March 25, 2024

Mr. Geoffrey Spain
Land Quality Bureau
Iowa Department of Natural Resources
502 East 9th Street
Des Moines, Iowa 50319-0034

HLW Engineering Group
Engineering Management

RE: Request for an Operational Change
Reduction/Termination Plan (RTP) – Leachate Collection System Shut-Down
Fayette County Sanitary Landfill 33-SDP-02-83C

Dear Mr. Spain:

On behalf of the Fayette County Solid Waste Management Commission, we are seeking a means to end leachate collection at the closed Fayette County Sanitary Landfill (33-SDP-02-83C) as allowed under rule and in general conformance with the IDNR guidance document "*Request to Reduce or End Post-Closure Care and Preparation of Post-Closure Care Reduction/Termination Plan*" dated April, 2023. The underlying goal of the proposed RTP is to initiate the shut-down now in advance of the end of the post-closure care period while demonstrating that the landfill system continues to maintain hydraulic control and water quality control and is protective of human health and the environment. This goal aligns with the stated goal in the referenced IDNR Guidance. *Note that at this time we are not asking for any additional reductions in PCC monitoring of groundwater, gas, or cap condition(s).*

History

The site was closed under the Closure Permit issued June 20, 2013. Operation of the leachate collection system was initiated in the mid-to-late 1990's (1997 estimated) while the site was actively receiving waste. Available leachate testing data included herein begins in 2002 during the operational life of the facility. There have been two (2) 5-year demonstration periods (2014 to 2018, and 2019-2023) completed since Closure at the end of 2013 (and two (2) prior to Closure).

The hydrologic monitoring of site monitoring wells (semi-annual) predates the construction of the leachate control system. Available water quality data for perimeter monitoring wells included herein begins in 1993. There have been two (2) 5-year demonstration periods (2014 to 2018, and 2019-2023) completed since Closure at the end of 2013, and several prior to Closure.

The Fayette County Sanitary Landfill typically collects and hauls less than 80,000 gallons of leachate per year to treatment at the Oelwein WWTP. The volume hauled to treatment over the past 5-year demonstration period is summarized below.

2018 45,376 gallons/year
2019 80,734 gallons/year
2020 75,326 gallons/year
2021 74,698 gallons/year
2022 69,953 gallons/year
2023 63,445 gallons/year

A leachate collection system is present only in lined Cell 1, Cell 2, and Cell NEX. The majority of the landfill was constructed under previous rule and leachate collection was not incorporated into the older portions of the site. The individual disposal units can be isolated and tested at the South Manhole (Cell 1), the North Manhole (Cell 2), and the NEX Sump (Cell NEX).

Reduction/Termination Plan (RTP)

Cessation of Leachate Collection is proposed in general conformance of Section 2.1.1 of the reference Guidance as described below.

Preparatory Action Items

1. *How will leachate, gas, water quality, and final cover stability be assessed and what are the site-specific criteria that must be met in order to end leachate collection?*

   Leachate quality will continue to be monitored in the North Manhole, South Manhole, and the NEX Sump on an *annual* basis. Each sample from the discrete locations will be analyzed for *Appendix I compounds, BOD5, COD, Nitrogen Ammonia, pH, TSS, and chloride*. A sample from bulk storage (from the holding tank) will not be available during the evaluation period when the collection system is shut down.

   The site monitoring wells included in the HMSP will continue to be monitored semi-annually during the evaluation period. Water quality at the HMSP monitoring wells will need to be maintained.

   Additionally, the site perimeter will be visually monitored quarterly for signs of leachate seeps. The site is currently free of leachate seeps and should continue to be once the collection system is shut-down.

   Criteria that must be met over the upcoming 5-year demonstration period will include steady to decreasing trends in leachate quality over the 5-year demonstration period, maintaining water quality in the perimeter monitoring wells over the next 5-year demonstration period, and maintaining the absence of leachate seeps peripheral to the waste boundary.

   A summary of leachate testing from July 10, 2023 at the North Manhole, the South Manhole, and the NEX Sump is included in **Attachment A**. A summary of testing from bulk storage (from the holding tank) over time is included in **Attachment B**. Review of

the information in Attachment B indicates that the leachate character (2002 to present) is fairly low-strength over time with decreasing trends over the past two (2) 5-year demonstration periods.

It is recognized that Section 2.1.1 of the Guidance establishes a preference for use of leachate data that accurately represents the character of the individual disposal units, rather than combined leachate data (from bulk storage). Review of the data indicates that the bulk storage sample results (since closure in 2013) and the individual disposal unit samples results in July, 2023 correlate as follows:

Compound	**Bulk Storage Range**	**Cell 1 (South)**	**(Cell 2 (North)**	**Cell NEX**
BOD_5	18.5 – 50.2	33.0	23.0	127.0
COD	281 to 391	547	230	440
Ammonia	147 to 295	83.8	182	178
pH	6.9 to 7.0	6.4	6.8	6.9
TSS	54 to 82	36	33	238

The correlation of the bulk storage sample results and the sample results from the individual cells confirms that the historic trends in the leachate bulk storage data accurately represent trends over time. Further, moving forward (in the upcoming 5-year demonstration period) all correlations will be based on data collected from the individual landfill units, not from bulk storage samples.

An evaluation of water quality in perimeter monitoring wells for the general chemistry compounds is included in **Attachment C**, while a comprehensive evaluation of the groundwater quality is included in the 2023 Annual Water Quality Report dated February, 2024 (Doc #109352). Groundwater quality is maintained at the perimeter. The single corrective action at the site is related to landfill gas impact, rather than leachate impact.

2. *Identify present and future site conditions, if any, which are not conducive to reducing PCC. Establish a work plan and schedule for the mitigation of existing conditions, if needed.*

   At present, there are no site conditions deemed to be unfavorable to shutting down the leachate collection system. Future leachate seeps or degradation of water quality at perimeter monitoring wells would be considered contrary to shutting down the leachate collection system.

3. *Conduct a review of ongoing supplemental activities initiated to end or reduce PCC requirements to determine if the goals have been met or modifications to the supplemental activities and schedule are needed.*

   Not applicable to this request to shut down the leachate collection system.

4. *Compare the mitigation and supplemental activities schedules to the closure permit ending date and request a permit extension, if needed.*

   Not applicable to this request to shut down the leachate collection system.

5. *Conduct an on-site inspection with DNR Central Office and Field Office staff to observe conditions prior to requesting significant reductions of PCC requirements.*

   Fayette County Transfer Station staff and/or HLW Engineering personnel are available to meet the IDNR on the site to perform an inspection.

Compatibility with the approved Post-Closure Plan and proposed end use of the facility
It is deemed appropriate to facilitate the shut-down of the leachate control system now in advance of the end of the PCC period. Long-term, an Environmental Covenant will be sought when all PCC activities are ended. The current Closure Permit is scheduled to sunset in 2043, giving ample time to evaluate the site for one, or more, 5-year demonstration periods once the leachate collection system operation is terminated. Nothing in this proposal is contrary to the Post-Closure Plan or the anticipated end-use.

Site Criteria used to determine that leachate collection can be terminated at this site
The absence of leachate seeps, the maintenance of water quality in perimeter monitoring wells, and the steady and declining concentrations of compounds in the site leachate over the past two (2) 5-year demonstration periods are the basis for the proposed cessation of leachate collection. It is noted that the volume of leachate collected at the site is relatively small, and cessation of collection activities is perceived to be achievable over the next one (1) or two (2) 5-year demonstration periods. Further, it is the desire of Fayette County Solid Waste Management Commission to make the applicable demonstrations now, well in advance of the end of the PCC period. Once leachate collection cessation is verified to be acceptable as a permanent condition, then additional PCC activities can also be reduced accordingly as the end of the Closure Permit approaches in 2043.

Key monitoring parameters that will be used to determine the degree of stability of the waste.
The parameter used to characterize the leachate composition and stability will include:

1. Quantity (already determined to be low volume at less than 80,000 gallons per year).
2. BOD5
3. COD
4. Ammonia
5. pH
6. TSS
7. Appendix I

Supplemental monitoring parameters

There are no supplemental parameters proposed in addition to the listed parameters in the section above. Appendix I sampling may be considered supplemental but is proposed in order to draw a direct comparison to the testing in the perimeter monitoring wells.

Sampling points and sampling frequencies

Samples will be collected from each of the isolated Cells at the South Manhole (Cell 1), the North Manhole (Cell 2), and the NEX Sump (Cell NEX). The sampling of leachate will occur annually, with a report filed at the completion of the 5-year demonstration period (2028).

Equipment and methods that will be used to collect the samples

No special sample collection equipment is proposed to sample the leachate manholes and sumps. Samples will be collected as grab samples since there will be no flow in the collection system and flow weighted or time weighted composite sampling is not appropriate.

QA/QC Methods (sampling and laboratory)

Laboratory QA/QC will be as required by the laboratory management at a Certified laboratory. Field duplicates are routinely collected during site sampling events.

Statistical methods that will be used to evaluate the data

The evaluation of leachate data will include both raw concentrations over time and evaluation of trend lines on the plotted data (linear regression evaluation).

Modeling used to evaluate impact at the Point of Exposure (POE)

Modeling will not be performed as part of this evaluation. The actual water quality in perimeter point of compliance (POC) monitoring wells will be utilized as the criteria for compliance when the leachate collection system is shut off. The POE for the site is beyond the POC and compliance at the POC would confirm that there are no impacts at the POE.

Requested Schedule

It is proposed that leachate collection cease in 2024 and that the 5-year demonstration period (2024-2028) be initiated immediately.

The annual sampling of the leachate monitoring points will occur in the fall of each year, while monitoring of the HMSP well will continue semi-annually in the spring and fall of each year.

Inspections of the site perimeter will occur quarterly. Explosive gas monitoring and leachate levels will continue to be collected on a quarterly basis.

The Fayette County Solid Waste Management Commission desires to suspend leachate collection at the site now in order to establish long-term confirmation that leachate collection will not be required beyond the PCC period.

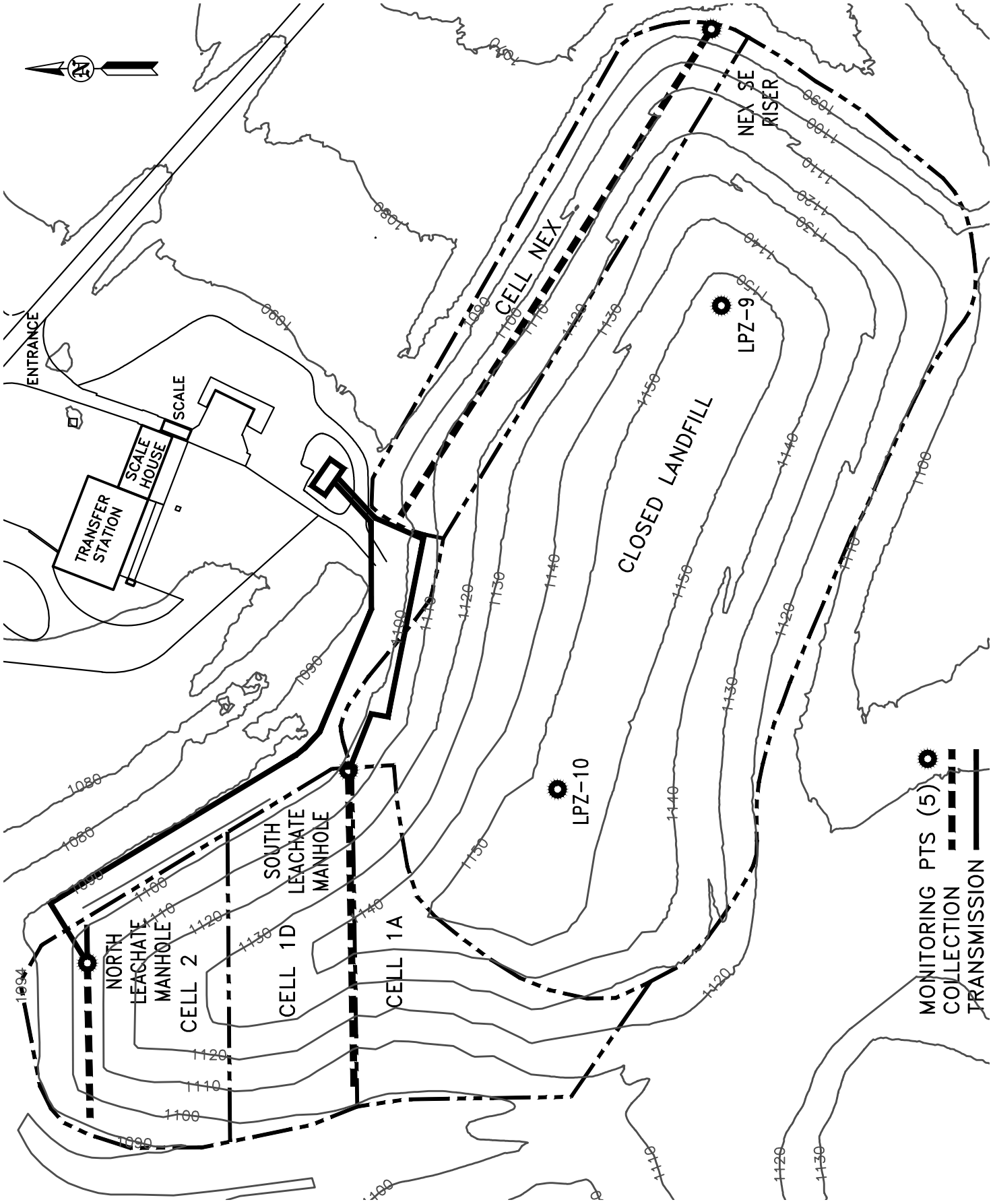
Please indicate whether the proposed operational change according to the RTP is acceptable.

Thank you for your consideration of this request, and please let me know if you have any questions or desire additional information in support of this request.

Respectfully submitted,
HLW Engineering Group, LLC

Todd Whipple, CPG.
Project Manager

cc: *Joan Swenka, Solid Waste Administrator*
Kelly Beacom, Chairman



HLW
HLW Engineering Group

LEACHATE SYSTEM AND MONITORING POINTS

FAYETTE COUNTY SANITARY LANDFILL
FAYETTE, IOWA

FIGURE: 4

REVISION	NO.	DATE
DRAWN DRA	PROJECT NO. 6041	DATE 12-12-23

Attachment A

July 10, 2023 Testing Results from Individual Landfill Cells

Fayette County Landfill Comprehensive Leachate Analyses

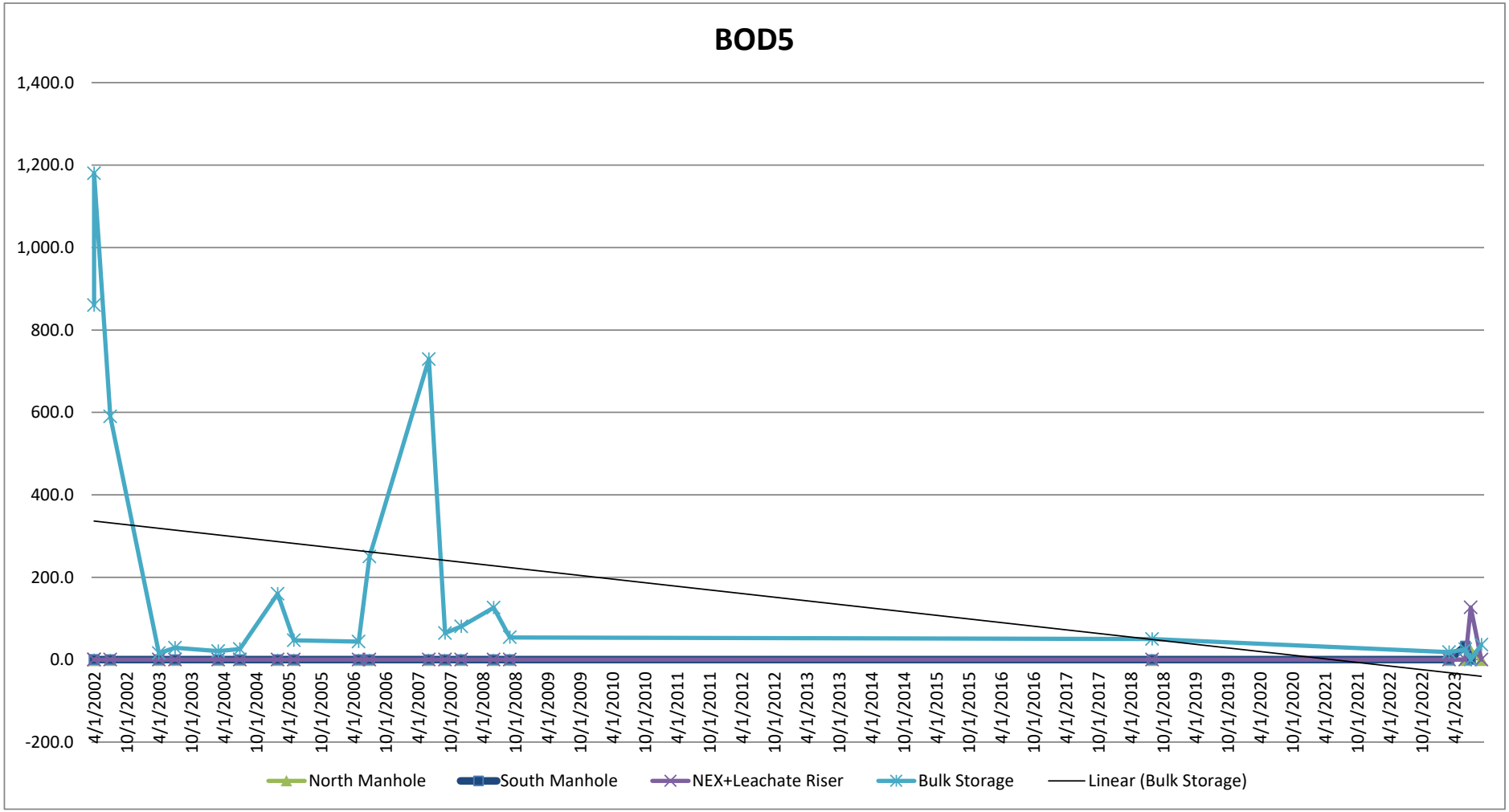
Compound	Units	7/10/2023 North Manhole	7/10/2023 South Manhole	7/10/2023 NEX Sump	IAC 137 State-Wide Standard
Acrylonitrile	ug/L	<5	<5	<5	0.32
Chloromethane	ug/L	<1	<1	<1	---
Vinyl Chloride	ug/L	<1	<1	<1	2.0
Bromomethane	ug/L	<1	<1	<1	10.0
Chloroethane	ug/L	<1	**1.2**	<1	2800
Trichlorofluoromethane	ug/L	<1	<1	<1	2000
1,1-Dichloroethylene	ug/L	<1	<1	<1	7.0
Acetone	ug/L	**13.8**	<1	**17.5**	6300
Methyl Iodide	ug/L	<1	<1	<1	---
Carbon Disulfide	ug/L	<1	<1	<1	700
Methylene Chloride	ug/L	<5	<5	<5	5.0
trans-1,2-Dichloroethylene	ug/L	<1	<1	<1	100
1,1-Dichloroethane	ug/L	<1	<1	<1	140
Vinyl Acetate	ug/L	<5	<5	<5	---
cis-1,2-Dichloroethylene	ug/L	<1	<1	<1	70.0
2-Butanone (MEK)	ug/L	<10	<10	<10	4000
Bromochloromethane	ug/L	<1	<1	<1	90.0
Chloroform	ug/L	<1	<1	<1	80.0
1,1,1-Trichloroethane	ug/L	<1	<1	<1	200
Carbon Tetrachloride	ug/L	<1	<1	<1	5.0
Benzene	ug/L	<1	**3.6**	<1	5.0
1,2-Dichloroethane	ug/L	<1	<1	<1	5.0
Trichloroethylene	ug/L	<1	<1	<1	5.0
1,2-Dichloropropane	ug/L	<1	<1	<1	5.0
Dibromomethane	ug/L	<1	<1	<1	70.0
Bromodichloromethane	ug/L	<1	<1	<1	80.0
cis-1,3-Dichloropropene	ug/L	<1	<1	<1	---
4-methyl-2-pentanone (MIBK)	ug/L	<5	<5	<5	560
Toluene	ug/L	<1	<1	<1	1000
trans-1,3-Dichloropropene	ug/L	<1	<1	<1	---
1,1,2-Trichloroethane	ug/L	<1	<1	<1	5.0
Tetrachloroethylene	ug/L	<1	<1	<1	5.0
2-Hexanone (MBK)	ug/L	<5	**14.0**	<5	---
Dibromochloromethane	ug/L	<1	<1	<1	80.0
1,2-Dibromomethane	ug/L	<1	<1	<1	1.8
Chlorobenzene	ug/L	<1	**2.0**	<1	100
1,1,1,2-Tetrachloroethane	ug/L	<1	<1	<1	70.0
Ethylbenzene	ug/L	<1	**11.5**	<1	700
Xylenes, total	ug/L	<2	**14.6**	<2	10000
Styrene	ug/L	<1	<1	<1	100
Bromoform	ug/L	<1	<1	<1	80.0
1,2,3-Trichloropropane	ug/L	<1	<1	<1	0.0058
trans-1,4-Dichloro-2-butene	ug/L	<5	<5	<5	1.8
1,1,2,2-Tetrachloroethane	ug/L	<1	<1	<1	0.3
1,4-Dichlorobenzene	ug/L	<1	**2.8**	<1	75.0
1,2-Dichlorobenzene	ug/L	<1	<1	<1	600
1,2-Dibromo-3-chloropropane	ug/L	<5	<5	<5	0.2
BOD5	mg/L	**23**	**33**	**127**	---
COD	mg/L	**230**	**547**	**440**	---
Nitrogen, ammonia	mg/L	**182**	**83.8**	**178**	30.0
pH	---	**6.8**	**6.4**	**6.9**	5-9
Solids, Total Suspended (TSS)	mg/L	**33**	**36**	**238**	---
chloride	mg/L	**594**	**823**	**1070**	---
Silver, total	mg/L	<0.004	<0.004	<0.004	0.1
Arsenic, total	mg/L	**0.0116**	**0.0067**	**0.0102**	0.01
Barium, total	mg/L	**0.527**	**0.161**	**0.343**	2.0
Beryllium, total	mg/L	<0.004	<0.004	<0.004	0.004
Cadmium, total	mg/L	<0.0008	<0.0008	<0.0008	0.005
Cobalt, total	mg/L	**0.003**	**0.0056**	**0.0136**	0.0021
Chromium, total	mg/L	<0.008	**0.0084**	**0.0131**	0.10
Copper, total	mg/L	**0.0063**	<0.004	**0.123**	1.3
Nickel, total	mg/L	**0.0770**	**0.0523**	**0.1410**	0.1
Lead, total	mg/L	<0.004	<0.004	<0.004	0.015
Antimony, total	mg/L	<0.002	<0.002	**0.0031**	0.006
Selenium, total	mg/L	<0.004	<0.004	<0.004	0.05
Thallium, total	mg/L	<0.002	<0.002	<0.002	0.002
Vanadium, total	mg/L	<0.02	<0.02	<0.02	0.035
Zinc, total	mg/L	**0.0382**	<0.02	**0.142**	2.0

Attachment B

Bulk Storage Sample Results with Correlation to Individual Landfill Cell Testing Results

Summary of Analytical Results
Fayette County Sanitary Landfill

Group No.		North	South	NEX	Bulk	
Well No.	Date	Manhole	Manhole	Riser	Storage	
Parameter						GWPS
BOD5						
No State Action Level	4/9/2002				860.0	NA
	4/29/2002				1180.0	NA
	7/8/2002				590.0	NA
	4/17/2003				16.0	NA
	7/1/2003				29.0	NA
	3/4/2004				21.0	NA
	7/7/2004				26.0	NA
	2/23/2005				160.0	NA
	5/4/2005				47.0	NA
	5/1/2006				43.8	NA
	7/19/2006				250.0	NA
	6/7/2007				729.0	NA
	9/21/2007				64.3	NA
	12/27/2007				80.4	NA
	6/24/2008				126.0	NA
	9/23/2008				54.1	NA
	8/17/2018				50.2	NA
	3/23/2023				18.5	NA
	6/14/2023				25.3	NA
	7/10/2023	23.0	33.0	127.0		NA
	9/14/2023				36.5	NA
	11/20/2023				27.9	
	Mean	23.00	33.00	127.00	211.19	


BOD5
1,400.0
1,200.0
1,000.0
800.0
600.0
400.0
200.0
0.0
-200.0
4/1/2002
10/1/2002
4/1/2003
10/1/2003
4/1/2004
10/1/2004
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4/1/2006
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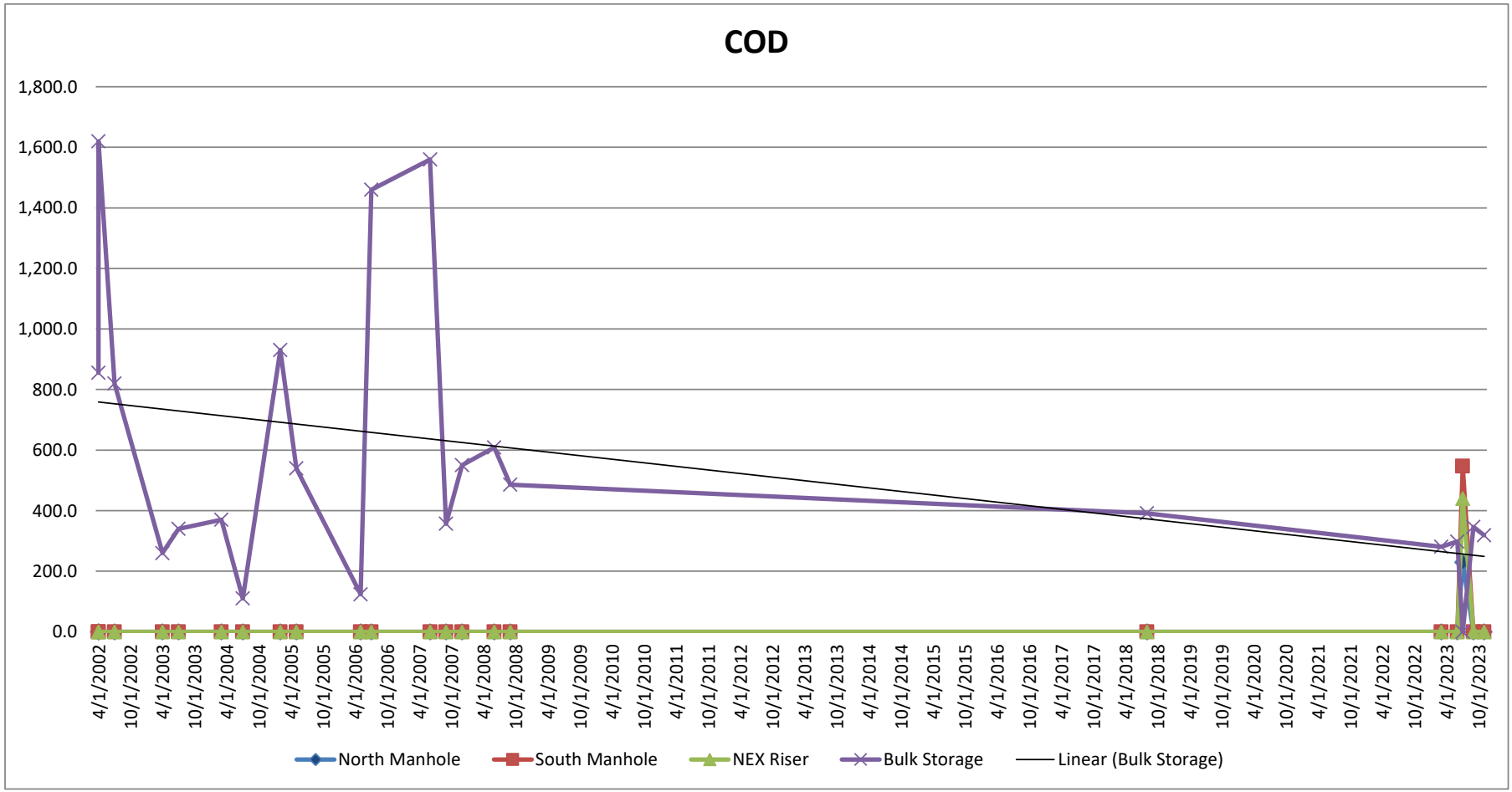
10/1/2019
4/1/2020
10/1/2020
4/1/2021
10/1/2021
4/1/2022
10/1/2022
4/1/2023
North Manhole
South Manhole
NEX+Leachate Riser
Bulk Storage
Linear (Bulk Storage)

Group No.		North	South	NEX	Bulk	
Well No.	Date	Manhole	Manhole	Riser	Storage	
Parameter						GWPS
Chemical Oxygen Demand; mg/L						
No State Action Level	4/9/2002				855	N/A
	4/29/2002				1620	N/A
	7/8/2002				820	N/A
	4/17/2003				260	N/A
	7/1/2003				340	N/A
	3/4/2004				370	N/A
	7/7/2004				110	N/A
	2/23/2005				930	N/A
	5/4/2005				540	N/A
	5/1/2006				124	N/A
	7/19/2006				1460	N/A
	6/7/2007				1560	N/A
	9/21/2007				357	N/A
	12/27/2007				550	N/A
	6/24/2008				609	N/A
	9/23/2008				486	N/A
	8/17/2018				391	
	3/23/2023				281	N/A
	6/14/2023				298	N/A
	7/10/2023	230	547	440		N/A
	9/14/2023				346	
	11/20/2023				319	
						N/A
	Mean	230.00	547	440	601.24	


COD
1,800.0
1,600.0
1,400.0
1,200.0
1,000.0
800.0
600.0
400.0
200.0
0.0
4/1/2002
10/1/2002
4/1/2003
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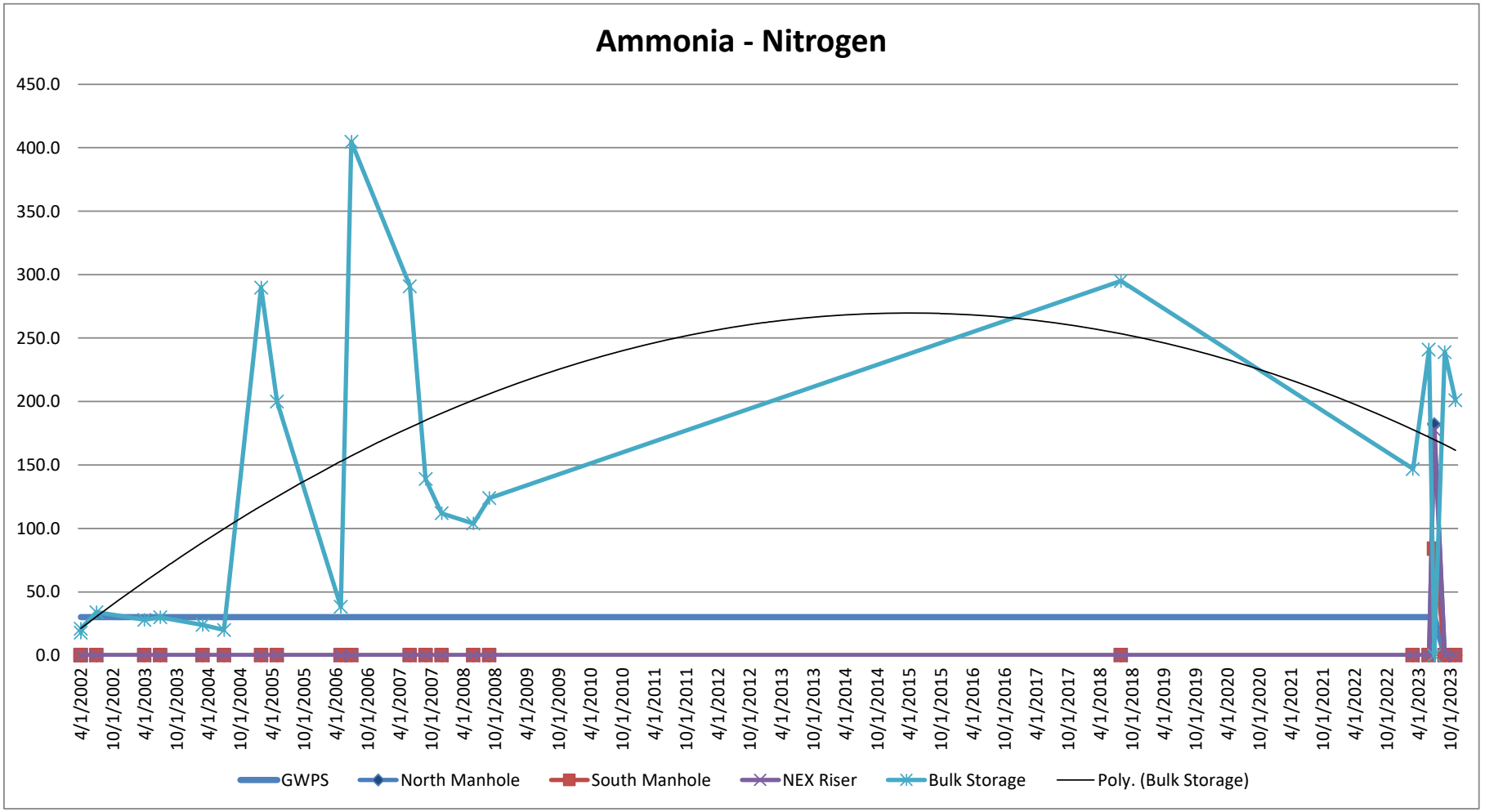
10/1/2020
4/1/2021
10/1/2021
4/1/2022
10/1/2022
4/1/2023
10/1/2023
North Manhole
South Manhole
NEX Riser
Bulk Storage
Linear (Bulk Storage)

Group No.		North	South	NEX	Bulk	
Well No.	Date	Manhole	Manhole	Riser	Storage	
Parameter						GWPS
Nitrogen, Ammonia; mg/L						
State Action Level = 30.0 mg/L	4/9/2002				17.8	30.00
IAC 137 Statewiide Standard	4/29/2002				21.0	30.00
	7/8/2002				34.0	30.00
	4/17/2003				28.0	30.00
	7/1/2003				30.0	30.00
	3/4/2004				24.0	30.00
	7/7/2004				20.0	30.00
	2/23/2005				290.0	30.00
	5/4/2005				200.0	30.00
	5/1/2006				38.2	30.00
	7/19/2006				405.0	30.00
	6/7/2007				291.0	30.00
	9/21/2007				139.0	30.00
	12/27/2007				112.0	30.00
	6/24/2008				104.0	30.00
	9/23/2008				124.0	30.00
	8/17/2018				295.0	30.00
	3/23/2023				147.0	30.00
	6/14/2023				241.0	30.00
	7/10/2023	182	83.8	178		30.00
	9/14/2023				239.0	
	11/20/2023				201.0	
	Mean	182	83.8	178	142.90476	


Ammonia - Nitrogen
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
4/1/2002
10/1/2002
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4/1/2021
10/1/2021
4/1/2022
10/1/2022
4/1/2023
10/1/2023
GWPS
North Manhole
South Manhole
NEX Riser
Bulk Storage
Poly. (Bulk Storage)

Group No.		North	South	NEX	Bulk	
Well No.	Date	Manhole	Manhole	Riser	Storage	
Parameter						GWPS
Chloride; mg/L						
State Action Level = 30.0 mg/L	4/9/2002					N/A
IAC 137 Statewiide Standard	4/29/2002					N/A
	7/8/2002					N/A
	4/17/2003					N/A
	7/1/2003					N/A
	3/4/2004					N/A
	7/7/2004					N/A
	2/23/2005					N/A
	5/4/2005					N/A
	5/1/2006					N/A
	7/19/2006					N/A
	6/7/2007					N/A
	9/21/2007					N/A
	12/27/2007					N/A
	6/24/2008					N/A
	9/23/2008					N/A
	8/17/2018					N/A
	3/23/2023					N/A
	6/14/2023					N/A
	7/10/2023	594	823	1070		N/A
	9/14/2023					
	11/20/2023					
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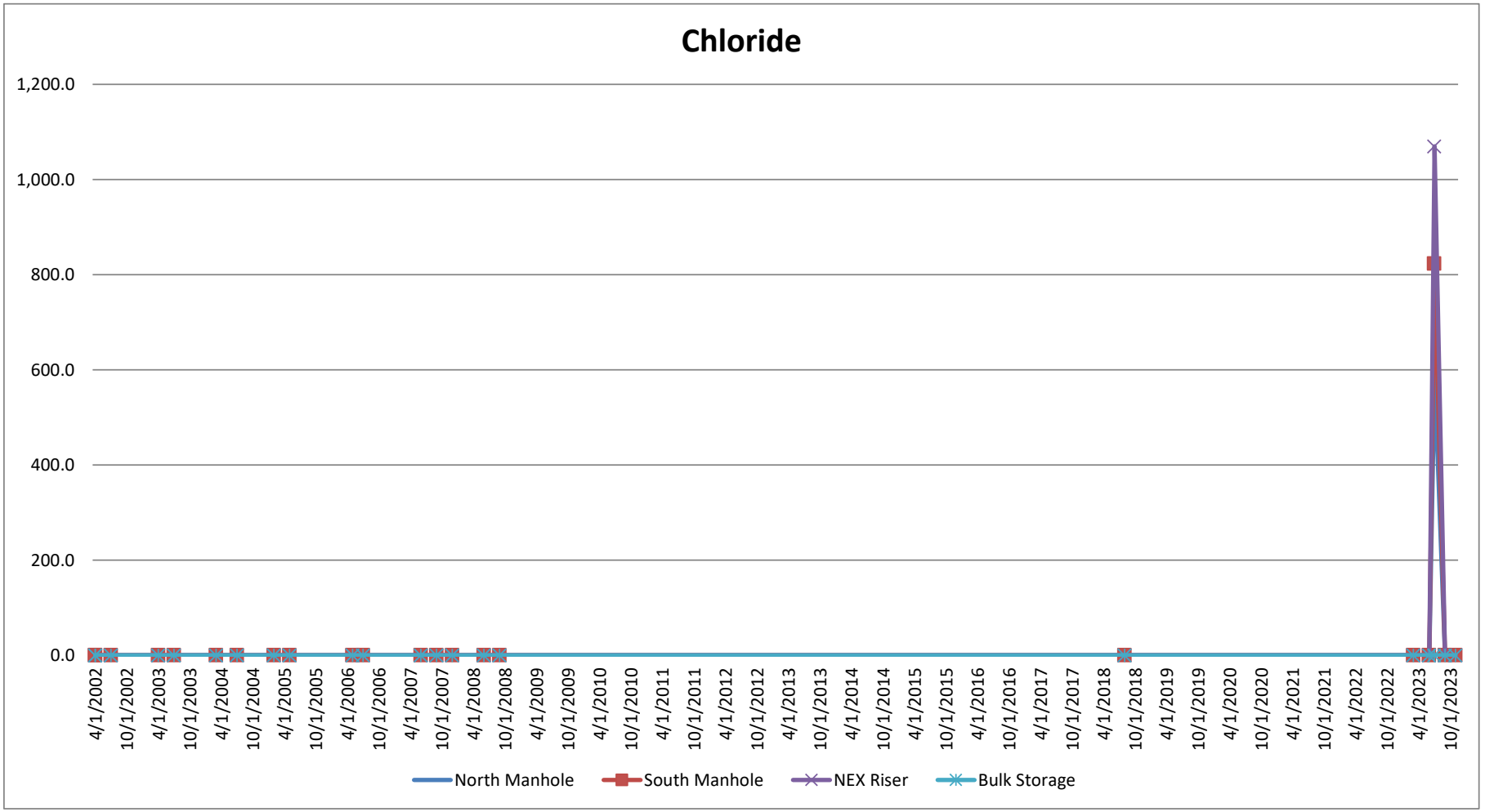
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4/1/2021
10/1/2021
4/1/2022
10/1/2022
4/1/2023
10/1/2023
North Manhole
South Manhole
NEX Riser
Bulk Storage

Group No.		North	South	NEX	Bulk	
Well No.	Date	Manhole	Manhole	Riser	Storage	
Parameter						GWPS
pH						
State Action Level = 6.0 to 9.0	4/9/2002				6.5	9.00
IAC 137 Statewiide Standard	4/29/2002				6.3	9.00
	7/8/2002				6.8	9.00
	4/17/2003				7.0	9.00
	7/1/2003				6.8	9.00
	3/4/2004				6.9	9.00
	7/7/2004				6.7	9.00
	2/23/2005				7.1	9.00
	5/4/2005				7.0	9.00
	5/1/2006				7.2	9.00
	7/19/2006				7.2	9.00
	6/7/2007				7.4	9.00
	9/21/2007				7.4	9.00
	12/27/2007				7.4	9.00
	6/24/2008				7.4	9.00
	9/23/2008				7.2	9.00
	8/17/2018				7.0	9.00
	3/23/2023				6.9	9.00
	6/14/2023				7.0	9.00
	7/10/2023	6.8	6.4	6.9		9.00
	9/14/2023				7.0	
	11/20/2023				7.0	
						9.00
	Mean	6.8	6.4	6.9	7.0095238	

6.00
6.00
6.00
6.00
6.00
6.00
6.00
6.00
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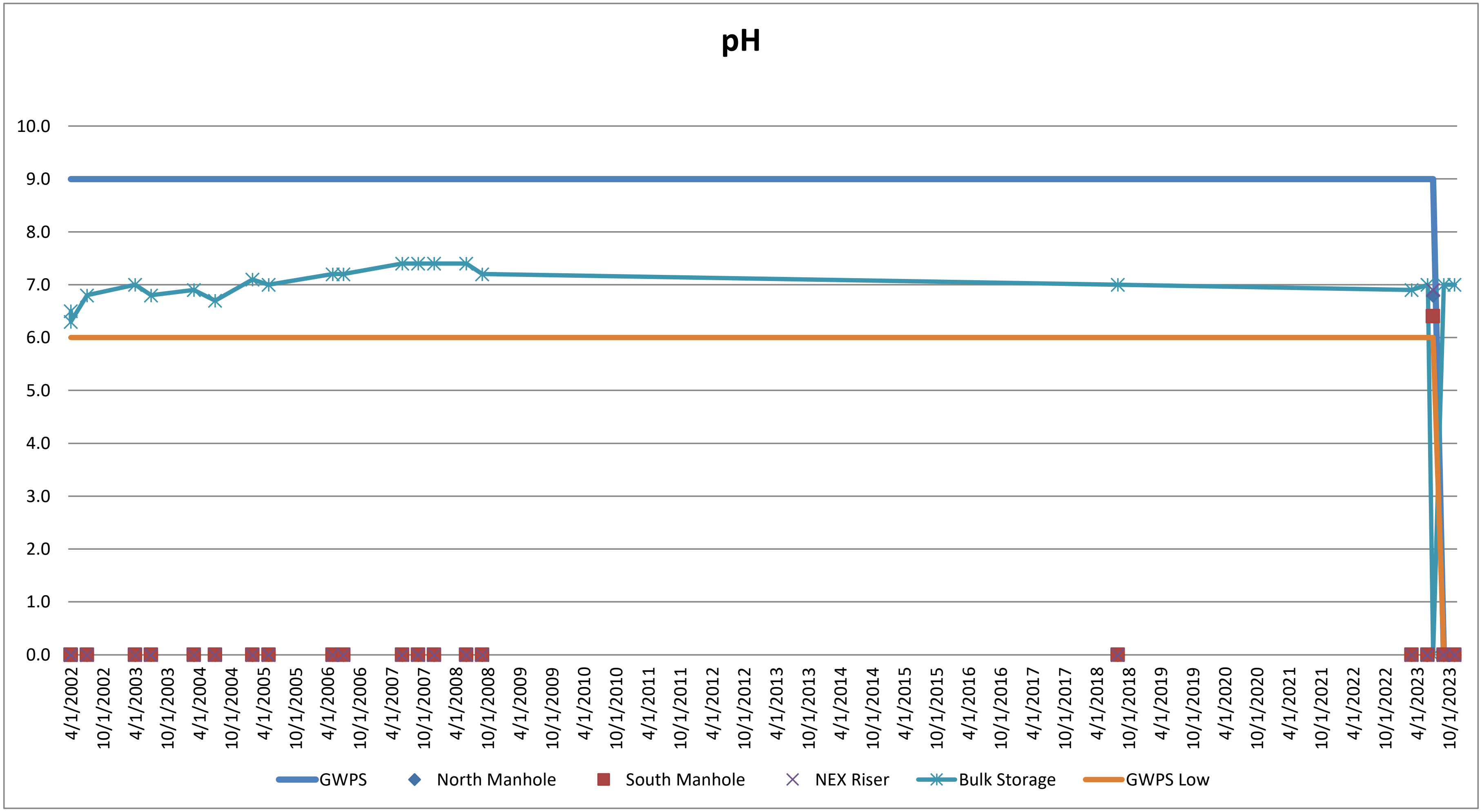
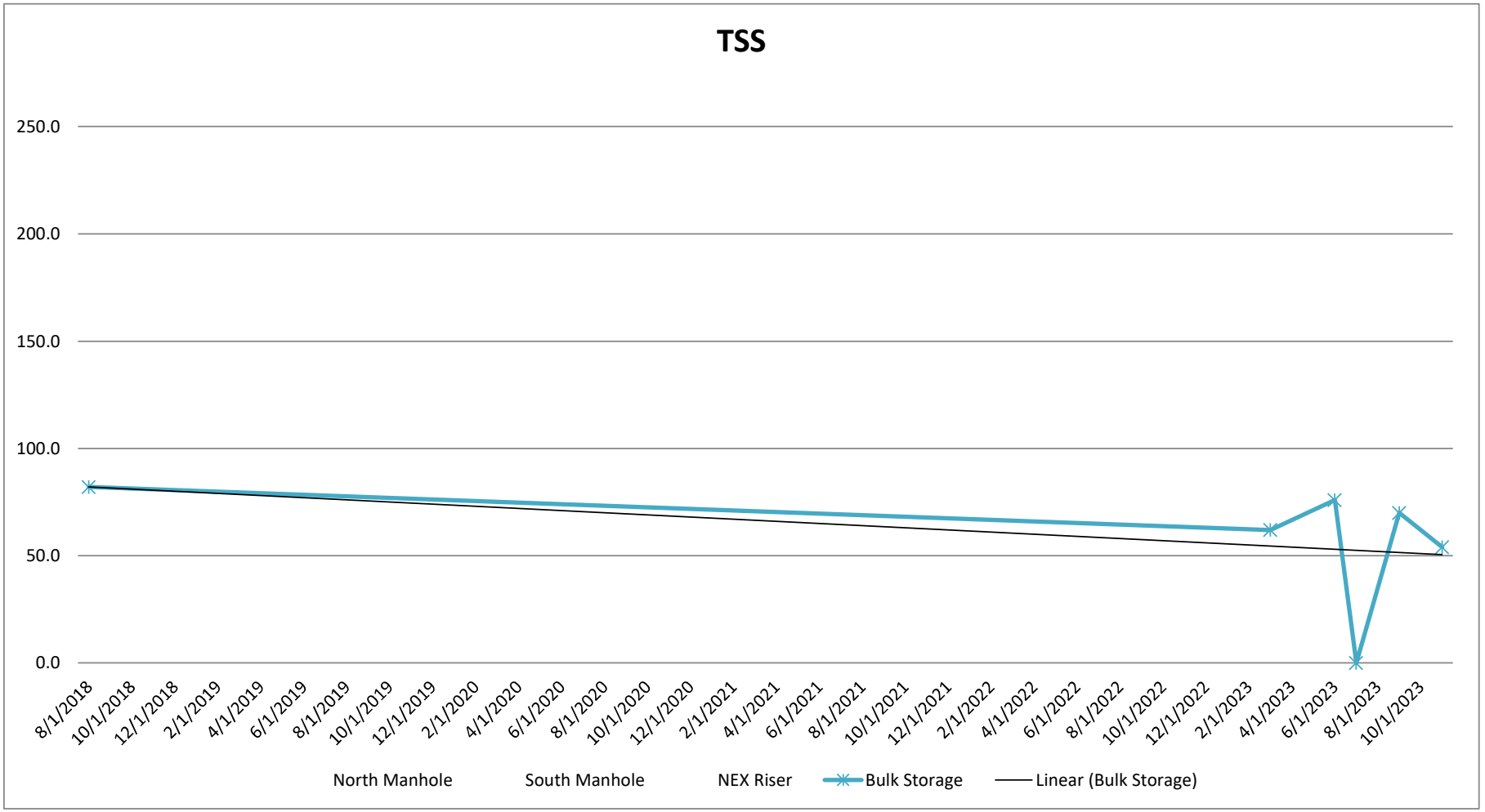
6.00



Group No.		North	South	NEX	Bulk	
Well No.	Date	Manhole	Manhole	Riser	Storage	
Parameter						GWPS
TSS						
No State Action Level	4/9/2002					NA
	4/29/2002					NA
	7/8/2002					NA
	4/17/2003					NA
	7/1/2003					NA
	3/4/2004					NA
	7/7/2004					NA
	2/23/2005					NA
	5/4/2005					NA
	5/1/2006					NA
	7/19/2006					NA
	6/7/2007					NA
	9/21/2007					NA
	12/27/2007					NA
	6/24/2008					NA
	9/23/2008					NA
	8/17/2018				82.0	NA
	3/23/2023				62.0	NA
	6/14/2023				76.0	NA
	7/10/2023	33	36	238		NA
	9/14/2023				70.0	
	11/20/2023				54.0	
						NA
	Mean	33	36	238	68.8	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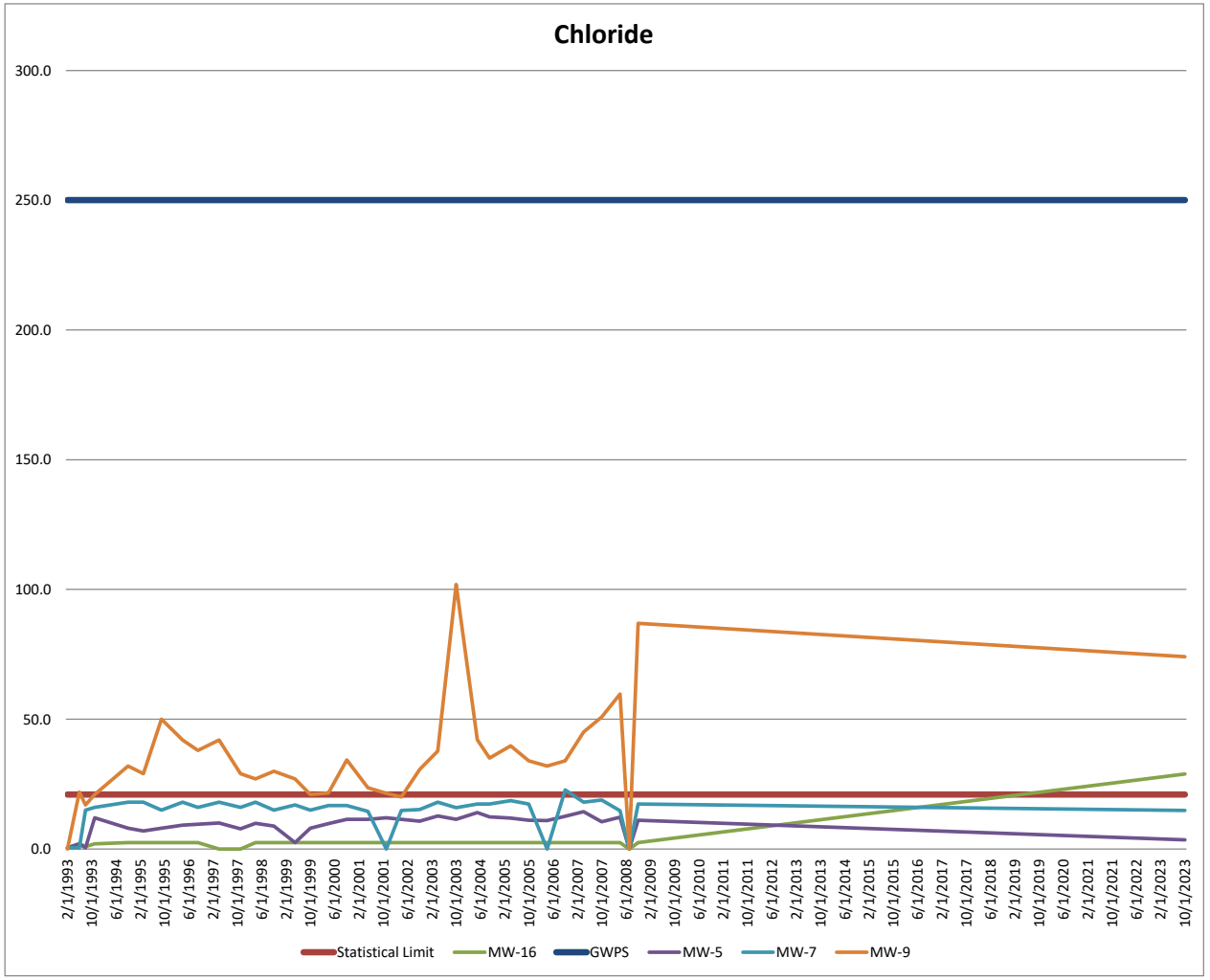
10/1/2022
12/1/2022
2/1/2023
4/1/2023
6/1/2023
8/1/2023
10/1/2023
North Manhole
South Manhole
NEX Riser
Bulk Storage
Linear (Bulk Storage)

Attachment C

General Chemistry Testing Results – Perimeter Monitoring Wells over Time

Summary of Analytical Results
Fayette County Sanitary Landfill

Group No.		UP	UP	UP	DOWN	DOWN	DOWN	DOWN	DOWN	DOWN	DOWN	DOWN	DOWN		
Well No.	Date	MW-12	MW-17	MW-21	MW-16	MW-5	MW-7	MW-9	MW-24	MW-25	MW-26	MW-32	MW-33	Groundwater	
Parameter														Mean+2STD	GWPS
Chloride; mg/L															
State Action Level = 250mg/L	Feb-93				0.5	0.5	0.5							21.09	250.00
Based on Secondary Drinking	Jun-93				2.0	2.0	0.5	22.0						21.09	250.00
Water Standard (EPA)	Aug-93				1.0	0.5	15.0	17.0						21.09	250.00
	Nov-93				2.0	12.0	16.0	21.0						21.09	250.00
	Oct-94				2.5	8.0	18.0	32.0						21.09	250.00
	Mar-95				2.5	7.0	18.0	29.0						21.09	250.00
	Sep-95				2.5	8.0	15.0	50.0						21.09	250.00
	Apr-96				2.5	9.2	18.0	42.0						21.09	250.00
	Sep-96			2.5	2.5	9.6	16.0	38.0						21.09	250.00
	Apr-97			2.5		10.0	18.0	42.0						21.09	250.00
	Nov-97			2.5		7.8	16.0	29.0						21.09	250.00
	Apr-98			2.5	2.5	9.9	18.0	27.0						21.09	250.00
	Oct-98			2.5	2.5	8.9	15.0	30.0						21.09	250.00
	May-99			2.5	2.5	2.5	17.0	27.0						21.09	250.00
	Oct-99			2.5	2.5	8.0	15.0	21.0						21.09	250.00
	Apr-00			2.5	2.5	9.8	16.7	21.6						21.09	250.00
	Oct-00			2.5	2.5	11.5	16.7	34.3						21.09	250.00
	May-01			2.5	2.5	11.4	14.5	23.6						21.09	250.00
	Nov-01			2.5	2.5	12.0		21.5						21.09	250.00
	Apr-02			2.5	2.5	11.4	14.9	20.1						21.09	250.00
	Oct-02			2.5	2.5	10.7	15.2	30.7						21.09	250.00
	Apr-03			6.4	2.5	12.8	18.0	37.7						21.09	250.00
	Oct-03			2.5	2.5	11.5	15.9	102.0						21.09	250.00
	May-04			2.5	2.5	14.0	17.4	42.1						21.09	250.00
	Sep-04	8.0		2.5	2.5	12.4	17.3	35.0						21.09	250.00
	Apr-05			2.5	2.5	11.9	18.7	39.8						21.09	250.00
	Oct-05			2.5	2.5	11.1	17.4	34.0						21.09	250.00
	Apr-06	9.6		2.5	2.5	11.0		32.0						21.09	250.00
	Oct-06			2.5	2.5	12.6	22.8	34.0						21.09	250.00
	Apr-07		28.0	2.5	2.5	14.5	18.1	45.1						21.09	250.00
	Oct-07	6.7	24.5	2.5	2.5	10.5	18.9	50.8						21.09	250.00
	Apr-08	7.4	20.6	2.5	2.5	12.3	14.8	59.7						21.09	250.00
	Jul-08	6.1	20.7											21.09	250.00
	Oct-08	6.7	14.6	2.5	2.5	11.1	17.3	87.0						21.09	250.00
	Oct-23	4.4	24.1	dry	28.9	3.6	14.9	74.1	dry	21.3	19.9	26.9	26.1	21.09	250.00
														21.09	250.00
	Mean	6.52			3.18	9.41	15.80	37.94	#DIV/0!	21.30	19.90	26.90	26.10		
	Standard Dev	7.28													
	Mean+2STD	21.09													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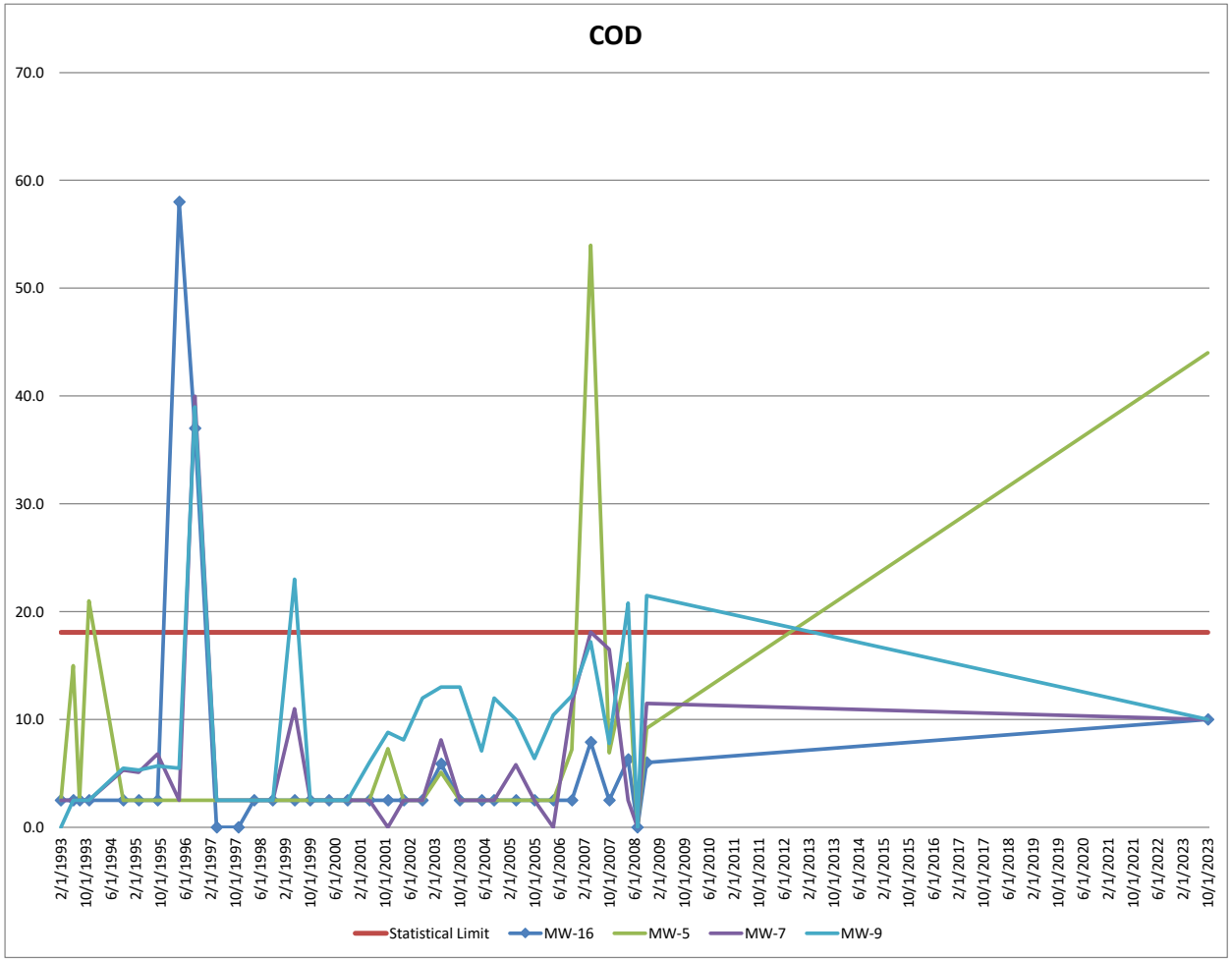
2/1/2021
10/1/2021
6/1/2022
2/1/2023
10/1/2023
Statistical Limit
MW-16
GWPS
MW-5
MW-7
MW-9

Group No.		UP	UP	UP	DOWN	DOWN	DOWN	DOWN	DOWN	DOWN	DOWN	DOWN	DOWN		
Well No.	Date	MW-12	MW-17	MW-21	MW-16	MW-5	MW-7	MW-9	MW-24	MW-25	MW-26	MW-32	MW-33	Groundwater	
Parameter														Mean+2STD	GWPS
Chemical Oxygen Demand; mg/L															
No State Action Level	Feb-93				2.5	2.5	2.5							18.09	N/A
	Jun-93				2.5	15	2.5	2.5						18.09	N/A
	Aug-93				2.5	2.5	2.5	2.5						18.09	N/A
	Nov-93				2.5	21	2.5	2.5						18.09	N/A
	Oct-94				2.5	2.5	5.3	5.5						18.09	N/A
	Mar-95				2.5	2.5	5.1	5.3						18.09	N/A
	Sep-95				2.5	2.5	6.8	5.7						18.09	N/A
	Apr-96				58	2.5	2.5	5.5						18.09	N/A
	Sep-96			2.5	37	2.5	40	39						18.09	N/A
	Apr-97			2.5		2.5	2.5	2.5						18.09	N/A
	Nov-97			2.5		2.5	2.5	2.5						18.09	N/A
	Apr-98			2.5	2.5	2.5	2.5	2.5						18.09	N/A
	Oct-98			2.5	2.5	2.5	2.5	2.5						18.09	N/A
	May-99			2.5	2.5	2.5	11	23						18.09	N/A
	Oct-99			2.5	2.5	2.5	2.5	2.5						18.09	N/A
	Apr-00			2.5	2.5	2.5	2.5	2.5						18.09	N/A
	Oct-00			2.5	2.5	2.5	2.5	2.5						18.09	N/A
	May-01			2.5	2.5	2.5	2.5	6						18.09	N/A
	Nov-01			5.6	2.5	7.3		8.8						18.09	N/A
	Apr-02			2.5	2.5	2.5	2.5	8.1						18.09	N/A
	Oct-02			2.5	2.5	2.5	2.5	12						18.09	N/A
	Apr-03			8.6	5.9	5.1	8.1	13						18.09	N/A
	Oct-03			2.5	2.5	2.5	2.5	13						18.09	N/A
	May-04			2.5	2.5	2.5	2.5	7.1						18.09	N/A
	Sep-04	5.1		2.5	2.5	2.5	2.5	12						18.09	N/A
	Apr-05			2.5	2.5	2.5	5.8	10						18.09	N/A
	Oct-05			2.5	2.5	2.5	2.5	6.4						18.09	N/A
	Apr-06	2.5		2.5	2.5	2.5		10.4						18.09	N/A
	Oct-06			6	2.5	7.2	11.5	12.2						18.09	N/A
	Apr-07		30.3	8.2	7.9	54	18.1	17.2						18.09	N/A
	Oct-07	2.5	5	2.5	2.5	6.9	16.5	7.8						18.09	N/A
	Apr-08	9.3	20.8	11.4	6.3	15.2	2.5	20.8						18.09	N/A
	Jul-08	8.9	18.2											18.09	N/A
	Oct-08	5.5	8.8	8.6	6	9.2	11.5	21.5						18.09	N/A
	Oct-23	10	10	dry	10	44	10	10	dry	10	10	10	24	18.09	N/A
	Mean	6.13			6.05	7.20	6.24	9.25	#DIV/0!	10.00	10.00	10.00	24.00		
	Standard Dev	5.98													
	Mean+2STD	18.09													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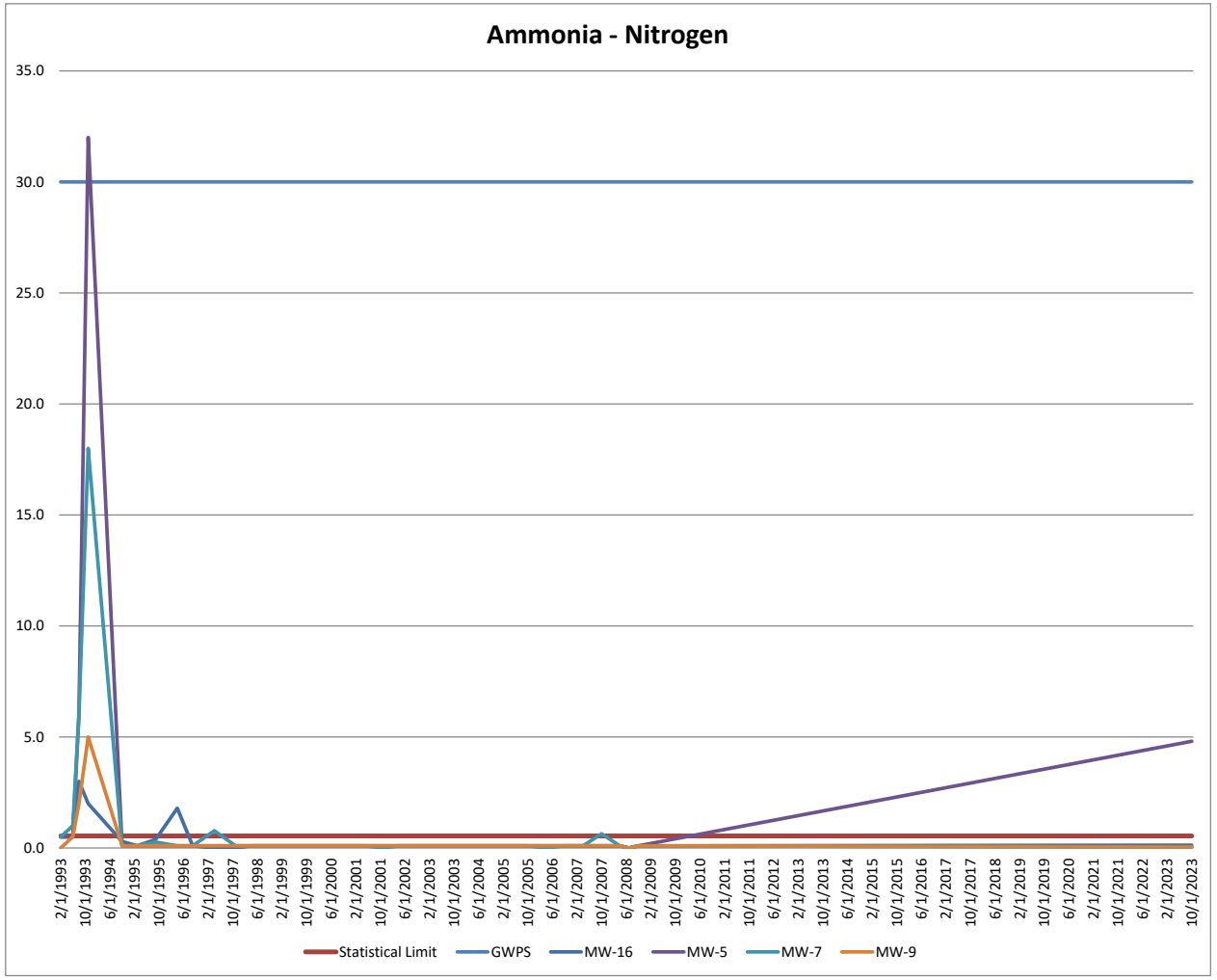
6/1/2022
2/1/2023
10/1/2023
Statistical Limit
MW-16
MW-5
MW-7
MW-9

Group No.		UP	UP	UP	DOWN	DOWN	DOWN	DOWN	DOWN	DOWN	DOWN	DOWN	DOWN		
Well No.	Date	MW-12	MW-17	MW-21	MW-16	MW-5	MW-7	MW-9	MW-24	MW-25	MW-26	MW-32	MW-33	Groundwater	
Parameter														Mean+2STD	GWPS
Nitrogen, Ammonia; mg/L															
State Action Level = 30.0 mg/L	Feb-93				0.5	0.5	0.5							0.55	30.00
IAC 137 Statewiide Standard	Jun-93				0.5	0.5	1	0.5						0.55	30.00
	Aug-93				3	6	6	2						0.55	30.00
	Nov-93				2	32	18	5						0.55	30.00
	Oct-94				0.3	0.1	0.1	0.1						0.55	30.00
	Mar-95				0.1	0.1	0.1	0.1						0.55	30.00
	Sep-95				0.39	0.1	0.27	0.1						0.55	30.00
	Apr-96				1.8	0.1	0.1	0.1						0.55	30.00
	Sep-96			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Apr-97			0.1		0.1	0.78	0.1						0.55	30.00
	Nov-97			0.46		0.1	0.1	0.1						0.55	30.00
	Apr-98			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Oct-98			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	May-99			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Oct-99			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Apr-00			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Oct-00			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	May-01			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Nov-01			0.1	0.1	0.1		0.1						0.55	30.00
	Apr-02			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Oct-02			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Apr-03			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Oct-03			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	May-04			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Sep-04	0.1		0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Apr-05			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Oct-05			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Apr-06	0.1		0.1	0.1	0.1		0.1						0.55	30.00
	Oct-06			0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Apr-07		0.1	0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Oct-07	0.1	0.22	0.1	0.1	0.1	0.64	0.1						0.55	30.00
	Apr-08	0.1	0.32	1.29	0.1	0.1	0.1	0.1						0.55	30.00
	Jul-08	0.1	0.1											0.55	30.00
	Oct-08	0.1	0.1	0.1	0.1	0.1	0.1	0.1						0.55	30.00
	Oct-23	0.05	0.05	dry	0.13	4.8	0.05	0.05	dry	0.05	0.05	0.05	0.1	0.55	30.00
	Mean	0.15			0.344375	1.3735294	0.92625	0.3166667	#DIV/0!	0.05	0.05	0.05	0.1		
	Standard Dev	0.20													
	Mean+2STD	0.55													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Statistical Limit
GWPS
MW-16
MW-5
MW-7
MW-9