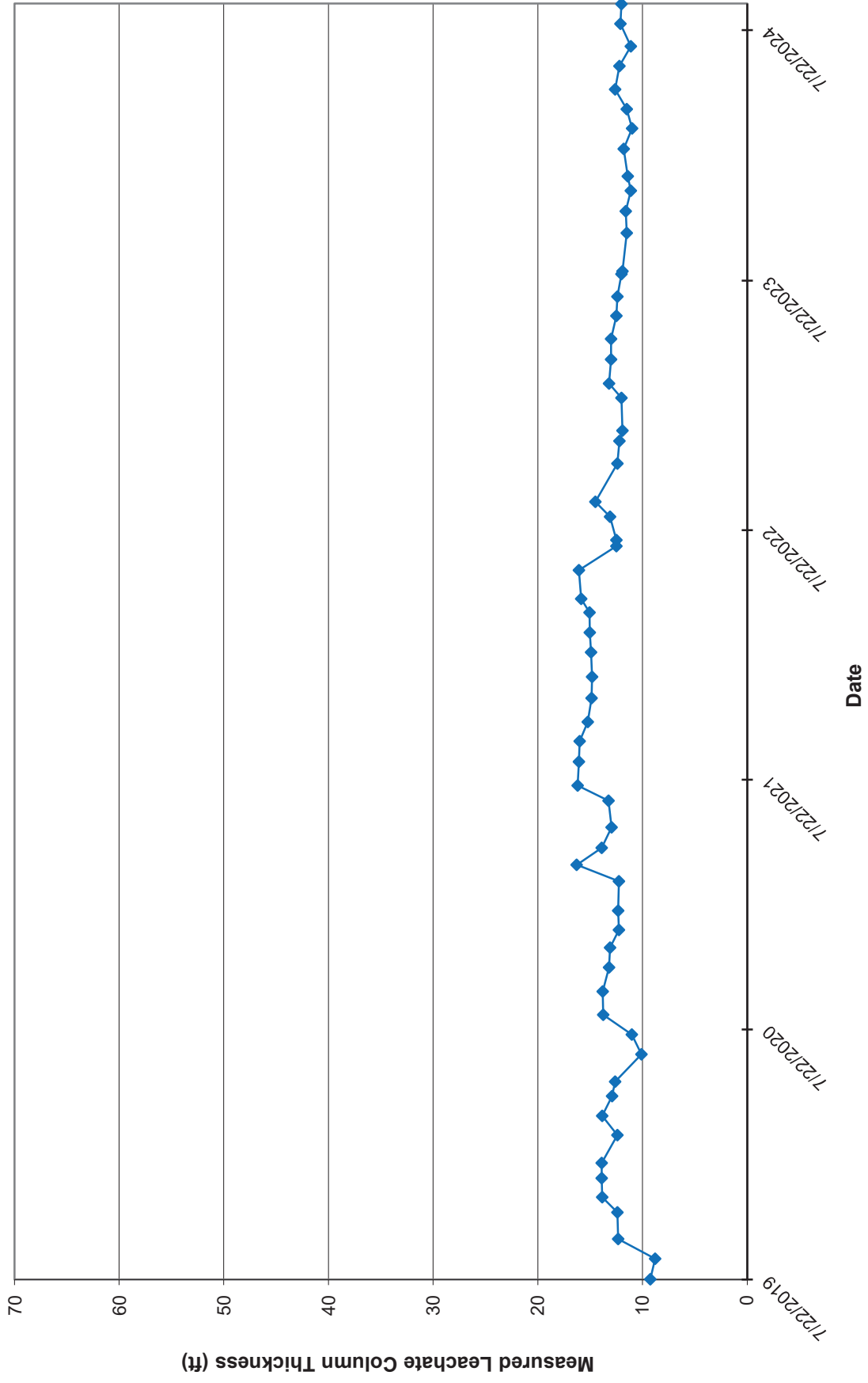
**PZ-3
Phase 1**



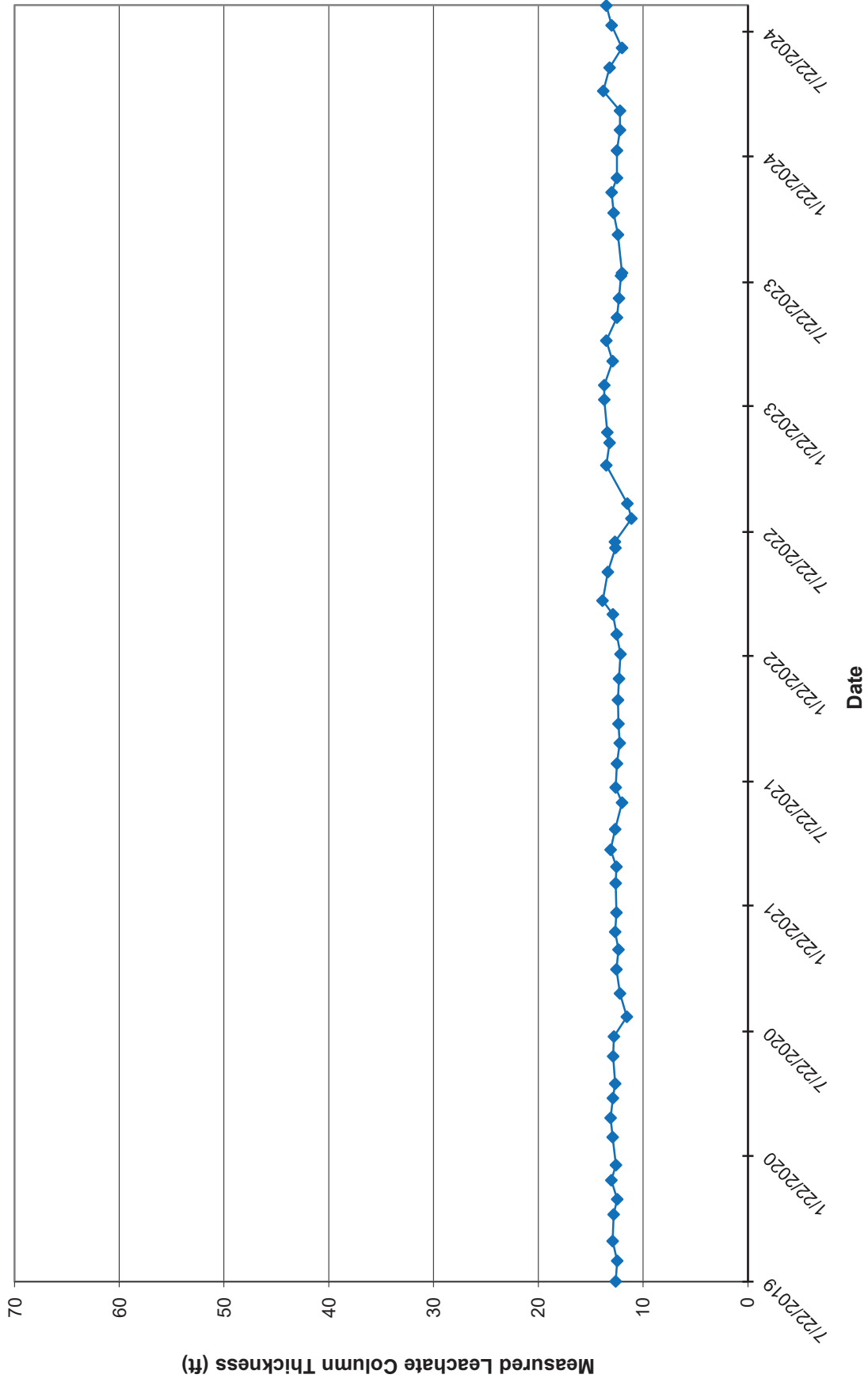
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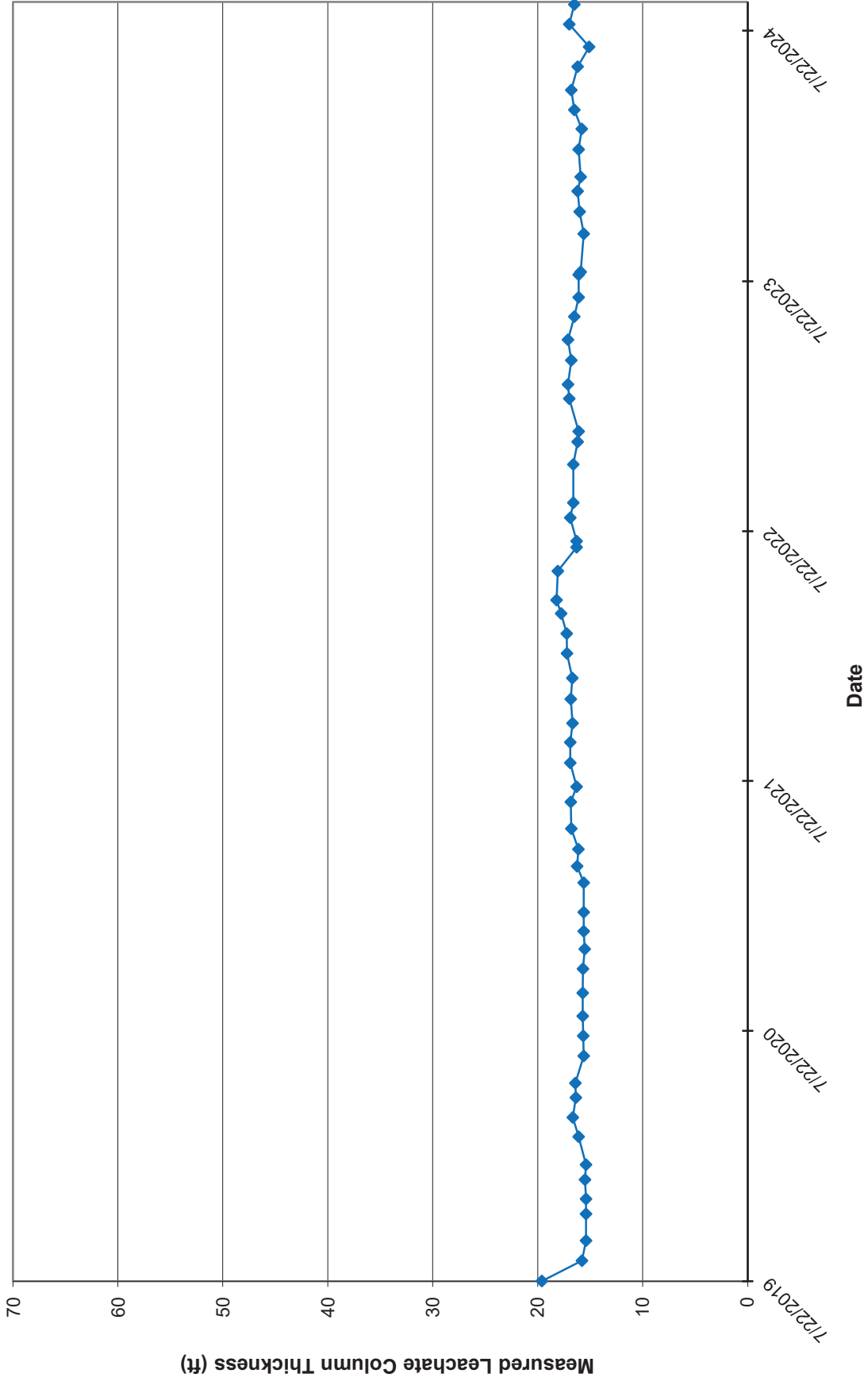
**PZ-7
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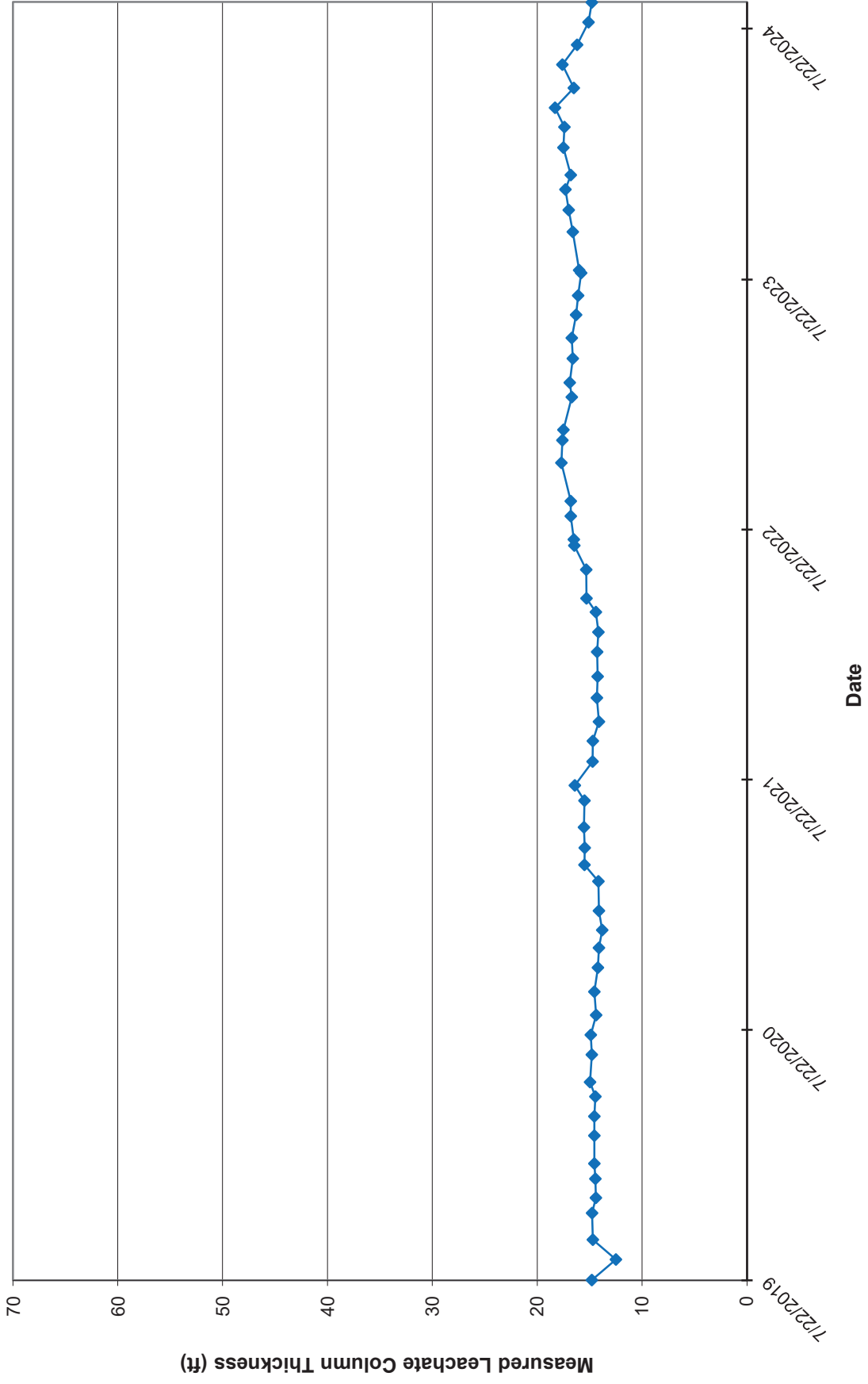
**PZ-7R
Phase 1**



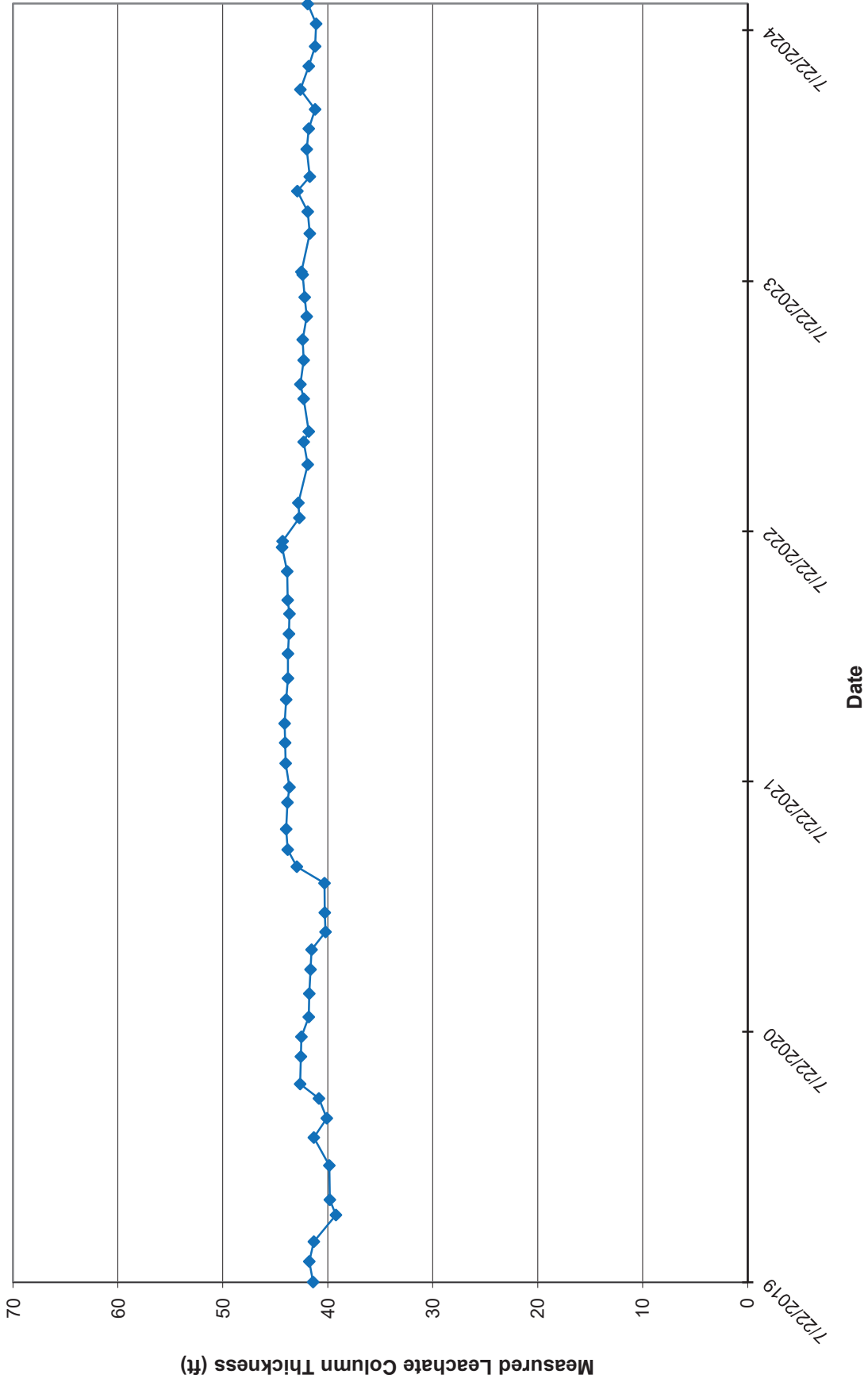
**PZ-8
Phase 1**



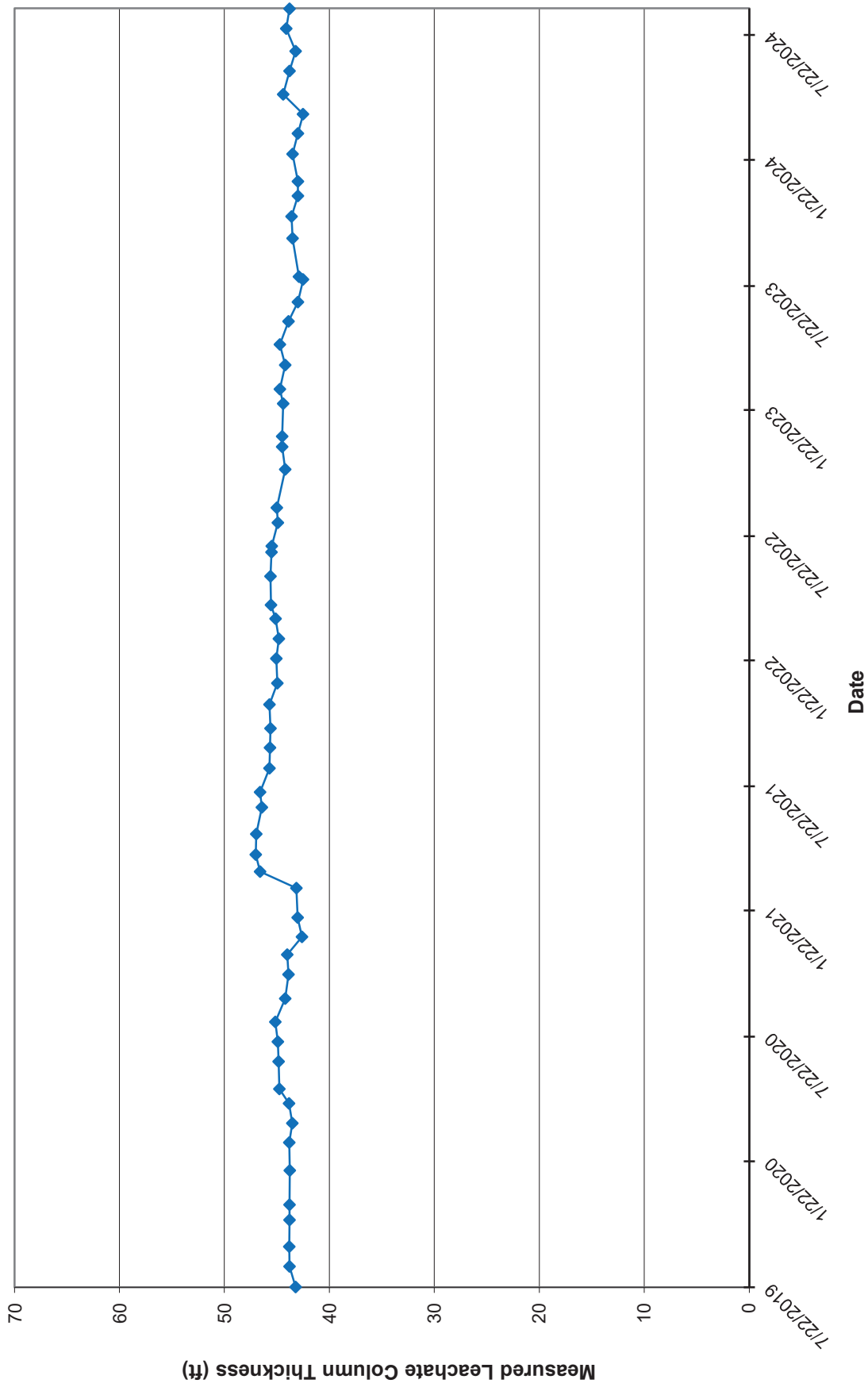
**PZ-9
Phase 1**



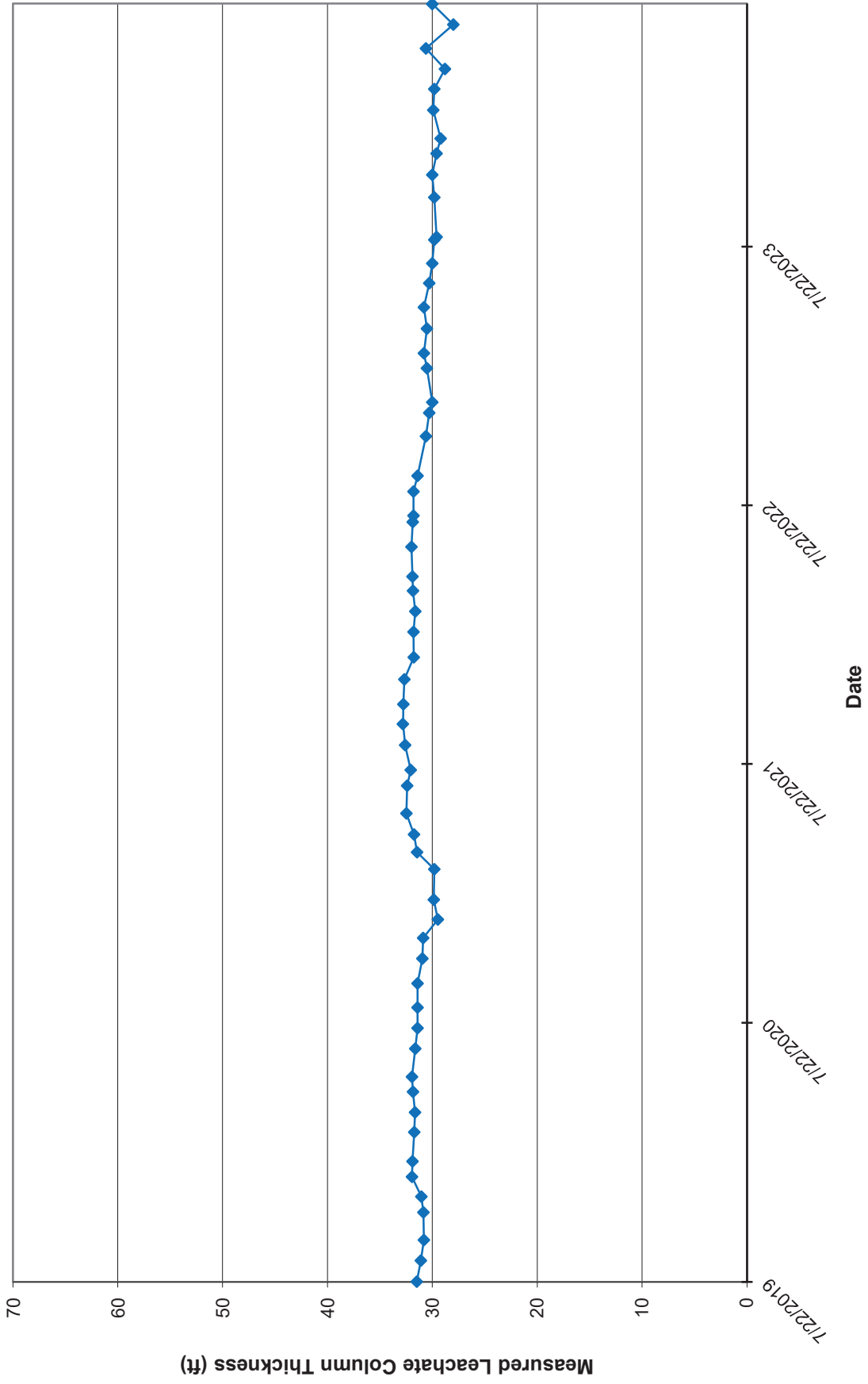
**PZ-10
Phase 1**



PZ-10R
Phase 1



**PZ-11
Phase 1**



LW-5
Phase 1

