2024 ACM Report

Winneshiek County Sanitary Landfill
Winneshiek County, Iowa
Permit #96-SDP-1-74P

Winneshiek County Area Solid Waste Agency
201 West Main Street
Decorah, Iowa 52101-1497

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Project number: 60711359

March 2025

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LICENSED PROFESSIONAL ENGINEER CHRISTOPHER G. OELKERS 22053 IOWA	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the state of Iowa. March 31, 2025 CHRISTOPHER G. OELKERS, PE Date License No. 22053 My license renewal date is December 31, 2025. Pages or sheets covered by this seal: ____________________ ____________________ ____________________ Date Issued:

Certification page (PE or ground water scientist signature) 113.10(1)"d"

For the purposes of this rule, a "qualified groundwater scientist" means a scientist or an engineer who has received a baccalaureate or postgraduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields demonstrated by state registration, professional certifications, or completion of accredited University programs that enable that individual to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action.

Qualified Groundwater Specialist:

Russell J Henning

March 31, 2025

RUSSELL J. HENNING, PG

Date

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Executive Summary

ES.1 Period of Report Coverage

This Assessment of Corrective Measures Report (ACM) for the Winneshiek County Sanitary Landfill (Landfill) includes a summary of all groundwater, surface water, leachate, and landfill gas sampling completed as part of the ACM in calendar year 2024.

ES.2 Report Priority

An Assessment of Corrective Measures (ACM) study began in August 2022. The ACM was started due to cobalt in groundwater at MW-29A, MW-31A and MW-35 that exceeded the cobalt GWPS of 2.1 µg/L. One new well was installed downgradient of MW-31A, and two new wells and surface water monitoring point were installed downgradient of MW-29A. As part of the ACM all groundwater wells which had sufficient groundwater levels were sampled for cation/anions and redox parameters. Two leachate manholes, MH-1AA and MH-4-2 were sampled for Appendix I. Two leachate lagoon bays, LB-1 and LB-2 were sampled. Two groundwater underdrains, GU-1 and GU-2 were sampled for Appendix I. Three surface water sample locations, SW-1, SW-2, and SW-5 were sampled for Appendix I. A site-specific GWPS of 3.4 µg/L for cobalt has been established and is detailed in the current HMSP (Document No. 110947).

ES.3 Remedy Selection

As a result of the review of performance, implementation, and costs of listed remedies, it is recommended the remedy consist of monitored natural attenuation (MNA) and source control measures to address the site groundwater issues. MNA will consist of following the current HMSP groundwater monitoring program for the site. Source control measures are already being implemented. Landfill capping is reducing infiltration from precipitation and as a result less leachate is being generated. The leachate collection system will continue to be monitored for obstructions and leaks.

1. Introduction

1.1 Purpose

Groundwater sample results and statistical analyses since November 2019 for Winneshiek County Landfill (Landfill) found cobalt concentrations in groundwater above the groundwater protection standards (GWPS) in four downgradient monitoring wells. This initiated the assessment of corrective measures (ACM) in May 2022 as outlined in the Iowa Administrative Code (IAC) 113.10(6)"g", 113.10(7), and 113.10(8).

Groundwater wells and surface water monitoring points were installed to further evaluate the extent of cobalt GWPS exceedances near monitoring wells MW-29A, MW-31A and MW-35. Monitoring wells MW-38A, MW-39A and MW-40A were installed downgradient of MW-12A, MW-27A, and MW-35 in August 2021. Monitoring wells MW-42A, MW-43A and MW-44A were installed downgradient of MW-11, MW-31A, and MW-29A in August 2022. Surface water monitoring point SW-5 was installed downstream of SW-1 and MW-29A in May 2023.

The Landfill is in rural Winneshiek County approximately 5 miles southeast of the City of Decorah, Iowa, in Section 9, T 97N, R 7W. The street address is 2000 - 140th Avenue, Decorah, Iowa, 52101. Figure 1 presents the monitoring locations.

Information regarding the monitoring points is included in Table 1. Recent and historical sampling results for cobalt are presented in Table 2. Analysis of sample data was conducted in accordance with Chapter 113 of the Iowa Administrative Code (IAC). Output from the statistical analyses is included in Appendix A. Historical monitoring point analytical data summary tables are presented in Appendix B. Groundwater elevation contour maps, based on data obtained in March 2024, are presented as Figures 2 and 3.

The purpose of this report is to meet the requirements of IAC 567 – 113.10(6)"g" and 113.10(7) which includes:

- Characterize the nature and extent of the release of cobalt by summarizing work conducted by AECOM,
- Characterize the nature and any potential risk posed by cobalt,
- Evaluate remedy alternatives in accordance with the criteria listed in IAC 113.10(7) and 113.10(8),
- Prepare recommendation based on the results.

1.2 Scope of Work and Regulatory Requirements

This report has been prepared to meet the requirements of IAC 113.10(6)"g", 113.10(7), and 113.10(8). Field activities completed as part of this scope and analytical data evaluated in the following sections were conducted to determine the extent of cobalt above GWPS in groundwater and surface water. The remedies evaluated in Section 6 were selected based on their broad applicability to site conditions and plume characteristics for anticipated treatment alternatives for the cobalt in groundwater east of the closed, clay lined landfill Cell 4.

2. Winneshiek County Sanitary Landfill History and Construction

Nishna Sanitary Services initially developed the Landfill in 1974. The Landfill was privately owned and operated until 1991 when the Winneshiek County Solid Waste Agency (Agency) purchased the facility. Since that time, the Landfill has served as the primary disposal site for the waste generated in the Winneshiek Service Area. In 2022, the Winneshiek County Sanitary Landfill accepted approximately 21,590 tons.

Waste disposal at the Landfill began in 1974 with the development of original Area 1. Original Area 1 was constructed without a liner or leachate collection system. A leachate toe drain was installed around the perimeter of Areas 1, 2, and 3 in 1993 as part of an assessment of corrective measures (ACM).

Original Area 2 was developed from about 1982 and was used until 1994, except for some construction and demolition (C&D) disposal that continued in a small portion of original Area 2 until 2000-2002. Original Area 2 has no liner or leachate collection system. As noted, a leachate toe drain was installed along the western perimeter as part of 1993 ACM. A landfill gas collection trench extends south of original Area 2 and original Area 3.

Development of original Area 3 began in about 1988 and continued until 1994. Original Area 3 was constructed without a liner or leachate collection system. As noted, a leachate toe drain was installed along the eastern side and a landfill gas collection trench along the south side as part of 1993 ACM.

Development of original Cell 4 began in 1994. It is constructed with a clay liner and leachate collection system.

Development of original Cell 5 began in 1996. It is constructed with a composite liner and leachate collection system.

In 2016, the Agency completed the 2016 Closure and Capital Improvements Project (2016 Project). The 2016 Project included a 20-acre abutment liner over the east side of original Areas 1 and 3, and original Cell 4, and a new cell in the gap between original Area 1 and original Cell 5, Phase II, called the original Cell 5 Expansion Area. Also, the 2016 Project included the final closure on the remaining footprint of original Areas 1, 2 and 3. Slopes greater than 5% have a 4-foot soil final cover, and the remaining portions are closed with either a composite final cover system or are covered with the abutment liner. Original Cell 4 is effectively closed as it is mostly covered by the abutment liner, except for the south and east side slopes. Those slopes have 2 feet of temporary cover and are densely vegetated. The active cell, including the abutment liner, the original Cell 5 Expansion Area and original Cell 5, is now known as C5 EXP. Final closures of the C5 EXP, including the south and east side slopes of original Cell 4, will be a composite final cover system with passive gas vents.

The final part of the 2016 Project was a 4.5-million-gallon leachate lagoon. From this lagoon, the Landfill staff can recirculate, evaporate and loadout the leachate. The lagoon collects leachate from the west and central toe drains, original Cell 4, original Cell 5, and the C5 EXP. The Agency installed diversion manholes with valving to either discharge underdrain groundwater to the creek or discharge to the lagoon for the groundwater underdrains at original Cell 5, the C5 EXP and the lagoon itself. The C5 EXP groundwater discharge and the combined original Cell 5 and lagoon groundwater discharge are sampled as part of the current detection monitoring program.

As noted, an ACM was conducted to assess the location and quantity of leachate at the Landfill. Analyses of groundwater samples taken at the Landfill in 1990 indicated a possible shallow (water table) groundwater contamination issue downgradient from the unlined landfill cell designated Area 1. Groundwater sampling results from monitoring well MW-4 showed elevated constituent concentrations attributable to leachate or landfill gas interaction with shallow groundwater. To determine the extent to which the original fill area with leachate and landfill gas had interacted with groundwater, six (6) leachate head piezometers (LHPZ-1 through LHPZ-6) were installed. In September 1991, a groundwater assessment plan (BP-D, 1991), approved by the IDNR, was implemented. To measure the extent of the contaminant plume, MW-4B and four temporary wells (B-1 through B-4) were installed downgradient from MW-4 and sampled. An electromagnetic survey was also conducted (BP-D, 1992) to determine the extent of contamination. Data from these investigations confirmed on-site groundwater impact and began to define the extent of the plume. A leachate collection plan was developed (BP-D, 1992) and a gravity interceptor leachate system was installed around Areas 1, 2 and 3 to intercept contaminants released from the Landfill (refer to Figure 1, West Toe Drain).

To further assess the impact of leachate on shallow groundwater downgradient from the Landfill and to monitor the effectiveness of the leachate interceptor and collection system, monitoring wells MWII-1 through MWII-6 were installed downgradient of MW-4 and MW-4B in May 1993. Leachate head within the Landfill is evaluated annually to determine if the leachate control system is effectively reducing leachate within Areas 1 through 3. Organic compounds, 1,1-Dichloroethane, 1,4-Dichlorobenzene, Benzene, Chlorobenzene were detected in groundwater samples from MW-4 and MW-4B from October 2008 through May 2015. Recent semi-annual groundwater sampled between May 2014 and November 2023 have had no Appendix I organic detections. Analysis of full Appendix II constituents in groundwater samples from MW-4 were obtained in April 2009, April 2010, May 2014, September 2015, November 2016, November 2017, and June 2023. Analysis of Appendix II constituents in groundwater samples from MW-4B were obtained in February 2010, October 2014, September 2015, November 2016, and November 2017. There have been no Appendix II detections above the reporting limit (RL) for MW-4 and MW-4B. This confirms that the leachate interceptor and collection system is effective. The water table map (Figure 2) also verifies groundwater flow towards the leachate interceptor.

2.1 Winneshiek County Sanitary Landfill Geology and Hydrogeology

The subsurface geologic formations encountered during installation of site wells at the Landfill are included on the boring logs and monitoring well/piezometer documentation forms (Iowa DNR Form 542-1277) presented in Appendix A of the 2024 HMSP. Boring and well locations are shown on HMSP Figure 4. The site geology and hydrogeology of the Landfill has been comprehensively investigated in several studies, including the report for Phase II: Hydrogeologic Investigation at the Winneshiek County Sanitary Landfill (Brown, et al., 1990), Winneshiek County Sanitary Landfill HMSP Update (Rust E&I, 1997), and Winneshiek County Sanitary Landfill HMSP Update (AECOM, 2010), and will be summarized here.

The Landfill is located on a generally eastward sloping upland that is part of an interfluve bordered on the east by an unnamed, northward flowing tributary to the Trout River and on the northwest by a different unnamed, northward flowing drainageway that drains to the Trout River (HMSP Figure 1; AWQR Figure 2). In this part of Winneshiek County, thin Quaternary-age deposits overlie Ordovician-age bedrock.

In uplands, the thin Quaternary deposits include loess overlying either remnants of Pre-Illinoian-age glacial diamicton (“till”) that locally contains isolated lenses of fluvioglacial material or Quaternary-age colluvium. On side slopes, the loess overlies either Quaternary-age colluvium or, where the colluvium is absent, bedrock. In lowlands, the thin Quaternary-age deposits consist of fine-grained alluvium. In portions of the site area, such as east of original Cell 4, landfill construction activities have removed the Quaternary deposits, and fine-grained, construction-derived soil fill overlies Ordovician-age Maquoketa Formation bedrock. Fine-grained, construction-derived soil fill overlies loess east of original Cell 5.

The Quaternary-age deposits overlie a gently dipping Ordovician-age bedrock sequence that consists of the upper and lower Elgin Member of the Maquoketa Formation and the underlying Galena Formation. In parts of the eastern and northeastern portion of the site, the Maquoketa Formation is eroded away and absent. In that area, the Galena Formation is the uppermost bedrock unit.

Groundwater is monitored in two water-bearing zones: 1) the shallow groundwater measured by the water table, and 2) the deep groundwater measured in the Ordovician-age upper and lower Elgin Member of the Maquoketa Formation and, where the Maquoketa is absent, the Ordovician-age Galena Formation. Shallow wells are screened in different geologic units from the west side to east side of the Landfill because the water table occurs in successively different hydrostratigraphic units as one moves downslope and downgradient. Water table and deeper bedrock groundwater are interconnected on the east side of the Landfill and act as one water table monitoring zone. Groundwater on the east side discharges to Trout Creek and its tributaries.

2.1.1 Water Table

The water table occurs in successively different stratigraphic units, downslope toward the Trout River at the Landfill, including Quaternary-age loess, undifferentiated Pre-Illinoian glacial diamicton (“till”), colluvium, alluvium, and Ordovician-age Maquoketa Formation.

Water table elevations are measured in 30 water table wells at the Landfill. Figure 2 shows the water table elevations for March 2024 which is representative of site conditions. In the immediate Landfill area, water table groundwater generally flows from a groundwater divide in two directions: east to northeast and northwest from a groundwater high located near the southwest corner of the Landfill area toward the tributaries to the Trout River. Water table head is considered to mimic (reflect) the surface topography and surface water hydrology. On the east to northeast side of the landfill, the water table is in uppermost bedrock unit as it flows and discharges to the tributaries of the Trout River.

2.1.2 Piezometric Surface in the Uppermost Bedrock

The uppermost bedrock beneath the site is a gently dipping Ordovician-age bedrock sequence that consists of the upper and lower Elgin Member of the Maquoketa Formation and the underlying Galena Formation. The contact between the Maquoketa Formation and the underlying Galena Formation is an unconformity (an uneven erosional surface). The Maquoketa Formation is composed of significant thicknesses of shale and claystone and is a regional aquitard. The Galena Group, composed of limestone and dolomite, is part of a regional aquifer system. In parts of the eastern and northeastern portion of the site, the Maquoketa Formation is largely eroded away and absent. In that area, the Galena Formation is the uppermost bedrock unit.

Groundwater flow in the Maquoketa Formation aquitard is primarily downward, and groundwater flow in the Galena Group aquifer is primarily horizontal. As a result, springs are present near monitoring well MW-40B which discharge into the pond formed on the tributary of the Trout River. Regional groundwater flow in the Galena Group is primarily east toward Trout River, the regional groundwater discharge point.

Bedrock groundwater elevations are measured in 7 piezometer wells at the Landfill. Figure 3 shows the bedrock elevations for March 2024 which is representative for site conditions. In the immediate Landfill area, groundwater in bedrock generally flows from southwest to northeast of the Landfill area toward the tributaries to the Trout River. On the east side of the landfill, groundwater flow transitions from a confined aquitard to an unconfined aquitard, and discharges to the tributary of the Trout River.

2.1.3 Current Site Map

The Landfill location in Winneshiek County and site map showing the current monitoring system is shown on Figure 1.

2.1.4 Current Groundwater Contour Maps

As noted, groundwater is monitored in two water-bearing units: 1) the shallow groundwater measured by the water table, and 2) deep groundwater measured by the potentiometric surface of the Elgin Member of the Ordovician Maquoketa Formation and Galena Formation bedrock stratigraphic units.

2.1.4.1 Water Table Groundwater Flow

The water table at the site occurs within the Quaternary Deposits and weathered bedrock, depending on location. The Quaternary Deposits are composed of a sequence of Wisconsinan-aged glacial till and glaciofluvial outwash mantled by wind-blown loess. The water table mimics the surface topography.

The water table has been altered in areas nearby the downgradient portion of the facility due to landfill base grade design being keyed into the underlying aquitard and use of groundwater drainage layers for sections of C5 EXP. Groundwater moves on-site as throughflow from the elevated areas to the northwest, northeast, and east of the site.

A water table elevation contour map was prepared based on elevations measured during March 2024 (Figure 2). The map shows groundwater flow direction consistent with site history. Groundwater elevations vary seasonally from March to September. For example, monitoring well MW-37A groundwater elevation increased by 11.11 ft from March 2024 to August 2024. Overall, water table groundwater levels increased by an average of 1.48ft.

Horizontal water table groundwater gradients for the site are relatively uniform and flat, varying from 0.031 to 0.060 ft/ft, with a mean of 0.040 ft/ft. The average linear velocity for the water table varies from 118 ft/year to 232 ft/year with a mean of 154 ft/yr. based on gradient, geometric mean hydraulic conductivity of 2.629 ft/day (0.8 m/day) and assumed porosity of 0.25.

Monitoring well nests with water table and bedrock wells were used to estimate vertical groundwater gradients. Paired monitoring well nests are MW-1/MW-19R; MW-3/MW-18; MW-12A/MW-35; MW-26A/MW-36; MW-31A/MW-11; MW-29A/MW-30; and MW-7A/MW-22. Vertical hydraulic gradients vary from -0.07 upward to 1.44 ft/ft downward from the water table to bedrock.

2.1.4.2 Deep Groundwater Flow

Figure 3 presents the March 2024 potentiometric surface within the weathered and variably fractured carbonate Elgin Member of the Ordovician Maquoketa Formation and Galena Formation. The potentiometric surface is also consistent with previous years, showing the direction of groundwater movement in the northeast and east directions. Hydraulic gradients of the potentiometric surface vary from 0.027 to 0.028 ft/ft, with a mean of 0.0275 ft/ft. The average linear velocity for the bedrock is estimated to be 2.61 ft/yr. based on gradient, bedrock hydraulic conductivity of 0.026 ft/day (0.008 m/d) and assumed porosity of 0.10.

The potentiometric surface is generally flat and uniform across the site. The measured water levels depicted on Figure 3 indicate there is no apparent mounding of the potentiometric surface to suggest variable flow directions. Groundwater elevations in bedrock vary seasonally from March to August. Bedrock groundwater levels increased by an average of 0.21 ft from March 2024 to August 2024 with a range of 1.27 ft decrease to 1.72 ft increase.

2.2 Leachate Collection System

The leachate system (Figure 1) at the Winneshiek County Landfill (Winne) consists of four separate components:

1. <u>Toe Drain Leachate Collection Pipe Around Original Areas 1, 2 and 3 - Installed in Approximately 1992</u>. This toe drain system includes a gravity collection system, transfer pumping to leachate Lagoon Bay No. 2.
2. <u>Leachate Collection System - Constructed as Part of Original Cell 4</u>. This is a gravity collection system that flows to a leachate sump at the northeast corner of original Cell 4. Leachate is pumped from the sump to leachate Lagoon Bay No. 2.
3. <u>Leachate Collection System - Constructed as Part of Original Cell 5</u>. This is similar to the original Cell 4 system and flows to the northeast corner of original Cell 5. Leachate is pumped from the sump to leachate Lagoon Bay No. 2.
4. <u>Leachate Collection System – Constructed as Part of the 2016 Project</u>. There is a gravity collection system in the original Cell 5 Expansion Area that travels to Lagoon Bay No. 2. Also, there is a gravity toe drain that runs along the bottom of the abutment liner. The section across the north edge of original Cell 4 travels by gravity to the east to Lagoon Bay No. 2. The section across the west edge of original Cell 5 travels north and is deposited in the original Cell 5 Expansion Area Leachate Collection System.

Leachate piezometers LHPZ-1, LHPZ-2, LHPZ-3, LHPZ-4 and LHPZ-6 monitor leachate levels in original Areas 1, 2 and 3. Leachate levels have remained stable since 2014.

When conditions allow, leachate is pumped through a sprinkler system and recirculated over composite-lined areas of the Landfill – C5 EXP. This has proven to be successful in the past and reduces leachate accumulation in leachate Lagoon Bay No. 2. Leachate is dispersed from the sprinklers and is partially evaporated and/or used by the vegetation on the site (evapotranspiration) with a reduction in volume. Leachate piezometers LHPZ 4-1, 5-1, 5-2, 5E-1 and 5E-2 (Figure 1) have been installed to monitor leachate levels above the top of the liner; and to date, the recirculation does not appear to result in any consistent leachate build-up in the system. Approximately 2.80 MG of leachate was recirculated in 2022.

In August 2017, Winne installed an SMI 420F Evaporator in Lagoon Bay No. 2 (see Figure No. 1). The anchoring points are adjusted by the landfill staff depending on the wind conditions, and the evaporator is not operated when wind is greater than 15 MPH to control the mist from drifting outside the lagoon boundary. The evaporator is designed to evaporate 2,000 gallons per hour at 50ºF. The use of the Evaporator has had a significant effect on the leachate levels in the lagoon. In 2022, the evaporators were operated from May through November, for a total of 101 days and 849 total hours. Assuming the equipment evaporation rate is 2,000 gallons per hour, approximately 1.7 MG of leachate was evaporated in 2024. No leachate was hauled to the Decorah sanitary sewer since the Lagoons were approved for use by IDNR in 2016.

The leachate lines are cleaned every 3 years in accordance with Iowa Administrative Code (IAC) 113.7(5)"b"(5). Overall, the leachate system at the landfill appears to be functioning as designed.

2.3 Landfill Gas System

Landfill gas (LFG), produced during biodegradation of the waste, can migrate through soils. Methane and carbon dioxide are the primary constituents. Methane is explosive at concentrations between 5% (lower explosive limit) (LEL) and 15% (upper explosive limit) (UEL) in air and can collect in buildings or other structures.

At Winneshiek County Landfill, the LFG generated is passively vented through the final cover using a series of gas vents in original Areas 1, 2 and 3. The trenches are excavated into the waste 6 feet below the final cover. In the trenches, horizontal perforated PVC pipe surrounded by granular material or tire shreds create a path of least resistance for the LFG to collect. The final cover is placed over the trench to prevent precipitation from entering the waste mass. Vertical PVC pipes are connected to the horizontal pipes equipped with roof turbines, allowing the LFG to vent to the atmosphere.

Methane monitoring is conducted quarterly at Winneshiek County Landfill in accordance with the permit. The site perimeter and all site buildings are inspected to check for the presence of methane gas. The perimeter sample locations are sited on each side of the facility. Methane concentrations greater than 1.25% (25% of the LEL) in facility structures or greater than 5% at the facility boundary require immediate action, as discussed in IAC 113.26(15)c(1-3). Readings are field recorded and included in the annual Methane Monitoring Report.

2.3.1 LFG MONITORING RESULTS

During 2024, Winneshiek County Landfill was monitored for LFG in accordance with the permit. Methane monitoring was conducted using an RKI Eagle Portable Multi-Gas Meter which monitors for organic gases such as methane, oxygen deficiency, hydrogen sulfide and carbon monoxide. Methane gas was not recorded in any of the facility buildings or monitoring points.

2.4 Current Assessment Monitoring Activities

Currently, there are eight shallow monitoring wells (MW-7A, MW-24A, MW-29A, MW-31A, MW-40A, MW-42A, MW-43A, and MW-44A) and two bedrock (MW-11 and MW-35) monitoring well with ongoing and newly identified SSIs. Table 3 presents a summary of ongoing and newly identified SSIs and SSLs. The groundwater protection standards used in the comparisons were obtained from the IDNR website at:

https://programs.iowadnr.gov/riskcalc/Home/statewidestandards

Wells MW-29A, MW-31A, and MW-35 are new monitoring wells installed in 2019.

In addition, three wells and one surface water monitoring point have been installed as part of the ACM. Wells MW-42A, MW-43A and MW-44A were installed to monitor groundwater downgradient of well nest

MW-31A and MW-11, and groundwater downgradient of leachate lagoon well MW-29A. Surface water monitoring point, SW-5 was installed downstream of monitoring wells MW-29A and MW-43A.

2.5 Corrective Action Activities

As noted previously, a leachate collection plan was developed (BP-D, 1992) and a gravity interceptor leachate system was installed around Areas 1, 2 and 3 to intercept contaminants released from the Landfill (refer to Figure 1, West Toe Drain). In addition, a landfill gas trench was installed at the southern edge of Areas 2 and 3 (refer to 2022 AWQR Appendix E – Methane Monitoring Program Report).

Current activities include the development of ponds with control structures on the eastside of landfill. These ponds were built because of a storm event which discharged silt to the tributary of Trout River. These ponds will slow discharge and silt related to storm events which produce large overland flows to the creek.

In May 2022, IDNR comment letter noted the Spring 2022 Water quality sampling report Table 7 indicated that levels of cobalt exceeded the groundwater protection standard at monitoring wells MW-29A, MW-31A and MW-35. In accordance with 567 Iowa Administrative Code (IAC) 113.10(6)"g", the permit holder has certain schedule obligations that result in the preparation of an Assessment of Corrective Measures (ACM) report within 180 days of the initial finding (567 IAC 113.10(7)"a"). The Landfill responded by providing tasks and schedule for preparing an ACM.

3. Historical Groundwater Quality

The evaluation of historical groundwater quality for the report is based on data collected between November 2019 and December 2024 (Appendix B). The following section identifies the historical detections of cobalt the monitoring wells in pre-corrective action.

3.1 Historical Detected Cobalt Concentrations

Table 2 presents a list of historical detections of cobalt in the monitoring wells in pre-corrective action. Wells MW-12A, MW-27A, MW-29A, MW-31A, MW-35, MW-42A, and MW-43A have had confirmed cobalt concentrations in groundwater above the GWPS. Wells MW-12A and MW-27A have gone dry due to reduced recharge by landfill capping of Cell 4, leachate collection for Areas 1, 2, and 3, leachate collection of Cells 4 and 5EXP, and changes in climate since 2015. These wells have been replaced by new downgradient wells MW-38A (replaces MW-27A), MW-39A (replaces MW-12A) and MW-40A (replaces MW-26A).

3.1.1 Water Quality Monitoring

Water quality at the Landfill is monitored by a system of active groundwater detection monitoring wells, a groundwater sump (GU-01) that receives water from original Cell 5, a groundwater sump (GU-02) that receives water from the original Cell 5 Expansion Area, and four surface water staff gauges. Leachate is monitored in two manholes (MH-1 and MH-4-2) and two leachate lagoon bays (Bay #1 and Bay #2). Locations of hydrologic monitoring points are shown on Figure 1.

3.2 Groundwater Characteristics of Cobalt

Potential sources for cobalt are the landfill, agricultural and weathering of soil and bedrock.

For agricultural, recent research has found heavy metals in glyphosate-based herbicides and other pesticides (Defarge et al., 2017). Heavy metals include arsenic, cobalt, chromium, nickel, and lead. Cobalt in glyphosate-based herbicides ranges from 50 – 150 µg/L. USDA (2018) noted for Iowa corn and soybeans that herbicide active ingredients were applied to 95% of corn acres planted. Of that, approximately 20% of planted acres in Iowa used glyphosate as herbicide. Herbicide active ingredients were applied to 100 percent of the soybean acres planted. Glyphosate potassium salt was the most widely used pesticide on soybean acres and glyphosate potassium salt was the active ingredient with the greatest total amount applied. Of that, approximately 33% of planted acres in Iowa used glyphosate potassium salt. The landfill is bordered by agriculture on three sides, west, south, and east. Typically, the farmland adjacent to the landfill is rotated between corn and soybeans.

Soil deposits at the landfill consist of glacial till, loess, and colluvium. Bedrock consists of shale and limestone. The presence of heavy metals can be naturally occurring, either due to the presence of suspended sediment in groundwater samples or dissolution of metals from surrounding soil (sediments) and bedrock into groundwater. Smith, et al. (2014) produced geochemical and mineralogical maps for soils in conterminous United States. Heavy metal samples obtained from planted/cultivated land from the soil A horizon near the site, measured concentrations of arsenic (6.5 – 6.6 mg/Kg), barium (669 – 672 mg/Kg), chromium (48 – 50 mg/Kg), cobalt (10.1 – 12.5 mg/Kg), lead (18.2 – 21.9 mg/Kg), nickel (20.2 – 21.1 mg/Kg), and zinc (72 – 87 mg/Kg). Heavy metal samples obtained from planted/cultivated land from the soil C horizon near the site, measured concentrations of arsenic (7.1 – 9.5 mg/Kg), barium (654 – 676 mg/Kg), chromium (37 – 46 mg/Kg), cobalt (12.5 – 14.7 mg/Kg), lead (16.7 – 18.6 mg/Kg). nickel (26.5 – 33.4 mg/Kg) and zinc (65 – 81 mg/Kg).

Site soil and rock samples could be geochemically analyzed by synthetic precipitation leaching procedure (SPLP EPA SW-846 Method 1312). SPLP was designed to simulate material sitting in-situ (in or on top of the ground surface) exposed to rainfall to "determine the mobility of both organic and inorganic analytes present in liquids, soils, and wastes" from leachate the material would produce. SPLP is an appropriate method to assess chemical mobility in the environment, and generally, is a better analysis to evaluate native soil and bedrock for its potential to leach metals into groundwater (Melia 2021).

There have been several significant rainfall-runoff events at the landfill between 2016 – 2022. One occurred in Fall 2016 which inundated two monitoring wells, MW-8A and MW-23 and caused runoff along drainageway by leachate lagoons, and culvert adjacent to MW-25A. This event produced elevated metals in groundwater between MW-8A, MW-23 and MW-29A. The concentrations of cobalt at MW-29A are remnants of that event. Given the low groundwater flow rates in the sediments and bedrock, it will take time for the concentrations to decrease. Another significant time of rainfall-runoff occurred in 2019. Rainfall-runoff has flooded the area adjacent to monitoring well MWII-3 which has elevated nickel concentrations in groundwater. Nickel concentrations measured in MWII-3 increased after the 2019 events. MWII-3 was an older well, installed 30 years ago, and with a failed annular seal. This well was abandoned and replaced by MW-46A in November 2023. Finally, leakage was observed from manholes MH-1AA and MH-4-2 in August 2022. The original Cell 4 leachate discharge pipe was partially plugged at the outlet due to debris lodged in the rodent guard at Lagoon Bay No. 2. The rodent guard was removed, and the discharge was cleared and cleaned later in Fall 2022. These changes in groundwater are related to rainfall-runoff, leakage from manholes, and not attributed to a leak from the landfill liner.

3.3 Assessment of Corrective Measures

In May 2022, an IDNR comment letter noted levels of cobalt exceeded the groundwater protection standard at monitoring wells MW-29A, MW-31A and MW-35. In accordance with 567 Iowa Administrative Code (IAC) 113.10(6)"g", *the permit holder has certain schedule obligations that result in the preparation of an Assessment of Corrective Measures report within 180 days of the initial finding (567 IAC 113.10(7)"a"*).

Water table monitoring wells MW-29A, MW-31A, MW-33A, and MWII-3, and bedrock monitoring wells MW-11 and MW-35 are in assessment monitoring. Groundwater concentrations for total cobalt were briefly reviewed. Groundwater concentrations downgradient of Cell 4 have been nondetect or low cobalt below cobalt GPS for three new wells MW-38A, MW-39A, MW-40A which were installed in September 2021.

3.3.1 ACM Monitoring

As part of the ACM, characterizing nature and extent was completed by installing additional downgradient monitoring wells and one surface water sampling location. One additional monitoring well MW-42A was installed downgradient of MW-31A and MW-11 and two additional water table wells, MW-43A and MW-44A, were installed downgradient of MW-29A. An additional surface water sampling location, SW-5, was installed downstream of SW-1 and downgradient of MW-29A.

The new monitoring wells were installed east of the landfill fence adjacent to Cell 4, C5 EXP and leachate lagoon in a flat lying area west of tributary creek of Trout River. All three wells were installed as water table wells and were sampled in August 2022, December 2022, June 2023, November 2023, June 2024, and December 2024. The wells were installed in saturated fine-grained sediments consisting of loess and weathered Maquoketa and Galena Formation bedrock. At completion, the wells had sufficient groundwater within the screened interval. Surface water locations, SW-2 and SW-5 were sampled in June and December 2024. Surface water location SW-1 was sampled in June 2024 with no sample in December 2024 due to stream went dry.

Detailed information on borings, well installation, well development and aquifer testing is provided in an updated HMSP. **Refer to the current Hydrologic Monitoring System Plan (HMSP) (IDNR September 2024 (refer to IDNR Doc No. 110947).**

3.3.2 Field Observations

Field observations consisted of measurement of groundwater and surface water levels, sampling groundwater, measurement of leachate levels in perimeter drain manholes on the west and north side, and sampling leachate from selected manholes.

3.3.2.1 Groundwater Sampling

Groundwater was sampled for Appendix I parameters from permit monitoring wells as defined by HMSP (2024). In addition, all monitoring wells which had sufficient groundwater were sampled for cations and anions, general chemistry (nitrates, ammonia, COD, TOC, TSS, total alkalinity, bicarbonate alkalinity, BOD, TDS), and field measured redox parameters (pH, specific conductance, oxidation reduction potential (ORP) and dissolved oxygen (RDO)).

3.3.2.2 Perimeter Drain Survey

Perimeter drain manholes MH-1AA, MH-2, MH-3, MH-5, MH-6, MH-7, MH-8, and MH-9 on north and east side of Areas 1, 2, and 3, and MH-4-2 on east side of Cell 4 were opened to observe flow and measure liquid levels. Two manholes, MH-1AA and MH-4-2 were observed to be seeping liquid through the manhole joints to the ground surface. These two manholes were sampled for Appendix I as part of the ACM. All other manholes were either dry or had low liquid levels which could not be sampled.

3.3.2.3 Surface Water Flow

Surface water flow from the landfill Cell 4 and C5 EXP flows through culverts. On the north side of C5 EXP surface water flows from the north side of landfill to a culvert and then north towards monitoring well MWII-3 and drainage to Trout River. On the east side of the site by monitoring well MW-25A, there is a culvert and drainage ditch by westside of leachate lagoon which directs surface water to east towards a tributary of Trout River.

3.3.2.4 Gas Monitoring Groundwater Wells

3.3.3 A landfill gas monitoring survey was conducted during the spring 2024 groundwater sampling events. Selected groundwater monitoring wells were sampled for presence of landfill gas. A hand-held gas meter was used to measure methane(CH_4), oxygen(O_2), hydrogen sulfide(H_2S), carbon monoxide(CO), and volatile organic carbon(VOC).Sample Results

A summary of sample results for groundwater, leachate manholes and leachate lagoon related ACM constituent cobalt are presented in Table 2. The ACM was started because of cobalt in groundwater exceeding the GWPS of 2.1 µg/L. Other parameters which have SSIs but not above a GPS are arsenic, barium, cadmium, nickel, and zinc (Table 3).

For additional perspective pertaining to affected wells, historical sampling results for monitoring wells MW-8A and MW-23 are presented in Appendix B. The reason why these results are included is an extreme rain and runoff event occurred in Fall 2016. Before (April 2016), after (November 2016) and three years after (November 2019) the event are presented. The result for arsenic, cobalt, nickel, and zinc significantly increased due to wells MW-8A, and MW-23 being overtopped by runoff which caused discharge inside of monitoring well casing. Before the event, arsenic, cobalt, nickel, and zinc results were primarily estimated (J) or nondetect. Over a three-year period, these parameters generally decreased. Monitoring wells MW-29A and MW-43A results appear to reflect this storm water runoff event.

Monitoring results downgradient of manhole MH-4-2 appear to be related to blockage of leachate discharge pipe to leachate lagoon which caused seepage from manhole joints to ground surface.

Another series of significant rain and runoff events occurred in 2019. May 2019 had 10.45-in total rainfall; June 2019 had 9.70-in; July 2019 had 5.70-in; and September 2019 had 7.45-in. Nickel concentrations in MWII-3 have increased since 2019. The area around well MWII-3 is generally wet, and receives stormwater runoff via a culvert on the north-side of C5 EXP. Well MWII-3 is an older monitoring well installed in 1993 which may have a failed annular space seal. Well MW-46A was installed adjacent to well MWII-3 and MWII-3 was abandoned in November 2023.

Surface water samples in March 2022 were very high for arsenic, cobalt, nickel, and zinc. These high results are related to winter meltwater runoff.

3.3.4 Iso-concentration Maps

Iso-concentration maps were created for cobalt. Figures 4 through 8 present iso-concentration contours for detection monitoring wells and manholes MH-1AA and MH-4-2.

Cobalt groundwater and manhole sample results were mapped and are presented in Figures 4, 5,6. 7 and 8. Cobalt concentrations above the site-wide GWPS of 3.4 µg/L occurred at MW-29A and MW-31A. The cobalt concentrations attenuate at the tributary of Trout River downgradient of MW-29A. These concentrations are considered remnants of the Fall 2016 rainfall-runoff event. Cobalt concentrations at MW-31A may be related to leakage from manhole MH-4-2 due to blockage of leachate pipe downstream of the manhole. The cobalt result for MW-31A is also an order of magnitude higher than Spring 2022. This result has not been confirmed. The cobalt result for manhole MH-4-2 was 2.17 µg/L as compared to MW-31A. This concentration is significantly less than measured in groundwater. Cobalt in groundwater downgradient of MW-31A attenuates to below site-wide GWPS of 3.4µg/L as it moves towards the tributary of Trout River downgradient of MW-31A.

3.3.5 Cations/Anions

All groundwater monitoring wells which had sufficient groundwater were sampled for major cations and anions. In addition, manholes MH-1AA and MH-4-2, and surface water sample locations, SW-1, SW-2, and SW-5 were sampled for major cations and anions.

Stiff plots are presented in Figures 9 and 10 (embedded in this report). Stiff plots are a type of graphical presentation of chemical analyses. Stiff plots are useful in making quick visual comparisons between samples of water from different sources. The ions are plotted as a polygon. The larger the area of the polygon, the greater the concentrations of the various ions. Ions plotted are calcium, sodium plus potassium, magnesium, manganese, chloride, bicarbonate, and sulfate.

The stiff plot for 2022 (Figure 9) shows a relationship between manhole MH-4-2 and downgradient monitoring wells MW-31A, MW-42A and MW-43A. The polygonal shape and area show a decrease in ion concentrations as groundwater flows from MW-31A downgradient to MW-43A. This affirms that concentrations are attenuating as groundwater moves towards and discharges to the tributary of the Trout River.

The stiff plot for 2023 (Figure 10) shows the change in groundwater chemistry between manhole MH-4-2 and downgradient monitoring wells MW-31A, MW-42A and MW-43A because of removing the blockage and rodent guard from the leachate line which stopped the leak from manhole MH-4-2. The polygonal shape and area show a decrease in ion concentrations as groundwater flows from MW-31A downgradient to MW-43A. This confirms that concentrations are attenuating as groundwater moves towards and discharges to the tributary of the Trout River.

Trilinear (Piper) plots are presented in Figures 11 and 12 (embedded in this report). Trilinear diagrams consist of two triangular diagrams which describe the relative compositions of cations and anions, and a diamond-shaped diagram which combines the compositions of cations and anions. The major ionic species in most natural waters are Na^{+}, K^{+}, Ca^{+2}, Mg^{+2}, Cl^{-}, CO_3^{-2}, HCO_3^{-} and SO_4^{-2}.

In terms of cations, most of the groundwater monitoring wells are calcium type. The exceptions are well MW-31A and manhole MH-4-2 are sodium or potassium type. In terms of anions, most of the groundwater monitoring wells and manholes are bicarbonate type. The exception is monitoring well MW-11 which is sulfate type. The trilinear plot for 2022 (Figure 11) shows a relationship between manhole MH-4-2 and downgradient monitoring well MW-31A, with these two sample points plotting close to each other. The other downgradient locations MW-42A, MW-43A and MW-44A plot farther away indicating the source of groundwater is different. The trilinear plot for 2023 (Figure 12) shows a relationship between manhole MH-4-2 and downgradient monitoring well MW-31A, with these two sample points separated from each other. This demonstrates the effectiveness of removing the blockage from the leachate line which stopped the leak from manhole MH-4-2. Based on comparison of MH-4-2 and monitoring wells MW-31A, MW-11, and MW-42A, this remedy has removed the leachate impacts on MW-31A and MW-42A. There is no vertical impact on MW-11. This confirms that concentrations are attenuating as groundwater moves towards and discharges to the tributary of the Trout River.

Figure 9
2022 Cations-Anions Stiff Plot
Winneshiek County Solid Waste Agency
Decorah, IA

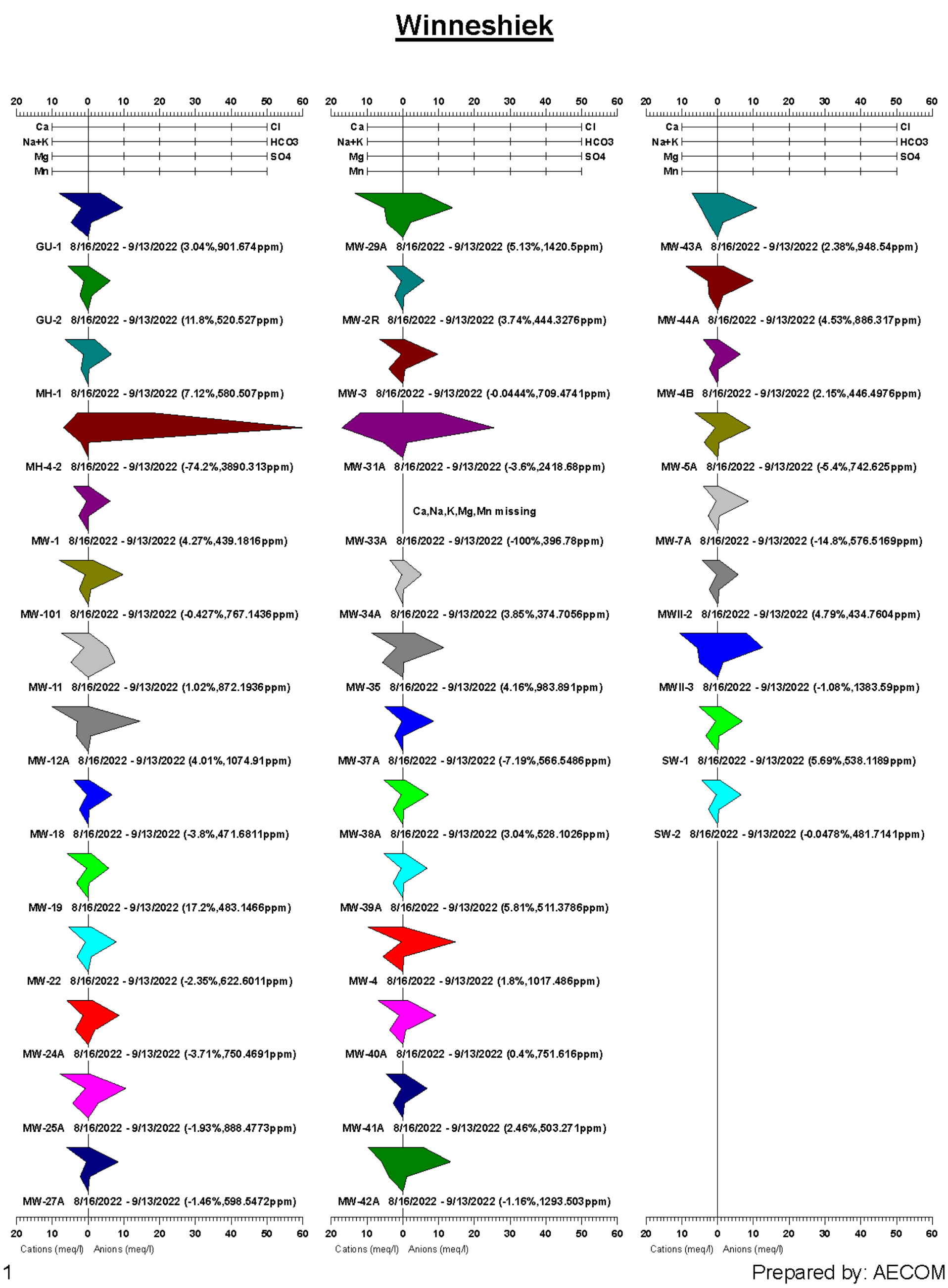
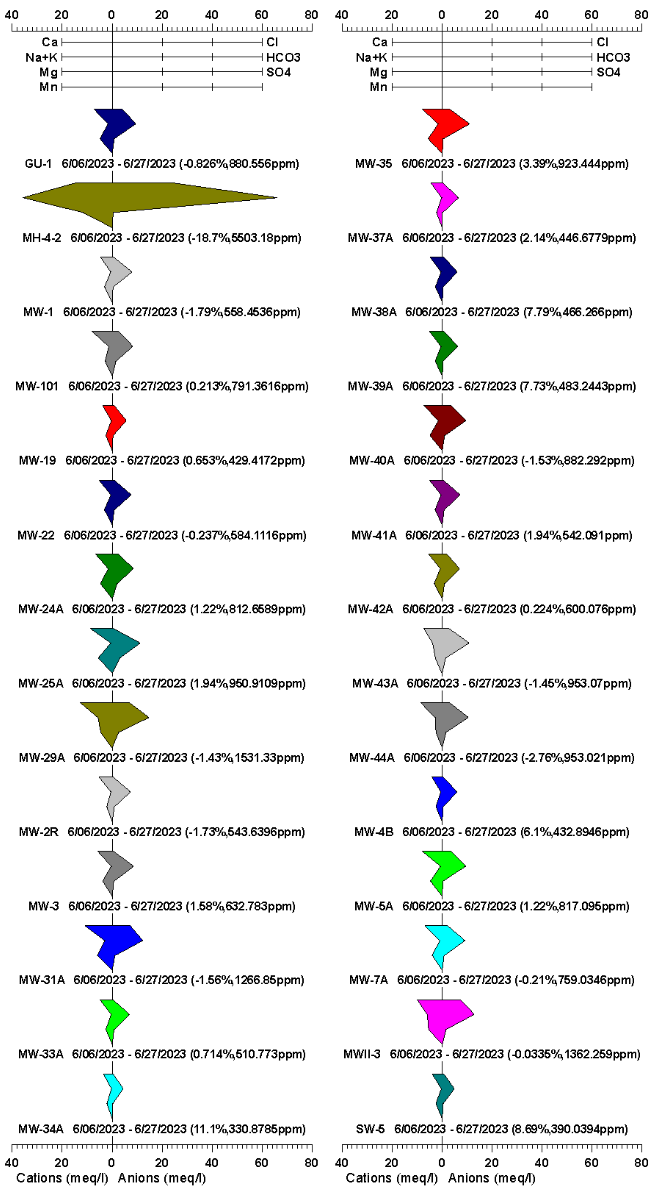


Figure 10
2023 Cations-Anions Stiff Plot
Winneshiek County Solid Waste Agency
Decorah, IA

Winneshiek



1 Prepared by: AECOM

Figure 11
2022 Cations-Anions Trilinear Plot
Winneshiek County Solid Waste Agency
Decorah, IA

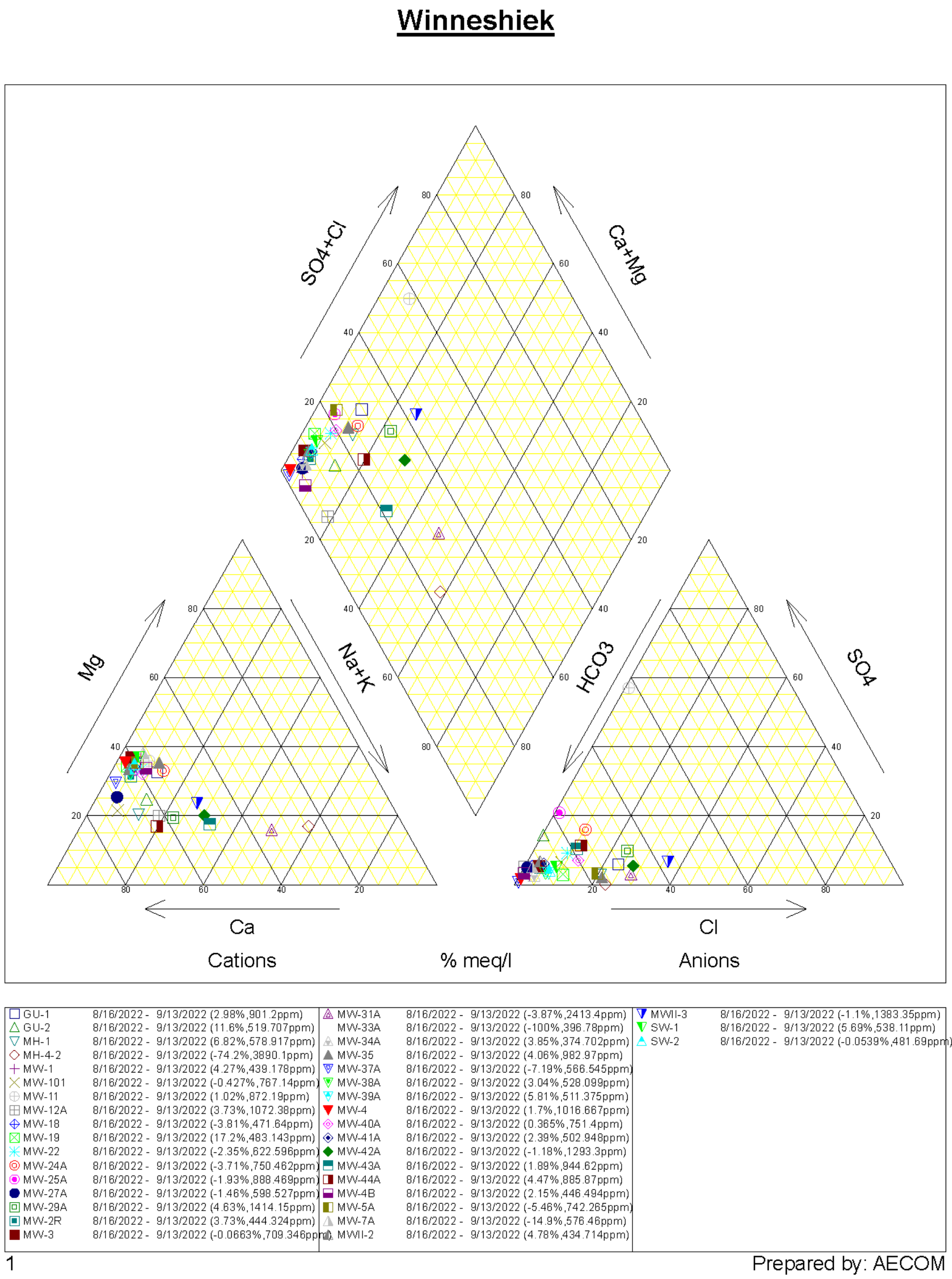
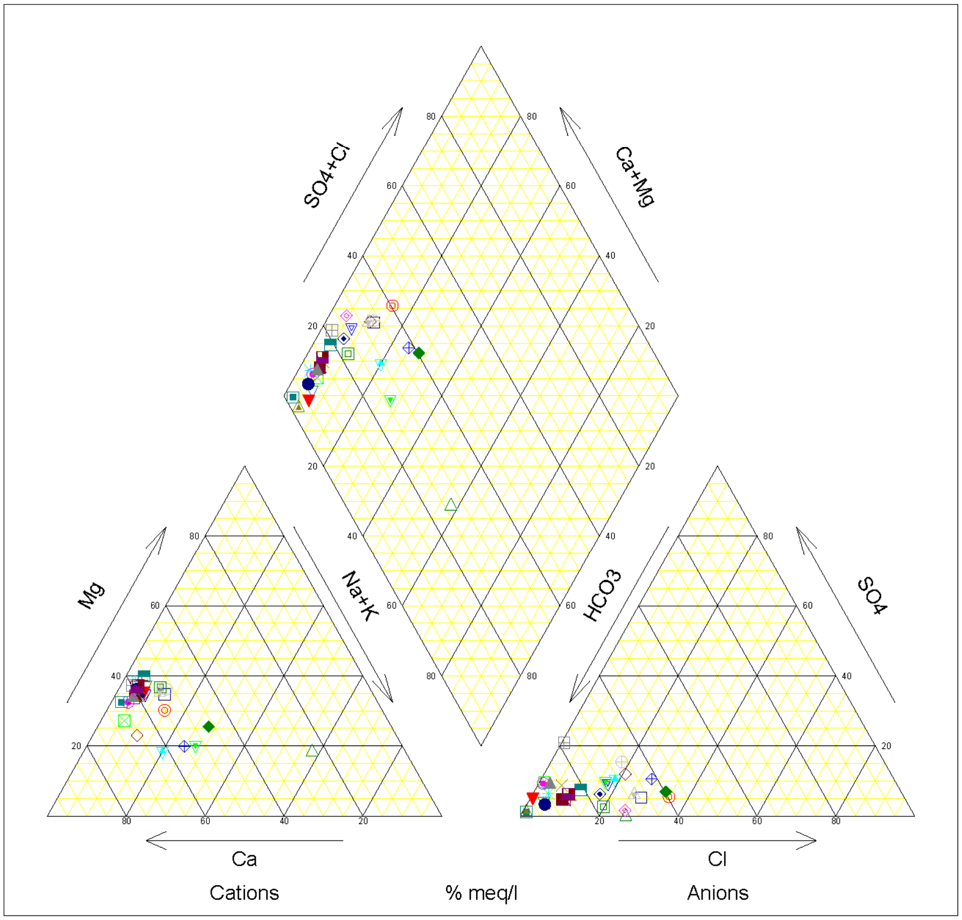


Figure 12
2023 Cations-Anions Trilinear Plot
Winneshiek County Solid Waste Agency
Decorah, IA

Winneshiek



GU-1	6/06/2023 - 6/27/2023 (-0.872%,880.21ppm)	MW-38A	6/06/2023 - 6/27/2023 (7.79%,466.259ppm)
MH-4-2	6/06/2023 - 6/27/2023 (-18.8%,5501.9ppm)	MW-39A	6/06/2023 - 6/27/2023 (7.73%,483.227ppm)
MW-1	6/06/2023 - 6/27/2023 (-1.79%,558.45ppm)	MW-4	6/06/2023 - 6/27/2023 (-29.8%,868.076ppm)
MW-101	6/06/2023 - 6/27/2023 (0.208%,791.33ppm)	MW-40A	6/06/2023 - 6/27/2023 (-1.6%,881.79ppm)
MW-19	6/06/2023 - 6/27/2023 (0.629%,429.33ppm)	MW-41A	6/06/2023 - 6/27/2023 (1.87%,541.768ppm)
MW-22	6/06/2023 - 6/27/2023 (-0.238%,584.108ppm)	MW-42A	6/06/2023 - 6/27/2023 (0.215%,600.03ppm)
MW-24A	6/06/2023 - 6/27/2023 (1.22%,812.648ppm)	MW-43A	6/06/2023 - 6/27/2023 (-1.94%,949.29ppm)
MW-25A	6/06/2023 - 6/27/2023 (1.94%,950.904ppm)	MW-44A	6/06/2023 - 6/27/2023 (-2.81%,952.645ppm)
MW-29A	6/06/2023 - 6/27/2023 (-1.84%,1526.12ppm)	MW-4B	6/06/2023 - 6/27/2023 (6.1%,432.891ppm)
MW-2R	6/06/2023 - 6/27/2023 (-1.73%,543.636ppm)	MW-5A	6/06/2023 - 6/27/2023 (1.2%,816.934ppm)
MW-3	6/06/2023 - 6/27/2023 (1.56%,632.677ppm)	MW-7A	6/06/2023 - 6/27/2023 (-0.215%,758.9971ppm)
MW-31A	6/06/2023 - 6/27/2023 (-1.68%,1265.57ppm)	MWII-3	6/06/2023 - 6/27/2023 (-0.0581%,1361.972ppm)
MW-33A	6/06/2023 - 6/27/2023 (0.636%,510.445ppm)	SW-1	6/06/2023 - 6/27/2023 (10.4%,451.63ppm)
MW-34A	6/06/2023 - 6/27/2023 (11.1%,330.874ppm)	SW-2	6/06/2023 - 6/27/2023 (6.6%,406.07ppm)
MW-35	6/06/2023 - 6/27/2023 (3.28%,922.6ppm)	SW-5	6/06/2023 - 6/27/2023 (8.68%,390.001ppm)
MW-37A	6/06/2023 - 6/27/2023 (2.14%,446.666ppm)		

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Prepared by: AECOM

3.3.6 Groundwater Trends for Cobalt

Cobalt time series plots for monitoring well groups are presented. Figure 13 represents cobalt concentrations in groundwater and surface water downgradient of monitoring well MW-29A. Figure 14 represents cobalt concentrations in groundwater downgradient of Cell 4 manhole MH-4-2. Figure 15 represents cobalt concentrations in groundwater downgradient of monitoring well MW-35.

Figure 13 shows that cobalt concentrations in groundwater decrease and attenuate to below the GWPS (2.1 µg/L) from MW-29A downgradient to MW-43A and to discharge point SW-5. Cobalt concentrations measured at SW-5 are nondetect. Figure 14 shows that cobalt concentrations in groundwater decrease and attenuate as groundwater moves from MW-31A downgradient to MW-42A to discharge point SW-5. In addition, Figure 14 shows vertical attenuation in groundwater between MW-31A and MW-11. Figure 15 shows that the that cobalt concentrations in groundwater decrease and attenuate as groundwater flows from MW-35 downgradient to MW-38A, MW-39A, and MW-40A and to discharge point SW-5.

Figure 13
Cobalt Time Series Plot – Downgradient of MW-29A
Winneshiek County Solid Waste Agency
Decorah, IA

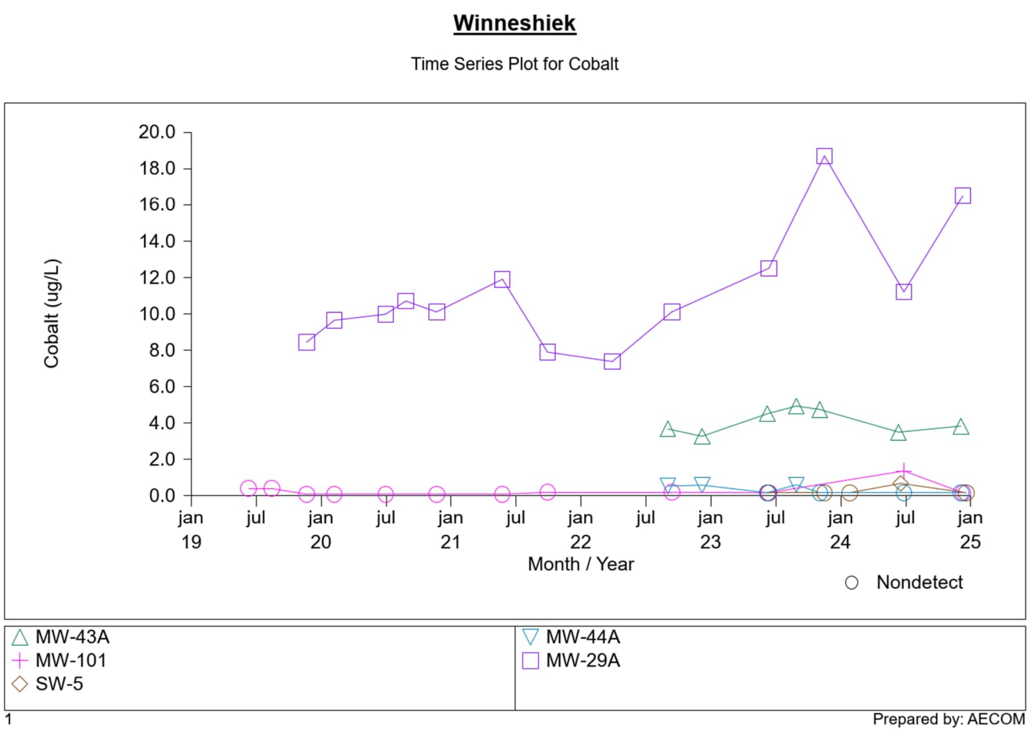


Figure 14
Cobalt Time Series Plot – Downgradient of MH-4-2
Winneshiek County Solid Waste Agency
Decorah, IA

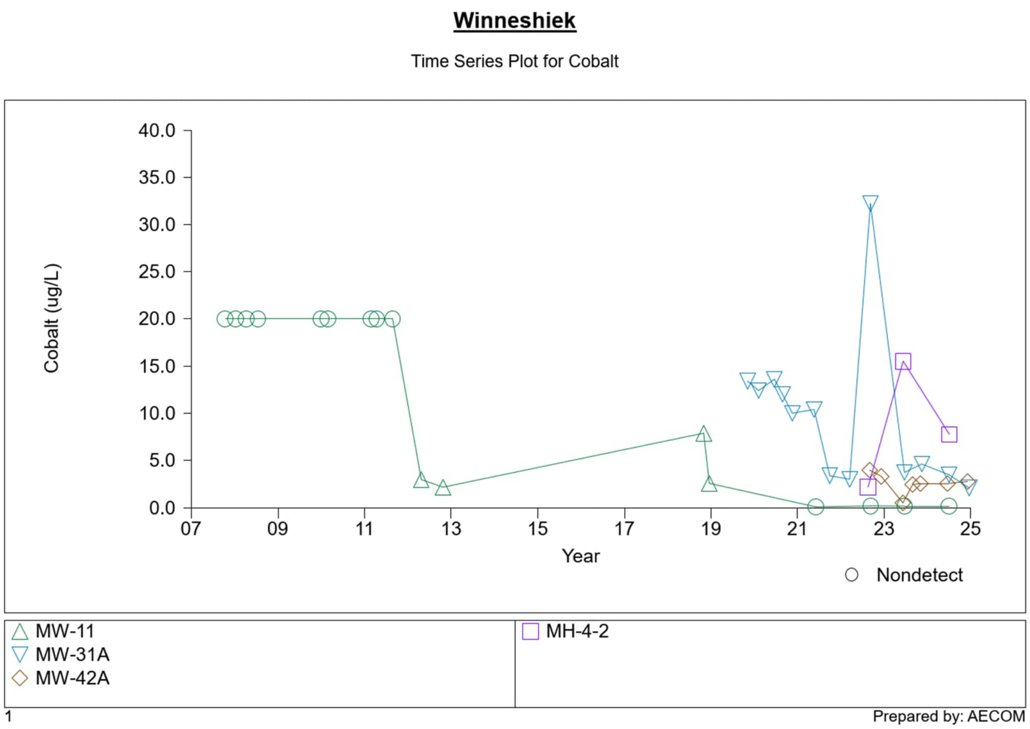
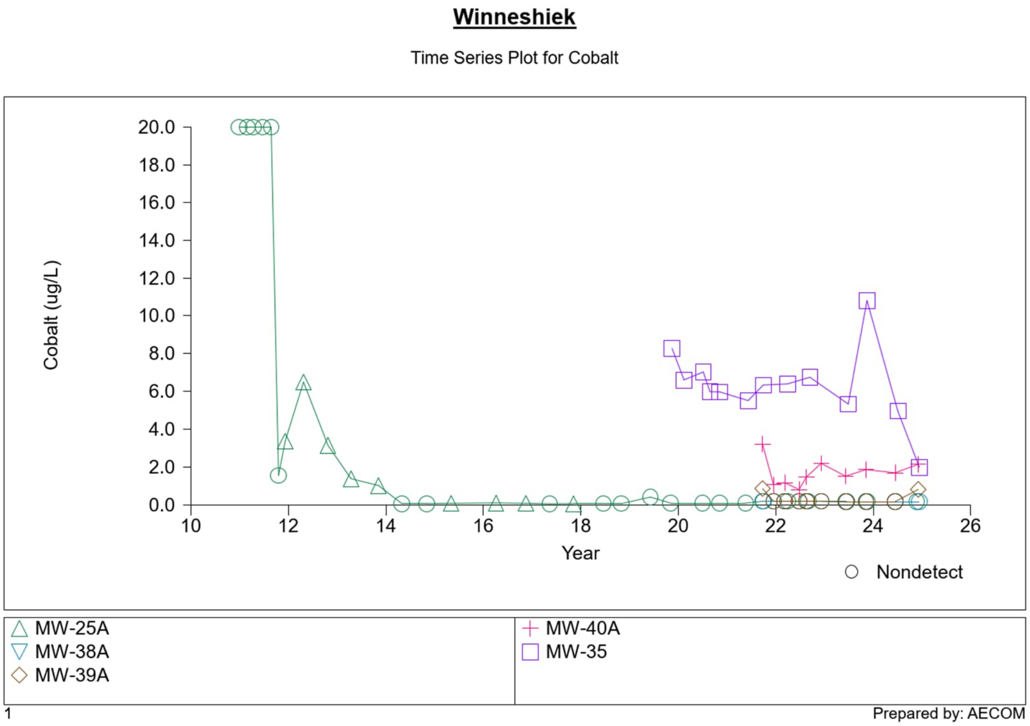


Figure 15
Cobalt Time Series Plot – Downgradient of MW-35
Winneshiek County Solid Waste Agency
Decorah, IA



3.3.7 Redox Calculations

Redox variables dissolved oxygen, nitrate, manganese, iron, sulfate, and sulfide are presented in Table 4. Redox assignment was completed using USGS (2009) redox processes in groundwater. In terms of general redox categories, 15 wells identify as oxic, 7 wells identify as anoxic, and 13 wells identify as mixed (oxic-anoxic). In terms of redox processes, the results for the monitoring wells fall into the following groups: O2, Fe(III)/SO4, O2-Fe(III)/SO4, NO3-Fe(III)/SO4, O2-Mn(IV), and Mn(IV).

3.4 Leachate and Gas Migration

Landfill gas and leachate migration are the primary sources for groundwater contamination downgradient of a closed, lined landfill Cell No. 4. The Landfill has a landfill gas and leachate control and collection systems installed and operational. As noted, a perimeter drain was installed around Cells 1, 2, and 3 in 1993. A landfill gas venting system was installed on the south end of landfill Cells 2 and 3. Cell 4 and Cell 5EXP have leachate collection systems. Source area leachate samples were collected in August 2022 from the landfill perimeter drain (Cells 1, 2, and 3) manhole MH-1AA and August 2022 and June 2023 and 2024 Cell No. 4 collection system's manhole MW-4-2. Samples were analyzed for cobalt concentrations.

The cobalt concentration for the leachate collection system manhole MH-1AA was 3.39 µg/L in July 2024. This manhole was dry in December 2024. The cobalt concentrations for leachate manhole MH-4-2 were 2.17 µg/L (< GWPS 2.1 µg/L) in 2022,15.5 µg/L in 2023, and 7.77 µg/L in 2024. This manhole was dry in November 2023 and December 2024.

In addition to the leachate collection system, the landfill Cells 1, 2, 3 and 4 have landfill cover which has reduced the leachate production within the Winneshiek County Landfill through limiting infiltration of precipitation.

3.4.1 Landfill Gas Survey

Monitoring wells MW-1, MW-7A, MW-11, MW-12A, MW-24A, MW-25A, MW-26A, MW-27A, MW-29A, MW-30, MW-31A, MW-35, MW-36, MW-39A, MW-38A, MW-40A, MW-42A, MW-100, and MW-101 were sampled for presence of VOCs, CH_4(%), H_2S (ppm), O_2(%), and CO (ppm) in air. Field sample results are presented in Table 5.

In general, there was one well, MW-7A which had detected VOCs. Several monitoring wells detected hydrogen sulfide (H_2S). This indicates reducing conditions occur downgradient of Landfill Cell 4. These reducing conditions may be mobilizing cobalt in soil and bedrock and be the cause of increased cobalt in groundwater.

4. Risk for Off-Site Impact

The groundwater present beneath the Landfill does not meet the IAC Chapter 137 definition of a protected groundwater source, which is defined as a saturated bed, formation, or group of formations which has a hydraulic conductivity of at least 0.44 meters per day (m/d) and a total dissolved solids concentration of less than 2,500 mg/L. Monitoring well data for hydraulic conductivity has a geometric mean of 0.091 m/d and mean TDS concentration of 725 mg/L. The unit is not currently or likely in the future to be used as a potable water source. There are no current or anticipated future users of the shallow groundwater at or adjacent to the property. Existing private and public potable water sources are screened in the deeper bedrock aquifers. The following sections discuss the relative risk or likelihood for off-site impact by groundwater containing constituents at concentrations above their respective GWPS.

4.1 Off-site Impact

The potential for off-site impact from the migration of cobalt released due to the Landfill's presence is unlikely since it is restricted by several factors. The presence of the shale aquitard reduces the potential of cobalt released by Landfill leachate and landfill gas to reach the bedrock aquifer which is generally used for human consumption and use. The most likely offsite impact will be groundwater discharge to tributary of Trout River. Due to the small reach between the limits of waste of the Winneshiek County Landfill and the tributary of Trout River, reducing conditions may develop in the shallow aquifer and may not be abated prior to the groundwater discharging to the river. Thus, soluble cobalt in groundwater may be discharged into the surface water. Based on of groundwater and surface water results, there have been no increases in surface water concentrations or cobalt concentrations above the site-specific GWPS because of groundwater discharge to tributary of Trout River.

No confirmed statistically significant increases were noted at detection monitoring points not currently in assessment monitoring at the Landfill in 2024. All monitoring wells currently in the detection monitoring program will remain as detection monitoring points. Detections of Appendix I constituents at wells (MW-29A, MW-31A, and MW-35) currently in the assessment monitoring program were above site-wide standards for a protected groundwater source for Cobalt (GWPS 3.4 µg/L). Cobalt concentrations varied from spring to fall.

Regarding Cobalt, the World Health Organization (2006) provided references noting surface water and groundwater concentrations of Cobalt have a natural range between 1 – 10 µg/L. Natural sources include erosion (wind-blown continental dusts such as loess), weathering of rocks and soil, seawater spray, volcanoes, forest fires, extraction by plants, and continental and marine biogenic emissions. The major anthropogenic sources of environmental Cobalt include mining and processing (smelting) of Cobalt-bearing ores, the use of Cobalt-containing sludge or phosphate fertilizers on soil, the disposal of Cobalt containing waste, and atmospheric deposition from activities such as the burning of fossil fuels and smelting and refining of metals (Smith & Carson, 1981). The Winneshiek County Landfill area was farmed in the past, and the area surrounding the landfill is currently farmed; hence, the most likely source for Cobalt is phosphate fertilizers and herbicides. Another possible source may be due to deposition of wind-blown silts in the form of loess during the last glaciation which occurred in the Winneshiek County area. As such, Cobalt levels at this location below 10 µg/L are considered naturally occurring due to leaching from soil and bedrock, and application of fertilizers, pesticides, and herbicides upgradient of landfill, which are also below the Non-Protected Groundwater Source statewide standard.

Most surface water detections of metals in 2024, were at very low levels, mainly nondetect or estimated (J-flagged). There were no detections of organics in 2024. Downstream constituents detected at SW-2 are not significantly greater than upstream location SW-1. Surface water monitoring will continue in detection monitoring for 2025.

5. Assessment of Risk

5.1 Media of Concern

Possible corrective measures technologies are selected based on their ability to treat or control those media that may present unacceptable risks to human health or the environment. The media considered during this study are groundwater and surface water.

Concentrations of cobalt in groundwater and surface water may pose a potential human health risk if they reach public water supply wells/sources. This could potentially happen if impacted groundwater of a sufficient volume is discharged to nearby streams or migrates off-site to residential water wells. There are no identified active drinking water wells on-site or within ½ mile downgradient of the impacted areas, screened in the water table aquifer. Due to impacted groundwater potentially discharging to Trout River, surface water is considered a media of concern since downstream users may be impacted.

5.2 Exposure Pathways

Exposure pathways must be identified to select appropriate potential corrective measure technologies. Exposure pathways describe how a chemical can move from its source to a receptor. Components include source, release, transport, migration, and fate of the chemical.

The cobalt concentrations detected in the groundwater at the site have been summarized in the previous sections of this report. The source of cobalt impact in groundwater may originate from leachate and groundwater interactions beneath the unlined Landfill Cell 4; natural occurrence of cobalt in sediments and bedrock; or agricultural sources such as fertilizer, pesticides and herbicides used to grow corn and soybeans. Release mechanisms for contaminants at the site likely consist of the following:

- Mobilization of naturally occurring cobalt into on-site and near-site groundwater through the presence of geochemically reducing conditions near the Landfill area (i.e., landfill cap preventing infiltration of electron acceptor constituents).
- Mobilization of impacted groundwater into near-site surface water.
- Leachate discharging into the groundwater and providing an organic carbon source which aids in increasing the reducing conditions.

The primary transport mechanism for cobalt is movement with groundwater. Oxidizing conditions or the addition of electron acceptors to impacted groundwater would sequester (precipitating) cobalt in site soils.

However, due to the relatively short reach between the limits of waste of the Landfill and the surface water in tributary of Trout River, the extent of the reducing conditions in the shallow aquifer appear to attenuate between the landfill and the river.

Cobalt impacted groundwater is potentially discharging into the tributary of Trout River, but surface water samples collected upgradient and downgradient of the Landfill in tributary of Trout River indicate low concentrations of cobalt below the cobalt GWPS. This is attributed to the following possibilities: 1) The volume of highly concentrated cobalt impacted groundwater is extremely small when mixing with the surface water volume which has a low concentration of cobalt; and 2) the surface water has more dissolved oxygen or electron acceptor constituents which promote oxidizing conditions and cause cobalt to precipitate out of solution.

Possible exposure pathways would include dermal exposure and ingestion through contact of water with elevated cobalt. Based on currently available monitoring data, cobalt appears to be naturally attenuated at the Facility's boundary once mixed with the surface water of tributary of Trout River. Continued monitoring is conducted to evaluate the extent of human health concerns by measuring concentrations of cobalt and evaluating for increasing trends.

5.3 Potential Receptors

A receptor survey was performed as part of the nature and extent study for the site. This assessment did not identify any drinking water wells installed in the shallow aquifer within ½ mile downgradient of the site. There are no domestic wells located on the site. The results of the risk assessment indicated no human receptors were identified. On-site shallow aquifer groundwater and surface water are not used as a drinking water source, and site access is restricted.

The tributary of Trout River appears to be the only potential receptor for impacted groundwater. Concentrations in surface water samples collected from tributary of Trout River are below the GWPS and are also below human health criteria concentrations for cobalt (0.0.0021 mg/L) noted in Iowa Cumulative Risk Calculator, Water Quality Standards, for a Protected Groundwater Source (https://programs.iowadnr.gov/riskcalc/Home/statewidestandards).

5.4 Assessment Summary

The results of previous field investigations indicated the vertical and horizontal extent of groundwater impacts have been characterized. The potential environmental risk posed by the presence of cobalt in the groundwater impacts at the Landfill is low. The rationale for this assessment is as follows:

• Relatively low concentrations of cobalt have been detected in the groundwater under the Facility and immediately downgradient of the landfill units of the site (refer to Figures 4 through 8).

• The tributary of the Trout River is a discharge point for groundwater from the Facility, and cobalt concentrations in surface water samples are below the GWPS and surface water human health criteria.

• No private drinking water wells or public water supply wells have been identified (downgradient of the impacted areas in the same hydraulic flow regime) within ½ mile of the site.

• No surface water or drinking water intakes have been identified near the site.

• No other apparent human health issues or environmental receptors have been identified, which could be affected by this impact.

6. Discussion of Remedial Technologies

This section of the report presents corrective measure technologies which have been identified and subjected to preliminary screening for feasibility. The goals of the screening process are to identify technologies that may be relevant to achieving corrective measures objectives and to eliminate from further consideration those measures which are unsuitable based on-site characteristics, waste characteristics, technology, or regulatory limitations. Potential corrective measures that are eliminated will not be considered further.

6.1 Institutional Controls

Institutional controls are those actions that will control land use access to the site and access to potentially impacted groundwater. Institutional controls will not affect site remediation but will control deleterious effects by reducing the potential for public exposure. Institutional controls include monitoring groundwater and surface water quality, deed restrictions, and site access control.

Monitoring groundwater and surface water quality is the primary means of estimating the risks associated with potential groundwater and surface water impacts. Although monitoring will not accomplish remediation of site impacts, it will provide a means of evaluating the effectiveness of remedial actions. It will also keep the owners, regulators, planners, and public informed of the location and concentrations of site-related chemicals. Winneshiek County Landfill is currently conducting groundwater sampling and analysis at the site in accordance with IAC 567—113.10, and the additional IDNR requirements specified in the solid waste disposal permit number 96-SDP-1-74P, subsequent permit amendments, and the HMSP.

Access control restricts access to the site by humans. This is an important means of preventing human contact with impacted media. Access control is currently accomplished with locked gates at road entrances. Property access is further restricted by fencing. Access control will continue.

These institutional controls have already been implemented at the site.

6.2 Source Control Measures

Landfill gas, leachate migration, and the landfill cover system are the primary sources contributing to the release of soluble cobalt from naturally deposited sources. Although the landfill cover contributes to reducing conditions in the groundwater, it also significantly reduces the amount of leachate generation by limiting infiltration. Cobalt contamination downgradient of the clay lined Winneshiek County Landfill Cell 4 unit may be a result of organic constituents being released via the leachate and landfill gas into the groundwater and reducing conditions developing in the shallow aquifer system since electron acceptor constituents are not readily replenished. Source control measures have been previously implemented at Winneshiek County Landfill include a landfill gas, leachate control and collection system and landfill capping as noted in Section 3.4. The implemented source control measure is intended to reduce or eliminate landfill gas and leachate migration into groundwater.

6.2.1 Performance of Remedy

The performance of the leachate extraction system and landfill capping has been documented through long term groundwater monitoring. Groundwater monitoring at HMSP monitoring wells have been statistically analyzed for decreasing trends in cobalt concentrations. The ability to achieve cleanup standards at the point of compliance have been demonstrated through long term monitoring. The reliability of the leachate collection system and landfill capping is site-specific but has been effective at other facilities. The source control measures would be closely linked with monitored natural attenuation (MNA) to monitor the performance and reliability. The inclusion of source control measures (i.e., leachate collection and landfill capping) to MNA would increase the reliability to achieve remedial goals and decrease the time to complete the remedy.

6.2.2 Implementation Criteria

No adjustments to the leachate collection system, landfill gas removal, and landfill capping are required.

6.2.3 Cost of Remedy

The leachate collection system, landfill gas removal, and landfill capping are currently implemented. There is no additional cost.

6.3 Monitored Natural Attenuation (MNA)

MNA is a form of treatment that relies on natural physical, chemical, and biological processes to reduce contaminant concentrations. MNA includes natural subsurface processes such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials that reduce chemical concentrations to acceptable levels. For the cobalt concentrations at the site, the primary mechanism of MNA is anticipated to be associated with geochemical changes (more oxidized conditions) binding and sequestering these naturally occurring compounds. Monitored natural attenuation is not the same as "no action". As the name implies, monitored natural attenuation requires monitoring of the groundwater (and potentially surface water) during remedy implementation.

Monitoring of groundwater quality is the primary means of estimating the risks associated with groundwater impacts. Although monitoring will not accomplish any remediation of site impacts, it will provide a means of evaluating the effectiveness of other remedial actions. It will also keep the owners, regulators, planners, and public informed of the location and concentrations of site related chemicals. The Facility is conducting groundwater sampling and analysis in accordance with an approved HMSP. Groundwater monitoring will continue.

The current HMSP groundwater monitoring network has been upgraded with additional groundwater monitoring wells and surface water monitoring being utilized to provide additional coverage and evaluate groundwater cobalt concentrations near the Facility's property boundary. If concentrations are detected at the Facility's compliance boundary at statistically significant concentrations when compared to upstream concentrations and do not indicate a decreasing trend as a result of implemented remedial action, then further evaluation of remedial actions would be considered.

This technology does not require extraction of impacted groundwater or separate discharge of treated groundwater. In addition, groundwater remediation via natural attenuation can be less costly than other remedial technologies. This technology is retained for further consideration.

6.3.1 Performance of Potential Remedy

The performance of MNA can be documented through long term monitoring. Cobalt concentrations measured in the most recent eight (8) samples for monitoring wells MW-29A, MW-31A and MW-35 indicate no significant increases in concentration. The geochemical processes driving mobilization and sequestration of cobalt is well documented. Detailed scientific studies conducted by and for the EPA on natural attenuation of metals have resulted in an understanding of the geochemical parameters which indicate that favorable conditions are present at a facility for natural attenuation of redox sensitive metals to occur. The ability to achieve cleanup standards at the point of compliance can be demonstrated through long term monitoring.

Implementation of MNA does not require intrusive construction which minimizes any potential safety impacts to site personnel and is compatible with on-site environmental conditions. Since intrusive construction activity is not required, residual generation of media of concern is restricted to those associated with sampling. All impacts are restricted to proximity to the Winneshiek County Landfill and are restricted to on-site property. Implementation of MNA is protective of human health and the environment and compatible with on-site environmental conditions.

The reliability of MNA is site-specific. Reliability as a remedial alternative has generally been higher at sites where the occurrence of natural attenuation has been documented, as is the case at sites where metals concentrations have been documented as decreasing. Coupled with source control measures, the long-term reliability of MNA to achieve remedial goals is expected to be good.

Evaluating the time to complete the remedy is difficult but is possible. Cobalt is a naturally occurring metal in the sediment with its mobility depending on the groundwater geochemical conditions, namely the groundwater redox conditions. Completion of the MNA remedy can be achieved by limiting the source into the groundwater such as leachate from the Landfill. Natural attenuation is intended to reduce the contaminant concentrations migrating from the Landfill to an acceptable level not harmful to human health or environment. MNA can be implemented immediately upon approval by the IDNR. MNA would continue for a number of years until groundwater concentrations decrease to less than the GWPS.

6.3.2 Implementation Criteria

The actual activities involved in natural attenuation monitoring are comparable to that of compliance and/or assessment monitoring, which is already required by the solid waste regulations. The Landfill is currently subject to the Iowa Solid Waste Management Regulations, which govern the Facility's permit. The MNA remedy will comply with these regulations. Implementation of MNA at the site is rated high for operational reliability, has no construction difficulties, and requires no permits from other agencies. Implementation can begin immediately upon approval. No additional environmental or public health requirements are anticipated for monitored natural attenuation.

The MNA alternative (which includes monitoring) is a commonly implemented remedial approach that is accepted by local communities. This remedial approach will not require excavating, moving and/or management of contaminated media; therefore, implementation of the remedy will not cause an exposure safety concern.

6.3.3 Cost of Remedy

The cost to implement MNA at the site is considered very low. The only costs associated with implementation of this alternative are associated with long-term groundwater monitoring. Startup costs are limited and would consist of a MNA sampling and analysis plan. Operational costs are limited to the additional wells sampling, analysis, and reporting. Significant cost savings are recognized with this alternative since long-term groundwater monitoring is permit-required and will occur regardless of remedy selection.

6.4 Groundwater Containment Technologies

Groundwater containment technologies involve using low permeability barriers to restrict impacted groundwater flow to achieve compliance with GWPS. Containment may be coupled with pump and treat systems or source control measures to provide additional control over groundwater flow and prevent contaminant migration. Barriers which surround the contaminant area are typically more effective than those that only partially surround the area of concern. These technologies are particularly useful when current technologies are unable to remediate source areas. Containment technology is not considered feasible.

6.5 Groundwater Extraction Technologies

Three primary methods exist to extract impacted groundwater: vertical extraction wells, horizontal extraction wells, and interception trenches. These technologies remove impacted groundwater from the aquifer and are often paired with treatment technology (physical, chemical, or biological) to reduce toxicity, mobility and/or volume of contaminants of the extracted water prior to discharge.

- Vertical extraction wells are typically 4- to 6-inch diameter wells installed for the purposes of hydraulic containment and mass removal.
- Horizontal extraction wells are typically more effective than vertical wells for hydraulic containment and mass removal.

- Interception trenches placed below the water table are used to intercept contaminants migrating laterally in shallow aquifer systems. This method consists of a gravel filled trench with a perforated pipe used to collect and transmit water for treatment/disposal.

Because of the depth to water table and shallow bedrock depth in the downgradient area, an interception trench (or toe-drain) is not considered feasible for these site conditions. Also, because of the hydraulic properties of the downgradient sediments and bedrock, groundwater extraction is not considered feasible for these site conditions.

7. Monitored Natural Attenuation Estimated Costs

MNA is proposed to be implemented at the site are described in Section 6.3. There are no additional costs for implementing MNA.

8. Regulatory and Implementation Schedule

Pending approval of this Assessment of Corrective Measures report, the potential schedule for meeting IAC 567 Chapter 113 regulation requirements for remedy selection and implementation of the remedy is summarized on the following table.

Event/Deliverable	Regulatory Requirement	Regulatory Required Time Period	Tentative Completion/Implementation Date	Comments
ACM Report Submittal to IDNR	113.10(7)"a" and IDNR AWQR dated March 31, 2022	Modified	March 31, 2025	Completion data per IDNR comment letter dated May 3, 2023
IDNR approval of ACM	N/A	N/A	March 31, 2025	Contingent upon IDNR's review and comment(s) regarding the ACM
Public Meeting	113.10(7)"d"	Within 60 days of IDNR approval of ACM	May 30, 2025	Contingent upon approval of ACM by IDNR
Select Remedy	113.10(8)"a"	Within 60 days of holding the public meeting	July 30, 2025	Contingent upon when public meeting is conducted
Remedial Selection Report submittal to IDNR	113.10(8)"a"	Within 14 days of selecting a remedy	August 13, 2025	Contingent upon when remedy is selected
Initiation of excavation /construction of source control remedy	N/A	N/A	N/A	N/A
Completion and startup of source control remedy	N/A	N/A	N/A	N/A

Corrective action monitoring	113.10(9)	Variable	2029	Contingent upon Appendix II constituents do not exceed GWPS for 3 consecutive years per statistical procedures and performance standards

9. Summary and Conclusions

The most recent sampling events (June and November 2024) show cobalt concentrations in groundwater from four of the HMSP monitoring wells (MW-29A, MW-31A, MW-35, and MW-43A) at the landfill with detections above the site-wide GWPS (3.4 µg/L) for a protected groundwater source. All the remaining HMSP monitoring wells (21) had cobalt concentrations below the GWPS. Surface water samples collected from the tributary of the Trout River at upstream (SW-1) and downstream (SW-2 and SW-5) relative to the landfill had cobalt concentrations below the GWPS. These sample points indicate that the cobalt concentrations in groundwater are attenuated prior to discharge into the surface water.

The assessment did not identify any drinking water wells installed in the same water table aquitard within 1-mile of the site. There are no domestic wells located on the site. The results indicate no human receptors. On-site water table groundwater and surface water are not used as a drinking water source, and site access is restricted. Based on current monitoring data, cobalt in groundwater is naturally attenuated at the landfill boundary once discharged and mixed with surface water from the tributary of the Trout River.

As a result of the review of performance, implementation, and costs of listed remedies, it is recommended the remedy consist of MNA and source control measures to address the site groundwater issues. MNA will consist of following the current HMSP groundwater monitoring program for the site. Groundwater concentrations and trends will be monitored over time. Source control measures are already being implemented. The leachate collection system will continue to be monitored for obstructions and leaks. Landfill capping is reducing infiltration from precipitation and as a result less leachate is being generated.

9.1 Sampling

- Continue to monitor groundwater, leachate, and leachate lagoons for next 3 – 5 years. More time and samples are required to monitor attenuation in concentrations over time. Groundwater concentrations and trends will be monitored over time.
- Continue annual sampling of cations/anions and redox parameters.
- Cobalt has been added to sample parameters collected and analyzed from the leachate lagoon bays.

9.2 Manholes

- Manholes MH-1AA and MH-4-2 have been repaired for leaks and leachate drains have been cleared of obstructions.
- Continue to monitor leachate collection system for obstructions.
- Continue to monitor leachate collection system for leaks.
- Appendix I sampling has been added to semi-annual for MH-1AA and MH-4-2.

9.3 Monitoring

- A new water table well, MW-45A has been installed north of landfill road as a replacement of MW-5AR.
- Well MWII-3 has been abandoned and replaced with new well MW-46A.
- Manholes MH-1AA and MH-4-2 have been added to semi-annual monitoring.
- Monitoring wells MW-43A and MW-44A and surface water monitoring point SW-5 have been added to semi-annual monitoring.
- Surface water ditches have been rerouted outside the typical 50-FT exclusion zone around groundwater monitoring wells.

9.4 Site-Specific Standards

Review site-specific risk standards for arsenic, barium, cobalt, nickel, and zinc.

10. References

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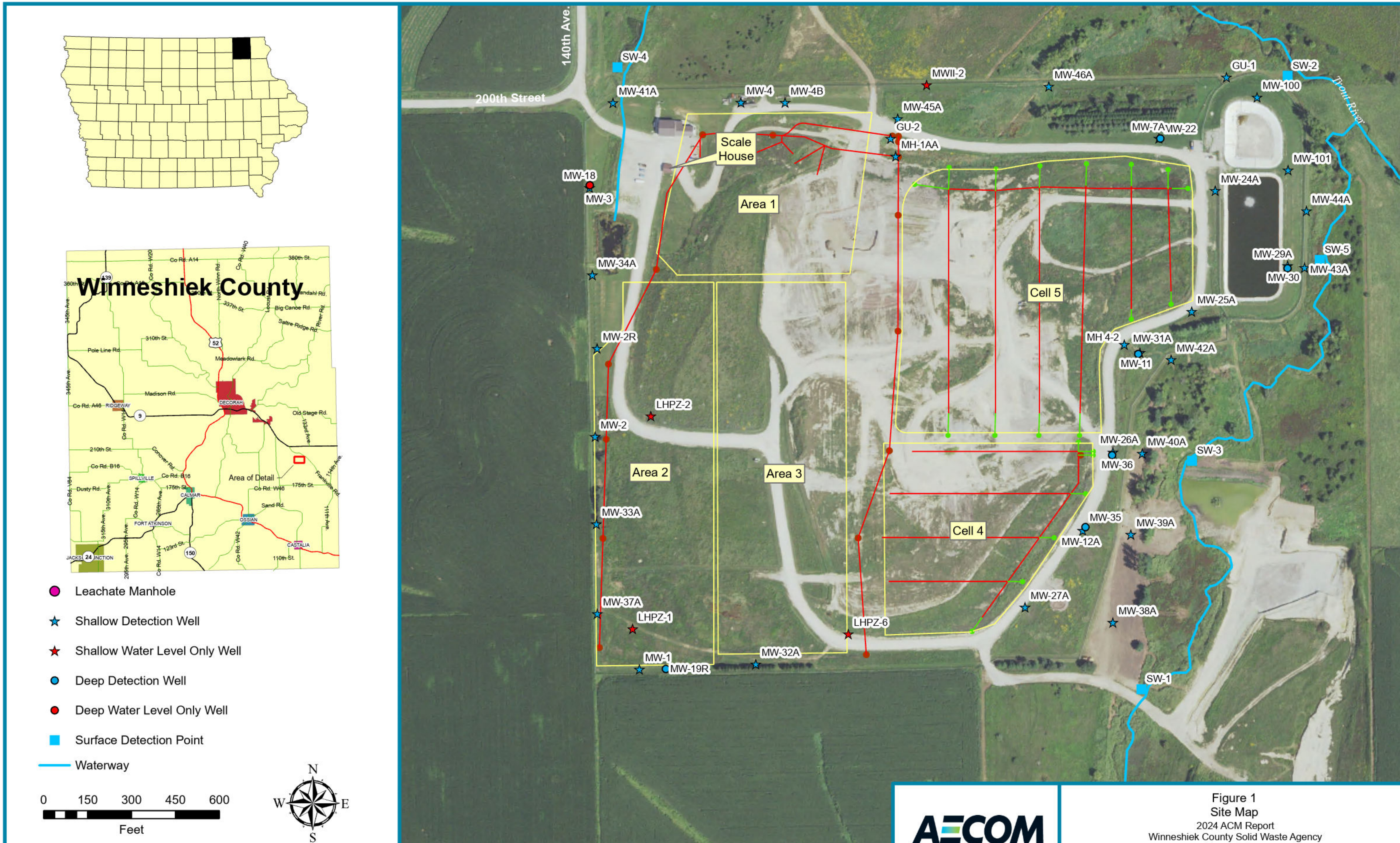
Figures



Aerial Photography Source: USDA National Agriculture Imagery Program, 2021

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AECOM

Figure 1
Site Map
2024 ACM Report
Winneshiek County Solid Waste Agency
Decorah, Iowa

March 2025

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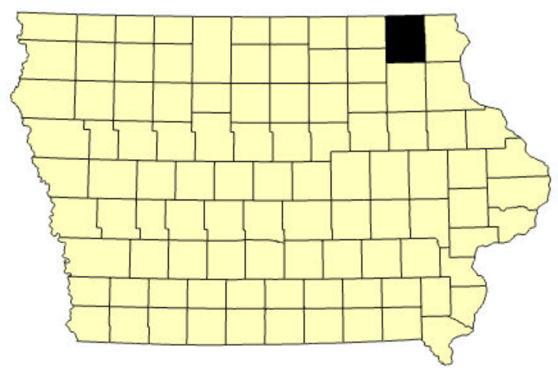

Water Table Contour

Flow Line

Waterway

MW-1 919.08 Monitoring Point with Water Elevation AMSL

0 150 300 450 600

Feet

N W E S

Based on March 2024 water elevations.
NM = Not Measured

Aerial Photography Source: USDA National Agriculture Imagery Program, 2021

AECOM

Figure 2
Shallow Water Table Contour Map

2024 ACM Report
Winneshiek County Solid Waste Agency
Decorah, Iowa

March 2025

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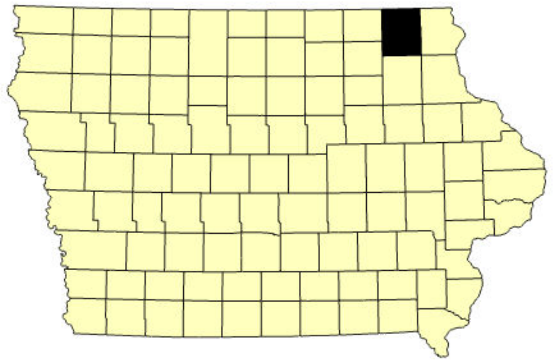


Potentiometric Contour

Flow Line

Waterway

MW-1 919.08 Monitoring Point with Water Elevation AMSL

0 150 300 450 600

Feet

N E S W

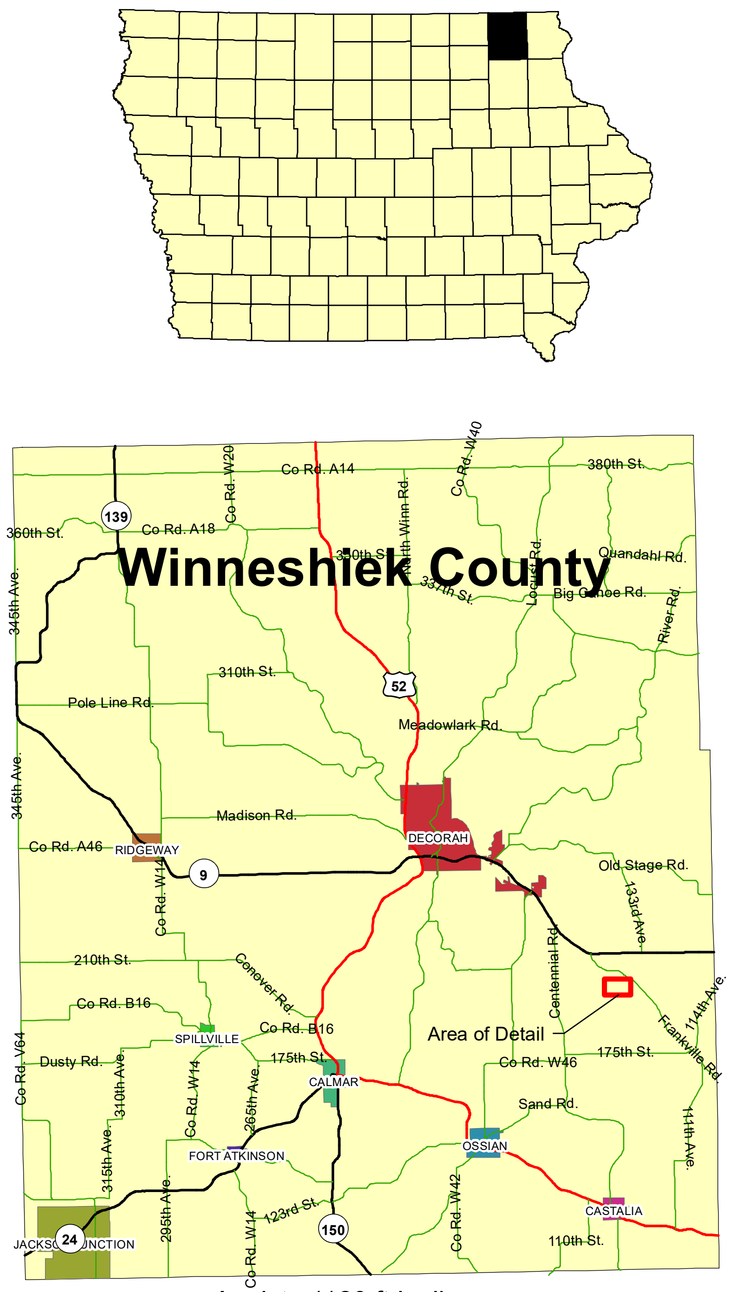
NM = Not measured
Based on March 2024 water elevations.

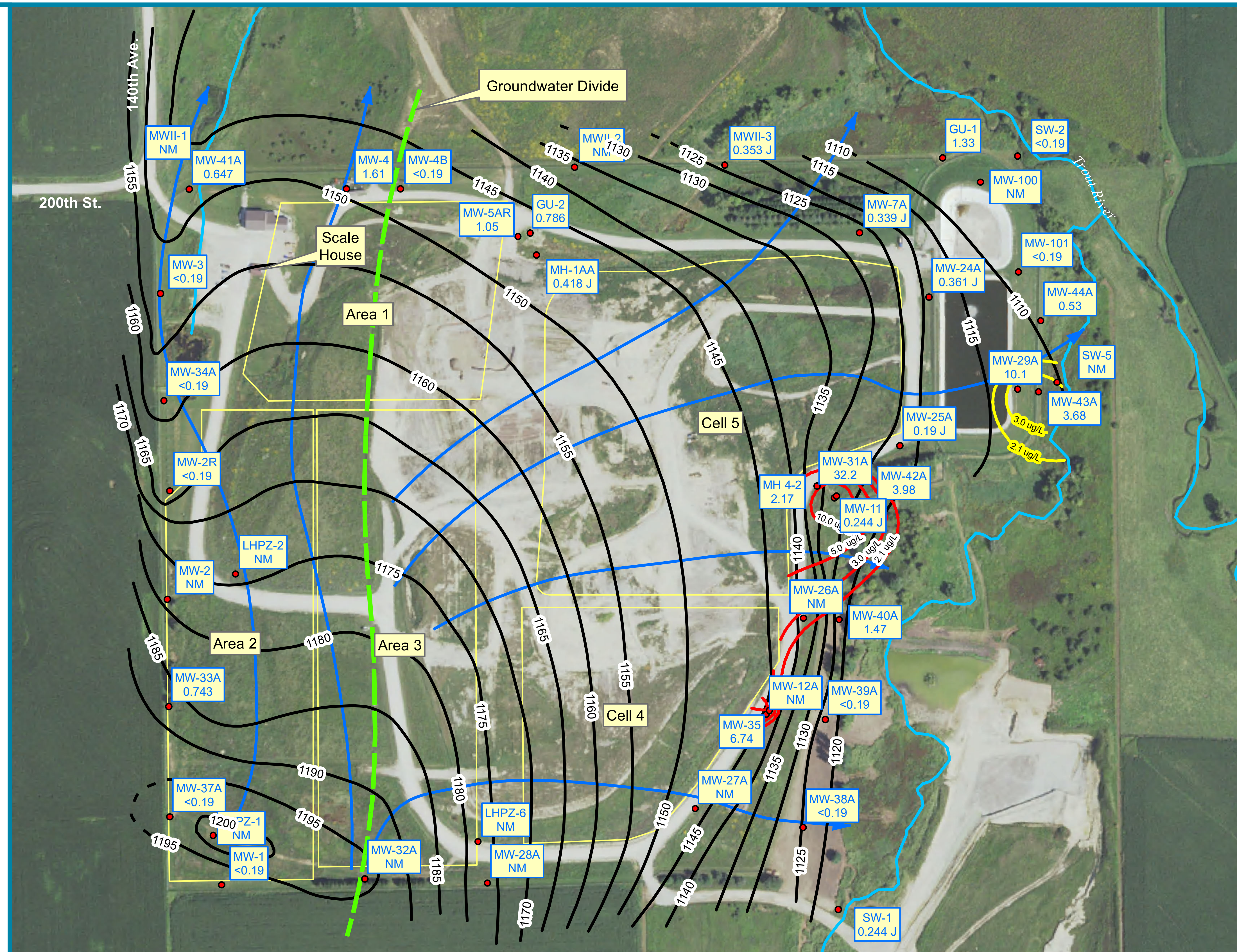
Aerial Photography Source: USDA National Agriculture Imagery Program, 2021

AECOM

Figure 3
Deep Well Water Elevations
2024 ACM Report
Winneshiek County Solid Waste Agency
Decorah, Iowa

March 2025 60711359





Analyte 1120 ft Isoline

Analyte 1105 ft Isoline

Water Table Contour

Flow Line

Waterway

MW-1 919.08 Monitoring Point with Analyte Value, ug/L

N W E S

0 150 300 450 600

Feet

Water table contours based on May 2023 water elevations.
NM = Not Measured

Aerial Photography Source: USDA National Agriculture Imagery Program, 2021

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AECOM

Figure 4
September 2022 Cobalt Iso-concentration Contour Map

2024 ACM Report
Winneshiek County Solid Waste Agency
Decorah, Iowa

March 2025

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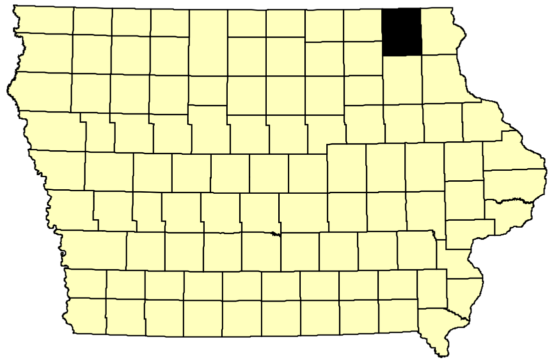

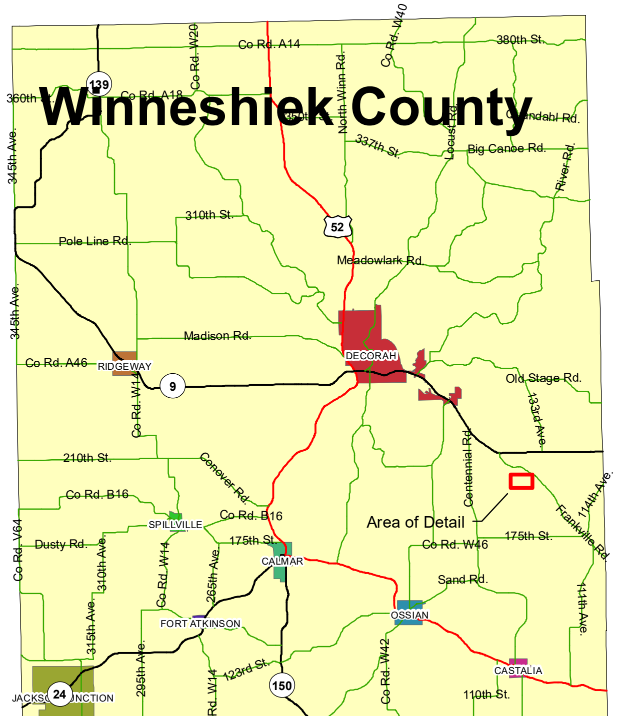

Analyte 1120 ft Isoline

Analyte 1105 ft Isoline

Water Table Contour

Flow Line

Waterway

MW-1 919.08 — Monitoring Point with Analyte Value, ug/L

0 150 300 450 600

Feet

Water table contours based on May 2023 water elevations.
NM = Not Measured

Aerial Photography Source: USDA National Agriculture Imagery Program, 2021

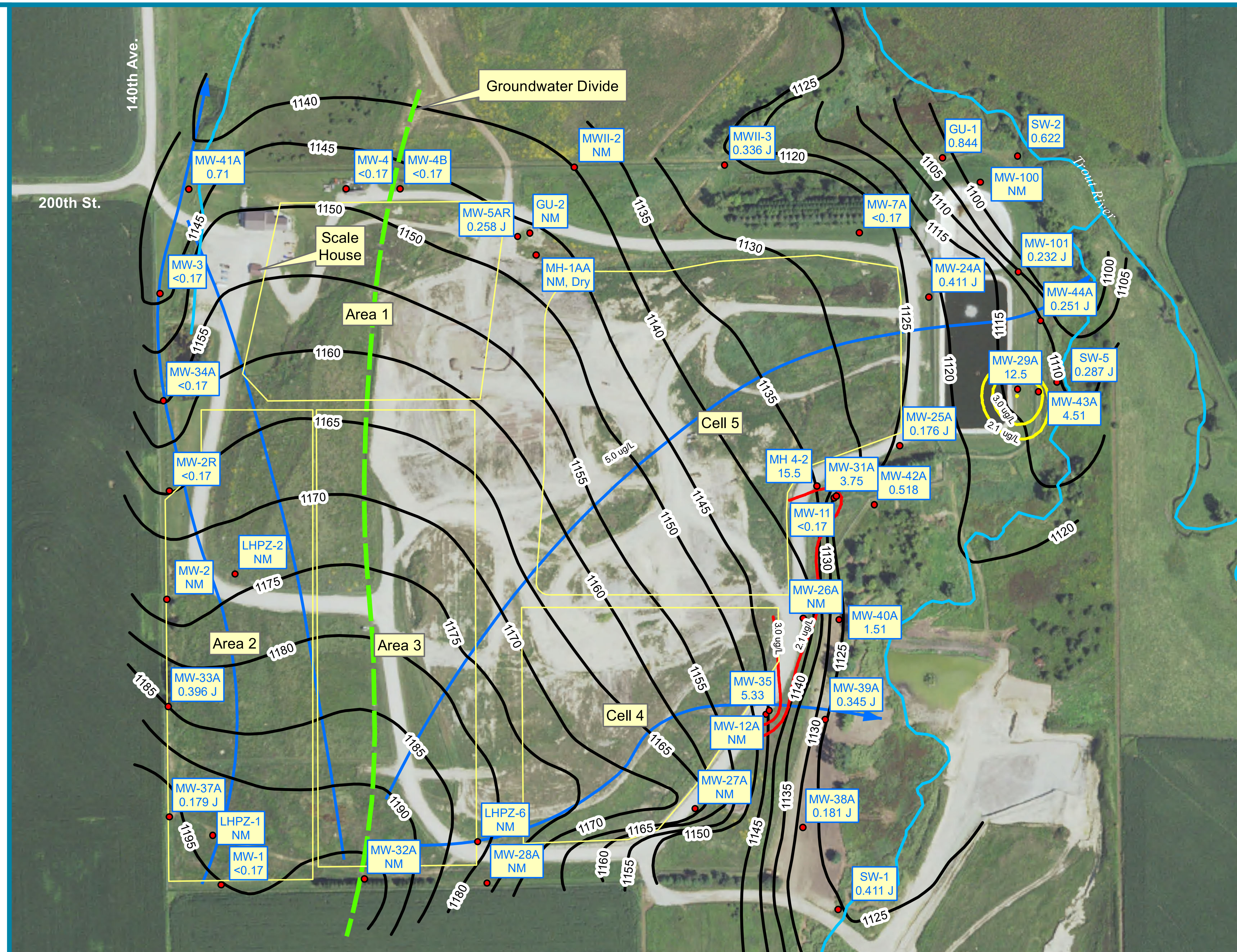

Figure 5
June 2023 Cobalt Iso-concentration Contour Map
2024 ACM Report
Winneshiek County Solid Waste Agency
Decorah, Iowa

March 2025 60711359

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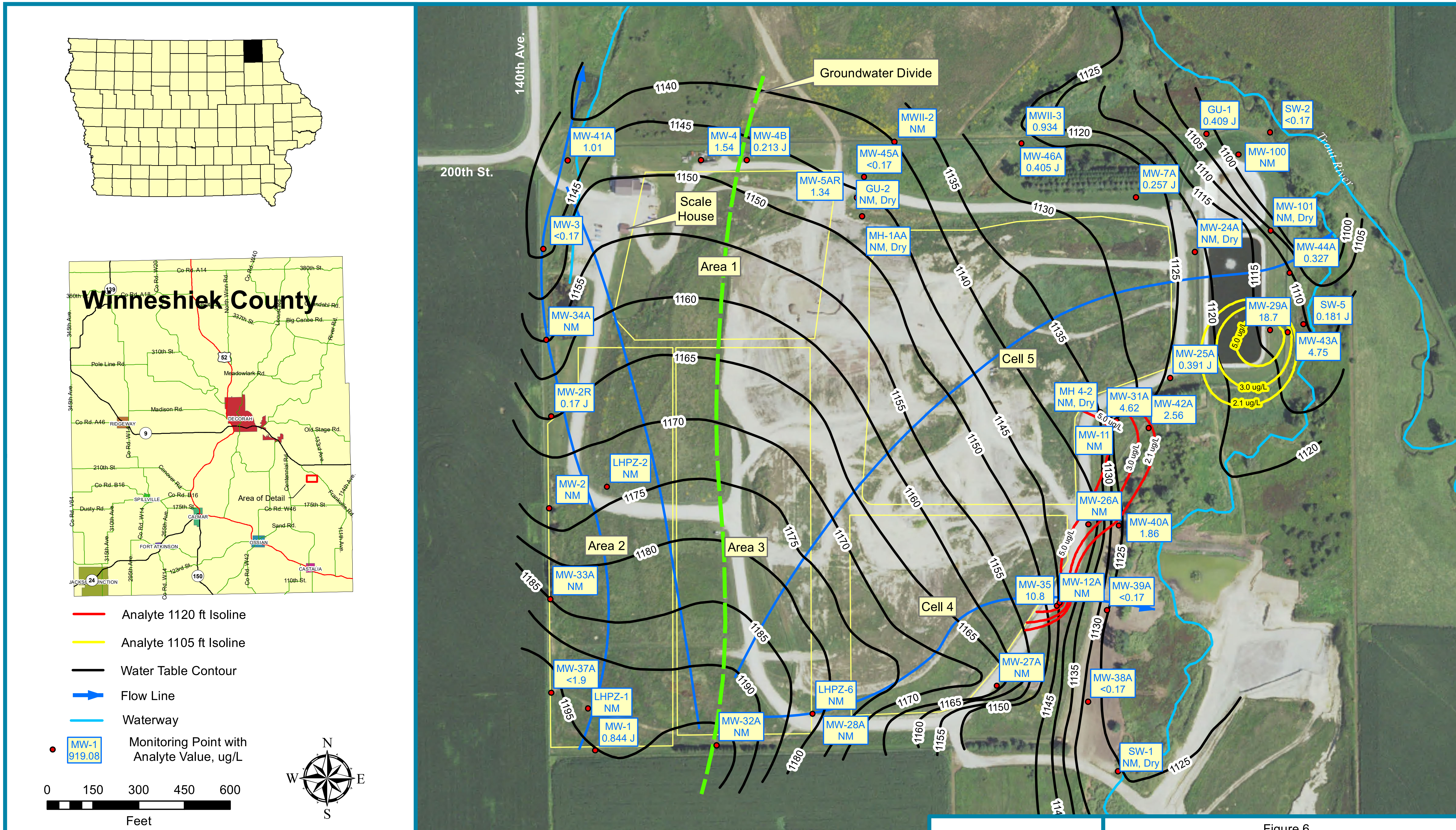

Water table contours based on May 2023 water elevations.
NM = Not Measured

Aerial Photography Source: USDA National Agriculture Imagery Program, 2021

AECOM

Figure 6
November 2023 Cobalt Iso-concentration Contour Map
2024 ACM Report
Winneshiek County Solid Waste Agency
Decorah, Iowa
March 2025
60711359

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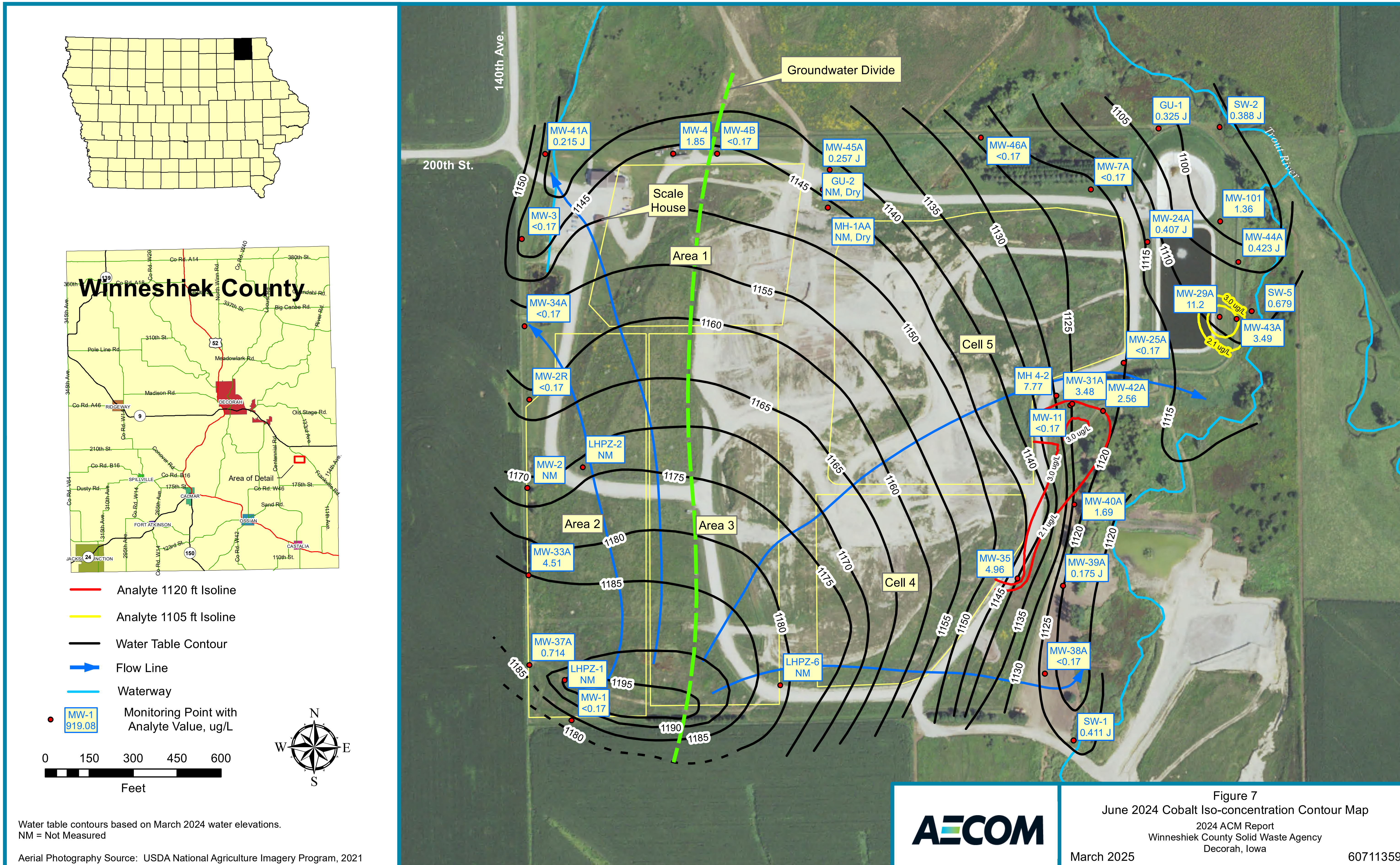

Winneshiek County
Analyte 1120 ft Isoline
Analyte 1105 ft Isoline
Water Table Contour
Flow Line
Waterway
Monitoring Point with Analyte Value, ug/L
MW-1 919.08
0 150 300 450 600
Feet
N E S W
Groundwater Divide
Scale House
Area 1
Area 2
Area 3
Cell 4
Cell 5
140th Ave.
200th St.
Trout River
MW-41A 0.215 J
MW-4 1.85
MW-4B <0.17
MW-45A 0.257 J
GU-2 NM, Dry
MH-1AA NM, Dry
MW-46A <0.17
MW-7A <0.17
GU-1 0.325 J
SW-2 0.388 J
MW-101 1.36
MW-24A 0.407 J
MW-44A 0.423 J
MW-29A 11.2
SW-5 0.679
MW-43A 3.49
MW-25A <0.17
MW-3 <0.17
MW-34A <0.17
MW-2R <0.17
LHPZ-2 NM
MW-2 NM
MW-33A 4.51
MW-37A 0.714
LHPZ-1 NM
MW-1 <0.17
LHPZ-6 NM
MH 4-2 7.77
MW-31A 3.48
MW-42A 2.56
MW-11 <0.17
MW-40A 1.69
MW-35 4.96
MW-39A 0.175 J
MW-38A <0.17
SW-1 0.411 J
3.0 ug/L
2.1 ug/L
Water table contours based on March 2024 water elevations.
NM = Not Measured
Aerial Photography Source: USDA National Agriculture Imagery Program, 2021
AECOM
Figure 7
June 2024 Cobalt Iso-concentration Contour Map
2024 ACM Report
Winneshiek County Solid Waste Agency
Decorah, Iowa
March 2025
60711359
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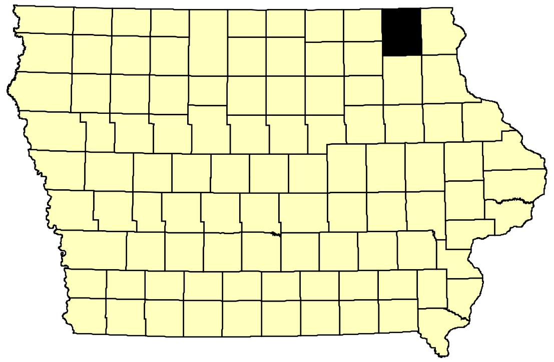

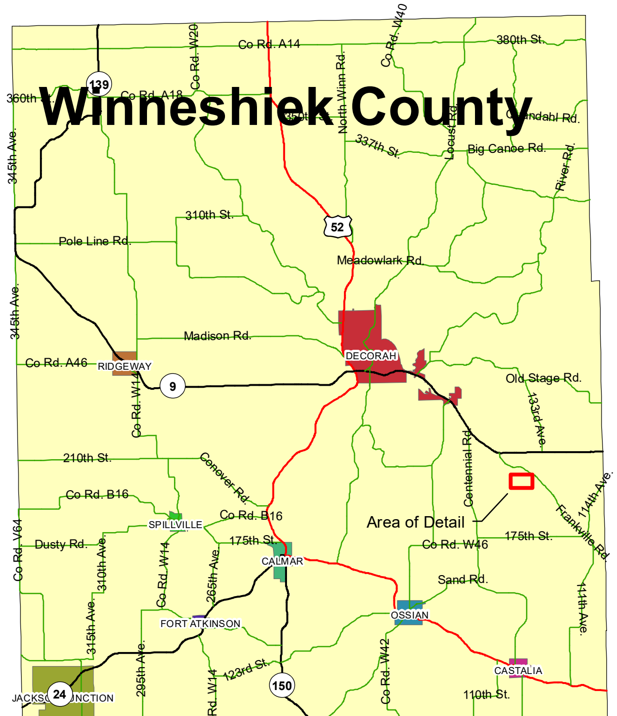

- Analyte 1120 ft Isoline
- Analyte 1105 ft Isoline
- Water Table Contour
- Flow Line
- Waterway
- MW-1 919.08 — Monitoring Point with Analyte Value, ug/L

0 150 300 450 600
Feet

N
W E
S

Water table contours based on March 2024 water elevations.
NM = Not Measured

Aerial Photography Source: USDA National Agriculture Imagery Program, 2021

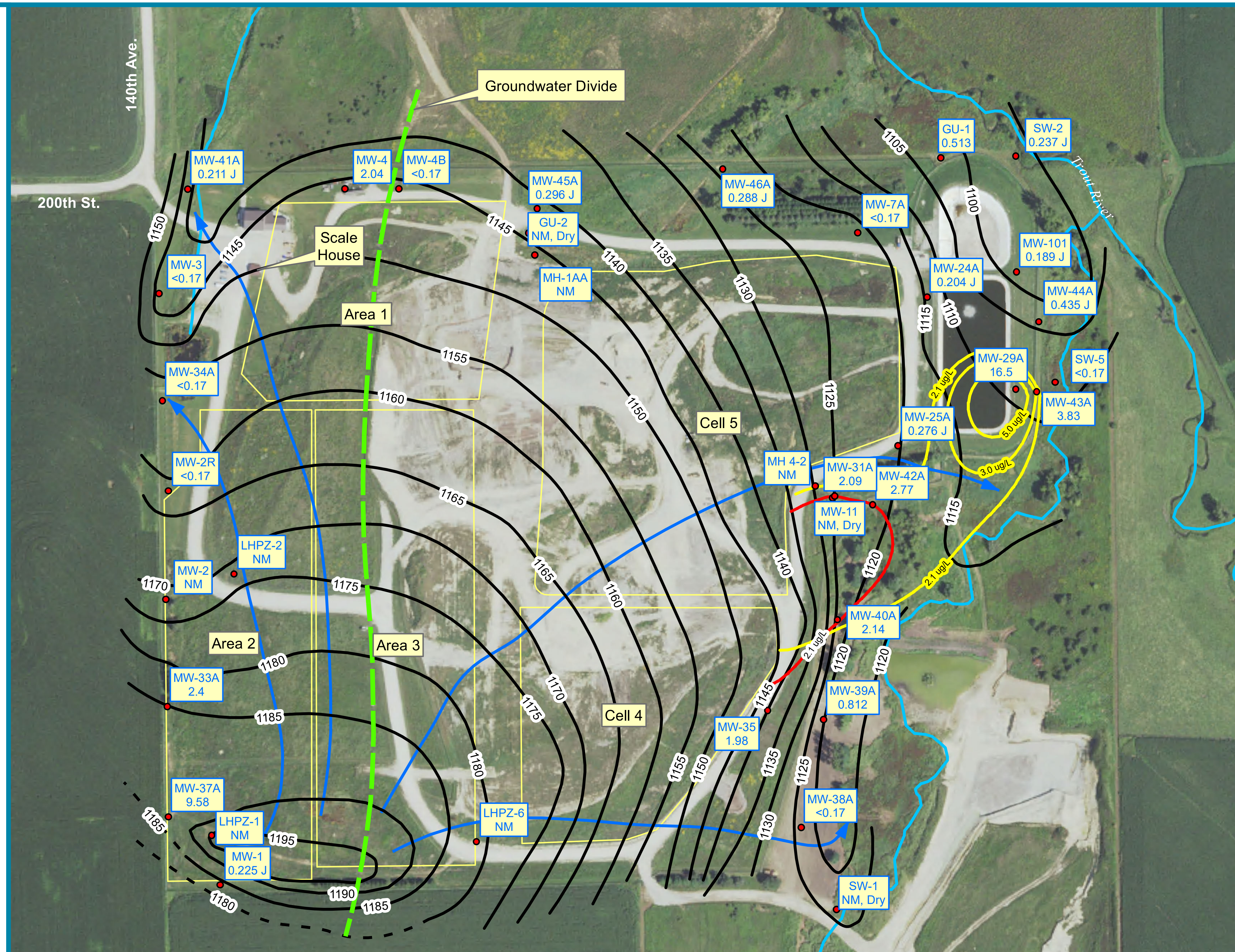

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Figure 8
November 2024 Cobalt Iso-concentration Contour Map
2024 ACM Report
Winneshiek County Solid Waste Agency
Decorah, Iowa
March 2025 60711359

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Tables

TABLE 1
WINNESHIEK COUNTY LANDFILL
MONITORING WELL INFORMATION
2024 ACM REPORT

Source:	AECOM Field Survey, December 2010-2024				IDNR Form 542-1277, AECOM, 2008-2024							Hydrologic Monitoring System Plan, AECOM, 2024		
	Iowa State Plane Coordinates, North Zone		Top of Riser Pipe	Ground Surface	Top of Screen	Bottom of Screen	Depth to Top of	Depth to Bottom of	Depth of	Depth to Top of	Screen	Screened Geologic		
Well	Easting	Northing	Elevation	Elevation	Elevation	Elevation	Screen	Screen	Borehole	Filter Pack	Length	Unit	Groundwater System	Area Monitored
MW-1	5,408,195.72	3,913,421.82	1,200.92	1,198.32	1,186.85	1,176.85	11.47	21.47	23.57	9.05	10.0	Qt/fluv	Water table	Upgradient Area 2
MW-2	5,408,044.45	3,914,216.43	1,188.40	1,186.24	1,177.87	1,167.87	8.37	18.37	20.53	7.53	10.0	Qt/Oeu	Water table	Area 2
MW-2R	5,408,051.29	3,914,517.66	1,175.36	1,173.20	1,156.80	1,146.80	16.40	26.40	49.60	13.60	10.0	Oeu	Water table	Area 2
MW-3	5,408,025.58	3,915,066.23	1,162.81	1,160.62	1,133.94	1,123.94	26.68	36.68	38.62	25.62	10.0	Qt	Water table	Area 1
MW-4	5,408,542.24	3,915,357.81	1,180.35	1,177.74	1,145.82	1,135.82	33.92	43.92	46.48	33.98	10.0	Qt/fluv	Water table	Area 1
MW-4B	5,408,692.96	3,915,357.41	1,180.15	1,178.39	1,152.25	1,142.25	26.14	36.14	39.36	26.86	10.0	Qt/fluv	Water table	Area 1
MW-7A	5,409,969.23	3,915,235.15	1,136.05	1,133.21	1,122.90	1,115.90	10.31	17.31	16.69	4.69	7.0	Qt	Water table	Cell 5 EXP
MW-11	5,409,898.76	3,914,498.17	1,138.92	1,136.50	1,106.50	1,096.50	30.00	40.00	40.00	25.00	10.0	Oeu/Oel	Uppermost bedrock	Cell 5 EXP
MW-12A	5,409,709.31	3,913,895.76	1,170.99	1,168.68	1,156.68	1,141.68	12.00	27.00	28.00	10.50	15.0	Qf,Oe	Water table	Cell 4
MW-18	5,408,026.23	3,915,074.47	1,163.02	1,160.46	1,123.65	1,118.65	36.81	41.81	45.86	36.28	5.0	Oeu	Uppermost bedrock	Upgradient Areas 1 & Cell 5 EXP
MW-19R	5,408,286.04	3,913,422.68	1,204.15	1,201.45	1,153.45	1,133.45	48.00	68.00	74.50	44.50	20.0	Oel	Uppermost bedrock	Upgradient Area 2, Area 3, Cell 4
MW-22	5,409,974.11	3,915,234.17	1,135.52	1,133.05	1,102.70	1,092.70	30.35	40.35	39.65	27.65	10.0	Og	Uppermost bedrock	Areas 1 & Cell 5 EXP
MW-24A	5,410,161.70	3,915,056.27	1,132.98	1,130.69	1,120.69	1,110.69	10.00	20.00	21.00	8.50	10.0	Qf,Ql,Oe	Water table	Cell 5 EXP
MW-25A	5,410,081.30	3,914,643.63	1,137.98	1,135.71	1,126.71	1,116.71	9.00	19.00	20.00	7.40	10.0	Qf,Ql,Oe	Water table	Cell 5 EXP
MW-26A	5,409,812.33	3,914,162.84	1,164.65	1,162.53	1,155.03	1,145.03	7.50	17.50	18.50	6.00	10.0	Qf,Qc,Oe	Water table	Cell 4
MW-27A	5,409,512.24	3,913,633.72	1,178.02	1,175.38	1,167.88	1,159.88	7.50	15.50	16.00	6.00	8.0	Qf,Oe	Water table	Cell 4
MW-29A	5,410,408.62	3,914,800.14	1,133.85	1,131.55	1,116.55	1,106.55	15.00	25.00	26.50	13.00	10.0	Ql/Qc/Og	Water table	Cell 5 EXP
MW-30	5,410,408.52	3,914,791.00	1,133.76	1,131.32	1,103.32	1,093.32	28.00	38.00	55.00	26.00	10.0	Og	Uppermost bedrock	Cell 5 EXP
MW-31A	5,409,904.69	3,914,503.22	1,138.77	1,136.17	1,126.17	1,116.17	10.00	20.00	21.50	8.00	10.0	Ql/Oel	Water table	Cell 5 EXP
MW-32A	5,408,593.17	3,913,439.47	1,219.37	1,216.84	1,206.84	1,196.84	10.00	20.00	24.00	8.00	10.0	Ql/Qt	Water table	Upgradient Cell 4
MW-33A	5,408,048.70	3,913,918.26	1,205.88	1,203.33	1,193.83	1,183.83	9.50	19.50	20.00	7.50	10.0	Ql/Qt	Water table	Area 2
MW-34A	5,408,035.12	3,914,768.26	1,166.70	1,164.20	1,150.20	1,140.20	14.00	24.00	24.00	12.00	10.0	Ql/Qt	Water table	Areas 1 & 2
MW-35	5,409,718.44	3,913,907.16	1,170.60	1,168.10	1,125.10	1,115.10	43.00	53.00	85.00	41.00	10.0	Oel	Uppermost bedrock	Cell 4
MW-36	5,409,809.52	3,914,152.69	1,165.22	1,162.80	1,089.80	1,079.80	73.00	83.00	85.00	71.00	10.0	Og	Uppermost bedrock	Cells 4 and 5 EXP
MW-37A	5,408,051.74	3,913,611.62	1,210.30	1,207.50	1,198.50	1,183.50	9.00	24.00	24.00	8.00	15.0	Ql/Qt/fluv	Water table	Upgradient Area 2
MW-38A	5,409,812.01	3,913,581.77	1,148.37	1,145.47	1,130.47	1,115.47	15.00	30.00	30.00	14.00	15.0	Ql/Og	Water table	Cell 4
MW-39A	5,409,873.50	3,913,882.29	1,146.90	1,143.99	1,128.99	1,113.99	15.00	30.00	30.50	14.00	15.0	Ql/Og	Water table	Cell 4
MW-40A	5,409,912.45	3,914,159.08	1,151.17	1,148.32	1,123.82	1,108.82	24.00	39.00	39.50	23.00	15.0	Ql/Og	Water table	Cell 4
MW-41A	5,408,105.55	3,915,356.48	1,149.75	1,146.63	1,136.63	1,126.63	10.00	20.00	20.00	8.50	10.0	Ql/Qt	Water table	Area 1
MW-42A	5,410,010.99	3,914,479.14	1,135.43	1,131.86	1,121.86	1,111.86	10.00	20.00	20.00	8.50	10.0	Oel/Og	Water table	Cell 4
MW-43A	5,410,466.60	3,914,793.51	1,119.21	1,116.31	1,109.31	1,099.31	7.00	17.00	17.50	5.00	10.0	Og	Water table	Leachate Lagoon
MW-44A	5,410,472.94	3,914,990.26	1,117.88	1,114.67	1,107.67	1,097.67	7.00	17.00	17.00	5.00	10.0	Og	Water table	Leachate Lagoon
MW-45A	5,409,077.77	3,915,302.20	1,147.69	1,145.13	1,139.13	1,129.13	6.00	16.00	20.00	5.00	10.0	Ql	Water table	Cell 5 EXP
MW-46A	5,409,593.45	3,915,412.44	1,130.82	1,128.04	1,123.04	1,113.04	5.00	15.00	15.50	4.00	10.0	Ql	Water table	Cell 5 EXP
MWII-2	5,409,176.36	3,915,417.68	1,145.20	1,142.76	1,133.42	1,123.42	9.34	19.34	19.66	6.66	10.0	Ql	Water table	Cell 5 EXP
MW-100	5,410,304.42	3,915,375.49	1,134.14	1,132.16	1,110.16	1,100.16	22.00	32.00	35.00	20.00	10.0	Qt/fluv	Water table	Leachate Lagoon
MW-101	5,410,410.39	3,915,126.49	1,134.55	1,132.10	1,104.10	1,094.10	28.00	38.00	40.00	26.00	10.0	Qt/fluv	Water table	Leachate Lagoon
Abandoned Wells														
MW-1R	5,407,836.16	3,913,605.00	1,208.27	1,205.94	1,198.44	1,188.44	7.50	17.50	18.50	6.00	10.0	Ql/Qt	Water table	Abandoned 2021
MW-5	5,409,242.99	3,915,038.63	1,156.86	1,156.02	1,146.03	1,136.03	9.99	19.99	20.81	8.31	10.0	Oeu/Oel	Water table	Abandoned 1995
MW-5A	5,409,082.14	3,914,870.35	1,156.86	1,156.02	1,141.18	1,131.18	9.90	19.90	20.00	7.20	10.0	Oeu/Oel	Water table	Abandoned 2016
MW-5AR	5,409,019.66	3,915,224.19	1,153.90	1,151.00	1,139.00	1,129.00	12.00	22.00	23.00	10.00	10.0	Oeu/Oel	Water table	Abandoned 2023
MW-6	5,409,237.28	3,915,063.37	1,158.04	1,546.04	1,131.54	1,121.54	26.50	36.50	46.50	25.00	10.0	Oeu/Oel	Water table	Abandoned 1995
MW-6A	5,409,723.95	3,914,097.12	1,165.73	1,162.81	1,151.33	1,141.33	14.40	24.40	25.00	10.00	10.0	Oeu/Oel	Water table	Abandoned 1999
MW-7	5,409,255.36	3,914,509.43	1,179.18	1,177.18	1,163.68	1,153.68	15.50	25.50	6.00	14.00	10.0	Qt	Water table	Abandoned 1995
MW-8	5,409,304.71	3,914,273.64	1,164.52	1,162.52	1,144.52	1,134.52	18.00	28.00	28.50	16.50	10.0	Oeu/Oel	Water table	Abandoned 1997
MW-8A	5,410,164.15	3,914,804.91	1,129.57	1,126.76	1,116.52	1,109.52	10.24	17.24	16.76	4.76	7.0	Qt/Oel	Water table	Abandoned 2022
MW-9	5,409,420.83	3,913,440.45	1,188.19	1,186.19	1,171.59	1,161.59	16.60	26.60	27.10	15.10	10.0	Qt/Oel	Water table	Abandoned 1997
MW-10	5,408,743.16	3,913,437.40	1,217.70	1,215.70	1,211.70	1,201.70	6.00	16.00	17.00	4.50	10.0	Qt/Oel	Water table	Abandoned 1997
MW-12	5,409,796.73	3,913,847.68	1,153.63	1,151.21	1,092.96	1,082.96	58.25	68.25	100.65	49.75	10.0	Og	Uppermost bedrock	Abandoned 2021
MW-19	5,408,335.29	3,913,424.91	1,205.50	1,203.77	1,151.83	1,131.83	51.94	71.94	172.84	48.62	20.0	Oel	Uppermost bedrock	Abandoned 2021
MW-20	5,409,438.91	3,913,464.34	1,161.99	1,160.16	1,098.54	1,088.54	61.62	71.62	72.62	59.12	10.0	Og	Uppermost bedrock	Abandoned 1997
MW-21	5,409,205.87	3,915,062.42	1,158.36	1,156.15	1,102.62	1,092.62	53.53	63.53	109.41	51.35	10.0	Og	Uppermost bedrock	Abandoned 1995
MW-21A	5,409,037.25	3,914,795.25	1,158.36	1,156.15	1,097.04	1,087.04	54.50	64.50	65.00	52.00	10.0	Og	Uppermost bedrock	Abandoned 2016
MW-21B	5,409,723.95	3,914,097.12	1,168.56	1,165.16	1,113.06	1,103.06	52.10	62.10	66.00	54.00	10.0	Og	Uppermost bedrock	Abandoned 1999
MW-21AR	5,409,020.46	3,915,214.29	1,153.61	1,151.20	1,079.20	1,074.20	72.00	77.00	80.50	70.00	5.0	Og	Uppermost bedrock	Abandoned 2023
MW-23	5,410,162.90	3,914,799.05	1,129.38	1,126.83	1,096.50	1,086.50	30.33	40.33	39.67	27.67	10.0	Og	Uppermost bedrock	Abandoned 2022
MW-28A	5,408,935.00	3,913,427.61	1,215.47	1,212.86	1,205.56	1,198.56	7.30	14.30	15.50	6.00	7.0	Ql,Oe	Water table	Abandoned 2023
MWII-1	5,408,065.71	3,915,425.24	1,149.22	1,146.36	1,137.33	1,122.33	9.03	24.03	24.97	6.97	15.0	Qt/Og	Water table	Abandoned 2022
MWII-3	5,409,595.22	3,915,423.69	1,129.58	1,127.09	1,117.55	1,112.55	9.54	14.54	13.96	6.46	5.0	Qt	Water table	Abandoned 2023
MWII-4	5,408,076.47	3,915,619.90	1,149.33	1,146.51	1,137.37	1,127.37	9.14	19.14	19.86	6.86	10.0	Qt	Water table	Abandoned 2017
MWII-5	5,409,595.22	3,915,417.68	1,165.20	1,162.20	1,154.20	1,139.20	11.00	26.00	27.50	9.00	15.0	Qt	Water table	Abandoned 1997
MWII-5A	5,408,732.72	3,915,702.65	1,164.98	1,162.15	1,147.15	1,137.15	14.90	24.90	25.00	13.10	10.0	Qt	Water table	Abandoned 2017
MWII-6	5,409,251.36	3,915,705.18	1,152.87	1,150.00	1,143.87	1,133.87	9.00	19.00	25.00	7.00	10.0	Qt	Water table	Abandoned 2017

Notes:
Elevations given in feet, North American GeodeticVertical Datum of 1988.
Depths given in feet below ground surface.
Geological unit symbols:
fluv = Quaternary Fluvioglacial Material
Qf = Quaternary Fill Placed During Landfill Construction
Ql = Quaternary Loess
Qc = Quaternary, Pre-Wisconsin Episode Colluvium
Qt = Quaternary Till
Oeu = Ordovician Maquoketa Formation, Upper Elgin Member (Interbedded Limestone and Shale)
Oel = Ordovician Maquoketa Formation, Lower Elgin Member (Shale)
Og = Ordovician Galena Group Dubuque Formation (Limestone)
NA = Not Available

L:\PROJECTS\60711359 - Winneshiek\400-Technical\405\2024 ACM\Winneshiek Table 1 ACM Monitoring Well Information 2025-03-20.xlsx

Table 2
Summary of Cobalt Concentrations in Groundwater, Surface Water, Underdrains, and Leachate
2024 ACM Report
Winneshiek County Landfill
Permit No. 96-SDP-1-74P

Well	Sample Date																			Units
	Nov-19	Feb-20	Jun-20	Aug-20	Nov-20	May-21	Aug-21	Sep-21	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22	Jun-23	Aug-23	Nov-23	Jun-24	Aug-24	Nov-24	
Groundwater																				
MWII-3**	0.247 J	--	0.222 J	--	0.247 J	0.25 J		0.394 J	--	0.376 J	--	0.353 J	--	0.336 J	--	0.934	--	--	--	µg/L
MW-5AR**	<0.091	--	<0.091	--	<0.091	0.998	1.47	1.94	--	2.56	--	1.05	--	0.258 J	--	1.34	--	--	--	µg/L
MW-7A	<0.091	--	<0.091	--	<0.091	<0.091	--	<0.19	--	<0.19	--	0.339 J	--	<0.17	--	0.257 J	<0.17	--	<0.17	µg/L
MW-11	dry	--	dry	--	dry	0.285 J	--	dry	--	dry	dry	0.244 J	--	<0.17	--	dry	<0.17	--	dry	µg/L
MW-12A**	4.15	--	9.64	--	2.59	dry	--	dry	--	dry	--	dry	--	dry	--	dry	--	--	--	µg/L
MW-22	0.099 J	--	<0.091	0.115 J	<0.091	0.122 J	--	<0.19	--	<0.19	--	<0.19	--	<0.17	--	<0.17	<0.17	--	<0.17	µg/L
MW-24A	0.383 J	--	0.32 J	--	0.57	0.363 J	--	dry	--	dry	--	0.361 J	dry	0.411 J	--	dry	0.407 J	--	0.204 J	µg/L
MW-25A	<0.091	--	<0.091	--	<0.091	0.135 J	--	<0.19	--	<0.19	--	0.19 J	--	0.176 J	--	0.391 J	<0.17	--	0.276 J	µg/L
MW-27A**	dry	--	3.07	--	dry	dry	--	dry	--	dry	--	dry	--	dry	--	dry	--	--	--	µg/L
MW-29A	8.43	9.64	9.98	10.7	10.1	11.9	--	7.9	--	7.38	--	10.1	--	12.5	--	18.7	11.2	--	16.5	µg/L
MW-31A	13.4	12.4	13.6	12	10	10.4	--	3.37	--	3.01	--	32.2	--	3.75	--	4.62	3.48	--	2.09	µg/L
MW-35	8.27	6.6	7.03	5.98	5.97	5.51	--	6.33	--	6.39	--	6.74	--	5.33	--	10.8	4.96	--	1.98	µg/L
MW-38A	--	--	--	--	--	--	--	0.249 J	<0.19	<0.19	<0.19	<0.19	<0.19	0.181 J	--	<0.17	<0.17	--	<0.17	µg/L
MW-39A	--	--	--	--	--	--	--	0.857	0.382 J	<0.19	<0.19	<0.19	0.199 J	0.345 J	--	<0.17	0.175 J	--	0.812	µg/L
MW-40A	--	--	--	--	--	--	--	3.22	1.06	1.17	0.807	1.47	2.19	1.51	--	1.86	1.69	--	2.14	µg/L
MW-42A	--	--	--	--	--	--	--	--	--	--	--	3.98	3.31	0.518	2.46	2.56	2.56	--	2.77	µg/L
MW-43A	--	--	--	--	--	--	--	--	--	--	--	3.68	3.27	4.51	4.93	4.75	3.49	--	3.83	µg/L
MW-44A	--	--	--	--	--	--	--	--	--	--	--	0.53	0.583	0.251 J	*0.603*	0.327	0.423 J	--	0.435 J	µg/L
MW-45A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.17	0.257 J	0.389 J	0.296 J	µg/L
MW-46A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.405 J	<0.17	0.241 J	0.288 J	µg/L
MW-101	0.48 J	0.434 J	<0.091	--	0.113 J	0.399 J	--	0.241 J	--	dry		<0.19	--	0.232 J	dry	dry	*1.36*	--	0.189 J	µg/L
Surface Water																				
SW-1	0.264 J	--	0.327 J	--	0.153 J	0.787	--	<0.19	--	4.36	0.244 J	<0.19	--	0.411 J	--	dry	<0.17	--	dry	µg/L
SW-2	0.171 J	--	0.495 J	--	0.174 J	0.302 J	--	0.361 J	--	3.17	0.693	0.212 J	--	0.622	--	<0.17	0.388 J	--	0.237 J	µg/L
SW-5	--	--	--	--	--	--	--	--	--	--	--	--	--	0.287 J	--	0.181J	*0.679*	--	<0.17	µg/L
Underdrain Groundwater																				
GU-1	0.392 J	--	0.544	--	0.153 J	0.208 J	--	0.387 J	--	1.37	--	1.33	--	0.844	--	0.409 J	0.325 J	--	0.513	µg/L
GU-2	0.699	--	0.339 J	--	25.3	dry	--	7.22	--	3.05	--	0.786	--	dry	--	dry	dry	--	dry	µg/L
Leachate Manholes																				
MH-1	--	--	--	--	--	--	--	--	--	--	--	0.481 J	--	dry	--	dry	*3.39*	--	dry	µg/L
MH-4-2	--	--	--	--	--	--	--	--	--	--	--	2.17	--	15.5	--	dry	7.77	--	dry	µg/L
Leachate Lagoons																				
LB-1	--	--	--	--	--	--	--	--	--	--	--	--	--	2.40	--	--	--	--	--	µg/L
LB-2	--	--	--	--	--	--	--	--	--	--	--	--	--	6.78	--	--	--	--	--	µg/L

Notes:
Shading = > 3.4 µg/L site-wide standard
**Well has been abandoned and/or is no longer being sampled

L:\PROJECTS\60711359 - Winneshiek\400-Technical\405\2024 ACM\Winneshiek Table 2 ACM COBALT SUMMARY 2025-03-20.xlsx

Table 3
Summary of Ongoing SSIs and SSLs
2024 ACM Report
Winneshiek County Landfill
Permit No. 96-SDP-1-74P

Well	Parameter	Units	Spring Event	Summer Event	Fall Event	Winter Event	Total Number Sample Events (n)	Percent Nondetects	LCL	UCL	IDNR Statewide Standard	Exceeds Standard ?	Upgradient Background Prediction Limit	**Sample Dates**			**UCL < GWPS**		
														Initial Exceedance	**Resample(s)**	**5th background sample**	**1st Year**	**2nd Year**	**3rd Year**
Shallow (Water Table)																			
MW-7A	Barium	µg/L	190	--	**425**	196	24	0	156	240	2000	No	292 LnPL	6/13/2023	8/29/2023; 11/13/2023; 6/18/2024	11/19/2024	2024	--	--
MW-24A	Nickel	µg/L	8.53	--	*2.95 J*	--	16	6.3	6.62	10.46	100	No	20.9 NPL	8/30/2022	6/14/2023; 6/18/2024; 11/21/2024	NA	--	--	--
MW-29A	Arsenic	µg/L	4.54	--	**6.75**	--	13	7.7	3.50	6.80	10	No	4.57 NPL	2/6/2020	6/30/2020; 8/26/2020; 11/20/2020	5/24/2021	2022	2023	2024
	Cobalt	µg/L	**11.2**	--	**16.5**	--	13	0	8.85	13.13	3.4	YES	3.4 NPL	11/20/2019	2/26/2020; 6/30/2020; 8/26/2020	11/20/2020	--	--	--
	Nickel	µg/L	**63.9**	--	**69.6**	--	13	0	51.83	68.82	100	No	20.9 NPL	2/6/2020	6/30/2020; 8/26/2020; 11/20/2020	5/24/2021	2022	2023	2024
MW-31A	Cobalt	µg/L	**3.48**	--	2.09	--	13	0	3.89	12.95	3.4	YES	3.4 NPL	11/5/2019	2/7/2020; 6/18/2020; 8/26/2020	11/18/2020	--	--	--
	Nickel	µg/L	**30.3**	--	**32.3**	--	13	0	26.67	52.68	100	No	20.9 NPL	11/5/2019	2/7/2020; 6/18/2020; 8/26/2020	11/18/2020	2022	2023	2024
MW-40A	Cobalt	µg/L	1.69	--	2.14	--	10	0	1.11	2.28	3.4	No	3.4 NPL	9/23/2021	12/14/2021; 3/7/2022; 6/23/2022	8/17/2022	2024	--	--
	Nickel	µg/L	11.1	--	16.8	--	10	0	9.15	16.79	100	No	20.9 NPL	9/23/2021	12/14/2021; 3/7/2022; 6/23/2022	8/17/2022	2022	2023	2024
MW-42A	Cobalt	µg/L	2.56	--	2.77	--	7	0	At least 8 samples required to calculate confidence interval		3.4	NA	3.4 NPL	8/31/2022	16/6/2022; 6/7/2023; 8/28/2023	11/2/2023	--	--	--
	Nickel	µg/L	16.6	--	**27.6**	**23.5**	8	0	10.29	30.14	100	No	20.9 NPL	8/31/2022	16/6/2022; 6/7/2023; 8/28/2023	11/2/2023	2024	--	--
MW-43A	Arsenic	µg/L	**6.28**	--	**6.32**	--	7	0	At least 8 samples required to calculate confidence interval		10	NA	4.57 NPL	8/31/2022	16/6/2022; 6/7/2023; 8/28/2023	11/2/2023	--	--	--
	Barium	µg/L	163	--	214	--	7	0			2000	NA	292 LnPL	8/31/2022	16/6/2022; 6/7/2023; 8/28/2023	11/2/2023	--	--	--
	Cobalt	µg/L	**3.49**	--	**3.83**	--	7	0			3.4	NA	3.4 NPL	8/31/2022	16/6/2022; 6/7/2023; 8/28/2023	11/2/2023	--	--	--
	Nickel	µg/L	17.3	--	**25.9**	--	7	0			100	NA	20.9 NPL	8/31/2022	16/6/2022; 6/7/2023; 8/28/2023	11/2/2023	--	--	--
MW-44A	Barium	µg/L	137	--	159	--	7	0	At least 8 samples required to calculate confidence interval		2000	No	292 LnPL	8/31/2022	16/6/2022; 6/7/2023; 8/28/2023	11/2/2023	--	--	--
	Cadmium	µg/L	**0.389**	--	*0.181 J*	--	7	42.9			5	No	0.209 NPL	8/31/2022	16/6/2022; 6/7/2023; 8/28/2023	11/2/2023	--	--	--
	Nickel	µg/L	**21.6**	--	**34.2**	--	7	0			100	No	20.9 NPL	8/31/2022	16/6/2022; 6/7/2023; 8/28/2023	11/2/2023	--	--	--
	Zinc	µg/L	*13.8 J*	--	*19.5 J*	--	7	57.1			2000	No	18.6 NPL	8/31/2022	16/6/2022; 6/7/2023; 8/28/2023	11/2/2023	--	--	--

Table 3
Summary of Ongoing SSIs and SSLs
2024 ACM Report
Winneshiek County Landfill
Permit No. 96-SDP-1-74P

Well	Parameter	Units	Spring Event	Summer Event	Fall Event	Winter Event	Total Number Sample Events (n)	Percent Nondetects	LCL	UCL	IDNR Statewide Standard	Exceeds Standard ?	Upgradient Background Prediction Limit	**Sample Dates**			**UCL < GWPS**		
														Initial Exceedance	**Resample(s)**	**5th background sample**	**1st Year**	**2nd Year**	**3rd Year**
Deep (Bedrock)																			
MW-11	Cobalt	µg/L	*<0.17*	--	--	--	6	66.7	At least 8 samples required to calculate confidence interval		3.4	NA	3.4 NPL	10/31/2018	12/17/2018; 6/3/2021; 8/3/2021	9/7/2022	--	--	--
	Zinc	µg/L	**60**	--	--	--	7	0			2000	No	18.6 NPL	10/31/2018	12/17/2018; 6/3/2021; 8/3/2021	9/7/2022	2021	2022	2023
MW-35	Cobalt	µg/L	**4.96**	--	1.98	**--**	13	0	5.53	7.68	3.4	YES	3.4 NPL	11/15/2019	2/12/2020	11/5/2020	--	--	--

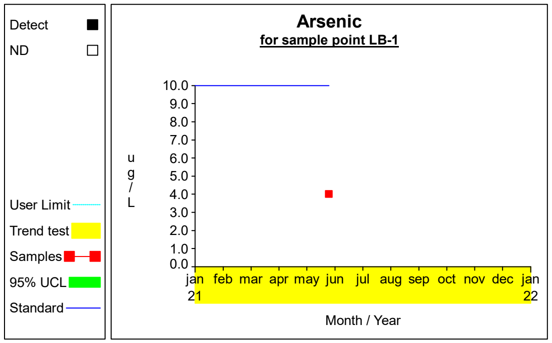
Notes:
NS = No statewide standard exists.
NPL = Nonparametric prediction limit; PL = parametric prediction limits
NA = Not applicable or not established.
Interwell NPL for organics equals reporting limits for the measurements shown
Prediction limit exceedances (SSI) shown in bold font.
False positive rate for all comparisons to statewide standards is 1.0%.
Only 2024 data is presented here; refer to appendices for complete historical data used in the statistical tests.
Gray shading for SSLs
Italics for estimated and nondetect values
60711359/400/405/2024 ACM/Table 3 - 2024 Winneshiek IDNR ACM.xlsx

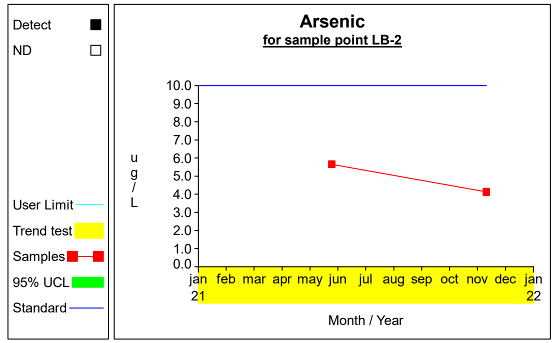
APPENDICES

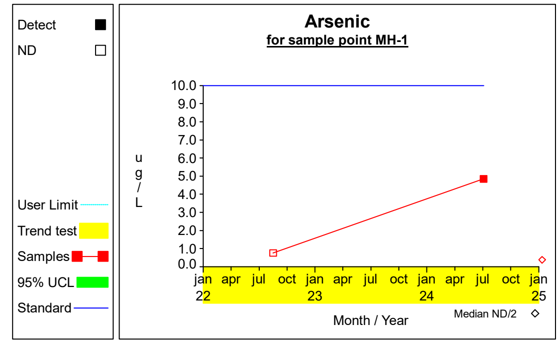
Appendix A – Statistical Reports

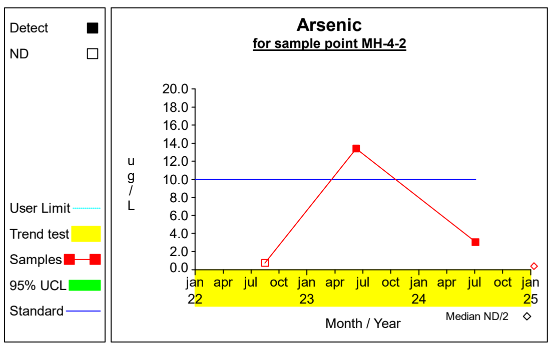
Winneshiek [ACM] Analysis prepared on: 3/19/2025

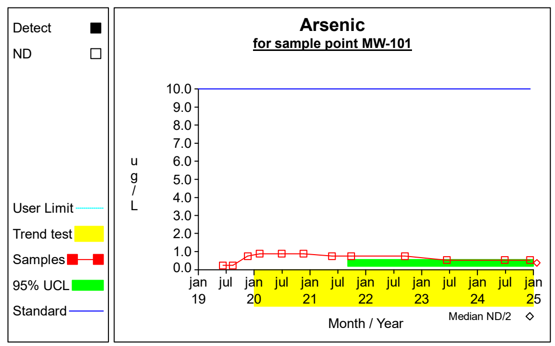
Confidence Limits (Assessment)

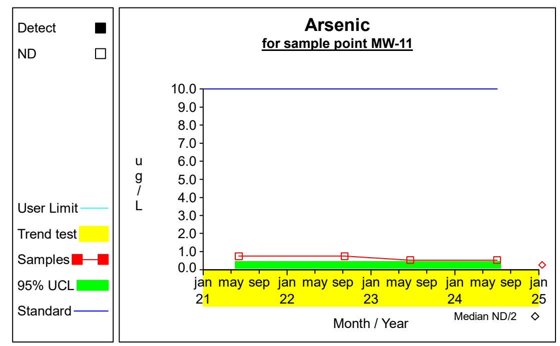


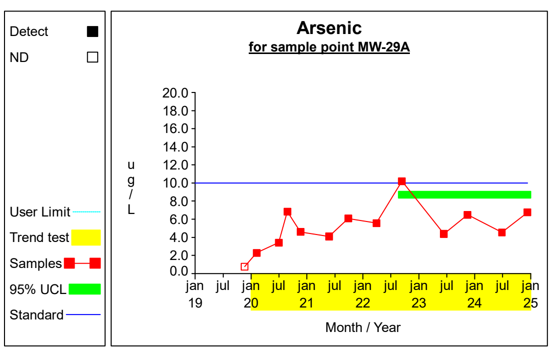


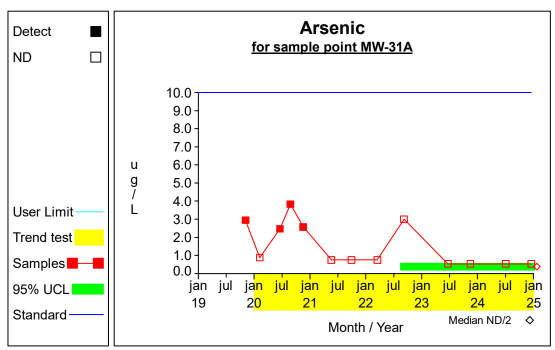


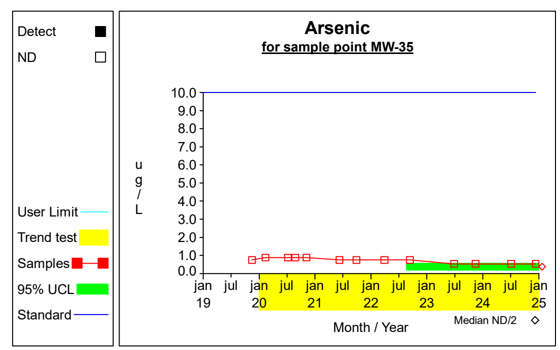




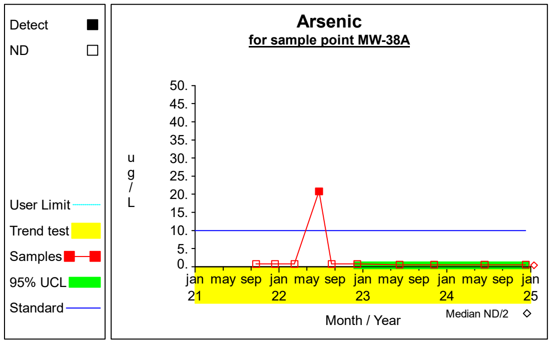


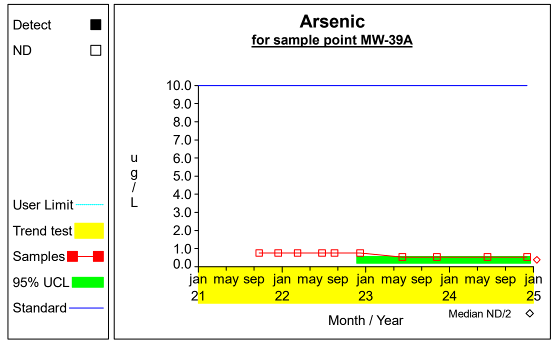


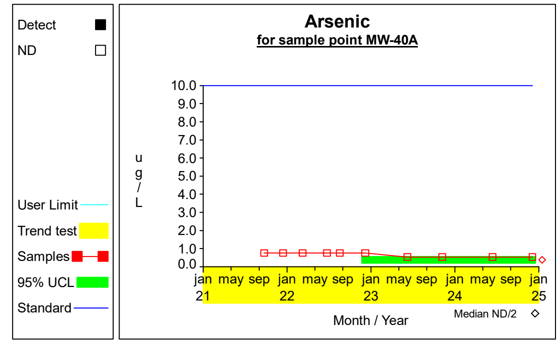


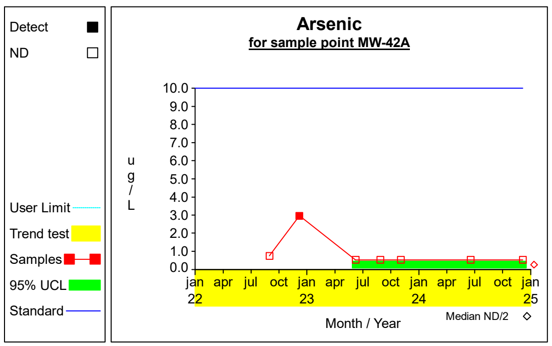


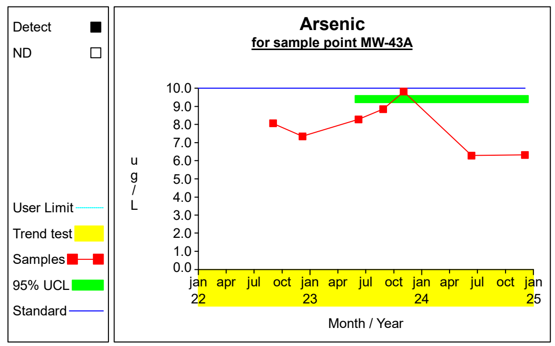
Confidence Limits (Assessment)

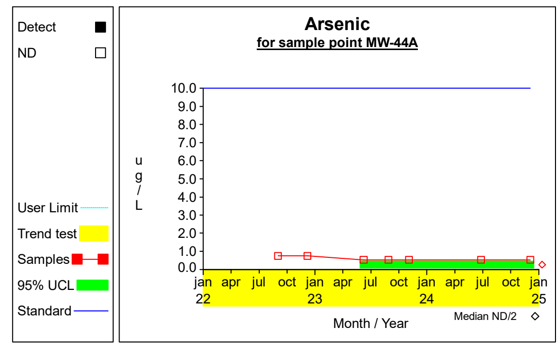


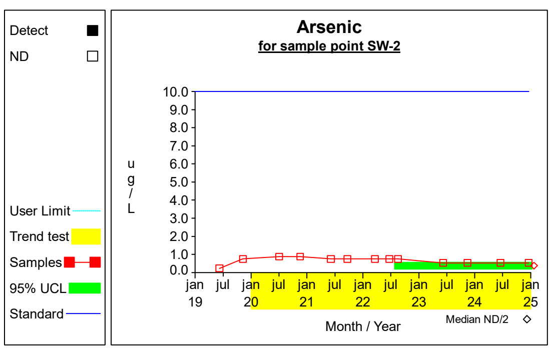


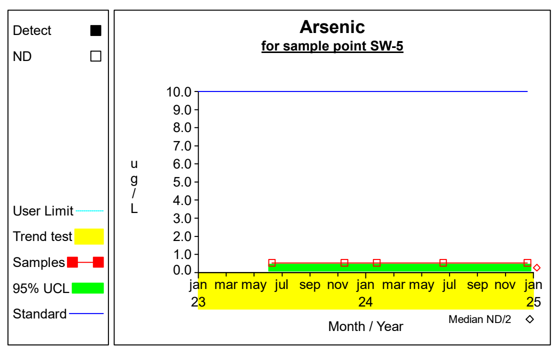


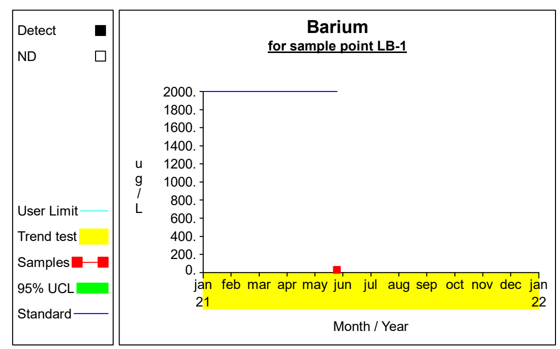




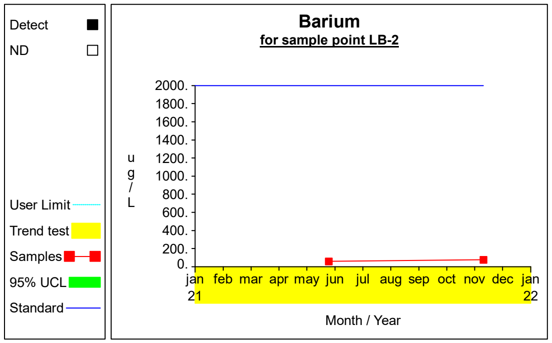


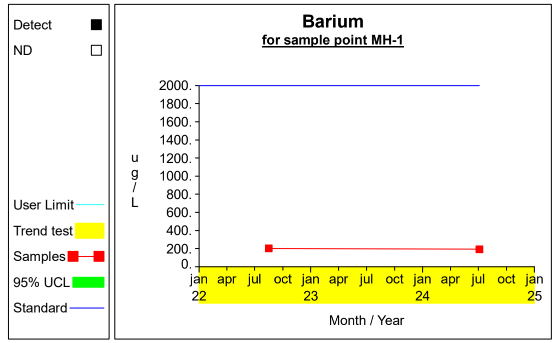


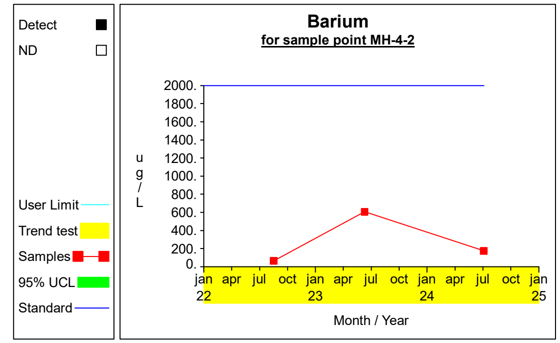


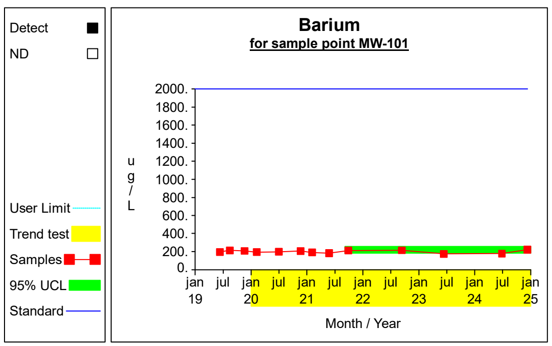


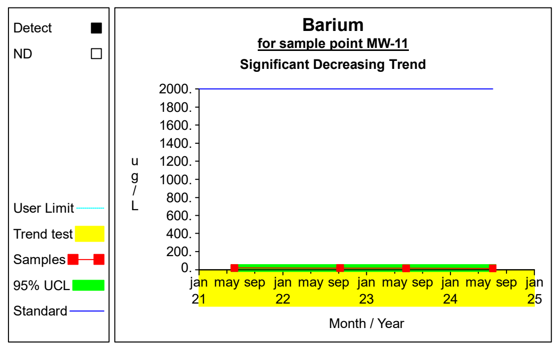
Confidence Limits (Assessment)

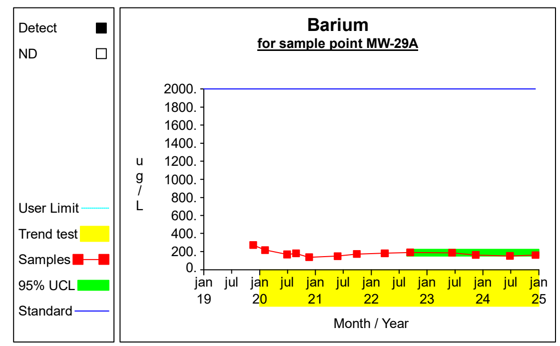


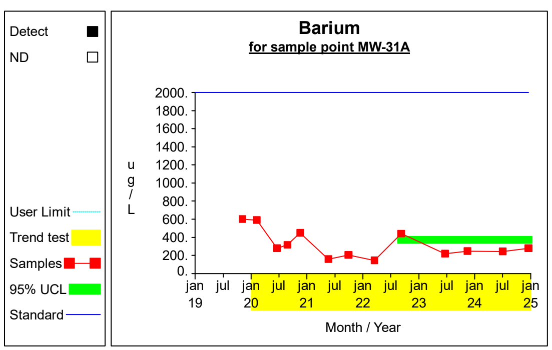


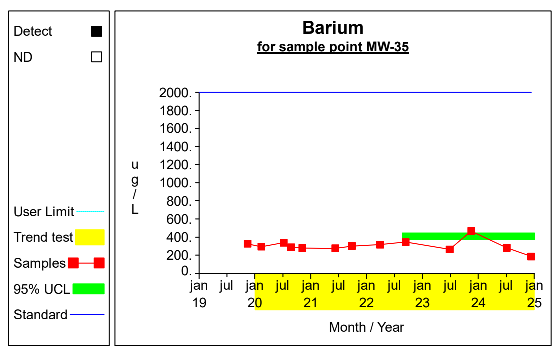


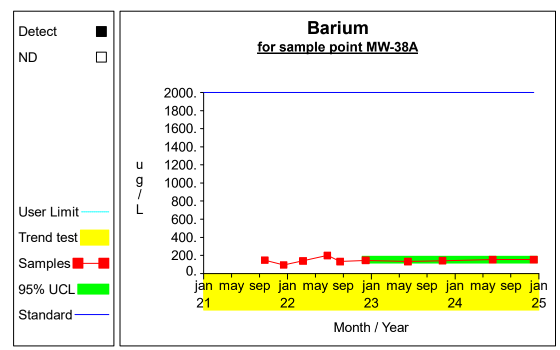












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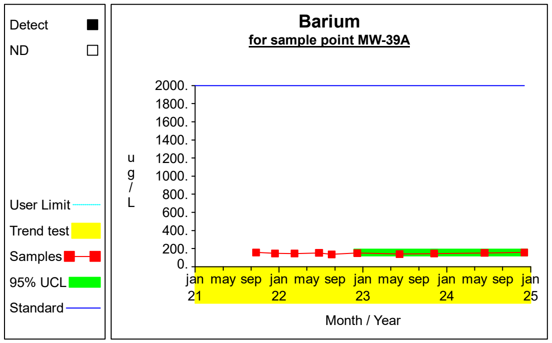
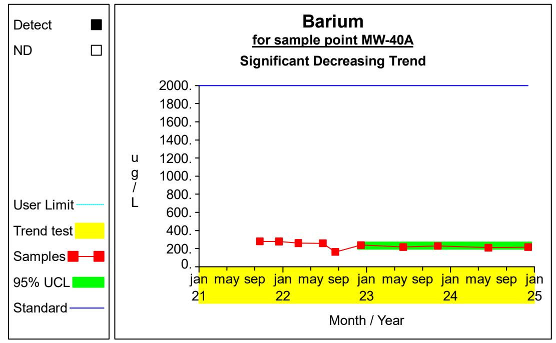
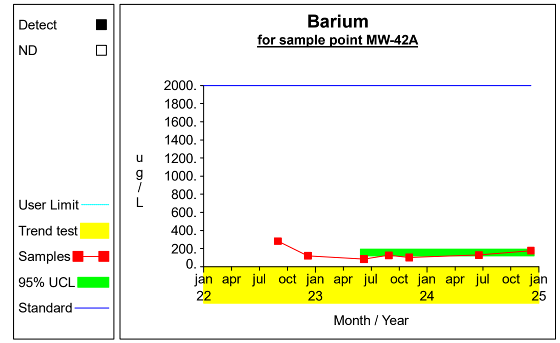
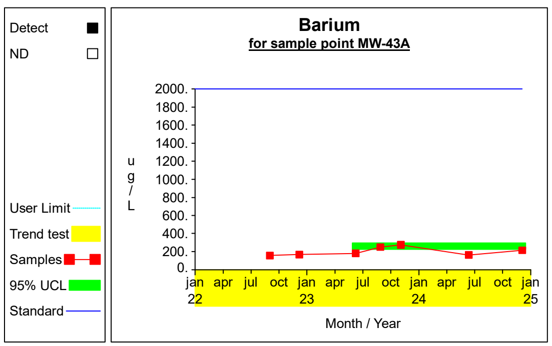
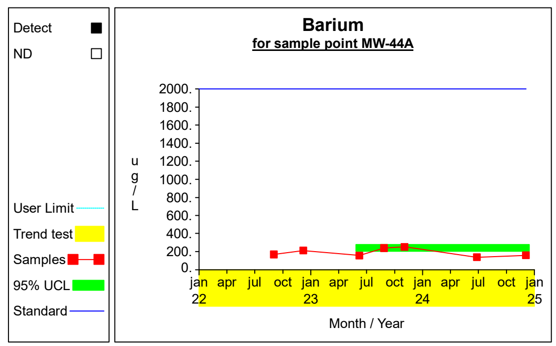
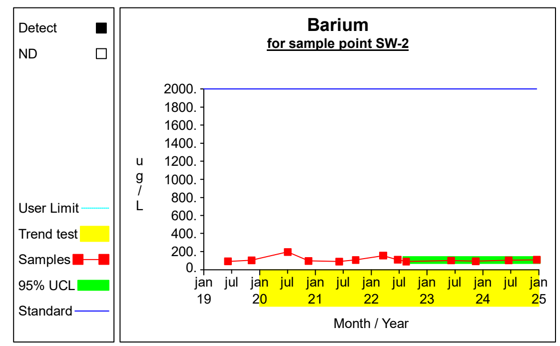


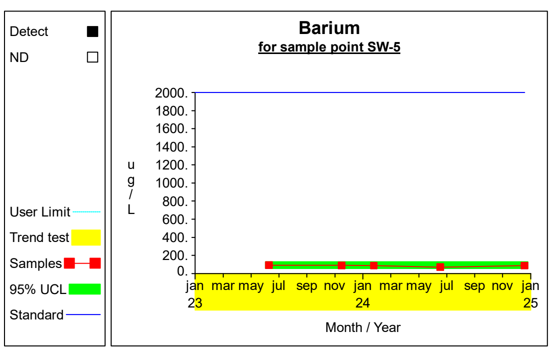


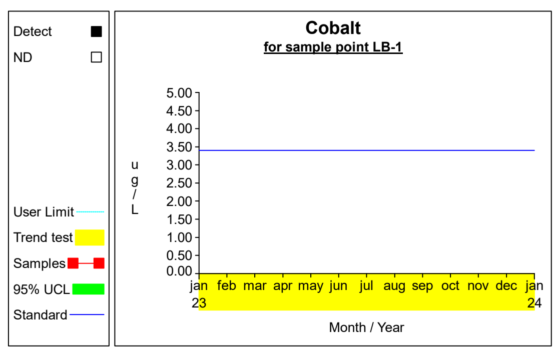


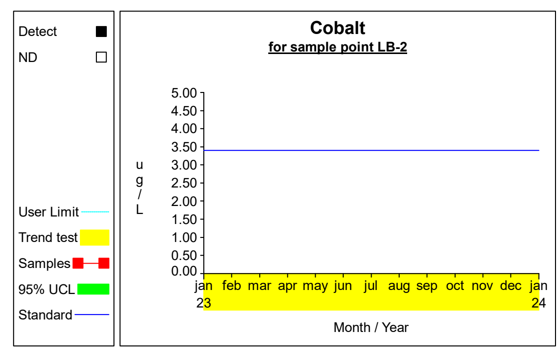






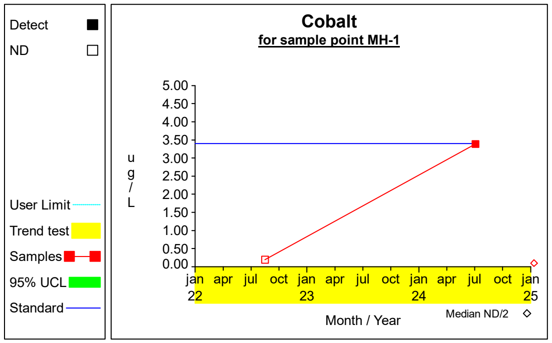


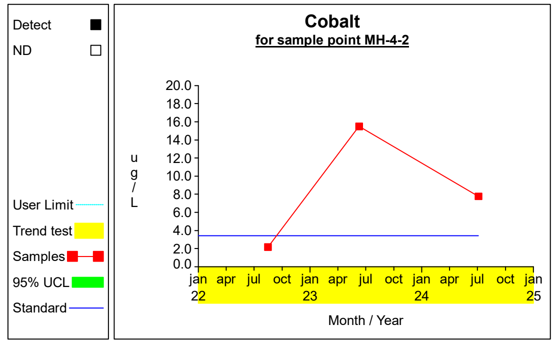


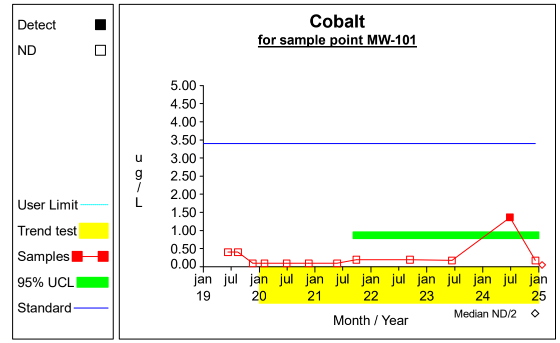


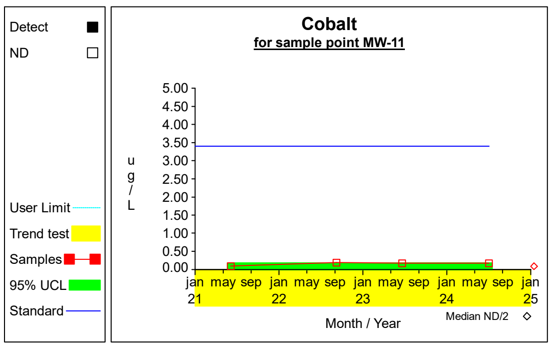
Winneshiek [ACM] Analysis prepared on: 3/19/2025

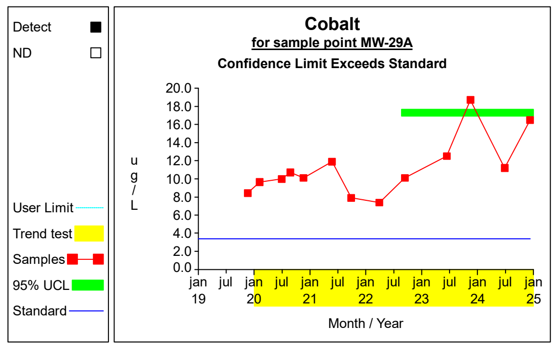
Confidence Limits (Assessment)

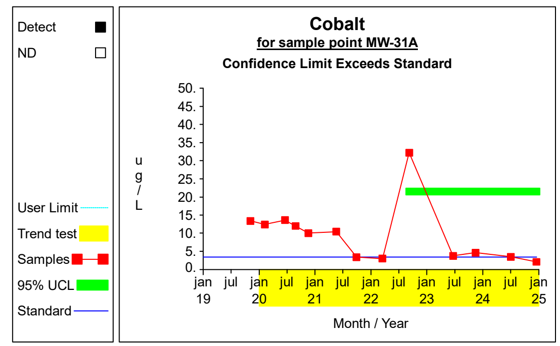


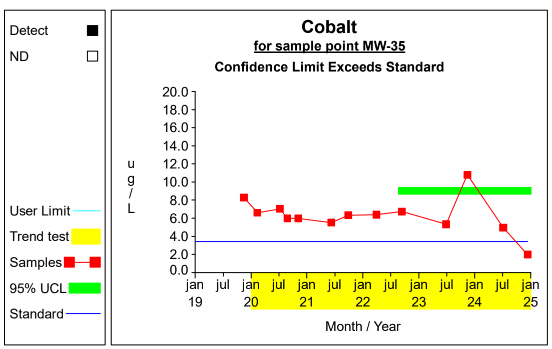


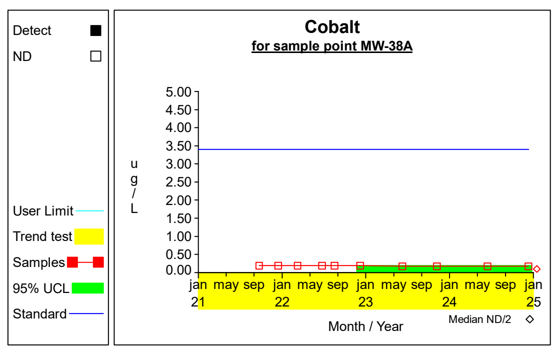


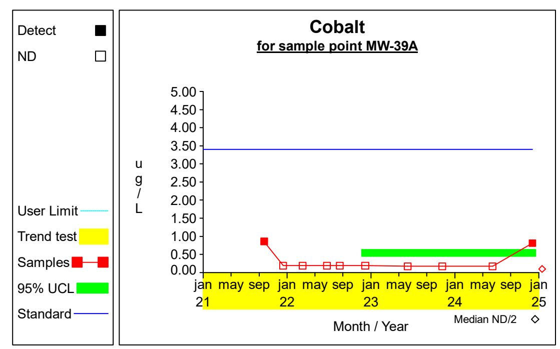




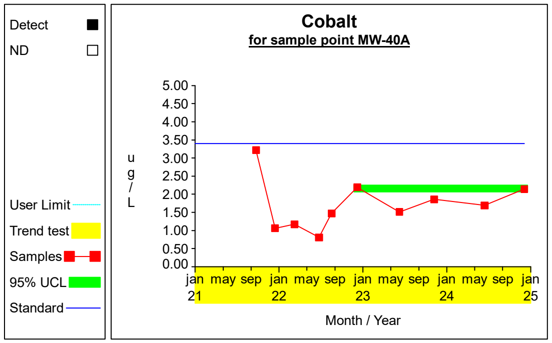


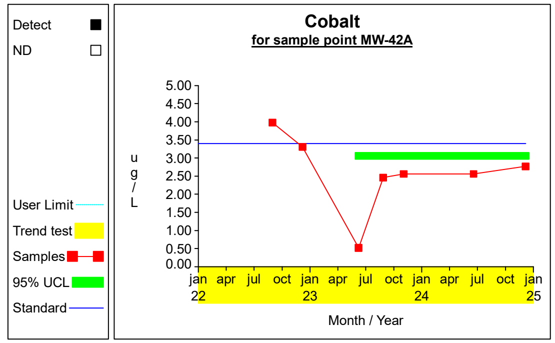


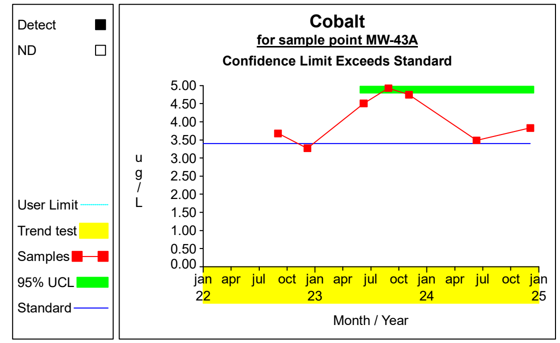


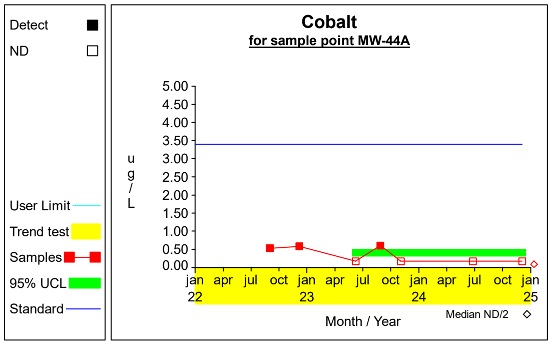


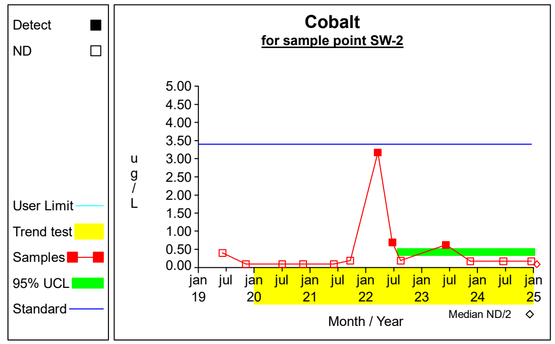
Confidence Limits (Assessment)

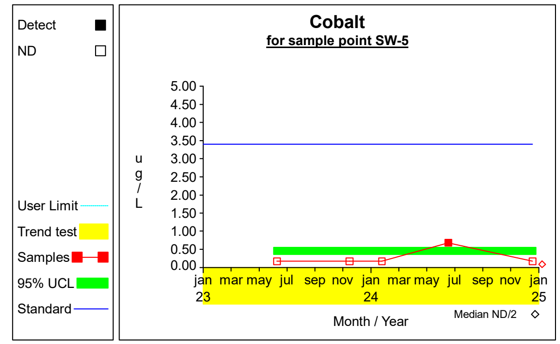


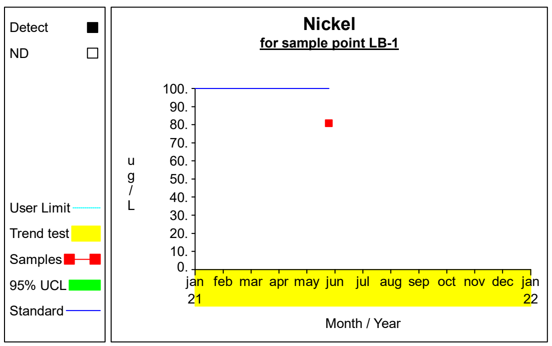


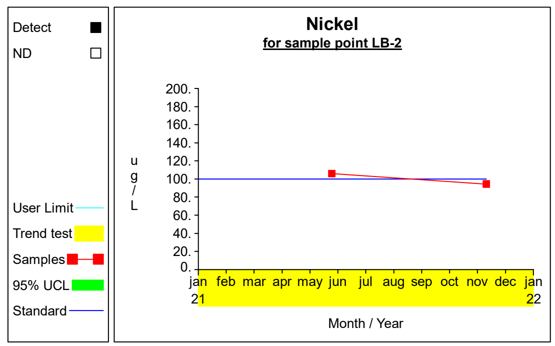


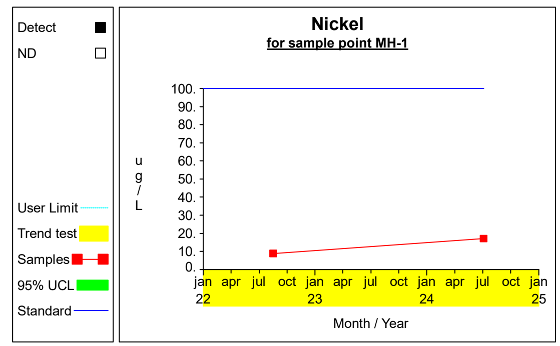




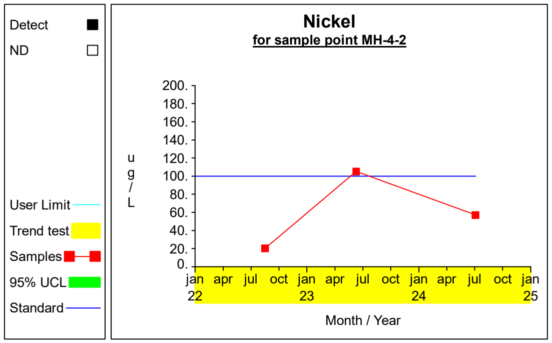


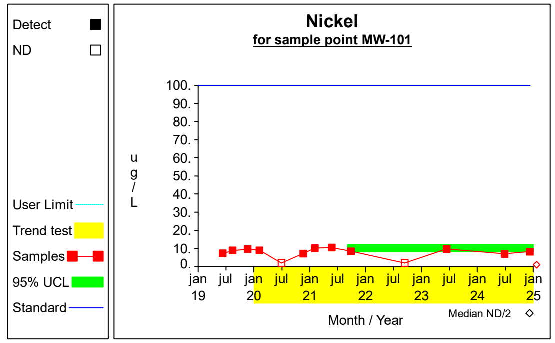


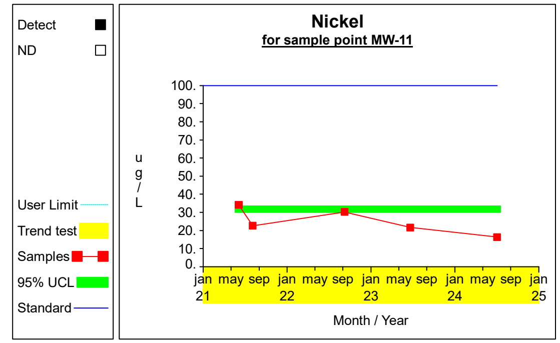


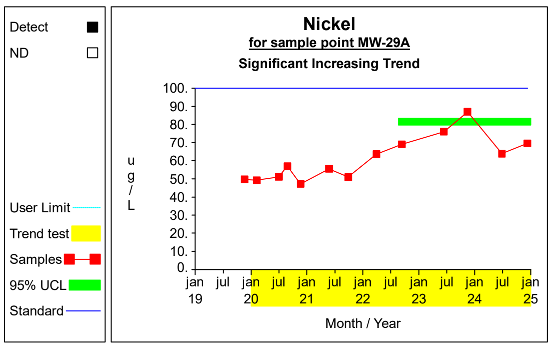


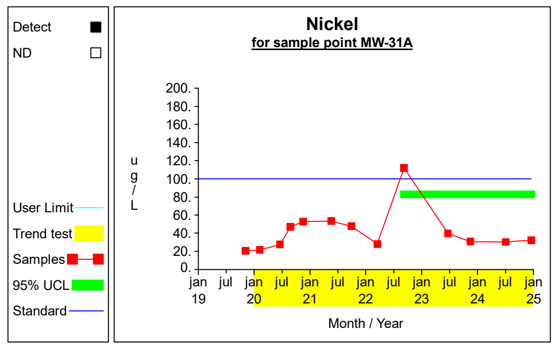
Confidence Limits (Assessment)

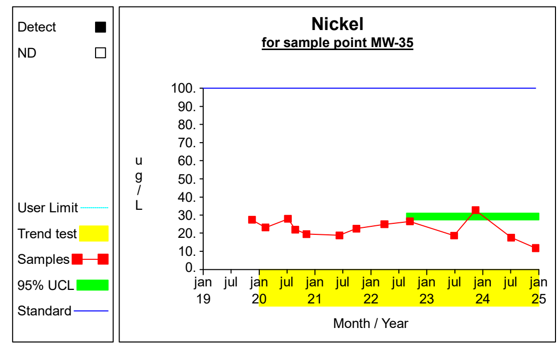


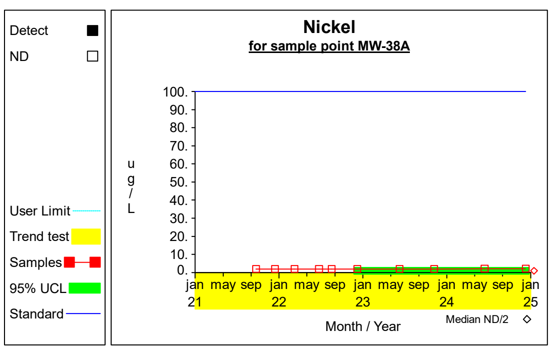


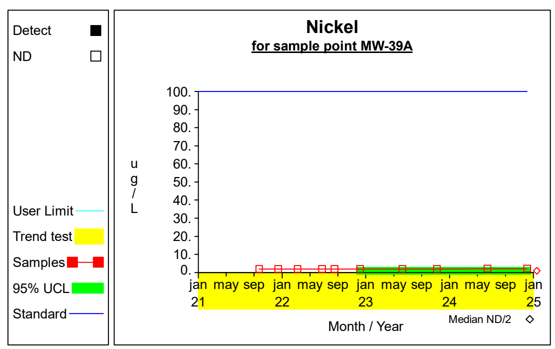


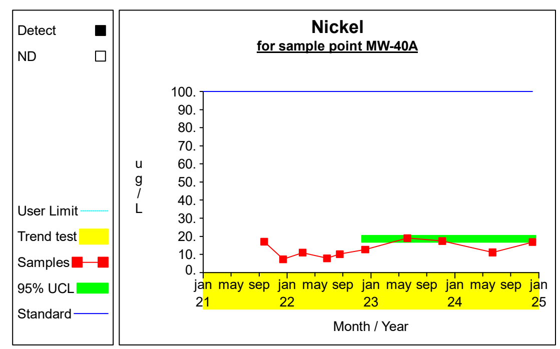




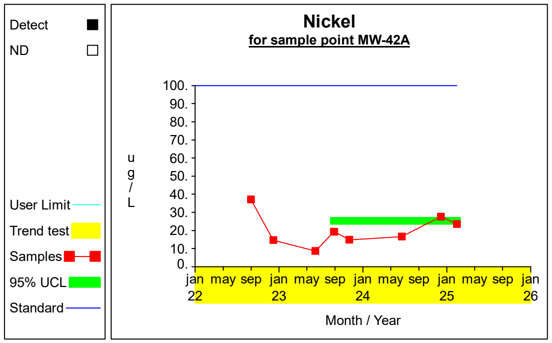


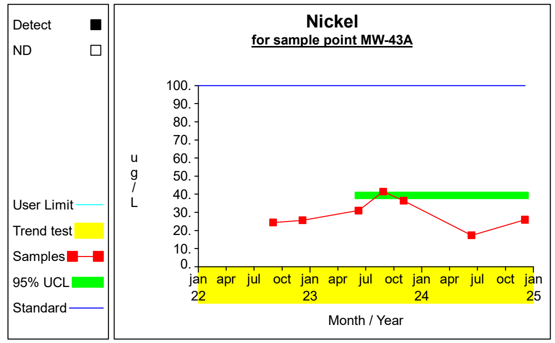


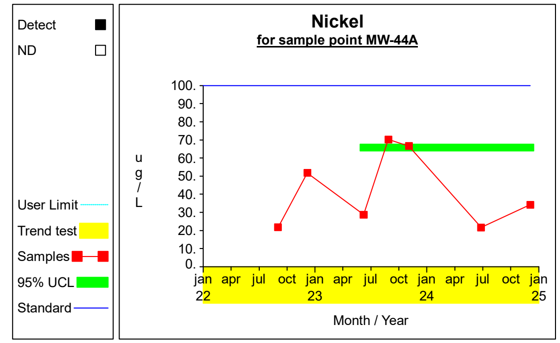


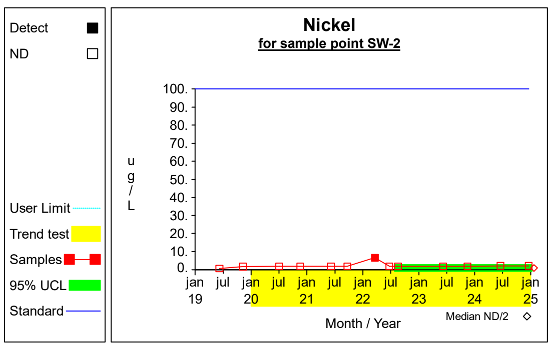


Confidence Limits (Assessment)









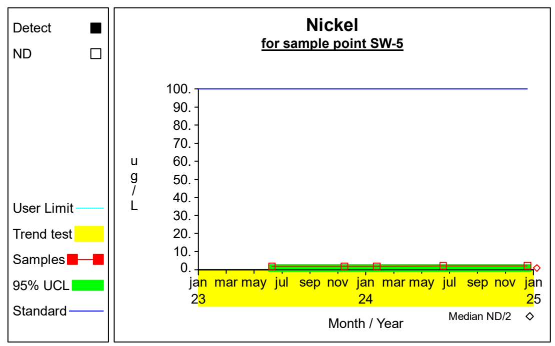


Table 1

Confidence Intervals for Comparing the Mean of the Last 5 Measurements to an Assessment Monitoring Standard

Constituent	Units	Well	N	Mean	SD	Factor	95% LCL	95% UCL	Standard	Trend
Arsenic	ug/L	LB-1	1							
Arsenic	ug/L	LB-2	2							
Arsenic	ug/L	MH-1	2							
Arsenic	ug/L	MH-4-2	3							
Arsenic	ug/L	MW-101	5	0.375	0.000	0.953	0.375	0.375	10.000	
Arsenic	ug/L	MW-11	4	0.265	0.000	1.176	0.265	0.265	10.000	
Arsenic	ug/L	MW-29A	5	6.470	2.352	0.953	4.228	8.712	10.000	
Arsenic	ug/L	MW-31A	5	0.375	0.000	0.953	0.375	0.375	10.000	
Arsenic	ug/L	MW-35	5	0.375	0.000	0.953	0.375	0.375	10.000	
Arsenic	ug/L	MW-38A	5	0.375	0.000	0.953	0.375	0.375	10.000	
Arsenic	ug/L	MW-39A	5	0.375	0.000	0.953	0.375	0.375	10.000	
Arsenic	ug/L	MW-40A	5	0.375	0.000	0.953	0.375	0.375	10.000	
Arsenic	ug/L	MW-42A	5	0.265	0.000	0.953	0.265	0.265	10.000	
Arsenic	ug/L	MW-43A	5	7.908	1.566	0.953	6.415	9.401	10.000	
Arsenic	ug/L	MW-44A	5	0.265	0.000	0.953	0.265	0.265	10.000	
Arsenic	ug/L	SW-2	5	0.375	0.000	0.953	0.375	0.375	10.000	
Arsenic	ug/L	SW-5	5	0.265	0.000	0.953	0.265	0.265	10.000	
Barium	ug/L	LB-1	1							
Barium	ug/L	LB-2	2							
Barium	ug/L	MH-1	2							
Barium	ug/L	MH-4-2	3							
Barium	ug/L	MW-101	5	199.800	21.993	0.953	178.835	220.765	2000.000	
Barium	ug/L	MW-11	4	16.525	2.027	1.176	14.141	18.909	2000.000	dec
Barium	ug/L	MW-29A	5	170.600	17.459	0.953	153.957	187.243	2000.000	
Barium	ug/L	MW-31A	5	286.000	89.163	0.953	201.005	370.995	2000.000	
Barium	ug/L	MW-35	5	308.400	105.182	0.953	208.134	408.666	2000.000	
Barium	ug/L	MW-38A	5	145.000	8.485	0.953	136.911	153.089	2000.000	
Barium	ug/L	MW-39A	5	148.000	6.892	0.953	141.430	154.570	2000.000	
Barium	ug/L	MW-40A	5	221.400	11.393	0.953	210.540	232.260	2000.000	dec
Barium	ug/L	MW-42A	5	122.880	35.345	0.953	89.187	156.573	2000.000	
Barium	ug/L	MW-43A	5	216.200	46.446	0.953	171.925	260.475	2000.000	
Barium	ug/L	MW-44A	5	189.000	52.972	0.953	138.504	239.496	2000.000	
Barium	ug/L	SW-2	5	99.760	8.025	0.953	92.110	107.410	2000.000	
Barium	ug/L	SW-5	5	85.160	8.618	0.953	76.945	93.375	2000.000	
Cobalt	ug/L	LB-1	0							
Cobalt	ug/L	LB-2	0							
Cobalt	ug/L	MH-1	2							
Cobalt	ug/L	MH-4-2	3							
Cobalt	ug/L	MW-101	5	0.308	0.588	0.953	0.000	0.869	3.400	
Cobalt	ug/L	MW-11	4	0.085	0.000	1.176	0.085	0.085	3.400	
Cobalt	ug/L	MW-29A	5	13.800	3.655	0.953	10.316	17.284	3.400	
Cobalt	ug/L	MW-31A	5	9.228	12.874	0.953	0.000	21.500	3.400	
Cobalt	ug/L	MW-35	5	5.962	3.212	0.953	2.900	9.024	3.400	
Cobalt	ug/L	MW-38A	5	0.095	0.000	0.953	0.095	0.095	3.400	
Cobalt	ug/L	MW-39A	5	0.238	0.321	0.953	0.000	0.544	3.400	
Cobalt	ug/L	MW-40A	5	1.878	0.290	0.953	1.601	2.155	3.400	
Cobalt	ug/L	MW-42A	5	2.174	0.932	0.953	1.285	3.062	3.400	
Cobalt	ug/L	MW-43A	5	4.302	0.617	0.953	3.714	4.890	3.400	
Cobalt	ug/L	MW-44A	5	0.189	0.232	0.953	0.000	0.409	3.400	
Cobalt	ug/L	SW-2	5	0.192	0.240	0.953	0.000	0.421	3.400	
Cobalt	ug/L	SW-5	5	0.204	0.266	0.953	0.000	0.457	3.400	

* - Insufficient Data
** - Significant Exceedance
LCL = Lower Confidence Limit
UCL = Upper Confidence Limit

Table 1

Confidence Intervals for Comparing the Mean of the Last 5 Measurements to an Assessment Monitoring Standard

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* - Insufficient Data
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LCL = Lower Confidence Limit
UCL = Upper Confidence Limit

Table 1

Confidence Intervals for Comparing the Mean of the Last 5 Measurements to an Assessment Monitoring Standard

Constituent	Units	Well	N	Mean	SD	Factor	95% LCL	95% UCL	Standard	Trend
Nickel	ug/L	LB-1	1							
Nickel	ug/L	LB-2	2							
Nickel	ug/L	MH-1	2							
Nickel	ug/L	MH-4-2	3							
Nickel	ug/L	MW-101	5	6.798	3.406	0.953	3.551	10.045	100.000	
Nickel	ug/L	MW-11	5	24.960	7.121	0.953	18.172	31.748	100.000	
Nickel	ug/L	MW-29A	5	73.120	8.867	0.953	64.667	81.573	100.000	inc
Nickel	ug/L	MW-31A	5	49.020	35.409	0.953	15.266	82.774	100.000	
Nickel	ug/L	MW-35	5	21.460	8.179	0.953	13.663	29.257	100.000	
Nickel	ug/L	MW-38A	5	0.950	0.000	0.953	0.950	0.950	100.000	
Nickel	ug/L	MW-39A	5	0.950	0.000	0.953	0.950	0.950	100.000	
Nickel	ug/L	MW-40A	5	15.400	3.343	0.953	12.213	18.587	100.000	
Nickel	ug/L	MW-42A	5	20.360	5.207	0.953	15.396	25.324	100.000	
Nickel	ug/L	MW-43A	5	30.420	9.373	0.953	21.485	39.355	100.000	
Nickel	ug/L	MW-44A	5	44.260	22.521	0.953	22.792	65.728	100.000	
Nickel	ug/L	SW-2	5	0.950	0.000	0.953	0.950	0.950	100.000	
Nickel	ug/L	SW-5	5	0.950	0.000	0.953	0.950	0.950	100.000	

* - Insufficient Data
** - Significant Exceedance
LCL = Lower Confidence Limit
UCL = Upper Confidence Limit

Table 1

Confidence Intervals for Comparing the Mean of the Last 5 Measurements to an Assessment Monitoring Standard

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* - Insufficient Data
** - Significant Exceedance
LCL = Lower Confidence Limit
UCL = Upper Confidence Limit

Worksheet 6 - Assessment Monitoring
Arsenic (ug/L) at MW-101

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **1.875** / **5** = **0.375**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]**^{2}/**N**) / (**N**-1))^{½} = ((**0.703** - **3.516**/**5**) / (**5**-1))^{½} = **0.0**	Compute sd of the last 5 measurements.
3	LCL = $\overline{X}$ - **tS**/**N**^{½} = **0.375** - **2.132** * **0.0**/**5**^{½} = **0.375**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{X}$ + **tS**/**N**^{½} = **0.375** + **2.132** * **0.0**/**5**^{½} = **0.375**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **9** * (**9**-1) / 2 = **36**	Number of sample pairs during trend detection period.
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **0.0**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**36** ± **2.576** * **0.0**^{½}) / 2 = [**18.0**, **18.0**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**0.0**, **0.0**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Arsenic (ug/L) at MW-11

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **1.06** / **4** = **0.265**	Compute the mean of the last 4 measurements.
2	$S = ((\mathbf{sum[X^2]} - \mathbf{sum[X]}^2/\mathbf{N}) / (\mathbf{N}-1))^{1/2}$ $= ((\mathbf{0.281} - \mathbf{1.124/4}) / (\mathbf{4}-1))^{1/2}$ $= \mathbf{1.85 \times 10^{-9}}$	Compute sd of the last 4 measurements.
3	$LCL = \overline{\mathbf{X}} - \mathbf{tS/N}^{1/2}$ $= \mathbf{0.265} - \mathbf{2.353} * \mathbf{1.85 \times 10^{-9}/4}^{1/2}$ = **0.265**	Compute lower confidence limit for the mean of the last 4 measurements.
4	$UCL = \overline{\mathbf{X}} + \mathbf{tS/N}^{1/2}$ $= \mathbf{0.265} + \mathbf{2.353} * \mathbf{1.85 \times 10^{-9}/4}^{1/2}$ = **0.265**	Compute upper confidence limit for the mean of the last 4 measurements.
5	N' = **N** * (**N**-1) / 2 = **4** * (**4**-1) / 2 = **6**	Number of sample pairs during trend detection period.
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **0.0**	Variance estimate for slope.
8	$M(S) = (\mathbf{N'} \pm \mathbf{Z}_{.995} * \mathbf{var(S)}^{1/2}) / 2$ $= (\mathbf{6} \pm \mathbf{2.576} * \mathbf{0.0}^{1/2}) / 2$ = [**3.0**, **3.0**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**0.0**, **0.0**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Arsenic (ug/L) at MW-29A

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **32.35** / **5** = **6.47**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**231.431** - **1046.523/5**) / (**5**-1))^{½} = **2.352**	Compute sd of the last 5 measurements.
3	LCL = $\overline{\mathbf{X}}$ - **tS/N**^{½} = **6.47** - **2.132** * **2.352/5**^{½} = **4.228**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{\mathbf{X}}$ + **tS/N**^{½} = **6.47** + **2.132** * **2.352/5**^{½} = **8.712**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **12** * (**12**-1) / 2 = **66**	Number of sample pairs during trend detection period.
6	S = **0.594**	Sen's estimator of trend.
7	var(S) = **212.667**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**66** ± **2.576** * **212.667**^{½}) / 2 = [**14.217**, **51.783**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-0.669**, **2.286**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Arsenic (ug/L) at MW-31A

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **1.875** / **5** = **0.375**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**0.703** - **3.516/5**) / (**5**-1))^{½} = **0.0**	Compute sd of the last 5 measurements.
3	LCL = $\overline{\mathbf{X}}$ - **tS/N**^{½} = **0.375** - **2.132** * **0.0/5**^{½} = **0.375**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{\mathbf{X}}$ + **tS/N**^{½} = **0.375** + **2.132** * **0.0/5**^{½} = **0.375**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **12** * (**12**-1) / 2 = **66**	Number of sample pairs during trend detection period.
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **120.667**	Variance estimate for slope.
8	M(S) = (**N'** ± $\mathbf{Z}_{.995}$ * **var(S)**^{½}) / 2 = (**66** ± **2.576** * **120.667**^{½}) / 2 = [**18.852**, **47.148**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-0.744**, **0.0**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Arsenic (ug/L) at MW-35

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **1.875** / **5** = **0.375**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**0.703** - **3.516/5**) / (**5**-1))^{½} = **0.0**	Compute sd of the last 5 measurements.
3	LCL = $\overline{\mathbf{X}}$ - **tS/N**^{½} = **0.375** - **2.132** * **0.0/5**^{½} = **0.375**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{\mathbf{X}}$ + **tS/N**^{½} = **0.375** + **2.132** * **0.0/5**^{½} = **0.375**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **12** * (**12**-1) / 2 = **66**	Number of sample pairs during trend detection period.
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **0.0**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**66** ± **2.576** * **0.0**^{½}) / 2 = [**33.0**, **33.0**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**0.0**, **0.0**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Arsenic (ug/L) at MW-38A

Step	Equation	Description
1	$\bar{X}$ = **sum[X]** / **N** = **1.875** / **5** = **0.375**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**0.703** - **3.516/5**) / (**5**-1))^{½} = **0.0**	Compute sd of the last 5 measurements.
3	LCL = $\bar{X}$ - **tS/N**^{½} = **0.375** - **2.132** * **0.0/5**^{½} = **0.375**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\bar{X}$ + **tS/N**^{½} = **0.375** + **2.132** * **0.0/5**^{½} = **0.375**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **10** * (**10**-1) / 2 = **45**	Number of sample pairs during trend detection period.
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **33.0**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**45** ± **2.576** * **33.0**^{½}) / 2 = [**15.101**, **29.899**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**0.0**, **0.0**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Arsenic (ug/L) at MW-39A

Step	Equation	Description
1	$\bar{X}$ = **sum[X]** / **N** = **1.875** / **5** = **0.375**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**0.703** - **3.516/5**) / (**5**-1))^{½} = **0.0**	Compute sd of the last 5 measurements.
3	LCL = $\bar{X}$ - **tS/N**^{½} = **0.375** - **2.132** * **0.0/5**^{½} = **0.375**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\bar{X}$ + **tS/N**^{½} = **0.375** + **2.132** * **0.0/5**^{½} = **0.375**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **10** * (**10**-1) / 2 = **45**	Number of sample pairs during trend detection period.
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **0.0**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**45** ± **2.576** * **0.0**^{½}) / 2 = [**22.5**, **22.5**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**0.0**, **0.0**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Arsenic (ug/L) at MW-40A

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **1.875** / **5** = **0.375**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2**/**N**) / (**N**-1))$^{1/2}$ = ((**0.703** - **3.516**/**5**) / (**5**-1))$^{1/2}$ = **0.0**	Compute sd of the last 5 measurements.
3	LCL = $\overline{X}$ - **tS/N**$^{1/2}$ = **0.375** - **2.132** * **0.0/5**$^{1/2}$ = **0.375**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{X}$ + **tS/N**$^{1/2}$ = **0.375** + **2.132** * **0.0/5**$^{1/2}$ = **0.375**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **10** * (**10**-1) / 2 = **45**	Number of sample pairs during trend detection period.
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **0.0**	Variance estimate for slope.
8	M(S) = (**N'** ± $Z_{.995}$ * **var(S)**$^{1/2}$) / 2 = (**45** ± **2.576** * **0.0**$^{1/2}$) / 2 = [**22.5**, **22.5**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**0.0**, **0.0**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Arsenic (ug/L) at MW-42A

Step	Equation	Description
1	$\overline{X} = \mathbf{sum[X]} / \mathbf{N}$ $= \mathbf{1.325} / \mathbf{5}$ $= \mathbf{0.265}$	Compute the mean of the last 5 measurements.
2	$S = ((\mathbf{sum[X^2]} - \mathbf{sum[X]}^2/\mathbf{N}) / (\mathbf{N}-1))^{1/2}$ $= ((\mathbf{0.351} - \mathbf{1.756}/\mathbf{5}) / (\mathbf{5}-1))^{1/2}$ $= \mathbf{0.0}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\mathbf{X}} - \mathbf{tS/N}^{1/2}$ $= \mathbf{0.265} - \mathbf{2.132} * \mathbf{0.0/5}^{1/2}$ $= \mathbf{0.265}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\mathbf{X}} + \mathbf{tS/N}^{1/2}$ $= \mathbf{0.265} + \mathbf{2.132} * \mathbf{0.0/5}^{1/2}$ $= \mathbf{0.265}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \mathbf{N} * (\mathbf{N}-1) / 2$ $= \mathbf{7} * (\mathbf{7}-1) / 2$ $= \mathbf{21}$	Number of sample pairs during trend detection period.
6	$S = \mathbf{0.0}$	Sen's estimator of trend.
7	$var(S) = \mathbf{16.0}$	Variance estimate for slope.
8	$M(S) = (\mathbf{N'} \pm \mathbf{Z}_{.995} * \mathbf{var(S)}^{1/2}) / 2$ $= (\mathbf{21} \pm \mathbf{2.576} * \mathbf{16.0}^{1/2}) / 2$ $= [\ \mathbf{5.348}, \mathbf{15.652}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \mathbf{-0.88}, \mathbf{0.0}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Arsenic (ug/L) at MW-43A

Step	Equation	Description
1	$\bar{X}$ = **sum[X]** / **N** = **39.54** / **5** = **7.908**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]**^{2}/**N**) / (**N**-1))^{½} = ((**322.498** - **1563.412**/**5**) / (**5**-1))^{½} = **1.566**	Compute sd of the last 5 measurements.
3	LCL = $\bar{X}$ - **tS/N**^{½} = **7.908** - **2.132** * **1.566/5**^{½} = **6.415**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\bar{X}$ + **tS/N**^{½} = **7.908** + **2.132** * **1.566/5**^{½} = **9.401**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **7** * (**7**-1) / 2 = **21**	Number of sample pairs during trend detection period.
6	S = **-0.512**	Sen's estimator of trend.
7	var(S) = **44.333**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**21** ± **2.576** * **44.333**^{½}) / 2 = [**1.924**, **19.076**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-3.456**, **2.803**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Arsenic (ug/L) at MW-44A

Step	Equation	Description
1	$\bar{X}$ = **sum[X]** / **N** = **1.325** / **5** = **0.265**	Compute the mean of the last 5 measurements.
2	$S = ((\mathbf{sum[X^2]} - \mathbf{sum[X]}^2/\mathbf{N}) / (\mathbf{N}-1))^{½}$ $= ((\mathbf{0.351} - \mathbf{1.756}/\mathbf{5}) / (\mathbf{5}-1))^{½}$ = **0.0**	Compute sd of the last 5 measurements.
3	$LCL = \bar{\mathbf{X}} - \mathbf{tS/N}^{½}$ $= \mathbf{0.265} - \mathbf{2.132} * \mathbf{0.0/5}^{½}$ = **0.265**	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \bar{\mathbf{X}} + \mathbf{tS/N}^{½}$ $= \mathbf{0.265} + \mathbf{2.132} * \mathbf{0.0/5}^{½}$ = **0.265**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **7** * (**7**-1) / 2 = **21**	Number of sample pairs during trend detection period.
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **0.0**	Variance estimate for slope.
8	$M(S) = (\mathbf{N'} \pm \mathbf{Z}_{.995} * \mathbf{var(S)}^{½}) / 2$ $= (\mathbf{21} \pm \mathbf{2.576} * \mathbf{0.0}^{½}) / 2$ = [**10.5**, **10.5**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**0.0**, **0.0**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Arsenic (ug/L) at SW-2

Step	Equation	Description
1	$\overline{X} = \textbf{sum[X]} / \textbf{N}$ $= \textbf{1.875} / \textbf{5}$ $= \textbf{0.375}$	Compute the mean of the last 5 measurements.
2	$S = ((\textbf{sum[X}^2\textbf{]} - \textbf{sum[X]}^2/\textbf{N}) / (\textbf{N}-1))^{1/2}$ $= ((\textbf{0.703} - \textbf{3.516}/\textbf{5}) / (\textbf{5}-1))^{1/2}$ $= \textbf{0.0}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\textbf{X}} - \textbf{tS}/\textbf{N}^{1/2}$ $= \textbf{0.375} - \textbf{2.132} * \textbf{0.0}/\textbf{5}^{1/2}$ $= \textbf{0.375}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\textbf{X}} + \textbf{tS}/\textbf{N}^{1/2}$ $= \textbf{0.375} + \textbf{2.132} * \textbf{0.0}/\textbf{5}^{1/2}$ $= \textbf{0.375}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \textbf{N} * (\textbf{N}-1) / 2$ $= \textbf{11} * (\textbf{11}-1) / 2$ $= \textbf{55}$	Number of sample pairs during trend detection period.
6	$S = \textbf{0.0}$	Sen's estimator of trend.
7	$var(S) = \textbf{0.0}$	Variance estimate for slope.
8	$M(S) = (\textbf{N'} \pm \textbf{Z}_{.995} * \textbf{var(S)}^{1/2}) / 2$ $= (\textbf{55} \pm \textbf{2.576} * \textbf{0.0}^{1/2}) / 2$ $= [\ \textbf{27.5}, \textbf{27.5}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \textbf{0.0}, \textbf{0.0}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Arsenic (ug/L) at SW-5

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **1.325** / **5** = **0.265**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]**^{2}/**N**) / (**N**-1))^{½} = ((**0.351** - **1.756**/**5**) / (**5**-1))^{½} = **0.0**	Compute sd of the last 5 measurements.
3	LCL = $\overline{\mathbf{X}}$ - **tS**/**N**^{½} = **0.265** - **2.132** * **0.0**/**5**^{½} = **0.265**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{\mathbf{X}}$ + **tS**/**N**^{½} = **0.265** + **2.132** * **0.0**/**5**^{½} = **0.265**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **5** * (**5**-1) / 2 = **10**	Number of sample pairs during trend detection period.
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **0.0**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**10** ± **2.576** * **0.0**^{½}) / 2 = [**5.0**, **5.0**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**0.0**, **0.0**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Barium (ug/L) at MW-101

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **999.0** / **5** = **199.8**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]**^{2}/**N**) / (**N**-1))^{½} = ((**201535.0** - **998001.0**/**5**) / (**5**-1))^{½} = **21.993**	Compute sd of the last 5 measurements.
3	LCL = $\overline{X}$ - **tS/N**^{½} = **199.8** - **2.132** * **21.993/5**^{½} = **178.835**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{X}$ + **tS/N**^{½} = **199.8** + **2.132** * **21.993/5**^{½} = **220.765**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **10** * (**10**-1) / 2 = **45**	Number of sample pairs during trend detection period.
6	S = **2.092**	Sen's estimator of trend.
7	var(S) = **125.0**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**45** ± **2.576** * **125.0**^{½}) / 2 = [**8.1**, **36.9**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-12.655**, **11.216**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Barium (ug/L) at MW-11

Step	Equation	Description
1	$\bar{X}$ = **sum[X]** / **N** = **66.1** / **4** = **16.525**	Compute the mean of the last 4 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2**/**N**) / (**N**-1))^{½} = ((**1104.63** - **4369.21**/**4**) / (**4**-1))^{½} = **2.027**	Compute sd of the last 4 measurements.
3	LCL = $\bar{X}$ - **tS/N**^{½} = **16.525** - **2.353** * **2.027/4**^{½} = **14.141**	Compute lower confidence limit for the mean of the last 4 measurements.
4	UCL = $\bar{X}$ + **tS/N**^{½} = **16.525** + **2.353** * **2.027/4**^{½} = **18.909**	Compute upper confidence limit for the mean of the last 4 measurements.
5	N' = **N** * (**N**-1) / 2 = **4** * (**4**-1) / 2 = **6**	Number of sample pairs during trend detection period.
6	S = **-1.521**	Sen's estimator of trend.
7	var(S) = **8.667**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**6** ± **2.576** * **8.667**^{½}) / 2 = [**-0.792**, **6.792**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-2.935**, **-0.792**]	Two-sided confidence interval for slope.
10	UCL(S) < 0	**Significant decreasing trend.**

Worksheet 6 - Assessment Monitoring
Barium (ug/L) at MW-29A

Step	Equation	Description
1	$\overline{X} = \mathbf{sum[X]} / \mathbf{N}$ $= \mathbf{853.0} / \mathbf{5}$ $= \mathbf{170.6}$	Compute the mean of the last 5 measurements.
2	$S = ((\mathbf{sum[X^2]} - \mathbf{sum[X]}^2/\mathbf{N}) / (\mathbf{N}-1))^{½}$ $= ((\mathbf{146741.0} - \mathbf{727609.0}/\mathbf{5}) / (\mathbf{5}-1))^{½}$ $= \mathbf{17.459}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\mathbf{X}} - \mathbf{tS/N}^{½}$ $= \mathbf{170.6} - \mathbf{2.132} * \mathbf{17.459/5}^{½}$ $= \mathbf{153.957}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\mathbf{X}} + \mathbf{tS/N}^{½}$ $= \mathbf{170.6} + \mathbf{2.132} * \mathbf{17.459/5}^{½}$ $= \mathbf{187.243}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \mathbf{N} * (\mathbf{N}-1) / 2$ $= \mathbf{12} * (\mathbf{12}-1) / 2$ $= \mathbf{66}$	Number of sample pairs during trend detection period.
6	$S = \mathbf{-4.007}$	Sen's estimator of trend.
7	$var(S) = \mathbf{212.667}$	Variance estimate for slope.
8	$M(S) = (\mathbf{N'} \pm \mathbf{Z}_{.995} * \mathbf{var(S)}^{½}) / 2$ $= (\mathbf{66} \pm \mathbf{2.576} * \mathbf{212.667}^{½}) / 2$ $= [\ \mathbf{14.217}, \mathbf{51.783}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \mathbf{-19.122}, \mathbf{9.998}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Barium (ug/L) at MW-31A

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **1430.0** / **5** = **286.0**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**440780.0** - **2.04**x**10^6/5**) / (**5**-1))^{½} = **89.163**	Compute sd of the last 5 measurements.
3	LCL = $\overline{X}$ - **tS/N**^{½} = **286.0** - **2.132** * **89.163/5**^{½} = **201.005**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{X}$ + **tS/N**^{½} = **286.0** + **2.132** * **89.163/5**^{½} = **370.995**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **12** * (**12**-1) / 2 = **66**	Number of sample pairs during trend detection period.
6	S = **-18.743**	Sen's estimator of trend.
7	var(S) = **211.667**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**66** ± **2.576** * **211.667**^{½}) / 2 = [**14.261**, **51.739**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-124.935**, **41.837**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Barium (ug/L) at MW-35

Step	Equation	Description
1	$\overline{X} = \mathbf{sum[X]} / \mathbf{N}$ $= \mathbf{1542.0} / \mathbf{5}$ $= \mathbf{308.4}$	Compute the mean of the last 5 measurements.
2	$S = ((\mathbf{sum[X^2]} - \mathbf{sum[X]}^2/\mathbf{N}) / (\mathbf{N}-1))^{1/2}$ $= ((\mathbf{519806.0} - \mathbf{2.38}\times\mathbf{10^6}/\mathbf{5}) / (\mathbf{5}-1))^{1/2}$ $= \mathbf{105.182}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\mathbf{X}} - \mathbf{tS/N}^{1/2}$ $= \mathbf{308.4} - \mathbf{2.132} * \mathbf{105.182/5}^{1/2}$ $= \mathbf{208.134}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\mathbf{X}} + \mathbf{tS/N}^{1/2}$ $= \mathbf{308.4} + \mathbf{2.132} * \mathbf{105.182/5}^{1/2}$ $= \mathbf{408.666}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \mathbf{N} * (\mathbf{N}-1) / 2$ $= \mathbf{12} * (\mathbf{12}-1) / 2$ $= \mathbf{66}$	Number of sample pairs during trend detection period.
6	$S = \mathbf{-5.575}$	Sen's estimator of trend.
7	$var(S) = \mathbf{212.667}$	Variance estimate for slope.
8	$M(S) = (\mathbf{N'} \pm \mathbf{Z}_{.995} * \mathbf{var(S)}^{1/2}) / 2$ $= (\mathbf{66} \pm \mathbf{2.576} * \mathbf{212.667}^{1/2}) / 2$ $= [\ \mathbf{14.217}, \mathbf{51.783}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \mathbf{-35.507}, \mathbf{38.169}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Barium (ug/L) at MW-38A

Step	Equation	Description
1	$\overline{X} = \mathbf{sum[X]} / \mathbf{N}$ $= \mathbf{725.0} / \mathbf{5}$ $= \mathbf{145.0}$	Compute the mean of the last 5 measurements.
2	$S = ((\mathbf{sum[X^2]} - \mathbf{sum[X]}^2/\mathbf{N}) / (\mathbf{N}-1))^{1/2}$ $= ((\mathbf{105413.0} - \mathbf{525625.0}/\mathbf{5}) / (\mathbf{5}-1))^{1/2}$ $= \mathbf{8.485}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\mathbf{X}} - \mathbf{tS/N}^{1/2}$ $= \mathbf{145.0} - \mathbf{2.132} * \mathbf{8.485/5}^{1/2}$ $= \mathbf{136.911}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\mathbf{X}} + \mathbf{tS/N}^{1/2}$ $= \mathbf{145.0} + \mathbf{2.132} * \mathbf{8.485/5}^{1/2}$ $= \mathbf{153.089}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \mathbf{N} * (\mathbf{N}-1) / 2$ $= \mathbf{10} * (\mathbf{10}-1) / 2$ $= \mathbf{45}$	Number of sample pairs during trend detection period.
6	$S = \mathbf{5.074}$	Sen's estimator of trend.
7	$var(S) = \mathbf{123.0}$	Variance estimate for slope.
8	$M(S) = (\mathbf{N'} \pm \mathbf{Z}_{.995} * \mathbf{var(S)}^{1/2}) / 2$ $= (\mathbf{45} \pm \mathbf{2.576} * \mathbf{123.0}^{1/2}) / 2$ $= [\ \mathbf{8.215}, \mathbf{36.785}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \mathbf{-19.731}, \mathbf{24.389}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Barium (ug/L) at MW-39A

Step	Equation	Description
1	$\bar{X}$ = **sum[X]** / **N** = **740.0** / **5** = **148.0**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2**/**N**) / (**N**-1))^{½} = ((**109710.0** - **547600.0**/**5**) / (**5**-1))^{½} = **6.892**	Compute sd of the last 5 measurements.
3	LCL = $\bar{X}$ - **tS**/**N**^{½} = **148.0** - **2.132** * **6.892**/**5**^{½} = **141.43**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\bar{X}$ + **tS**/**N**^{½} = **148.0** + **2.132** * **6.892**/**5**^{½} = **154.57**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **10** * (**10**-1) / 2 = **45**	Number of sample pairs during trend detection period.
6	S = **0.599**	Sen's estimator of trend.
7	var(S) = **123.0**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**45** ± **2.576** * **123.0**^{½}) / 2 = [**8.215**, **36.785**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-13.727**, **8.761**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Barium (ug/L) at MW-40A

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **1107.0** / **5** = **221.4**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**245609.0** - **1.23**x**10^6/5**) / (**5**-1))^{½} = **11.393**	Compute sd of the last 5 measurements.
3	LCL = $\overline{X}$ - **tS/N**^{½} = **221.4** - **2.132** * **11.393/5**^{½} = **210.54**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{X}$ + **tS/N**^{½} = **221.4** + **2.132** * **11.393/5**^{½} = **232.26**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **10** * (**10**-1) / 2 = **45**	Number of sample pairs during trend detection period.
6	S = **-23.808**	Sen's estimator of trend.
7	var(S) = **125.0**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**45** ± **2.576** * **125.0**^{½}) / 2 = [**8.1**, **36.9**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-42.018**, **-4.595**]	Two-sided confidence interval for slope.
10	UCL(S) < 0	**Significant decreasing trend.**

Worksheet 6 - Assessment Monitoring
Barium (ug/L) at MW-42A

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **614.4** / **5** = **122.88**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**80494.56** - **377487.36/5**) / (**5**-1))^{½} = **35.345**	Compute sd of the last 5 measurements.
3	LCL = $\overline{X}$ - **tS/N**^{½} = **122.88** - **2.132** * **35.345/5**^{½} = **89.187**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{X}$ + **tS/N**^{½} = **122.88** + **2.132** * **35.345/5**^{½} = **156.573**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **7** * (**7**-1) / 2 = **21**	Number of sample pairs during trend detection period.
6	S = **5.871**	Sen's estimator of trend.
7	var(S) = **44.333**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**21** ± **2.576** * **44.333**^{½}) / 2 = [**1.924**, **19.076**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-284.312**, **72.404**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Barium (ug/L) at MW-43A

Step	Equation	Description
1	$\bar{X}$ = **sum[X]** / **N** = **1081.0** / **5** = **216.2**	Compute the mean of the last 5 measurements.
2	$S = ((\mathbf{sum[X^2]} - \mathbf{sum[X]}^2/\mathbf{N}) / (\mathbf{N}-1))^{½}$ $= ((\mathbf{242341.0} - \mathbf{1.17}\text{x}\mathbf{10^6}/\mathbf{5}) / (\mathbf{5}-1))^{½}$ = **46.446**	Compute sd of the last 5 measurements.
3	$LCL = \bar{\mathbf{X}} - \mathbf{tS/N}^{½}$ $= \mathbf{216.2} - \mathbf{2.132} * \mathbf{46.446/5}^{½}$ = **171.925**	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \bar{\mathbf{X}} + \mathbf{tS/N}^{½}$ $= \mathbf{216.2} + \mathbf{2.132} * \mathbf{46.446/5}^{½}$ = **260.475**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **7** * (**7**-1) / 2 = **21**	Number of sample pairs during trend detection period.
6	S = **25.929**	Sen's estimator of trend.
7	var(S) = **44.333**	Variance estimate for slope.
8	$M(S) = (\mathbf{N'} \pm \mathbf{Z}_{.995} * \mathbf{var(S)}^{½}) / 2$ $= (\mathbf{21} \pm \mathbf{2.576} * \mathbf{44.333}^{½}) / 2$ = [**1.924**, **19.076**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-115.93**, **140.251**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Barium (ug/L) at MW-44A

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **945.0** / **5** = **189.0**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**189829.0** - **893025.0/5**) / (**5**-1))^{½} = **52.972**	Compute sd of the last 5 measurements.
3	LCL = $\overline{X}$ - **tS/N^{½}** = **189.0** - **2.132** * **52.972/5^{½}** = **138.504**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{X}$ + **tS/N^{½}** = **189.0** + **2.132** * **52.972/5^{½}** = **239.496**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **7** * (**7**-1) / 2 = **21**	Number of sample pairs during trend detection period.
6	S = **-3.991**	Sen's estimator of trend.
7	var(S) = **44.333**	Variance estimate for slope.
8	M(S) = (**N'** ± **$Z_{.995}$** * **var(S)^{½}**) / 2 = (**21** ± **2.576** * **44.333^{½}**) / 2 = [**1.924**, **19.076**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-127.316**, **172.566**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Barium (ug/L) at SW-2

Step	Equation	Description
1	$\overline{X} = \textbf{sum[X]} / \textbf{N}$ $= \textbf{498.8} / \textbf{5}$ $= \textbf{99.76}$	Compute the mean of the last 5 measurements.
2	$S = ((\textbf{sum[X}^2\textbf{]} - \textbf{sum[X]}^2/\textbf{N}) / (\textbf{N}-1))^{1/2}$ $= ((\textbf{50017.9} - \textbf{248801.44}/\textbf{5}) / (\textbf{5}-1))^{1/2}$ $= \textbf{8.025}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\textbf{X}} - \textbf{tS/N}^{1/2}$ $= \textbf{99.76} - \textbf{2.132} * \textbf{8.025/5}^{1/2}$ $= \textbf{92.11}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\textbf{X}} + \textbf{tS/N}^{1/2}$ $= \textbf{99.76} + \textbf{2.132} * \textbf{8.025/5}^{1/2}$ $= \textbf{107.41}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \textbf{N} * (\textbf{N}-1) / 2$ $= \textbf{11} * (\textbf{11}-1) / 2$ $= \textbf{55}$	Number of sample pairs during trend detection period.
6	$S = \textbf{-0.702}$	Sen's estimator of trend.
7	$var(S) = \textbf{164.0}$	Variance estimate for slope.
8	$M(S) = (\textbf{N'} \pm \textbf{Z}_{.995} * \textbf{var(S)}^{1/2}) / 2$ $= (\textbf{55} \pm \textbf{2.576} * \textbf{164.0}^{1/2}) / 2$ $= [\ \textbf{11.006}, \textbf{43.994}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \textbf{-32.069}, \textbf{8.652}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Barium (ug/L) at SW-5

Step	Equation	Description
1	$\overline{X} = \textbf{sum[X]} / \textbf{N}$ $= \textbf{425.8} / \textbf{5}$ $= \textbf{85.16}$	Compute the mean of the last 5 measurements.
2	$S = (\ (\textbf{sum[X}^{\textbf{2}}\textbf{]} - \textbf{sum[X]}^2/\textbf{N}) / (\textbf{N}-1)\ )^{½}$ $= (\ (\textbf{36558.22} - \textbf{181305.64}/\textbf{5}) / (\textbf{5}-1)\ )^{½}$ $= \textbf{8.618}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\textbf{X}} - \textbf{tS/N}^{½}$ $= \textbf{85.16} - \textbf{2.132} * \textbf{8.618/5}^{½}$ $= \textbf{76.945}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\textbf{X}} + \textbf{tS/N}^{½}$ $= \textbf{85.16} + \textbf{2.132} * \textbf{8.618/5}^{½}$ $= \textbf{93.375}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \textbf{N} * (\textbf{N}-1) / 2$ $= \textbf{5} * (\textbf{5}-1) / 2$ $= \textbf{10}$	Number of sample pairs during trend detection period.
6	$S = \textbf{-5.02}$	Sen's estimator of trend.
7	$var(S) = \textbf{16.667}$	Variance estimate for slope.
8	$M(S) = (\textbf{N'} \pm \textbf{Z}_{.995} * \textbf{var(S)}^{½}) / 2$ $= (\textbf{10} \pm \textbf{2.576} * \textbf{16.667}^{½}) / 2$ $= [\ \textbf{-0.258}, \textbf{10.258}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \textbf{-43.208}, \textbf{34.014}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Cobalt (ug/L) at MW-101

Step	Equation	Description
1	$\overline{X} = \textbf{sum[X]} / \textbf{N}$ $= \textbf{1.542} / \textbf{5}$ $= \textbf{0.308}$	Compute the mean of the last 5 measurements.
2	$S = ((\textbf{sum[X}^{\textbf{2}}\textbf{]} - \textbf{sum[X]}^2/\textbf{N}) / (\textbf{N}-1))^{½}$ $= ((\textbf{1.858} - \textbf{2.378}/\textbf{5}) / (\textbf{5}-1))^{½}$ $= \textbf{0.588}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\textbf{X}} - \textbf{tS/N}^{½}$ $= \textbf{0.308} - \textbf{2.132} * \textbf{0.588/5}^{½}$ $= \textbf{0.0}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\textbf{X}} + \textbf{tS/N}^{½}$ $= \textbf{0.308} + \textbf{2.132} * \textbf{0.588/5}^{½}$ $= \textbf{0.869}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \textbf{N} * (\textbf{N}-1) / 2$ $= \textbf{9} * (\textbf{9}-1) / 2$ $= \textbf{36}$	Number of sample pairs during trend detection period.
6	$S = \textbf{0.0}$	Sen's estimator of trend.
7	$var(S) = \textbf{26.667}$	Variance estimate for slope.
8	$M(S) = (\textbf{N'} \pm \textbf{Z}_{.995} * \textbf{var(S)}^{½}) / 2$ $= (\textbf{36} \pm \textbf{2.576} * \textbf{26.667}^{½}) / 2$ $= [\ \textbf{11.349}, \textbf{24.651}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \textbf{0.0}, \textbf{0.0}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Cobalt (ug/L) at MW-11

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **0.34** / **4** = **0.085**	Compute the mean of the last 4 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**0.029** - **0.116/4**) / (**4**-1))^{½} = **6.81x10^{-10}**	Compute sd of the last 4 measurements.
3	LCL = $\overline{\mathbf{X}}$ - **tS/N^{½}** = **0.085** - **2.353** * **6.81x10^{-10}/4^{½}** = **0.085**	Compute lower confidence limit for the mean of the last 4 measurements.
4	UCL = $\overline{\mathbf{X}}$ + **tS/N^{½}** = **0.085** + **2.353** * **6.81x10^{-10}/4^{½}** = **0.085**	Compute upper confidence limit for the mean of the last 4 measurements.
5	N' = **N** * (**N**-1) / 2 = **4** * (**4**-1) / 2 = **6**	Number of sample pairs during trend detection period.
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **0.0**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**6** ± **2.576** * **0.0**^{½}) / 2 = [**3.0**, **3.0**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**0.0**, **0.0**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Cobalt (ug/L) at MW-29A

Step	Equation	Description
1	$\bar{X}$ = **sum[X]** / **N** = **69.0** / **5** = **13.8**	Compute the mean of the last 5 measurements.
2	$S = ((\mathbf{sum[X^2]} - \mathbf{sum[X]}^2/\mathbf{N}) / (\mathbf{N}-1))^{1/2}$ $= ((\mathbf{1005.64} - \mathbf{4761.0/5}) / (\mathbf{5}-1))^{1/2}$ = **3.655**	Compute sd of the last 5 measurements.
3	$LCL = \bar{\mathbf{X}} - \mathbf{tS/N}^{1/2}$ $= \mathbf{13.8} - \mathbf{2.132} * \mathbf{3.655/5}^{1/2}$ = **10.316**	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \bar{\mathbf{X}} + \mathbf{tS/N}^{1/2}$ $= \mathbf{13.8} + \mathbf{2.132} * \mathbf{3.655/5}^{1/2}$ = **17.284**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **12** * (**12**-1) / 2 = **66**	Number of sample pairs during trend detection period.
6	S = **0.898**	Sen's estimator of trend.
7	var(S) = **211.667**	Variance estimate for slope.
8	$M(S) = (\mathbf{N'} \pm \mathbf{Z}_{.995} * \mathbf{var(S)}^{1/2}) / 2$ $= (\mathbf{66} \pm \mathbf{2.576} * \mathbf{211.667}^{1/2}) / 2$ = [**14.261**, **51.739**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-1.059**, **2.697**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Cobalt (ug/L) at MW-31A

Step	Equation	Description
1	$\overline{X} = \mathbf{sum[X]} / \mathbf{N}$ $= \mathbf{46.14} / \mathbf{5}$ $= \mathbf{9.228}$	Compute the mean of the last 5 measurements.
2	$S = ((\mathbf{sum[X^2]} - \mathbf{sum[X]}^2/\mathbf{N}) / (\mathbf{N}-1))^{1/2}$ $= ((\mathbf{1088.725} - \mathbf{2128.9/5}) / (\mathbf{5}-1))^{1/2}$ $= \mathbf{12.874}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\mathbf{X}} - \mathbf{tS/N}^{1/2}$ $= \mathbf{9.228} - \mathbf{2.132} * \mathbf{12.874/5}^{1/2}$ $= \mathbf{0.0}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\mathbf{X}} + \mathbf{tS/N}^{1/2}$ $= \mathbf{9.228} + \mathbf{2.132} * \mathbf{12.874/5}^{1/2}$ $= \mathbf{21.5}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \mathbf{N} * (\mathbf{N}-1) / 2$ $= \mathbf{12} * (\mathbf{12}-1) / 2$ $= \mathbf{66}$	Number of sample pairs during trend detection period.
6	$S = \mathbf{-2.256}$	Sen's estimator of trend.
7	$var(S) = \mathbf{212.667}$	Variance estimate for slope.
8	$M(S) = (\mathbf{N'} \pm \mathbf{Z}_{.995} * \mathbf{var(S)}^{1/2}) / 2$ $= (\mathbf{66} \pm \mathbf{2.576} * \mathbf{212.667}^{1/2}) / 2$ $= [\ \mathbf{14.217}, \mathbf{51.783}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \mathbf{-5.736}, \mathbf{0.169}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Cobalt (ug/L) at MW-35

Step	Equation	Description
1	$\overline{X} = \textbf{sum[X]} / \textbf{N}$ $= \textbf{29.81} / \textbf{5}$ $= \textbf{5.962}$	Compute the mean of the last 5 measurements.
2	$S = ((\textbf{sum[X}^2\textbf{]} - \textbf{sum[X]}^2/\textbf{N}) / (\textbf{N}-1))^{1/2}$ $= ((\textbf{218.999} - \textbf{888.636}/\textbf{5}) / (\textbf{5}-1))^{1/2}$ $= \textbf{3.212}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\textbf{X}} - \textbf{tS/N}^{1/2}$ $= \textbf{5.962} - \textbf{2.132} * \textbf{3.212/5}^{1/2}$ $= \textbf{2.9}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\textbf{X}} + \textbf{tS/N}^{1/2}$ $= \textbf{5.962} + \textbf{2.132} * \textbf{3.212/5}^{1/2}$ $= \textbf{9.024}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \textbf{N} * (\textbf{N}-1) / 2$ $= \textbf{12} * (\textbf{12}-1) / 2$ $= \textbf{66}$	Number of sample pairs during trend detection period.
6	$S = \textbf{-0.32}$	Sen's estimator of trend.
7	$var(S) = \textbf{212.667}$	Variance estimate for slope.
8	$M(S) = (\textbf{N'} \pm \textbf{Z}_{.995} * \textbf{var(S)}^{1/2}) / 2$ $= (\textbf{66} \pm \textbf{2.576} * \textbf{212.667}^{1/2}) / 2$ $= [\ \textbf{14.217}, \textbf{51.783}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \textbf{-1.001}, \textbf{0.426}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Cobalt (ug/L) at MW-38A

Step	Equation	Description
1	$\overline{X} = \mathbf{sum[X]} / \mathbf{N}$ $= \mathbf{0.475} / \mathbf{5}$ $= \mathbf{0.095}$	Compute the mean of the last 5 measurements.
2	$S = ((\mathbf{sum[X^2]} - \mathbf{sum[X]}^2/\mathbf{N}) / (\mathbf{N}-1))^{½}$ $= ((\mathbf{0.045} - \mathbf{0.226}/\mathbf{5}) / (\mathbf{5}-1))^{½}$ $= \mathbf{8.16} \times \mathbf{10^{-10}}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\mathbf{X}} - \mathbf{tS/N}^{½}$ $= \mathbf{0.095} - \mathbf{2.132} * \mathbf{8.16} \times \mathbf{10^{-10}} / \mathbf{5}^{½}$ $= \mathbf{0.095}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\mathbf{X}} + \mathbf{tS/N}^{½}$ $= \mathbf{0.095} + \mathbf{2.132} * \mathbf{8.16} \times \mathbf{10^{-10}} / \mathbf{5}^{½}$ $= \mathbf{0.095}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \mathbf{N} * (\mathbf{N}-1) / 2$ $= \mathbf{10} * (\mathbf{10}-1) / 2$ $= \mathbf{45}$	Number of sample pairs during trend detection period.
6	$S = \mathbf{0.0}$	Sen's estimator of trend.
7	$var(S) = \mathbf{0.0}$	Variance estimate for slope.
8	$M(S) = (\mathbf{N'} \pm \mathbf{Z}_{.995} * \mathbf{var(S)}^{½}) / 2$ $= (\mathbf{45} \pm \mathbf{2.576} * \mathbf{0.0}^{½}) / 2$ $= [\ \mathbf{22.5}, \mathbf{22.5}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \mathbf{0.0}, \mathbf{0.0}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Cobalt (ug/L) at MW-39A

Step	Equation	Description
1	$\overline{X} = \textbf{sum[X]} / \textbf{N}$	Compute the mean of the last 5 measurements.
	$= \textbf{1.192} / \textbf{5}$	
	$= \textbf{0.238}$	
2	$S = ((\textbf{sum[X}^{\textbf{2}}\textbf{]} - \textbf{sum[X]}^2/\textbf{N}) / (\textbf{N}-1))^{1/2}$	Compute sd of the last 5 measurements.
	$= ((\textbf{0.695} - \textbf{1.421}/\textbf{5}) / (\textbf{5}-1))^{1/2}$	
	$= \textbf{0.321}$	
3	$LCL = \overline{\textbf{X}} - \textbf{tS/N}^{1/2}$	Compute lower confidence limit for the mean of the last 5 measurements.
	$= \textbf{0.238} - \textbf{2.132} * \textbf{0.321/5}^{1/2}$	
	$= \textbf{0.0}$	
4	$UCL = \overline{\textbf{X}} + \textbf{tS/N}^{1/2}$	Compute upper confidence limit for the mean of the last 5 measurements.
	$= \textbf{0.238} + \textbf{2.132} * \textbf{0.321/5}^{1/2}$	
	$= \textbf{0.544}$	
5	$N' = \textbf{N} * (\textbf{N}-1) / 2$	Number of sample pairs during trend detection period.
	$= \textbf{10} * (\textbf{10}-1) / 2$	
	$= \textbf{45}$	
6	$S = \textbf{0.0}$	Sen's estimator of trend.
7	$var(S) = \textbf{59.667}$	Variance estimate for slope.
8	$M(S) = (\textbf{N'} \pm \textbf{Z}_{.995} * \textbf{var(S)}^{1/2}) / 2$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
	$= (\textbf{45} \pm \textbf{2.576} * \textbf{59.667}^{1/2}) / 2$	
	$= [\ \textbf{12.551}, \textbf{32.449}\ ]$	
9	$CL(S) = [\ \textbf{0.0}, \textbf{0.0}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Cobalt (ug/L) at MW-40A

Step	Equation	Description
1	$\overline{X} = \mathbf{sum[X]} / \mathbf{N}$ $= \mathbf{9.39} / \mathbf{5}$ $= \mathbf{1.878}$	Compute the mean of the last 5 measurements.
2	$S = ((\mathbf{sum[X^2]} - \mathbf{sum[X]}^2/\mathbf{N}) / (\mathbf{N}-1))^{½}$ $= ((\mathbf{17.972} - \mathbf{88.172/5}) / (\mathbf{5}-1))^{½}$ $= \mathbf{0.29}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\mathbf{X}} - \mathbf{tS/N}^{½}$ $= \mathbf{1.878} - \mathbf{2.132} * \mathbf{0.29/5}^{½}$ $= \mathbf{1.601}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\mathbf{X}} + \mathbf{tS/N}^{½}$ $= \mathbf{1.878} + \mathbf{2.132} * \mathbf{0.29/5}^{½}$ $= \mathbf{2.155}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \mathbf{N} * (\mathbf{N}-1) / 2$ $= \mathbf{10} * (\mathbf{10}-1) / 2$ $= \mathbf{45}$	Number of sample pairs during trend detection period.
6	$S = \mathbf{0.272}$	Sen's estimator of trend.
7	$var(S) = \mathbf{125.0}$	Variance estimate for slope.
8	$M(S) = (\mathbf{N'} \pm \mathbf{Z}_{.995} * \mathbf{var(S)}^{½}) / 2$ $= (\mathbf{45} \pm \mathbf{2.576} * \mathbf{125.0}^{½}) / 2$ $= [\ \mathbf{8.1}, \mathbf{36.9}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \mathbf{-0.835}, \mathbf{0.729}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Cobalt (ug/L) at MW-42A

Step	Equation	Description
1	$\overline{X} = \textbf{sum[X]} / \textbf{N}$ $= \textbf{10.868} / \textbf{5}$ $= \textbf{2.174}$	Compute the mean of the last 5 measurements.
2	$S = ((\textbf{sum[X}^{\textbf{2}}\textbf{]} - \textbf{sum[X]}^2/\textbf{N}) / (\textbf{N}-1))^{½}$ $= ((\textbf{27.1} - \textbf{118.113}/\textbf{5}) / (\textbf{5}-1))^{½}$ $= \textbf{0.932}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\textbf{X}} - \textbf{tS}/\textbf{N}^{½}$ $= \textbf{2.174} - \textbf{2.132} * \textbf{0.932}/\textbf{5}^{½}$ $= \textbf{1.285}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\textbf{X}} + \textbf{tS}/\textbf{N}^{½}$ $= \textbf{2.174} + \textbf{2.132} * \textbf{0.932}/\textbf{5}^{½}$ $= \textbf{3.062}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \textbf{N} * (\textbf{N}-1) / 2$ $= \textbf{7} * (\textbf{7}-1) / 2$ $= \textbf{21}$	Number of sample pairs during trend detection period.
6	$S = \textbf{-0.27}$	Sen's estimator of trend.
7	$var(S) = \textbf{43.333}$	Variance estimate for slope.
8	$M(S) = (\textbf{N'} \pm \textbf{Z}_{.995} * \textbf{var(S)}^{½}) / 2$ $= (\textbf{21} \pm \textbf{2.576} * \textbf{43.333}^{½}) / 2$ $= [\ \textbf{2.021}, \textbf{18.979}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \textbf{-4.47}, \textbf{1.969}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Cobalt (ug/L) at MW-43A

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **21.51** / **5** = **4.302**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X²]** - **sum[X]²/N**) / (**N**-1))^{½} = ((**94.057** - **462.68/5**) / (**5**-1))^{½} = **0.617**	Compute sd of the last 5 measurements.
3	LCL = $\overline{X}$ - **tS/N**^{½} = **4.302** - **2.132** * **0.617/5**^{½} = **3.714**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{X}$ + **tS/N**^{½} = **4.302** + **2.132** * **0.617/5**^{½} = **4.89**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **7** * (**7**-1) / 2 = **21**	Number of sample pairs during trend detection period.
6	S = **0.145**	Sen's estimator of trend.
7	var(S) = **44.333**	Variance estimate for slope.
8	M(S) = (**N'** ± $Z_{.995}$ * **var(S)**^{½}) / 2 = (**21** ± **2.576** * **44.333**^{½}) / 2 = [**1.924**, **19.076**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-1.847**, **1.901**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Cobalt (ug/L) at MW-44A

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **0.943** / **5** = **0.189**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**0.393** - **0.889**/**5**) / (**5**-1))^{½} = **0.232**	Compute sd of the last 5 measurements.
3	LCL = $\overline{X}$ - **tS/N**^{½} = **0.189** - **2.132** * **0.232/5**^{½} = **0.0**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{X}$ + **tS/N**^{½} = **0.189** + **2.132** * **0.232/5**^{½} = **0.409**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **7** * (**7**-1) / 2 = **21**	Number of sample pairs during trend detection period.
6	S = **-0.197**	Sen's estimator of trend.
7	var(S) = **35.667**	Variance estimate for slope.
8	M(S) = (**N'** ± $Z_{.995}$ * **var(S)**^{½}) / 2 = (**21** ± **2.576** * **35.667**^{½}) / 2 = [**2.808**, **18.192**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-0.696**, **0.036**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Cobalt (ug/L) at SW-2

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N**	Compute the mean of the last 5 measurements.
	= **0.962** / **5**	
	= **0.192**	
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))$^{1/2}$	Compute sd of the last 5 measurements.
	= ((**0.416** - **0.925**/**5**) / (**5**-1))$^{1/2}$	
	= **0.24**	
3	LCL = $\overline{X}$ - **tS/N**$^{1/2}$	Compute lower confidence limit for the mean of the last 5 measurements.
	= **0.192** - **2.132** * **0.24/5**$^{1/2}$	
	= **0.0**	
4	UCL = $\overline{X}$ + **tS/N**$^{1/2}$	Compute upper confidence limit for the mean of the last 5 measurements.
	= **0.192** + **2.132** * **0.24/5**$^{1/2}$	
	= **0.421**	
5	N' = **N** * (**N**-1) / 2	Number of sample pairs during trend detection period.
	= **11** * (**11**-1) / 2	
	= **55**	
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **99.667**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**$^{1/2}$) / 2	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
	= (**55** ± **2.576** * **99.667**$^{1/2}$) / 2	
	= [**14.641**, **40.359**]	
9	CL(S) = [**-0.027**, **0.0**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Cobalt (ug/L) at SW-5

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **1.019** / **5** = **0.204**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**0.49** - **1.038/5**) / (**5**-1))^{½} = **0.266**	Compute sd of the last 5 measurements.
3	LCL = $\overline{X}$ - **tS/N^{½}** = **0.204** - **2.132** * **0.266/5^{½}** = **0.0**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{X}$ + **tS/N^{½}** = **0.204** + **2.132** * **0.266/5^{½}** = **0.457**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **5** * (**5**-1) / 2 = **10**	Number of sample pairs during trend detection period.
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **8.0**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**10** ± **2.576** * **8.0**^{½}) / 2 = [**1.357**, **8.643**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-0.76**, **0.857**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Nickel (ug/L) at MW-101

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **33.99** / **5** = **6.798**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]**^{2}/**N**) / (**N**-1))^{½} = ((**277.466** - **1155.32**/**5**) / (**5**-1))^{½} = **3.406**	Compute sd of the last 5 measurements.
3	LCL = $\overline{X}$ - **tS/N**^{½} = **6.798** - **2.132** * **3.406/5**^{½} = **3.551**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{X}$ + **tS/N**^{½} = **6.798** + **2.132** * **3.406/5**^{½} = **10.045**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **10** * (**10**-1) / 2 = **45**	Number of sample pairs during trend detection period.
6	S = **-0.038**	Sen's estimator of trend.
7	var(S) = **124.0**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**45** ± **2.576** * **124.0**^{½}) / 2 = [**8.157**, **36.843**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-2.732**, **3.185**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Nickel (ug/L) at MW-11

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **124.8** / **5** = **24.96**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**3317.86** - **15575.04/5**) / (**5**-1))^{½} = **7.121**	Compute sd of the last 5 measurements.
3	LCL = $\overline{\mathbf{X}}$ - **tS/N**^{½} = **24.96** - **2.132** * **7.121/5**^{½} = **18.172**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{\mathbf{X}}$ + **tS/N**^{½} = **24.96** + **2.132** * **7.121/5**^{½} = **31.748**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **5** * (**5**-1) / 2 = **10**	Number of sample pairs during trend detection period.
6	S = **-5.46**	Sen's estimator of trend.
7	var(S) = **16.667**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**10** ± **2.576** * **16.667**^{½}) / 2 = [**-0.258**, **10.258**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-68.811**, **6.935**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Nickel (ug/L) at MW-29A

Step	Equation	Description
1	$\overline{X} = \textbf{sum[X]} / \textbf{N}$ $= \textbf{365.6} / \textbf{5}$ $= \textbf{73.12}$	Compute the mean of the last 5 measurements.
2	$S = ((\textbf{sum[X}^2\textbf{]} - \textbf{sum[X]}^2/\textbf{N}) / (\textbf{N}-1))^{1/2}$ $= ((\textbf{27047.18} - \textbf{133663.36}/\textbf{5}) / (\textbf{5}-1))^{1/2}$ $= \textbf{8.867}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\mathbf{X}} - \textbf{tS}/\textbf{N}^{1/2}$ $= \textbf{73.12} - \textbf{2.132} * \textbf{8.867}/\textbf{5}^{1/2}$ $= \textbf{64.667}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\mathbf{X}} + \textbf{tS}/\textbf{N}^{1/2}$ $= \textbf{73.12} + \textbf{2.132} * \textbf{8.867}/\textbf{5}^{1/2}$ $= \textbf{81.573}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \textbf{N} * (\textbf{N}-1) / 2$ $= \textbf{12} * (\textbf{12}-1) / 2$ $= \textbf{66}$	Number of sample pairs during trend detection period.
6	$S = \textbf{5.866}$	Sen's estimator of trend.
7	$var(S) = \textbf{212.667}$	Variance estimate for slope.
8	$M(S) = (\textbf{N'} \pm \textbf{Z}_{.995} * \textbf{var(S)}^{1/2}) / 2$ $= (\textbf{66} \pm \textbf{2.576} * \textbf{212.667}^{1/2}) / 2$ $= [\ \textbf{14.217}, \textbf{51.783}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \textbf{0.413}, \textbf{12.079}\ ]$	Two-sided confidence interval for slope.
10	$LCL(S) > 0$	**Significant increasing trend.**

Worksheet 6 - Assessment Monitoring
Nickel (ug/L) at MW-31A

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **245.1** / **5** = **49.02**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**17030.11** - **60074.01**/**5**) / (**5**-1))^{½} = **35.409**	Compute sd of the last 5 measurements.
3	LCL = $\overline{\mathbf{X}}$ - **tS/N**^{½} = **49.02** - **2.132** * **35.409/5**^{½} = **15.266**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{\mathbf{X}}$ + **tS/N**^{½} = **49.02** + **2.132** * **35.409/5**^{½} = **82.774**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **12** * (**12**-1) / 2 = **66**	Number of sample pairs during trend detection period.
6	S = **0.826**	Sen's estimator of trend.
7	var(S) = **212.667**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**66** ± **2.576** * **212.667**^{½}) / 2 = [**14.217**, **51.783**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-7.396**, **16.26**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Nickel (ug/L) at MW-35

Step	Equation	Description
1	$\bar{X}$ = **sum[X]** / **N** = **107.3** / **5** = **21.46**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))$^{1/2}$ = ((**2570.23** - **11513.29**/**5**) / (**5**-1))$^{1/2}$ = **8.179**	Compute sd of the last 5 measurements.
3	LCL = $\bar{X}$ - **tS/N**$^{1/2}$ = **21.46** - **2.132** * **8.179/5**$^{1/2}$ = **13.663**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\bar{X}$ + **tS/N**$^{1/2}$ = **21.46** + **2.132** * **8.179/5**$^{1/2}$ = **29.257**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **12** * (**12**-1) / 2 = **66**	Number of sample pairs during trend detection period.
6	S = **-1.176**	Sen's estimator of trend.
7	var(S) = **212.667**	Variance estimate for slope.
8	M(S) = (**N'** ± $Z_{.995}$ * **var(S)**$^{1/2}$) / 2 = (**66** ± **2.576** * **212.667**$^{1/2}$) / 2 = [**14.217**, **51.783**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-4.66**, **3.465**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Nickel (ug/L) at MW-38A

Step	Equation	Description
1	$\overline{X} = \textbf{sum[X]} / \textbf{N}$ $= \textbf{4.75} / \textbf{5}$ $= \textbf{0.95}$	Compute the mean of the last 5 measurements.
2	$S = ((\textbf{sum[X}^{\textbf{2}}\textbf{]} - \textbf{sum[X]}^2/\textbf{N}) / (\textbf{N}-1))^{½}$ $= ((\textbf{4.513} - \textbf{22.563}/\textbf{5}) / (\textbf{5}-1))^{½}$ $= \textbf{6.67} \times \textbf{10}^{\textbf{-9}}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\textbf{X}} - \textbf{tS/N}^{½}$ $= \textbf{0.95} - \textbf{2.132} * \textbf{6.67} \times \textbf{10}^{\textbf{-9}}/\textbf{5}^{½}$ $= \textbf{0.95}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\textbf{X}} + \textbf{tS/N}^{½}$ $= \textbf{0.95} + \textbf{2.132} * \textbf{6.67} \times \textbf{10}^{\textbf{-9}}/\textbf{5}^{½}$ $= \textbf{0.95}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \textbf{N} * (\textbf{N}-1) / 2$ $= \textbf{10} * (\textbf{10}-1) / 2$ $= \textbf{45}$	Number of sample pairs during trend detection period.
6	$S = \textbf{0.0}$	Sen's estimator of trend.
7	$var(S) = \textbf{0.0}$	Variance estimate for slope.
8	$M(S) = (\textbf{N'} \pm \textbf{Z}_{.995} * \textbf{var(S)}^{½}) / 2$ $= (\textbf{45} \pm \textbf{2.576} * \textbf{0.0}^{½}) / 2$ $= [\ \textbf{22.5}, \textbf{22.5}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \textbf{0.0}, \textbf{0.0}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Nickel (ug/L) at MW-39A

Step	Equation	Description
1	$\overline{X} = \textbf{sum[X]} / \textbf{N}$ $= \textbf{4.75} / \textbf{5}$ $= \textbf{0.95}$	Compute the mean of the last 5 measurements.
2	$S = ((\textbf{sum[X}^{\textbf{2}}\textbf{]} - \textbf{sum[X]}^2/\textbf{N}) / (\textbf{N}-1))^{½}$ $= ((\textbf{4.513} - \textbf{22.563}/\textbf{5}) / (\textbf{5}-1))^{½}$ $= \textbf{6.67}\text{x}\textbf{10}^{\textbf{-9}}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\textbf{X}} - \textbf{tS}/\textbf{N}^{½}$ $= \textbf{0.95} - \textbf{2.132} * \textbf{6.67}\text{x}\textbf{10}^{\textbf{-9}}/\textbf{5}^{½}$ $= \textbf{0.95}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\textbf{X}} + \textbf{tS}/\textbf{N}^{½}$ $= \textbf{0.95} + \textbf{2.132} * \textbf{6.67}\text{x}\textbf{10}^{\textbf{-9}}/\textbf{5}^{½}$ $= \textbf{0.95}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \textbf{N} * (\textbf{N}-1) / 2$ $= \textbf{10} * (\textbf{10}-1) / 2$ $= \textbf{45}$	Number of sample pairs during trend detection period.
6	$S = \textbf{0.0}$	Sen's estimator of trend.
7	$var(S) = \textbf{0.0}$	Variance estimate for slope.
8	$M(S) = (\textbf{N'} \pm \textbf{Z}_{.995} * \textbf{var(S)}^{½}) / 2$ $= (\textbf{45} \pm \textbf{2.576} * \textbf{0.0}^{½}) / 2$ $= [\ \textbf{22.5}, \textbf{22.5}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \textbf{0.0}, \textbf{0.0}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Nickel (ug/L) at MW-40A

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **77.0** / **5** = **15.4**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**1230.5** - **5929.0/5**) / (**5**-1))^{½} = **3.343**	Compute sd of the last 5 measurements.
3	LCL = $\overline{\mathbf{X}}$ - **tS/N**^{½} = **15.4** - **2.132** * **3.343/5**^{½} = **12.213**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{\mathbf{X}}$ + **tS/N**^{½} = **15.4** + **2.132** * **3.343/5**^{½} = **18.587**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **10** * (**10**-1) / 2 = **45**	Number of sample pairs during trend detection period.
6	S = **2.058**	Sen's estimator of trend.
7	var(S) = **125.0**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**45** ± **2.576** * **125.0**^{½}) / 2 = [**8.1**, **36.9**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-3.815**, **7.801**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Nickel (ug/L) at MW-42A

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N**	Compute the mean of the last 5 measurements.
	= **101.8** / **5**	
	= **20.36**	
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½}	Compute sd of the last 5 measurements.
	= ((**2181.1** - **10363.24**/**5**) / (**5**-1))^{½}	
	= **5.207**	
3	LCL = $\overline{\mathbf{X}}$ - **tS/N**^{½}	Compute lower confidence limit for the mean of the last 5 measurements.
	= **20.36** - **2.132** * **5.207/5**^{½}	
	= **15.396**	
4	UCL = $\overline{\mathbf{X}}$ + **tS/N**^{½}	Compute upper confidence limit for the mean of the last 5 measurements.
	= **20.36** + **2.132** * **5.207/5**^{½}	
	= **25.324**	
5	N' = **N** * (**N**-1) / 2	Number of sample pairs during trend detection period.
	= **8** * (**8**-1) / 2	
	= **28**	
6	S = **2.87**	Sen's estimator of trend.
7	var(S) = **65.333**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
	= (**28** ± **2.576** * **65.333**^{½}) / 2	
	= [**3.589**, **24.411**]	
9	CL(S) = [**-22.655**, **12.127**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Nickel (ug/L) at MW-43A

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **152.1** / **5** = **30.42**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**4978.31** - **23134.41/5**) / (**5**-1))^{½} = **9.373**	Compute sd of the last 5 measurements.
3	LCL = $\overline{X}$ - **tS/N**^{½} = **30.42** - **2.132** * **9.373/5**^{½} = **21.485**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{X}$ + **tS/N**^{½} = **30.42** + **2.132** * **9.373/5**^{½} = **39.355**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **7** * (**7**-1) / 2 = **21**	Number of sample pairs during trend detection period.
6	S = **0.665**	Sen's estimator of trend.
7	var(S) = **44.333**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**21** ± **2.576** * **44.333**^{½}) / 2 = [**1.924**, **19.076**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**-30.774**, **18.283**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Nickel (ug/L) at MW-44A

Step	Equation	Description
1	$\bar{X} = \mathbf{sum[X]} / \mathbf{N}$ $= \mathbf{221.3} / \mathbf{5}$ $= \mathbf{44.26}$	Compute the mean of the last 5 measurements.
2	$S = ((\mathbf{sum[X^2]} - \mathbf{sum[X]}^2/\mathbf{N}) / (\mathbf{N}-1))^{1/2}$ $= ((\mathbf{11823.49} - \mathbf{48973.69/5}) / (\mathbf{5}-1))^{1/2}$ $= \mathbf{22.521}$	Compute sd of the last 5 measurements.
3	$LCL = \bar{\mathbf{X}} - \mathbf{tS/N}^{1/2}$ $= \mathbf{44.26} - \mathbf{2.132} * \mathbf{22.521/5}^{1/2}$ $= \mathbf{22.792}$	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \bar{\mathbf{X}} + \mathbf{tS/N}^{1/2}$ $= \mathbf{44.26} + \mathbf{2.132} * \mathbf{22.521/5}^{1/2}$ $= \mathbf{65.728}$	Compute upper confidence limit for the mean of the last 5 measurements.
5	$N' = \mathbf{N} * (\mathbf{N}-1) / 2$ $= \mathbf{7} * (\mathbf{7}-1) / 2$ $= \mathbf{21}$	Number of sample pairs during trend detection period.
6	$S = \mathbf{3.69}$	Sen's estimator of trend.
7	$var(S) = \mathbf{44.333}$	Variance estimate for slope.
8	$M(S) = (\mathbf{N'} \pm \mathbf{Z}_{.995} * \mathbf{var(S)}^{1/2}) / 2$ $= (\mathbf{21} \pm \mathbf{2.576} * \mathbf{44.333}^{1/2}) / 2$ $= [\ \mathbf{1.924}, \mathbf{19.076}\ ]$	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	$CL(S) = [\ \mathbf{-59.459}, \mathbf{95.062}\ ]$	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Nickel (ug/L) at SW-2

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **4.75** / **5** = **0.95**	Compute the mean of the last 5 measurements.
2	$S = ((\mathbf{sum[X^2]} - \mathbf{sum[X]}^2/\mathbf{N}) / (\mathbf{N}-1))^{1/2}$ $= ((\mathbf{4.513} - \mathbf{22.563}/\mathbf{5}) / (\mathbf{5}-1))^{1/2}$ $= \mathbf{6.67 \times 10^{-9}}$	Compute sd of the last 5 measurements.
3	$LCL = \overline{\mathbf{X}} - \mathbf{tS/N}^{1/2}$ $= \mathbf{0.95} - \mathbf{2.132} * \mathbf{6.67 \times 10^{-9}/5}^{1/2}$ = **0.95**	Compute lower confidence limit for the mean of the last 5 measurements.
4	$UCL = \overline{\mathbf{X}} + \mathbf{tS/N}^{1/2}$ $= \mathbf{0.95} + \mathbf{2.132} * \mathbf{6.67 \times 10^{-9}/5}^{1/2}$ = **0.95**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **11** * (**11**-1) / 2 = **55**	Number of sample pairs during trend detection period.
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **40.0**	Variance estimate for slope.
8	$M(S) = (\mathbf{N'} \pm \mathbf{Z}_{.995} * \mathbf{var(S)}^{1/2}) / 2$ $= (\mathbf{55} \pm \mathbf{2.576} * \mathbf{40.0}^{1/2}) / 2$ = [**19.354**, **35.646**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the M^{th} largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**0.0**, **0.0**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Worksheet 6 - Assessment Monitoring
Nickel (ug/L) at SW-5

Step	Equation	Description
1	$\overline{X}$ = **sum[X]** / **N** = **4.75** / **5** = **0.95**	Compute the mean of the last 5 measurements.
2	S = ((**sum[X^2]** - **sum[X]^2/N**) / (**N**-1))^{½} = ((**4.513** - **22.563/5**) / (**5**-1))^{½} = **6.67**x**10^{-9}**	Compute sd of the last 5 measurements.
3	LCL = $\overline{X}$ - **tS/N**^{½} = **0.95** - **2.132** * **6.67**x**10^{-9}/5**^{½} = **0.95**	Compute lower confidence limit for the mean of the last 5 measurements.
4	UCL = $\overline{X}$ + **tS/N**^{½} = **0.95** + **2.132** * **6.67**x**10^{-9}/5**^{½} = **0.95**	Compute upper confidence limit for the mean of the last 5 measurements.
5	N' = **N** * (**N**-1) / 2 = **5** * (**5**-1) / 2 = **10**	Number of sample pairs during trend detection period.
6	S = **0.0**	Sen's estimator of trend.
7	var(S) = **0.0**	Variance estimate for slope.
8	M(S) = (**N'** ± **Z**$_{.995}$ * **var(S)**^{½}) / 2 = (**10** ± **2.576** * **0.0**^{½}) / 2 = [**5.0**, **5.0**]	Ordinal positions for two-sided lower confidence limits for slope. The LCL and UCL are the Mth largest slope estimates for the values shown. When the values are not integers, interpolation is used.
9	CL(S) = [**0.0**, **0.0**]	Two-sided confidence interval for slope.
10	the interval includes 0	There is no significant trend.

Table 9

Analytical Data Summary for LB-1

Constituents	Units	5/17/2021 6/8/2021
Arsenic	ug/L	4.01
Barium	ug/L	29.6
Nickel	ug/L	80.8

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for LB-2

Constituents	Units	5/17/2021 6/8/2021	11/10/2021
Arsenic	ug/L	5.66	4.13
Barium	ug/L	57.7	75.4
Nickel	ug/L	106.0	94.5

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MH-1

Constituents	Units	8/16/2022 9/13/2022	6/11/2024 7/3/2024
Arsenic	ug/L	<.75	4.85
Barium	ug/L	200	192
Cobalt	ug/L	<.19	3.39
Nickel	ug/L	8.86	17.10

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MH-4-2

Constituents	Units	8/16/2022 9/13/2022	6/6/2023 6/27/2023	6/11/2024 7/3/2024
Arsenic	ug/L	<.75	13.40	3.06
Barium	ug/L	62.7	605.0	174.0
Cobalt	ug/L	2.17	15.50	7.77
Nickel	ug/L	20	105	57

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-101

Constituents	Units	6/4/2019 6/13/2019	8/13/2019 8/15/2019	10/30/2019 11/20/2019	2/3/2020 2/17/2020	6/16/2020 7/7/2020	11/3/2020 11/23/2020	2/3/2021 2/24/2021
Arsenic	ug/L	<.232	<.232	<.750	<.880	<.880	<.880	
Barium	ug/L	196	213	207	194	198	205	191
Cobalt	ug/L	<.402	<.402	<.091	<.091	<.091	<.091	
Nickel	ug/L	7.24	8.82	9.54	8.93	<1.90	7.15	10.10

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-101

5/17/2021 6/8/2021	9/21/2021 9/29/2021	8/16/2022 9/13/2022	6/6/2023 6/27/2023	6/11/2024 7/3/2024	11/19/2024 12/18/2024
<.750	<.750	<.750	<.530	<.530	<.530
183	212	214	175	177	221
<.091	<.190	<.190	<.170	1.360	<.170
10.40	8.31	<1.90	9.62	6.92	8.19

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-11

Constituents	Units	10/28/2018 10/31/2018	12/17/2018	5/17/2021 6/8/2021	8/2/2021 8/3/2021	8/16/2022 9/13/2022	6/6/2023 6/27/2023	6/11/2024 7/3/2024
Arsenic	ug/L	<.57		<.75		<.75	<.53	<.53
Barium	ug/L	16.9		18.7		17.7	15.4	14.3
Cobalt	ug/L	7.890	2.570	<.091		<.190	<.170	<.170
Nickel	ug/L	43.3	35.1	34.1	22.6	30.2	21.6	16.3

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-29A

Constituents	Units	10/30/2019 11/20/2019	2/3/2020 2/17/2020	6/16/2020 7/7/2020	8/24/2020 8/26/2020	11/3/2020 11/23/2020	5/17/2021 6/8/2021	9/21/2021 9/29/2021
Arsenic	ug/L	<.75	2.28	3.40	6.84	4.59	4.09	6.09
Barium	ug/L	272	217	168	180	138	150	173
Cobalt	ug/L	8.43	9.64	9.98	10.70	10.10	11.90	7.90
Nickel	ug/L	49.7	49.2	51.1	57.0	47.2	55.5	51.0

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-29A

3/2/2022 3/29/2022	8/16/2022 9/13/2022	6/6/2023 6/27/2023	11/1/2023 11/20/2023	6/11/2024 7/3/2024	11/19/2024 12/18/2024
5.57	10.20	4.37	6.49	4.54	6.75
182	191	187	163	151	161
7.38	10.10	12.50	18.70	11.20	16.50
63.6	69.1	76.0	87.0	63.9	69.6

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-31A

Constituents	Units	10/30/2019 11/20/2019	2/3/2020 2/17/2020	6/16/2020 7/7/2020	8/24/2020 8/26/2020	11/3/2020 11/23/2020	5/17/2021 6/8/2021	9/21/2021 9/29/2021
Arsenic	ug/L	2.95	<.88	2.47	3.83	2.57	<.75	<.75
Barium	ug/L	602	591	279	317	449	160	205
Cobalt	ug/L	13.40	12.40	13.60	12.00	10.00	10.40	3.37
Nickel	ug/L	20.4	21.6	27.5	47.0	52.8	53.4	47.7

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-31A

3/2/2022 3/29/2022	8/16/2022 9/13/2022	6/6/2023 6/27/2023	11/1/2023 11/20/2023	6/11/2024 7/3/2024	11/19/2024 12/18/2024
<.75	<3.00	<.53	<.53	<.53	<.53
145	441	220	247	243	279
3.01	32.20	3.75	4.62	3.48	2.09
28.1	112.0	39.7	30.8	30.3	32.3

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-35

Constituents	Units	10/30/2019 11/20/2019	2/3/2020 2/17/2020	6/16/2020 7/7/2020	8/24/2020 8/26/2020	11/3/2020 11/23/2020	5/17/2021 6/8/2021	9/21/2021 9/29/2021
Arsenic	ug/L	<.75	<.88	<.88	<.88	<.88	<.75	<.75
Barium	ug/L	326	294	337	288	278	276	301
Cobalt	ug/L	8.27	6.60	7.03	5.98	5.97	5.51	6.33
Nickel	ug/L	27.4	23.2	27.9	22.0	19.5	18.8	22.5

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-35

3/2/2022 3/29/2022	8/16/2022 9/13/2022	6/6/2023 6/27/2023	11/1/2023 11/20/2023	6/11/2024 7/3/2024	11/19/2024 12/18/2024
<.75	<.75	<.53	<.53	<.53	<.53
316	345	264	467	280	186
6.39	6.74	5.33	10.80	4.96	1.98
24.9	26.5	18.7	32.7	17.6	11.8

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-38A

Constituents	Units	9/21/2021 9/29/2021	12/14/2021	3/2/2022 3/29/2022	6/22/2022 6/27/2022	8/16/2022 9/13/2022	12/6/2022 12/7/2022	6/6/2023 6/27/2023
Arsenic	ug/L	<.75	<.75	<.75	20.80	<.75	<.75	<.53
Barium	ug/L	148.0	94.3	139.0	200.0	133.0	145.0	133.0
Cobalt	ug/L	<.19	<.19	<.19	<.19	<.19	<.19	<.17
Nickel	ug/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-38A

11/1/2023 11/20/2023	6/11/2024 7/3/2024	11/19/2024 12/18/2024
<.53	<.53	<.53
141.0	153.0	153.0
<.17	<.17	<.17
<1.9	<2.1	<2.1

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-39A

Constituents	Units	9/21/2021 9/29/2021	12/14/2021	3/2/2022 3/29/2022	6/22/2022 6/27/2022	8/16/2022 9/13/2022	12/6/2022 12/7/2022	6/6/2023 6/27/2023
Arsenic	ug/L	<.75	<.75	<.75	<.75	<.75	<.75	<.53
Barium	ug/L	156	146	144	152	136	149	138
Cobalt	ug/L	.857	<.190	<.190	<.190	<.190	<.190	<.170
Nickel	ug/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-39A

11/1/2023 11/20/2023	6/11/2024 7/3/2024	11/19/2024 12/18/2024
<.53	<.53	<.53
145	152	156
<.170	<.170	.812
<1.9	<2.1	<2.1

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-40A

Constituents	Units	9/21/2021 9/29/2021	12/14/2021	3/2/2022 3/29/2022	6/22/2022 6/27/2022	8/16/2022 9/13/2022	12/6/2022 12/7/2022	6/6/2023 6/27/2023
Arsenic	ug/L	<.75	<.75	<.75	<.75	<.75	<.75	<.53
Barium	ug/L	279	278	260	257	162	238	216
Cobalt	ug/L	3.220	1.060	1.170	.807	1.470	2.190	1.510
Nickel	ug/L	17.00	7.32	11.00	7.85	10.20	12.70	19.00

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-40A

11/1/2023 11/20/2023	6/11/2024 7/3/2024	11/19/2024 12/18/2024
<.53	<.53	<.53
228	210	215
1.860	1.690	2.140
17.40	11.10	16.80

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-42A

Constituents	Units	8/16/2022 9/13/2022	12/6/2022 12/7/2022	6/6/2023 6/27/2023	8/24/2023 8/29/2023	11/1/2023 11/20/2023	6/11/2024 7/3/2024	11/19/2024 12/18/2024
Arsenic	ug/L	<.75	2.96	<.53	<.53	<.53	<.53	<.53
Barium	ug/L	281.0	119.0	83.4	125.0	101.0	128.0	177.0
Cobalt	ug/L	3.980	3.310	.518	2.460	2.560	2.560	2.770
Nickel	ug/L	37.20	14.70	8.62	19.30	14.80	16.60	27.60

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-42A

2/14/2025
23.50

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-43A

Constituents	Units	8/16/2022 9/13/2022	12/6/2022 12/7/2022	6/6/2023 6/27/2023	8/24/2023 8/29/2023	11/1/2023 11/20/2023	6/11/2024 7/3/2024	11/19/2024 12/18/2024
Arsenic	ug/L	8.06	7.34	8.28	8.85	9.81	6.28	6.32
Barium	ug/L	157	167	180	250	274	163	214
Cobalt	ug/L	3.68	3.27	4.51	4.93	4.75	3.49	3.83
Nickel	ug/L	24.4	25.6	31.0	41.5	36.4	17.3	25.9

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for MW-44A

Constituents	Units	8/16/2022 9/13/2022	12/6/2022 12/7/2022	6/6/2023 6/27/2023	8/24/2023 8/29/2023	11/1/2023 11/20/2023	6/11/2024 7/3/2024	11/19/2024 12/18/2024
Arsenic	ug/L	<.75	<.75	<.53	<.53	<.53	<.53	<.53
Barium	ug/L	168	212	157	239	253	137	159
Cobalt	ug/L	.530	.583	<.170	.603	<.170	<.170	<.170
Nickel	ug/L	21.7	51.8	28.7	70.2	66.6	21.6	34.2

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for SW-2

Constituents	Units	6/25/2014 6/27/2014	10/31/2014 11/10/2014	5/1/2015 5/12/2015	3/24/2016 4/13/2016	11/11/2016 11/30/2016	5/5/2017 5/25/2017	11/1/2017 11/22/2017
Arsenic	ug/L	2.990	<.945	<.945	<.672	<.672	<.505	.743
Barium	ug/L	105.0	117.0	105.0	128.0	100.0	60.5	104.0
Cobalt	ug/L	.9530	.4140	.7530	.2400	.1930	<.0453	.2470
Nickel	ug/L	1.140	.969	2.540	<1.530	<1.530	<.929	.982

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for SW-2

6/4/2018 6/27/2018	10/28/2018 10/31/2018	6/4/2019 6/13/2019	10/30/2019 11/20/2019	6/16/2020 7/7/2020	11/3/2020 11/23/2020	5/17/2021 6/8/2021	9/21/2021 9/29/2021	3/2/2022 3/29/2022
<.570	<.570	<.232	<.750	<.880	<.880	<.750	<.750	<.750
98.5	99.8	91.8	104.0	195.0	96.2	90.0	107.0	156.0
<.0610	<.0610	<.4020	<.0910	<.0910	<.0910	<.0910	<.1900	3.1700
<1.000	<1.000	<.625	<1.700	<1.900	<1.900	<1.900	<1.900	6.590

* - The displayed value is the arithmetic mean of multiple database matches.

Table 9

Analytical Data Summary for SW-2

6/22/2022 6/27/2022	8/16/2022 9/13/2022	6/6/2023 6/27/2023	11/1/2023 11/20/2023	6/11/2024 7/3/2024	11/19/2024 12/18/2024
<.750	<.750	<.530	<.530	<.530	<.530
110.0	89.7	101.0	94.1	104.0	110.0
.6930	<.1900	.6220	<.1700	<.1700	<.1700
<1.900	<1.900	<1.900	<1.900	<2.100	<2.100

* - The displayed value is the arithmetic mean of multiple database matches.

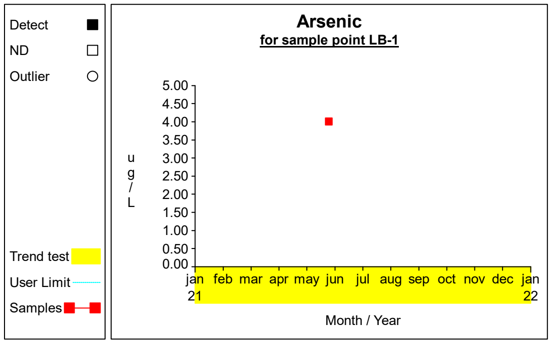
Table 9

Analytical Data Summary for SW-5

Constituents	Units	6/6/2023 6/27/2023	11/1/2023 11/20/2023	1/23/2024 1/25/2024	6/11/2024 7/3/2024	11/19/2024 12/18/2024
Arsenic	ug/L	<.53	<.53	<.53	<.53	<.53
Barium	ug/L	91.4	90.0	87.1	70.1	87.2
Cobalt	ug/L	<.170	<.170	<.170	.679	<.170
Nickel	ug/L	<1.9	<1.9	<1.9	<2.1	<2.1

* - The displayed value is the arithmetic mean of multiple database matches.

Time Series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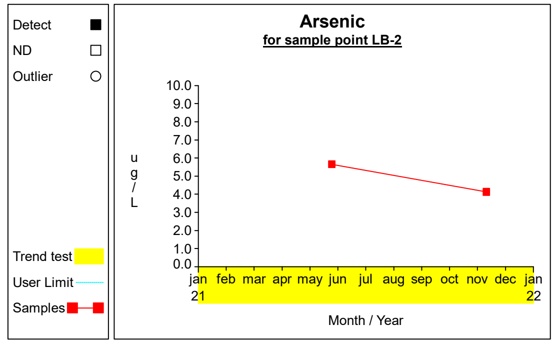
ND
Outlier
Trend test
User Limit
Samples
Arsenic
for sample point LB-1
ug/L
Month / Year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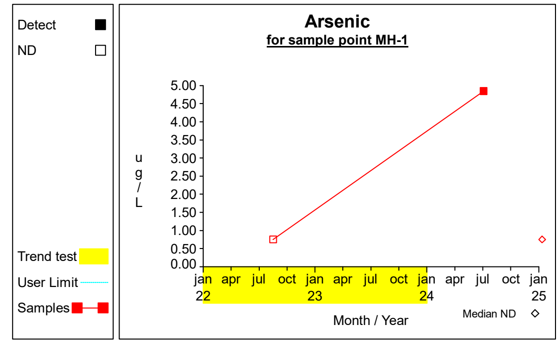
Arsenic
for sample point LB-2
ug/L
Month / Year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Trend test
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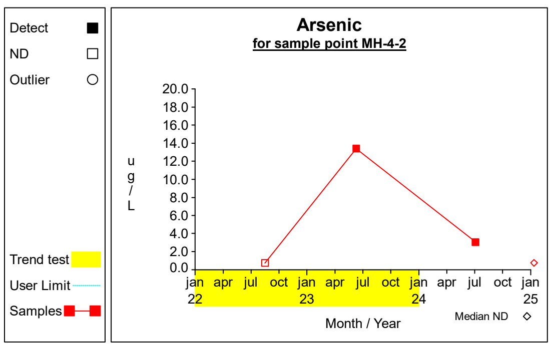
Samples
Arsenic
for sample point MH-1
ug/L
Month / Year
Median ND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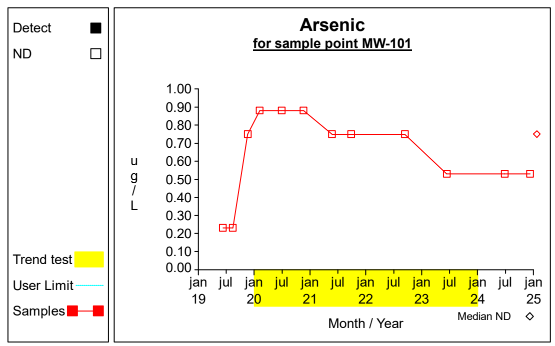
ND
Outlier
Trend test
User Limit
Samples
Arsenic
for sample point MH-4-2
ug/L
Month / Year
Median ND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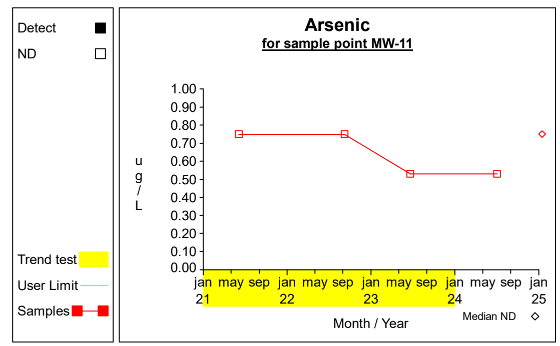
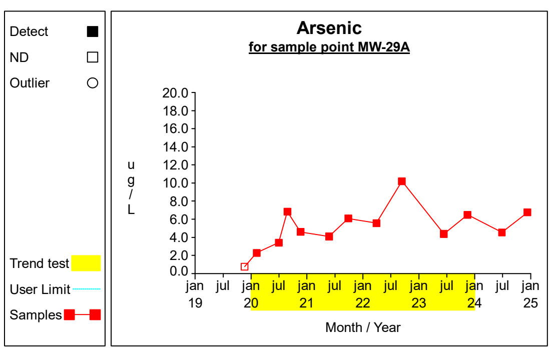
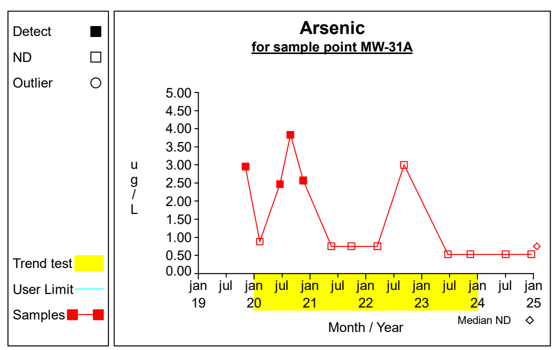
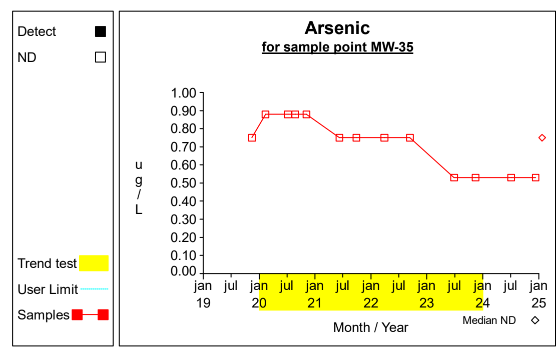
ND
Trend test
User Limit
Samples
Arsenic
for sample point MW-101
ug/L
Month / Year
Median ND

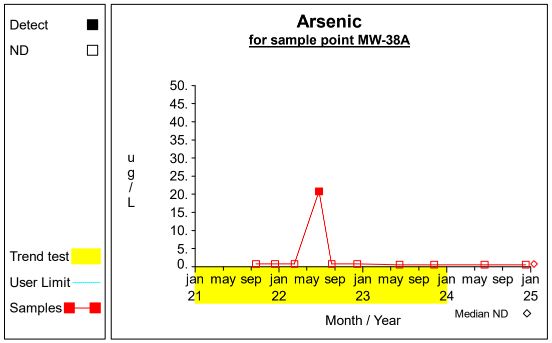

Detect
ND
Trend test
User Limit
Samples
Arsenic
for sample point MW-11
ug/L
Month / Year
Median ND

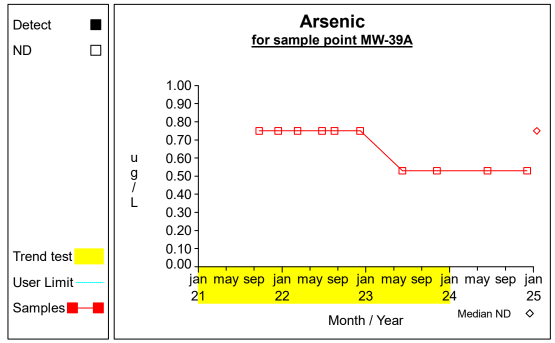

Detect
ND
Outlier
Trend test
User Limit
Samples
Arsenic
for sample point MW-29A
ug/L
Month / Year

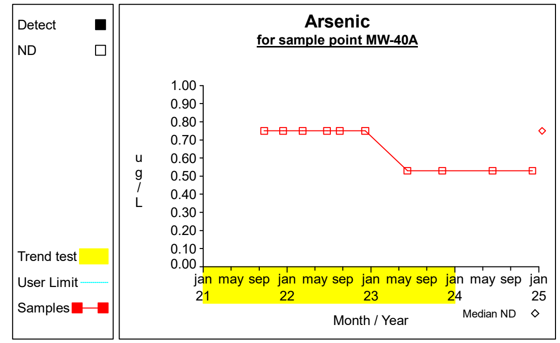

Detect
ND
Outlier
Trend test
User Limit
Samples
Arsenic
for sample point MW-31A
ug/L
Month / Year
Median ND

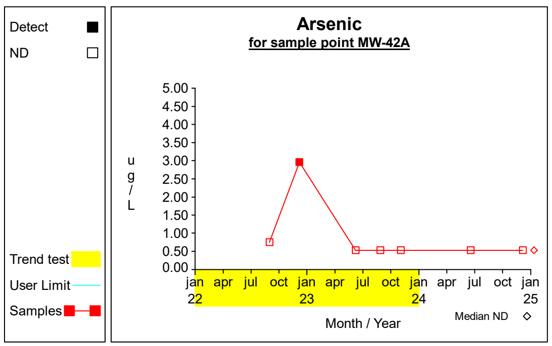

Detect
ND
Trend test
User Limit
Samples
Arsenic
for sample point MW-35
ug/L
Month / Year
Median ND

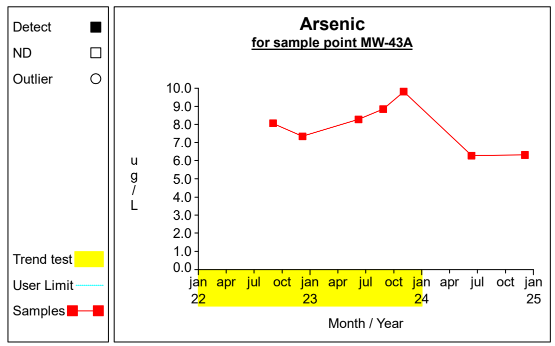
Time Series

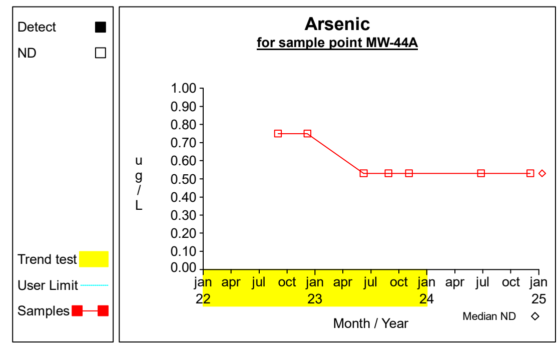

Detect
ND
Trend test
User Limit
Samples
Arsenic
for sample point MW-38A
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0.
u g / L
jan may sep jan may sep jan may sep jan may sep jan
21 22 23 24 25
Month / Year
Median ND

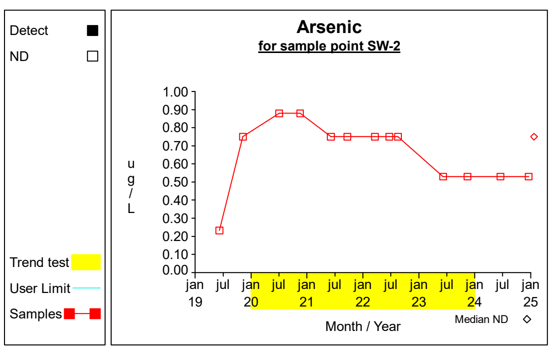

Detect
ND
Trend test
User Limit
Samples
Arsenic
for sample point MW-39A
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
u g / L
jan may sep jan may sep jan may sep jan may sep jan
21 22 23 24 25
Month / Year
Median ND

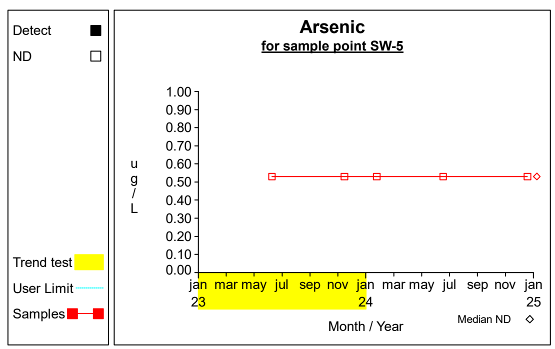

Detect
ND
Trend test
User Limit
Samples
Arsenic
for sample point MW-40A
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
u g / L
jan may sep jan may sep jan may sep jan may sep jan
21 22 23 24 25
Month / Year
Median ND

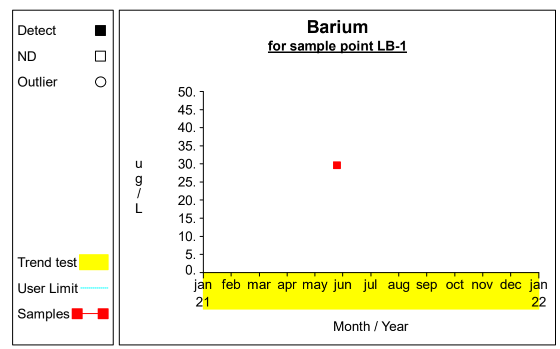

Detect
ND
Trend test
User Limit
Samples
Arsenic
for sample point MW-42A
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
u g / L
jan apr jul oct jan apr jul oct jan apr jul oct jan
22 23 24 25
Month / Year
Median ND


Detect
ND
Outlier
Trend test
User Limit
Samples
Arsenic
for sample point MW-43A
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
u g / L
jan apr jul oct jan apr jul oct jan apr jul oct jan
22 23 24 25
Month / Year

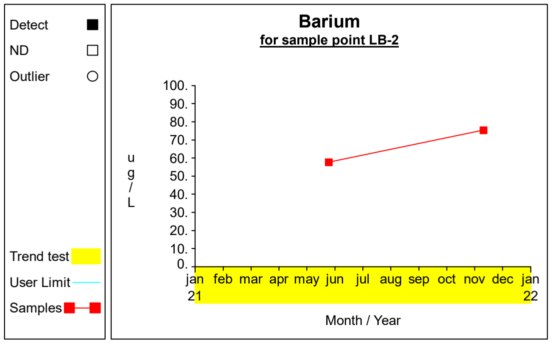

Detect
ND
Trend test
User Limit
Samples
Arsenic
for sample point MW-44A
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
u g / L
jan apr jul oct jan apr jul oct jan apr jul oct jan
22 23 24 25
Month / Year
Median ND

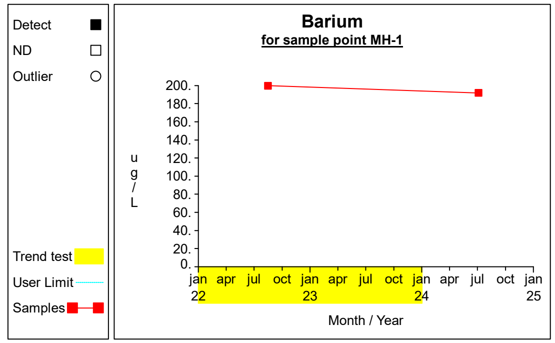

Detect
ND
Trend test
User Limit
Samples
Arsenic
for sample point SW-2
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
u g / L
jan jul jan jul jan jul jan jul jan jul jan jul jan
19 20 21 22 23 24 25
Month / Year
Median ND

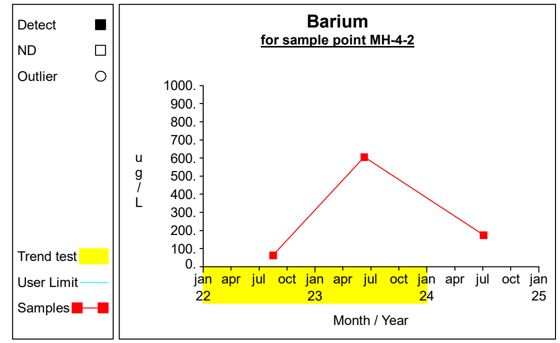

Detect
ND
Trend test
User Limit
Samples
Arsenic
for sample point SW-5
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
u g / L
jan mar may jul sep nov jan mar may jul sep nov jan
23 24 25
Month / Year
Median ND

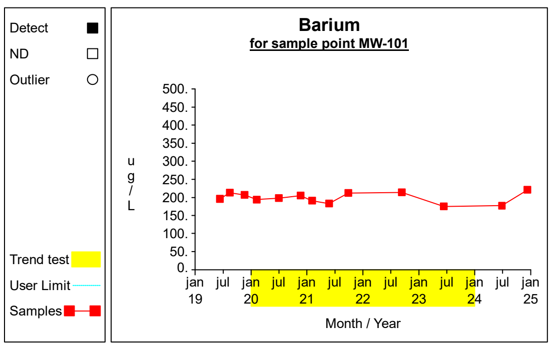

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point LB-1
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0.
u g / L
jan feb mar apr may jun jul aug sep oct nov dec jan
21 22
Month / Year

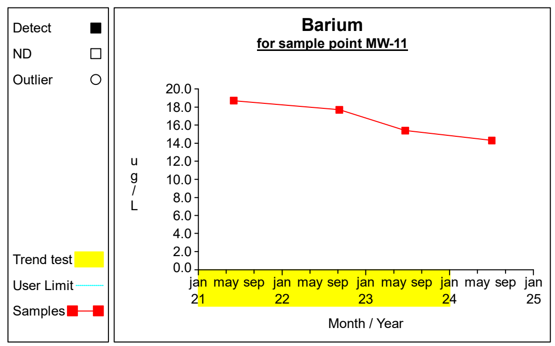
Time Series

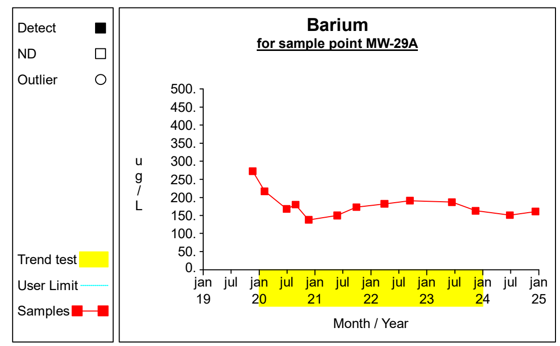

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point LB-2
u g / L
Month / Year

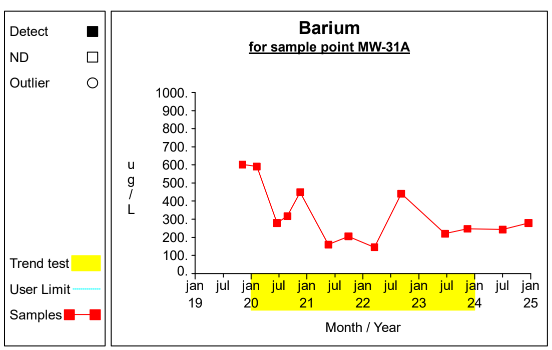

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point MH-1
u g / L
Month / Year

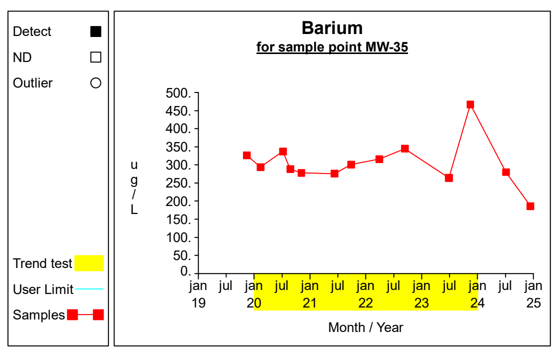

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point MH-4-2
u g / L
Month / Year

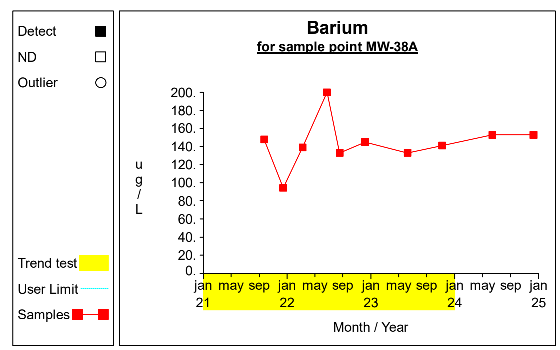

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point MW-101
u g / L
Month / Year


Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point MW-11
u g / L
Month / Year

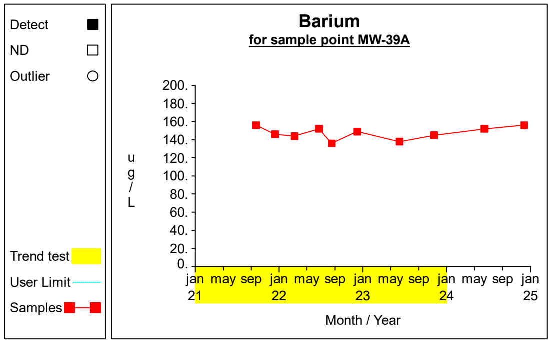

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point MW-29A
u g / L
Month / Year

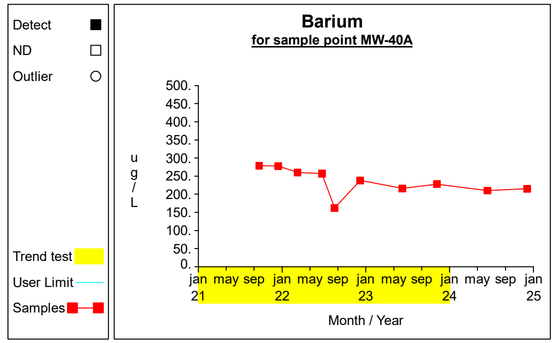

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point MW-31A
u g / L
Month / Year

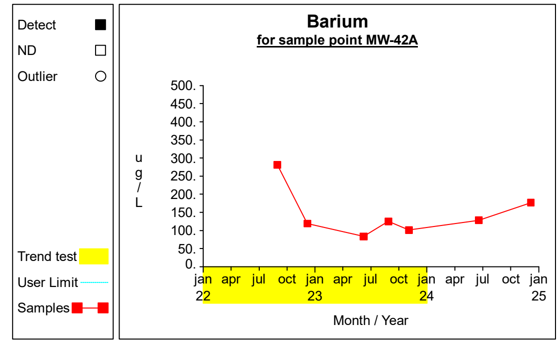

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point MW-35
u g / L
Month / Year

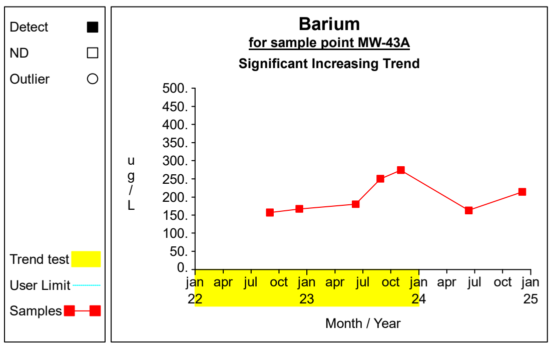

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point MW-38A
u g / L
Month / Year

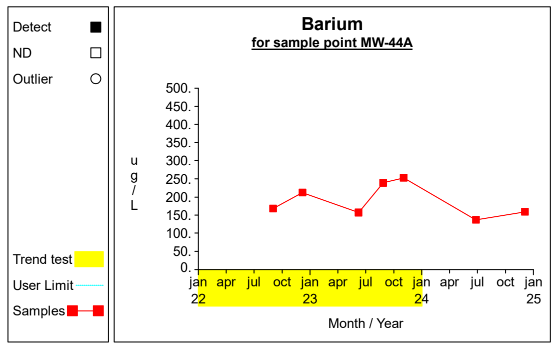
Time Series

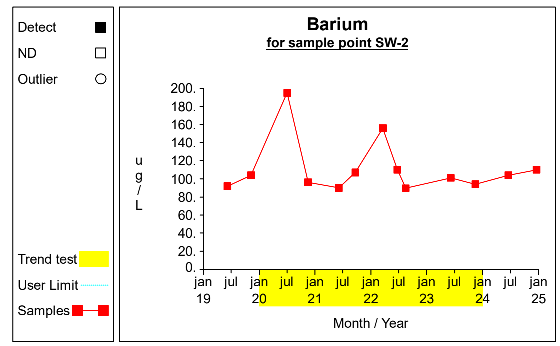

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point MW-39A
u g / L
Month / Year

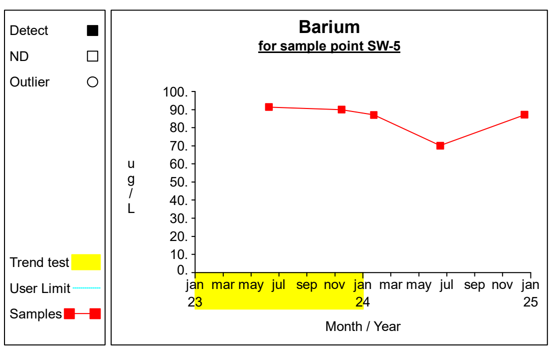

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point MW-40A
u g / L
Month / Year

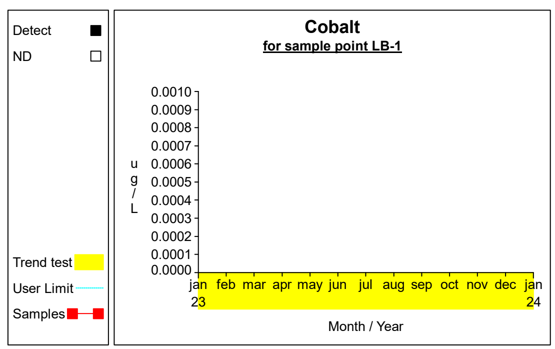

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point MW-42A
u g / L
Month / Year

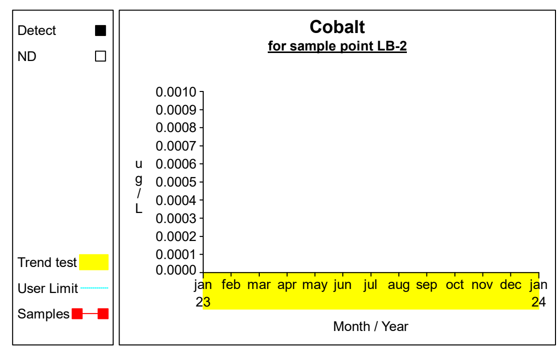

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point MW-43A
Significant Increasing Trend
u g / L
Month / Year


Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point MW-44A
u g / L
Month / Year

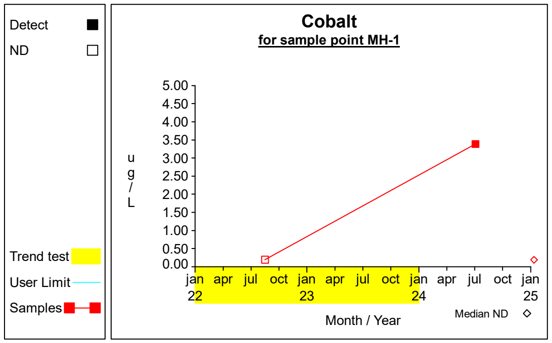

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point SW-2
u g / L
Month / Year

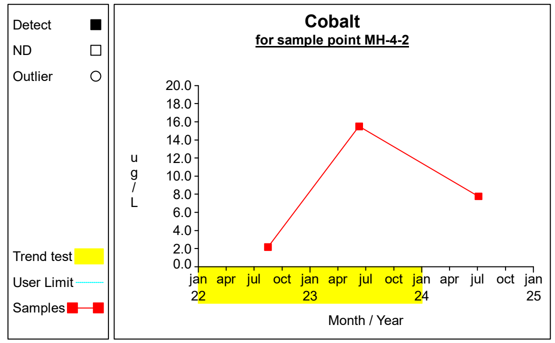

Detect
ND
Outlier
Trend test
User Limit
Samples
Barium
for sample point SW-5
u g / L
Month / Year

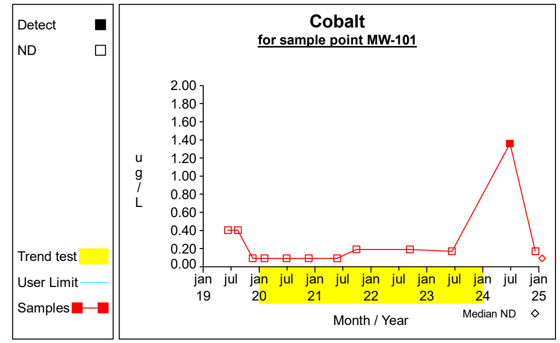

Detect
ND
Trend test
User Limit
Samples
Cobalt
for sample point LB-1
u g / L
Month / Year

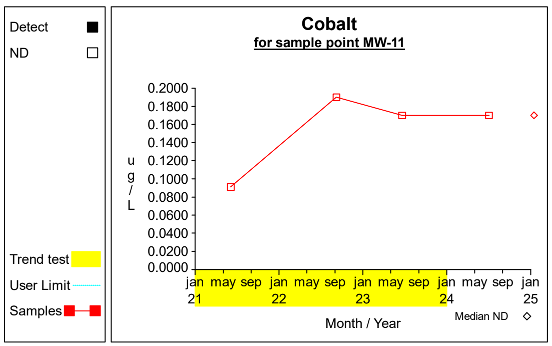

Detect
ND
Trend test
User Limit
Samples
Cobalt
for sample point LB-2
u g / L
Month / Year

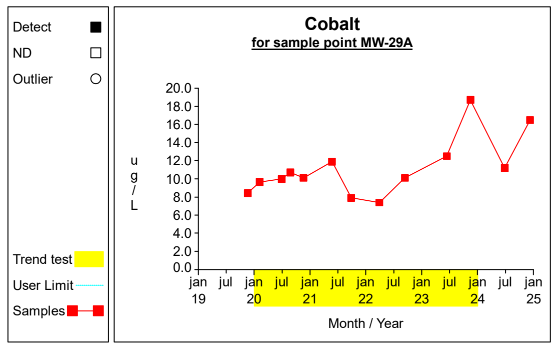
Time Series

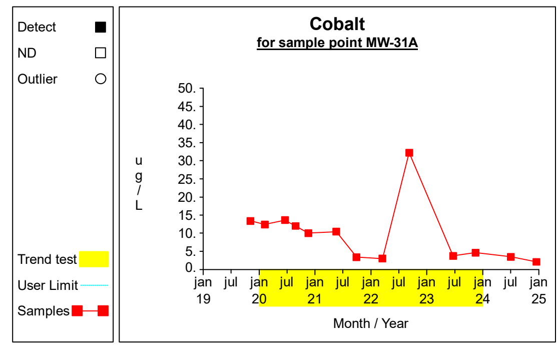

Detect
ND
Trend test
User Limit
Samples
Cobalt
for sample point MH-1
u g / L
Month / Year
Median ND

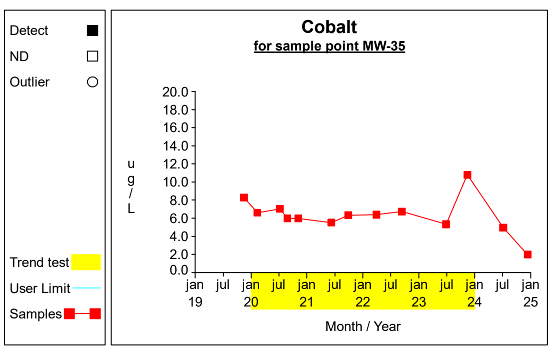

Detect
ND
Outlier
Trend test
User Limit
Samples
Cobalt
for sample point MH-4-2
u g / L
Month / Year

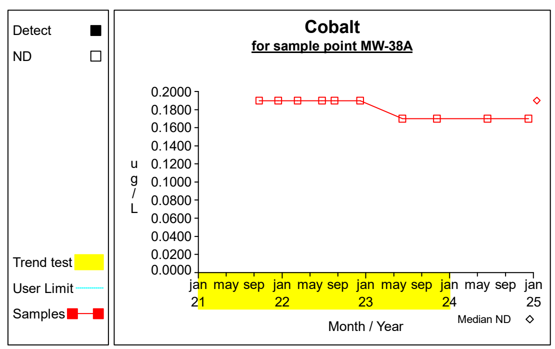

Detect
ND
Trend test
User Limit
Samples
Cobalt
for sample point MW-101
u g / L
Month / Year
Median ND

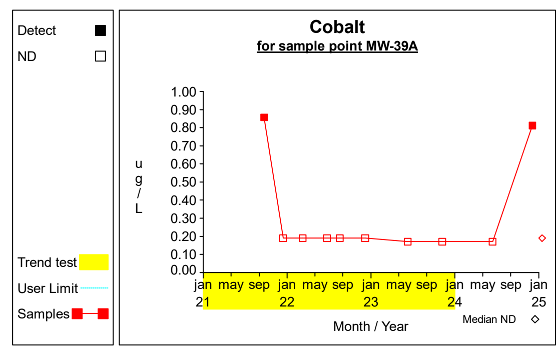

Detect
ND
Trend test
User Limit
Samples
Cobalt
for sample point MW-11
u g / L
Month / Year
Median ND


Detect
ND
Outlier
Trend test
User Limit
Samples
Cobalt
for sample point MW-29A
u g / L
Month / Year

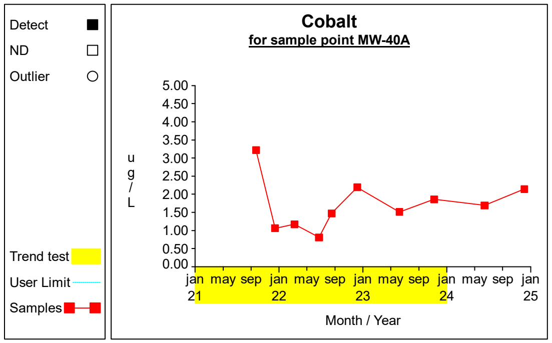

Detect
ND
Outlier
Trend test
User Limit
Samples
Cobalt
for sample point MW-31A
u g / L
Month / Year

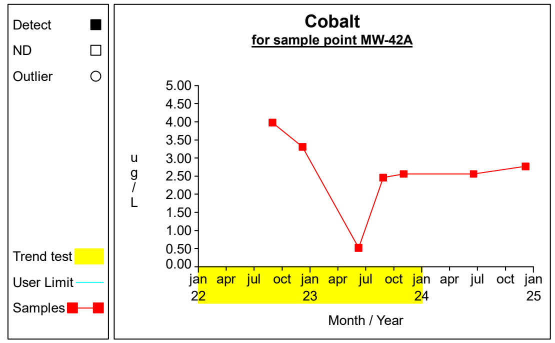

Detect
ND
Outlier
Trend test
User Limit
Samples
Cobalt
for sample point MW-35
u g / L
Month / Year

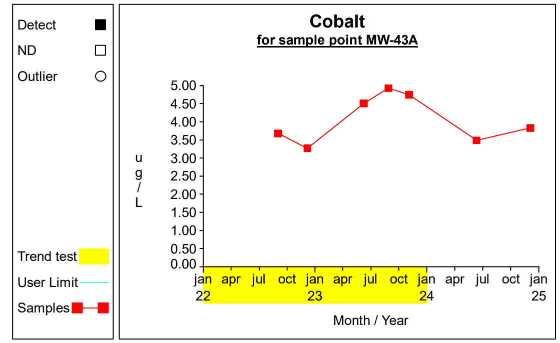

Detect
ND
Trend test
User Limit
Samples
Cobalt
for sample point MW-38A
u g / L
Month / Year
Median ND

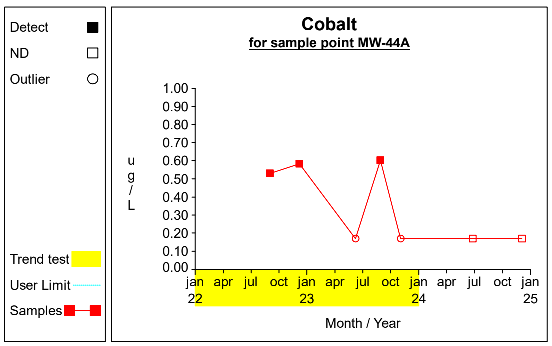

Detect
ND
Trend test
User Limit
Samples
Cobalt
for sample point MW-39A
u g / L
Month / Year
Median ND

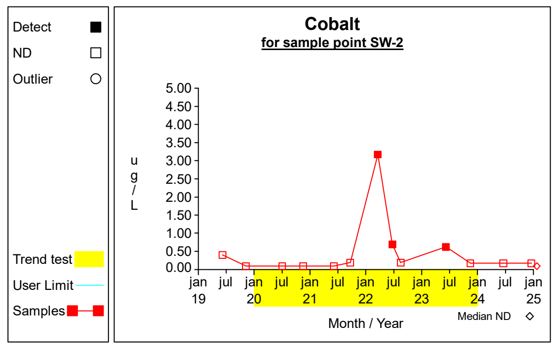
Time Series

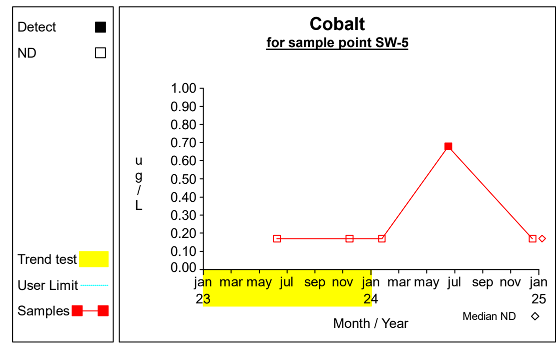

Detect
ND
Outlier
Trend test
User Limit
Samples
Cobalt
for sample point MW-40A
u g / L
Month / Year

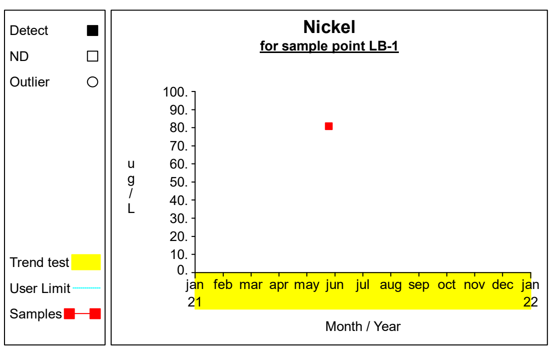

Detect
ND
Outlier
Trend test
User Limit
Samples
Cobalt
for sample point MW-42A
u g / L
Month / Year

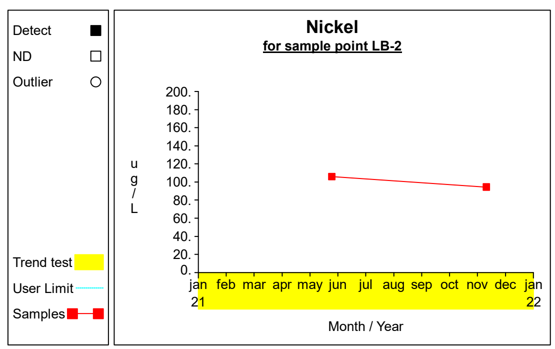

Detect
ND
Outlier
Trend test
User Limit
Samples
Cobalt
for sample point MW-43A
u g / L
Month / Year

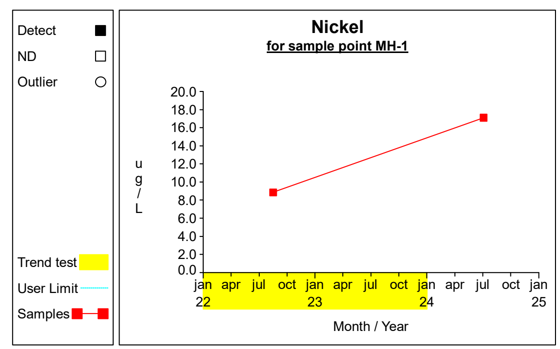

Detect
ND
Outlier
Trend test
User Limit
Samples
Cobalt
for sample point MW-44A
u g / L
Month / Year


Detect
ND
Outlier
Trend test
User Limit
Samples
Cobalt
for sample point SW-2
u g / L
Month / Year
Median ND

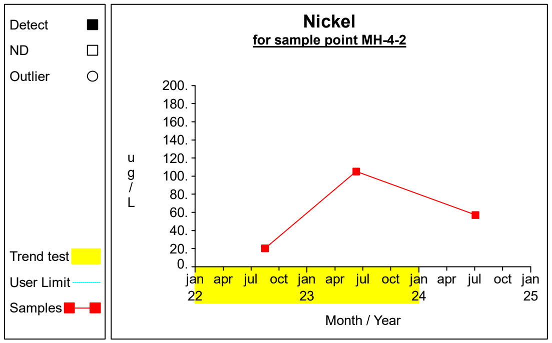

Detect
ND
Trend test
User Limit
Samples
Cobalt
for sample point SW-5
u g / L
Month / Year
Median ND

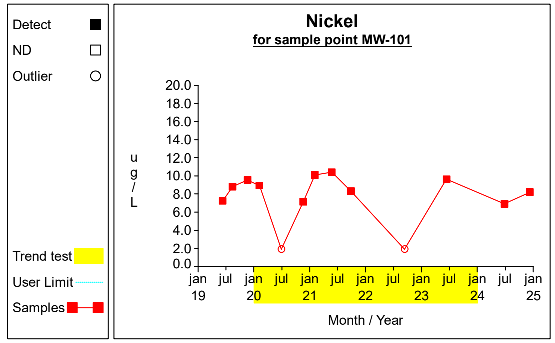

Detect
ND
Outlier
Trend test
User Limit
Samples
Nickel
for sample point LB-1
u g / L
Month / Year

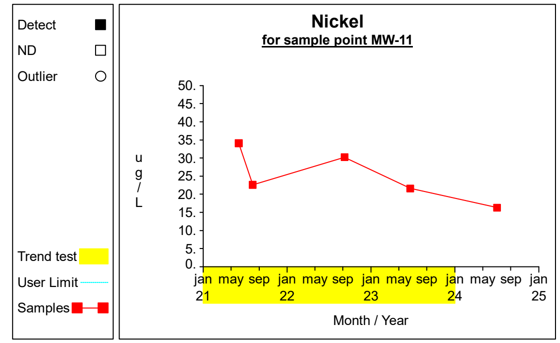

Detect
ND
Outlier
Trend test
User Limit
Samples
Nickel
for sample point LB-2
u g / L
Month / Year

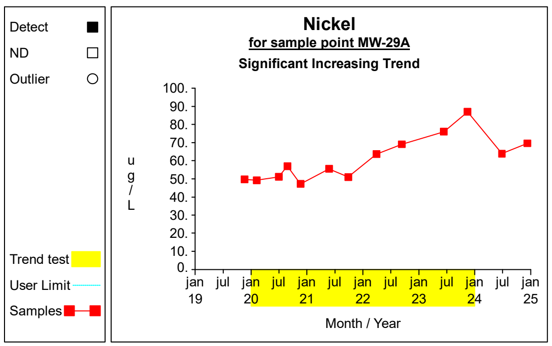

Detect
ND
Outlier
Trend test
User Limit
Samples
Nickel
for sample point MH-1
u g / L
Month / Year

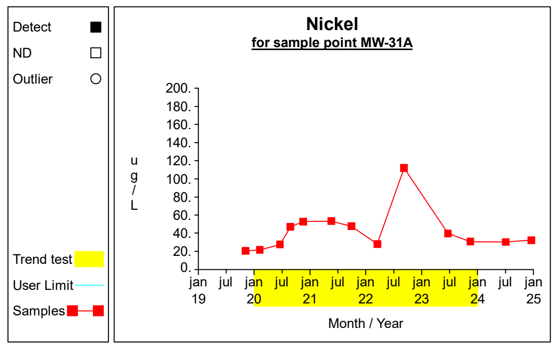
Time Series

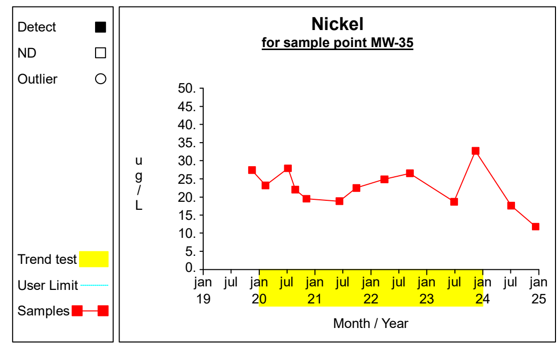

Detect
ND
Outlier
Trend test
User Limit
Samples
Nickel
for sample point MH-4-2
u g / L
Month / Year

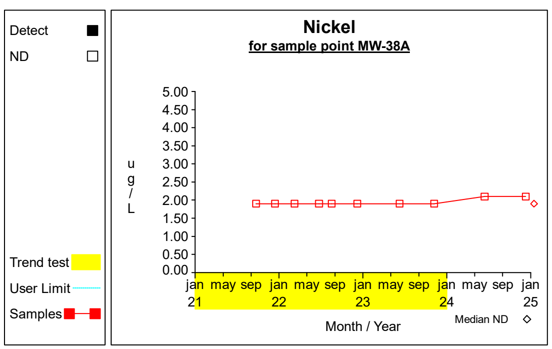

Detect
ND
Outlier
Trend test
User Limit
Samples
Nickel
for sample point MW-101
u g / L
Month / Year

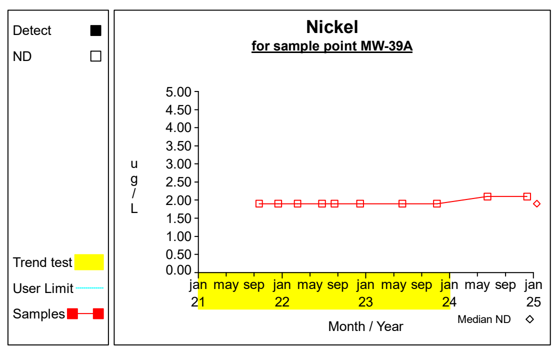

Detect
ND
Outlier
Trend test
User Limit
Samples
Nickel
for sample point MW-11
u g / L
Month / Year

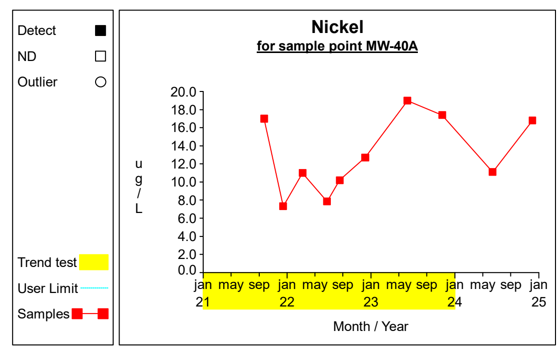

Detect
ND
Outlier
Trend test
User Limit
Samples
Nickel
for sample point MW-29A
Significant Increasing Trend
u g / L
Month / Year


Detect
ND
Outlier
Trend test
User Limit
Samples
Nickel
for sample point MW-31A
u g / L
Month / Year

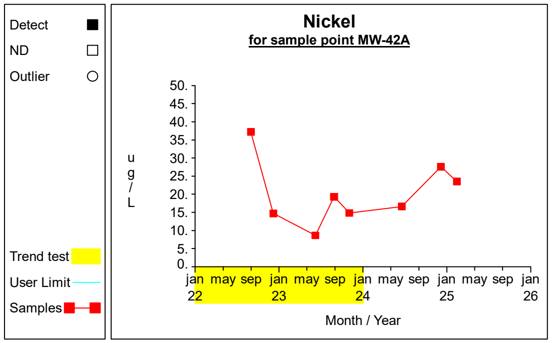

Detect
ND
Outlier
Trend test
User Limit
Samples
Nickel
for sample point MW-35
u g / L
Month / Year

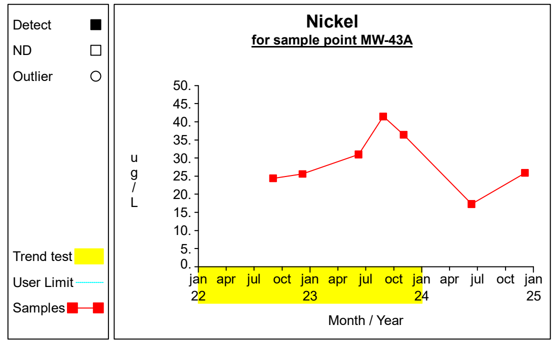

Detect
ND
Trend test
User Limit
Samples
Nickel
for sample point MW-38A
u g / L
Month / Year
Median ND

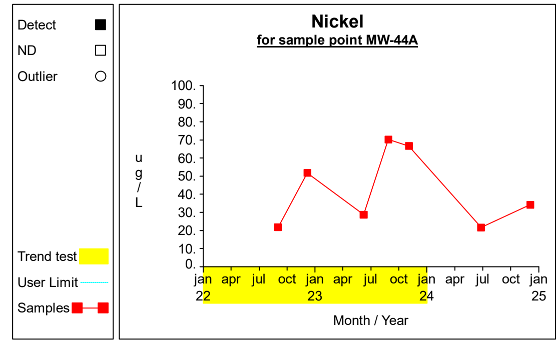

Detect
ND
Trend test
User Limit
Samples
Nickel
for sample point MW-39A
u g / L
Month / Year
Median ND

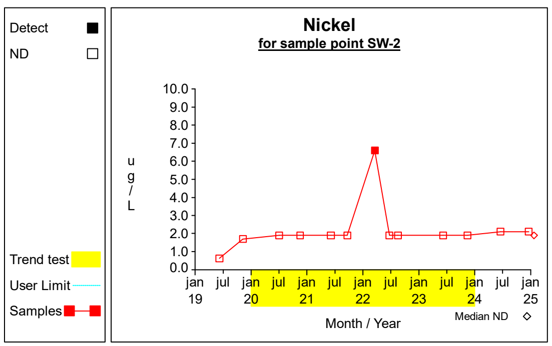

Detect
ND
Outlier
Trend test
User Limit
Samples
Nickel
for sample point MW-40A
u g / L
Month / Year

Time Series


Detect
ND
Outlier
Trend test
User Limit
Samples
Nickel
for sample point MW-42A
ug/L
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0.
jan may sep jan may sep jan may sep jan may sep jan
22 23 24 25 26
Month / Year


Detect
ND
Outlier
Trend test
User Limit
Samples
Nickel
for sample point MW-43A
ug/L
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0.
jan apr jul oct jan apr jul oct jan apr jul oct jan
22 23 24 25
Month / Year


Detect
ND
Outlier
Trend test
User Limit
Samples
Nickel
for sample point MW-44A
ug/L
100.
90.
80.
70.
60.
50.
40.
30.
20.
10.
0.
jan apr jul oct jan apr jul oct jan apr jul oct jan
22 23 24 25
Month / Year


Detect
ND
Trend test
User Limit
Samples
Nickel
for sample point SW-2
ug/L
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
jan jul jan jul jan jul jan jul jan jul jan jul jan
19 20 21 22 23 24 25
Month / Year
Median ND

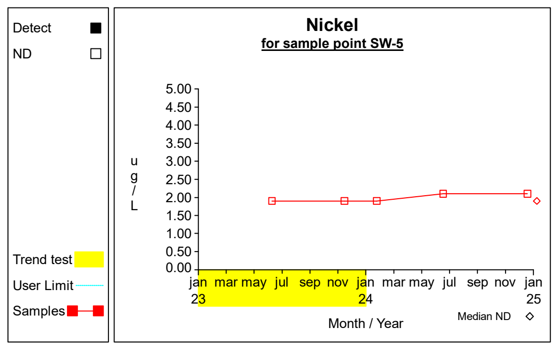

Detect
ND
Trend test
User Limit
Samples
Nickel
for sample point SW-5
ug/L
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
jan mar may jul sep nov jan mar may jul sep nov jan
23 24 25
Month / Year
Median ND

Table 1

Historical Volatile Organic Compound Detections

Constituent	Well	Date	Identifier	Result	Limit	Units
Benzene	LB-2	11/10/2021		7.23	2.20	ug/L
Beta-bhc	LB-2	5/25/2021		.0852	.0370	ug/L
Beta-bhc	LB-2	11/10/2021		.0669	.0370	ug/L
Endosulfan i	LB-2	5/25/2021		.378	.033	ug/L
Endosulfan i	LB-2	11/10/2021		.111	.033	ug/L
Toluene	LB-2	11/10/2021		39.1	4.3	ug/L
2-butanone	MH-1	7/03/2024		109.0	2.1	ug/L
Acetone	MH-1	7/03/2024		77.4	3.1	ug/L
Benzene	MH-1	8/16/2022		.513	.220	ug/L
Benzene	MH-1	7/03/2024		3.240	.220	ug/L
Ethylbenzene	MH-1	7/03/2024		1.83	.31	ug/L
Toluene	MH-1	7/03/2024		25.90	.43	ug/L
Xylenes	MH-1	7/03/2024		6.54	.40	ug/L
1,4-dichlorobenzene	MH-4-2	8/16/2022		1.55	.23	ug/L
Acetone	MH-4-2	8/16/2022		13.4	3.1	ug/L
Benzene	MH-4-2	8/16/2022		1.71	.22	ug/L
Chlorobenzene	MH-4-2	8/16/2022		1.65	.40	ug/L
Ethylbenzene	MH-4-2	8/16/2022		8.11	.31	ug/L
Toluene	MH-4-2	8/16/2022		4.61	.43	ug/L
Xylenes	MH-4-2	8/16/2022		14.9	.4	ug/L
2-butanone	MW-11	4/24/2012		2.29	.47	ug/L
Acetone	MW-11	4/24/2012		3.82	1.79	ug/L
Carbon disulfide	MW-11	10/24/2012		.78	.15	ug/L
Chloromethane	MW-11	10/24/2012		.31	.31	ug/L
1,1-dichloroethane	MW-31A	11/05/2019		1.26	.22	ug/L
1,1-dichloroethane	MW-31A	8/26/2020		1.40	.22	ug/L
1,1-dichloroethane	MW-31A	6/20/2023		1.23	.22	ug/L
Acetone	MW-31A	6/18/2020		11.8	3.1	ug/L
Endosulfan i	MW-31A	11/18/2020		.05310	.00244	ug/L
Endosulfan i	MW-31A	9/29/2021		.05800	.01200	ug/L
Benzene	MW-40A	9/23/2021		.543	.220	ug/L
Benzene	MW-40A	12/14/2021		.768	.220	ug/L
Benzene	MW-40A	12/06/2022		.994	.220	ug/L
Benzene	MW-40A	11/06/2023		.521	.220	ug/L
Benzene	MW-42A	12/06/2022		.539	.220	ug/L
1,2-dichlorobenzene	SW-2	4/08/2013		.147	.140	ug/L
2-butanone	SW-2	12/07/2011		1.24	.47	ug/L
2-butanone	SW-2	4/24/2012		1.21	.47	ug/L
2-butanone	SW-2	4/08/2013		8.70	.47	ug/L
2-butanone	SW-2	6/27/2014		1.99	.47	ug/L
Acetone	SW-2	2/21/2012		2.37	1.79	ug/L
Acetone	SW-2	4/24/2012		3.08	1.79	ug/L
Acetone	SW-2	8/23/2012		3.15	1.79	ug/L
Acetone	SW-2	4/08/2013		15.80	1.79	ug/L
Acetone	SW-2	6/27/2014		4.00	1.79	ug/L
Acetone	SW-2	4/08/2016		2.59	1.79	ug/L
Acetone	SW-2	11/14/2017		2.82	1.79	ug/L
Bromomethane	SW-2	6/27/2014		.250	.220	ug/L
Bromomethane	SW-2	5/11/2015		.249	.220	ug/L
Chloroethane	SW-2	12/07/2011		.18	.15	ug/L
Chloromethane	SW-2	11/17/2016		.507	.310	ug/L
Dichloromethane	SW-2	2/21/2012		.780	.170	ug/L
Dichloromethane	SW-2	8/23/2012		.210	.170	ug/L
Dichloromethane	SW-2	10/24/2012		.620	.170	ug/L
Dichloromethane	SW-2	11/17/2016		.707	.170	ug/L

Detections are shown for the constituents and sample points selected for the analysis
The Limit column refers to the laboratory reporting limit

Appendix B1 – Historical Data

WATER TABLE

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-1

Parameter Name	Units	GPS	DL	RL	Oct-07	Jan-08	Apr-08	Jul-08	Oct-08	Apr-09	Jul-09	Oct-09	Feb-10	Apr-10	Oct-10	Apr-11	Oct-11	Apr-12	Oct-12	Apr-13	Nov-13	May-14	Nov-14	May-15	Sep-15	Apr-16	Nov-16	May-17	Nov-17	Jun-18	Oct-18	Jun-19	Nov-19	Jun-20	Nov-20	May-21	Sep-21	Mar-22	Aug-22	Jun-23	Nov-23	Jan-24	Jun-24	Dec-24
Appendix I Inorganics																																												
Total Suspended Solids	mg/L	NS	0.581	1.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.17 J	<1.2	<3.2	<0.581	0.875 J	1.75 J	6.87	<0.638	2.88	<0.638	<0.638	1.25 J	<1.7	1.5 J	0.75 J	<0.638	<0.638	<0.638	276	--	<1.39	3.86
Turbidity, Field	NTU	NS	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.835	0.3323	3.463	0.0104	0.154	6.993	1.698	1.741	6.923	26.76	0.44	0.64	1.01	1.37	3.44	10.97	0	0.57	146.72	0.58	1.73	10.6
Turbidity, Lab	NTU	NS	0.4	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.6	<0.7	<0.7	<0.4	<0.4	0.4 J	0.6 J	0.4 J	1.6	0.56 J	<0.4	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	1	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<2.73	<1.45	<0.6	0.136 J	0.0993 J	<0.4	<0.161	<0.161	<0.161	<0.237	<0.237	<0.185	<0.185	<0.42	<0.42	<1.32	<0.53	<0.51	<0.51	<1.1	<1.1	<0.69	<0.69	<1	<1	--	<1	<1
Antimony, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<6	<6	<6	<6	<6	<6	<6	<2.73	<1.45	0.17 J	0.134 J	<0.0541	<0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	2	<1	1.81	<1	1.95	<1	6.88	<1	<1	<1	<1	<1	<1	<0.6	<0.216	3.95 J	2.31	1.45	0.354 J	<0.945	<0.945	<0.945	<0.672	<0.672	<0.505	0.662 J	<0.57	<0.57	0.604 J	<0.75	<0.88	<0.88	<0.75	<0.75	<0.75	<0.75	<0.53	1.03 J	--	<0.53	<0.53
Arsenic, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<0.47	<0.216	1.95	1.95	<0.544	<0.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	2	170	185	137	165	317	279	163	290	153	144	195	128	273	123	448	282	186	124	190	104	166	93.8	114	95.1	130	119	142	93.8	124	94.9	184	146	111	112	112	106	282	--	94.7	201
Barium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	182	124	178	134	136	116	124	212	101	358	284	189	125	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.12	<1	0.276 J	<0.079	<0.089	<0.0696	<0.0696	<0.08	<0.039	<0.039	<0.039	<0.221	<0.221	<0.125	<0.125	<0.19	<0.19	<0.53	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	--	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<0.051	<0.079	<0.0178	<0.0696	<0.0696	<0.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.044	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	0.4 J	0.12 J	<0.106	<0.1	<0.112	<0.112	<0.112	<0.0351	<0.0351	<0.0441	<0.0441	<0.06	<0.06	<0.167	<0.039	<0.049	<0.049	<0.051	<0.051	<0.055	<0.055	<0.1	0.209	--	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	0.27 J	<0.106	<0.106	<0.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	5	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	2.8 J	<1.81	2.55 J	0.643 J	<0.418	0.816 J	<1.24	<1.24	<1.24	0.852 J	0.423 J	0.87 J	<0.729	<0.76	1.15 J	<1.14	<0.98	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<20	<20	<1.81	<1.81	<0.39	0.439 J	<0.418	0.715 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.045	0.5	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	5.19 J	<1.55	4.7	0.857	0.745	0.231 J	0.168 J	<0.0528	0.182 J	0.052 J	<0.0274	0.065 J	0.083 J	<0.061	0.096 J	<0.402	<0.091	<0.091	0.105 J	<0.091	<0.19	0.317 J	<0.19	<0.17	0.844 J	--	<0.17	0.225 J
Cobalt, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<20	<20	<1.55	<1.55	1.24	0.688	0.612	0.145 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	5	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	19 J	3.94 J	18.2	7.01	2.25	1.04 J	0.906 J	<0.485	0.526 J	<1.22	<1.22	<2.19	<2.19	<1.6	<1.6	0.991 J	<2	<1.5	<1.5	<1.4	<1.4	<1.8	<1.8	<1.8	5.27	--	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<20	<20	13.8 J	<1.51	4.61	3.8	2.01	1.28 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	0.5	<4	<4	<4	<4	5.04	8.1	<4	5.38	<4	<4	<4	<4	3.44 J	1.84 J	4.6	<0.207	0.212 J	<0.18	<0.0967	<0.0967	0.303 J	<0.211	<0.211	<0.324	<0.324	<0.25	0.459 J	<0.186	<0.27	<0.11	<0.11	<0.21	<0.21	<0.24	<0.24	<0.24	0.994	--	<0.26	<0.26
Lead, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<4	<4	<4	<4	<4	<4	<4	<1	<0.804	<0.029	<0.207	<0.207	0.2 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	5	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	19.4 J	4.8 J	46	21	12.9	4.01	6.2	1.49 J	5.87	<1.53	<1.53	0.971 J	1.53 J	1.32 J	1.84 J	1.88 J	<1.7	<1.9	3.25 J	<1.9	<1.9	<1.9	<1.9	<1.9	20.9	--	<2.1	9.01
Nickel, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<50	<50	<50	<50	<50	<50	<50	11.8 J	5.05 J	36.2	21	12.9	5.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.69	<0.7	<1.48	4.98 J	4.17 J	1.15 J	<3.34	<3.34	<3.34	1.41 J	<0.63	<0.928	<0.928	<0.9	<0.9	<0.982	<1	<1	<1	<0.96	<0.96	<0.96	<0.96	<1.4	<1.4	--	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<5	<5	<5	<5	<5	<5	<5	<1.69	<0.7	<0.297	6.12	<1.46	1.14 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.7	<1.7	<0.135	<0.0789	<0.0789	<0.033	<0.042	<0.042	0.117 J	<0.153	<0.153	0.142 J	<0.14	<0.3	<0.3	<0.115	<0.37	<0.37	<0.37	<0.42	<0.42	<0.49	<0.49	<0.5	<0.5	--	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<20	<20	<1.7	<1.7	<0.027	<0.0789	<0.0789	0.0665 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.064	1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.84	<0.288	<0.0435	0.0796 J	<0.0267	<0.05	<0.0325	<0.0325	0.038 J	<0.0255	<0.0255	<0.0644	<0.0644	<0.17	<0.17	<0.57	<0.27	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	--	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<2	<2	<2	<2	<2	<2	<2	<0.84	<0.288	0.02 J	<0.0267	<0.0267	0.0566 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	5	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	3.59 J	2.74 J	6.35	0.904 J	<0.833	0.676 J	0.51 J	<0.449	0.542 J	0.466 J	0.394 J	<0.84	<0.84	<0.52	0.973 J	<2.15	1.04 J	<0.85	<0.85	<1.1	<1.1	<1.1	<1.1	<1.1	1.53 J	--	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<50	<50	<50	<50	<50	<50	<50	<2.1	<2.1	<0.94	<0.833	<0.833	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	20	51.2	<20	22.6	<20	42.9	51.2	36.6	50.8	<20	24	44.9	<20	13.9 J	<9.11	18 J	1.71 J	<0.625	<2	<6.95	<6.95	<6.95	<5.21	<5.21	<11.5	<11.5	<10	<10	<6.92	<10	<10	<10	<10	<10	<10	<10	<6.4	<6.4	--	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	34.8	33.1	36.9	<20	20.5	29.9	<20	<9.11	21.6	5.65	3.12 J	<0.625	2.01 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																																												
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<4	<5	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<10	<1	<1	<0.1	<0.1	0.21 J	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.006	0.19	1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<10	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.12	<0.12	1.17 J	<0.12	<0.12	<0.12	<0.12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.14	<0.14	0.48 J	0.185 J	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	0.18 J	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<0.2	3.09	1.52	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	0.516 J	--	<0.23	0.256 J
2-Butanone	µg/L	4000	1.04	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.47	0.65 J	0.8 J	0.709 J	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<1.04	<1.04	<1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1
Acetone	µg/L	6300	1.79	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	2.07 J	<1.79	<1.79	1.94 J	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	1.98 J	3.88 J	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	--	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2	<2.2
Benzene	µg/L	5	0.11	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.17 J	<0.11	0.65	0.287 J	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<4	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39
Bromomethane	µg/L	10	0.22	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.22	<0.22	0.26 J	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<10	<1	<0.15	<0.15	0.17 J	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<5	<5	<2	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	1	<1	<1	<1	<1	1.82	1.33	<1	1.06	<1	<1	<1	<1	1.63	0.43 J	9.15	4.66	<0.19	<0.19	1.42	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	2.89	4.64	<0.4	0.966 J
Chloroethane	µg/L	2800	0.15	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.15	<0.15	0.57 J	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	0.28 J	<0.17	0.26 J	<0.17	<0.17	0.228 J	<0.17	<0.17	<0.17	<0.17	<0.17	0.341 J	0.286 J	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	10	<10	<10	<10	<10	<10	<20	<50	<10	<10	<10	<20	<10	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	--	<7	<7
Styrene	µg/L	100	0.1	1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<4	<1	<1	<0.1	<0.1	0.11 J	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48	<0.48
Toluene	µg/L	1000	0.15	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<10	<5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	5	<5	<5	<5	<5	<5	<20	<5	<5	<5	<5	<5	<5	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	10	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.6	<0.6	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18
Xylenes	µg/L	10000	0.13	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.13	<0.13	0.32 J	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-1

Parameter Name	Units	GPS	Jul-09	Apr-10	May-14	Jun-14	Nov-14	Dec-14	May-15	Sep-15	Dec-15	Apr-16	Nov-16
Alcohols/Gycols by GC													
Acetonitrile	μg/L	NS	<10000	<10000	<126	--	--	--	--	<126	--	--	***166 J***
Isobutanol	μg/L	2100	<10000	<10000	<177	--	--	--	--	<177	--	--	<177
Herbicides (GC)													
2,4,5-T	μg/L	70	<0.21	<0.5	<0.475	--	--	--	--	<0.487	--	--	<0.508
2,4-D	μg/L	70	<1	<1	<0.51	--	--	--	--	<0.523	--	--	<0.546
Silvex (2,4,5-TP)	μg/L	50	<0.21	<0.5	<0.317	--	--	--	--	<0.325	--	--	<0.339
Inorganics													
Cyanide	μg/L	200	<10	<10	<3.1	--	--	--	--	<3.04	--	--	<3.52
Mercury	μg/L	2	<0.2	<0.2	<0.071	--	--	--	--	<0.0926	--	--	<0.142
Sulfide	μg/L	NS	<1000	<1000	<219	--	--	--	--	<219	--	--	<180
Tin	μg/L	4200	<100	<100	<12.1	--	--	--	--	<1.8	--	--	<0.832
PCBs (EPA Method 8082)													
PCB-1016	μg/L	NS	<0.8	<0.8	<0.0457	--	--	--	--	<0.0482	--	--	<0.0477
PCB-1221	μg/L	NS	<0.8	<0.8	<0.168	--	--	--	--	<0.178	--	--	<0.176
PCB-1232	μg/L	NS	<0.8	<0.8	<0.116	--	--	--	--	<0.122	--	--	<0.121
PCB-1242	μg/L	NS	<0.8	<0.8	<0.137	--	--	--	--	<0.144	--	--	<0.143
PCB-1248	μg/L	NS	<0.8	<0.8	<0.116	--	--	--	--	<0.122	--	--	<0.121
PCB-1254	μg/L	NS	<0.8	<0.8	<0.0968	--	--	--	--	<0.102	--	--	<0.101
PCB-1260	μg/L	NS	<0.8	<0.8	<0.0463	--	--	--	--	<0.0489	--	--	<0.0484
Pesticides (EPA Method 8081A)													
4,4'-DDD	μg/L	0.73	<0.032	<0.032	<0.00191	--	--	--	--	<0.00205	--	--	<0.00198
4,4'-DDE	μg/L	0.51	<0.032	<0.032	<0.00223	--	--	--	--	***0.00427 J***	***0.00671 J***	--	<0.00231
4,4'-DDT	μg/L	0.51	<0.032	<0.032	<0.00404	--	--	--	--	***0.00632 J***	***0.00947 J***	--	<0.00418
Aldrin	μg/L	0.01	<0.032	<0.032	<0.00479	--	--	--	--	<0.00511	--	--	<0.00495
alpha-BHC	μg/L	0.028	<0.032	<0.032	<0.00181	--	--	--	--	***0.00287 J***	<0.00189	--	<0.00187
beta-BHC	μg/L	0.042	<0.032	<0.032	***0.00594 J***	<0.00533	<0.00552	<0.00522	<0.0049	<0.00545	--	--	<0.00527
Chlordane	μg/L	2	<2	<2	<0.0681	--	--	--	--	<0.0727	--	--	<0.0703
delta-BHC	μg/L	2.1	<0.032	<0.032	<0.00245	--	--	--	--	***0.00458 J***	<0.00256	--	<0.00253
Dieldrin	μg/L	0.011	<0.032	<0.032	<0.00213	--	--	--	--	***0.00683 J***	<0.00222	--	<0.0022
Endosulfan I	μg/L	42	<0.032	<0.032	<0.00213	--	--	--	--	<0.00227	--	--	<0.0022
Endosulfan II	μg/L	42	<0.032	<0.032	***0.00375 J***	<0.00211	***0.00589 J***	<0.00207	<0.00194	<0.00216	--	--	<0.00209
Endosulfan sulfate	μg/L	NS	<0.032	<0.032	<0.00266	--	--	--	--	***0.00544 J***	***0.00772 J***	--	<0.00275
Endrin	μg/L	2	<0.032	<0.032	<0.00202	--	--	--	--	***0.00247 J***	<0.00211	--	<0.00209
Endrin aldehyde	μg/L	2.1	<0.032	<0.032	<0.00777	--	--	--	--	<0.0083	--	--	<0.00802
gamma-BHC (Lindane)	μg/L	0.2	<0.032	<0.032	<0.00202	--	--	--	--	***0.00267 J***	<0.00211	--	<0.00209
Heptachlor	μg/L	0.4	<0.032	<0.032	<0.00277	--	--	--	--	***0.00335 J***	***0.0049 J***	--	<0.00286
Heptachlor epoxide	μg/L	0.2	<0.032	<0.032	<0.00649	--	--	--	--	<0.00693	--	--	<0.0067
Methoxychlor	μg/L	40	<0.032	<0.032	***0.0171***	<0.00233	<0.00241	***0.00889 J***	***0.0117 J***	<0.00239	--	<0.00231	<0.00231
Toxaphene	μg/L	3	<2	<2	<0.0617	--	--	--	--	<0.0659	--	--	<0.0637
Semivolatile Organics by GC/MS													
1,2,4,5-Tetrachlorobenzene	μg/L	2.1	<10	<10	<0.126	--	--	--	--	<0.126	--	--	<0.132
1,3,5-Trinitrobenzene	μg/L	NS	<10	<10	<1.35	--	--	--	--	<1.35	--	--	<1.41
1,3-Dinitrobenzene	μg/L	1	<10	<10	<0.179	--	--	--	--	<0.179	--	--	<0.187
1,4-Naphthoquinone	μg/L	NS	<10	<10	<0.147	--	--	--	--	<0.147	--	--	<0.154
1,4-Phenylenediamine	μg/L	NS	<10	<10	<8.84	--	--	--	--	<8.84	--	--	<9.23
1-Naphthylamine	μg/L	NS	<10	<10	<0.253	--	--	--	--	<0.253	--	--	<0.264
2,3,4,6-Tetrachlorophenol	μg/L	NS	<10	<10	<0.211	--	--	--	--	<0.211	--	--	<0.22
2,4,5-Trichlorophenol	μg/L	700	<10	<10	<0.337	--	--	--	--	<0.337	--	--	<0.352
2,4,6-Trichlorophenol	μg/L	16	<10	<10	<0.232	--	--	--	--	<0.232	--	--	<0.242
2,4-Dichlorophenol	μg/L	20	<10	<10	<0.158	--	--	--	--	<0.158	--	--	<0.165
2,4-Dimethylphenol	μg/L	100	<10	<10	<0.221	--	--	--	--	<0.221	--	--	<0.231
2,4-Dinitrophenol	μg/L	14	<20	<20	<1.41	--	--	--	--	<1.41	--	--	<1.47
2,4-Dinitrotoluene	μg/L	0.25	<10	<10	<0.2	--	--	--	--	<0.2	--	--	<0.209
2,6-Dichlorophenol	μg/L	NS	<10	<10	<0.232	--	--	--	--	<0.232	--	--	<0.242
2,6-Dinitrotoluene	μg/L	0.26	<10	<10	<0.253	--	--	--	--	<0.253	--	--	<0.264
2-Acetylaminofluorene	μg/L	NS	<10	<10	<0.295	--	--	--	--	<0.295	--	--	<0.308
2-Chloronaphthalene	μg/L	560	<10	<10	<0.242	--	--	--	--	<0.242	--	--	<0.253
2-Chlorophenol	μg/L	40	<10	<10	<0.158	--	--	--	--	<0.158	--	--	<0.165
2-Methylnaphthalene	μg/L	28	<10	<10	<0.2	--	--	--	--	<0.2	--	--	<0.209
2-Methylphenol (o-Cresol)	μg/L	35	<10	<10	<0.189	--	--	--	--	<0.189	--	--	<0.198
2-Naphthylamine	μg/L	0.097	<10	<10	<0.232	--	--	--	--	<0.232	--	--	<0.242
2-Nitroaniline	μg/L	NS	<10	<10	<0.242	--	--	--	--	<0.242	--	--	<0.253
2-Nitrophenol	μg/L	NS	<10	<10	<0.168	--	--	--	--	<0.168	--	--	<0.176
3,3'-Dichlorobenzidine	μg/L	0.39	<10	<10	<0.484	--	--	--	--	<0.484	--	--	<0.505
3,3'-Dimethylbenzidine	μg/L	NS	<10	<10	<0.221	--	--	--	--	<0.221	--	--	<0.231
3/4-Methylphenol	μg/L	70	<10	<10	<0.189	--	--	--	--	<0.189	--	--	<0.198
3-Methylcholanthrene	μg/L	NS	<10	<10	<0.326	--	--	--	--	<0.326	--	--	<0.341
3-Nitroaniline	μg/L	NS	<10	<10	<0.232	--	--	--	--	<0.232	--	--	<0.242
4,6-Dinitro-2-methylphenol	μg/L	NS	<10	<10	<2.34	--	--	--	--	<2.34	--	--	<2.44
4-Aminobiphenyl	μg/L	0.0083	<10	<10	<0.316	--	--	--	--	<0.316	--	--	<0.33
4-Bromophenyl phenyl ether	μg/L	NS	<10	<10	<0.305	--	--	--	--	<0.305	--	--	<0.319
4-Chloro-3-methylphenol	μg/L	700	<10	<10	<0.2	--	--	--	--	<0.2	--	--	<0.209
4-Chloroaniline	μg/L	28	<10	<10	<0.147	--	--	--	--	<0.147	--	--	<0.154
4-Chlorophenyl phenyl ether	μg/L	NS	<10	<10	<0.263	--	--	--	--	<0.263	--	--	<0.275
4-Nitroaniline	μg/L	NS	<10	<10	<0.337	--	--	--	--	<0.337	--	--	<0.352
4-Nitrophenol	μg/L	60	<10	<10	<0.126	--	--	--	--	<0.126	--	--	<0.132
5-Nitro-o-toluidine	μg/L	NS	<10	<10	<0.179	--	--	--	--	<0.179	--	--	<0.187
7,12-Dimethylbenz (a) anthracene	μg/L	NS	<10	<10	<0.263	--	--	--	--	<0.263	--	--	<0.275
Acenaphthene	μg/L	420	<10	<10	<0.316	--	--	--	--	<0.316	--	--	<0.33
Acenaphthylene	μg/L	210	<10	<10	<0.221	--	--	--	--	<0.221	--	--	<0.231
Acetophenone	μg/L	NS	<10	<10	<0.232	--	--	--	--	<0.232	--	--	<0.242
Anthracene	μg/L	2100	<10	<10	<0.179	--	--	--	--	<0.179	--	--	<0.187
Benzo (a) anthracene	μg/L	0.24	<10	<10	<0.253	--	--	--	--	<0.253	--	--	<0.264
Benzo (a) pyrene	μg/L	0.2	<10	<10	<0.263	--	--	--	--	<0.263	--	--	<0.275
Benzo (b) fluoranthene	μg/L	0.24	<10	<10	<0.326	--	--	--	--	<0.326	--	--	<0.341
Benzo (g,h,i) perylene	μg/L	21	<10	<10	<0.242	--	--	--	--	<0.242	--	--	<0.253
Benzo (k) fluoranthene	μg/L	2.4	<10	<10	<0.211	--	--	--	--	<0.211	--	--	<0.22
Benzyl alcohol	μg/L	700	<10	<10	<0.189	--	--	--	--	<0.189	--	--	<0.198
Bis(2-chloroethoxy)methane	μg/L	NS	<10	<10	<0.274	--	--	--	--	<0.274	--	--	<0.286
Bis(2-chloroethyl)ether	μg/L	0.16	<10	<10	<0.189	--	--	--	--	<0.189	--	--	<0.198
Bis(2-chloroisopropyl) ether	μg/L	300	<10	<10	<0.189	--	--	--	--	<0.189	--	--	<0.198
Bis(2-ethylhexyl)phthalate	μg/L	6	<10	<10	<0.411	--	--	--	--	<0.411	--	--	<0.429
Butyl benzyl phthalate	μg/L	140	<10	<10	<0.358	--	--	--	--	<0.358	--	--	<0.374
Chlorobenzilate	μg/L	NS	<10	<10	<0.221	--	--	--	--	<0.221	--	--	<0.231
Chrysene	μg/L	24	<10	<10	<0.305	--	--	--	--	<0.305	--	--	<0.319
Diallate (cis or trans)	μg/L	NS	<10	<10	<0.242	--	--	--	--	<0.242	--	--	<0.253
Dibenzo (a,h) anthracene	μg/L	0.024	<10	<10	<0.263	--	--	--	--	<0.263	--	--	<0.275
Dibenzofuran	μg/L	7	<10	<10	<0.253	--	--	--	--	<0.253	--	--	<0.264
Diethyl phthalate	μg/L	5600	<10	<10	***0.361 J***	<2.99	***1.06 J***	***0.263 J***	<0.265	***0.453 J***	--	--	<0.286
Dimethoate	μg/L	1.4	<10	<10	<0.284	--	--	--	--	<0.284	--	--	<0.297
Dimethyl phthalate	μg/L	NS	<10	<10	<0.242	--	--	--	--	<0.242	--	--	<0.253
Di-n-butyl phthalate	μg/L	700	<10	<10	<0.537	--	--	--	--	<0.537	--	--	<0.56
Di-n-octyl phthalate	μg/L	140	<10	<10	***0.255 J***	<2.64	<0.256	<0.232	***1.08 J***	<0.242	--	--	***1.79 J***
Dinoseb	μg/L	7	<10	<10	<0.453	--	--	--	--	<0.453	--	--	<0.473
Diphenylamine	μg/L	180	<10	<10	<0.695	--	--	--	--	<0.695	--	--	<0.725
Disulfoton	μg/L	0.7	<10	<10	<0.305	--	--	--	--	<0.305	--	--	<0.319
Ethyl Methanesulfonate	μg/L	NS	<10	<10	<0.158	--	--	--	--	<0.158	--	--	<0.165
Famphur	μg/L	NS	<20	<20	<0.495	--	--	--	--	<0.495	--	--	<0.516
Fluoranthene	μg/L	280	<10	<10	<0.347	--	--	--	--	<0.347	--	--	<0.363
Fluorene	μg/L	280	<10	<10	<0.305	--	--	--	--	<0.305	--	--	<0.319
Hexachlorobenzene	μg/L	1	<10	<10	<0.284	--	--	--	--	<0.284	--	--	<0.297
Hexachlorobutadiene	μg/L	1	<10	<10	<0.137	--	--	--	--	<0.137	--	--	<0.143
Hexachlorocyclopentadiene	μg/L	50	<10	<10	<1.99	--	--	--	--	<1.99	--	--	<2.08
Hexachloroethane	μg/L	1	<10	<10	<0.137	--	--	--	--	<0.137	--	--	<0.143
Hexachloropropene	μg/L	NS	<10	<10	<1.73	--	--	--	--	<1.73	--	--	<1.8
Indeno (1,2,3-cd) pyrene	μg/L	0.24	<10	<10	<0.253	--	--	--	--	<0.253	--	--	<0.264
Isodrin	μg/L	NS	<10	<10	<0.4	--	--	--	--	<0.4	--	--	<0.418
Isophorone	μg/L	100	<10	<10	<0.232	--	--	--	--	<0.232	--	--	<0.242
Isosafrole	μg/L	NS	<10	<10	<0.189	--	--	--	--	<0.189	--	--	<0.198
Kepone	μg/L	NS	<10	<10	<0.253	--	--	--	--	<0.253	--	--	<0.264
Methapyrilene	μg/L	NS	<10	<10	<0.305	--	--	--	--	<0.305	--	--	<0.319
Methyl Methanesulfonate	μg/L	1.8	<10	<10	<0.147	--	--	--	--	<0.147	--	--	<0.154
Nitrobenzene	μg/L	14	<10	<10	<0.232	--	--	--	--	<0.232	--	--	<0.242
N-Nitrosodiethylamine	μg/L	NS	<10	<10	<0.316	--	--	--	--	<0.316	--	--	<0.33
N-Nitrosodimethylamine	μg/L	0.0034	<10	<10	<0.147	--	--	--	--	<0.147	--	--	<0.154
N-Nitrosodi-n-butylamine	μg/L	0.032	<10	<10	<0.305	--	--	--	--	<0.305	--	--	<0.319
N-Nitrosodi-n-propylamine	μg/L	NS	<10	<10	<0.274	--	--	--	--	<0.274	--	--	<0.286
N-Nitrosodiphenylamine	μg/L	36	<10	<10	<0.695	--	--	--	--	<0.695	--	--	<0.725
N-Nitrosomethylethylamine	μg/L	0.008	<10	<10	<0.211	--	--	--	--	<0.211	--	--	<0.22
N-Nitrosopiperidine	μg/L	NS	<10	<10	<0.158	--	--	--	--	<0.158	--	--	<0.165
N-Nitrosopyrrolidine	μg/L	0.083	<10	<10	<0.242	--	--	--	--	<0.242	--	--	<0.253
O,O,O-Triethyl phosphorothioate	μg/L	NS	<10	<10	<0.253	--	--	--	--	<0.253	--	--	<0.264
o-Toluidine	μg/L	11	<10	<10	<0.189	--	--	--	--	<0.189	--	--	<0.198
p-(Dimethylamino)azobenzene	μg/L	NS	<10	<10	<0.253	--	--	--	--	<0.253	--	--	<0.264
Parathion-ethyl	μg/L	NS	<10	<10	<0.189	--	--	--	--	<0.189	--	--	<0.198
Parathion-methyl	μg/L	1	<10	<10	<0.158	--	--	--	--	<0.158	--	--	<0.165
Pentachlorobenzene	μg/L	NS	<10	<10	<0.232	--	--	--	--	<0.232	--	--	<0.242
Pentachloronitrobenzene	μg/L	NS	<10	<10	<0.347	--	--	--	--	<0.347	--	--	<0.363
Pentachlorophenol	μg/L	1	<10	<10	<0.253	--	--	--	--	<0.253	--	--	<0.264
Phenacetin	μg/L	NS	<10	<10	<0.179	--	--	--	--	<0.179	--	--	<0.187
Phenanthrene	μg/L	210	<10	<10	<0.632	--	--	--	--	<0.632	--	--	<0.659
Phenol	μg/L	2000	<10	<10	<2.53	--	--	--	--	<2.53	--	--	<2.64
Phorate	μg/L	1.4	<10	<10	<0.179	--	--	--	--	<0.179	--	--	<0.187
Pronamide	μg/L	5	<10	<10	<0.274	--	--	--	--	<0.274	--	--	<0.286
Pyrene	μg/L	210	<10	<10	<0.242	--	--	--	--	<0.242	--	--	<0.253
Safrole	μg/L	NS	<10	<10	<0.211	--	--	--	--	<0.211	--	--	<0.22
Thionazin	μg/L	NS	<10	<10	<0.326	--	--	--	--	<0.326	--	--	<0.341
Volatile Organic Compounds													
1,1-Dichloropropene	μg/L	NS	<1	<1	<0.15	--	--	--	--	<0.15	--	--	<0.15
1,2,4-Trichlorobenzene	μg/L	70	<5	<5	<0.16	--	--	--	--	<0.16	--	--	<0.16
1,3-Dichlorobenzene	μg/L	600	<1	<1	<0.17	--	--	--	--	<0.17	--	--	<0.17
1,3-Dichloropropane	μg/L	NS	<1	<1	<0.16	--	--	--	--	<0.16	--	--	<0.16
2,2-Dichloropropane	μg/L	NS	<4	<4	<0.18	--	--	--	--	<0.18	--	--	<0.18
Acrolein	μg/L	NS	<10	<10	<1.5	--	--	--	--	<1.5	--	--	<1.5
Allyl chloride	μg/L	NS	<2	<2	<0.27	--	--	--	--	<0.27	--	--	<0.27
Chloroprene	μg/L	NS	<1	<1	<0.19	--	--	--	--	<0.19	--	--	<0.19
Dichlorodifluoromethane	μg/L	1000	<3	<3	<0.2	--	--	--	--	<0.2	--	--	<0.2
Ethyl Methacrylate	μg/L	NS	<2	<4	<0.15	--	--	--	--	<0.15	--	--	<0.15
Methacrylonitrile	μg/L	NS	<1	<1	<0.25	--	--	--	--	<0.25	--	--	<0.25
Methyl Methacrylate	μg/L	NS	<2	<4	<0.15	--	--	--	--	<0.15	--	--	<0.15
Naphthalene	μg/L	100	<5	<5	<0.37	--	--	--	--	<0.37	--	--	<0.37
Propionitrile	μg/L	NS	<10	<10	<2	--	--	--	--	<2	--	--	<2

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-2R

Parameter Name	Units	GPS	DL	RL	Oct-07	Jan-08	Apr-08	Jul-08	Oct-08	Apr-09	Oct-09	Apr-10	Oct-10	Apr-11	Oct-11	Apr-12	Oct-12	Apr-13	Nov-13	May-14	Nov-14	May-15	Sep-15	Apr-16	Nov-16	May-17	Nov-17	Jun-18	Oct-18	Jun-19	Nov-19	Jun-20	Nov-20	May-21	Sep-21	Mar-22	Sep-22	Jun-23	Nov-23	Jan-24	Jul-24	Nov-24
Appendix I Inorganics																																										
Total Suspended Solids	mg/L	NS	0.581	1.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***1.5 J***	<1.2	***1.38 J***	***2.13***	***2.13***	***1.75 J***	***1 J***	<1.02	***1.38 J***	***0.875 J***	***1.25 J***	<0.638	<0.638	***0.875 J***	***0.75 J***	***0.75 J***	<0.638	***1.5 J***	***1.38 J***	***1.75 J***	<1.39	***2.63***
Turbidity, Field	NTU	NS	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***0.8694***	***0.1373***	***3.299***	***1.752***	***1.473***	***2.242***	***0.9645***	***2.344***	***4.283***	***13.49***	***1.67***	***0.47***	0	***0.52***	***4.16***	***5.16***	***6.33***	***0.79***	***0.38***	0	***1.37***	***1.35***
Turbidity, Lab	NTU	NS	0.4	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***1***	<0.7	<0.7	***0.9 J***	***1.3***	***0.6 J***	<0.4	***1.1***	***0.4 J***	***0.8 J***	***0.43 J***	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	1	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<2.73	<1.45	<0.6	<0.541	***0.422 J***	<0.4	<0.161	<0.161	<0.161	<0.237	<0.237	<0.185	<0.185	<0.42	<0.42	<1.32	<0.53	<0.51	<0.51	<1.1	<1.1	<0.69	<0.69	<1	<1	--	<1	<1
Antimony, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<6	<6	<6	<6	<6	<2.73	<1.45	<0.12	***0.06 J***	***0.283 J***	<0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	2	<1	<1	<1	<1	***1.73***	<1	<1	<2	<2	<1	<0.6	<0.216	***3.95 J***	<5.44	***0.571 J***	<0.33	<0.945	<0.945	<0.945	<0.672	<0.672	<0.505	***0.533 J***	<0.57	<0.57	***0.486 J***	<0.75	<0.88	<0.88	<0.75	<0.75	<0.75	<0.75	<0.53	<0.53	--	<0.53	<0.53
Arsenic, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<1	<1	<1	<1	<2	<0.47	<0.216	<0.73	***1.04***	***0.829 J***	<0.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	2	***137***	***118***	***127***	***101***	***197***	***108***	***114***	***108***	***113***	***93.2***	***101***	***136***	***133***	***132***	***128***	***115***	***127***	***107***	***123***	***103***	***128***	***119***	***121***	***103***	***97.5***	***82.8***	***86.2***	***79***	***124***	***120***	***129***	***120***	***86.6***	***96.7***	***118***	--	***91***	***129***
Barium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	***107***	***115***	***99.3***	***87.6***	***90.2***	***110***	***123***	***121***	***122***	***127***	***119***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.051	<0.079	<0.089	<0.696	<0.0696	<0.08	<0.039	***0.039 J***	<0.039	<0.221	<0.221	<0.125	<0.125	<0.19	<0.19	<0.53	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	--	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<1	<1	***1.24***	<1	<1	<0.051	<0.079	<0.0178	<0.0696	<0.0696	<0.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	***0.24 J***	<0.229	<0.32	<1.06	***0.116 J***	<0.1	<0.112	<0.112	<0.112	<0.0351	<0.0351	<0.0441	<0.0441	<0.06	<0.06	<0.167	<0.039	<0.049	<0.049	<0.051	<0.051	<0.055	<0.055	<0.1	<0.1	--	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	<0.064	<0.106	<0.106	<0.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	5	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.81	<1.81	<1.95	<4.18	***0.448 J***	<0.5	<1.24	<1.24	<1.24	<0.355	<0.355	<0.729	<0.729	<0.76	<0.76	<1.14	<0.98	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<1.81	<1.81	<0.39	<0.418	***0.512 J***	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	0.5	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.55	<1.55	***0.5 J***	<0.554	***1.03***	***0.238 J***	***0.162 J***	***0.099 J***	***0.141 J***	***0.093 J***	***0.163 J***	***0.176 J***	***0.114 J***	***0.067 J***	***0.095 J***	<0.402	<0.091	<0.091	<0.091	***0.107 J***	<0.19	<0.19	<0.19	<0.17	***0.17 J***	--	<0.17	<0.17
Cobalt, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<1.55	<1.55	***0.31 J***	***0.33 J***	***0.444 J***	***0.153 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	5	<20	<20	***26.9***	<20	<20	<20	<20	<20	<20	<20	***5.58 J***	***4.1 J***	***3.75***	***2.39 J***	***3.36***	***1.02 J***	***0.669 J***	***0.825 J***	<0.485	<1.22	<1.22	<2.19	<2.19	<1.6	<1.6	***2.25***	<2	<1.5	<1.5	<1.4	<1.4	<1.8	<1.8	<1.8	***2.66 J***	--	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	***6.4 J***	<1.51	***1.09***	***2.1***	***3.07***	***1.21 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	0.5	<4	<4	<4	<4	***6.2***	<4	<4	<4	<4	<4	<1	***2.68 J***	<0.145	<2.07	***0.346 J***	<0.18	<0.0967	<0.0967	<0.0967	<0.211	<0.211	<0.324	<0.324	<0.25	<0.25	***0.52***	<0.27	<0.11	<0.11	<0.21	<0.21	<0.24	<0.24	<0.24	<0.24	--	<0.26	<0.26
Lead, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<4	<4	<4	<4	<4	<1	<0.804	<0.029	<0.207	<0.207	<0.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	5	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	***3.21 J***	***6.82 J***	***11.9***	***4.57***	***5.91***	***2.42***	***2.04 J***	***1.9 J***	***2.16 J***	***1.6 J***	***3.51 J***	***2.64 J***	***2.68 J***	***1.47 J***	<1	***0.921 J***	<1.7	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	--	<2.1	<2.1
Nickel, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<50	<50	<50	<50	<50	<2.58	***5.32 J***	***6.73***	***3.92***	***4.76***	***3.72***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.69	<0.7	***5.25 J***	<14.6	<1.46	<0.7	<3.34	<3.34	<3.34	***1.15 J***	<0.63	***0.986 J***	<0.928	***1.17 J***	***0.989 J***	<0.982	***1.01 J***	<1	***1.14 J***	***1.4 J***	***2.04 J***	***1.51 J***	***1 J***	***2.08 J***	<1.4	--	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<5	<5	<5	<5	<5	<1.69	<0.7	<0.297	***1.79 J***	<1.46	<0.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.7	<1.7	<0.135	<0.789	<0.0789	<0.033	<0.042	<0.042	<0.042	<0.153	<0.153	<0.14	<0.14	<0.3	<0.3	<0.115	<0.37	<0.37	<0.37	<0.42	<0.42	<0.49	<0.49	<0.5	<0.5	--	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<1.7	<1.7	<0.027	<0.0789	<0.0789	<0.033	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.84	<0.288	<0.0435	<0.267	<0.0267	<0.05	<0.0325	<0.0325	<0.0325	<0.0255	<0.0255	<0.0644	<0.0644	<0.17	<0.17	<0.57	<0.27	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	--	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<2	<2	<2	<2	<2	<0.84	<0.288	***0.02 J***	<0.0267	<0.0267	<0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	5	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<2.1	***2.25 J***	<4.7	<8.33	<0.833	<0.5	<0.449	<0.449	<0.449	<0.255	<0.255	<0.84	<0.84	<0.52	***0.534 J***	***2.4 J***	<0.82	<0.85	<0.85	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<50	<50	<50	<50	<50	<2.1	<2.1	<0.94	<0.833	<0.833	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	20	***52.3***	<20	***27.2***	<20	***52.7***	***28.7***	***34.6***	<20	<20	<20	<9.11	***17.1 J***	<4.6	<3.13	<0.625	<2	<6.95	<6.95	<6.95	***5.35 J***	<5.21	<11.5	<11.5	<10	<10	***7.24 J***	<10	<10	<10	<10	<10	<10	<10	<6.4	***21***	***8.48 J***	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	***29***	***36.6***	<20	<20	<20	<9.11	***18.7 J***	<0.92	<0.625	<0.625	***2.38 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																																										
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	1	<1	<1	<1	<1	<1	<1	<1	<4	<5	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<1.04	***1.11 J***	<1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1
Acetone	µg/L	6300	1.79	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	***2.01 J***	***4.35 J***	<1.79	***4.19 J***	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	--	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2	<2.2
Benzene	µg/L	5	0.11	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	1	<1	<1	<1	<1	<1	<1	<1	<4	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39
Bromomethane	µg/L	10	0.22	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	***0.313 J***	<0.22	<0.22	<0.22	<0.22	<0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	1	<1	<1	<1	<1	<1	<1	<1	<5	<10	<1	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	***1.97***	<0.15	<0.15	<0.15	<0.15	***0.777 J***	<0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	2	<2	<2	<2	<2	<2	<2	<2	<5	<5	<2	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.17	<0.17	***0.25 J***	<0.17	***0.361 J***	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	***0.637 J***	***0.293 J***	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	10	<10	<10	<10	<10	<10	<20	<10	<10	<20	<10	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	--	<7	<7
Styrene	µg/L	100	0.1	1	<1	<1	<1	<1	<1	<1	<1	<4	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48	<0.48
Toluene	µg/L	1000	0.15	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	***1.42***	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	5	<5	<5	<5	<5	<5	<10	<5	<5	<10	<5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	5	<5	<5	<5	<5	<5	<20	<5	<5	<5	<5	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	10	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.6	<0.6	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18
Xylenes	µg/L	10000	0.13	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	***0.848 J***	--	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-3

Parameter Name	Units	GPS	DL	RL	Oct-07	Jan-08	Apr-08	Jul-08	Oct-08	Apr-09	Oct-09	Apr-10	Oct-10	Apr-11	Oct-11	Apr-12	Oct-12	Apr-13	Nov-13	May-14	Nov-14	May-15	Sep-15	Apr-16	Nov-16	May-17	Nov-17	Jun-18	Oct-18	Jun-19	Nov-19	Jun-20	Nov-20	Jun-21	Aug-21	Sep-21	Mar-22	Jun-22	Sep-22	Jun-23	Nov-23	Jan-24	Jul-24	Dec-24
Appendix I Inorganics																																												
Total Suspended Solids	mg/L	NS	0.581	1.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***9.17***	***7.67***	***5.63***	***6.5***	***3.25***	***2***	***5.63***	***1.38 J***	***11***	***3.63***	***4.13***	***9.5***	***3.38***	***4.13***	***3.75***	***3.13***	***14.3***	***5.88***	***3.25***	***2.63***	***2.88***	--	***2.38***	***5***
Turbidity, Field	NTU	NS	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***8.389***	***12.2***	***9.094***	***10.02***	***7.028***	***0.5395***	***2.988***	***7.042***	***5.241***	***18.73***	***2.01***	***21.01***	***17.41***	***7.47***	***4.69***	***4.36***	***28.38***	***10.82***	***35.64***	***6.36***	***3.09***	***1.34***	***4.19***	***14.78***
Turbidity, Lab	NTU	NS	0.4	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***12.9***	***13.4***	***14.1***	***19.5***	***10.8***	***17***	***12.6***	***2.1***	***10.9***	***6.8***	***7.78***	--	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	1	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<2.73	<1.45	<0.6	<0.0541	<0.0541	<0.4	<0.161	<0.161	<0.161	<0.237	<0.237	<0.185	***0.207 J***	<0.42	<0.42	<1.32	<0.53	<0.51	<0.51	<1.1	--	<1.1	<0.69	--	<0.69	<1	<1	--	<1	<1
Antimony, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<6	<6	<6	<6	<6	<2.73	<1.45	<0.12	<0.0541	<0.0541	***0.765 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	2	***1.78***	***1.18***	<1	***1.42***	<1	<1	<1	<1	<1	<1	<0.6	***0.782 J***	***4.15 J***	***1.6***	***1.52***	***1.32 J***	***2.03***	***2.03***	***1.61 J***	***2.09***	***1.3 J***	***0.61 J***	***0.992 J***	<0.57	***2.28***	***1.11***	***0.988 J***	***2.24***	***1.22 J***	***1.39 J***	--	<0.75	***3.7***	<0.75	***0.858 J***	<0.53	***1.06 J***	--	<0.53	***1.34 J***
Arsenic, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<1	<1	<1	***1.04***	<1	***0.652 J***	<0.216	<0.73	***1.35***	***1.22***	***0.752 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	2	***153***	***140***	***154***	***151***	***140***	***143***	***128***	***147***	***146***	***140***	***132***	***172***	***147***	***160***	***176***	***148***	***193***	***170***	***180***	***180***	***184***	***168***	***166***	***176***	***189***	***158***	***163***	***176***	***193***	***199***	***171***	***188***	***210***	--	***205***	***176***	***193***	--	***146***	***205***
Barium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	***145***	***121***	***145***	***130***	***147***	***150***	***170***	***151***	***156***	***182***	***147***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.051	<0.079	<0.089	<0.0696	<0.0696	<0.08	<0.039	***0.049 J***	<0.039	<0.221	<0.221	<0.125	<0.125	<0.19	<0.19	<0.53	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	--	<0.27	<0.33	<0.33	--	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<1	<1	<1	<1	<1	<0.051	<0.079	<0.0178	<0.0696	<0.0696	<0.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.044	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	<0.32	<0.106	<0.106	<0.1	<0.112	<0.112	<0.112	<0.0351	<0.0351	<0.0441	<0.0441	<0.06	<0.06	<0.167	<0.039	<0.049	<0.049	<0.051	--	<0.051	<0.055	--	<0.055	<0.1	<0.1	--	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	<0.064	<0.106	<0.106	<0.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	5	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.81	<1.81	<1.95	<0.418	***0.92 J***	<0.5	<1.24	<1.24	<1.24	<0.355	<0.355	<0.729	<0.729	<0.76	***1.12 J***	<1.14	<0.98	<1.1	<1.1	<1.1	--	<1.1	<1.1	--	<1.1	<1.1	<1.1	--	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<1.81	<1.81	<0.39	<0.418	<0.418	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.045	0.5	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.55	<1.55	<0.075	***0.324 J***	***0.473 J***	***0.107 J***	***0.083 J***	***0.082 J***	***0.079 J***	***0.091 J***	***0.051 J***	***0.049 J***	***0.068 J***	***0.283 J***	***0.289 J***	<0.402	<0.091	***0.114 J***	<0.091	<0.091	--	<0.19	<0.19	--	<0.19	<0.17	<0.17	--	<0.17	<0.17
Cobalt, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<1.55	<1.55	***0.23 J***	***0.296 J***	***0.323 J***	***0.104 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	5	<20	<20	***38.5***	<20	<20	<20	<20	<20	<20	<20	***6.6 J***	<1.51	<0.6	***1.1***	***1.6***	<0.56	<0.485	<0.485	<0.485	<1.22	<1.22	<2.19	<2.19	<1.6	<1.6	<0.497	<2	<1.5	<1.5	<1.4	--	<1.4	<1.8	--	<1.8	<1.8	<1.8	--	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	***7.86 J***	<1.51	***0.57***	***1.11***	***0.812***	<0.56	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	0.5	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<1	<0.804	<0.145	<0.207	<0.207	***0.182 J***	***0.097 J***	***0.172 J***	<0.0967	<0.211	<0.211	<0.324	<0.324	<0.25	***0.408 J***	***0.206 J***	<0.27	***0.122 J***	<0.11	<0.21	--	<0.21	<0.24	--	<0.24	<0.24	<0.24	--	<0.26	<0.26
Lead, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<4	<4	<4	<4	<4	<1	<0.804	<0.029	<0.207	<0.207	<0.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	5	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<2.58	<2.58	<1.2	***1.84***	***1.44***	***0.931 J***	<0.581	<0.581	***0.788***	<1.53	<1.53	<0.929	<0.929	***1.39 J***	***2.15 J***	***0.888 J***	<1.7	<1.9	<1.9	<1.9	--	<1.9	<1.9	--	<1.9	<1.9	<1.9	--	<2.1	<2.1
Nickel, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<50	<50	<50	<50	<50	<2.58	<2.58	***1.49***	***2***	***1.32***	***1.8 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.69	<0.7	<1.48	<1.46	<1.46	<0.7	<3.34	<3.34	<3.34	***0.785 J***	<0.63	<0.928	<0.928	<0.9	<0.9	<0.982	<1	<1	<1	<0.96	--	<0.96	<0.96	--	<0.96	<1.4	<1.4	--	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<5	<5	<5	<5	<5	<1.69	<0.7	<0.297	<1.46	<1.46	<0.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.7	<1.7	<0.135	<0.0789	<0.0789	<0.033	<0.042	***0.06 J***	***0.091 J***	<0.153	<0.153	<0.14	<0.14	<0.3	<0.3	<0.115	<0.37	<0.37	<0.37	<0.42	--	<0.42	<0.49	--	<0.49	***0.702 J***	<0.5	--	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<1.7	<1.7	<0.027	<0.0789	<0.0789	<0.033	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.064	1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.84	<0.288	<0.0435	<0.0267	<0.0267	***0.149 J***	<0.0325	<0.0325	<0.0325	<0.0255	<0.0255	<0.0644	<0.0644	<0.17	<0.17	<0.57	<0.27	<0.26	<0.26	<0.26	--	<0.26	<0.26	--	<0.26	<0.26	<0.26	--	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<2	<2	<2	<2	<2	<0.84	<0.288	<0.0087	<0.0267	<0.0267	***0.161 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	5	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<2.1	<2.1	<4.7	<0.833	<0.833	<0.5	<0.449	<0.449	<0.449	<0.255	<0.255	<0.84	<0.84	<0.52	***1.18 J***	***2.78 J***	<0.82	<0.85	<0.85	<1.1	--	<1.1	<1.1	--	<1.1	<1.1	<1.1	--	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<50	<50	<50	<50	<50	<2.1	<2.1	<0.94	<0.833	<0.833	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	20	***35.9***	<20	***40.3***	<20	<20	***27.4***	***23***	***21.2***	<20	<20	<9.11	***17.4 J***	<4.6	<0.625	<0.625	<2	<6.95	<6.95	<6.95	<5.21	<5.21	<11.5	<11.5	<10	<10	<6.92	<10	<10	<10	<10	--	<10	<10	--	<10	<6.4	<6.4	--	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	***27.4***	***25.5***	***21.5***	***25.5***	<20	<9.11	***12.4 J***	<0.92	<0.625	<0.625	<2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																																												
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	1	<1	<1	<1	<1	<1	<1	<1	<4	<5	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	--	<0.38	<0.38	<0.38	--	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	--	<0.19	<0.19	<0.19	--	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47	<0.47	--	<0.47	<0.47	<0.47	--	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	--	<0.45	<0.45	<0.45	--	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	--	<0.22	<0.22	<0.22	--	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	--	<0.56	<0.56	<0.56	--	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.006	0.19	1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59	<0.59	--	<0.59	<0.59	<0.59	--	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2	<1.2	--	<1.2	<1.2	<1.2	--	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34	<0.34	--	<0.34	<0.34	<0.34	--	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	--	<0.37	<0.37	<0.37	--	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	--	<0.39	<0.39	<0.39	--	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	--	<0.27	<0.27	<0.27	--	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23	<0.23	--	<0.23	<0.23	<0.23	--	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<1.04	<1.04	<1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	--	<2.1	<2.1	<2.1	--	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	<2	<2	<2	--	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	--	<2.1	<2.1	<2.1	--	<2.1	<2.1
Acetone	µg/L	6300	1.79	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	***2.41 J***	<1.79	<1.79	***3.16 J***	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	--	<3.1	<3.1	--	<3.1	<3.1	<3.1	--	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2	<2.2	--	<2.2	<2.2	<2.2	--	<2.2	<2.2
Benzene	µg/L	5	0.11	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	***0.613***	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	--	<0.22	<0.22	<0.22	--	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54	<0.54	--	<0.54	<0.54	<0.54	--	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	1	<1	<1	<1	<1	<1	<1	<1	<4	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	--	<0.39	<0.39	<0.39	--	<0.39	<0.39
Bromomethane	µg/L	10	0.22	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	***0.676 J***	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	--	<1.1	<1.1	<1.1	--	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	1	<1	<1	<1	<1	<1	<1	<1	<5	<10	<1	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	***1.08***	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	--	<0.45	<0.45	<0.45	--	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	2	<2	<2	<2	<2	<2	<2	<2	<5	<5	<2	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65	<0.65	--	<0.65	<0.65	<0.65	--	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4	--	<0.4	<0.4	<0.4	--	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79	<0.79	--	<0.79	<0.79	<0.79	--	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	***0.366 J***	<0.31	<0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61	<0.61	--	<0.61	<0.61	<0.61	--	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	--	<0.21	<0.21	<0.21	--	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25	<0.25	--	<0.25	<0.25	<0.25	--	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75	<0.75	--	<0.75	<0.75	<0.75	--	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33	<0.33	--	<0.33	<0.33	<0.33	--	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.17	***0.38 J***	***0.38 J***	<0.17	***0.352 J***	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7	<1.7	--	<1.7	<1.7	<1.7	--	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	<0.31	--	<0.31	<0.31	<0.31	--	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	10	<10	<10	<10	<10	<10	<20	<10	<10	<20	<10	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<7	<7	<7	<7	<7	<7	<7	--	<7	<7	--	<7	<7	<7	--	<7	<7
Styrene	µg/L	100	0.1	1	<1	<1	<1	<1	<1	<1	<1	<4	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	--	<0.37	<0.37	<0.37	--	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48	<0.48	--	<0.48	<0.48	<0.48	--	<0.48	<0.48
Toluene	µg/L	1000	0.15	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	***0.58 J***	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43	--	<0.43	<0.43	***1.2***	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	--	<0.27	<0.27	<0.27	--	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	5	<5	<5	<5	<5	<5	<10	<5	<5	<10	<5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	--	<0.56	<0.56	<0.56	--	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	--	<1.1	<1.1	<1.1	--	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	5	<5	<5	<5	<5	<5	<20	<5	<5	<5	<5	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78	<0.78	--	<0.78	<0.78	<0.78	--	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43	--	<0.43	<0.43	<0.43	--	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	--	<0.38	<0.38	<0.38	--	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3	<1.3	--	<1.3	<1.3	<1.3	--	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	10	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	--	<2.5	<2.5	<2.5	--	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.6	<0.6	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18	--	<0.18	<0.18	<0.18	--	<0.18	<0.18
Xylenes	µg/L	10000	0.13	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4	--	<0.4	<0.4	***0.592 J***	--	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-4

Parameter Name	Units	GPS	DL	RL	Oct-07	Jan-08	Apr-08	Jul-08	Oct-08	Apr-09	Oct-09	Feb-10	Apr-10	Oct-10	Apr-11	Oct-11	Apr-12	Oct-12	Apr-13	Nov-13	May-14	Nov-14	May-15	Sep-15	Mar-16	Nov-16	May-17	Nov-17	Jun-18	Oct-18	Jun-19	Oct-19	Jun-20	Nov-20	May-21	Sep-21	Mar-22	Sep-22	Jun-23	Nov-23	Jun-24	Nov-24	Feb-25
Appendix I Inorganics																																											
Total Suspended Solids	mg/L	NS	0.581	1.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.83	<1.2	<1.2	<0.581	<0.581	2.88	1.88	2.5	2.75	<0.638	0.75 J	0.75 J	<0.638	1 J	1.38 J	<1.7	1.63 J	1.38 J	8.5	2.25	2.45	--
Turbidity, Field	NTU	NS	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10.58	0.0997	1.081	0.149	1.843	8.78	0.7597	1.418	7.767	5.27	0.49	1.25	0	1.18	3.81	0	0	1.15	1.14	0.88	1.17	0.84
Turbidity, Lab	NTU	NS	0.4	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.2	<0.7	<0.7	<0.4	<0.4	0.5 J	<0.4	3.3	1.4	0.44 J	1.58	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	1	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<2.73	<1.45	<0.12	3.74	0.108 J	0.422 J	<0.161	<0.161	<0.161	<0.237	<0.237	<0.185	0.691 J	<0.42	<0.42	<1.32	<0.53	<0.51	<0.51	<1.1	<1.1	<0.69	<0.69	<1	<1	<1	<1	--
Antimony, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<6	<6	<6	<6	<6	<6	<2.73	<1.45	<0.12	0.173 J	0.0954 J	0.762 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	2	23.6	16.6	21.4	7.64	4.72	3.4	5.9	7.85	6.44	8.54	6.57	4.05	2.1	2.46	16.4	1.87	1.24 J	<0.945	<0.945	<0.945	<0.672	<0.672	<0.505	0.784 J	0.637 J	<0.57	0.653 J	<0.75	<0.88	<0.88	<0.75	<0.75	<0.75	0.762 J	<0.53	1.15 J	0.792 J	1.05 J	--
Arsenic, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	3.31	4.79	5.63	9.49	5.68	5.67	4.61	1.47	1.52	<0.544	1.96	1.31 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	2	742	603	793	544	514	549	623	564	580	529	542	513	533	710	774	514	513	469	463	479	484	539	482	40.6	530	464	451	191	421	409	475	482	503	536	134	514	485	518	--
Barium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	545	534	534	585	425	540	491	527	588	623	501	503	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.051	<0.079	0.06 J	<0.0696	<0.0696	<0.08	<0.039	<0.039	<0.039	<0.221	<0.221	<0.125	<0.125	<0.19	<0.19	<0.53	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33	<0.33	--
Beryllium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<0.051	<0.079	<0.0178	<0.0696	<0.0696	0.223 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	0.5	1.21	0.834	1.36	<0.5	<0.5	<0.5	<0.5	0.53	<0.5	<0.5	<0.5	0.236 J	<0.229	0.41 J	0.43 J	0.191 J	0.144 J	0.117 J	0.149 J	0.133 J	0.17 J	0.142 J	<0.0441	0.273 J	0.124 J	0.158 J	<0.167	<0.039	0.139	0.163	0.184	0.122	0.118	0.076 J	<0.1	<0.1	<0.1	0.254	<0.1
Cadmium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	0.26 J	0.287 J	0.215 J	0.244 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	5	<20	<20	28	<20	<20	<20	<20	<20	<20	<20	<20	<1.81	<1.81	0.42 J	6.89	<0.418	147	<1.24	<1.24	<1.24	<0.355	<0.355	<0.729	2.28 J	<0.76	<0.76	<1.14	<0.98	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.2	<1.2	--
Chromium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<20	<1.81	<1.81	<0.39	<0.418	<0.418	4.97	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	0.5	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	8.27 J	5.85 J	10.1	10	4.37	6.09	0.967	0.448 J	0.33 J	0.411 J	0.441 J	<0.0453	3.75	1.44	0.458 J	<0.402	<0.091	0.264 J	1.48	0.937	1.07	1.44	1.61	<0.17	1.54	1.85	2.04	--
Cobalt, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<20	8.5 J	5.46 J	10	8.82	4.61	4.97	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	5	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	23.6	12 J	<1.51	2.08	6.13	2.39	4.71	0.52 J	<0.485	<0.485	<1.22	<1.22	<2.19	5.84	<1.6	<1.6	0.966 J	<2	<1.5	<1.5	<1.4	<1.4	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	--
Copper, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<20	12.3 J	<1.51	0.96	1.1	2.61	0.935 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	0.5	<4	<4	4.15	<4	<4	<4	<4	<4	<4	<4	<4	<1	0.9 J	0.78	2.45	0.324 J	<0.18	0.109 J	<0.0967	<0.0967	<0.211	<0.211	<0.324	<0.324	<0.25	<0.25	<0.186	<0.27	<0.11	<0.11	<0.21	<0.21	<0.24	<0.24	<0.24	<0.24	0.27 J	<0.26	--
Lead, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<4	<4	<4	<4	<4	<4	<1	<0.804	0.05 J	<0.207	<0.207	0.353 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	5	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	14 J	13.3 J	12.8	18.2	15.8	105	5.99	5.63	4.31 J	5.7	4.28 J	3.22 J	11.9	5.78	3.99 J	5.23	<1.7	3.58 J	11.9	5.36	5.05	7.47	7.16	<1.9	5.36	6.27	6.17	--
Nickel, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<50	<50	<50	<50	<50	<50	14.3 J	14 J	11.3	14.9	16.4	23.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.69	<0.7	<0.297	1.64 J	1.52 J	<0.7	<3.34	<3.34	<3.34	<0.63	<0.63	<0.928	31.6	<0.9	<0.9	<0.982	<1	<1	<1	<0.96	<0.96	<0.96	<0.96	<1.4	<1.4	<1.4	<1.4	--
Selenium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<5	<5	<5	<5	<5	<5	<1.69	<0.7	<0.297	<1.46	<1.46	<0.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.7	<1.7	<0.027	<0.0789	<0.0789	<0.033	<0.042	<0.042	<0.042	0.165 J	<0.153	<0.14	<0.14	<0.3	<0.3	<0.115	<0.37	<0.37	<0.37	<0.42	<0.42	<0.49	<0.49	<0.5	<0.5	1.21	<0.5	--
Silver, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<20	<1.7	<1.7	<0.027	<0.0789	<0.0789	<0.033	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.84	<0.288	0.01 J	0.148 J	0.0371 J	0.079 J	<0.0325	<0.0325	<0.0325	0.031 J	0.028 J	<0.0644	<0.0644	<0.17	<0.17	<0.57	<0.27	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.57	<0.57	--
Thallium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<2	<2	<2	<2	<2	<2	<0.84	<0.288	0.03 J	0.087	0.0313	<0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	5	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<2.1	3.66 J	3.25	9.47	0.843 J	7.19	1.02 J	0.695 J	0.787 J	0.785 J	0.948 J	<0.84	1.07 J	0.913 J	1.23 J	<2.15	1.23 J	0.892 J	1.06 J	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--
Vanadium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<50	<50	<50	<50	<50	<50	<2.1	2.24 J	<0.94	<0.833	<0.833	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	20	69.1	<20	36.5	<20	21.1	50.7	52.6	<20	41	47.1	<20	<9.11	14.2 J	4.5 J	13.6	<0.625	2.01 J	<6.95	<6.95	<6.95	<5.21	<5.21	<11.5	<11.5	<10	<10	<6.92	<10	<10	<10	<10	<10	<10	<10	<6.4	<6.4	<9.7	<9.7	--
Zinc, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	44.3	46.7	<20	45.6	39.9	53.7	<9.11	14.8 J	4.69 J	4.77 J	6.66	3.05 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																																											
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	1	<1	<1	<1	<1	<1	<1	<1	<2	<10	<5	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--
1,1,1-Trichloroethane	µg/L	200	0.12	1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--
1,1,2-Trichloroethane	µg/L	5	0.12	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--
1,1-Dichloroethane	µg/L	140	0.21	1	2.94	2.24	1.5	1.18	<1	<1	<1	1.67	1.01	<1	<1	0.58 J	0.56 J	0.34 J	0.812 J	<0.21	<0.21	<0.21	<0.21	<0.21	0.32 J	<0.21	<0.21	<0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--
1,1-Dichloroethylene	µg/L	7	0.15	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--
1,2,3-Trichloropropane	µg/L	0.0058	0.19	1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--
1,2-Dibromoethane	µg/L	0.05	0.13	1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--
1,2-Dichlorobenzene	µg/L	600	0.14	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.14	<0.14	<0.14	0.38 J	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--
1,2-Dichloroethane	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	0.208 J	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--
1,2-Dichloropropane	µg/L	5	0.87	1	1.21	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--
1,4-Dichlorobenzene	µg/L	75	0.2	1	3.41	2.66	4.37	2.14	2.54	2.93	3.35	4.88	3.12	3.77	3.68	3.83	4.33	2.62	4.84	1.72	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.55 J	0.405 J	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	0.293 J	0.425 J	<0.23	--
2-Butanone	µg/L	4000	1.04	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.47	<0.47	<0.47	0.816 J	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<1.04	<1.04	<1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--
2-Hexanone	µg/L	NS	0.2	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--
4-Methyl-2-pentanone	µg/L	560	0.22	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--
Acetone	µg/L	6300	1.79	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	3.88 J	4.28 J	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	--
Acrylonitrile	µg/L	0.32	0.53	5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--
Benzene	µg/L	5	0.11	0.5	2.29	1.45	1.63	0.58	0.61	0.65	0.92	2.01	1.07	1.7	1.3	0.95	1.08	0.48 J	1.48	0.459 J	0.48 J	<0.11	<0.11	<0.11	0.269 J	0.138 J	<0.11	0.156 J	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	0.372 J	<0.22	0.413 J	0.223 J	<0.22	--
Bromochloromethane	µg/L	90	0.12	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--
Bromodichloromethane	µg/L	80	0.12	1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--
Bromomethane	µg/L	10	0.22	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--
Carbon disulfide	µg/L	700	0.15	1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<1	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--
Carbon Tetrachloride	µg/L	5	0.24	2	<2	<2	<2	<2	<2	<2	<2	<2	<5	<5	<2	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--
Chlorobenzene	µg/L	100	0.19	1	3.43	1.95	2.93	1.04	1.03	1.21	2.01	3.95	1.98	2.19	2.05	1.62	2.2	1.08	2.46	<0.19	<0.19	0.236 J	<0.19	<0.19	<0.19	<0.19	<0.19	0.205 J	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.402 J	<0.4	<0.4	<0.4	<0.4	--
Chloroethane	µg/L	2800	0.15	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	0.82 J	0.53 J	<0.15	1.01 J	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--
Chloromethane	µg/L	NS	0.31	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--
cis-1,2-Dichloroethylene	µg/L	70	0.13	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.37 J	0.19 J	0.21 J	0.302 J	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--
cis-1,3-Dichloropropene	µg/L	NS	0.15	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--
Dibromochloromethane	µg/L	80	0.2	5	<5	<5	<5	<5	<5	<5	<5	<5	<50	<5	<5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--
Dibromomethane	µg/L	70	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--
Dichloromethane	µg/L	5	0.17	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	0.355 J	<0.17	<0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--
Ethylbenzene	µg/L	700	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--
Iodomethane	µg/L	NS	0.8	10	<10	<10	<10	<10	<10	<20	<10	<10	<10	<20	<10	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	--
Styrene	µg/L	100	0.1	1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--
Tetrachloroethylene	µg/L	5	0.18	1	<1	1.16	<1	<1	<1	<1	<1	<2	<1	<1	<1	0.39 J	0.36 J	0.25 J	0.265 J	0.766 J	0.531 J	0.507 J	0.648 J	0.453 J	0.532 J	0.598 J	0.53 J	0.491 J	0.493 J	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--
Toluene	µg/L	1000	0.15	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.15	<0.15	<0.15	0.319 J	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	2.09	<0.43	<0.43	--
Trans-1,2-dichloroethylene	µg/L	100	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	0.23 J	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--
trans-1,3-Dichloropropene	µg/L	NS	0.22	5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<10	<5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--
Tribromomethane	µg/L	80	0.14	5	<5	<5	<5	<5	<5	<20	<5	<5	<50	<5	<5	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--
Trichloroethylene	µg/L	5	0.19	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--
Trichlorofluoromethane	µg/L	2000	0.17	4	<4	<4	<4	<4	<4	<4	<4	<4	<5	<4	<4	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--
Trichloromethane	µg/L	80	0.28	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--
Vinyl Acetate	µg/L	NS	0.74	10	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<4	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--
Vinyl Chloride	µg/L	2	0.1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.32 J	0.26 J	0.17 J	0.524 J	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.6	<0.6	<0.18	<0.18	0.315 J	0.438 J	0.28 J	0.315 J	<0.18	<0.18	0.305 J	<0.18	<0.18	<0.18	--
Xylenes	µg/L	10000	0.13	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1.16 J	<0.4	<0.4	--

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-4

Parameter Name	Units	GPS	Apr-09	Apr-10	May-14	Jun-14	Nov-14	Dec-14	May-15	Sep-15	Nov-16	Nov-17	Jun-23
Alcohols/Gycols by GC													
Acetonitrile	µg/L	NS	<10000	<10000	<126	--	--	--	--	<126	<252	<126	<570
Isobutanol	µg/L	2100	<10000	<10000	<177	--	--	--	--	<177	<354	<177	<550
Herbicides (GC)													
2,4,5-T	µg/L	70	<0.21	<0.5	<0.476	--	--	--	--	<0.525	<0.515	<0.527	<0.07
2,4-D	µg/L	70	<1	<1	<0.511	--	--	--	--	<0.564	<0.553	<0.566	<0.2
Silvex (2,4,5-TP)	µg/L	50	<0.21	<0.5	<0.318	--	--	--	--	<0.35	<0.344	<0.352	<0.07
Inorganics													
Cyanide	µg/L	200	<10	<10	<3.1	--	--	--	--	<3.04	<3.52	<3.46	<4.3
Mercury	µg/L	2	<0.2	<0.2	<0.071	--	--	--	--	<0.0926	<0.142	<0.112	<0.14
Sulfide	µg/L	NS	<1000	<1000	<219	--	--	--	--	<219	<180	<231	<231
Tin	µg/L	4200	<100	<100	<12.1	--	--	--	--	<1.8	<0.832	<1.62	<2.3
PCBs (EPA Method 8082)													
PCB-1016	µg/L	NS	<0.8	<0.8	<0.0457	--	--	--	--	<0.0482	<0.0457	<0.0472	<0.17
PCB-1221	µg/L	NS	<0.8	<0.8	<0.168	--	--	--	--	<0.178	<0.168	<0.174	<0.17
PCB-1232	µg/L	NS	<0.8	<0.8	<0.116	--	--	--	--	<0.122	<0.116	<0.12	<0.17
PCB-1242	µg/L	NS	<0.8	<0.8	<0.137	--	--	--	--	<0.144	<0.137	<0.141	<0.17
PCB-1248	µg/L	NS	<0.8	<0.8	<0.116	--	--	--	--	<0.122	<0.116	<0.12	<0.11
PCB-1254	µg/L	NS	<0.8	<0.8	<0.0968	--	--	--	--	<0.102	<0.0968	<0.1	<0.11
PCB-1260	µg/L	NS	<0.8	<0.8	<0.0463	--	--	--	--	<0.0489	<0.0463	<0.0478	<0.11
Pesticides (EPA Method 8081A)													
4,4'-DDD	µg/L	0.73	<0.032	<0.032	<0.002	--	--	--	--	<0.00184	<0.00198	<0.00196	<0.027
4,4'-DDE	µg/L	0.51	<0.032	<0.032	<0.00233	--	--	--	--	<0.00214	<0.00231	<0.00228	<0.027
4,4'-DDT	µg/L	0.51	<0.032	<0.032	<0.00422	--	--	--	--	<0.00388	<0.00418	<0.00413	<0.042
Aldrin	µg/L	0.01	<0.032	<0.032	<0.005	--	--	--	--	<0.00459	<0.00495	<0.00489	<0.032
alpha-BHC	µg/L	0.028	<0.032	<0.032	<0.00189	--	--	--	--	<0.00173	<0.00187	<0.00185	<0.029
beta-BHC	µg/L	0.042	<0.032	<0.032	<0.00533	--	--	--	--	<0.0049	<0.00527	<0.00522	<0.037
Chlordane	µg/L	2	<2	<2	<0.0711	--	--	--	--	<0.0653	<0.0703	<0.0696	<0.81
delta-BHC	µg/L	2.1	<0.032	<0.032	<0.00256	--	--	--	--	<0.00235	<0.00253	<0.0025	<0.027
Dieldrin	µg/L	0.011	<0.032	<0.032	<0.00222	--	--	--	--	<0.00204	<0.0022	<0.00217	<0.026
Endosulfan I	µg/L	42	<0.032	<0.032	<0.00222	--	--	--	--	<0.00204	<0.0022	<0.00217	<0.033
Endosulfan II	µg/L	42	<0.032	<0.032	<0.00211	--	--	--	--	<0.00194	<0.00209	<0.00207	<0.029
Endosulfan sulfate	µg/L	NS	<0.032	<0.032	<0.00278	--	--	--	--	<0.00255	<0.00275	***0.00282 J***	<0.03
Endrin	µg/L	2	<0.032	<0.032	<0.00211	--	--	--	--	<0.00194	<0.00209	<0.00207	<0.026
Endrin aldehyde	µg/L	2.1	<0.032	<0.032	<0.00811	--	--	--	--	<0.00745	<0.00802	***0.00884 J***	<0.029
gamma-BHC (Lindane)	µg/L	0.2	<0.032	<0.032	<0.00211	--	--	--	--	<0.00194	<0.00209	<0.00207	<0.036
Heptachlor	µg/L	0.4	<0.032	<0.032	<0.00289	--	--	--	--	<0.00265	<0.00286	<0.00283	<0.033
Heptachlor epoxide	µg/L	0.2	<0.032	<0.032	<0.00678	--	--	--	--	<0.00622	<0.0067	<0.00663	<0.029
Methoxychlor	µg/L	40	<0.032	<0.032	<0.00233	--	--	--	--	<0.00214	<0.00231	<0.00228	<0.041
Toxaphene	µg/L	3	<2	<2	<0.0644	--	--	--	--	<0.0592	<0.0637	<0.063	<0.69
Semivolatile Organics by GC/MS													
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<10	<10	<0.129	--	--	--	--	<0.135	<0.132	<0.141	<0.628
1,3,5-Trinitrobenzene	µg/L	NS	<10	<10	<1.38	--	--	--	--	<1.44	<1.41	<1.51	<2.67
1,3-Dinitrobenzene	µg/L	1	<10	<10	<0.183	--	--	--	--	<0.191	<0.187	<0.2	<3.72
1,4-Naphthoquinone	µg/L	NS	<10	<10	<0.151	--	--	--	--	<0.157	<0.154	<0.165	<4.19
1,4-Phenylenediamine	µg/L	NS	<10	<10	<9.03	--	--	--	--	<9.44	<9.23	<9.88	<2.21
1-Naphthylamine	µg/L	NS	<10	<10	<0.258	--	--	--	--	<0.27	<0.264	<0.282	<2.91
2,3,4,6-Tetrachlorophenol	µg/L	NS	<10	<10	<0.215	--	--	--	--	<0.225	<0.22	<0.235	<6.16
2,4,5-Trichlorophenol	µg/L	700	<10	<10	<0.344	--	--	--	--	<0.36	<0.352	<0.376	<6.16
2,4,6-Trichlorophenol	µg/L	16	<10	<10	<0.237	--	--	--	--	<0.247	<0.242	<0.259	<5.81
2,4-Dichlorophenol	µg/L	20	<10	<10	<0.161	--	--	--	--	<0.169	<0.165	<0.176	<0.988
2,4-Dimethylphenol	µg/L	100	<10	<10	<0.226	--	--	--	--	<0.236	<0.231	<0.247	<0.674
2,4-Dinitrophenol	µg/L	14	<20	<20	<1.44	--	--	--	--	<1.51	<1.47	<1.58	<15.1
2,4-Dinitrotoluene	µg/L	0.25	<10	<10	<0.204	--	--	--	--	<0.213	<0.209	<0.224	<7.44
2,6-Dichlorophenol	µg/L	NS	<10	<10	<0.237	--	--	--	--	<0.247	<0.242	<0.259	<0.802
2,6-Dinitrotoluene	µg/L	0.26	<10	<10	<0.258	--	--	--	--	<0.27	<0.264	<0.282	<0.605
2-Acetylaminofluorene	µg/L	NS	<10	<10	<0.301	--	--	--	--	<0.315	<0.308	<0.329	<3.14
2-Chloronaphthalene	µg/L	560	<10	<10	<0.247	--	--	--	--	<0.258	<0.253	<0.271	<0.744
2-Chlorophenol	µg/L	40	<10	<10	<0.161	--	--	--	--	<0.169	<0.165	<0.176	<0.628
2-Methylnaphthalene	µg/L	28	<10	<10	<0.204	--	--	--	--	<0.213	<0.209	<0.224	<0.686
2-Methylphenol (o-Cresol)	µg/L	35	<10	<10	<0.194	--	--	--	--	<0.202	<0.198	<0.212	<0.756
2-Naphthylamine	µg/L	0.097	<10	<10	<0.237	--	--	--	--	<0.247	<0.242	<0.259	<2.44
2-Nitroaniline	µg/L	NS	<10	<10	<0.247	--	--	--	--	<0.258	<0.253	<0.271	<6.86
2-Nitrophenol	µg/L	NS	<10	<10	<0.172	--	--	--	--	<0.18	<0.176	<0.188	<7.91
3,3'-Dichlorobenzidine	µg/L	0.39	<85	<10	<0.495	--	--	--	--	<0.517	<0.505	<0.541	<1.63
3,3'-Dimethylbenzidine	µg/L	NS	<20	<10	<0.226	--	--	--	--	<0.236	<0.231	<0.247	<1.74
3/4-Methylphenol	µg/L	70	<10	<10	<0.194	--	--	--	--	<0.202	<0.198	<0.212	<0.814
3-Methylcholanthrene	µg/L	NS	<10	<10	<0.333	--	--	--	--	<0.348	<0.341	<0.365	<0.372
3-Nitroaniline	µg/L	NS	<10	<10	<0.237	--	--	--	--	<0.247	<0.242	<0.259	<3.14
4,6-Dinitro-2-methylphenol	µg/L	NS	<10	<10	<2.39	--	--	--	--	<2.49	<2.44	<2.61	<8.02
4-Aminobiphenyl	µg/L	0.0083	<20	<10	<0.323	--	--	--	--	<0.337	<0.33	<0.353	<2.56
4-Bromophenyl phenyl ether	µg/L	NS	<10	<10	<0.312	--	--	--	--	<0.326	<0.319	<0.341	<0.814
4-Chloro-3-methylphenol	µg/L	700	<10	<10	<0.204	--	--	--	--	<0.213	<0.209	<0.224	<0.977
4-Chloroaniline	µg/L	28	<10	<10	<0.151	--	--	--	--	<0.157	<0.154	<0.165	<0.721
4-Chlorophenyl phenyl ether	µg/L	NS	<10	<10	<0.269	--	--	--	--	<0.281	<0.275	<0.294	<0.802
4-Nitroaniline	µg/L	NS	<10	<10	<0.344	--	--	--	--	<0.36	<0.352	<0.376	<1.51
4-Nitrophenol	µg/L	60	<10	<10	<0.129	--	--	--	--	<0.135	<0.132	<0.141	<8.84
5-Nitro-o-toluidine	µg/L	NS	<10	<10	<0.183	--	--	--	--	<0.191	<0.187	<0.2	<3.26
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<10	<10	<0.269	--	--	--	--	<0.281	<0.275	<0.294	<2.21
Acenaphthene	µg/L	420	<10	<10	<0.323	--	--	--	--	<0.337	<0.33	<0.353	<0.744
Acenaphthylene	µg/L	210	<10	<10	<0.226	--	--	--	--	<0.236	<0.231	<0.247	<0.837
Acetophenone	µg/L	NS	<10	<10	<0.237	--	--	--	--	<0.247	<0.242	<0.259	<0.802
Anthracene	µg/L	2100	<10	<10	<0.183	--	--	--	--	<0.191	<0.187	<0.2	<1.01
Benzo (a) anthracene	µg/L	0.24	<10	<10	<0.258	--	--	--	--	<0.27	<0.264	<0.282	<0.988
Benzo (a) pyrene	µg/L	0.2	<10	<10	<0.269	--	--	--	--	<0.281	<0.275	<0.294	<9.42
Benzo (b) fluoranthene	µg/L	0.24	<10	<10	<0.333	--	--	--	--	<0.348	<0.341	<0.365	<5.7
Benzo (g,h,i) perylene	µg/L	21	<10	<10	<0.247	--	--	--	--	<0.258	<0.253	<0.271	<7.33
Benzo (k) fluoranthene	µg/L	2.4	<10	<10	<0.215	--	--	--	--	<0.225	<0.22	<0.235	<2.36
Benzyl alcohol	µg/L	700	<10	<10	<0.194	--	--	--	--	<0.202	<0.198	<0.212	<1.52
Bis(2-chloroethoxy)methane	µg/L	NS	<10	<10	<0.28	--	--	--	--	<0.292	<0.286	<0.306	<0.884
Bis(2-chloroethyl)ether	µg/L	0.16	<10	<10	<0.194	--	--	--	--	<0.202	<0.198	<0.212	<0.953
Bis(2-chloroisopropyl) ether	µg/L	300	<10	<10	<0.194	--	--	--	--	<0.202	<0.198	<0.212	<0.628
Bis(2-ethylhexyl)phthalate	µg/L	6	<10	<10	<0.419	--	--	--	--	<0.438	<0.429	<0.459	<6.4
Butyl benzyl phthalate	µg/L	140	<10	<10	<0.366	--	--	--	--	<0.382	<0.374	<0.4	<6.28
Chlorobenzilate	µg/L	NS	<10	<10	<0.226	--	--	--	--	<0.236	<0.231	<0.247	<4.19
Chrysene	µg/L	24	<10	<10	<0.312	--	--	--	--	<0.326	<0.319	<0.341	<1.69
Diallate (cis or trans)	µg/L	NS	<10	<10	<0.247	--	--	--	--	<0.258	<0.253	<0.271	<4.65
Dibenz(a,h) anthracene	µg/L	0.024	<10	<10	<0.269	--	--	--	--	<0.281	<0.275	<0.294	<4.53
Dibenzofuran	µg/L	7	<10	<10	<0.258	--	--	--	--	<0.27	<0.264	<0.282	<0.86
Diethyl phthalate	µg/L	5600	<10	<10	***0.504 J***	***0.735 J***	<0.286	<0.283	<0.271	<0.292	<0.286	<0.306	<1.98
Dimethoate	µg/L	1.4	<10	<10	<0.29	--	--	--	--	<0.303	<0.297	<0.318	<4.19
Dimethyl phthalate	µg/L	NS	<10	<10	<0.247	--	--	--	--	<0.258	<0.253	<0.271	<1.16
Di-n-butyl phthalate	µg/L	700	<10	<10	<0.548	--	--	--	--	<0.573	<0.56	<0.6	<6.51
Di-n-octyl phthalate	µg/L	140	<10	<10	<0.247	--	--	--	--	<0.258	<0.253	<0.271	***33.6 J***
Dinoseb	µg/L	7	<10	<10	<0.462	--	--	--	--	<0.483	<0.473	<0.506	<2.79
Diphenylamine	µg/L	180	<10	<10	<0.71	--	--	--	--	<0.742	<0.725	<0.776	<6.98
Disulfoton	µg/L	0.7	<70	<10	<0.312	--	--	--	--	<0.326	<0.319	<0.341	<2.79
Ethyl Methanesulfonate	µg/L	NS	<10	<10	<0.161	--	--	--	--	<0.169	<0.165	<0.176	<4.19
Famphur	µg/L	NS	<20	<20	<0.505	--	--	--	--	<0.528	<0.516	<0.553	<4.42
Fluoranthene	µg/L	280	<10	<10	<0.355	--	--	--	--	<0.371	<0.363	<0.388	<1.98
Fluorene	µg/L	280	<10	<10	<0.312	--	--	--	--	<0.326	<0.319	<0.341	<0.919
Hexachlorobenzene	µg/L	1	<10	<10	<0.29	--	--	--	--	<0.303	<0.297	<0.318	<0.814
Hexachlorobutadiene	µg/L	1	<10	<10	<0.14	--	--	--	--	<0.146	<0.143	<0.153	<1
Hexachlorocyclopentadiene	µg/L	50	<10	<10	<2.03	--	--	--	--	<2.12	<2.08	<2.22	<3.93
Hexachloroethane	µg/L	1	<10	<10	<0.14	--	--	--	--	<0.146	<0.143	<0.153	<1.13
Hexachloropropene	µg/L	NS	<10	<10	<1.76	--	--	--	--	<1.84	<1.8	<1.93	<1.02
Indeno(1,2,3-cd) pyrene	µg/L	0.24	<10	<10	<0.258	--	--	--	--	<0.27	<0.264	<0.282	<4.88
Isodrin	µg/L	NS	<10	<10	<0.409	--	--	--	--	<0.427	<0.418	<0.447	<5.47
Isophorone	µg/L	100	<10	<10	<0.237	--	--	--	--	<0.247	<0.242	<0.259	<1.08
Isosafrole	µg/L	NS	<10	<10	<0.194	--	--	--	--	<0.202	<0.198	<0.212	<2.67
Kepone	µg/L	NS	<10	<10	<0.258	--	--	--	--	<0.27	<0.264	<0.282	<1.16
Methapyrilene	µg/L	NS	<10	<10	<0.312	--	--	--	--	<0.326	<0.319	<0.341	<0.884
Methyl Methanesulfonate	µg/L	1.8	<10	<10	<0.151	--	--	--	--	<0.157	<0.154	<0.165	<3.84
Nitrobenzene	µg/L	14	<10	<10	<0.237	--	--	--	--	<0.247	<0.242	<0.259	<0.93
N-Nitrosodiethylamine	µg/L	NS	<10	<10	<0.323	--	--	--	--	<0.337	<0.33	<0.353	<3.95
N-Nitrosodimethylamine	µg/L	0.0034	<10	<10	<0.151	--	--	--	--	<0.157	<0.154	<0.165	<0.837
N-Nitrosodi-n-butylamine	µg/L	0.032	<10	<10	<0.312	--	--	--	--	<0.326	<0.319	<0.341	<4.53
N-Nitrosodi-n-propylamine	µg/L	NS	<10	<10	<0.28	--	--	--	--	<0.292	<0.286	<0.306	<1.07
N-Nitrosodiphenylamine	µg/L	36	<10	<10	<0.71	--	--	--	--	<0.742	<0.725	<0.776	<0.872
N-Nitrosomethylethylamine	µg/L	0.008	<10	<10	<0.215	--	--	--	--	<0.225	<0.22	<0.235	<5.7
N-Nitrosopiperidine	µg/L	NS	<10	<10	<0.161	--	--	--	--	<0.169	<0.165	<0.176	<3.14
N-Nitrosopyrrolidine	µg/L	0.003	<10	<10	<0.247	--	--	--	--	<0.258	<0.253	<0.271	<4.19
O,O,O-Triethyl phosphorothioate	µg/L	NS	<10	<10	<0.258	--	--	--	--	<0.27	<0.264	<0.282	<3.53
o-Toluidine	µg/L	13	<10	<10	<0.194	--	--	--	--	<0.202	<0.198	<0.212	<3.37
p-Dimethylaminoazobenzene	µg/L	NS	<10	<10	<0.258	--	--	--	--	<0.27	<0.264	<0.282	<2.56
Parathion ethyl	µg/L	NS	<10	<10	<0.194	--	--	--	--	<0.202	<0.198	<0.212	<2.56
Parathion-methyl	µg/L	1	<10	<10	<0.161	--	--	--	--	<0.169	<0.165	<0.176	<2.67
Pentachlorobenzene	µg/L	NS	<10	<10	<0.237	--	--	--	--	<0.247	<0.242	<0.259	<3.26
Pentachloronitrobenzene	µg/L	NS	<10	<10	<0.355	--	--	--	--	<0.371	<0.363	<0.388	<6.74
Pentachlorophenol	µg/L	1	<10	<10	<0.258	--	--	--	--	<0.27	<0.264	<0.282	<11.2
Phenacetin	µg/L	NS	<10	<10	<0.183	--	--	--	--	<0.191	<0.187	<0.2	<2.23
Phenanthrene	µg/L	210	<10	<10	<0.645	--	--	--	--	<0.674	<0.659	<0.706	<0.919
Phenol	µg/L	2000	<20	<10	<2.58	--	--	--	--	<2.7	<2.64	<2.82	<1.28
Phorate	µg/L	1.4	<60	<10	<0.183	--	--	--	--	<0.191	<0.187	<0.2	<3.72
Pronamide	µg/L	5	<10	<10	<0.28	--	--	--	--	<0.292	<0.286	<0.306	<3.14
Pyrene	µg/L	210	<10	<10	<0.247	--	--	--	--	<0.258	<0.253	<0.271	<0.919
Safrole	µg/L	NS	<10	<10	<0.215	--	--	--	--	<0.225	<0.22	<0.235	<3.26
Thionazin	µg/L	NS	<10	<10	<0.333	--	--	--	--	<0.348	<0.341	<0.365	<4.07
Volatile Organic Compounds													
1,1-Dichloropropene	µg/L	NS	<1	<1	<0.15	--	--	--	--	<0.15	<0.15	<0.15	<0.43
1,2,4-Trichlorobenzene	µg/L	70	<5	<5	<0.16	--	--	--	--	<0.16	<0.16	<0.16	<0.79
1,3-Dichlorobenzene	µg/L	600	<1	<1	<0.17	--	--	--	--	<0.17	<0.17	<0.17	<0.3
1,3-Dichloropropane	µg/L	NS	<1	<1	<0.16	--	--	--	--	<0.16	<0.16	<0.16	<0.4
2,2-Dichloropropane	µg/L	NS	<4	<4	<0.18	--	--	--	--	<0.18	<0.18	<0.18	<0.69
Acrolein	µg/L	NS	<10	<10	<1.5	--	--	--	--	<1.5	<1.5	<1.5	<3.6
Allyl chloride	µg/L	NS	<2	<2	<0.27	--	--	--	--	<0.27	<0.27	<0.27	<0.7
Chloroprene	µg/L	NS	<1	<1	<0.19	--	--	--	--	<0.19	<0.19	<0.19	<0.25
Dichlorodifluoromethane	µg/L	1000	<3	<5	<0.2	--	--	--	--	<0.2	<0.2	<0.2	<0.25
Ethyl Methacrylate	µg/L	NS	<2	<2	<0.15	--	--	--	--	<0.15	<0.15	<0.15	<0.68
Methacrylonitrile	µg/L	NS	<1	<2	<0.25	--	--	--	--	<0.25	<0.25	<0.25	<3.3
Methyl Methacrylate	µg/L	NS	<2	<2	<0.15	--	--	--	--	<0.15	<0.15	<0.15	<0.76
Naphthalene	µg/L	100	<10	<5	<0.37	--	--	--	--	<0.37	<0.37	<0.37	<3
Propionitrile	µg/L	NS	<10	<200	<2	--	--	--	--	<2	<2	<2	<3.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-4B

Parameter Name	Units	GPS	DL	RL	Oct-07	Jan-08	Apr-08	Jul-08	Oct-08	Apr-09	Oct-09	Feb-10	Apr-10	Oct-10	Apr-11	Oct-11	Apr-12	Oct-12	Apr-13	Nov-13	May-14	Oct-14	May-15	Jul-15	Sep-15	Mar-16	Nov-16	May-17	Nov-17	Jun-18	Oct-18	Jun-19	Oct-19	Feb-20	Jun-20	Nov-20	May-21	Sep-21	Mar-22	Sep-22	Jun-23	Nov-23	Jan-24	Jun-24	Aug-24	Nov-24
Appendix I Inorganics																																														
Total Suspended Solids	mg/L	NS	0.581	1.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.13	6.83	15.5	6	14.4	<0.581	<0.581	1.38 J	5.37	1 J	1.25 J	<0.638	0.875 J	1.25 J	0.75 J	<0.638	1.13 J	<1.7	<0.638	0.75 J	1.75 J	2.13	<1.39	<1.39	<1.43
Turbidity, Field	NTU	NS	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10.87	0.8004	1.147	9.4	75.69	1.571	1.342	9.311	7.859	9.43	3.77	0.89	1.67	0.82	3.98	1.23	5.15	0.06	0	0.67	1.95	0.87	1.75	2.37	1.14
Turbidity, Lab	NTU	NS	0.4	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.6	27.4	87	15.6	37.6	<0.4	0.5 J	1.3	7.2	0.6 J	1.14	0.59 J	--	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	1	<6	<6	<6	<6	<6	<6	<6	10.6	<6	<6	<6	<2.73	<1.45	0.22 J	0.698 J	0.256 J	0.994 J	<0.161	<0.161	--	<0.161	<0.237	<0.237	<0.185	<0.185	<0.42	0.503 J	<1.32	<0.53	--	<0.51	<0.51	<1.1	<1.1	<0.69	<0.69	<1	<1	--	<1	--	<1
Antimony, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<6	<6	<6	<6	<6	<6	<2.73	<1.45	0.17 J	0.3 J	0.199 J	0.448 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	2	<1	2.26	<1	<1	<1	2.29	1.45	2.34	<1	<1	<1	1.14	2.53	14.1	15.3	1.19	1.19 J	<0.945	<0.945	--	<0.945	1.17 J	<0.672	<0.505	<0.505	<0.57	<0.57	0.547 J	<0.75	--	<0.88	<0.88	<0.75	<0.75	<0.75	<0.75	<0.53	<0.53	--	<0.53	--	<0.53
Arsenic, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<1	<1	<1	<1	<1	<1	2.16	<0.216	9.74	9.92	1.06	1.17 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	2	344	358	337	264	343	447	372	441	339	346	211	404	540	920	644	333	462	144	307	--	237	396	205	213	217	305	206	187	455	168	180	178	176	189	184	209	183	267	413	184	--	225
Barium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	393	277	314	216	189	229	445	495	665	474	312	467	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.051	<0.079	0.12 J	0.109 J	<0.0696	0.114 J	<0.039	<0.039	--	0.052 J	<0.221	<0.221	<0.125	<0.125	<0.19	<0.19	<0.53	<0.27	--	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	--	<0.33	--	<0.33
Beryllium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<0.051	<0.079	<0.0178	<0.0696	<0.0696	<0.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.044	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	0.25 J	0.189 J	0.137 J	<0.1	<0.112	<0.112	--	<0.112	0.121 J	<0.0351	<0.0441	<0.0441	<0.06	<0.06	<0.167	0.135	<0.039	<0.049	<0.049	<0.051	<0.051	<0.055	<0.055	<0.1	<0.1	--	<0.1	--	<0.1
Cadmium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	0.07 J	<0.106	0.135 J	0.164 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	5	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	3.5 J	4.47 J	8.6	36	<0.418	0.65 J	<1.24	<1.24	--	<1.24	0.4 J	<0.355	<0.729	<0.729	<0.76	1.04 J	<1.14	<0.98	--	<1.1	<1.1	<1.1	<1.1	1.67 J	<1.1	<1.1	<1.1	--	<1.2	--	<1.2
Chromium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<20	<1.81	<1.81	1.37 J	0.959 J	<0.418	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.045	0.5	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	4.43 J	8.7 J	18.7	15.1	4.67	6.79	0.968	2.05	--	1.77	6.05	0.035 J	<0.0453	0.362 J	0.834	0.068 J	<0.402	0.221 J	--	<0.091	0.149 J	<0.091	<0.19	<0.19	<0.19	<0.17	0.213 J	--	<0.17	--	<0.17
Cobalt, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<20	7.7 J	8.28 J	15.6	11.6	4.39	6.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	5	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	11.8 J	<1.51	11.8	12.1	3.76	2.39	4.11	1.67 J	--	0.618 J	1.88 J	<1.22	<2.19	<2.19	1.6 J	<1.6	2.09	<2	--	<1.5	<1.5	<1.4	<1.4	<1.8	<1.8	<1.8	<1.8	--	<1.8	--	<1.8
Copper, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<20	12.3 J	<1.51	0.61	<0.17	3.13	2.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	0.5	<4	<4	<4	<4	<4	7.68	<4	<4	13.8	5.32	<4	<1	0.91 J	3.68	3.97	5.55	<0.18	0.117 J	<0.0967	--	0.141 J	<0.211	<0.211	<0.324	<0.324	<0.25	<0.25	<0.186	<0.27	--	<0.11	<0.11	<0.21	<0.21	<0.24	<0.24	<0.24	<0.24	--	<0.26	--	<0.26
Lead, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<4	<4	4.4	<4	<4	<4	<1	<0.804	0.22 J	<0.207	0.9	<0.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	5	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	24.4 J	38.7 J	57.6	62.4	16	22.3	2.51 J	9.83	--	4.5 J	13.4	<1.53	<0.929	2.91 J	5.11	<1	1.57 J	3.57 J	--	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	3.5 J	--	<2.1	--	<2.1
Nickel, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<50	<50	<50	<50	<50	<50	29.4 J	35.3 J	46.8	42.6	15.1	22.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.69	<0.7	<0.297	1.74 J	2.24 J	<0.7	<3.34	<3.34	--	<3.34	<0.63	<0.63	<0.928	<0.928	<0.9	<0.9	<0.982	<1	--	<1	<1	<0.96	<0.96	<0.96	<0.96	<1.4	<1.4	--	<1.4	--	<1.4
Selenium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<5	<5	<5	<5	<5	<5	<1.69	<0.7	<0.297	<1.46	<1.46	<0.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.7	<1.7	<0.027	<0.0789	<0.0789	<0.033	<0.042	0.053 J	--	<0.042	0.173 J	<0.153	<0.14	<0.14	<0.3	<0.3	<0.115	<0.37	--	<0.37	<0.37	<0.42	<0.42	<0.49	<0.49	<0.5	<0.5	--	5.37	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<20	<1.7	<1.7	<0.027	<0.0789	<0.0789	<0.033	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.064	1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.84	<0.288	0.01 J	0.155	0.0384 J	0.308 J	<0.0325	<0.0325	--	<0.0325	0.03 J	<0.0255	<0.0644	<0.0644	<0.17	<0.17	<0.57	<0.27	--	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	--	<0.57	--	<0.57
Thallium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<2	<2	<2	<2	<2	<2	<0.84	<0.288	0.03 J	0.0349 J	0.0473 J	<0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	5	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<2.1	<2.1	8.18	11.3	1.55	0.783 J	1.11 J	0.782 J	--	0.707 J	0.709 J	1.06 J	1.09 J	1.01 J	0.99 J	1.36 J	<2.15	0.956 J	--	1.06 J	1.41 J	1.14 J	<1.1	<1.1	1.15 J	<1.1	1.5 J	--	<1.1	--	<1.1
Vanadium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<50	<50	<50	<50	<50	<50	<2.1	<2.1	<0.94	<0.833	0.912 J	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	20	52.2	<20	26.2	<20	<20	36.3	31.7	<20	27.1	22	<20	<9.11	10.8 J	7.01	13.3	<0.625	3.49 J	<6.95	<6.95	--	<6.95	<5.21	<5.21	<11.5	<11.5	<10	<10	<6.92	<10	--	<10	<10	<10	<10	<10	<10	<6.4	<6.4	--	<9.7	--	<9.7
Zinc, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	30.6	<20	<20	<20	<20	<20	<9.11	9.99 J	2.02 J	1.75 J	<0.625	2.46 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																																														
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	1	<1	<1	<1	<1	<1	<1	<1	<2	<10	<5	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.21	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	--	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.12	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	--	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.47	<0.47	<0.47	<0.47	--	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47	--	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.12	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	--	<0.45
1,1-Dichloroethane	µg/L	140	0.21	1	<1	<1	<1	<1	<1	1.28	1.81	<1	<1	<1	<1	1.87	1.97	1.94	2.28	<0.21	1.52	<0.21	<0.21	--	<0.21	0.58 J	<0.21	<0.21	<0.21	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	--	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	--	<0.56
1,2,3-Trichloropropane	µg/L	0.006	0.19	1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.19	<0.59	<0.59	<0.59	<0.59	--	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59	--	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.5	--	<0.5	<0.5	<0.5	<0.5	<0.5	<1.2	<1.2	<1.2	<1.2	--	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2	--	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.34	<0.34	<0.34	<0.34	--	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34	--	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.14	<0.14	<0.14	0.292 J	<0.14	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.14	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	--	<0.37
1,2-Dichloroethane	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	0.18 J	<0.18	0.204 J	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.18	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	--	<0.39
1,2-Dichloropropane	µg/L	5	0.87	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	--	<0.87	<0.87	<0.87	<0.87	<0.87	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	--	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	1	<1	<1	<1	<1	<1	1.17	1.57	<1	<1	<1	<1	2.31	2.55	3.78	3.36	<0.2	<0.2	<0.2	<0.2	--	<0.2	<0.2	<0.2	<0.2	<0.2	0.326 J	<0.23	<0.23	<0.23	--	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	0.554 J	--	<0.23	--	<0.23
2-Butanone	µg/L	4000	1.04	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.47	0.54 J	<0.47	0.635 J	<0.47	<0.47	<0.47	<0.47	--	<0.47	<0.47	<1.04	<1.04	<1.04	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	--	<2.1
2-Hexanone	µg/L	NS	0.2	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<2	<2	<2	--	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	--	<2
4-Methyl-2-pentanone	µg/L	560	0.22	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.22	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	--	<2.1
Acetone	µg/L	6300	1.79	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.79	2.04 J	2.04 J	<1.79	<1.79	<1.79	<1.79	<1.79	--	<1.79	<1.79	<1.79	<1.79	<1.79	<3.1	<3.1	3.97 J	<3.1	--	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	--	<3.1	--	<3.1
Acrylonitrile	µg/L	0.32	0.53	5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	--	<0.53	<0.53	<0.53	<0.53	<0.53	<2.2	<2.2	<2.2	<2.2	--	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2	--	<2.2
Benzene	µg/L	5	0.11	0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	1.04	0.56	<0.5	<0.5	<0.5	0.89	0.98	1.25	1.15	0.313 J	0.724	<0.11	0.481 J	--	<0.11	0.496 J	<0.11	<0.11	<0.11	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	--	<0.22
Bromochloromethane	µg/L	90	0.12	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.12	<0.54	<0.54	<0.54	<0.54	--	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54	--	<0.54
Bromodichloromethane	µg/L	80	0.12	1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.12	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	--	<0.39
Bromomethane	µg/L	10	0.22	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	0.549 J	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	--	<1.1
Carbon disulfide	µg/L	700	0.15	1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<1	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	--	<0.45
Carbon Tetrachloride	µg/L	5	0.24	2	<2	<2	<2	<2	<2	<2	<2	<2	<5	<5	<2	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	--	<0.24	<0.24	<0.24	<0.24	<0.24	<0.65	<0.65	<0.65	<0.65	--	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65	--	<0.65
Chlorobenzene	µg/L	100	0.19	1	<1	<1	<1	<1	<1	1.06	1.91	<1	<1	<1	<1	2.51	2.87	3.66	3.2	<0.19	<0.19	<0.19	1.29	--	<0.19	<0.19	<0.19	<0.19	0.254 J	0.525 J	<0.4	<0.4	<0.4	--	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.607 J	--	<0.4	--	<0.4
Chloroethane	µg/L	2800	0.15	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	0.45 J	0.4 J	<0.15	0.487 J	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	<0.79	<0.79	<0.79	<0.79	--	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79	--	<0.79
Chloromethane	µg/L	NS	0.31	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	<0.31	<0.31	<0.31	<0.31	<0.61	<0.61	<0.61	<0.61	--	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61	--	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	--	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	<0.25	<0.25	<0.25	<0.25	--	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25	--	<0.25
Dibromochloromethane	µg/L	80	0.2	5	<5	<5	<5	<5	<5	<5	<5	<5	<50	<5	<5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2	<0.2	<0.2	<0.2	<0.2	<0.75	<0.75	<0.75	<0.75	--	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75	--	<0.75
Dibromomethane	µg/L	70	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.18	<0.33	<0.33	<0.33	<0.33	--	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33	--	<0.33
Dichloromethane	µg/L	5	0.17	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.17	<0.17	0.28 J	0.171 J	<0.17	0.38 J	1.6 J	<0.17	--	<0.17	<0.17	0.197 J	<0.17	<0.17	<1.7	<1.7	<1.7	<1.7	--	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7	--	<1.7
Ethylbenzene	µg/L	700	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.21	<0.31	<0.31	<0.31	<0.31	--	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	--	<0.31
Iodomethane	µg/L	NS	0.8	10	<10	<10	<10	<10	<10	<20	<10	<10	<10	<20	<10	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	--	<0.8	<0.8	<0.8	<0.8	<0.8	<7	<7	<7	<7	--	<7	<7	<7	<7	<7	<7	<7	<7	--	<7	--	<7
Styrene	µg/L	100	0.1	1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	--	<0.37
Tetrachloroethylene	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	0.29 J	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.18	<0.48	<0.48	<0.48	<0.48	--	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48	--	<0.48
Toluene	µg/L	1000	0.15	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.15	0.21 J	<0.15	0.394 J	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	0.875 J	--	<0.43	--	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.21	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	--	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<10	<5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.22	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	--	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	--	<1.1
Tribromomethane	µg/L	80	0.14	5	<5	<5	<5	<5	<5	<20	<5	<5	<50	<5	<5	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.14	<0.78	<0.78	<0.78	<0.78	--	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78	--	<0.78
Trichloroethylene	µg/L	5	0.19	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.19	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	--	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	4	<4	<4	<4	<4	<4	<4	<4	<4	<5	<4	<4	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	--	<0.17	<0.17	<0.17	<0.17	<0.17	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	--	<0.38
Trichloromethane	µg/L	80	0.28	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	--	<0.28	<0.28	<0.28	<0.28	<0.28	<1.3	<1.3	<1.3	<1.3	--	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3	--	<1.3
Vinyl Acetate	µg/L	NS	0.74	10	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<4	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	--	<0.74	<0.74	<0.74	<0.74	<0.74	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5	--	<2.5
Vinyl Chloride	µg/L	2	0.1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.17 J	0.27 J	0.28 J	0.284 J	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.6	<0.6	<0.18	0.373 J	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	--	<0.18
Xylenes	µg/L	10000	0.13	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	--	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-4B

Parameter Name	Units	GPS	Feb-10	Oct-14	Dec-14	May-15	Jul-15	Sep-15	Dec-15	Nov-16	Nov-17
Alcohols/Glycols by G.C											
Acetonitrile	µg/L	NS	<10000	<126	--	--	--	<126	--	<252	<126
Isobutanol	µg/L	2100	<10000	<177	--	--	--	<177	--	<354	<177
Herbicides (G.C)											
2,4,5-T	µg/L	70	<0.23	<0.55	--	--	--	<0.514	--	<0.541	<0.497
2,4-D	µg/L	70	<1	<0.591	--	--	--	<0.552	--	<0.581	<0.533
Silvex (2,4,5-TP)	µg/L	50	<0.23	<0.367	--	--	--	<0.343	--	<0.361	<0.332
Inorganics											
Cyanide	µg/L	200	<10	<3.1	--	--	--	<3.04	--	<3.52	<3.46
Mercury	µg/L	2	<0.2	<0.073	--	--	--	<0.0926	--	<0.142	<0.112
Sulfide	µg/L	NS	<1000	<219	--	--	--	<219	--	<180	<231
Tin	µg/L	4200	<100	***75.4 J***	***90.3 J***	<1.8	<12.1	<1.8	--	<0.932	<1.62
PCBs (EPA Method 8082)											
PCB-1016	µg/L	NS	<0.8	<0.0477	--	--	--	<0.0488	--	<0.0482	<0.0467
PCB-1221	µg/L	NS	<0.8	<0.176	--	--	--	<0.18	--	<0.178	<0.172
PCB-1232	µg/L	NS	<0.8	<0.121	--	--	--	<0.124	--	<0.122	<0.118
PCB-1242	µg/L	NS	<0.8	<0.143	--	--	--	<0.146	--	<0.144	<0.14
PCB-1248	µg/L	NS	<0.8	<0.121	--	--	--	<0.124	--	<0.122	<0.118
PCB-1254	µg/L	NS	<0.8	<0.101	--	--	--	<0.103	--	<0.102	<0.0989
PCB-1260	µg/L	NS	<0.8	<0.0484	--	--	--	<0.0494	--	<0.0489	<0.0473
Pesticides (EPA Method 8081A)											
4,4'-DDD	µg/L	0.73	<0.032	<0.0018	--	--	--	<0.002	--	<0.00205	<0.00194
4,4'-DDE	µg/L	0.51	<0.032	<0.0021	--	--	--	<0.00233	--	<0.00239	<0.00226
4,4'-DDT	µg/L	0.51	<0.032	<0.0038	--	--	--	<0.00422	--	<0.00432	<0.00409
Aldrin	µg/L	0.01	<0.032	<0.0045	--	--	--	<0.005	--	<0.00511	<0.00484
alpha-BHC	µg/L	0.028	<0.032	<0.0017	--	--	--	<0.00189	--	<0.00193	<0.00183
beta-BHC	µg/L	0.042	<0.032	<0.0048	--	--	--	<0.00533	--	<0.00545	<0.00516
Chlordane	µg/L	2	<2	<0.064	--	--	--	<0.0711	--	<0.0727	<0.0688
delta-BHC	µg/L	2.1	<0.032	<0.0023	--	--	--	<0.00256	--	<0.00261	<0.00247
Dieldrin	µg/L	0.011	<0.032	<0.002	--	--	--	<0.00222	--	<0.00227	<0.00215
Endosulfan I	µg/L	42	<0.032	<0.002	--	--	--	***0.00257 J***	***0.0149 J***	<0.00227	<0.00215
Endosulfan II	µg/L	42	<0.032	<0.0019	--	--	--	<0.00211	--	<0.00216	<0.00204
Endosulfan sulfate	µg/L	NS	<0.032	<0.0025	--	--	--	<0.00278	--	<0.00284	<0.00269
Endrin	µg/L	2	<0.032	<0.0019	--	--	--	<0.00211	--	<0.00216	<0.00204
Endrin aldehyde	µg/L	2.1	<0.032	<0.0073	--	--	--	<0.00811	--	<0.0083	<0.00785
gamma-BHC (Lindane)	µg/L	0.2	<0.032	<0.0019	--	--	--	<0.00211	--	<0.00216	<0.00204
Heptachlor	µg/L	0.4	<0.032	<0.0026	--	--	--	<0.00289	--	<0.00295	<0.0028
Heptachlor epoxide	µg/L	0.2	<0.032	<0.0061	--	--	--	<0.00678	--	<0.00693	<0.00656
Methoxychlor	µg/L	40	<0.032	<0.0021	--	--	--	<0.00233	--	<0.00239	<0.00226
Toxaphene	µg/L	3	<2	<0.058	--	--	--	<0.0644	--	<0.0659	<0.0624
Semivolatile Organics by GC/MS											
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<10	<0.133	--	--	--	<0.129	--	<0.132	<0.13
1,3,5-Trinitrobenzene	µg/L	NS	<10	<1.42	--	--	--	<1.38	--	<1.41	<1.39
1,3-Dinitrobenzene	µg/L	1	<10	<0.189	--	--	--	<0.183	--	<0.187	<0.185
1,4-Naphthoquinone	µg/L	NS	<10	<0.156	--	--	--	<0.151	--	<0.154	<0.152
1,4-Phenylenediamine	µg/L	NS	<10	<9.33	--	--	--	<9.03	--	<9.23	<9.13
1-Naphthylamine	µg/L	NS	<10	<0.267	--	--	--	<0.258	--	<0.264	<0.261
2,3,4,6-Tetrachlorophenol	µg/L	NS	<10	<0.222	--	--	--	<0.215	--	<0.22	<0.217
2,4,5-Trichlorophenol	µg/L	700	<10	<0.356	--	--	--	<0.344	--	<0.352	<0.348
2,4,6-Trichlorophenol	µg/L	16	<10	<0.244	--	--	--	<0.237	--	<0.242	<0.239
2,4-Dichlorophenol	µg/L	20	<10	<0.167	--	--	--	<0.161	--	<0.165	<0.163
2,4-Dimethylphenol	µg/L	100	<10	<0.233	--	--	--	<0.226	--	<0.231	<0.228
2,4-Dinitrophenol	µg/L	14	<20	<1.49	--	--	--	<1.44	--	<1.47	***2.34 J***
2,4-Dinitrotoluene	µg/L	0.25	<10	<0.211	--	--	--	<0.204	--	<0.209	<0.207
2,6-Dichlorophenol	µg/L	NS	<10	<0.244	--	--	--	<0.237	--	<0.242	<0.239
2,6-Dinitrotoluene	µg/L	0.26	<10	<0.267	--	--	--	<0.258	--	<0.264	<0.261
2-Acetylaminofluorene	µg/L	NS	<10	<0.311	--	--	--	<0.301	--	<0.308	<0.304
2-Chloronaphthalene	µg/L	560	<10	<0.256	--	--	--	<0.247	--	<0.253	<0.25
2-Chlorophenol	µg/L	40	<10	<0.167	--	--	--	<0.161	--	<0.165	<0.163
2-Methylnaphthalene	µg/L	28	<10	<0.211	--	--	--	<0.204	--	<0.209	<0.207
2-Methylphenol (o-Cresol)	µg/L	35	<10	<0.2	--	--	--	<0.194	--	<0.198	<0.196
2-Naphthylamine	µg/L	0.097	<10	<0.244	--	--	--	<0.237	--	<0.242	<0.239
2-Nitroaniline	µg/L	NS	<10	<0.256	--	--	--	<0.247	--	<0.253	<0.25
2-Nitrophenol	µg/L	NS	<10	<0.178	--	--	--	<0.172	--	<0.176	<0.174
3,3'-Dichlorobenzidine	µg/L	0.39	<10	<0.511	--	--	--	<0.495	--	<0.505	<0.5
3,3'-Dimethylbenzidine	µg/L	NS	<10	<0.233	--	--	--	<0.226	--	<0.231	<0.228
3/4-Methylphenol	µg/L	70	<10	<0.2	--	--	--	<0.194	--	<0.198	<0.196
3-Methylcholanthrene	µg/L	NS	<10	<0.344	--	--	--	<0.333	--	<0.341	<0.337
3-Nitroaniline	µg/L	NS	<10	<0.244	--	--	--	<0.237	--	<0.242	<0.239
4,6-Dinitro-2-methylphenol	µg/L	NS	<10	<2.47	--	--	--	<2.39	--	<2.44	<2.41
4-Aminobiphenyl	µg/L	0.0083	<10	<0.333	--	--	--	<0.323	--	<0.33	<0.326
4-Bromophenyl phenyl ether	µg/L	NS	<10	<0.322	--	--	--	<0.312	--	<0.319	<0.315
4-Chloro-3-methylphenol	µg/L	700	<10	<0.211	--	--	--	<0.204	--	<0.209	<0.207
4-Chloroaniline	µg/L	28	<10	<0.156	--	--	--	<0.151	--	<0.154	<0.152
4-Chlorophenyl phenyl ether	µg/L	NS	<10	<0.278	--	--	--	<0.269	--	<0.275	<0.272
4-Nitroaniline	µg/L	NS	<10	<0.356	--	--	--	<0.344	--	<0.352	<0.348
4-Nitrophenol	µg/L	60	<10	<0.133	--	--	--	<0.129	--	<0.132	<0.13
5-Nitro-o-toluidine	µg/L	NS	<10	<0.189	--	--	--	<0.183	--	<0.187	<0.185
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<10	<0.278	--	--	--	<0.269	--	<0.275	<0.272
Acenaphthene	µg/L	420	<10	<0.333	--	--	--	<0.323	--	<0.33	<0.326
Acenaphthylene	µg/L	210	<10	<0.233	--	--	--	<0.226	--	<0.231	<0.228
Acetophenone	µg/L	NS	<10	<0.244	--	--	--	<0.237	--	<0.242	<0.239
Anthracene	µg/L	2100	<10	<0.189	--	--	--	<0.183	--	<0.187	<0.185
Benzo (a) anthracene	µg/L	0.24	<10	<0.267	--	--	--	<0.258	--	<0.264	<0.261
Benzo (a) pyrene	µg/L	0.2	<10	***0.535 J***	<0.263	<0.255	<0.266	<0.269	--	<0.275	<0.272
Benzo (b) fluoranthene	µg/L	0.24	<10	***0.514 J***	<0.326	<0.316	<0.33	<0.333	--	<0.341	<0.337
Benzo (g,h,i) perylene	µg/L	21	<10	***0.394 J***	<0.242	<0.235	<0.245	<0.247	--	<0.253	<0.25
Benzo (k) fluoranthene	µg/L	2.4	<10	***0.723 J***	<0.211	<0.204	<0.213	<0.215	--	<0.22	<0.217
Benzyl alcohol	µg/L	700	<10	<0.2	--	--	--	<0.194	--	<0.198	<0.196
Bis(2-chloroethoxy)methane	µg/L	NS	<10	<0.289	--	--	--	<0.28	--	<0.286	<0.283
Bis(2-chloroethyl)ether	µg/L	0.16	<10	<0.2	--	--	--	<0.194	--	<0.198	<0.196
Bis(2-chloroisopropyl) ether	µg/L	300	<10	<0.2	--	--	--	<0.194	--	<0.198	<0.196
Bis(2-ethylhexyl)phthalate	µg/L	6	<10	<0.433	--	--	--	<0.419	--	<0.429	<0.424
Butyl benzyl phthalate	µg/L	140	<10	***0.466 J***	<0.358	<0.347	<0.362	<0.366	--	<0.374	<0.37
Chlorobenzilate	µg/L	NS	<10	<0.233	--	--	--	<0.226	--	<0.231	<0.228
Chrysene	µg/L	24	<10	<0.322	--	--	--	<0.312	--	<0.319	<0.315
Diallate (cis or trans)	µg/L	NS	<10	<0.256	--	--	--	<0.247	--	<0.253	<0.25
Dibenzo (a,h) anthracene	µg/L	0.024	<10	***0.364 J***	<0.263	<0.255	<0.266	<0.269	--	<0.275	<0.272
Dibenzofuran	µg/L	7	<10	<0.267	--	--	--	<0.258	--	<0.264	<0.261
Diethyl phthalate	µg/L	5600	<10	<0.289	--	--	--	<0.28	--	<0.286	<0.283
Dimethoate	µg/L	1.4	<10	<0.3	--	--	--	<0.29	--	<0.297	<0.293
Dimethyl phthalate	µg/L	NS	<10	<0.256	--	--	--	<0.247	--	<0.253	<0.25
Di-n-butyl phthalate	µg/L	700	<10	<0.567	--	--	--	<0.548	--	<0.56	<0.554
Di-n-octyl phthalate	µg/L	140	<10	***1.36J***	<0.242	<0.235	<0.245	<0.247	--	<0.253	<0.25
Dinoseb	µg/L	7	<10	<0.478	--	--	--	<0.462	--	<0.473	<0.467
Diphenylamine	µg/L	180	<10	<0.733	--	--	--	<0.71	--	<0.725	<0.717
Disulfoton	µg/L	0.7	<10	<0.322	--	--	--	<0.312	--	<0.319	<0.315
Ethyl Methanesulfonate	µg/L	NS	<10	<0.167	--	--	--	<0.161	--	<0.165	<0.163
Famphur	µg/L	NS	<20	<0.522	--	--	--	<0.505	--	<0.516	<0.511
Fluoranthene	µg/L	280	<10	<0.367	--	--	--	<0.355	--	<0.363	<0.359
Fluorene	µg/L	280	<10	<0.322	--	--	--	<0.312	--	<0.319	<0.315
Hexachlorobenzene	µg/L	1	<10	<0.3	--	--	--	<0.29	--	<0.297	<0.293
Hexachlorobutadiene	µg/L	1	<10	<0.144	--	--	--	<0.14	--	<0.143	<0.141
Hexachlorocyclopentadiene	µg/L	50	<10	<2.1	--	--	--	<2.03	--	<2.08	<2.05
Hexachloroethane	µg/L	1	<10	<0.144	--	--	--	<0.14	--	<0.143	<0.141
Hexachloropropene	µg/L	NS	<10	<1.82	--	--	--	<1.76	--	<1.8	<1.78
Indeno (1,2,3-cd) pyrene	µg/L	0.24	<10	***0.403 J***	<0.253	<0.245	<0.255	<0.258	--	<0.264	<0.261
Isodrin	µg/L	NS	<10	<0.422	--	--	--	<0.409	--	<0.418	<0.413
Isophorone	µg/L	100	<10	<0.244	--	--	--	<0.237	--	<0.242	<0.239
Isosafrole	µg/L	NS	<10	<0.2	--	--	--	<0.194	--	<0.198	<0.196
Kepone	µg/L	NS	<10	<0.267	--	--	--	<0.258	--	<0.264	<0.261
Methapyrilene	µg/L	NS	<10	<0.322	--	--	--	<0.312	--	<0.319	<0.315
Methyl Methanesulfonate	µg/L	1.8	<10	<0.156	--	--	--	<0.151	--	<0.154	<0.152
Nitrobenzene	µg/L	14	<10	<0.244	--	--	--	<0.237	--	<0.242	<0.239
N-Nitrosodiethylamine	µg/L	NS	<10	<0.333	--	--	--	<0.323	--	<0.33	<0.326
N-Nitrosodimethylamine	µg/L	0.0034	<10	<0.156	--	--	--	<0.151	--	<0.154	<0.152
N-Nitrosodi-n-butylamine	µg/L	0.032	<10	<0.322	--	--	--	<0.312	--	<0.319	<0.315
N-Nitrosodi-n-propylamine	µg/L	NS	<10	<0.289	--	--	--	<0.28	--	<0.286	<0.283
N-Nitrosodiphenylamine	µg/L	36	<10	<0.733	--	--	--	<0.71	--	<0.725	<0.717
N-Nitrosomethylethylamine	µg/L	0.008	<10	<0.222	--	--	--	<0.215	--	<0.22	<0.217
N-Nitrosopiperidine	µg/L	NS	<10	<0.167	--	--	--	<0.161	--	<0.165	<0.163
N-Nitrosopyrrolidine	µg/L	0.083	<10	<0.256	--	--	--	<0.247	--	<0.253	<0.25
O,O,O-Triethyl phosphorothioate	µg/L	NS	<10	<0.267	--	--	--	<0.258	--	<0.264	<0.261
o-Toluidine	µg/L	11	<10	<0.2	--	--	--	<0.194	--	<0.198	<0.196
p-(Dimethylamino)azobenzene	µg/L	NS	<10	<0.267	--	--	--	<0.258	--	<0.264	<0.261
Parathion-ethyl	µg/L	NS	<10	<0.2	--	--	--	<0.194	--	<0.198	<0.196
Parathion-methyl	µg/L	1	<10	<0.167	--	--	--	<0.161	--	<0.165	<0.163
Pentachlorobenzene	µg/L	NS	<10	<0.244	--	--	--	<0.237	--	<0.242	<0.239
Pentachloronitrobenzene	µg/L	NS	<10	<0.367	--	--	--	<0.355	--	<0.363	<0.359
Pentachlorophenol	µg/L	1	<10	<0.267	--	--	--	<0.258	--	<0.264	***1.7 J***
Phenacetin	µg/L	NS	<10	<0.189	--	--	--	<0.183	--	<0.187	<0.185
Phenanthrene	µg/L	210	<10	<0.667	--	--	--	<0.645	--	<0.659	<0.652
Phenol	µg/L	2000	<10	<2.67	--	--	--	<2.58	--	<2.64	<2.61
Phorate	µg/L	1.4	<10	<0.189	--	--	--	<0.183	--	<0.187	<0.185
Pronamide	µg/L	5	<10	<0.289	--	--	--	<0.28	--	<0.286	<0.283
Pyrene	µg/L	210	<10	<0.256	--	--	--	<0.247	--	<0.253	<0.25
Safrole	µg/L	NS	<10	<0.222	--	--	--	<0.215	--	<0.22	<0.217
Thionazin	µg/L	NS	<10	<0.344	--	--	--	<0.333	--	<0.341	<0.337
Volatile Organic Compounds											
1,1-Dichloropropene	µg/L	NS	<1	<0.15	--	--	--	<0.15	--	<0.15	<0.15
1,2,4-Trichlorobenzene	µg/L	70	<5	<0.16	--	--	--	<0.16	--	<0.16	<0.16
1,3-Dichlorobenzene	µg/L	600	<1	<0.17	--	--	--	<0.17	--	<0.17	<0.17
1,3-Dichloropropane	µg/L	NS	<1	<0.16	--	--	--	<0.16	--	<0.16	<0.16
2,2-Dichloropropane	µg/L	NS	<4	<0.18	--	--	--	<0.18	--	<0.18	<0.18
Acrolein	µg/L	NS	<10	<1.5	--	--	--	<1.5	--	<1.5	<1.5
Allyl chloride	µg/L	NS	<2	<0.27	--	--	--	<0.27	--	<0.27	<0.27
Chloroprene	µg/L	NS	<1	<0.19	--	--	--	<0.19	--	<0.19	<0.19
Dichlorodifluoromethane	µg/L	1000	<3	<0.2	--	--	--	<0.2	--	<0.2	<0.2
Ethyl Methacrylate	µg/L	NS	<2	<0.15	--	--	--	<0.15	--	<0.15	<0.15
Methacrylonitrile	µg/L	NS	<1	<0.25	--	--	--	<0.25	--	<0.25	<0.25
Methyl Methacrylate	µg/L	NS	<2	<0.15	--	--	--	<0.15	--	<0.15	<0.15
Naphthalene	µg/L	100	<5	<0.37	--	--	--	<0.37	--	<0.37	<0.37
Propionitrile	µg/L	NS	<10	<2	--	--	--	<2	--	<2	<2

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-7A

Parameter Name	Units	GPS	DL	RL	Oct-07	Jan-08	Apr-08	Jul-08	Oct-08	Apr-09	Oct-09	Apr-10	Oct-10	Apr-11	Oct-11	Apr-12	Oct-12	Apr-13	Nov-13	May-14	Oct-14	May-15	Sep-15	Apr-16	Nov-16	May-17	Nov-17	Jun-18	Oct-18	Jun-19	Nov-19	Feb-20	Jun-20	Nov-20	Feb-21	May-21	Sep-21	Mar-22	Aug-22	Jun-23	Aug-23	Nov-23	Jun-24	Nov-24	Feb-25
Appendix I Inorganics																																													
Total Suspended Solids	mg/L	NS	0.581	1.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.41	<1.13	<1.2	***0.75 J***	***0.875 J***	***1.13 J***	***0.75 J***	***1.25 J***	***2.5***	<0.638	***2.63***	<0.638	***2.5***	***1 J***	***0.875 J***	<0.638	***1 J***	<0.638	***1.88***	<0.638	***5.13***	***3.13***	<1.39	<1.54	--
Turbidity, Field	NTU	NS	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***0.7996***	***0.6573***	***1.002***	***0.5112***	***0.6005***	***5.661***	***1.116***	***0.371***	***4.211***	***12.99***	***1.04***	0	***4.41***	***0.76***	***0.51***	***1.3***	***3.32***	0	***2.24***	***0.84***	***1.11***	***1.42***	***1.83***	***0.22***	***0.75***
Turbidity, Lab	NTU	NS	0.4	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.6	<0.7	***0.7 J***	<0.4	<0.4	***0.6 J***	<0.4	***0.5 J***	***1.5***	<0.4	***1.93***	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	1	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<2.73	***1.84 J***	<0.12	***0.435 J***	***0.0751 J***	***0.988 J***	***0.164 J***	<0.161	<0.161	<0.237	<0.237	<0.185	<0.185	<0.42	<0.42	<1.32	<0.53	--	<0.51	***1.67***	<1.1	<1.1	<1.1	<0.69	<0.69	<1	--	<1	<1	<1	--
Antimony, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<6	<6	<6	<6	<6	<2.73	<1.45	<0.12	***0.135 J***	<0.0541	***0.78 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	2	<1	***1.45***	***1.15***	<1	***2.23***	<1	<1	<2	<1	<1	<0.6	***0.876 J***	***0.81 J***	***0.97 J***	<0.544	<0.33	<0.945	<0.945	<0.945	<0.672	<0.672	<0.505	<0.505	<0.57	<0.57	***0.43 J***	<0.75	--	<0.88	<0.88	--	<0.75	<0.75	<0.75	<0.75	<0.53	--	<0.53	<0.53	<0.53	--
Arsenic, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<1	<1	<1	<1	<2	<0.47	<0.216	***1.17***	***1.26***	<0.544	<0.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	2	***191***	***202***	***301***	***185***	***381***	***195***	***220***	***181***	***263***	***197***	***319***	***307***	***316***	***155***	***326***	***149***	***184***	***152***	***240***	***165***	***315***	***150***	***172***	***166***	***171***	***160***	***185***	***174***	***139***	***160***	--	***166***	***156***	***143***	***71.9***	***323***	***366***	***451***	***190***	***425***	***196***
Barium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	***174***	***197***	***170***	***181***	***192***	***294***	***178***	***305***	***148***	***287***	***149***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	***0.159 J***	***0.782 J***	***0.06 J***	<0.0696	<0.0696	<0.08	<0.039	<0.039	<0.039	<0.221	<0.221	<0.125	<0.125	<0.19	<0.19	<0.53	<0.27	--	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27	<0.33	--	<0.33	<0.33	<0.33	--
Beryllium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<1	<1	<1	<1	<1	<0.051	<0.079	<0.0178	<0.0696	<0.0696	<0.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.044	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	***0.08 J***	<0.106	<0.106	<0.1	<0.112	<0.112	<0.112	<0.0351	<0.0351	<0.0441	<0.0441	<0.06	<0.06	<0.167	***0.061 J***	--	<0.049	***0.058 J***	--	<0.051	<0.051	<0.055	<0.055	<0.1	--	<0.1	<0.1	<0.1	--
Cadmium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	<0.064	<0.106	<0.106	<0.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	5	<20	<20	***64.5***	<20	<20	<20	<20	<20	<20	<20	***1.99 J***	***4.53 J***	***0.52 J***	***6.59***	***0.771 J***	***4.6***	***4.2 J***	***3.75 J***	<1.24	***4.02 J***	<0.355	***2.45 J***	***3.22 J***	***5.26***	***3.27 J***	<1.14	***2.95 J***	--	***2.12 J***	***2.39 J***	--	***3.29 J***	***3.38 J***	***3.01 J***	<1.1	<1.1	--	<1.1	***3.34 J***	<1.2	--
Chromium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	***8.35 J***	***2.13 J***	<0.39	***3.7 J***	***0.68 J***	***4.2***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.045	0.5	<20	<20	***21.4***	<20	<20	<20	<20	<20	<20	<20	***3.68 J***	***7.51 J***	***1.03***	***0.661***	***0.604***	***0.15 J***	<0.0528	<0.0528	***0.078 J***	<0.0274	***0.029 J***	<0.0453	<0.0453	***0.066 J***	<0.061	<0.402	<0.091	--	<0.091	<0.091	--	<0.091	<0.19	<0.19	***0.339 J***	<0.17	--	***0.257 J***	<0.17	<0.17	--
Cobalt, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<1.55	<1.55	***0.45 J***	***0.199 J***	***0.612***	<0.054	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	5	<20	<20	***50.7***	<20	<20	<20	<20	<20	<20	<20	***18.7 J***	***16.6 J***	***2.25***	***4.7***	***1.86***	***0.579 J***	<0.485	<0.485	<0.485	<1.22	<1.22	<2.19	<2.19	<1.6	<1.6	***1.02 J***	<2	--	<1.5	<1.5	--	<1.4	<1.4	<1.8	<1.8	<1.8	--	<1.8	<1.8	<1.8	--
Copper, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	***11.6 J***	<1.51	***1.84***	***1.49***	***2.32***	<0.56	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	0.5	<4	<4	***4.16***	<4	***9.46***	<4	<4	<4	***5.41***	<4	***4.72***	***8.96***	***0.84***	***1.52***	***0.211 J***	***0.224 J***	***0.113 J***	<0.0967	***0.8***	<0.211	<0.211	<0.324	<0.324	<0.25	<0.25	<0.186	<0.27	--	<0.11	<0.11	--	<0.21	<0.21	<0.24	<0.24	<0.24	--	<0.24	<0.26	<0.26	--
Lead, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<4	<4	<4	<4	<4	<1	<0.804	***1.97***	<0.207	<0.207	<0.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	5	<50	<50	***53.6***	<50	<50	<50	<50	<50	<50	<50	***9.7 J***	***9.51 J***	***7.27***	***3.35***	***6.39***	***0.459 J***	***0.586 J***	<0.581	***3.6 J***	<1.53	***6.7***	***1.11 J***	<0.929	***1.68 J***	<1	***2.07***	<1.7	--	<1.9	<1.9	--	<1.9	<1.9	<1.9	<1.9	***5.11***	--	***12.8***	<2.1	***8.81***	--
Nickel, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<50	<50	<50	<50	<50	***8.09 J***	***4.72 J***	***5.59***	***1.77***	***9.21***	***0.498 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.69	<0.7	<0.297	<1.46	<1.46	<0.7	<3.34	<3.34	<3.34	***0.821 J***	<0.63	<0.928	<0.928	<0.9	<0.9	<0.982	<1	--	<1	<1	--	<0.96	<0.96	<0.96	<0.96	<1.4	--	<1.4	<1.4	<1.4	--
Selenium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<5	<5	<5	<5	<5	<1.69	<0.7	<0.297	***1.64 J***	<1.46	<0.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.7	<1.7	<0.027	<0.0789	<0.0789	<0.033	<0.042	<0.042	<0.042	<0.153	<0.153	<0.14	<0.14	<0.3	<0.3	<0.115	<0.37	--	<0.37	<0.37	--	<0.42	<0.42	<0.49	<0.49	<0.5	--	<0.5	<0.5	<0.5	--
Silver, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<20	<20	<20	<20	<20	<1.7	<1.7	<0.027	<0.0789	<0.0789	<0.033	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.064	1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.84	<0.288	***0.01 J***	***0.084 J***	<0.0267	***0.151 J***	<0.0325	<0.0325	<0.0325	<0.0255	***0.05 J***	<0.0644	<0.0644	<0.17	<0.17	<0.57	<0.27	--	<0.26	<0.26	--	<0.26	<0.26	<0.26	<0.26	<0.26	--	<0.26	<0.57	<0.57	--
Thallium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<2	<2	<2	<2	<2	<0.84	<0.288	***0.03 J***	***0.0433 J***	<0.0267	<0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	5	<50	<50	***75.6***	<50	<50	<50	<50	<50	<50	<50	***2.14 J***	***11.5 J***	***1.44***	***1.63***	<0.833	***1.2 J***	***0.727 J***	***0.459 J***	***0.666 J***	***0.429 J***	***0.377 J***	<0.84	***0.917 J***	***0.603 J***	***0.673 J***	<2.15	<0.82	--	<0.85	<0.85	--	<1.1	<1.1	***1.21 J***	<1.1	<1.1	--	<1.1	<1.1	<1.1	--
Vanadium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	<50	<50	<50	<50	<50	<2.1	<2.1	<0.94	<0.833	<0.833	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	20	***45.8***	<20	***94.9***	<20	***67***	***35***	***41.8***	***25.9***	***38.6***	<20	***15.2 J***	***17.6 J***	***2.42 J***	***8.06***	<0.625	***3.26 J***	***7.01 J***	<6.95	***26.5***	<5.21	<5.21	<11.5	<11.5	<10	<10	***6.99 J***	***35.8***	<10	<10	<10	--	<10	<10	<10	<10	<6.4	--	<6.4	<9.7	<9.7	--
Zinc, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	***30.9***	***44.5***	***22.9***	***29.4***	<20	<9.11	***13.8 J***	***3.53 J***	***2.45 J***	<0.625	<2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																																													
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	1	<1	<1	<1	<1	<1	<1	<1	<10	<4	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	--	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	<0.38	--
1,1,1-Trichloroethane	µg/L	200	0.12	1	<1	<1	<1	<1	<1	<1	<1	<5	<5	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	<0.19	--
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.47	<0.47	<0.47	<0.47	--	<0.47	<0.47	--	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47	<0.47	<0.47	--
1,1,2-Trichloroethane	µg/L	5	0.12	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	--	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	<0.45	--
1,1-Dichloroethane	µg/L	140	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	--
1,1-Dichloroethylene	µg/L	7	0.15	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	--	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	<0.56	--
1,2,3-Trichloropropane	µg/L	0.006	0.19	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.59	<0.59	<0.59	<0.59	--	<0.59	<0.59	--	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59	<0.59	<0.59	--
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	5	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.2	<1.2	<1.2	<1.2	--	<1.2	<1.2	--	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2	<1.2	<1.2	--
1,2-Dibromoethane	µg/L	0.05	0.13	1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.34	<0.34	<0.34	<0.34	--	<0.34	<0.34	--	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34	<0.34	<0.34	--
1,2-Dichlorobenzene	µg/L	600	0.14	1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	--	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	<0.37	--
1,2-Dichloroethane	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	--	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	<0.39	--
1,2-Dichloropropane	µg/L	5	0.87	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27	--
1,4-Dichlorobenzene	µg/L	75	0.2	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	***0.236 J***	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.23	<0.23	<0.23	<0.23	--	<0.23	<0.23	--	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23	<0.23	<0.23	--
2-Butanone	µg/L	4000	1.04	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.47	***1.27 J***	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<1.04	<1.04	<1.04	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	--	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	<2.1	--
2-Hexanone	µg/L	NS	0.2	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<2	<2	<2	--	<2	<2	--	<2	<2	<2	<2	<2	--	<2	<2	<2	--
4-Methyl-2-pentanone	µg/L	560	0.22	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	--	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	<2.1	--
Acetone	µg/L	6300	1.79	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	***2.04 J***	<1.79	<1.79	***2.2 J***	<3.1	<3.1	<3.1	<3.1	--	<3.1	<3.1	--	<3.1	<3.1	<3.1	<3.1	<3.1	--	<3.1	<3.1	<3.1	--
Acrylonitrile	µg/L	0.32	0.53	5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<2.2	<2.2	<2.2	<2.2	--	<2.2	<2.2	--	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2	<2.2	<2.2	--
Benzene	µg/L	5	0.11	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	***0.242 J***	<0.22	<0.22	<0.22	--	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.22	--	***0.404 J***	<0.22	<0.22	--
Bromochloromethane	µg/L	90	0.12	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.54	<0.54	<0.54	<0.54	--	<0.54	<0.54	--	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54	<0.54	<0.54	--
Bromodichloromethane	µg/L	80	0.12	1	<1	<1	<1	<1	<1	<1	<1	<10	<5	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	--	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	<0.39	--
Bromomethane	µg/L	10	0.22	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	<1.1	--
Carbon disulfide	µg/L	700	0.15	1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<1	<0.15	<0.15	***0.15 J***	<0.15	<0.15	<0.15	***0.642 J***	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	--	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	<0.45	--
Carbon Tetrachloride	µg/L	5	0.24	2	<2	<2	<2	<2	<2	<2	<2	<5	<5	<2	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.65	<0.65	<0.65	<0.65	--	<0.65	<0.65	--	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65	<0.65	<0.65	--
Chlorobenzene	µg/L	100	0.19	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4	--	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4	<0.4	--
Chloroethane	µg/L	2800	0.15	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	***0.21 J***	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.79	<0.79	<0.79	<0.79	--	<0.79	<0.79	--	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79	<0.79	<0.79	--
Chloromethane	µg/L	NS	0.31	3	<3	<3	<3	<3	<3	<3	<3	<3	<10	<3	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.61	<0.61	<0.61	<0.61	--	<0.61	<0.61	--	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61	<0.61	<0.61	--
cis-1,2-Dichloroethylene	µg/L	70	0.13	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	--
cis-1,3-Dichloropropene	µg/L	NS	0.15	5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.25	<0.25	<0.25	<0.25	--	<0.25	<0.25	--	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25	<0.25	<0.25	--
Dibromochloromethane	µg/L	80	0.2	5	<5	<5	<5	<5	<5	<5	<5	<50	<5	<5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.75	<0.75	<0.75	<0.75	--	<0.75	<0.75	--	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75	<0.75	<0.75	--
Dibromomethane	µg/L	70	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.33	<0.33	<0.33	<0.33	--	<0.33	<0.33	--	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33	<0.33	<0.33	--
Dichloromethane	µg/L	5	0.17	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.17	<0.17	***0.25 J***	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	***0.348 J***	<0.17	<1.7	<1.7	<1.7	<1.7	--	<1.7	<1.7	--	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7	<1.7	<1.7	--
Ethylbenzene	µg/L	700	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.31	<0.31	<0.31	<0.31	--	<0.31	<0.31	--	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	<0.31	<0.31	--
Iodomethane	µg/L	NS	0.8	10	<10	<10	<10	<10	<10	<20	<10	<10	<10	<10	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<7	<7	<7	<7	--	<7	<7	--	<7	<7	<7	<7	<7	--	<7	<7	<7	--
Styrene	µg/L	100	0.1	1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	--	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	<0.37	--
Tetrachloroethylene	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.48	<0.48	<0.48	<0.48	--	<0.48	<0.48	--	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48	<0.48	<0.48	--
Toluene	µg/L	1000	0.15	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43	--	<0.43	<0.43	<0.43	<0.43	<0.43	--	***2***	<0.43	<0.43	--
Trans-1,2-dichloroethylene	µg/L	100	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27	--
trans-1,3-Dichloropropene	µg/L	NS	0.22	5	<5	<5	<5	<5	<5	<10	<5	<5	<20	<5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	--	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	<0.56	--
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	<1.1	--
Tribromomethane	µg/L	80	0.14	5	<5	<5	<5	<5	<5	<20	<5	<50	<5	<5	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.78	<0.78	<0.78	<0.78	--	<0.78	<0.78	--	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78	<0.78	<0.78	--
Trichloroethylene	µg/L	5	0.19	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43	--	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43	<0.43	--
Trichlorofluoromethane	µg/L	2000	0.17	4	<4	<4	<4	<4	<4	<4	<4	<5	<4	<4	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	--	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	<0.38	--
Trichloromethane	µg/L	80	0.28	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<1.3	<1.3	<1.3	<1.3	--	<1.3	<1.3	--	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3	<1.3	<1.3	--
Vinyl Acetate	µg/L	NS	0.74	10	<2	<2	<2	<2	<2	<4	<2	<2	<5	<2	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	--	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	<2.5	--
Vinyl Chloride	µg/L	2	0.1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.6	<0.6	<0.18	<0.18	--	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18	<0.18	--
Xylenes	µg/L	10000	0.13	3	<3	<3	<3	<3	<3	<3	<3	<3	<6	<3	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4	--	<0.4	<0.4	<0.4	<0.4	<0.4	--	***0.64 J***	<0.4	<0.4	--

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-5A-5AR

Parameter Name	Units	GPS	Jun-24
Alcohols/Gycols by GC			
Acetonitrile	µg/L	NS	<2600
Isobutanol	µg/L	2100	<2400
Herbicides (GC)			
2,4,5-T	µg/L	70	<0.0713
2,4-D	µg/L	70	<0.274
Silvex (2,4,5-TP)	µg/L	50	<0.0241
Inorganics			
Cyanide	µg/L	200	<3.5
Mercury	µg/L	2	<0.11
Sulfide	µg/L	NS	<1410
Tin	µg/L	4200	<2.3
PCBs (EPA Method 8082)			
PCB-1016	µg/L	NS	<0.745
PCB-1221	µg/L	NS	<0.745
PCB-1232	µg/L	NS	<0.745
PCB-1242	µg/L	NS	<0.745
PCB-1248	µg/L	NS	<0.627
PCB-1254	µg/L	NS	<0.627
PCB-1260	µg/L	NS	<0.627
Pesticides (EPA Method 8081A)			
4,4'-DDD	µg/L	0.73	<0.0227
4,4'-DDE	µg/L	0.51	<0.0273
4,4'-DDT	µg/L	0.51	<0.0182
Aldrin	µg/L	0.01	<0.02
alpha-BHC	µg/L	0.028	<0.00909
beta-BHC	µg/L	0.042	<0.0382
Chlordane	µg/L	2	<0.355
delta-BHC	µg/L	2.1	<0.0291
Dieldrin	µg/L	0.011	<0.0191
Endosulfan I	µg/L	42	<0.0255
Endosulfan II	µg/L	42	<0.0236
Endosulfan sulfate	µg/L	NS	<0.0164
Endrin	µg/L	2	<0.0255
Endrin aldehyde	µg/L	2.1	<0.0245
gamma-BHC (Lindane)	µg/L	0.2	<0.00909
Heptachlor	µg/L	0.4	<0.0209
Heptachlor epoxide	µg/L	0.2	<0.0291
Methoxychlor	µg/L	40	<0.0291
Toxaphene	µg/L	3	<0.909
Semivolatile Organics by GC/MS			
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<0.614
1,3,5-Trinitrobenzene	µg/L	NS	<2.61
1,3-Dinitrobenzene	µg/L	1	<3.64
1,4-Naphthoquinone	µg/L	NS	<4.09
1,4-Phenylenediamine	µg/L	NS	<2.16
1-Naphthylamine	µg/L	NS	<2.84
2,3,4,6-Tetrachlorophenol	µg/L	NS	<6.02
2,4,5-Trichlorophenol	µg/L	700	<6.02
2,4,6-Trichlorophenol	µg/L	16	<5.68
2,4-Dichlorophenol	µg/L	20	<0.966
2,4-Dimethylphenol	µg/L	100	<0.659
2,4-Dinitrophenol	µg/L	14	<14.8
2,4-Dinitrotoluene	µg/L	0.25	<7.27
2,6-Dichlorophenol	µg/L	NS	<0.784
2,6-Dinitrotoluene	µg/L	0.26	<0.591
2-Acetylaminofluorene	µg/L	NS	<3.07
2-Chloronaphthalene	µg/L	560	<0.727
2-Chlorophenol	µg/L	40	<0.614
2-Methylnaphthalene	µg/L	28	<0.67
2-Methylphenol (o-Cresol)	µg/L	35	<0.739
2-Naphthylamine	µg/L	0.097	<2.39
2-Nitroaniline	µg/L	NS	<6.7
2-Nitrophenol	µg/L	NS	<7.73
3,3'-Dichlorobenzidine	µg/L	0.39	<1.59
3,3'-Dimethylbenzidine	µg/L	NS	<1.7
3/4-Methylphenol	µg/L	70	<0.795
3-Methylcholanthrene	µg/L	NS	<0.364
3-Nitroaniline	µg/L	NS	<3.07
4,6-Dinitro-2-methylphenol	µg/L	NS	<7.84
4-Aminobiphenyl	µg/L	0.0083	<2.5
4-Bromophenyl phenyl ether	µg/L	NS	<0.795
4-Chloro-3-methylphenol	µg/L	700	<0.955
4-Chloroaniline	µg/L	28	<0.705
4-Chlorophenyl phenyl ether	µg/L	NS	<0.784
4-Nitroaniline	µg/L	NS	<1.48
4-Nitrophenol	µg/L	60	<8.64
5-Nitro-o-toluidine	µg/L	NS	<3.18
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<2.16
Acenaphthene	µg/L	420	<0.727
Acenaphthylene	µg/L	210	<0.818
Acetophenone	µg/L	NS	<0.784
Anthracene	µg/L	2100	<0.989
Benzo (a) anthracene	µg/L	0.24	<0.966
Benzo (a) pyrene	µg/L	0.2	<9.2
Benzo (b) fluoranthene	µg/L	0.24	<5.57
Benzo (g,h,i) perylene	µg/L	21	<7.16
Benzo (k) fluoranthene	µg/L	2.4	<2.5
Benzyl alcohol	µg/L	700	<1.48
Bis(2-chloroethoxy)methane	µg/L	NS	<0.864
Bis(2-chloroethyl)ether	µg/L	0.16	<0.932
Bis(2-chloroisopropyl) ether	µg/L	300	<0.614
Bis(2-ethylhexyl)phthalate	µg/L	6	<6.25
Butyl benzyl phthalate	µg/L	140	<6.14
Chlorobenzilate	µg/L	NS	<4.09
Chrysene	µg/L	24	<0.989
Diallate (cis or trans)	µg/L	NS	<4.55
Dibenzo (a,h) anthracene	µg/L	0.024	<4.43
Dibenzofuran	µg/L	7	<0.841
Diethyl phthalate	µg/L	5600	<1.93
Dimethoate	µg/L	1.4	<4.09
Dimethyl phthalate	µg/L	NS	<1.14
Di-n-butyl phthalate	µg/L	700	<6.36
Di-n-octyl phthalate	µg/L	140	<7.95
Dinoseb	µg/L	7	<2.73
Diphenylamine	µg/L	180	<6.82
Disulfoton	µg/L	0.7	<2.73
Ethyl Methanesulfonate	µg/L	NS	<4.09
Famphur	µg/L	NS	<4.32
Fluoranthene	µg/L	280	<1.93
Fluorene	µg/L	280	<0.898
Hexachlorobenzene	µg/L	1	<0.795
Hexachlorobutadiene	µg/L	1	<0.977
Hexachlorocyclopentadiene	µg/L	50	<5.8
Hexachloroethane	µg/L	1	<1.1
Hexachloropropene	µg/L	NS	<2.95
Indeno (1,2,3-cd) pyrene	µg/L	0.24	<4.77
Isodrin	µg/L	NS	<5.34
Isophorone	µg/L	100	<1.06
Isosafrole	µg/L	NS	<2.61
Kepone	µg/L	NS	<1.14
Methapyrilene	µg/L	NS	<0.864
Methyl Methanesulfonate	µg/L	1.8	<3.75
Nitrobenzene	µg/L	14	<0.909
N-Nitrosodiethylamine	µg/L	NS	<3.86
N-Nitrosodimethylamine	µg/L	0.0034	<0.818
N-Nitrosodi-n-butylamine	µg/L	0.032	<4.43
N-Nitrosodi-n-propylamine	µg/L	NS	<1.05
N-Nitrosodiphenylamine	µg/L	36	<0.852
N-Nitrosomethylethylamine	µg/L	0.008	<5.57
N-Nitrosopiperidine	µg/L	NS	<3.07
N-Nitrosopyrrolidine	µg/L	0.083	<4.09
O,O,O-Triethyl phosphorothioate	µg/L	NS	<3.64
o-Toluidine	µg/L	11	<3.3
p-(Dimethylamino)azobenzene	µg/L	NS	<2.5
Parathion-ethyl	µg/L	NS	<2.5
Parathion-methyl	µg/L	1	<2.61
Pentachlorobenzene	µg/L	NS	<3.18
Pentachloronitrobenzene	µg/L	NS	<6.59
Pentachlorophenol	µg/L	1	<10.9
Phenacetin	µg/L	NS	<2.16
Phenanthrene	µg/L	210	<0.898
Phenol	µg/L	2000	<1.25
Phorate	µg/L	1.4	<3.64
Pronamide	µg/L	5	<3.07
Pyrene	µg/L	210	<0.898
Safrole	µg/L	NS	<3.18
Thionazin	µg/L	NS	<3.98
Volatile Organic Compounds			
1,1-Dichloropropene	µg/L	NS	<0.43
1,2,4-Trichlorobenzene	µg/L	70	<0.75
1,3-Dichlorobenzene	µg/L	600	<0.3
1,3-Dichloropropane	µg/L	NS	<0.4
2,2-Dichloropropane	µg/L	NS	<0.69
Acrolein	µg/L	NS	<3.6
Allyl chloride	µg/L	NS	<0.7
Chloroprene	µg/L	NS	<0.23
Dichlorodifluoromethane	µg/L	1000	<0.25
Ethyl Methacrylate	µg/L	NS	<0.68
Methacrylonitrile	µg/L	NS	<3.3
Methyl Methacrylate	µg/L	NS	<0.76
Naphthalene	µg/L	100	<3
Propionitrile	µg/L	NS	<3.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-24A

Parameter Name	Units	GPS	DL	RL	Feb-11	Apr-11	Jun-11	Dec-11	Feb-12	Apr-12	Jun-12	Oct-12	Apr-13	Nov-13	May-14	Nov-14	May-15	Sep-15	Apr-16	Nov-16	May-17	Nov-17	Jun-18	Oct-18	Jun-19	Aug-19	Nov-19	Jun-20	Nov-20	May-21	Sep-21	Mar-22	Aug-22	Dec-22	Jun-23	Nov-23	Jun-24	Nov-24
Appendix I Inorganics																																						
Total Suspended Solids	mg/L	NS	0.581	1.88	--	--	--	--	--	--	--	--	--	--	--	<1.41	<1.2	Dry	<0.581	Dry	<0.581	Dry	<0.887	***1.63 J***	<0.638	<0.638	***1.88***	<0.638	***1.13 J***	***0.875 J***	Dry	Dry	<0.638	Dry	***1.13 J***	Dry	<1.39	<1.48
Turbidity, Field	NTU	NS	NS	NS	--	--	--	--	--	--	--	--	--	--	--	***2.467***	***0.027***	--	***0.0912***	--	***1.33***	--	***0.3474***	***1.339***	***5.01***	***15.61***	***0.45***	***1.06***	***0.03***	***2.31***	--	--	***0.49***	--	***1.7***	--	***4.69***	***1.34***
Turbidity, Lab	NTU	NS	0.4	1	--	--	--	--	--	--	--	--	--	--	--	<0.6	<0.7	--	<0.4	--	***0.4 J***	--	<0.4	***0.9 J***	***0.75 J***	***0.63 J***	***0.63 J***	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	1	<6	<6	<6	<2.73	***0.2 J***	***4.41 J***	<0.12	<0.12	***0.356 J***	***0.243 J***	***0.602 J***	<0.161	<0.161	--	<0.237	--	<0.185	--	<0.42	<0.42	<1.32	--	<0.53	<0.51	***1.99***	<1.1	--	--	<0.69	--	<1	--	<1	<1
Antimony, Dissolved	µg/L	NS	NS	NS	<6	<6	<6	<2.73	***0.12 J***	<1.45	<0.12	<0.12	***0.215 J***	***0.212 J***	<0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	2	<1	<2	<2	***0.679 J***	<0.73	<0.216	<0.73	<0.73	***1.67***	***0.836 J***	<0.33	<0.945	<0.945	--	<0.672	--	<0.505	--	<0.57	<0.57	***0.498 J***	--	<0.75	<0.88	<0.88	<0.75	--	--	<0.75	--	<0.53	--	<0.53	<0.53
Arsenic, Dissolved	µg/L	NS	NS	NS	<1	<3	<2	<0.47	***1.33***	<0.216	***1.09***	***0.87 J***	***1.69***	***0.759 J***	<0.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	2	***177***	***274***	***139***	***196***	***210***	***156***	***192***	***180***	***164***	***169***	***135***	***187***	***168***	--	***124***	--	***142***	--	***130***	***145***	***94.1***	--	***122***	***97.8***	***108***	***105***	--	--	***109***	--	***132***	--	***152***	***117***
Barium, Dissolved	µg/L	NS	NS	NS	***182***	***225***	***147***	***154***	***194***	***146***	***162***	***190***	***150***	***160***	***116***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	1	<1	<1	<1	<0.051	***0.09 J***	<0.079	***0.02 J***	***0.05 J***	<0.0696	<0.0696	<0.08	<0.039	<0.039	--	<0.221	--	<0.125	--	<0.19	<0.19	<0.53	--	<0.27	<0.27	<0.27	<0.27	--	--	<0.27	--	<0.33	--	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	NS	<1	<1	<1	<0.051	***0.04 J***	<0.079	<0.0178	<0.0178	<0.0696	<0.0696	<0.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.044	0.5	<0.5	<0.5	<0.5	***0.147 J***	***0.09 J***	<0.229	<0.064	<0.064	***0.224 J***	***0.371 J***	<0.1	***0.372 J***	***0.188 J***	--	***0.084 J***	--	<0.0441	--	***0.077 J***	***0.144 J***	<0.167	--	***0.128***	***0.053 J***	***0.333***	<0.051	--	--	***0.08 J***	--	<0.1	--	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	NS	<0.5	<0.5	<0.5	<0.124	***0.16 J***	<0.229	<0.064	***0.12 J***	***0.211 J***	***0.295 J***	***0.285 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	5	<20	<20	<20	***3.15 J***	<0.39	***2.69 J***	<0.39	***2.08 J***	***1.3 J***	***0.824 J***	***1.17 J***	<1.24	<1.24	--	***1.42 J***	--	***1.91 J***	--	***1.35 J***	***1.08 J***	<1.14	--	***1.24 J***	<1.1	<1.1	<1.1	--	--	<1.1	--	***1.18 J***	--	<1.2	***1.91 J***
Chromium, Dissolved	µg/L	NS	NS	NS	<20	<20	<20	<1.81	<0.39	***1.86 J***	***0.89 J***	***1.98 J***	<0.418	***0.465 J***	***1.07 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.045	0.5	<20	<20	<20	***1.79 J***	***3.6***	<1.55	***1.07***	***1.03***	***5.56***	***3***	***1.12***	***0.549***	***0.351 J***	--	***0.306 J***	--	<0.0453	--	***0.339 J***	***0.44 J***	<0.402	--	***0.383 J***	***0.32 J***	***0.57***	***0.363 J***	--	--	***0.361 J***	--	***0.411 J***	--	***0.407 J***	***0.204 J***
Cobalt, Dissolved	µg/L	NS	NS	NS	<20	<20	<20	<1.55	***2.7***	<1.55	***0.48 J***	***0.31 J***	***4.33***	***1.74***	***0.427 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	5	<20	***26.6***	<20	***13.7 J***	***5.19***	***2.55 J***	***1.45***	***2.88***	***3.34***	***4.18***	***2.74***	***1.25 J***	***1.25 J***	--	***2.27 J***	--	<2.19	--	***5.26***	***1.68 J***	***2.12***	--	<2	***1.79 J***	***1.8 J***	***1.78 J***	--	--	<1.8	--	***2.82 J***	--	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	NS	<20	***24.4***	<20	***10.1 J***	***5.33***	<1.51	***1.65***	***2.26***	***1.67***	***2.93***	***2.1***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	0.5	<4	***4.17***	<4	***2.19 J***	***2.7***	***2.21 J***	***0.63 J***	***0.73***	***0.631***	***0.671***	***0.552 J***	<0.0967	***0.103 J***	--	<0.211	--	<0.324	--	<0.25	<0.25	<0.186	--	<0.27	<0.11	***0.295 J***	<0.21	--	--	<0.24	--	<0.24	--	<0.26	<0.26
Lead, Dissolved	µg/L	NS	NS	NS	<4	<4	<4	<1	***1.36***	<0.804	***0.09***	***0.99***	<0.207	<0.207	***0.219 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	5	<50	<50	<50	***6.15 J***	***12.6***	***6.6 J***	***5.89***	***6.7***	***16.5***	***27.8***	***15.7***	***17.5***	***14.6***	--	***8.78***	--	***8.8***	--	***9.67***	***10.6***	***8.67***	***6.78***	***7.39***	***5.83***	***5.28***	***5.49***	--	--	***6.42***	--	***7.85***	--	***8.53***	***2.95 J***
Nickel, Dissolved	µg/L	NS	NS	NS	<50	<50	<50	***3.89 J***	***13.9***	***6.78 J***	***6.47***	***5.26***	***14.7***	***26.1***	***11.8***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	5	<5	<5	<5	<1.69	<0.297	<0.7	<0.297	<0.297	<1.46	<1.46	<0.7	<3.34	<3.34	--	***0.653 J***	--	<0.928	--	***1.17 J***	<0.9	<0.982	--	***1.03 J***	<1	***1.39 J***	<0.96	--	--	<0.96	--	<1.4	--	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	NS	<5	<5	<5	<1.69	<0.297	<0.7	<0.297	<0.297	<1.46	<1.46	<0.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	1	<20	<20	<20	<1.7	<0.027	<1.7	<0.027	<0.027	<0.0789	<0.0789	<0.033	<0.042	<0.042	--	<0.153	--	<0.14	--	***0.34 J***	<0.3	<0.115	--	<0.37	<0.37	<0.37	<0.42	--	--	<0.49	--	<0.5	--	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	NS	<20	<20	<20	<1.7	<0.027	<1.7	<0.027	<0.027	<0.0789	<0.0789	<0.033	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.064	1	<2	<2	<2	<0.84	<0.0087	<0.288	<0.0087	<0.0087	***0.0402 J***	<0.0267	<0.05	<0.0325	<0.0325	--	<0.0255	--	<0.0644	--	<0.17	<0.17	<0.57	--	<0.27	<0.26	***0.352 J***	<0.26	--	--	<0.26	--	<0.26	--	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	NS	<2	<2	<2	<0.84	***0.01 J***	<0.288	<0.0087	***0.01 J***	<0.0267	<0.0267	<0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	5	<50	<50	<50	<2.1	***3.09***	***2.9 J***	***1.3***	***1.34***	***1.52***	***1.18***	***1.58 J***	***0.923 J***	***0.759 J***	--	***0.674 J***	--	<0.84	--	***0.848 J***	***1.3 J***	<2.15	--	<0.82	<0.85	***1.23 J***	<1.1	--	--	<1.1	--	<1.1	--	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	NS	<50	<50	<50	<2.1	***3.35***	***2.45 J***	***1.4***	<0.94	<0.833	<0.833	***0.974 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	20	***43.5***	***28.1***	<20	<9.11	***22.9***	***15.3 J***	***1.84 J***	***7.62***	<0.625	***7.48***	<2	***7.53 J***	<6.95	--	<5.21	--	<11.5	--	<10	<10	<6.92	--	***65.4***	<10	<10	<10	--	--	<10	--	<6.4	--	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	NS	***47.4***	<20	<20	***25.2***	***13.4***	<9.11	<0.92	***7.3***	***1.24 J***	***5.86***	***3.2 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																																						
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	1	<2	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	--	<0.21	--	<0.38	<0.38	<0.38	--	<0.38	<0.38	<0.38	<0.38	--	--	<0.38	--	<0.38	--	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	--	<0.12	--	<0.19	<0.19	<0.19	--	<0.19	<0.19	<0.19	<0.19	--	--	<0.19	--	<0.19	--	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	--	<0.1	--	<0.47	<0.47	<0.47	--	<0.47	<0.47	<0.47	<0.47	--	--	<0.47	--	<0.47	--	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	--	<0.12	--	<0.45	<0.45	<0.45	--	<0.45	<0.45	<0.45	<0.45	--	--	<0.45	--	<0.45	--	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	--	<0.21	--	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	--	--	<0.22	--	<0.22	--	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	2	<2	<2	<2	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	--	<0.15	--	<0.56	<0.56	<0.56	--	<0.56	<0.56	<0.56	<0.56	--	--	<0.56	--	<0.56	--	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.006	0.19	1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	--	<0.19	--	<0.59	<0.59	<0.59	--	<0.59	<0.59	<0.59	<0.59	--	--	<0.59	--	<0.59	--	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	5	<10	<10	<10	<0.12	***0.12 J***	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.5	--	<0.5	--	<0.5	--	<1.2	<1.2	<1.2	--	<1.2	<1.2	<1.2	<1.2	--	--	<1.2	--	<1.2	--	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	1	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.13	--	<0.34	<0.34	<0.34	--	<0.34	<0.34	<0.34	<0.34	--	--	<0.34	--	<0.34	--	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	1	<1	<1	<1	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	<0.14	--	<0.14	--	<0.37	<0.37	<0.37	--	<0.37	<0.37	<0.37	<0.37	--	--	<0.37	--	<0.37	--	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	--	<0.18	--	<0.39	<0.39	<0.39	--	<0.39	<0.39	<0.39	<0.39	--	--	<0.39	--	<0.39	--	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	1	<1	<1	<1	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	--	<0.87	--	<0.87	--	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27	--	--	<0.27	--	<0.27	--	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	1	<1	<1	<1	<0.2	<0.2	<0.2	<0.2	<0.2	***0.246 J***	<0.2	<0.2	<0.2	<0.2	--	<0.2	--	<0.2	--	<0.23	<0.23	<0.23	--	<0.23	<0.23	<0.23	<0.23	--	--	<0.23	--	<0.23	--	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	10	<10	<10	<10	***1.29 J***	<0.47	***2.96 J***	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47	--	<1.04	--	<2.1	<2.1	<2.1	--	<2.1	<2.1	<2.1	<2.1	--	--	<2.1	--	<2.1	--	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	10	<10	<10	<10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2	--	<0.2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	<2	--	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	10	<10	<10	<10	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	--	<0.22	--	<2.1	<2.1	<2.1	--	<2.1	<2.1	<2.1	<2.1	--	--	<2.1	--	<2.1	--	<2.1	<2.1
Acetone	µg/L	6300	1.79	10	<10	<10	<10	<1.79	***1.89 J***	***3.97 J***	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	--	***1.94 J***	--	<1.79	--	<3.1	<3.1	***3.49 J***	--	<3.1	<3.1	<3.1	<3.1	--	--	<3.1	--	<3.1	--	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	5	<10	<10	<10	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	--	<0.53	--	<0.53	--	<2.2	<2.2	<2.2	--	<2.2	<2.2	<2.2	<2.2	--	--	<2.2	--	<2.2	--	<2.2	<2.2
Benzene	µg/L	5	0.11	0.5	<0.5	<0.5	<0.5	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	--	<0.11	--	<0.11	--	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	--	--	<0.22	--	<0.22	--	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	5	<5	<5	<5	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	--	<0.12	--	<0.54	<0.54	<0.54	--	<0.54	<0.54	<0.54	<0.54	--	--	<0.54	--	<0.54	--	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	--	<0.12	--	<0.39	<0.39	<0.39	--	<0.39	<0.39	<0.39	<0.39	--	--	<0.39	--	<0.39	--	<0.39	<0.39
Bromomethane	µg/L	10	0.22	4	<4	<4	<20	<0.22	***0.3 J***	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	--	<0.22	--	<1.1	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1	--	--	<1.1	--	<1.1	--	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	1	<1	<1	<1	<0.15	<0.15	<0.15	<0.15	***0.16 J***	<0.24	<0.15	<0.15	***0.451 J***	<0.15	--	<0.15	--	<0.15	--	<0.45	<0.45	<0.45	--	<0.45	<0.45	<0.45	<0.45	--	--	<0.45	--	<0.45	--	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	2	<2	<2	<2	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	--	<0.24	--	<0.24	--	<0.65	<0.65	<0.65	--	<0.65	<0.65	<0.65	<0.65	--	--	<0.65	--	<0.65	--	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	--	<0.19	--	<0.4	<0.4	<0.4	--	<0.4	<0.4	<0.4	<0.4	--	--	<0.4	--	<0.4	--	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	4	<4	<4	<4	***0.45 J***	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	--	<0.15	--	<0.79	<0.79	<0.79	--	<0.79	<0.79	<0.79	<0.79	--	--	<0.79	--	<0.79	--	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	3	<3	<3	<3	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	--	<0.31	--	<0.61	<0.61	<0.61	--	<0.61	<0.61	<0.61	<0.61	--	--	<0.61	--	<0.61	--	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	1	<1	<1	<1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.13	--	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	--	--	<0.21	--	<0.21	--	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	5	<5	<5	<5	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	--	<0.15	--	<0.25	<0.25	<0.25	--	<0.25	<0.25	<0.25	<0.25	--	--	<0.25	--	<0.25	--	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	5	<5	<5	<5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2	--	<0.2	--	<0.75	<0.75	<0.75	--	<0.75	<0.75	<0.75	<0.75	--	--	<0.75	--	<0.75	--	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	--	<0.18	--	<0.33	<0.33	<0.33	--	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	--	<0.33	--	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	5	<5	<5	<5	<0.17	***0.63 J***	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	--	<0.17	--	<0.17	--	<1.7	<1.7	<1.7	--	<1.7	<1.7	<1.7	<1.7	--	--	<1.7	--	<1.7	--	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	--	<0.21	--	<0.31	<0.31	<0.31	--	<0.31	<0.31	<0.31	<0.31	--	--	<0.31	--	<0.31	--	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	10	<20	<10	<10	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	--	<0.8	--	<0.8	--	<7	<7	<7	--	<7	<7	<7	<7	--	--	<7	--	<7	--	<7	<7
Styrene	µg/L	100	0.1	1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	--	<0.1	--	<0.37	<0.37	<0.37	--	<0.37	<0.37	<0.37	<0.37	--	--	<0.37	--	<0.37	--	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	--	<0.18	--	<0.48	<0.48	<0.48	--	<0.48	<0.48	<0.48	<0.48	--	--	<0.48	--	<0.48	--	<0.48	<0.48
Toluene	µg/L	1000	0.15	1	<1	<1	<1	<0.15	<0.15	<0.15	<0.15	<0.15	***0.184 J***	<0.15	<0.15	<0.15	<0.15	--	<0.15	--	<0.15	--	<0.43	<0.43	<0.43	--	<0.43	<0.43	<0.43	<0.43	--	--	<0.43	--	<0.43	--	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	--	<0.21	--	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27	--	--	<0.27	--	<0.27	--	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	5	<5	<5	<5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	--	<0.22	--	<0.56	<0.56	<0.56	--	<0.56	<0.56	<0.56	<0.56	--	--	<0.56	--	<0.56	--	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.13	--	<1.1	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1	--	--	<1.1	--	<1.1	--	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	5	<5	<5	<5	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	<0.14	--	<0.14	--	<0.78	<0.78	<0.78	--	<0.78	<0.78	<0.78	<0.78	--	--	<0.78	--	<0.78	--	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	--	<0.19	--	<0.43	<0.43	<0.43	--	<0.43	<0.43	<0.43	<0.43	--	--	<0.43	--	<0.43	--	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	4	<4	<4	<4	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	--	<0.17	--	<0.17	--	<0.38	<0.38	<0.38	--	<0.38	<0.38	<0.38	<0.38	--	--	<0.38	--	<0.38	--	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	1	<1	<1	<1	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	--	<0.28	--	<0.28	--	<1.3	<1.3	<1.3	--	<1.3	<1.3	<1.3	<1.3	--	--	<1.3	--	<1.3	--	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	10	<2	<2	<2	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	--	<0.74	--	<0.74	--	<2.5	<2.5	<2.5	--	<2.5	<2.5	<2.5	<2.5	--	--	<2.5	--	<2.5	--	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	--	<0.1	--	<0.6	<0.6	<0.18	--	<0.18	<0.18	<0.18	<0.18	--	--	<0.18	--	<0.18	--	<0.18	<0.18
Xylenes	µg/L	10000	0.13	3	<3	<3	<3	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.13	--	<0.4	<0.4	<0.4	--	<0.4	<0.4	<0.4	<0.4	--	--	<0.4	--	<0.4	--	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-24A

Parameter Name	Units	GPS	Jun-20	Jun-24
Alcohols/Gycols by GC				
Acetonitrile	µg/L	NS	<404	<2600
Isobutanol	µg/L	2100	<553	<2400
Herbicides (GC)				
2,4,5-T	µg/L	70	<0.525	<0.0759
2,4-D	µg/L	70	<0.563	<0.292
Silvex (2,4,5-TP)	µg/L	50	<0.35	<0.0257
Inorganics				
Cyanide	µg/L	200	<5	<3.5
Mercury	µg/L	2	<0.1	<0.11
Sulfide	µg/L	NS	<10000	<1410
Tin	µg/L	4200	<2.4	<2.3
PCBs (EPA Method 8082)				
PCB-1016	µg/L	NS	<0.274	<0.74
PCB-1221	µg/L	NS	<0.274	<0.74
PCB-1232	µg/L	NS	<0.274	<0.74
PCB-1242	µg/L	NS	<0.274	<0.74
PCB-1248	µg/L	NS	<0.221	<0.622
PCB-1254	µg/L	NS	<0.221	<0.622
PCB-1260	µg/L	NS	<0.221	<0.622
Pesticides (EPA Method 8081A)				
4,4'-DDD	µg/L	0.73	***0.00195 J***	<0.0226
4,4'-DDE	µg/L	0.51	<0.00221	<0.0271
4,4'-DDT	µg/L	0.51	<0.004	<0.018
Aldrin	µg/L	0.01	<0.00474	<0.0198
alpha-BHC	µg/L	0.028	***0.00189 J***	<0.00902
beta-BHC	µg/L	0.042	<0.00505	<0.0379
Chlordane	µg/L	2	<0.0674	<0.352
delta-BHC	µg/L	2.1	<0.00242	<0.0289
Dieldrin	µg/L	0.011	<0.00211	<0.0189
Endosulfan I	µg/L	42	<0.00211	<0.0253
Endosulfan II	µg/L	42	***0.0043 J***	<0.0235
Endosulfan sulfate	µg/L	NS	<0.00263	<0.0162
Endrin	µg/L	2	<0.002	<0.0253
Endrin aldehyde	µg/L	2.1	<0.00768	<0.0244
gamma-BHC (Lindane)	µg/L	0.2	<0.002	<0.00902
Heptachlor	µg/L	0.4	<0.00274	<0.0207
Heptachlor epoxide	µg/L	0.2	<0.00642	<0.0289
Methoxychlor	µg/L	40	<0.00221	<0.0289
Toxaphene	µg/L	3	<0.0611	<0.902
Semivolatile Organics by GC/MS				
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<1.84	<0.563
1,3,5-Trinitrobenzene	µg/L	NS	<1.49	<2.4
1,3-Dinitrobenzene	µg/L	1	<1.15	<3.33
1,4-Naphthoquinone	µg/L	NS	<1.13	<3.75
1,4-Phenylenediamine	µg/L	NS	<0.575	<1.98
1-Naphthylamine	µg/L	NS	<1.01	<2.6
2,3,4,6-Tetrachlorophenol	µg/L	NS	<1.14	<5.52
2,4,5-Trichlorophenol	µg/L	700	<1.26	<5.52
2,4,6-Trichlorophenol	µg/L	16	<1.38	<5.21
2,4-Dichlorophenol	µg/L	20	<1.26	<0.885
2,4-Dimethylphenol	µg/L	100	<1.15	<0.604
2,4-Dinitrophenol	µg/L	14	<6.55	<13.5
2,4-Dinitrotoluene	µg/L	0.25	<1.26	<6.67
2,6-Dichlorophenol	µg/L	NS	<1.26	<0.719
2,6-Dinitrotoluene	µg/L	0.26	<1.26	<0.542
2-Acetylaminofluorene	µg/L	NS	<1.38	<2.81
2-Chloronaphthalene	µg/L	560	<1.49	<0.667
2-Chlorophenol	µg/L	40	<1.26	<0.563
2-Methylnaphthalene	µg/L	28	<1.49	<0.615
2-Methylphenol (o-Cresol)	µg/L	35	<1.15	<0.677
2-Naphthylamine	µg/L	0.097	<0.989	<2.19
2-Nitroaniline	µg/L	NS	<1.38	<6.15
2-Nitrophenol	µg/L	NS	<1.84	<7.08
3,3'-Dichlorobenzidine	µg/L	0.39	<2.07	<1.46
3,3'-Dimethylbenzidine	µg/L	NS	<2.3	<1.56
3/4-Methylphenol	µg/L	70	<0.874	<0.729
3-Methylcholanthrene	µg/L	NS	<2.87	<0.333
3-Nitroaniline	µg/L	NS	<1.15	<2.81
4,6-Dinitro-2-methylphenol	µg/L	NS	<2.87	<7.19
4-Aminobiphenyl	µg/L	0.0083	<1.1	<2.29
4-Bromophenyl phenyl ether	µg/L	NS	<2.18	<0.729
4-Chloro-3-methylphenol	µg/L	700	<1.09	<0.875
4-Chloroaniline	µg/L	28	<1.38	<0.646
4-Chlorophenyl phenyl ether	µg/L	NS	<1.49	<0.719
4-Nitroaniline	µg/L	NS	<1.95	<1.35
4-Nitrophenol	µg/L	60	<2.87	<7.92
5-Nitro-o-toluidine	µg/L	NS	<3.56	<2.92
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<1.06	<1.98
Acenaphthene	µg/L	420	<1.49	<0.667
Acenaphthylene	µg/L	210	<1.49	<0.75
Acetophenone	µg/L	NS	<3.45	<0.719
Anthracene	µg/L	2100	<1.26	<0.906
Benzo (a) anthracene	µg/L	0.24	<1.26	<0.885
Benzo (a) pyrene	µg/L	0.2	<1.72	<8.44
Benzo (b) fluoranthene	µg/L	0.24	<1.38	<5.1
Benzo (g,h,i) perylene	µg/L	21	<1.84	<6.56
Benzo (k) fluoranthene	µg/L	2.4	<1.38	<2.29
Benzyl alcohol	µg/L	700	<1.26	<1.35
Bis(2-chloroethoxy)methane	µg/L	NS	<1.26	<0.792
Bis(2-chloroethyl)ether	µg/L	0.16	<1.26	<0.854
Bis(2-chloroisopropyl) ether	µg/L	300	<1.38	<0.563
Bis(2-ethylhexyl)phthalate	µg/L	6	<2.99	<5.73
Butyl benzyl phthalate	µg/L	140	<1.72	<5.63
Chlorobenzilate	µg/L	NS	<3.33	<3.75
Chrysene	µg/L	24	<1.26	<0.906
Diallate (cis or trans)	µg/L	NS	<1.49	<4.17
Dibenzo (a,h) anthracene	µg/L	0.024	<2.18	<4.06
Dibenzofuran	µg/L	7	<1.38	<0.771
Diethyl phthalate	µg/L	5600	<1.26	<1.77
Dimethoate	µg/L	1.4	<1.15	<3.75
Dimethyl phthalate	µg/L	NS	<2.87	<1.04
Di-n-butyl phthalate	µg/L	700	<1.38	<5.83
Di-n-octyl phthalate	µg/L	140	<3.45	<7.29
Dinoseb	µg/L	7	<0.575	<2.5
Diphenylamine	µg/L	180	<1.01	<6.25
Disulfoton	µg/L	0.7	<0.736	<2.5
Ethyl Methanesulfonate	µg/L	NS	<0.575	<3.75
Famphur	µg/L	NS	<0.736	<3.96
Fluoranthene	µg/L	280	<1.08	<1.77
Fluorene	µg/L	280	<1.49	<0.823
Hexachlorobenzene	µg/L	1	<1.61	<0.729
Hexachlorobutadiene	µg/L	1	<1.38	<0.896
Hexachlorocyclopentadiene	µg/L	50	<2.41	<5.31
Hexachloroethane	µg/L	1	<1.49	<1.01
Hexachloropropene	µg/L	NS	<1.84	<2.71
Indeno (1,2,3-cd) pyrene	µg/L	0.24	<2.3	<4.38
Isodrin	µg/L	NS	<0.667	<4.9
Isophorone	µg/L	100	<1.14	<0.969
Isosafrole	µg/L	NS	<0.575	<2.4
Kepone	µg/L	NS	<2.07	<1.04
Methapyrilene	µg/L	NS	<2.18	<0.792
Methyl Methanesulfonate	µg/L	1.8	<0.575	<3.44
Nitrobenzene	µg/L	14	<1.26	<0.833
N-Nitrosodiethylamine	µg/L	NS	<0.575	<3.54
N-Nitrosodimethylamine	µg/L	0.0034	<1.05	<0.75
N-Nitrosodi-n-butylamine	µg/L	0.032	<0.575	<4.06
N-Nitrosodi-n-propylamine	µg/L	NS	<1.15	<0.958
N-Nitrosodiphenylamine	µg/L	36	<1.09	<0.781
N-Nitrosomethylethylamine	µg/L	0.008	<1.49	<5.1
N-Nitrosopiperidine	µg/L	NS	<0.575	<2.81
N-Nitrosopyrrolidine	µg/L	0.083	<0.575	<3.75
O,O,O-Triethyl phosphorothioate	µg/L	NS	<0.575	<3.33
o-Toluidine	µg/L	11	<0.77	<3.02
p-(Dimethylamino)azobenzene	µg/L	NS	<0.897	<2.29
Parathion-ethyl	µg/L	NS	<1.84	<2.29
Parathion-methyl	µg/L	1	<0.862	<2.4
Pentachlorobenzene	µg/L	NS	<0.667	<2.92
Pentachloronitrobenzene	µg/L	NS	<0.575	<6.04
Pentachlorophenol	µg/L	1	<2.64	<10
Phenacetin	µg/L	NS	<2.07	<1.98
Phenanthrene	µg/L	210	<1.26	<0.823
Phenol	µg/L	2000	<2.76	<1.15
Phorate	µg/L	1.4	<0.575	<3.33
Pronamide	µg/L	5	<0.575	<2.81
Pyrene	µg/L	210	<1.61	<0.823
Safrole	µg/L	NS	<0.575	<2.92
Thionazin	µg/L	NS	<0.874	<3.65
Volatile Organic Compounds				
1,1-Dichloropropene	µg/L	NS	<0.43	<0.43
1,2,4-Trichlorobenzene	µg/L	70	<0.75	<0.75
1,3-Dichlorobenzene	µg/L	600	<0.3	<0.3
1,3-Dichloropropane	µg/L	NS	<0.4	<0.4
2,2-Dichloropropane	µg/L	NS	<0.69	<0.69
Acrolein	µg/L	NS	<3.6	<3.6
Allyl chloride	µg/L	NS	<0.7	<0.7
Chloroprene	µg/L	NS	<0.23	<0.23
Dichlorodifluoromethane	µg/L	1000	<0.25	<0.25
Ethyl Methacrylate	µg/L	NS	<0.68	<0.68
Methacrylonitrile	µg/L	NS	<3.3	<3.3
Methyl Methacrylate	µg/L	NS	<0.76	<0.76
Naphthalene	µg/L	100	<3	<3
Propionitrile	µg/L	NS	<3.4	<3.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-25A

Parameter Name	Units	GPS	DL	RL	Dec-10	Feb-11	Apr-11	Jun-11	Aug-11	Oct-11	Dec-11	Apr-12	Oct-12	Apr-13	Nov-13	May-14	Nov-14	May-15	Sep-15	Apr-16
Appendix I Inorganics																				
Total Suspended Solids	mg/L	NS	0.581	1.88	--	--	--	--	--	--	--	--	--	--	--	--	<1.41	<1.2	Dry	<0.581
Turbidity, Field	NTU	NS	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	***0.3307***	***2.571***	--	***0.1175***
Turbidity, Lab	NTU	NS	0.4	1	--	--	--	--	--	--	--	--	--	--	--	--	<0.6	<0.7	--	***0.6 J***
Antimony	µg/L	6	0.185	1	<6	<12	<6	<6	<6	<2.73	<2.73	***3.9 J***	***0.39 J***	***0.374 J***	***0.0911 J***	***0.415 J***	<0.161	<0.161	--	<0.237
Antimony, Dissolved	µg/L	NS	NS	NS	<6	<6	<6	<6	<6	<2.73	<2.73	<1.45	<0.12	***0.188 J***	***0.0703 J***	<0.4	--	--	--	--
Arsenic	µg/L	10	0.505	2	<1	<1	<2	<2	<2	<0.6	<0.6	***0.877 J***	***0.98 J***	***1.17***	***0.662 J***	<0.33	<0.945	<0.945	--	<0.672
Arsenic, Dissolved	µg/L	NS	NS	NS	<1	<1	<3	<2	<2	<0.47	<0.47	<0.216	<0.73	***0.935 J***	<0.544	<0.33	--	--	--	--
Barium	µg/L	2000	1.04	2	***250***	***181***	***235***	***206***	***208***	***217***	***218***	***246***	***246***	***149***	***218***	***126***	***212***	***160***	--	***150***
Barium, Dissolved	µg/L	NS	NS	NS	***215***	***185***	***211***	***193***	***195***	***213***	***206***	***206***	***209***	***127***	***196***	***123***	--	--	--	--
Beryllium	µg/L	4	0.125	1	<1	<1	<1	<1	<1	***0.054 J***	<0.051	***0.29 J***	***0.13 J***	<0.0696	<0.0696	<0.08	<0.039	<0.039	--	<0.221
Beryllium, Dissolved	µg/L	NS	NS	NS	<1	<1	<1	<1	<1	<0.051	<0.051	<0.079	<0.0178	<0.0696	<0.0696	<0.08	--	--	--	--
Cadmium	µg/L	5	0.0441	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	***0.13 J***	<0.229	***0.35 J***	***0.175 J***	***0.189 J***	<0.1	<0.112	<0.112	--	<0.0351
Cadmium, Dissolved	µg/L	NS	NS	NS	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.124	<0.229	<0.064	<0.106	***0.133 J***	<0.1	--	--	--	--
Chromium	µg/L	100	0.729	5	<20	<20	<20	<20	<20	<1.81	***3.88 J***	***2.6 J***	***1.68 J***	***2.06 J***	***0.99 J***	***1.38 J***	<1.24	<1.24	--	***1.82 J***
Chromium, Dissolved	µg/L	NS	NS	NS	<20	<20	<20	<20	<20	<1.81	***2.27 J***	<1.81	***0.46 J***	***0.944 J***	***0.465 J***	***0.894 J***	--	--	--	--
Cobalt	µg/L	3.4	0.0453	0.5	<20	<20	<20	<20	<20	<1.55	***3.36 J***	***6.49 J***	***3.15***	***1.38***	***1.02***	<0.054	<0.0528	***0.073 J***	--	***0.094 J***
Cobalt, Dissolved	µg/L	NS	NS	NS	<20	<20	<20	<20	<20	<1.55	***1.9 J***	<1.55	***0.29 J***	***0.339 J***	***0.486 J***	***0.142 J***	--	--	--	--
Copper	µg/L	1300	2.19	5	<20	<20	***24.9***	<20	***20.4***	***13.4 J***	***15 J***	***6.56 J***	***5.85***	***5.52***	***1.9***	***1.66 J***	<0.485	<0.485	--	<1.22
Copper, Dissolved	µg/L	NS	NS	NS	<20	<20	***22.4***	<20	<20	***13.7 J***	***13.9 J***	<1.51	***1.49***	***2***	***1.94***	***1.05 J***	--	--	--	--
Lead	µg/L	15	0.324	0.5	***4***	<4	<4	<4	<4	<1	***1.61 J***	***4.18***	***2.69***	***0.377 J***	<0.207	***0.395 J***	<0.0967	***0.252 J***	--	<0.211
Lead, Dissolved	µg/L	NS	NS	NS	<4	<4	<4	<4	<4	<1	<1	<0.804	<0.029	<0.207	<0.207	<0.18	--	--	--	--
Nickel	µg/L	100	0.929	5	<50	<50	<50	<50	<50	***3.21 J***	***7.37 J***	***8.7 J***	***13.1***	***7.1***	***4.86***	***1.8 J***	***1.4 J***	***0.972 J***	--	<1.53
Nickel, Dissolved	µg/L	NS	NS	NS	<50	<50	<50	<50	<50	***5.73 J***	***7.13 J***	***6.19 J***	***2.91***	***3.47***	***4.64***	***2.75***	--	--	--	--
Selenium	µg/L	50	0.928	5	<5	<5	<5	<5	<5	<1.69	<1.69	<0.7	<0.297	***2.96 J***	<1.46	***1.36 J***	<3.34	<3.34	--	***1.97 J***
Selenium, Dissolved	µg/L	NS	NS	NS	<5	<5	<5	<5	<5	<1.69	<1.69	<0.7	<0.297	***1.64 J***	<1.46	***1.46 J***	--	--	--	--
Silver	µg/L	100	0.14	1	<20	<20	<20	<20	<20	<1.7	<1.7	<1.7	<0.027	<0.0789	<0.0789	<0.033	<0.042	<0.042	--	<0.153
Silver, Dissolved	µg/L	NS	NS	NS	<20	<20	<20	<20	<20	<1.7	<1.7	<1.7	<0.027	<0.0789	<0.0789	<0.033	--	--	--	--
Thallium	µg/L	2	0.0644	1	<2	<2	<2	<2	<2	<0.84	<0.84	<0.288	<0.0087	***0.0629 J***	<0.0267	<0.05	<0.0325	<0.0325	--	<0.0255
Thallium, Dissolved	µg/L	NS	NS	NS	<2	<2	<2	<2	<2	<0.84	<0.84	<0.288	***0.01 J***	<0.0267	<0.0267	<0.05	--	--	--	--
Vanadium	µg/L	35	0.84	5	<50	<50	<50	<50	<50	<2.1	<2.1	***7.51 J***	***3.05***	***1.8***	***0.972 J***	***1.39 J***	***0.71 J***	***0.622 J***	--	***0.75 J***
Vanadium, Dissolved	µg/L	NS	NS	NS	<50	<50	<50	<50	<50	<2.1	<2.1	***2.16 J***	<0.94	<0.833	<0.833	***1.08 J***	--	--	--	--
Zinc	µg/L	2000	11.5	20	***106***	***51.1***	<20	<20	<20	<9.11	***11.1 J***	<9.11	***14.9***	***4.11 J***	<0.625	<2	<6.95	<6.95	--	<5.21
Zinc, Dissolved	µg/L	NS	NS	NS	***80.6***	***48.2***	<20	<20	<20	<9.11	***11.2 J***	***19.8 J***	***3.55 J***	***1.06 J***	***8.51***	***3.14 J***	--	--	--	--
Appendix I Organics																				
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	1	<1	<2	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21
1,1,1-Trichloroethane	µg/L	200	0.12	1	<1	<1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1
1,1,2-Trichloroethane	µg/L	5	0.12	1	<1	<1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12
1,1-Dichloroethane	µg/L	140	0.21	1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21
1,1-Dichloroethylene	µg/L	7	0.15	2	<2	<2	<2	<2	<2	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15
1,2,3-Trichloropropane	µg/L	0.0058	0.19	1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	5	<10	<10	<10	<10	<10	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.5	--	<0.5
1,2-Dibromoethane	µg/L	0.05	0.13	1	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13
1,2-Dichlorobenzene	µg/L	600	0.14	1	<4	<1	<1	<1	<1	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	<0.14
1,2-Dichloroethane	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18
1,2-Dichloropropane	µg/L	5	0.87	1	<1	<1	<1	<1	<1	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	--	<0.87
1,4-Dichlorobenzene	µg/L	75	0.2	1	<4	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2
2-Butanone	µg/L	4000	1.04	10	<10	<10	<10	<10	<10	***0.97 J***	<0.47	***1.51 J***	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47
2-Hexanone	µg/L	NS	0.2	10	<10	<10	<10	<10	<10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2
4-Methyl-2-pentanone	µg/L	560	0.22	10	<10	<10	<10	<10	<10	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22
Acetone	µg/L	6300	1.79	10	<10	<10	<10	<10	<10	<1.79	<1.79	***2.55 J***	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	--	<1.79
Acrylonitrile	µg/L	0.32	0.53	5	<10	<10	<10	<10	<10	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	--	<0.53
Benzene	µg/L	5	0.11	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.11	***0.11 J***	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	--	<0.11
Bromochloromethane	µg/L	90	0.12	5	<5	<5	<5	<5	<5	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12
Bromodichloromethane	µg/L	80	0.12	1	<1	<1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12
Bromomethane	µg/L	10	0.22	4	<4	<4	<4	<20	<4	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22
Carbon disulfide	µg/L	700	0.15	1	<1	<1	<1	<1	<1	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	***0.751 J***	<0.15	--	<0.15
Carbon Tetrachloride	µg/L	5	0.24	2	<2	<2	<2	<2	<2	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	--	<0.24
Chlorobenzene	µg/L	100	0.19	1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19
Chloroethane	µg/L	2800	0.15	4	<4	<4	<4	<4	<4	***0.27 J***	***0.19 J***	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15
Chloromethane	µg/L	NS	0.31	3	<3	<3	<3	<3	<3	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31
cis-1,2-Dichloroethylene	µg/L	70	0.13	1	<1	<1	<1	<1	<1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13
cis-1,3-Dichloropropene	µg/L	NS	0.15	5	<5	<5	<5	<5	<5	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15
Dibromochloromethane	µg/L	80	0.2	5	<5	<5	<5	<5	<5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2
Dibromomethane	µg/L	70	0.18	1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18
Dichloromethane	µg/L	5	0.17	5	<5	<5	<5	<5	<5	***0.21 J***	<0.17	<0.17	<0.17	***0.179 J***	<0.17	<0.17	<0.17	<0.17	--	<0.17
Ethylbenzene	µg/L	700	0.21	1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21
Iodomethane	µg/L	NS	0.8	10	<10	<20	<10	<10	<10	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	--	<0.8
Styrene	µg/L	100	0.1	1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1
Tetrachloroethylene	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18
Toluene	µg/L	1000	0.15	1	<1	<1	<1	<1	<1	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15
Trans-1,2-dichloroethylene	µg/L	100	0.21	1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21
trans-1,3-Dichloropropene	µg/L	NS	0.22	5	<5	<5	<5	<5	<5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13
Tribromomethane	µg/L	80	0.14	5	<5	<5	<5	<5	<5	<0.14	<0.14	<0.14	<0.14	***0.215 J***	<0.14	<0.14	<0.14	<0.14	--	<0.14
Trichloroethylene	µg/L	5	0.19	1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19
Trichlorofluoromethane	µg/L	2000	0.17	4	<4	<4	<4	<4	<4	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	--	<0.17
Trichloromethane	µg/L	80	0.28	1	<1	<1	<1	<1	<1	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	--	<0.28
Vinyl Acetate	µg/L	NS	0.74	10	<2	<2	<2	<2	<2	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	--	<0.74
Vinyl Chloride	µg/L	2	0.1	1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1
Xylenes	µg/L	10000	0.13	3	<3	<3	<3	<3	<3	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13

Parameter Name	Nov-16	May-17	Nov-17	Jun-18	Oct-18	Jun-19	Nov-19	Feb-20	Jun-20	Nov-20	May-21	Sep-21	Mar-22	Aug-22	Jun-23	Nov-23	Jan-24	Jun-24	Nov-24
Appendix I Inorganics																			
Total Suspended Solids	***1.63***	***0.625 J***	***1.13 J***	<0.638	***3.13***	***4.13***	***0.875 J***	<0.638	***0.75 J***	<0.638	<0.638	<0.638	***1.38 J***	***1.13 J***	<0.638	<0.638	<0.638	<1.39	<1.48
Turbidity, Field	***0.0964***	***2.055***	***1.035***	***1.556***	***3.178***	***2.73***	***0.94***	0	***0.76***	***0.65***	***0.89***	***3.97***	***2.24***	***0.94***	***0.95***	***0.69***	***0.43***	***2.82***	***3.38***
Turbidity, Lab	***1.4***	<0.4	<0.4	<0.4	***1.7***	***0.56 J***	***1.14***	***0.64***	--	--	--	--	--	--	--	--	--	--	--
Antimony	<0.237	<0.185	<0.185	<0.42	<0.42	<1.32	<0.53	--	<0.51	<0.51	<1.1	<1.1	<0.69	<0.69	<1	<1	--	<1	<1
Antimony, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	<0.672	<0.505	<0.505	<0.57	<0.57	***0.796 J***	<0.75	--	<0.88	<0.88	<0.75	<0.75	<0.75	<0.75	<0.53	<0.53	--	<0.53	<0.53
Arsenic, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	***208***	***176***	***205***	***163***	***190***	***153***	***188***	***174***	***147***	***197***	***199***	***192***	***154***	***159***	***189***	***219***	--	***178***	***229***
Barium, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	<0.221	<0.125	<0.125	<0.19	<0.19	<0.53	<0.27	--	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	--	<0.33	<0.33
Beryllium, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	<0.0351	<0.0441	<0.0441	<0.06	***0.094 J***	<0.167	***0.039 J***	--	<0.049	<0.049	<0.051	<0.051	<0.055	***0.064 J***	<0.1	<0.1	--	<0.1	<0.1
Cadmium, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	<0.355	<0.729	<0.729	***1.59 J***	***1.42 J***	***1.84 J***	***1.81 J***	--	***1.52 J***	<1.1	<1.1	***1.58 J***	***1.65 J***	***1.36 J***	<1.1	<1.1	--	***2.64 J***	<1.2
Chromium, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	***0.075***	<0.0453	***0.058 J***	***0.074 J***	***0.32 J***	<0.402	<0.091	--	<0.091	<0.091	***0.135 J***	<0.19	<0.19	***0.19 J***	***0.176 J***	***0.391 J***	--	<0.17	***0.276 J***
Cobalt, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	<1.22	<2.19	<2.19	<1.6	<1.6	<0.497	<2	--	<1.5	<1.5	<1.4	<1.4	<1.8	<1.8	<1.8	<1.8	--	<1.8	<1.8
Copper, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	<0.211	<0.324	<0.324	<0.25	<0.25	***0.357 J***	<0.27	--	<0.11	<0.11	<0.21	<0.21	<0.24	<0.24	<0.24	<0.24	--	<0.26	<0.26
Lead, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	<1.53	***2.06 J***	***1.72 J***	***1.17 J***	***3.8 J***	***1.13 J***	<1.7	--	<1.9	<1.9	<1.9	<1.9	<1.9	***2.26 J***	<1.9	***17***	***3.93 J***	<2.1	***9.12***
Nickel, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	***0.696***	<0.928	***1.4 J***	***1.19 J***	***0.994 J***	***1.07 J***	***1.36 J***	--	***1.3 J***	***1.08 J***	***2.69 J***	***1.96 J***	***1.76 J***	<0.96	<1.4	<1.4	--	***2.02 J***	<1.4
Selenium, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	<0.153	<0.14	***0.146 J***	<0.3	<0.3	<0.115	<0.37	--	<0.37	<0.37	<0.42	<0.42	<0.49	<0.49	<0.5	<0.5	--	<0.5	<0.5
Silver, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	<0.0255	<0.0644	<0.0644	<0.17	<0.17	<0.57	<0.27	--	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	--	<0.57	<0.57
Thallium, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	***0.599***	<0.84	<0.84	***0.763 J***	***1.09 J***	***3 J***	<0.82	--	<0.85	***0.948 J***	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Vanadium, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	<5.21	<11.5	<11.5	<10	<10	***14.7 J***	***85.2***	<10	<10	<10	<10	<10	<10	<10	<6.4	<6.4	--	<9.7	<9.7
Zinc, Dissolved	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																			
1,1,1,2-Tetrachloroethane	<0.21	<0.21	<0.21	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38
1,1,1-Trichloroethane	<0.12	<0.12	<0.12	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19
1,1,2,2-Tetrachloroethane	<0.1	<0.1	<0.1	<0.47	<0.47	<0.47	<0.47	--	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47	<0.47
1,1,2-Trichloroethane	<0.12	<0.12	<0.12	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45
1,1-Dichloroethane	<0.21	<0.21	<0.21	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22
1,1-Dichloroethylene	<0.15	<0.15	<0.15	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56
1,2,3-Trichloropropane	<0.19	<0.19	<0.19	<0.59	<0.59	<0.59	<0.59	--	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59	<0.59
1,2-Dibromo-3-chloropropane	<0.5	<0.5	<0.5	<1.2	<1.2	<1.2	<1.2	--	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2	<1.2
1,2-Dibromoethane	<0.13	<0.13	<0.13	<0.34	<0.34	<0.34	<0.34	--	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34	<0.34
1,2-Dichlorobenzene	<0.14	<0.14	<0.14	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37
1,2-Dichloroethane	<0.18	<0.18	<0.18	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39
1,2-Dichloropropane	<0.87	<0.87	<0.87	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27
1,4-Dichlorobenzene	<0.2	<0.2	<0.2	<0.23	<0.23	<0.23	<0.23	--	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23	<0.23
2-Butanone	<1.04	<1.04	<1.04	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1
2-Hexanone	<0.2	<0.2	<0.2	<2	<2	<2	<2	--	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2
4-Methyl-2-pentanone	<0.22	<0.22	<0.22	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1
Acetone	<1.79	<1.79	***2.39 J***	<3.1	<3.1	<3.1	<3.1	--	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	--	<3.1	<3.1
Acrylonitrile	<0.53	<0.53	<0.53	<2.2	<2.2	<2.2	<2.2	--	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2	<2.2
Benzene	<0.11	<0.11	<0.11	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22
Bromochloromethane	<0.12	<0.12	<0.12	<0.54	<0.54	<0.54	<0.54	--	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54	<0.54
Bromodichloromethane	<0.12	<0.12	<0.12	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39
Bromomethane	<0.22	<0.22	<0.22	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Carbon disulfide	<0.15	<0.15	<0.15	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45
Carbon Tetrachloride	<0.24	<0.24	<0.24	<0.65	<0.65	<0.65	<0.65	--	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65	<0.65
Chlorobenzene	<0.19	<0.19	<0.19	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4
Chloroethane	<0.15	<0.15	<0.15	<0.79	<0.79	<0.79	<0.79	--	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79	<0.79
Chloromethane	<0.31	<0.31	<0.31	<0.61	<0.61	<0.61	<0.61	--	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61	<0.61
cis-1,2-Dichloroethylene	<0.13	<0.13	<0.13	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21
cis-1,3-Dichloropropene	<0.15	<0.15	<0.15	<0.25	<0.25	<0.25	<0.25	--	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25	<0.25
Dibromochloromethane	<0.2	<0.2	<0.2	<0.75	<0.75	<0.75	<0.75	--	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75	<0.75
Dibromomethane	<0.18	<0.18	<0.18	<0.33	<0.33	<0.33	<0.33	--	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33	<0.33
Dichloromethane	<0.17	<0.17	<0.17	<1.7	<1.7	<1.7	<1.7	--	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7	<1.7
Ethylbenzene	<0.21	<0.21	<0.21	<0.31	<0.31	<0.31	<0.31	--	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	***0.316 J***	--	<0.31	<0.31
Iodomethane	<0.8	<0.8	<0.8	<7	<7	<7	<7	--	<7	<7	<7	<7	<7	<7	<7	<7	--	<7	<7
Styrene	<0.1	<0.1	<0.1	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37
Tetrachloroethylene	<0.18	<0.18	<0.18	<0.48	<0.48	<0.48	<0.48	--	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48	<0.48
Toluene	<0.15	<0.15	<0.15	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	***2.86***	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	<0.21	<0.21	<0.21	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27
trans-1,3-Dichloropropene	<0.22	<0.22	<0.22	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56
trans-1,4-Dichloro-2-butene	<0.13	<0.13	<0.13	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Tribromomethane	<0.14	<0.14	<0.14	<0.78	<0.78	<0.78	<0.78	--	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78	<0.78
Trichloroethylene	<0.19	<0.19	<0.19	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43
Trichlorofluoromethane	<0.17	<0.17	<0.17	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38
Trichloromethane	<0.28	<0.28	<0.28	<1.3	<1.3	<1.3	<1.3	--	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3	<1.3
Vinyl Acetate	<0.74	<0.74	<0.74	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5
Vinyl Chloride	<0.1	<0.1	<0.1	<0.6	<0.6	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18
Xylenes	<0.13	<0.13	<0.13	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	***1.74 J***	--	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-29A

Parameter Name	Units	GPS	DL	Nov-19	Feb-20	Jun-20	Aug-20	Nov-20	May-21	Sep-21	Mar-22	Jun-22	Sep-22	Dec-22	Jun-23	Nov-23	Jun-24	Dec-24
Appendix I Inorganics																		
Total Suspended Solids	mg/L	NS	0.581	***3.25 J***	***5***	***6.25***	***10.4***	***4.8***	***5.38***	***7.5***	***4.33 J***	--	***14.3***	--	***3.87***	***4***	***7***	***13.7***
Turbidity, Field	NTU	NS	NS	***1.33***	***4.47***	***22.71***	***63.02***	***45.29***	***56.29***	***43.58***	***48.96***	***74.41***	***5.11***	***21.07***	***59.78***	***15.27***	***55.13***	***32.22***
Turbidity, Lab	NTU	NS	0.4	***3.71***	***6.57***	--	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	<0.53	<0.58	<0.51	<0.51	<0.51	<1.1	<1.1	<0.69	--	<2.76	--	<1	<1	<1	<1
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	***1.74 J***	***2.28***	***3.4***	***6.84***	***4.59***	***4.09***	***6.09***	***5.57***	--	***10.2***	--	***4.37***	***6.49***	***4.54***	***6.75***
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	***272***	***217***	***168***	***180***	***138***	***150***	***173***	***182***	--	***191***	--	***187***	***163***	***151***	***161***
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<1.08	--	<0.33	<0.33	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	***0.131***	***0.104***	<0.049	***0.18***	<0.049	<0.051	***0.059 J***	***0.066 J***	--	***0.092 J***	--	***0.12 J***	<0.1	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	<0.98	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	***1.67 J***	--	<1.1	--	<1.1	<1.1	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	***8.43***	***9.64***	***9.98***	***10.7***	***10.1***	***11.9***	***7.9***	***7.38***	--	***10.1***	--	***12.5***	***18.7***	***11.2***	***16.5***
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	<2	<3.2	<1.5	<1.5	<1.5	<1.4	<1.4	<1.8	--	<1.8	--	<1.8	<1.8	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	<0.27	<0.27	<0.11	<0.11	<0.11	<0.21	<0.21	<0.24	--	<0.24	--	<0.24	<0.24	<0.26	<0.26
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	***49.7***	***49.2***	***51.1***	***57***	***47.2***	***55.5***	***51***	***63.6***	--	***69.1***	--	***76***	***87***	***63.9***	***69.6***
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	<1	<1	<1	<1	<1	<0.96	<0.96	<0.96	--	<0.96	--	<1.4	<1.4	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.42	<0.42	<0.49	--	<1.96	--	<0.5	<0.5	***1.1***	<0.5
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.27	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	--	<0.26	--	<0.26	<0.26	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	<0.82	<0.82	<0.85	<0.85	<0.85	<1.1	<1.1	<1.1	--	<1.1	--	<1.1	<1.1	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	<10	<10	<10	<10	<10	<10	<10	***42.1***	--	<10	--	***7.9 J***	***8.31 J***	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																		
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	--	<0.38	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	--	<0.19	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47	--	<0.47	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	--	<0.45	<0.45	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	--	<0.22	<0.22	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	--	<0.56	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59	--	<0.59	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2	--	<1.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34	--	<0.34	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	--	<0.37	<0.37	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	--	<0.39	<0.39	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	--	<0.27	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23	--	<0.23	<0.23	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	--	<2.1	<2.1	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	--	<2	<2	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	--	<2.1	<2.1	<2.1	<2.1
Acetone	µg/L	6300	1.79	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	--	<3.1	--	<3.1	<3.1	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2	--	<2.2	<2.2	<2.2	<2.2
Benzene	µg/L	5	0.11	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	--	<0.22	<0.22	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54	--	<0.54	<0.54	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	--	<0.39	<0.39	<0.39	<0.39
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	--	<1.1	<1.1	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	--	<0.45	<0.45	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65	--	<0.65	<0.65	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	--	<0.4	<0.4	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79	--	<0.79	<0.79	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61	--	<0.61	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	--	<0.21	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25	--	<0.25	<0.25	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75	--	<0.75	<0.75	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33	--	<0.33	<0.33	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7	--	<1.7	<1.7	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	--	<0.31	<0.31	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7	<7	<7	<7	--	<7	--	<7	<7	<7	<7
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	--	<0.37	<0.37	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48	--	<0.48	<0.48	<0.48	<0.48
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	--	<0.43	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	--	<0.27	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	--	<0.56	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	--	<1.1	<1.1	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78	--	<0.78	<0.78	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	--	<0.43	<0.43	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	--	<0.38	<0.38	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3	--	<1.3	<1.3	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5	--	<2.5	<2.5	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	--	<0.18	<0.18	<0.18	<0.18
Xylenes	µg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	--	<0.4	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-29A

Parameter Name	Units	GPS	Nov-20	May-21	Mar-22	Jun-22	Sep-22	Dec-22	Jun-23	Nov-23	Jun-24	Dec-24
Alcohols/Gycols by GC												
Acetonitrile	µg/L	NS	<404	<0.404	<404	--	--	--	--	--	--	--
Isobutanol	µg/L	2100	<553	<0.553	<553	--	--	--	--	--	--	--
Herbicides (GC)												
2,4,5-T	µg/L	70	<0.48	<0.509	<0.159	--	--	--	--	--	--	--
2,4-D	µg/L	70	<0.516	<0.546	<0.624	--	--	--	--	--	--	--
Silvex (2,4,5-TP)	µg/L	50	<0.321	<0.34	<0.147	--	--	--	--	--	--	--
Inorganics												
Cyanide	µg/L	200	<5	<0.0053	<4.3	--	--	--	--	--	--	--
Mercury	µg/L	2	<0.1	<0.00015	<0.11	--	--	--	--	--	--	--
Sulfide	µg/L	NS	<10000	***21***	<231	<231	<231	<231	<231	<231	<1410	***2930 J***
Tin	µg/L	4200	<2.4	<3	<3	--	--	--	--	--	--	--
PCBs (EPA Method 8082)												
PCB-1016	µg/L	NS	<0.313	<0.289	<0.177	--	--	--	--	--	--	--
PCB-1221	µg/L	NS	<0.313	<0.289	<0.177	--	--	--	--	--	--	--
PCB-1232	µg/L	NS	<0.313	<0.289	<0.177	--	--	--	--	--	--	--
PCB-1242	µg/L	NS	<0.313	<0.289	<0.177	--	--	--	--	--	--	--
PCB-1248	µg/L	NS	<0.253	<0.233	<0.115	--	--	--	--	--	--	--
PCB-1254	µg/L	NS	<0.253	<0.233	<0.115	--	--	--	--	--	--	--
PCB-1260	µg/L	NS	<0.253	<0.233	<0.115	--	--	--	--	--	--	--
Pesticides (EPA Method 8081A)												
4,4'-DDD	µg/L	0.73	<0.00217	<0.00933	<0.0281	--	--	--	--	--	--	--
4,4'-DDE	µg/L	0.51	<0.00253	<0.00944	<0.0281	--	--	--	--	--	--	--
4,4'-DDT	µg/L	0.51	<0.00458	<0.0133	<0.0438	--	--	--	--	--	--	--
Aldrin	µg/L	0.01	<0.00542	<0.0133	<0.0333	--	--	--	--	--	--	--
alpha-BHC	µg/L	0.028	<0.00205	<0.0111	<0.0302	--	--	--	--	--	--	--
beta-BHC	µg/L	0.042	<0.00578	<0.0144	<0.0385	--	--	--	--	--	--	--
Chlordane	µg/L	2	<0.0771	<0.244	<0.844	--	--	--	--	--	--	--
delta-BHC	µg/L	2.1	<0.00277	<0.0167	<0.0281	--	--	--	--	--	--	--
Dieldrin	µg/L	0.011	<0.00241	<0.0133	<0.0271	--	--	--	--	--	--	--
Endosulfan I	µg/L	42	<0.00241	<0.0122	<0.0344	--	--	--	--	--	--	--
Endosulfan II	µg/L	42	<0.00229	<0.009	<0.0302	--	--	--	--	--	--	--
Endosulfan sulfate	µg/L	NS	<0.00301	<0.00933	<0.0313	--	--	--	--	--	--	--
Endrin	µg/L	2	<0.00229	<0.0111	<0.0271	--	--	--	--	--	--	--
Endrin aldehyde	µg/L	2.1	<0.0088	<0.0107	<0.0302	--	--	--	--	--	--	--
gamma-BHC (Lindane)	µg/L	0.2	***0.00384 J***	<0.0156	<0.0375	--	--	--	--	--	--	--
Heptachlor	µg/L	0.4	<0.00313	<0.0133	<0.0344	--	--	--	--	--	--	--
Heptachlor epoxide	µg/L	0.2	<0.00735	<0.0101	<0.0302	--	--	--	--	--	--	--
Methoxychlor	µg/L	40	<0.00253	<0.0156	<0.0427	--	--	--	--	--	--	--
Toxaphene	µg/L	3	<0.0699	<0.456	<0.719	--	--	--	--	--	--	--
Semivolatile Organics by GC/MS												
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<1.88	<1.8	<0.643	--	--	--	--	--	--	--
1,3,5-Trinitrobenzene	µg/L	NS	<1.53	<1.46	<2.74	--	--	--	--	--	--	--
1,3-Dinitrobenzene	µg/L	1	<1.18	<1.12	<3.81	--	--	--	--	--	--	--
1,4-Naphthoquinone	µg/L	NS	<1.15	<1.1	<4.29	--	--	--	--	--	--	--
1,4-Phenylenediamine	µg/L	NS	<0.588	<0.562	<2.26	--	--	--	--	--	--	--
1-Naphthylamine	µg/L	NS	<1.04	<0.989	<2.98	--	--	--	--	--	--	--
2,3,4,6-Tetrachlorophenol	µg/L	NS	<1.16	<1.11	<6.31	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	µg/L	700	<1.29	<1.24	<6.31	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	µg/L	16	<1.41	<1.35	<5.95	--	--	--	--	--	--	--
2,4-Dichlorophenol	µg/L	20	<1.29	<1.24	<1.01	--	--	--	--	--	--	--
2,4-Dimethylphenol	µg/L	100	<1.18	<1.12	<0.69	--	--	--	--	--	--	--
2,4-Dinitrophenol	µg/L	14	<6.71	<6.4	<15.5	--	--	--	--	--	--	--
2,4-Dinitrotoluene	µg/L	0.25	<1.29	<1.24	<7.62	--	--	--	--	--	--	--
2,6-Dichlorophenol	µg/L	NS	<1.29	<1.24	<0.821	--	--	--	--	--	--	--
2,6-Dinitrotoluene	µg/L	0.26	<1.29	<1.24	<0.619	--	--	--	--	--	--	--
2-Acetylaminofluorene	µg/L	NS	<1.41	<1.35	<3.21	--	--	--	--	--	--	--
2-Chloronaphthalene	µg/L	560	<1.53	<1.46	<0.762	--	--	--	--	--	--	--
2-Chlorophenol	µg/L	40	<1.29	<1.24	<0.643	--	--	--	--	--	--	--
2-Methylnaphthalene	µg/L	28	<1.53	<1.46	<0.702	--	--	--	--	--	--	--
2-Methylphenol (o-Cresol)	µg/L	35	<1.18	<1.12	<0.774	--	--	--	--	--	--	--
2-Naphthylamine	µg/L	0.097	<1.01	<0.966	<2.5	--	--	--	--	--	--	--
2-Nitroaniline	µg/L	NS	<1.41	<1.35	<7.02	--	--	--	--	--	--	--
2-Nitrophenol	µg/L	NS	<1.88	<1.8	<8.1	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	µg/L	0.39	<2.12	<2.02	<1.67	--	--	--	--	--	--	--
3,3'-Dimethylbenzidine	µg/L	NS	<2.35	<2.25	<1.79	--	--	--	--	--	--	--
3/4-Methylphenol	µg/L	70	<0.894	<0.854	<0.833	--	--	--	--	--	--	--
3-Methylcholanthrene	µg/L	NS	<2.94	<2.81	<0.381	--	--	--	--	--	--	--
3-Nitroaniline	µg/L	NS	<1.18	<1.12	<3.21	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	µg/L	NS	<2.94	<2.81	<8.21	--	--	--	--	--	--	--
4-Aminobiphenyl	µg/L	0.0083	<1.13	<1.08	<2.62	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	µg/L	NS	<2.24	<2.13	<0.833	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	µg/L	700	<1.12	<1.07	<1	--	--	--	--	--	--	--
4-Chloroaniline	µg/L	28	<1.41	<1.35	<0.738	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	µg/L	NS	<1.53	<1.46	<0.821	--	--	--	--	--	--	--
4-Nitroaniline	µg/L	NS	<2	<1.91	<1.55	--	--	--	--	--	--	--
4-Nitrophenol	µg/L	60	<2.94	<2.81	<9.05	--	--	--	--	--	--	--
5-Nitro-o-toluidine	µg/L	NS	<3.65	<3.48	<3.33	--	--	--	--	--	--	--
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<1.08	<1.03	<2.26	--	--	--	--	--	--	--
Acenaphthene	µg/L	420	<1.53	<1.46	<0.762	--	--	--	--	--	--	--
Acenaphthylene	µg/L	210	<1.53	<1.46	<0.857	--	--	--	--	--	--	--
Acetophenone	µg/L	NS	<3.53	<3.37	<0.821	--	--	--	--	--	--	--
Anthracene	µg/L	2100	<1.29	<1.24	<1.04	--	--	--	--	--	--	--
Benzo (a) anthracene	µg/L	0.24	<1.29	<1.24	<1.01	--	--	--	--	--	--	--
Benzo (a) pyrene	µg/L	0.2	<1.76	<1.69	<9.64	--	--	--	--	--	--	--
Benzo (b) fluoranthene	µg/L	0.24	<1.41	<1.35	<5.83	--	--	--	--	--	--	--
Benzo (g,h,i) perylene	µg/L	21	<1.88	<1.8	<7.5	--	--	--	--	--	--	--
Benzo (k) fluoranthene	µg/L	2.4	<1.41	<1.35	<2.62	--	--	--	--	--	--	--
Benzyl alcohol	µg/L	700	<1.29	<1.24	<1.55	--	--	--	--	--	--	--
Bis(2-chloroethoxy)methane	µg/L	NS	<1.29	<1.24	<0.905	--	--	--	--	--	--	--
Bis(2-chloroethyl)ether	µg/L	0.16	<1.29	<1.24	<0.976	--	--	--	--	--	--	--
Bis(2-chloroisopropyl) ether	µg/L	300	<1.41	<1.35	<0.643	--	--	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	µg/L	6	<3.06	<2.92	<6.55	--	--	--	--	--	--	--
Butyl benzyl phthalate	µg/L	140	<1.76	<1.69	<6.43	--	--	--	--	--	--	--
Chlorobenzilate	µg/L	NS	<3.41	<3.26	<4.29	--	--	--	--	--	--	--
Chrysene	µg/L	24	<1.29	<1.24	<1.04	--	--	--	--	--	--	--
Diallate (cis or trans)	µg/L	NS	<1.53	<1.46	<4.76	--	--	--	--	--	--	--
Dibenzo (a,h) anthracene	µg/L	0.024	<2.24	<2.13	<4.64	--	--	--	--	--	--	--
Dibenzofuran	µg/L	7	<1.41	<1.35	<0.881	--	--	--	--	--	--	--
Diethyl phthalate	µg/L	5600	<1.29	<1.24	<2.02	--	--	--	--	--	--	--
Dimethoate	µg/L	1.4	<1.18	<1.12	<4.29	--	--	--	--	--	--	--
Dimethyl phthalate	µg/L	NS	<2.94	<2.81	<1.19	--	--	--	--	--	--	--
Di-n-butyl phthalate	µg/L	700	<1.41	<1.35	<6.67	--	--	--	--	--	--	--
Di-n-octyl phthalate	µg/L	140	<3.53	<3.37	<8.33	--	--	--	--	--	--	--
Dinoseb	µg/L	7	<0.588	<0.562	<2.86	--	--	--	--	--	--	--
Diphenylamine	µg/L	180	<1.04	<0.989	<7.14	--	--	--	--	--	--	--
Disulfoton	µg/L	0.7	<0.753	<0.719	<2.86	--	--	--	--	--	--	--
Ethyl Methanesulfonate	µg/L	NS	<0.588	<0.562	<4.29	--	--	--	--	--	--	--
Famphur	µg/L	NS	<0.753	<0.719	<4.52	--	--	--	--	--	--	--
Fluoranthene	µg/L	280	<1.11	<1.06	<2.02	--	--	--	--	--	--	--
Fluorene	µg/L	280	<1.53	<1.46	<0.94	--	--	--	--	--	--	--
Hexachlorobenzene	µg/L	1	<1.65	<1.57	<0.833	--	--	--	--	--	--	--
Hexachlorobutadiene	µg/L	1	<1.41	<1.35	<1.02	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	µg/L	50	<2.47	<2.36	<6.07	--	--	--	--	--	--	--
Hexachloroethane	µg/L	1	<1.53	<1.46	<1.15	--	--	--	--	--	--	--
Hexachloropropene	µg/L	NS	<1.88	<1.8	<3.1	--	--	--	--	--	--	--
Indeno (1,2,3-cd) pyrene	µg/L	0.24	<2.35	<2.25	<5	--	--	--	--	--	--	--
Isodrin	µg/L	NS	<0.682	<0.652	<5.6	--	--	--	--	--	--	--
Isophorone	µg/L	100	<1.16	<1.11	<1.11	--	--	--	--	--	--	--
Isosafrole	µg/L	NS	<0.588	<0.562	<2.74	--	--	--	--	--	--	--
Kepone	µg/L	NS	<2.12	<2.02	<1.19	--	--	--	--	--	--	--
Methapyrilene	µg/L	NS	<2.24	<2.13	<0.905	--	--	--	--	--	--	--
Methyl Methanesulfonate	µg/L	1.8	<0.588	<0.562	<3.93	--	--	--	--	--	--	--
Nitrobenzene	µg/L	14	<1.29	<1.24	<0.952	--	--	--	--	--	--	--
N-Nitrosodiethylamine	µg/L	NS	<0.588	<0.562	<4.05	--	--	--	--	--	--	--
N-Nitrosodimethylamine	µg/L	0.0034	<1.07	<1.02	<0.857	--	--	--	--	--	--	--
N-Nitrosodi-n-butylamine	µg/L	0.032	<0.588	<0.562	<4.64	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	µg/L	NS	<1.18	<1.12	<1.1	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	µg/L	36	<1.12	<1.07	<0.893	--	--	--	--	--	--	--
N-Nitrosomethylethylamine	µg/L	0.008	<1.53	<1.46	<5.83	--	--	--	--	--	--	--
N-Nitrosopiperidine	µg/L	NS	<0.588	<0.562	<3.21	--	--	--	--	--	--	--
N-Nitrosopyrrolidine	µg/L	0.083	<0.588	<0.562	<4.29	--	--	--	--	--	--	--
O,O,O-Triethyl phosphorothioate	µg/L	NS	<0.588	<0.562	<3.81	--	--	--	--	--	--	--
o-Toluidine	µg/L	11	<0.788	<0.753	<3.45	--	--	--	--	--	--	--
p-(Dimethylamino)azobenzene	µg/L	NS	<0.918	<0.876	<2.62	--	--	--	--	--	--	--
Parathion-ethyl	µg/L	NS	<1.88	<1.8	<2.62	--	--	--	--	--	--	--
Parathion-methyl	µg/L	1	<0.882	<0.843	<2.74	--	--	--	--	--	--	--
Pentachlorobenzene	µg/L	NS	<0.682	<0.652	<3.33	--	--	--	--	--	--	--
Pentachloronitrobenzene	µg/L	NS	<0.588	<0.562	<6.9	--	--	--	--	--	--	--
Pentachlorophenol	µg/L	1	<2.71	<2.58	<11.4	--	--	--	--	--	--	--
Phenacetin	µg/L	NS	<2.12	<2.02	<2.26	--	--	--	--	--	--	--
Phenanthrene	µg/L	210	<1.29	<1.24	<0.94	--	--	--	--	--	--	--
Phenol	µg/L	2000	<2.82	<2.7	<1.31	--	--	--	--	--	--	--
Phorate	µg/L	1.4	<0.588	<0.562	<3.81	--	--	--	--	--	--	--
Pronamide	µg/L	5	<0.588	<0.562	<3.21	--	--	--	--	--	--	--
Pyrene	µg/L	210	<1.65	<1.57	<0.94	--	--	--	--	--	--	--
Safrole	µg/L	NS	<0.588	<0.562	<3.33	--	--	--	--	--	--	--
Thionazin	µg/L	NS	<0.894	<0.854	<4.17	--	--	--	--	--	--	--
Volatile Organic Compounds												
1,1-Dichloropropene	µg/L	NS	<0.43	<0.43	<0.43	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	µg/L	70	<0.75	<0.75	<0.75	--	--	--	--	--	--	--
1,3-Dichlorobenzene	µg/L	600	<0.3	<0.3	<0.3	--	--	--	--	--	--	--
1,3-Dichloropropane	µg/L	NS	<0.4	<0.4	<0.4	--	--	--	--	--	--	--
2,2-Dichloropropane	µg/L	NS	<0.69	<0.69	<0.69	--	--	--	--	--	--	--
Acrolein	µg/L	NS	<3.6	<3.6	<3.6	--	--	--	--	--	--	--
Allyl chloride	µg/L	NS	<0.7	<0.7	<0.7	--	--	--	--	--	--	--
Chloroprene	µg/L	NS	<0.23	<0.23	<0.23	--	--	--	--	--	--	--
Dichlorodifluoromethane	µg/L	1000	<0.25	<0.25	<0.25	--	--	--	--	--	--	--
Ethyl Methacrylate	µg/L	NS	<0.68	<0.68	<0.68	--	--	--	--	--	--	--
Methacrylonitrile	µg/L	NS	<3.3	<3.3	<3.3	--	--	--	--	--	--	--
Methyl Methacrylate	µg/L	NS	<0.76	<0.76	<0.76	--	--	--	--	--	--	--
Naphthalene	µg/L	100	<3	<3	<3	--	--	--	--	--	--	--
Propionitrile	µg/L	NS	<3.4	<3.4	<3.4	--	--	--	--	--	--	--

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-31A

Parameter Name	Units	GPS	DL	Nov-19	Feb-20	Jun-20	Aug-20	Nov-20	May-21	Sep-21	Mar-22	Sep-22	Jun-23	Nov-23	Jul-24	Dec-24
Appendix I Inorganics																
Total Suspended Solids	mg/L	NS	0.581	***9***	***2.63***	***19***	***10.4***	***7.25***	***1.88***	***1.63 J***	<0.638	***5***	***6.07***	***1.25 J***	***2.25***	<3.7
Turbidity, Field	NTU	NS	NS	***2.06***	***0.26***	***1.79***	***26.27***	***8.36***	***7***	***5.51***	***0.86***	***74.5***	***4.71***	***4.04***	***2.38***	***5.3***
Turbidity, Lab	NTU	NS	0.4	***13.8***	***3.72***	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	<0.53	<0.58	<0.51	<0.51	***0.771 J***	<1.1	<1.1	<0.69	***2.22***	<1	<1	<1	<1
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	***2.95***	***1.42 J***	***2.47***	***3.83***	***2.57***	***0.821 J***	<0.75	<0.75	<3	***0.602 J***	***0.571 J***	<0.53	***0.562 J***
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	***602***	***591***	***279***	***317***	***449***	***160***	***205***	***145***	***441***	***220***	***247***	***243***	***279***
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	***0.179***	***0.08 J***	***0.316***	<0.049	***0.424***	***0.26***	***2.04***	***0.302***	***0.984***	***0.34***	<0.1	***0.16 J***	***0.161 J***
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	<0.98	<1.1	***1.34 J***	<1.1	***2.5 J***	***1.31 J***	<1.1	<1.1	***7.31***	<1.1	<1.1	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	***13.4***	***12.4***	***13.6***	***12***	***10***	***10.4***	***3.37***	***3.01***	***32.2***	***3.75***	***4.62***	***3.48***	***2.09***
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	<2	<3.2	***1.84 J***	<1.5	***5.01***	***3.47 J***	***9.84***	***3.31 J***	***21.3***	***3.61 J***	<1.8	***1.91 J***	***2.6 J***
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	***1.15***	<0.27	***1.37***	<0.11	***0.583***	***0.609***	<0.21	<0.24	***1.68***	***0.283 J***	<0.24	<0.26	<0.26
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	***20.4***	***21.6***	***27.5***	***47***	***52.8***	***53.4***	***47.7***	***28.1***	***112***	***39.7***	***30.8***	***30.3***	***32.3***
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	<1	<1	<1	<1	***1.13 J***	<0.96	<0.96	<0.96	***1.86 J***	<1.4	<1.4	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.42	<0.42	<0.49	<0.49	<0.5	<0.5	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.27	<0.26	<0.26	<0.26	***0.286 J***	<0.26	***0.355 J***	<0.26	***0.777 J***	<0.26	<0.26	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	<0.82	<0.82	***0.997 J***	<0.85	***0.873 J***	<1.1	<1.1	***1.62 J***	***3.26 J***	<1.1	<1.1	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	<10	<10	<10	<10	***13.8 J***	<10	<10	<10	***18.1 J***	***23.5***	<6.4	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	***1.26***	***0.724 J***	***0.774 J***	***1.4***	<0.22	***0.306 J***	<0.22	***0.475 J***	<0.22	***1.23***	***0.859 J***	***0.358 J***	***0.484 J***
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	***5.19 J***	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
Acetone	µg/L	6300	1.79	<3.1	<3.1	***11.8***	<3.1	***3.74 J***	<3.1	***4.88 J***	<3.1	***9.48 J***	<3.1	<3.1	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
Benzene	µg/L	5	0.11	***0.457 J***	***0.266 J***	***0.225 J***	***0.288 J***	***0.253 J***	<0.22	<0.22	<0.22	***0.264 J***	<0.22	<0.22	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	***0.232 J***	<0.21	<0.21	<0.21	<0.21	<0.21	***0.222 J***	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	***0.442 J***	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Xylenes	µg/L	10000	0.13	***0.541 J***	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-31A

Parameter Name	Units	GPS	Nov-20	Feb-21	May-21	Aug-21	Sep-21	Mar-22	Sep-22	Jun-23	Nov-23	Jul-24	Dec-24
Alcohols/Gycols by GC													
Acetonitrile	µg/L	NS	<404	--	<404	--	--	<404	--	--	--	--	--
Isobutanol	µg/L	2100	<553	--	<553	--	--	<553	--	--	--	--	--
Herbicides (GC)													
2,4,5-T	µg/L	70	<0.502	--	<0.521	--	--	<0.156	--	--	--	--	--
2,4-D	µg/L	70	<0.539	--	<0.559	--	--	<0.609	--	--	--	--	--
Silvex (2,4,5-TP)	µg/L	50	<0.335	--	<0.348	--	--	<0.143	--	--	--	--	--
Inorganics													
Cyanide	µg/L	200	<5	--	<5.3	--	--	<4.3	--	--	--	--	--
Mercury	µg/L	2	<0.1	--	<0.15	--	--	<0.11	--	--	--	--	--
Sulfide	µg/L	NS	<10000	--	<231	--	--	<231	--	--	--	--	--
Tin	µg/L	4200	<2.4	--	<3	--	--	<3	--	--	--	--	--
PCBs (EPA Method 8082)													
PCB-1016	µg/L	NS	<0.317	--	<0.295	--	--	<0.193	--	--	--	--	--
PCB-1221	µg/L	NS	<0.317	--	<0.295	--	--	<0.193	--	--	--	--	--
PCB-1232	µg/L	NS	<0.317	--	<0.295	--	--	<0.193	--	--	--	--	--
PCB-1242	µg/L	NS	<0.317	--	<0.295	--	--	<0.193	--	--	--	--	--
PCB-1248	µg/L	NS	<0.256	--	<0.239	--	--	<0.125	--	--	--	--	--
PCB-1254	µg/L	NS	<0.256	--	<0.239	--	--	<0.125	--	--	--	--	--
PCB-1260	µg/L	NS	<0.256	--	<0.239	--	--	<0.125	--	--	--	--	--
Pesticides (EPA Method 8081A)													
4,4'-DDD	µg/L	0.73	<0.0022	--	<0.00955	--	--	<0.0307	--	--	--	--	--
4,4'-DDE	µg/L	0.51	***0.0101 J***	--	<0.00966	--	--	<0.0307	--	--	--	--	--
4,4'-DDT	µg/L	0.51	<0.00463	--	<0.0136	--	--	<0.0477	--	--	--	--	--
Aldrin	µg/L	0.01	***0.00639 J***	--	<0.0136	--	--	<0.0364	--	--	--	--	--
alpha-BHC	µg/L	0.028	<0.00207	--	<0.0114	--	--	<0.033	--	--	--	--	--
beta-BHC	µg/L	0.042	<0.00585	--	<0.0148	--	--	<0.042	--	--	--	--	--
Chlordane	µg/L	2	<0.078	--	<0.25	--	--	<0.92	--	--	--	--	--
delta-BHC	µg/L	2.1	***0.00462 J***	--	<0.017	--	--	<0.0307	--	--	--	--	--
Dieldrin	µg/L	0.011	***0.00422 J***	--	<0.0136	--	--	<0.0295	--	--	--	--	--
Endosulfan I	µg/L	42	***0.0531***	***0.00598 J***	***0.026 J***	<0.0126	***0.058***	<0.0375	<0.0384	<0.033	<0.0375	<0.0263	<0.0261
Endosulfan II	µg/L	42	***0.0125 J***	--	<0.0092	--	--	<0.033	--	--	--	--	--
Endosulfan sulfate	µg/L	NS	<0.00305	--	<0.00955	--	--	<0.0341	--	--	--	--	--
Endrin	µg/L	2	***0.00985 J***	--	<0.0114	--	--	<0.0295	--	--	--	--	--
Endrin aldehyde	µg/L	2.1	<0.0089	--	<0.0109	--	--	<0.033	--	--	--	--	--
gamma-BHC (Lindane)	µg/L	0.2	***0.00481 J***	--	<0.0159	--	--	<0.0409	--	--	--	--	--
Heptachlor	µg/L	0.4	<0.00317	--	<0.0136	--	--	<0.0375	--	--	--	--	--
Heptachlor epoxide	µg/L	0.2	<0.00744	--	<0.0103	--	--	<0.033	--	--	--	--	--
Methoxychlor	µg/L	40	<0.00256	--	<0.0159	--	--	<0.0466	--	--	--	--	--
Toxaphene	µg/L	3	<0.0707	--	<0.466	--	--	<0.784	--	--	--	--	--
Semivolatile Organics by GC/MS													
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<1.68	--	<1.9	--	--	<0.563	--	--	--	--	--
1,3,5-Trinitrobenzene	µg/L	NS	<1.37	--	<1.55	--	--	<2.4	--	--	--	--	--
1,3-Dinitrobenzene	µg/L	1	<1.05	--	<1.19	--	--	<3.33	--	--	--	--	--
1,4-Naphthoquinone	µg/L	NS	<1.03	--	<1.17	--	--	<3.75	--	--	--	--	--
1,4-Phenylenediamine	µg/L	NS	<0.526	--	<0.595	--	--	<1.98	--	--	--	--	--
1-Naphthylamine	µg/L	NS	<0.926	--	<1.05	--	--	<2.6	--	--	--	--	--
2,3,4,6-Tetrachlorophenol	µg/L	NS	<1.04	--	<1.18	--	--	<5.52	--	--	--	--	--
2,4,5-Trichlorophenol	µg/L	700	<1.16	--	<1.31	--	--	<5.52	--	--	--	--	--
2,4,6-Trichlorophenol	µg/L	16	<1.26	--	<1.43	--	--	<5.21	--	--	--	--	--
2,4-Dichlorophenol	µg/L	20	<1.16	--	<1.31	--	--	<0.885	--	--	--	--	--
2,4-Dimethylphenol	µg/L	100	<1.05	--	<1.19	--	--	<0.604	--	--	--	--	--
2,4-Dinitrophenol	µg/L	14	<6	--	<6.79	--	--	<13.5	--	--	--	--	--
2,4-Dinitrotoluene	µg/L	0.25	<1.16	--	<1.31	--	--	<6.67	--	--	--	--	--
2,6-Dichlorophenol	µg/L	NS	<1.16	--	<1.31	--	--	<0.719	--	--	--	--	--
2,6-Dinitrotoluene	µg/L	0.26	<1.16	--	<1.31	--	--	<0.542	--	--	--	--	--
2-Acetylaminofluorene	µg/L	NS	<1.26	--	<1.43	--	--	<2.81	--	--	--	--	--
2-Chloronaphthalene	µg/L	560	<1.37	--	<1.55	--	--	<0.667	--	--	--	--	--
2-Chlorophenol	µg/L	40	<1.16	--	<1.31	--	--	<0.563	--	--	--	--	--
2-Methylnaphthalene	µg/L	28	<1.37	--	<1.55	--	--	<0.615	--	--	--	--	--
2-Methylphenol (o-Cresol)	µg/L	35	<1.05	--	<1.19	--	--	<0.677	--	--	--	--	--
2-Naphthylamine	µg/L	0.097	<0.905	--	<1.02	--	--	<2.19	--	--	--	--	--
2-Nitroaniline	µg/L	NS	<1.26	--	<1.43	--	--	<6.15	--	--	--	--	--
2-Nitrophenol	µg/L	NS	<1.68	--	<1.9	--	--	<7.08	--	--	--	--	--
3,3'-Dichlorobenzidine	µg/L	0.39	<1.89	--	<2.14	--	--	<1.46	--	--	--	--	--
3,3'-Dimethylbenzidine	µg/L	NS	<2.11	--	<2.38	--	--	<3.56	--	--	--	--	--
3/4-Methylphenol	µg/L	70	<0.8	--	<0.905	--	--	<0.729	--	--	--	--	--
3-Methylcholanthrene	µg/L	NS	<2.63	--	<2.98	--	--	<0.333	--	--	--	--	--
3-Nitroaniline	µg/L	NS	<1.05	--	<1.19	--	--	<2.81	--	--	--	--	--
4,6-Dinitro-2-methylphenol	µg/L	NS	<2.63	--	<2.98	--	--	<7.19	--	--	--	--	--
4-Aminobiphenyl	µg/L	0.0003	<1.01	--	<1.14	--	--	<2.29	--	--	--	--	--
4-Bromophenyl phenyl ether	µg/L	NS	<2	--	<2.26	--	--	<0.729	--	--	--	--	--
4-Chloro-3-methylphenol	µg/L	700	<1	--	<1.13	--	--	<0.875	--	--	--	--	--
4-Chloroaniline	µg/L	28	<1.26	--	<1.43	--	--	<0.646	--	--	--	--	--
4-Chlorophenyl phenyl ether	µg/L	NS	<1.37	--	<1.55	--	--	<0.719	--	--	--	--	--
4-Nitroaniline	µg/L	NS	<1.79	--	<2.02	--	--	<1.35	--	--	--	--	--
4-Nitrophenol	µg/L	60	<2.63	--	<2.98	--	--	<7.92	--	--	--	--	--
5-Nitro-o-toluidine	µg/L	NS	<3.26	--	<3.69	--	--	<2.92	--	--	--	--	--
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<0.968	--	<1.1	--	--	<1.98	--	--	--	--	--
Acenaphthene	µg/L	420	<1.37	--	<1.55	--	--	<0.667	--	--	--	--	--
Acenaphthylene	µg/L	210	<1.37	--	<1.55	--	--	<0.75	--	--	--	--	--
Acetophenone	µg/L	NS	<3.16	--	<3.57	--	--	<0.719	--	--	--	--	--
Anthracene	µg/L	2100	<1.16	--	<1.31	--	--	<0.906	--	--	--	--	--
Benzo (a) anthracene	µg/L	0.24	<1.16	--	<1.31	--	--	<0.885	--	--	--	--	--
Benzo (a) pyrene	µg/L	0.2	<1.58	--	<1.79	--	--	<8.44	--	--	--	--	--
Benzo (b) fluoranthene	µg/L	0.24	<1.26	--	<1.43	--	--	<5.1	--	--	--	--	--
Benzo (g,h,i) perylene	µg/L	21	<1.68	--	<1.9	--	--	<6.56	--	--	--	--	--
Benzo (k) fluoranthene	µg/L	2.4	<1.26	--	<1.43	--	--	<2.29	--	--	--	--	--
Benzyl alcohol	µg/L	700	<1.16	--	<1.31	--	--	<1.35	--	--	--	--	--
Bis(2-chloroethoxy)methane	µg/L	NS	<1.16	--	<1.31	--	--	<0.792	--	--	--	--	--
Bis(2-chloroethyl)ether	µg/L	0.16	<1.16	--	<1.31	--	--	<0.854	--	--	--	--	--
Bis(2-chloroisopropyl) ether	µg/L	300	<1.26	--	<1.43	--	--	<0.563	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	µg/L	6	<2.74	--	<3.1	--	--	<5.73	--	--	--	--	--
Butyl benzyl phthalate	µg/L	140	<1.58	--	<1.79	--	--	<5.63	--	--	--	--	--
Chlorobenzilate	µg/L	NS	<3.05	--	<3.45	--	--	<3.75	--	--	--	--	--
Chrysene	µg/L	24	<1.16	--	<1.31	--	--	<0.906	--	--	--	--	--
Diallate (cis or trans)	µg/L	NS	<1.37	--	<1.55	--	--	<4.17	--	--	--	--	--
Dibenzo (a,h) anthracene	µg/L	0.024	<2	--	<2.26	--	--	<4.06	--	--	--	--	--
Dibenzofuran	µg/L	7	<1.26	--	<1.43	--	--	<0.771	--	--	--	--	--
Diethyl phthalate	µg/L	5600	<1.16	--	<1.31	--	--	<1.77	--	--	--	--	--
Dimethoate	µg/L	1.4	<1.05	--	<1.19	--	--	<3.75	--	--	--	--	--
Dimethyl phthalate	µg/L	NS	<2.63	--	<2.98	--	--	<1.04	--	--	--	--	--
Di-n-butyl phthalate	µg/L	700	<1.26	--	<1.43	--	--	<5.83	--	--	--	--	--
Di-n-octyl phthalate	µg/L	140	<3.16	--	<3.57	--	--	<7.29	--	--	--	--	--
Dinoseb	µg/L	7	<0.526	--	<0.595	--	--	<2.5	--	--	--	--	--
Diphenylamine	µg/L	180	<0.926	--	<1.05	--	--	<6.25	--	--	--	--	--
Disulfoton	µg/L	0.7	<0.674	--	<0.762	--	--	<2.5	--	--	--	--	--
Ethyl Methanesulfonate	µg/L	NS	<0.526	--	<0.595	--	--	<3.75	--	--	--	--	--
Famphur	µg/L	NS	<0.674	--	<0.762	--	--	<3.96	--	--	--	--	--
Fluoranthene	µg/L	280	<0.989	--	<1.12	--	--	<1.77	--	--	--	--	--
Fluorene	µg/L	280	<1.37	--	<1.55	--	--	<0.823	--	--	--	--	--
Hexachlorobenzene	µg/L	1	<1.47	--	<1.67	--	--	<0.729	--	--	--	--	--
Hexachlorobutadiene	µg/L	1	<1.26	--	<1.43	--	--	<0.896	--	--	--	--	--
Hexachlorocyclopentadiene	µg/L	50	<2.21	--	<2.5	--	--	<3.35	--	--	--	--	--
Hexachloroethane	µg/L	1	<1.37	--	<1.55	--	--	<1.91	--	--	--	--	--
Hexachloropropene	µg/L	NS	<1.68	--	<1.9	--	--	<2.71	--	--	--	--	--
Indeno(1,2,3-cd) pyrene	µg/L	0.24	<2.11	--	<2.38	--	--	<4.38	--	--	--	--	--
Isodrin	µg/L	NS	<0.611	--	<0.69	--	--	<4.9	--	--	--	--	--
Isophorone	µg/L	100	<1.04	--	<1.18	--	--	<0.969	--	--	--	--	--
Isosafrole	µg/L	NS	<0.526	--	<0.595	--	--	<2.4	--	--	--	--	--
Kepone	µg/L	NS	<1.89	--	<2.14	--	--	<1.04	--	--	--	--	--
Methapyrilene	µg/L	NS	<2	--	<2.26	--	--	<0.792	--	--	--	--	--
Methyl Methanesulfonate	µg/L	1.8	<0.526	--	<0.595	--	--	<3.44	--	--	--	--	--
Nitrobenzene	µg/L	14	<1.16	--	<1.31	--	--	<0.833	--	--	--	--	--
N-Nitrosodiethylamine	µg/L	NS	<0.526	--	<0.595	--	--	<3.54	--	--	--	--	--
N-Nitrosodimethylamine	µg/L	0.0034	<0.958	--	<1.08	--	--	<0.75	--	--	--	--	--
N-Nitrosodi-n-butylamine	µg/L	0.032	<0.526	--	<0.595	--	--	<4.06	--	--	--	--	--
N-Nitrosodi-n-propylamine	µg/L	NS	<1.05	--	<1.19	--	--	<0.958	--	--	--	--	--
N-Nitrosodiphenylamine	µg/L	36	<1	--	<1.13	--	--	<0.781	--	--	--	--	--
N-Nitrosomethylethylamine	µg/L	0.008	<1.37	--	<1.55	--	--	<5.1	--	--	--	--	--
N-Nitrosopiperidine	µg/L	NS	<0.526	--	<0.595	--	--	<2.85	--	--	--	--	--
N-Nitrosopyrrolidine	µg/L	0.083	<0.526	--	<0.595	--	--	<3.75	--	--	--	--	--
O,O,O-Triethylphosphorothioate	µg/L	NS	<0.526	--	<0.595	--	--	<3.02	--	--	--	--	--
o-Toluidine	µg/L	11	<0.705	--	<0.798	--	--	<3.02	--	--	--	--	--
p-(Dimethylamino)azobenzene	µg/L	NS	<0.821	--	<0.929	--	--	<2.29	--	--	--	--	--
Parathion ethyl	µg/L	NS	<1.68	--	<1.9	--	--	<2.29	--	--	--	--	--
Parathion methyl	µg/L	1	<0.789	--	<0.893	--	--	<2.4	--	--	--	--	--
Pentachlorobenzene	µg/L	NS	<0.611	--	<0.69	--	--	<2.92	--	--	--	--	--
Pentachloronitrobenzene	µg/L	NS	<0.526	--	<0.595	--	--	<6.04	--	--	--	--	--
Pentachlorophenol	µg/L	1	<2.42	--	<2.74	--	--	<10	--	--	--	--	--
Phenacetin	µg/L	NS	<1.89	--	<2.14	--	--	<1.98	--	--	--	--	--
Phenanthrene	µg/L	210	<1.16	--	<1.31	--	--	<0.823	--	--	--	--	--
Phenol	µg/L	2000	<2.53	--	<2.86	--	--	<1.15	--	--	--	--	--
Phorate	µg/L	1.4	<0.526	--	<0.595	--	--	<3.33	--	--	--	--	--
Pronamide	µg/L	5	<0.526	--	<0.595	--	--	<2.81	--	--	--	--	--
Pyrene	µg/L	210	<1.47	--	<1.67	--	--	<0.823	--	--	--	--	--
Safrole	µg/L	NS	<0.526	--	<0.595	--	--	<2.92	--	--	--	--	--
Thionazin	µg/L	NS	<0.8	--	<0.905	--	--	<3.65	--	--	--	--	--
Volatile Organic Compounds													
1,1-Dichloropropene	µg/L	NS	<0.43	--	<0.43	--	--	<0.43	--	--	--	--	--
1,2,4-Trichlorobenzene	µg/L	70	<0.75	--	<0.75	--	--	<0.75	--	--	--	--	--
1,3-Dichlorobenzene	µg/L	600	<0.3	--	<0.3	--	--	<0.3	--	--	--	--	--
1,3-Dichloropropane	µg/L	NS	<0.4	--	<0.4	--	--	<0.4	--	--	--	--	--
2,2-Dichloropropane	µg/L	NS	<0.69	--	<0.69	--	--	<0.69	--	--	--	--	--
Acrolein	µg/L	NS	<3.6	--	<3.6	--	--	<3.6	--	--	--	--	--
Allyl chloride	µg/L	NS	<0.7	--	<0.7	--	--	<0.7	--	--	--	--	--
Chloroprene	µg/L	NS	<0.23	--	<0.23	--	--	<0.23	--	--	--	--	--
Dichlorodifluoromethane	µg/L	1000	<0.25	--	<0.25	--	--	<0.25	--	--	--	--	--
Ethyl Methacrylate	µg/L	NS	<0.68	--	<0.68	--	--	<0.68	--	--	--	--	--
Methacrylonitrile	µg/L	NS	<3.3	--	<3.3	--	--	<3.3	--	--	--	--	--
Methyl Methacrylate	µg/L	NS	<0.76	--	<0.76	--	--	<0.76	--	--	--	--	--
Naphthalene	µg/L	100	<3	--	<3	--	--	<3	--	--	--	--	--
Propionitrile	µg/L	NS	<3.4	--	<3.4	--	--	<3.4	--	--	--	--	--

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-33A

Parameter Name	Units	GPS	DL	Nov-19	Feb-20	Jun-20	Aug-20	Nov-20	Jun-21	Aug-21	Sep-21	Mar-22	Sep-22	Jun-23	Nov-23	Jun-24	Aug-24	Dec-24
Appendix I Inorganics																		
Total Suspended Solids	mg/L	NS	0.581	***47***	***52***	***5.25***	***74***	***8.75***	***50.3***	***29.9***	***8.33***	***7.62***	***14.8***	***4.5***	Dry	***59***	***52***	***43***
Turbidity, Field	NTU	NS	NS	***97.42***	***17.14***	***22.42***	***506.36***	***82.5***	***8.74***	***33.68***	***10.46***	***28.51***	***11.49***	***5.19***	--	***51.45***	***6.21***	***13.51***
Turbidity, Lab	NTU	NS	0.4	***68.8***	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	<0.53	<0.58	<0.51	<0.51	<0.51	<1.1	<1.1	<1.1	***0.846 J***	<0.69	<1	--	<1	--	<1
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	***42.4***	***80.9***	***5.23***	***65.8***	***17.9***	***35.3***	***52.7***	***18.4***	***11.3***	***13.8***	***1.16 J***	--	***24.3***	***51.8***	***112***
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	***144***	***176***	***105***	***203***	***177***	***168***	***149***	***152***	***176***	***138***	***108***	--	***255***	--	***199***
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	--	<0.33	--	<0.33
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	<0.039	<0.039	<0.049	<0.049	<0.049	<0.051	***0.098 J***	<0.051	***0.062 J***	***0.108***	***0.113 J***	--	<0.1	--	<0.1
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	<0.98	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.2	--	<1.2
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	***3***	***2.59***	***0.478 J***	***2.34***	***1.83***	***3.2***	***3.2***	***2.03***	***0.503***	***0.743***	***0.396 J***	--	***4.51***	--	***2.4***
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	<2	<3.2	<1.5	<1.5	<1.5	<1.4	<1.4	<1.4	<1.8	<1.8	<1.8	--	***4.25 J***	--	<1.8
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	<0.27	<0.27	<0.11	***0.316 J***	***0.116 J***	<0.21	***0.303 J***	<0.21	<0.24	<0.24	<0.24	--	***0.692***	--	<0.26
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	***2.65 J***	***2.37 J***	***2.79 J***	***2.89 J***	***3.32 J***	***2.95 J***	***2.95 J***	<1.9	***2.82 J***	***5.16***	<1.9	--	***3.31 J***	--	***2.15 J***
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	<1	<1	<1	<1	<1	<0.96	<0.96	<0.96	***1.56 J***	<0.96	<1.4	--	<1.4	--	<1.4
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.42	<0.42	<0.42	<0.49	<0.49	<0.5	--	<0.5	--	<0.5
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.27	<0.26	<0.26	<0.26	<0.26	<0.26	***0.91 J***	<0.26	<0.26	<0.26	<0.26	--	<0.57	--	<0.57
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	<0.82	<0.82	<0.85	***2.91 J***	***1.16 J***	<1.1	<1.1	<1.1	***1.15 J***	***2.48 J***	<1.1	--	***1.11 J***	--	<1.1
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<6.4	--	<20	--	<9.7
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																		
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	--	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	--	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47	--	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	--	<0.45
1,1-Dichloroethane	µg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	--	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	--	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59	--	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2	--	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34	--	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	--	<0.37
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	--	<0.39
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	--	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23	--	***0.231 J***
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	--	<2.1
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	--	<2
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	--	<2.1
Acetone	µg/L	6300	1.79	<3.1	***3.69 J***	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	--	***37.7***	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2	--	<2.2
Benzene	µg/L	5	0.11	<0.22	<0.22	<0.22	<0.22	***0.614***	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	--	***2.45***
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54	--	<0.54
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	--	<0.39
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	--	<1.1
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	--	<0.45
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65	--	<0.65
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	***1.27***	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	--	***2.37***
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79	--	<0.79
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61	--	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	--	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25	--	<0.25
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75	--	<0.75
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33	--	<0.33
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7	--	<1.7
Ethylbenzene	µg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	--	<0.31
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	--	<7	--	<7
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	***0.819 J***	<0.37	<0.37	<0.37	<0.37	--	<0.37	--	<0.37
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48	--	<0.48
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	--	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	--	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	--	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	--	<1.1
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78	--	<0.78
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	--	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	--	<0.38
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3	--	<1.3
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5	--	<2.5
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	--	<0.18
Xylenes	µg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	--	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-33A

Parameter Name	Units	GPS	Sep-21	Sep-22
Alcohols/Gycols by GC				
Acetonitrile	µg/L	NS	<404	<404
Isobutanol	µg/L	2100	<553	<553
Herbicides (GC)				
2,4,5-T	µg/L	70	<0.161	--
2,4-D	µg/L	70	<0.629	<2
Silvex (2,4,5-TP)	µg/L	50	<0.148	<0.5
Inorganics				
Cyanide	µg/L	200	<5.3	<4.3
Mercury	µg/L	2	<0.15	<0.11
Sulfide	µg/L	NS	<231	<231
Tin	µg/L	4200	<3	<3
PCBs (EPA Method 8082)				
PCB-1016	µg/L	NS	<0.295	<0.177
PCB-1221	µg/L	NS	<0.295	<0.177
PCB-1232	µg/L	NS	<0.295	<0.177
PCB-1242	µg/L	NS	<0.295	<0.177
PCB-1248	µg/L	NS	<0.239	<0.115
PCB-1254	µg/L	NS	<0.239	<0.115
PCB-1260	µg/L	NS	<0.239	<0.115
Pesticides (EPA Method 8081A)				
4,4'-DDD	µg/L	0.73	<0.00955	<0.0281
4,4'-DDE	µg/L	0.51	<0.00966	<0.0281
4,4'-DDT	µg/L	0.51	<0.0136	<0.0438
Aldrin	µg/L	0.01	<0.0136	<0.0333
alpha-BHC	µg/L	0.028	<0.0114	<0.0302
beta-BHC	µg/L	0.042	<0.0148	<0.0385
Chlordane	µg/L	2	<0.25	<0.844
delta-BHC	µg/L	2.1	<0.017	<0.0281
Dieldrin	µg/L	0.011	<0.0136	<0.0271
Endosulfan I	µg/L	42	<0.0125	<0.0344
Endosulfan II	µg/L	42	<0.0092	<0.0302
Endosulfan sulfate	µg/L	NS	<0.00955	<0.0313
Endrin	µg/L	2	<0.0114	<0.0271
Endrin aldehyde	µg/L	2.1	<0.0109	<0.0302
gamma-BHC (Lindane)	µg/L	0.2	<0.0159	<0.0375
Heptachlor	µg/L	0.4	<0.0136	<0.0344
Heptachlor epoxide	µg/L	0.2	<0.0103	<0.0302
Methoxychlor	µg/L	40	<0.0159	<0.0427
Toxaphene	µg/L	3	<0.466	<0.719
Semivolatile Organics by GC/MS				
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<1.68	<0.563
1,3,5-Trinitrobenzene	µg/L	NS	<1.37	<2.4
1,3-Dinitrobenzene	µg/L	1	<1.05	<3.33
1,4-Naphthoquinone	µg/L	NS	<1.03	<3.75
1,4-Phenylenediamine	µg/L	NS	<0.526	<1.98
1-Naphthylamine	µg/L	NS	<0.926	<2.6
2,3,4,6-Tetrachlorophenol	µg/L	NS	<1.04	<5.52
2,4,5-Trichlorophenol	µg/L	700	<1.16	<5.52
2,4,6-Trichlorophenol	µg/L	16	<1.26	<5.21
2,4-Dichlorophenol	µg/L	20	<1.16	<0.885
2,4-Dimethylphenol	µg/L	100	<1.05	<0.604
2,4-Dinitrophenol	µg/L	14	<6	<13.5
2,4-Dinitrotoluene	µg/L	0.25	<1.16	<6.67
2,6-Dichlorophenol	µg/L	NS	<1.16	<0.719
2,6-Dinitrotoluene	µg/L	0.26	<1.16	<0.542
2-Acetylaminofluorene	µg/L	NS	<1.26	<2.81
2-Chloronaphthalene	µg/L	560	<1.37	<0.667
2-Chlorophenol	µg/L	40	<1.16	<0.563
2-Methylnaphthalene	µg/L	28	<1.37	<0.615
2-Methylphenol (o-Cresol)	µg/L	35	<1.05	<0.677
2-Naphthylamine	µg/L	0.097	<0.905	<2.19
2-Nitroaniline	µg/L	NS	<1.26	<6.15
2-Nitrophenol	µg/L	NS	<1.68	<7.08
3,3'-Dichlorobenzidine	µg/L	0.39	<1.89	<1.46
3,3'-Dimethylbenzidine	µg/L	NS	<2.11	<1.56
3/4-Methylphenol	µg/L	70	<0.8	<0.729
3-Methylcholanthrene	µg/L	NS	<2.63	<0.333
3-Nitroaniline	µg/L	NS	<1.05	<2.81
4,6-Dinitro-2-methylphenol	µg/L	NS	<2.63	<7.19
4-Aminobiphenyl	µg/L	0.0083	<1.01	<2.29
4-Bromophenyl phenyl ether	µg/L	NS	<2	<0.729
4-Chloro-3-methylphenol	µg/L	700	<1	<0.875
4-Chloroaniline	µg/L	28	<1.26	<0.646
4-Chlorophenyl phenyl ether	µg/L	NS	<1.37	<0.719
4-Nitroaniline	µg/L	NS	<1.79	<1.35
4-Nitrophenol	µg/L	60	<2.63	<7.92
5-Nitro-o-toluidine	µg/L	NS	<3.26	<2.92
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<0.968	<1.98
Acenaphthene	µg/L	420	<1.37	<0.667
Acenaphthylene	µg/L	210	<1.37	<0.75
Acetophenone	µg/L	NS	<3.16	<0.719
Anthracene	µg/L	2100	<1.16	<0.906
Benzo (a) anthracene	µg/L	0.24	<1.16	<0.885
Benzo (a) pyrene	µg/L	0.2	<1.58	<8.44
Benzo (b) fluoranthene	µg/L	0.24	<1.26	<5.1
Benzo (g,h,i) perylene	µg/L	21	<1.68	<6.56
Benzo (k) fluoranthene	µg/L	2.4	<1.26	<2.29
Benzyl alcohol	µg/L	700	<1.16	<1.35
Bis(2-chloroethoxy)methane	µg/L	NS	<1.16	<0.792
Bis(2-chloroethyl)ether	µg/L	0.16	<1.16	<0.854
Bis(2-chloroisopropyl) ether	µg/L	300	<1.26	<0.563
Bis(2-ethylhexyl)phthalate	µg/L	6	<2.74	<5.73
Butyl benzyl phthalate	µg/L	140	<1.58	<5.63
Chlorobenzilate	µg/L	NS	<3.05	<3.75
Chrysene	µg/L	24	<1.16	<0.906
Diallate (cis or trans)	µg/L	NS	<1.37	<4.17
Dibenzo (a,h) anthracene	µg/L	0.024	<2	<4.06
Dibenzofuran	µg/L	7	<1.26	<0.771
Diethyl phthalate	µg/L	5600	<1.16	<1.77
Dimethoate	µg/L	1.4	<1.05	<3.75
Dimethyl phthalate	µg/L	NS	<2.63	<1.04
Di-n-butyl phthalate	µg/L	700	<1.26	<5.83
Di-n-octyl phthalate	µg/L	140	<3.16	<7.29
Dinoseb	µg/L	7	<0.526	<2.5
Diphenylamine	µg/L	180	<0.926	<6.25
Disulfoton	µg/L	0.7	<0.674	<2.5
Ethyl Methanesulfonate	µg/L	NS	<0.526	<3.75
Famphur	µg/L	NS	<0.674	<3.96
Fluoranthene	µg/L	280	<0.989	<1.77
Fluorene	µg/L	280	<1.37	<0.823
Hexachlorobenzene	µg/L	1	<1.47	<0.729
Hexachlorobutadiene	µg/L	1	<1.26	<0.896
Hexachlorocyclopentadiene	µg/L	50	<2.21	<5.31
Hexachloroethane	µg/L	1	<1.37	<1.01
Hexachloropropene	µg/L	NS	<1.68	<2.71
Indeno (1,2,3-cd) pyrene	µg/L	0.24	<2.11	<4.38
Isodrin	µg/L	NS	<0.611	<4.9
Isophorone	µg/L	100	<1.04	<0.969
Isosafrole	µg/L	NS	<0.526	<2.4
Kepone	µg/L	NS	<1.89	<1.04
Methapyrilene	µg/L	NS	<2	<0.792
Methyl Methanesulfonate	µg/L	1.8	<0.526	<3.44
Nitrobenzene	µg/L	14	<1.16	<0.833
N-Nitrosodiethylamine	µg/L	NS	<0.526	<3.54
N-Nitrosodimethylamine	µg/L	0.0034	<0.958	<0.75
N-Nitrosodi-n-butylamine	µg/L	0.032	<0.526	<4.06
N-Nitrosodi-n-propylamine	µg/L	NS	<1.05	<0.958
N-Nitrosodiphenylamine	µg/L	36	<1	<0.781
N-Nitrosomethylethylamine	µg/L	0.008	<1.37	<5.1
N-Nitrosopiperidine	µg/L	NS	<0.526	<2.81
N-Nitrosopyrrolidine	µg/L	0.083	<0.526	<3.75
O,O,O-Triethyl phosphorothioate	µg/L	NS	<0.526	<3.33
o-Toluidine	µg/L	11	<0.705	<3.02
p-(Dimethylamino)azobenzene	µg/L	NS	<0.821	<2.29
Parathion-ethyl	µg/L	NS	<1.68	<2.29
Parathion-methyl	µg/L	1	<0.789	<2.4
Pentachlorobenzene	µg/L	NS	<0.611	<2.92
Pentachloronitrobenzene	µg/L	NS	<0.526	<6.04
Pentachlorophenol	µg/L	1	<2.42	<10
Phenacetin	µg/L	NS	<1.89	<1.98
Phenanthrene	µg/L	210	<1.16	<0.823
Phenol	µg/L	2000	<2.53	<1.15
Phorate	µg/L	1.4	<0.526	<3.33
Pronamide	µg/L	5	<0.526	<2.81
Pyrene	µg/L	210	<1.47	<0.823
Safrole	µg/L	NS	<0.526	<2.92
Thionazin	µg/L	NS	<0.8	<3.65
Volatile Organic Compounds				
1,1-Dichloropropene	µg/L	NS	<0.43	<0.43
1,2,4-Trichlorobenzene	µg/L	70	<0.75	<0.75
1,3-Dichlorobenzene	µg/L	600	<0.3	<0.3
1,3-Dichloropropane	µg/L	NS	<0.4	<0.4
2,2-Dichloropropane	µg/L	NS	<0.69	<0.69
Acrolein	µg/L	NS	<3.6	<3.6
Allyl chloride	µg/L	NS	<0.7	<0.7
Chloroprene	µg/L	NS	<0.23	<0.23
Dichlorodifluoromethane	µg/L	1000	<0.25	<0.25
Ethyl Methacrylate	µg/L	NS	<0.68	<0.68
Methacrylonitrile	µg/L	NS	<3.3	<3.3
Methyl Methacrylate	µg/L	NS	<0.76	<0.76
Naphthalene	µg/L	100	<3	<3
Propionitrile	µg/L	NS	<3.4	<3.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-34A

Parameter Name	Units	GPS	DL	Nov-19	Feb-20	Jul-20	Aug-20	Nov-20	Jun-21	Sep-21	Mar-22	Sep-22	Jun-23	Nov-23	Jul-24	Dec-24
Appendix I Inorganics																
Total Suspended Solids	mg/L	NS	0.581	***1.88***	***4.5***	***3.13***	***1.63 J***	***1.25 J***	***2.75***	***2***	***2.88***	<2.22	***2.5***	***2.25***	<1.39	***6***
Turbidity, Field	NTU	NS	NS	***1.46***	***6.78***	***5.06***	***5.97***	***5***	***2.73***	***10.46***	***8.91***	***12.61***	***2***	***4.28***	***5.88***	***8.37***
Turbidity, Lab	NTU	NS	0.4	***1.43***	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	μg/L	6	0.185	<0.53	<0.58	<0.51	<0.51	<0.51	<1.1	<1.1	<0.69	<0.69	<1	<1	<1	<1
Antimony, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	μg/L	10	0.505	<0.75	<0.88	<0.88	<0.88	<0.88	<0.75	<0.75	<0.75	<0.75	<0.53	<0.53	<0.53	<0.53
Arsenic, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	μg/L	2000	1.04	***80.4***	***80***	***76.3***	***75.2***	***73.6***	***76.9***	***74.9***	***69.7***	***79.5***	***65.5***	***69.3***	***70.1***	***67.5***
Barium, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	μg/L	4	0.125	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33	<0.33
Beryllium, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	μg/L	5	0.0441	<0.039	<0.039	<0.049	<0.049	<0.049	<0.051	<0.051	<0.055	<0.055	<0.1	<0.1	<0.1	<0.1
Cadmium, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	μg/L	100	0.729	***1.37 J***	***1.66 J***	***1.63 J***	***3.06 J***	***1.36 J***	***1.29 J***	<1.1	***1.56 J***	***1.81 J***	***1.48 J***	***1.96 J***	***1.31 J***	***1.88 J***
Chromium, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	μg/L	3.4	0.0453	<0.091	***0.122 J***	<0.091	<0.091	<0.091	<0.091	<0.19	<0.19	<0.19	<0.17	<0.17	<0.17	<0.17
Cobalt, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	μg/L	1300	2.19	<2	<3.2	<1.5	<1.5	<1.5	<1.4	<1.4	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Copper, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	μg/L	15	0.324	<0.27	<0.27	<0.11	<0.11	<0.11	<0.21	<0.21	<0.24	<0.24	<0.24	<0.24	<0.26	<0.26
Lead, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	μg/L	100	0.929	<1.7	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<2.1	<2.1
Nickel, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	μg/L	50	0.928	***1.85 J***	***1.95 J***	***1.23 J***	<1	***1.69 J***	***1.59 J***	***1.59 J***	***1.74 J***	***2.27 J***	***1.46 J***	***2.12 J***	<1.4	***2.01 J***
Selenium, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	μg/L	100	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.42	<0.42	<0.49	***0.747 J***	<0.5	<0.5	<0.5	<0.5
Silver, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	μg/L	2	0.0644	<0.27	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.57	<0.57
Thallium, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	μg/L	35	0.84	<0.82	<0.82	<0.85	***1.72 J***	<0.85	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Vanadium, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	μg/L	2000	11.5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<6.4	***8.31 J***	<9.7	<9.7
Zinc, Dissolved	μg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																
1,1,1,2-Tetrachloroethane	μg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	μg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	μg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	μg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
1,1-Dichloroethane	μg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
1,1-Dichloroethylene	μg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	μg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	μg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	μg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	μg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
1,2-Dichloroethane	μg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
1,2-Dichloropropane	μg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	μg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
2-Butanone	μg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
2-Hexanone	μg/L	NS	0.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
4-Methyl-2-pentanone	μg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
Acetone	μg/L	6300	1.79	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1
Acrylonitrile	μg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
Benzene	μg/L	5	0.11	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
Bromochloromethane	μg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54
Bromodichloromethane	μg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
Bromomethane	μg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Carbon disulfide	μg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
Carbon Tetrachloride	μg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65
Chlorobenzene	μg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chloroethane	μg/L	2800	0.15	<0.79	***4.44***	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79
Chloromethane	μg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	μg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	μg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Dibromochloromethane	μg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75
Dibromomethane	μg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Dichloromethane	μg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Ethylbenzene	μg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Iodomethane	μg/L	NS	0.8	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
Styrene	μg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
Tetrachloroethylene	μg/L	5	0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48
Toluene	μg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	μg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	μg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	μg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Tribromomethane	μg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78
Trichloroethylene	μg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trichlorofluoromethane	μg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
Trichloromethane	μg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Vinyl Acetate	μg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Vinyl Chloride	μg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Xylenes	μg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4	***0.499 J***	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-37A

Parameter Name	Units	GPS	DL	Sep-21	Dec-21	Mar-22	Jun-22	Aug-22	Dec-22	Jun-23	Nov-23	Jun-24	Dec-24
Appendix I Inorganics													
Total Suspended Solids	mg/L	NS	0.581	***159***	***45.6***	***17.3***	***31.3***	***1 J***	***4.88***	***26.5***	Dry	***4.62***	***18***
Turbidity, Field	NTU	NS	NS	***97.89***	***47.38***	***16.61***	***9.81***	0	***10.27***	***26.51***	--	***11.39***	***1.87***
Turbidity, Lab	NTU	NS	0.4	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	<1.1	<1.1	<0.69	<0.69	<0.69	<0.69	<1	--	<1	<1
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	***1.38 J***	<0.75	***4.57***	<0.75	<0.75	***0.91 J***	***0.53 J***	--	***1.62 J***	***153***
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	***202***	***137***	***273***	***144***	***122***	***247***	***111***	--	***134***	***849***
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	--	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	***0.052 J***	<0.051	<0.055	<0.055	<0.055	<0.055	<0.1	--	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	***1.5 J***	***1.16 J***	<1.1	***1.57 J***	***1.33 J***	<1.1	***1.33 J***	--	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	***0.681***	***0.194 J***	***0.263 J***	<0.19	<0.19	<0.19	***0.179 J***	--	***0.714***	***9.58***
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	***2.5 J***	<1.4	<1.8	<1.8	<1.8	<1.8	<1.8	--	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	***1.06***	***0.275 J***	<0.24	<0.24	<0.24	<0.24	***0.244 J***	--	<0.26	<0.26
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	--	<2.1	***4.39 J***
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96	<1.4	--	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	***0.503 J***	<0.42	<0.49	<0.49	<0.49	<0.49	<0.5	--	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	--	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	***1.67 J***	***1.3 J***	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	<10	<10	<10	<10	<10	<10	<6.4	--	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Appendix I Organics													
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23	***0.321 J***
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1
Acetone	µg/L	6300	1.79	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	--	***18.1***	<3.1
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2	<2.2
Benzene	µg/L	5	0.11	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	***6.01***
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	***0.71 J***
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	***0.815 J***	<0.61	--	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7	<7	<7	--	<7	<7
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	***0.94 J***	<0.48	<0.48	<0.48	<0.48	--	<0.48	<0.48
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18
Xylenes	µg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-38A

Parameter Name	Units	GPS	DL	Sep-21	Dec-21	Mar-22	Jun-22	Aug-22	Dec-22	Jun-23	Nov-23	Jun-24	Dec-24
Appendix I Inorganics													
Total Suspended Solids	mg/L	NS	0.581	***8.63***	***14.3***	***2.67 J***	***0.875 J***	<0.638	***1.13 J***	***9.12***	***3.5***	***3.13***	***3***
Turbidity, Field	NTU	NS	NS	***11.36***	***29.12***	***2.49***	***0.08***	***3.12***	0	***6.34***	***1.1***	***1.62***	***15.68***
Turbidity, Lab	NTU	NS	0.4	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	<1.1	<1.1	<0.69	<0.69	<0.69	<0.69	<1	<1	<1	<1
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	<0.75	<0.75	<0.75	***20.8***	<0.75	<0.75	<0.53	<0.53	<0.53	<0.53
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	***148***	***94.3***	***139***	***200***	***133***	***145***	***133***	***141***	***153***	***153***
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	<0.051	<0.051	<0.055	<0.055	<0.055	<0.055	<0.1	<0.1	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	***0.249 J***	<0.19	<0.19	<0.19	<0.19	<0.19	***0.181 J***	<0.17	<0.17	<0.17
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	<1.4	<1.4	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	<0.21	<0.21	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.26	<0.26
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	***2.01 J***	<2.1	<2.1
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	<0.96	<0.96	<0.96	***2.77 J***	<0.96	<0.96	<1.4	<1.4	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	<0.42	<0.42	<0.49	<0.49	<0.49	<0.49	<0.5	<0.5	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	<10	<10	<10	<10	<10	<10	<6.4	<6.4	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Appendix I Organics													
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
Acetone	µg/L	6300	1.79	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
Benzene	µg/L	5	0.11	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	***0.747 J***	<0.61	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	***0.772 J***	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Xylenes	µg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-39A

Parameter Name	Units	GPS	DL	Sep-21	Dec-21	Mar-22	Jun-22	Aug-22	Dec-22	Jun-23	Nov-23	Jun-24	Aug-24	Dec-24
Appendix I Inorganics														
Total Suspended Solids	mg/L	NS	0.581	***54.6***	***45.2***	***3.67 J***	***5.63***	***0.75 J***	***13.3***	***43.7***	***52***	***14.3***	***34.6***	***116***
Turbidity, Field	NTU	NS	NS	***102.71***	***70.75***	***10.72***	***10.22***	***0.51***	***20.65***	***71.92***	***71.35***	***25.54***	***66.58***	***271.18***
Turbidity, Lab	NTU	NS	0.4	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	<1.1	<1.1	<0.69	<0.69	<0.69	<0.69	<1	<1	<1	--	<1
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.53	<0.53	<0.53	--	<0.53
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	***156***	***146***	***144***	***152***	***136***	***149***	***138***	***145***	***152***	--	***156***
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	***0.353 J***	--	<0.33
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	<0.051	<0.051	<0.055	<0.055	<0.055	<0.055	<0.1	<0.1	<0.1	--	<0.1
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.2	--	<1.2
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	***0.857***	***0.382 J***	<0.19	<0.19	<0.19	***0.199 J***	***0.345 J***	<0.17	***0.175 J***	--	***0.812***
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	<1.4	<1.4	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	--	***2.08 J***
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	***0.259 J***	***0.343 J***	<0.24	<0.24	<0.24	<0.24	***0.339 J***	***0.252 J***	<0.26	--	***0.589***
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	***3.68 J***	***2.01 J***	<1.9	<1.9	<1.9	<1.9	<1.9	***2.54 J***	<2.1	--	***2.86 J***
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96	<1.4	<1.4	<1.4	--	<1.4
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	<0.42	<0.42	<0.49	<0.49	<0.49	<0.49	<0.5	<0.5	<0.5	--	<0.5
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.57	--	<0.57
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	<10	<10	<10	<10	<10	<10	<6.4	<6.4	***68.3***	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics														
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45
1,1-Dichloroethane	µg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1
Acetone	µg/L	6300	1.79	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	--	<3.1
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2
Benzene	µg/L	5	0.11	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7
Ethylbenzene	µg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7	<7	<7	<7	<7	--	<7
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	***0.721 J***	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18
Xylenes	µg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-40A

Parameter Name	Units	GPS	DL	Sep-21	Dec-21	Mar-22	Jun-22	Aug-22	Dec-22	Jun-23	Nov-23	Jun-24	Dec-24
Appendix I Inorganics													
Total Suspended Solids	mg/L	NS	0.581	***81.5***	***33***	***12.3***	***21.4***	***47.7***	***24.5***	***6.75***	***8.25***	***7.13***	***22.3***
Turbidity, Field	NTU	NS	NS	***100.92***	***26.96***	***40.36***	***17.09***	***98.21***	***13.86***	***5.58***	***20.13***	***12.07***	***42.5***
Turbidity, Lab	NTU	NS	0.4	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	<1.1	<1.1	<0.69	<0.69	<0.69	<0.69	<1	<1	<1	<1
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	<0.75	***0.759 J***	<0.75	<0.75	<0.75	<0.75	<0.53	***0.558 J***	<0.53	<0.53
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	***279***	***278***	***260***	***257***	***162***	***238***	***216***	***228***	***210***	***215***
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	<0.051	<0.051	<0.055	<0.055	***0.064 J***	<0.055	***0.163 J***	<0.1	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	***3.22***	***1.06***	***1.17***	***0.807***	***1.47***	***2.19***	***1.51***	***1.86***	***1.69***	***2.14***
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	***2.64 J***	<1.4	<1.8	<1.8	***2.08 J***	<1.8	***7.71***	<1.8	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	***0.379 J***	***0.271 J***	<0.24	<0.24	***0.272 J***	<0.24	<0.24	<0.24	<0.26	***0.282 J***
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	***17***	***7.32***	***11***	***7.85***	***10.2***	***12.7***	***19***	***17.4***	***11.1***	***16.8***
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	***1.55 J***	<0.96	<0.96	<0.96	<0.96	<0.96	<1.4	<1.4	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	<0.42	<0.42	<0.49	<0.49	<0.49	<0.49	<0.5	<0.5	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	<1.1	<1.1	***1.12 J***	<1.1	***1.69 J***	<1.1	***1.91 J***	<1.1	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	<10	<10	<10	<10	<10	<10	<6.4	--	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--
Appendix I Organics													
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
Acetone	µg/L	6300	1.79	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	***3.83 J***	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
Benzene	µg/L	5	0.11	***0.543***	***0.768***	<0.22	<0.22	<0.22	***0.994***	<0.22	***0.521***	***0.25 J***	<0.22
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	***0.737 J***	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Xylenes	µg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-40A

Parameter Name	Units	GPS	Nov-23	Jun-24
Alcohols/Gycols by GC				
Acetonitrile	µg/L	NS	<0.57	<2600
Isobutanol	µg/L	2100	<0.55	<2400
Herbicides (GC)				
2,4,5-T	µg/L	70	<0.0668	<0.0625
2,4-D	µg/L	70	<0.257	<0.24
Silvex (2,4,5-TP)	µg/L	50	<0.0226	<0.0212
Inorganics				
Cyanide	µg/L	200	<4.3	<3.5
Mercury	µg/L	2	<0.00014	<0.11
Sulfide	µg/L	NS	<231	<1410
Tin	µg/L	4200	<2.3	<2.3
PCBs (EPA Method 8082)				
PCB-1016	µg/L	NS	<0.16	<0.745
PCB-1221	µg/L	NS	<0.16	<0.745
PCB-1232	µg/L	NS	<0.16	<0.745
PCB-1242	µg/L	NS	<0.16	<0.745
PCB-1248	µg/L	NS	<0.104	<0.627
PCB-1254	µg/L	NS	<0.104	<0.627
PCB-1260	µg/L	NS	<0.104	<0.627
Pesticides (EPA Method 8081A)				
4,4'-DDD	µg/L	0.73	<0.0255	<0.0227
4,4'-DDE	µg/L	0.51	<0.0255	<0.0273
4,4'-DDT	µg/L	0.51	<0.0396	<0.0182
Aldrin	µg/L	0.01	<0.0302	<0.02
alpha-BHC	µg/L	0.028	<0.0274	<0.00909
beta-BHC	µg/L	0.042	<0.0349	<0.0382
Chlordane	µg/L	2	<0.764	<0.355
delta-BHC	µg/L	2.1	<0.0255	<0.0291
Dieldrin	µg/L	0.011	<0.0245	<0.0191
Endosulfan I	µg/L	42	<0.0311	<0.0255
Endosulfan II	µg/L	42	<0.0274	<0.0236
Endosulfan sulfate	µg/L	NS	<0.0283	<0.0164
Endrin	µg/L	2	<0.0245	<0.0255
Endrin aldehyde	µg/L	2.1	<0.0274	<0.0245
gamma-BHC (Lindane)	µg/L	0.2	<0.034	<0.00909
Heptachlor	µg/L	0.4	<0.0311	<0.0209
Heptachlor epoxide	µg/L	0.2	<0.0274	<0.0291
Methoxychlor	µg/L	40	<0.0387	<0.0291
Toxaphene	µg/L	3	<0.651	<0.909
Semivolatile Organics by GC/MS				
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<0.54	<0.563
1,3,5-Trinitrobenzene	µg/L	NS	<2.3	<2.4
1,3-Dinitrobenzene	µg/L	1	<3.2	<3.33
1,4-Naphthoquinone	µg/L	NS	<3.6	<3.75
1,4-Phenylenediamine	µg/L	NS	<1.9	<1.98
1-Naphthylamine	µg/L	NS	<2.5	<2.6
2,3,4,6-Tetrachlorophenol	µg/L	NS	<5.3	<5.52
2,4,5-Trichlorophenol	µg/L	700	<5.3	<5.52
2,4,6-Trichlorophenol	µg/L	16	<5	<5.21
2,4-Dichlorophenol	µg/L	20	<0.85	<0.885
2,4-Dimethylphenol	µg/L	100	<0.58	<0.604
2,4-Dinitrophenol	µg/L	14	<13	<13.5
2,4-Dinitrotoluene	µg/L	0.25	<6.4	<6.67
2,6-Dichlorophenol	µg/L	NS	<0.69	<0.719
2,6-Dinitrotoluene	µg/L	0.26	<0.52	<0.542
2-Acetylaminofluorene	µg/L	NS	<2.7	<2.81
2-Chloronaphthalene	µg/L	560	<0.64	<0.667
2-Chlorophenol	µg/L	40	<0.54	<0.563
2-Methylnaphthalene	µg/L	28	<0.59	<0.615
2-Methylphenol (o-Cresol)	µg/L	35	<0.65	<0.677
2-Naphthylamine	µg/L	0.097	<2.1	<2.19
2-Nitroaniline	µg/L	NS	<5.9	<6.15
2-Nitrophenol	µg/L	NS	<6.8	<7.08
3,3'-Dichlorobenzidine	µg/L	0.39	<1.4	<1.46
3,3'-Dimethylbenzidine	µg/L	NS	<1.5	<1.56
3/4-Methylphenol	µg/L	70	<0.7	<0.729
3-Methylcholanthrene	µg/L	NS	<0.32	<0.333
3-Nitroaniline	µg/L	NS	<2.7	<2.81
4,6-Dinitro-2-methylphenol	µg/L	NS	<6.9	<7.19
4-Aminobiphenyl	µg/L	0.0083	<2.2	<2.29
4-Bromophenyl phenyl ether	µg/L	NS	<0.7	<0.729
4-Chloro-3-methylphenol	µg/L	700	<0.84	<0.875
4-Chloroaniline	µg/L	28	<0.62	<0.646
4-Chlorophenyl phenyl ether	µg/L	NS	<0.69	<0.719
4-Nitroaniline	µg/L	NS	<1.3	<1.35
4-Nitrophenol	µg/L	60	<7.6	<7.92
5-Nitro-o-toluidine	µg/L	NS	<2.8	<2.92
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<1.9	<1.98
Acenaphthene	µg/L	420	<0.64	<0.667
Acenaphthylene	µg/L	210	<0.72	<0.75
Acetophenone	µg/L	NS	<0.69	<0.719
Anthracene	µg/L	2100	<0.87	<0.906
Benzo (a) anthracene	µg/L	0.24	<0.85	<0.885
Benzo (a) pyrene	µg/L	0.2	<8.1	<8.44
Benzo (b) fluoranthene	µg/L	0.24	<4.9	<5.1
Benzo (g,h,i) perylene	µg/L	21	<6.3	<6.56
Benzo (k) fluoranthene	µg/L	2.4	<2.2	<2.29
Benzyl alcohol	µg/L	700	<1.3	<1.35
Bis(2-chloroethoxy)methane	µg/L	NS	<0.76	<0.792
Bis(2-chloroethyl)ether	µg/L	0.16	<0.82	<0.854
Bis(2-chloroisopropyl) ether	µg/L	300	<0.54	<0.563
Bis(2-ethylhexyl)phthalate	µg/L	6	<5.5	<5.73
Butyl benzyl phthalate	µg/L	140	<5.4	<5.63
Chlorobenzilate	µg/L	NS	<3.6	<3.75
Chrysene	µg/L	24	<0.87	<0.906
Diallate (cis or trans)	µg/L	NS	<4	<4.17
Dibenzo (a,h) anthracene	µg/L	0.024	<3.9	<4.06
Dibenzofuran	µg/L	7	<0.74	<0.771
Diethyl phthalate	µg/L	5600	<1.7	<1.77
Dimethoate	µg/L	1.4	<3.6	<3.75
Dimethyl phthalate	µg/L	NS	<1	<1.04
Di-n-butyl phthalate	µg/L	700	<5.6	<5.83
Di-n-octyl phthalate	µg/L	140	<7	<7.29
Dinoseb	µg/L	7	<0.288	<2.5
Diphenylamine	µg/L	180	<6	<6.25
Disulfoton	µg/L	0.7	<2.4	<2.5
Ethyl Methanesulfonate	µg/L	NS	<3.6	<3.75
Famphur	µg/L	NS	<3.8	<3.96
Fluoranthene	µg/L	280	<1.7	<1.77
Fluorene	µg/L	280	<0.79	<0.823
Hexachlorobenzene	µg/L	1	<0.7	<0.729
Hexachlorobutadiene	µg/L	1	<0.86	<0.896
Hexachlorocyclopentadiene	µg/L	50	<5.1	<5.31
Hexachloroethane	µg/L	1	<0.97	<1.01
Hexachloropropene	µg/L	NS	<2.6	<2.71
Indeno (1,2,3-cd) pyrene	µg/L	0.24	<4.2	<4.38
Isodrin	µg/L	NS	<4.7	<4.9
Isophorone	µg/L	100	<0.93	<0.969
Isosafrole	µg/L	NS	<2.3	<2.4
Kepone	µg/L	NS	<1	<1.04
Methapyrilene	µg/L	NS	<0.76	<0.792
Methyl Methanesulfonate	µg/L	1.8	<3.3	<3.44
Nitrobenzene	µg/L	14	<0.8	<0.833
N-Nitrosodiethylamine	µg/L	NS	<3.4	<3.54
N-Nitrosodimethylamine	µg/L	0.0034	<0.72	<0.75
N-Nitrosodi-n-butylamine	µg/L	0.032	<3.9	<4.06
N-Nitrosodi-n-propylamine	µg/L	NS	<0.92	<0.958
N-Nitrosodiphenylamine	µg/L	36	<0.75	<0.781
N-Nitrosomethylethylamine	µg/L	0.008	<4.9	<5.1
N-Nitrosopiperidine	µg/L	NS	<2.7	<2.81
N-Nitrosopyrrolidine	µg/L	0.083	<3.6	<3.75
O,O,O-Triethyl phosphorothioate	µg/L	NS	<3.2	<3.33
o-Toluidine	µg/L	11	<2.9	<3.02
p-(Dimethylamino)azobenzene	µg/L	NS	<2.2	<2.29
Parathion-ethyl	µg/L	NS	<2.2	<2.29
Parathion-methyl	µg/L	1	<2.3	<2.4
Pentachlorobenzene	µg/L	NS	<2.8	<2.92
Pentachloronitrobenzene	µg/L	NS	<5.8	<6.04
Pentachlorophenol	µg/L	1	<9.6	<10
Phenacetin	µg/L	NS	<1.9	<1.98
Phenanthrene	µg/L	210	<0.79	<0.823
Phenol	µg/L	2000	<1.1	<1.15
Phorate	µg/L	1.4	<3.2	<3.33
Pronamide	µg/L	5	<2.7	<2.81
Pyrene	µg/L	210	<0.79	<0.823
Safrole	µg/L	NS	<2.8	<2.92
Thionazin	µg/L	NS	<3.5	<3.65
Volatile Organic Compounds				
1,1-Dichloropropene	µg/L	NS	<0.43	<0.43
1,2,4-Trichlorobenzene	µg/L	70	<0.75	<0.75
1,3-Dichlorobenzene	µg/L	600	<0.3	<0.3
1,3-Dichloropropane	µg/L	NS	<0.4	<0.4
2,2-Dichloropropane	µg/L	NS	<0.69	<0.69
Acrolein	µg/L	NS	<3.6	<3.6
Allyl chloride	µg/L	NS	<0.7	<0.7
Chloroprene	µg/L	NS	<0.23	<0.23
Dichlorodifluoromethane	µg/L	1000	<0.25	<0.25
Ethyl Methacrylate	µg/L	NS	<0.68	<0.68
Methacrylonitrile	µg/L	NS	<3.3	<3.3
Methyl Methacrylate	µg/L	NS	<0.76	<0.76
Naphthalene	µg/L	100	<3	<3
Propionitrile	µg/L	NS	<3.4	<3.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-41A

Parameter Name	Units	GPS	DL	Sep-22	Dec-22	Jun-23	Aug-23	Nov-23	Jan-24	Jul-24	Dec-24
Appendix I Inorganics											
Total Suspended Solids	mg/L	NS	0.581	***4.38***	***3.13***	***4.13***	***3.63***	***1.5 J***	***1.75 J***	***2.63***	***6***
Turbidity, Field	NTU	NS	NS	***12.37***	***2***	***1.78***	***4.4***	***0.57***	***0.98***	***1.73***	***12.99***
Turbidity, Lab	NTU	NS	0.4	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	***0.761 J***	<0.69	<1	<1	<1	--	<1	<1
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	<0.75	<0.75	***0.708 J***	***0.866 J***	<0.53	--	***0.595 J***	***0.967 J***
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	***154***	***143***	***145***	***141***	***169***	--	***125***	***159***
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.27	<0.27	<0.33	<0.33	<0.33	--	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	<0.055	<0.055	<0.1	<0.1	<0.1	--	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	***0.647***	***0.415 J***	***0.71***	***0.541***	***1.01***	<0.17	***0.215 J***	***0.211 J***
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	<1.8	<1.8	<1.8	<1.8	<1.8	--	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	<0.24	<0.24	<0.24	<0.24	<0.24	--	<0.26	<0.26
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	<1.9	<1.9	<1.9	<1.9	<1.9	--	<2.1	<2.1
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	<0.96	<0.96	<1.4	<1.4	<1.4	--	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	<0.49	<0.49	<0.5	<0.5	<0.5	--	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.26	<0.26	<0.26	<0.26	<0.26	--	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	<10	<10	<6.4	<6.4	<6.4	--	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Appendix I Organics											
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2	--	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1
Acetone	µg/L	6300	1.79	<3.1	<3.1	<3.1	<3.1	<3.1	--	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2	<2.2
Benzene	µg/L	5	0.11	<0.22	***0.323 J***	<0.22	<0.22	<0.22	--	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7	--	<7	<7
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48	<0.48
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18
Xylenes	µg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-42A

Parameter Name	Units	GPS	DL	Aug-22	Dec-22	Jun-23	Aug-23	Nov-23	Jun-24	Dec-24	Feb-25
Appendix I Inorganics											
Total Suspended Solids	mg/L	NS	0.581	***6.25***	***13.3***	***18.6***	***7***	***8***	***4.38***	***14.1***	--
Turbidity, Field	NTU	NS	NS	***18.52***	***6.5***	***17.27***	***3.57***	***8.67***	***9***	***33.63***	***4.29***
Turbidity, Lab	NTU	NS	0.4	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	***0.69 J***	<0.69	<1	<1	<1	<1	<1	--
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	<0.75	***2.96***	<0.53	***0.56 J***	***0.541 J***	<0.53	***0.547 J***	--
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	***281***	***119***	***83.4***	***125***	***101***	***128***	***177***	--
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.27	<0.27	<0.33	<0.33	<0.33	<0.33	<0.33	--
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	***0.281***	<0.055	<0.1	<0.1	<0.1	<0.1	<0.1	--
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	***1.95 J***	<1.1	<1.1	<1.1	<1.1	<1.2	<1.2	--
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	***3.98***	***3.31***	***0.518***	***2.46***	***2.56***	***2.56***	***2.77***	--
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	***9.67***	<1.8	<1.8	<1.8	<1.8	<1.8	***2 J***	--
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	***0.41 J***	<0.24	<0.24	<0.24	<0.24	<0.26	<0.26	--
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	***37.2***	***14.7***	***8.62***	***19.3***	***14.8***	***16.6***	***27.6***	***23.5***
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	<0.96	<0.96	<1.4	<1.4	<1.4	<1.4	<1.4	--
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	<0.49	<0.49	<0.5	<0.5	<0.5	<0.5	<0.5	--
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	***0.385 J***	<0.26	<0.26	<0.26	<0.26	<0.57	<0.57	--
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	<10	<10	<6.4	<6.4	<6.4	<9.7	<9.7	--
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Appendix I Organics											
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--
1,1-Dichloroethane	µg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	--
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2	<2	<2	--
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--
Acetone	µg/L	6300	1.79	***3.14 J***	***3.47 J***	<3.1	<3.1	<3.1	<3.1	<3.1	--
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--
Benzene	µg/L	5	0.11	<0.22	***0.539***	<0.22	<0.22	<0.22	<0.22	<0.22	--
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--
Ethylbenzene	µg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7	<7	<7	--
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--
Xylenes	µg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-42A

Parameter Name	Units	GPS	Jun-24
Alcohols/Gycols by GC			
Acetonitrile	µg/L	NS	<2600
Isobutanol	µg/L	2100	<2400
Herbicides (GC)			
2,4,5-T	µg/L	70	<0.062
2,4-D	µg/L	70	<0.239
Silvex (2,4,5-TP)	µg/L	50	<0.021
Inorganics			
Cyanide	µg/L	200	<3.5
Mercury	µg/L	2	<0.11
Sulfide	µg/L	NS	<1410
Tin	µg/L	4200	<2.3
PCBs (EPA Method 8082)			
PCB-1016	µg/L	NS	<0.742
PCB-1221	µg/L	NS	<0.742
PCB-1232	µg/L	NS	<0.742
PCB-1242	µg/L	NS	<0.742
PCB-1248	µg/L	NS	<0.624
PCB-1254	µg/L	NS	<0.624
PCB-1260	µg/L	NS	<0.624
Pesticides (EPA Method 8081A)			
4,4'-DDD	µg/L	0.73	<0.0226
4,4'-DDE	µg/L	0.51	<0.0271
4,4'-DDT	µg/L	0.51	<0.0181
Aldrin	µg/L	0.01	<0.0199
alpha-BHC	µg/L	0.028	<0.00904
beta-BHC	µg/L	0.042	<0.038
Chlordane	µg/L	2	<0.353
delta-BHC	µg/L	2.1	<0.0289
Dieldrin	µg/L	0.011	<0.019
Endosulfan I	µg/L	42	<0.0253
Endosulfan II	µg/L	42	<0.0235
Endosulfan sulfate	µg/L	NS	<0.0163
Endrin	µg/L	2	<0.0253
Endrin aldehyde	µg/L	2.1	<0.0244
gamma-BHC (Lindane)	µg/L	0.2	<0.00904
Heptachlor	µg/L	0.4	<0.0208
Heptachlor epoxide	µg/L	0.2	<0.0289
Methoxychlor	µg/L	40	<0.0289
Toxaphene	µg/L	3	<0.904
Semivolatile Organics by GC/MS			
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<0.587
1,3,5-Trinitrobenzene	µg/L	NS	<2.5
1,3-Dinitrobenzene	µg/L	1	<3.48
1,4-Naphthoquinone	µg/L	NS	<3.91
1,4-Phenylenediamine	µg/L	NS	<2.07
1-Naphthylamine	µg/L	NS	<2.72
2,3,4,6-Tetrachlorophenol	µg/L	NS	<5.76
2,4,5-Trichlorophenol	µg/L	700	<5.76
2,4,6-Trichlorophenol	µg/L	16	<5.43
2,4-Dichlorophenol	µg/L	20	<0.924
2,4-Dimethylphenol	µg/L	100	<0.63
2,4-Dinitrophenol	µg/L	14	<14.1
2,4-Dinitrotoluene	µg/L	0.25	<6.96
2,6-Dichlorophenol	µg/L	NS	<0.75
2,6-Dinitrotoluene	µg/L	0.26	<0.565
2-Acetylaminofluorene	µg/L	NS	<2.93
2-Chloronaphthalene	µg/L	560	<0.696
2-Chlorophenol	µg/L	40	<0.587
2-Methylnaphthalene	µg/L	28	<0.641
2-Methylphenol (o-Cresol)	µg/L	35	<0.707
2-Naphthylamine	µg/L	0.097	<2.28
2-Nitroaniline	µg/L	NS	<6.41
2-Nitrophenol	µg/L	NS	<7.39
3,3'-Dichlorobenzidine	µg/L	0.39	<1.52
3,3'-Dimethylbenzidine	µg/L	NS	<1.63
3/4-Methylphenol	µg/L	70	<0.761
3-Methylcholanthrene	µg/L	NS	<0.348
3-Nitroaniline	µg/L	NS	<2.93
4,6-Dinitro-2-methylphenol	µg/L	NS	<7.5
4-Aminobiphenyl	µg/L	0.0083	<2.39
4-Bromophenyl phenyl ether	µg/L	NS	<0.761
4-Chloro-3-methylphenol	µg/L	700	<0.913
4-Chloroaniline	µg/L	28	<0.674
4-Chlorophenyl phenyl ether	µg/L	NS	<0.75
4-Nitroaniline	µg/L	NS	<1.41
4-Nitrophenol	µg/L	60	<8.26
5-Nitro-o-toluidine	µg/L	NS	<3.04
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<2.07
Acenaphthene	µg/L	420	<0.696
Acenaphthylene	µg/L	210	<0.783
Acetophenone	µg/L	NS	<0.75
Anthracene	µg/L	2100	<0.946
Benzo (a) anthracene	µg/L	0.24	<0.924
Benzo (a) pyrene	µg/L	0.2	<8.8
Benzo (b) fluoranthene	µg/L	0.24	<5.33
Benzo (g,h,i) perylene	µg/L	21	<6.85
Benzo (k) fluoranthene	µg/L	2.4	<2.39
Benzyl alcohol	µg/L	700	<1.41
Bis(2-chloroethoxy)methane	µg/L	NS	<0.826
Bis(2-chloroethyl)ether	µg/L	0.16	<0.891
Bis(2-chloroisopropyl) ether	µg/L	300	<0.587
Bis(2-ethylhexyl)phthalate	µg/L	6	<5.98
Butyl benzyl phthalate	µg/L	140	<5.87
Chlorobenzilate	µg/L	NS	<3.91
Chrysene	µg/L	24	<0.946
Diallate (cis or trans)	µg/L	NS	<4.35
Dibenzo (a,h) anthracene	µg/L	0.024	<4.24
Dibenzofuran	µg/L	7	<0.804
Diethyl phthalate	µg/L	5600	<1.85
Dimethoate	µg/L	1.4	<3.91
Dimethyl phthalate	µg/L	NS	<1.09
Di-n-butyl phthalate	µg/L	700	<6.09
Di-n-octyl phthalate	µg/L	140	<7.61
Dinoseb	µg/L	7	<2.61
Diphenylamine	µg/L	180	<6.52
Disulfoton	µg/L	0.7	<2.61
Ethyl Methanesulfonate	µg/L	NS	<3.91
Famphur	µg/L	NS	<4.13
Fluoranthene	µg/L	280	<1.85
Fluorene	µg/L	280	<0.859
Hexachlorobenzene	µg/L	1	<0.761
Hexachlorobutadiene	µg/L	1	<0.935
Hexachlorocyclopentadiene	µg/L	50	<5.54
Hexachloroethane	µg/L	1	<1.05
Hexachloropropene	µg/L	NS	<2.83
Indeno (1,2,3-cd) pyrene	µg/L	0.24	<4.57
Isodrin	µg/L	NS	<5.11
Isophorone	µg/L	100	<1.01
Isosafrole	µg/L	NS	<2.5
Kepone	µg/L	NS	<1.09
Methapyrilene	µg/L	NS	<0.826
Methyl Methanesulfonate	µg/L	1.8	<3.59
Nitrobenzene	µg/L	14	<0.87
N-Nitrosodiethylamine	µg/L	NS	<3.7
N-Nitrosodimethylamine	µg/L	0.0034	<0.783
N-Nitrosodi-n-butylamine	µg/L	0.032	<4.24
N-Nitrosodi-n-propylamine	µg/L	NS	<1
N-Nitrosodiphenylamine	µg/L	36	<0.815
N-Nitrosomethylethylamine	µg/L	0.008	<5.33
N-Nitrosopiperidine	µg/L	NS	<2.93
N-Nitrosopyrrolidine	µg/L	0.083	<3.91
O,O,O-Triethyl phosphorothioate	µg/L	NS	<3.48
o-Toluidine	µg/L	11	<3.15
p-(Dimethylamino)azobenzene	µg/L	NS	<2.39
Parathion-ethyl	µg/L	NS	<2.39
Parathion-methyl	µg/L	1	<2.5
Pentachlorobenzene	µg/L	NS	<3.04
Pentachloronitrobenzene	µg/L	NS	<6.3
Pentachlorophenol	µg/L	1	<10.4
Phenacetin	µg/L	NS	<2.07
Phenanthrene	µg/L	210	<0.859
Phenol	µg/L	2000	<1.2
Phorate	µg/L	1.4	<3.48
Pronamide	µg/L	5	<2.93
Pyrene	µg/L	210	<0.859
Safrole	µg/L	NS	<3.04
Thionazin	µg/L	NS	<3.8
Volatile Organic Compounds			
1,1-Dichloropropene	µg/L	NS	<0.43
1,2,4-Trichlorobenzene	µg/L	70	<0.75
1,3-Dichlorobenzene	µg/L	600	<0.3
1,3-Dichloropropane	µg/L	NS	<0.4
2,2-Dichloropropane	µg/L	NS	<0.69
Acrolein	µg/L	NS	<3.6
Allyl chloride	µg/L	NS	<0.7
Chloroprene	µg/L	NS	<0.23
Dichlorodifluoromethane	µg/L	1000	<0.25
Ethyl Methacrylate	µg/L	NS	<0.68
Methacrylonitrile	µg/L	NS	<3.3
Methyl Methacrylate	µg/L	NS	<0.76
Naphthalene	µg/L	100	<3
Propionitrile	µg/L	NS	<3.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-43A

Parameter Name	Units	GPS	DL	Sep-22	Dec-22	Jun-23	Aug-23	Nov-23	Jun-24	Aug-24	Dec-24
Appendix I Inorganics											
Total Suspended Solids	mg/L	NS	0.581	***31.5***	***26***	***30.3***	***39***	***37***	***22***	***28.5***	***29***
Turbidity, Field	NTU	NS	NS	***22.75***	***26.61***	***67.2***	***14.62***	***5***	***3.89***	***11.63***	***12.02***
Turbidity, Lab	NTU	NS	0.4	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	<0.69	<0.69	<1	<4	<1	<1	--	<1
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	***8.06***	***7.34***	***8.28***	***8.85***	***9.81***	***6.28***	--	***6.32***
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	***157***	***167***	***180***	***250***	***274***	***163***	--	***214***
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.27	<0.27	<0.33	<0.33	<0.33	<0.33	--	<0.33
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	<0.055	<0.055	<0.1	<0.1	<0.1	<0.1	--	<0.1
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	<1.1	<1.1	<1.1	<1.1	***12***	<1.2	--	<1.2
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	***3.68***	***3.27***	***4.51***	***4.93***	***4.75***	***3.49***	--	***3.83***
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	<1.8	<1.8	<1.8	<1.8	***6.4***	<1.8	--	<1.8
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	<0.24	<0.24	<0.24	<0.24	<0.24	<0.26	--	<0.26
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	***24.4***	***25.6***	***31***	***41.5***	***36.4***	***17.3***	--	***25.9***
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	<0.96	<0.96	<1.4	<1.4	<1.4	<1.4	--	<1.4
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	<0.49	<0.49	<0.5	<0.5	<0.5	***9.36***	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.26	<0.26	<0.26	<0.26	<0.26	<0.57	--	<0.57
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	<10	<10	<6.4	***8.74 J***	***7.36 J***	<9.7	--	***12.8 J***
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--
Appendix I Organics											
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45
1,1-Dichloroethane	µg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2	<2	--	<2
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1
Acetone	µg/L	6300	1.79	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	--	<3.1
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2
Benzene	µg/L	5	0.11	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7
Ethylbenzene	µg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7	<7	--	<7
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18
Xylenes	µg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-43A

Parameter Name	Units	GPS	Jul-24
Alcohols/Gycols by GC			
Acetonitrile	µg/L	NS	<2600
Isobutanol	µg/L	2100	<2400
Herbicides (GC)			
2,4,5-T	µg/L	70	<0.0734
2,4-D	µg/L	70	<0.282
Silvex (2,4,5-TP)	µg/L	50	<0.0248
Inorganics			
Cyanide	µg/L	200	<3.5
Mercury	µg/L	2	--
Sulfide	µg/L	NS	<1410
Tin	µg/L	4200	<2.3
PCBs (EPA Method 8082)			
PCB-1016	µg/L	NS	<0.716
PCB-1221	µg/L	NS	<0.716
PCB-1232	µg/L	NS	<0.716
PCB-1242	µg/L	NS	<0.716
PCB-1248	µg/L	NS	<0.602
PCB-1254	µg/L	NS	<0.602
PCB-1260	µg/L	NS	<0.602
Pesticides (EPA Method 8081A)			
4,4'-DDD	µg/L	0.73	<0.0218
4,4'-DDE	µg/L	0.51	<0.0262
4,4'-DDT	µg/L	0.51	<0.0175
Aldrin	µg/L	0.01	<0.0192
alpha-BHC	µg/L	0.028	<0.00873
beta-BHC	µg/L	0.042	<0.0367
Chlordane	µg/L	2	<0.34
delta-BHC	µg/L	2.1	<0.0279
Dieldrin	µg/L	0.011	<0.0183
Endosulfan I	µg/L	42	<0.0244
Endosulfan II	µg/L	42	<0.0227
Endosulfan sulfate	µg/L	NS	<0.0157
Endrin	µg/L	2	<0.0244
Endrin aldehyde	µg/L	2.1	<0.0236
gamma-BHC (Lindane)	µg/L	0.2	<0.00873
Heptachlor	µg/L	0.4	<0.0201
Heptachlor epoxide	µg/L	0.2	<0.0279
Methoxychlor	µg/L	40	<0.0279
Toxaphene	µg/L	3	<0.873
Semivolatile Organics by GC/MS			
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<0.675
1,3,5-Trinitrobenzene	µg/L	NS	<2.88
1,3-Dinitrobenzene	µg/L	1	<4
1,4-Naphthoquinone	µg/L	NS	<4.5
1,4-Phenylenediamine	µg/L	NS	<2.38
1-Naphthylamine	µg/L	NS	<3.13
2,3,4,6-Tetrachlorophenol	µg/L	NS	<6.63
2,4,5-Trichlorophenol	µg/L	700	<6.63
2,4,6-Trichlorophenol	µg/L	16	<6.25
2,4-Dichlorophenol	µg/L	20	<1.06
2,4-Dimethylphenol	µg/L	100	<0.725
2,4-Dinitrophenol	µg/L	14	<16.3
2,4-Dinitrotoluene	µg/L	0.25	<8
2,6-Dichlorophenol	µg/L	NS	<0.863
2,6-Dinitrotoluene	µg/L	0.26	<0.65
2-Acetylaminofluorene	µg/L	NS	<3.38
2-Chloronaphthalene	µg/L	560	<0.8
2-Chlorophenol	µg/L	40	<0.675
2-Methylnaphthalene	µg/L	28	<0.738
2-Methylphenol (o-Cresol)	µg/L	35	<0.813
2-Naphthylamine	µg/L	0.097	<2.63
2-Nitroaniline	µg/L	NS	<7.38
2-Nitrophenol	µg/L	NS	<8.5
3,3'-Dichlorobenzidine	µg/L	0.39	<1.75
3,3'-Dimethylbenzidine	µg/L	NS	<1.88
3/4-Methylphenol	µg/L	70	<0.875
3-Methylcholanthrene	µg/L	NS	<0.4
3-Nitroaniline	µg/L	NS	<3.38
4,6-Dinitro-2-methylphenol	µg/L	NS	<8.63
4-Aminobiphenyl	µg/L	0.0083	<2.75
4-Bromophenyl phenyl ether	µg/L	NS	<0.875
4-Chloro-3-methylphenol	µg/L	700	<1.05
4-Chloroaniline	µg/L	28	<0.775
4-Chlorophenyl phenyl ether	µg/L	NS	<0.863
4-Nitroaniline	µg/L	NS	<1.63
4-Nitrophenol	µg/L	60	<9.5
5-Nitro-o-toluidine	µg/L	NS	<3.5
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<2.38
Acenaphthene	µg/L	420	<0.8
Acenaphthylene	µg/L	210	<0.9
Acetophenone	µg/L	NS	<0.863
Anthracene	µg/L	2100	<1.09
Benzo (a) anthracene	µg/L	0.24	<1.06
Benzo (a) pyrene	µg/L	0.2	<10.1
Benzo (b) fluoranthene	µg/L	0.24	<6.13
Benzo (g,h,i) perylene	µg/L	21	<7.88
Benzo (k) fluoranthene	µg/L	2.4	<2.75
Benzyl alcohol	µg/L	700	<1.63
Bis(2-chloroethoxy)methane	µg/L	NS	<0.95
Bis(2-chloroethyl)ether	µg/L	0.16	<1.03
Bis(2-chloroisopropyl) ether	µg/L	300	<0.675
Bis(2-ethylhexyl)phthalate	µg/L	6	<6.88
Butyl benzyl phthalate	µg/L	140	<6.75
Chlorobenzilate	µg/L	NS	<4.5
Chrysene	µg/L	24	<1.09
Diallate (cis or trans)	µg/L	NS	<5
Dibenzo (a,h) anthracene	µg/L	0.024	<4.88
Dibenzofuran	µg/L	7	<0.925
Diethyl phthalate	µg/L	5600	<2.13
Dimethoate	µg/L	1.4	<4.5
Dimethyl phthalate	µg/L	NS	<1.25
Di-n-butyl phthalate	µg/L	700	<7
Di-n-octyl phthalate	µg/L	140	<8.75
Dinoseb	µg/L	7	<3
Diphenylamine	µg/L	180	<7.5
Disulfoton	µg/L	0.7	<3
Ethyl Methanesulfonate	µg/L	NS	<4.5
Famphur	µg/L	NS	<4.75
Fluoranthene	µg/L	280	<2.13
Fluorene	µg/L	280	<0.988
Hexachlorobenzene	µg/L	1	<0.875
Hexachlorobutadiene	µg/L	1	<1.08
Hexachlorocyclopentadiene	µg/L	50	<6.38
Hexachloroethane	µg/L	1	<1.21
Hexachloropropene	µg/L	NS	<3.25
Indeno (1,2,3-cd) pyrene	µg/L	0.24	<5.25
Isodrin	µg/L	NS	<5.88
Isophorone	µg/L	100	<1.16
Isosafrole	µg/L	NS	<2.88
Kepone	µg/L	NS	<1.25
Methapyrilene	µg/L	NS	<0.95
Methyl Methanesulfonate	µg/L	1.8	<4.13
Nitrobenzene	µg/L	14	<1
N-Nitrosodiethylamine	µg/L	NS	<4.25
N-Nitrosodimethylamine	µg/L	0.0034	<0.9
N-Nitrosodi-n-butylamine	µg/L	0.032	<4.88
N-Nitrosodi-n-propylamine	µg/L	NS	<1.15
N-Nitrosodiphenylamine	µg/L	36	<0.938
N-Nitrosomethylethylamine	µg/L	0.008	<6.13
N-Nitrosopiperidine	µg/L	NS	<3.38
N-Nitrosopyrrolidine	µg/L	0.083	<4.5
O,O,O-Triethyl phosphorothioate	µg/L	NS	<4
o-Toluidine	µg/L	11	<3.63
p-(Dimethylamino)azobenzene	µg/L	NS	<2.75
Parathion-ethyl	µg/L	NS	<2.75
Parathion-methyl	µg/L	1	<2.88
Pentachlorobenzene	µg/L	NS	<3.5
Pentachloronitrobenzene	µg/L	NS	<7.25
Pentachlorophenol	µg/L	1	<12
Phenacetin	µg/L	NS	<2.38
Phenanthrene	µg/L	210	<0.988
Phenol	µg/L	2000	<1.38
Phorate	µg/L	1.4	<4
Pronamide	µg/L	5	<3.38
Pyrene	µg/L	210	<0.988
Safrole	µg/L	NS	<3.5
Thionazin	µg/L	NS	<4.38
Volatile Organic Compounds			
1,1-Dichloropropene	µg/L	NS	<0.43
1,2,4-Trichlorobenzene	µg/L	70	<0.75
1,3-Dichlorobenzene	µg/L	600	<0.3
1,3-Dichloropropane	µg/L	NS	<0.4
2,2-Dichloropropane	µg/L	NS	<0.69
Acrolein	µg/L	NS	<3.6
Allyl chloride	µg/L	NS	<0.7
Chloroprene	µg/L	NS	<0.23
Dichlorodifluoromethane	µg/L	1000	<0.25
Ethyl Methacrylate	µg/L	NS	<0.68
Methacrylonitrile	µg/L	NS	<3.3
Methyl Methacrylate	µg/L	NS	<0.76
Naphthalene	µg/L	100	<3
Propionitrile	µg/L	NS	<3.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-44A

Parameter Name	Units	GPS	DL	Sep-22	Dec-22	Jun-23	Aug-23	Nov-23	Jun-24	Dec-24
Appendix I Inorganics										
Total Suspended Solids	mg/L	NS	0.581	***8***	***2.88***	***1.13 J***	***1.5 J***	***0.875 J***	***1.88***	***7.67***
Turbidity, Field	NTU	NS	NS	***1.79***	***2.06***	***10.04***	***1.56***	***0.38***	***2.63***	***9.13***
Turbidity, Lab	NTU	NS	0.4	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	<0.69	<0.69	<1	<1	<1	<1	<1
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	<0.75	<0.75	<0.53	<0.53	***0.666 J***	***0.663 J***	<0.53
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	***168***	***212***	***157***	***239***	***253***	***137***	***159***
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.27	<0.27	<0.33	<0.33	<0.33	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	<0.055	***0.082 J***	***0.306***	***0.416***	***0.795***	***0.389***	***0.181 J***
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	<1.1	<1.1	<1.1	<1.1	<1.1	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	***0.53***	***0.583***	***0.251 J***	***0.603***	***0.327***	***0.423 J***	***0.435 J***
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	<1.8	<1.8	<1.8	<1.8	***2.58 J***	***9.56 J***	<1.8
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	<0.24	<0.24	<0.24	<0.24	<0.24	***0.313 J***	<0.26
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	***21.7***	***51.8***	***28.7***	***70.2***	***66.6***	***21.6***	***34.2***
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	<0.96	<0.96	<1.4	<1.4	<1.4	***1.99 J***	<1.4
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	<0.49	<0.49	<0.5	<0.5	<0.5	***1.01***	<0.5
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.26	<0.26	<0.26	<0.26	<0.26	***0.748 J***	<0.57
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	***13.4 J***	***21.3***	***18.1 J***	***27.3***	***26***	***13.8 J***	***19.5 J***
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--
Appendix I Organics										
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
Acetone	µg/L	6300	1.79	<3.1	<3.1	***3.17 J***	<3.1	<3.1	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
Benzene	µg/L	5	0.11	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7	<7	<7
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Xylenes	µg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-44A

Parameter Name	Units	GPS	Jun-24
Alcohols/Gycols by GC			
Acetonitrile	µg/L	NS	<2600
Isobutanol	µg/L	2100	<2400
Herbicides (GC)			
2,4,5-T	µg/L	70	<0.0745
2,4-D	µg/L	70	<0.286
Silvex (2,4,5-TP)	µg/L	50	<0.0252
Inorganics			
Cyanide	µg/L	200	<3.5
Mercury	µg/L	2	<0.11
Sulfide	µg/L	NS	<1410
Tin	µg/L	4200	***3.28 J***
PCBs (EPA Method 8082)			
PCB-1016	µg/L	NS	<0.745
PCB-1221	µg/L	NS	<0.745
PCB-1232	µg/L	NS	<0.745
PCB-1242	µg/L	NS	<0.745
PCB-1248	µg/L	NS	<0.627
PCB-1254	µg/L	NS	<0.627
PCB-1260	µg/L	NS	<0.627
Pesticides (EPA Method 8081A)			
4,4'-DDD	µg/L	0.73	<0.0227
4,4'-DDE	µg/L	0.51	<0.0273
4,4'-DDT	µg/L	0.51	<0.0182
Aldrin	µg/L	0.01	<0.02
alpha-BHC	µg/L	0.028	<0.00909
beta-BHC	µg/L	0.042	<0.0382
Chlordane	µg/L	2	<0.355
delta-BHC	µg/L	2.1	<0.0291
Dieldrin	µg/L	0.011	<0.0191
Endosulfan I	µg/L	42	<0.0255
Endosulfan II	µg/L	42	<0.0236
Endosulfan sulfate	µg/L	NS	<0.0164
Endrin	µg/L	2	<0.0255
Endrin aldehyde	µg/L	2.1	<0.0245
gamma-BHC (Lindane)	µg/L	0.2	<0.00909
Heptachlor	µg/L	0.4	<0.0209
Heptachlor epoxide	µg/L	0.2	<0.0291
Methoxychlor	µg/L	40	<0.0291
Toxaphene	µg/L	3	<0.909
Semivolatile Organics by GC/MS			
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<0.54
1,3,5-Trinitrobenzene	µg/L	NS	<2.3
1,3-Dinitrobenzene	µg/L	1	<3.2
1,4-Naphthoquinone	µg/L	NS	<3.6
1,4-Phenylenediamine	µg/L	NS	<1.9
1-Naphthylamine	µg/L	NS	<2.5
2,3,4,6-Tetrachlorophenol	µg/L	NS	<5.3
2,4,5-Trichlorophenol	µg/L	700	<5.3
2,4,6-Trichlorophenol	µg/L	16	<5
2,4-Dichlorophenol	µg/L	20	<0.85
2,4-Dimethylphenol	µg/L	100	<0.58
2,4-Dinitrophenol	µg/L	14	<13
2,4-Dinitrotoluene	µg/L	0.25	<6.4
2,6-Dichlorophenol	µg/L	NS	<0.69
2,6-Dinitrotoluene	µg/L	0.26	<0.52
2-Acetylaminofluorene	µg/L	NS	<2.7
2-Chloronaphthalene	µg/L	560	<0.64
2-Chlorophenol	µg/L	40	<0.54
2-Methylnaphthalene	µg/L	28	<0.59
2-Methylphenol (o-Cresol)	µg/L	35	<0.65
2-Naphthylamine	µg/L	0.097	<2.1
2-Nitroaniline	µg/L	NS	<5.9
2-Nitrophenol	µg/L	NS	<6.8
3,3'-Dichlorobenzidine	µg/L	0.39	<1.4
3,3'-Dimethylbenzidine	µg/L	NS	<1.5
3/4-Methylphenol	µg/L	70	<0.7
3-Methylcholanthrene	µg/L	NS	<0.32
3-Nitroaniline	µg/L	NS	<2.7
4,6-Dinitro-2-methylphenol	µg/L	NS	<6.9
4-Aminobiphenyl	µg/L	0.0083	<2.2
4-Bromophenyl phenyl ether	µg/L	NS	<0.7
4-Chloro-3-methylphenol	µg/L	700	<0.84
4-Chloroaniline	µg/L	28	<0.62
4-Chlorophenyl phenyl ether	µg/L	NS	<0.69
4-Nitroaniline	µg/L	NS	<1.3
4-Nitrophenol	µg/L	60	<7.6
5-Nitro-o-toluidine	µg/L	NS	<2.8
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<1.9
Acenaphthene	µg/L	420	<0.64
Acenaphthylene	µg/L	210	<0.72
Acetophenone	µg/L	NS	<0.69
Anthracene	µg/L	2100	<0.87
Benzo (a) anthracene	µg/L	0.24	<0.85
Benzo (a) pyrene	µg/L	0.2	<8.1
Benzo (b) fluoranthene	µg/L	0.24	<4.9
Benzo (g,h,i) perylene	µg/L	21	<6.3
Benzo (k) fluoranthene	µg/L	2.4	<2.2
Benzyl alcohol	µg/L	700	<1.3
Bis(2-chloroethoxy)methane	µg/L	NS	<0.76
Bis(2-chloroethyl)ether	µg/L	0.16	<0.82
Bis(2-chloroisopropyl) ether	µg/L	300	<0.54
Bis(2-ethylhexyl)phthalate	µg/L	6	<5.5
Butyl benzyl phthalate	µg/L	140	<5.4
Chlorobenzilate	µg/L	NS	<3.6
Chrysene	µg/L	24	<0.87
Diallate (cis or trans)	µg/L	NS	<4
Dibenzo (a,h) anthracene	µg/L	0.024	<3.9
Dibenzofuran	µg/L	7	<0.74
Diethyl phthalate	µg/L	5600	<1.7
Dimethoate	µg/L	1.4	<3.6
Dimethyl phthalate	µg/L	NS	<1
Di-n-butyl phthalate	µg/L	700	<5.6
Di-n-octyl phthalate	µg/L	140	<7
Dinoseb	µg/L	7	<2.4
Diphenylamine	µg/L	180	<6
Disulfoton	µg/L	0.7	<2.4
Ethyl Methanesulfonate	µg/L	NS	<3.6
Famphur	µg/L	NS	<3.8
Fluoranthene	µg/L	280	<1.7
Fluorene	µg/L	280	<0.79
Hexachlorobenzene	µg/L	1	<0.7
Hexachlorobutadiene	µg/L	1	<0.86
Hexachlorocyclopentadiene	µg/L	50	<5.1
Hexachloroethane	µg/L	1	<0.97
Hexachloropropene	µg/L	NS	<2.6
Indeno (1,2,3-cd) pyrene	µg/L	0.24	<4.2
Isodrin	µg/L	NS	<4.7
Isophorone	µg/L	100	<0.93
Isosafrole	µg/L	NS	<2.3
Kepone	µg/L	NS	<1
Methapyrilene	µg/L	NS	<0.76
Methyl Methanesulfonate	µg/L	1.8	<3.3
Nitrobenzene	µg/L	14	<0.8
N-Nitrosodiethylamine	µg/L	NS	<3.4
N-Nitrosodimethylamine	µg/L	0.0034	<0.72
N-Nitrosodi-n-butylamine	µg/L	0.032	<3.9
N-Nitrosodi-n-propylamine	µg/L	NS	<0.92
N-Nitrosodiphenylamine	µg/L	36	<0.75
N-Nitrosomethylethylamine	µg/L	0.008	<4.9
N-Nitrosopiperidine	µg/L	NS	<2.7
N-Nitrosopyrrolidine	µg/L	0.083	<3.6
O,O,O-Triethyl phosphorothioate	µg/L	NS	<3.2
o-Toluidine	µg/L	11	<2.9
p-(Dimethylamino)azobenzene	µg/L	NS	<2.2
Parathion-ethyl	µg/L	NS	<2.2
Parathion-methyl	µg/L	1	<2.3
Pentachlorobenzene	µg/L	NS	<2.8
Pentachloronitrobenzene	µg/L	NS	<5.8
Pentachlorophenol	µg/L	1	<9.6
Phenacetin	µg/L	NS	<1.9
Phenanthrene	µg/L	210	<0.79
Phenol	µg/L	2000	<1.1
Phorate	µg/L	1.4	<3.2
Pronamide	µg/L	5	<2.7
Pyrene	µg/L	210	<0.79
Safrole	µg/L	NS	<2.8
Thionazin	µg/L	NS	<3.5
Volatile Organic Compounds			
1,1-Dichloropropene	µg/L	NS	<0.43
1,2,4-Trichlorobenzene	µg/L	70	<0.75
1,3-Dichlorobenzene	µg/L	600	<0.3
1,3-Dichloropropane	µg/L	NS	<0.4
2,2-Dichloropropane	µg/L	NS	<0.69
Acrolein	µg/L	NS	<3.6
Allyl chloride	µg/L	NS	<0.7
Chloroprene	µg/L	NS	<0.23
Dichlorodifluoromethane	µg/L	1000	<0.25
Ethyl Methacrylate	µg/L	NS	<0.68
Methacrylonitrile	µg/L	NS	<3.3
Methyl Methacrylate	µg/L	NS	<0.76
Naphthalene	µg/L	100	<3
Propionitrile	µg/L	NS	<3.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-45A

Parameter Name	Units	GPS	DL	Nov-23	Jan-24	Jul-24	Sep-24	Nov-24
Appendix I Inorganics								
Total Suspended Solids	mg/L	NS	0.581	***2.5***	***1.13 J***	<1.39	***2.63***	***3.25***
Turbidity, Field	NTU	NS	NS	***1.87***	0	***0.67***	***2.16***	***6.59***
Turbidity, Lab	NTU	NS	0.4	--	--	--	--	--
Antimony	µg/L	6	0.185	<1	<1	<1	<1	<1
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--
Arsenic	µg/L	10	0.505	<0.53	<0.53	<0.53	<0.53	<0.53
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--
Barium	µg/L	2000	1.04	***218***	***137***	***103***	***118***	***128***
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.33	<0.33	<0.33	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Cadmium	µg/L	5	0.0441	<0.1	<0.1	<0.1	***0.194 J***	***0.132 J***
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Chromium	µg/L	100	0.729	***2.02 J***	<1.1	<1.2	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	<0.17	***0.263 J***	***0.257 J***	***0.389 J***	***0.296 J***
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--
Copper	µg/L	1300	2.19	<1.8	<1.8	<1.8	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--
Lead	µg/L	15	0.324	<0.24	<0.24	<0.26	***0.265 J***	<0.26
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--
Nickel	µg/L	100	0.929	<1.9	<1.9	<2.1	<2.1	<2.1
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--
Selenium	µg/L	50	0.928	<1.4	<1.4	<1.4	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Silver	µg/L	100	0.14	<0.5	<0.5	<0.5	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.26	<0.26	<0.57	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Vanadium	µg/L	35	0.84	***1.13 J***	<1.1	<1.1	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Zinc	µg/L	2000	11.5	<6.4	***8.46 J***	<9.7	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--
Appendix I Organics								
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1
Acetone	µg/L	6300	1.79	<3.1	<3.1	<3.1	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2
Benzene	µg/L	5	0.11	<0.22	<0.22	<0.22	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	<0.48	<0.48	<0.48
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18
Xylenes	µg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location MW-46A

Parameter Name	Units	GPS	DL	Nov-23	Jan-24	Jun-24	Sep-24	Dec-24
Appendix I Inorganics								
Total Suspended Solids	mg/L	NS	0.581	***11.5***	***36.1***	***10.3***	***26.3***	***19.6***
Turbidity, Field	NTU	NS	NS	***79.73***	***173.01***	***12.22***	***68.05***	***103.12***
Turbidity, Lab	NTU	NS	0.4	--	--	--	--	--
Antimony	µg/L	6	0.185	<1	<1	<1	<1	<1
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--
Arsenic	µg/L	10	0.505	***0.78 J***	***0.984 J***	***0.714 J***	***0.77 J***	***0.805 J***
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--
Barium	µg/L	2000	1.04	***262***	***275***	***213***	***236***	***262***
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.33	<0.33	<0.33	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Cadmium	µg/L	5	0.0441	<0.1	***0.123 J***	<0.1	<0.1	***0.115 J***
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Chromium	µg/L	100	0.729	<1.1	***1.12 J***	<1.2	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	***0.405 J***	***0.253 J***	<0.17	***0.241 J***	***0.288 J***
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--
Copper	µg/L	1300	2.19	<1.8	***2.39 J***	<1.8	***1.99 J***	***1.99 J***
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--
Lead	µg/L	15	0.324	<0.24	***0.393 J***	<0.26	***0.386 J***	***0.307 J***
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--
Nickel	µg/L	100	0.929	***33.8***	***35***	***26.6***	***26.6***	***28.2***
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--
Selenium	µg/L	50	0.928	<1.4	<1.4	<1.4	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Silver	µg/L	100	0.14	<0.5	<0.5	***9.06***	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.26	<0.26	<0.57	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Vanadium	µg/L	35	0.84	<1.1	***2.14 J***	<1.1	***1.17 J***	***1.35 J***
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--
Zinc	µg/L	2000	11.5	<6.4	***7.19 J***	<9.7	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--
Appendix I Organics								
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1
Acetone	µg/L	6300	1.79	<3.1	<3.1	***3.37 J***	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2
Benzene	µg/L	5	0.11	<0.22	<0.22	<0.22	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	<0.48	<0.48	<0.48
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18
Xylenes	µg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-100

This well has been dry for every sampling event since the well was drilled in 2016.

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-101

Parameter Name	Units	GPS	DL	Jun-19	Aug-19	Nov-19	Feb-20	Jun-20	Nov-20	Feb-21	May-21	Sep-21	Mar-22	Sep-22	Jun-23	Aug-23	Nov-23	Jun-24	Dec-24
Appendix I Inorganics																			
Total Suspended Solids	mg/L	NS	0.581	***1.63 J***	***1.25 J***	***1.63 J***	***3.25***	***1.63 J***	***2.63***	***1.88***	***27.6***	***3.13***	Dry	***2***	<1.7	Dry	Dry	***1.75 J***	<1.53
Turbidity, Field	NTU	NS	NS	***0.75***	***3.94***	***2.85***	***1.38***	***1.98***	***1.27***	***1.63***	***480.28***	***6.14***	--	***5.49***	***1.73***	--	--	***4.32***	***3.35***
Turbidity, Lab	NTU	NS	0.4	***0.62 J***	***1.65***	***1.91***	***1.46***	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	<1.32	<1.32	<0.53	<0.58	<0.51	<0.51	--	<1.1	<1.1	--	<0.69	<1	--	--	<1	<1
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	***0.735 J***	***0.506 J***	<0.75	<0.88	<0.88	<0.88	--	<0.75	<0.75	--	<0.75	<0.53	--	--	***0.541 J***	<0.53
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	***196***	***213***	***207***	***194***	***198***	***205***	***191***	***183***	***212***	--	***214***	***175***	--	--	***177***	***221***
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.53	<0.53	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	--	<0.27	<0.33	--	--	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	<0.167	<0.167	***0.045 J***	<0.039	<0.049	<0.049	--	<0.051	<0.051	--	<0.055	<0.1	--	--	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	<1.14	<1.14	<0.98	<1.1	<1.1	<1.1	--	<1.1	<1.1	--	<1.1	<1.1	--	--	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	<0.402	***0.521 J***	***0.48 J***	***0.434 J***	<0.091	***0.113 J***	--	***0.399 J***	***0.241 J***	--	<0.19	***0.232 J***	--	--	***1.36***	***0.189 J***
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	<0.497	<0.497	<2	<3.2	<1.5	<1.5	--	<1.4	<1.4	--	<1.8	<1.8	--	--	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	***0.261 J***	<0.186	<0.27	<0.27	<0.11	<0.11	--	<0.21	<0.21	--	<0.24	<0.24	--	--	<0.26	<0.26
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	***7.24***	***8.82***	***9.54***	***8.93***	***4.61 J***	***7.15***	***10.1***	***10.4***	***8.31***	--	***3.73 J***	***9.62***	--	--	***6.92***	***8.19***
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	<0.982	<0.982	<1	<1	<1	<1	--	<0.96	<0.96	--	<0.96	<1.4	--	--	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	<0.115	<0.115	<0.37	<0.37	<0.37	<0.37	--	<0.42	<0.42	--	<0.49	<0.5	--	--	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.57	<0.57	<0.27	<0.26	<0.26	<0.26	--	<0.26	<0.26	--	<0.26	<0.26	--	--	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	***2.61 J***	<2.15	<0.82	<0.82	<0.85	<0.85	--	<1.1	<1.1	--	<1.1	<1.1	--	--	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	***8.28 J***	***7.3 J***	<10	<10	<10	<10	--	<10	<10	--	<10	<6.4	--	--	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																			
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	--	<0.38	<0.38	--	--	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	--	<0.19	<0.19	--	--	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47	<0.47	--	<0.47	<0.47	--	--	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	--	<0.45	<0.45	--	--	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	--	<0.22	<0.22	--	--	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	--	<0.56	<0.56	--	--	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59	<0.59	--	<0.59	<0.59	--	--	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2	<1.2	--	<1.2	<1.2	--	--	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34	<0.34	--	<0.34	<0.34	--	--	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	--	<0.37	<0.37	--	--	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	--	<0.39	<0.39	--	--	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	--	<0.27	<0.27	--	--	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23	<0.23	--	<0.23	<0.23	--	--	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	--	<2.1	<2.1	--	--	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	<2	<2	--	--	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	--	<2.1	<2.1	--	--	<2.1	<2.1
Acetone	µg/L	6300	1.79	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	--	<3.1	<3.1	--	<3.1	<3.1	--	--	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2	<2.2	--	<2.2	<2.2	--	--	<2.2	<2.2
Benzene	µg/L	5	0.11	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	--	<0.22	<0.22	--	--	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54	<0.54	--	<0.54	<0.54	--	--	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	--	<0.39	<0.39	--	--	<0.39	<0.39
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	--	<1.1	<1.1	--	--	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	--	<0.45	<0.45	--	--	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65	<0.65	--	<0.65	<0.65	--	--	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4	--	<0.4	<0.4	--	--	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79	<0.79	--	<0.79	<0.79	--	--	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61	<0.61	--	<0.61	<0.61	--	--	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	--	<0.21	<0.21	--	--	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25	<0.25	--	<0.25	<0.25	--	--	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75	<0.75	--	<0.75	<0.75	--	--	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33	<0.33	--	<0.33	<0.33	--	--	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7	<1.7	--	<1.7	<1.7	--	--	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	<0.31	--	<0.31	<0.31	--	--	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7	<7	--	<7	<7	--	<7	<7	--	--	<7	<7
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	--	<0.37	<0.37	--	--	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48	<0.48	--	<0.48	<0.48	--	--	<0.48	<0.48
Toluene	µg/L	1000	0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43	--	<0.43	<0.43	--	--	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	--	<0.27	<0.27	--	--	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	--	<0.56	<0.56	--	--	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	--	<1.1	<1.1	--	--	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78	<0.78	--	<0.78	<0.78	--	--	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43	--	<0.43	<0.43	--	--	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	--	<0.38	<0.38	--	--	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3	<1.3	--	<1.3	<1.3	--	--	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	--	<2.5	<2.5	--	--	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18	--	<0.18	<0.18	--	--	<0.18	<0.18
Xylenes	µg/L	10000	0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4	--	<0.4	<0.4	--	--	<0.4	<0.4

Winneshiek County Landfill
Appendix I Results
Monitoring Location GU-1

Parameter Name	Units	GPS	DL	RL	Jul-09	Oct-09	Feb-10	Apr-10	Jun-10	Aug-10	Oct-10	Dec-10	Apr-11	Oct-11	Apr-12	Oct-12	Apr-13	Nov-13	May-14	Nov-14	May-15	Jul-15	Sep-15	Apr-16	Nov-16	May-17	Nov-17	Jun-18	Aug-18	Oct-18	Jun-19	Nov-19	Jul-20	Nov-20	Jun-21	Sep-21	Mar-22	Sep-22	Jun-23	Nov-23	Jul-24	Dec-24
Appendix I Inorganics																																										
Total Suspended Solids	mg/L	NS	0.581	1.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Dry	Dry	***84.5***	***1.63 J***	Dry	***5.75***	***1.5 J***	***3 J***	***1.38 J***	***3.33 J***	--	***5.5***	***3.63***	***3.25***	***4.25***	***1.38 J***	***1.88***	***2.75***	***13.3***	***3.25***	***2.88***	***2***	***1.5 J***	<3.7
Turbidity, Field	NTU	NS	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***73.8***	***1.378***	--	--	***19.21***	***13.29***	***8.973***	***8.72***	***12.82***	***2.63***	***19.87***	***8.12***	***16.24***	***18.27***	***4.79***	***8.49***	***16.37***	***11.29***	***6.93***	***11.21***	***6.49***	***11.73***
Turbidity, Lab	NTU	NS	0.4	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***27***	***4.2***	--	***32.5***	***0.5 J***	***0.9 J***	***1.2***	***8.6***	--	***7.2***	***14.6***	***2.92***	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	1	<6	<6	<6	<6	<6	<6	<6	<6	<6	<2.73	<1.45	***0.67 J***	***0.741 J***	***0.548 J***	--	--	<0.161	--	--	<0.237	<0.237	<0.185	***0.331 J***	***5.76***	***11.5***	<0.42	<1.32	<0.53	<0.51	<0.51	<1.1	<1.1	***2.2***	***1.94 J***	<1	<1	<1	<1
Antimony, Dissolved	µg/L	NS	NS	NS	<6	<6	<6	<6	<6	***8.01***	<6	<6	<6	<2.73	<1.45	***0.65 J***	***0.647 J***	***0.547 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	2	***1.4***	***4.02***	***1.26***	<1	<1	<1	<1	***1.72***	<1	***0.645 J***	***5.81***	***2.29***	***1.3***	***1.9***	--	--	***7.87***	<0.945	--	***0.942 J***	<0.672	<0.505	***0.696 J***	***0.859 J***	--	***0.88 J***	***1.1***	***0.887 J***	<0.88	<0.88	<0.75	<0.75	***1.87 J***	<0.75	<0.53	<0.53	<0.53	<0.53
Arsenic, Dissolved	µg/L	NS	NS	NS	***1.12***	<1	<1	<1	<1	<1	<1	<1	<1	***0.576 J***	<0.216	***3.46***	***1.36***	***2.33***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	2	***254***	***307***	***252***	***240***	***232***	***232***	***306***	***270***	***214***	***251***	***224***	***149***	***187***	***139***	--	--	***514***	--	--	***262***	***242***	***262***	***249***	***253***	--	***222***	***220***	***250***	***222***	***215***	***248***	***220***	***237***	***228***	***209***	***238***	***228***	***241***
Barium, Dissolved	µg/L	NS	NS	NS	***266***	***249***	***241***	***241***	***235***	***234***	***235***	***244***	***229***	***235***	***217***	***156***	***180***	***140***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.051	<0.079	***0.03 J***	<0.0696	<0.0696	--	--	***0.06 J***	--	--	<0.221	<0.221	<0.125	<0.125	<0.19	--	<0.19	<0.53	<0.27	<0.27	<0.27	<0.27	<0.27	***0.863 J***	<0.27	<0.33	<0.33	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	NS	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.051	<0.079	<0.0178	<0.0696	<0.0696	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	<0.064	<0.106	<0.106	--	--	<0.112	--	--	<0.0351	<0.0351	<0.0441	<0.0441	***0.062 J***	--	<0.06	<0.167	<0.039	<0.049	<0.049	***0.051 J***	<0.051	<0.055	<0.055	<0.1	<0.1	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	NS	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	<0.064	<0.106	<0.106	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	5	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.81	<1.81	***2.33 J***	<0.418	<0.418	--	--	<1.24	--	--	<0.355	<0.355	<0.729	<0.729	<0.76	--	***1.06 J***	<1.14	<0.98	<1.1	<1.1	<1.1	<1.1	***2.33 J***	<1.1	<1.1	<1.1	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	NS	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.81	<1.81	***2.4 J***	<0.418	<0.418	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	0.5	<20	<20	<20	<20	<20	<20	<20	<20	<20	***1.96 J***	<1.55	***0.89***	***0.533***	***0.823***	--	--	***0.214 J***	--	--	***2.1***	***0.247 J***	<0.0453	***0.192 J***	***2.45***	--	***0.829***	***0.476 J***	***0.392 J***	***0.544***	***0.153 J***	***0.208 J***	***0.387 J***	***1.37***	***1.33***	***0.844***	***0.409 J***	***0.325 J***	***0.513***
Cobalt, Dissolved	µg/L	NS	NS	NS	<20	<20	<20	<20	<20	<20	<20	<20	<20	***1.74 J***	<1.55	***0.85***	***0.51***	***0.836***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	5	<20	<20	<20	<20	<20	<20	<20	<20	<20	***13.3 J***	***2.75 J***	***10.4***	***4.14***	***7.48***	--	--	<0.485	--	--	<1.22	<1.22	<2.19	<2.19	<1.6	--	<1.6	<0.497	<2	<1.5	<1.5	***1.6 J***	<1.4	***4.38 J***	<1.8	<1.8	<1.8	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	NS	<20	<20	<20	<20	<20	<20	<20	<20	***21.1***	***14.6 J***	<1.51	***9.81***	***4.22***	***7.67***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	0.5	<4	<4	<4	<4	<4	<4	<4	<4	<4	<1	<0.804	***0.46 J***	<0.207	***0.224 J***	--	--	***0.308 J***	--	--	<0.211	<0.211	<0.324	<0.324	<0.25	--	<0.25	<0.186	<0.27	<0.11	<0.11	<0.21	<0.21	***1.85***	<0.24	<0.24	<0.24	<0.26	<0.26
Lead, Dissolved	µg/L	NS	NS	NS	<4	<4	<4	<4	<4	<4	***30.2***	<4	<4	<1	<0.804	***0.48 J***	<0.207	<0.207	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	5	<50	<50	<50	<50	<50	<50	<50	<50	<50	***13.6 J***	***11 J***	***21.6***	***10.9***	***19.6***	--	--	***12.1***	--	--	***14.2***	***13.1***	***14.7***	***15.1***	***18.7***	***11.5***	***16.3***	***14.2***	***16.2***	***14.4***	***15***	***16.7***	***14.8***	***17.7***	***18.3***	***18***	***18.3***	***16.6***	***16.1***
Nickel, Dissolved	µg/L	NS	NS	NS	<50	<50	<50	<50	<50	<50	<50	<50	<50	***15.7 J***	***13.2 J***	***20.8***	***10.1***	***20.8***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.69	<0.7	<0.297	***1.78 J***	***3.7 J***	--	--	<3.34	--	--	<0.63	<0.63	<0.928	<0.928	<0.9	--	<0.9	<0.982	<1	<1	<1	***1.42 J***	<0.96	***3.37 J***	<0.96	<1.4	<1.4	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.69	<0.7	<0.297	<1.46	<1.46	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.7	<1.7	<0.027	<0.0789	<0.0789	--	--	<0.042	--	--	<0.153	<0.153	<0.14	<0.14	<0.3	--	<0.3	<0.115	<0.37	<0.37	<0.37	<0.42	<0.42	***0.776 J***	<0.49	<0.5	<0.5	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	NS	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.7	<1.7	<0.027	<0.0789	<0.0789	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.84	<0.288	<0.0087	<0.0267	<0.0267	--	--	<0.0325	--	--	<0.0255	***0.032 J***	<0.0644	<0.0644	<0.17	--	<0.17	<0.57	<0.27	<0.26	***0.994 J***	***1.54***	<0.26	***2.56***	<0.26	<0.26	<0.26	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	NS	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.84	<0.288	***0.01 J***	<0.0267	<0.0267	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	5	<50	<50	<50	<50	<50	<50	<50	<50	<50	<2.1	***2.24 J***	***2.2***	<0.833	***1.54***	--	--	<0.449	--	--	<0.255	<0.255	<0.84	<0.84	<0.52	--	<0.52	***2.19 J***	<0.82	<0.85	<0.85	<1.1	<1.1	***1.33 J***	<1.1	<1.1	<1.1	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	NS	NS	<50	<50	<50	<50	<50	<50	<50	<50	<50	<2.1	<2.1	***2.15***	<0.833	***1.38***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	20	***53.5***	***46.5***	<20	***27.5***	***36.2***	***49.5***	<20	***61.4***	<20	***9.32 J***	***107***	***30.3***	***18.4***	***25.4***	--	--	<6.95	--	--	<5.21	***6.02 J***	<11.5	<11.5	***126***	***1380***	<10	<6.92	<10	<10	<10	***13.4 J***	<10	***31.1***	<10	***9.89 J***	***9.11 J***	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	NS	***47.6***	***46.4***	<20	***27.8***	***36.9***	***58.6***	***36.7***	***46.4***	<20	<9.11	***39.2***	***23.4***	***15.7***	***26.7***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																																										
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	1	<1	<1	<2	<10	<1	<1	<5	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	--	--	<0.21	--	--	<0.21	<0.21	<0.21	<0.21	<0.38	--	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	1	<1	<1	<1	<5	<1	<1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	--	--	<0.12	--	--	<0.12	<0.12	<0.12	<0.12	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.47	--	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	--	--	<0.12	--	--	<0.12	<0.12	<0.12	<0.12	<0.45	--	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	***0.26 J***	***0.42 J***	<0.21	<0.21	<0.21	--	--	<0.21	--	--	<0.21	<0.21	<0.21	<0.21	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.15	<0.15	<0.15	<0.15	<0.15	--	--	<0.15	--	--	<0.15	<0.15	<0.15	<0.15	<0.56	--	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	--	--	<0.19	--	--	<0.19	<0.19	<0.19	<0.19	<0.59	--	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.12	<0.12	<0.12	<0.12	<0.12	--	--	<0.5	--	--	<0.5	<0.5	<0.5	<0.5	<1.2	--	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	--	--	<0.13	--	--	<0.13	<0.13	<0.13	<0.13	<0.34	--	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	1	<1	<1	<1	<1	<1	<1	<1	<4	<1	<0.14	<0.14	<0.14	***0.154 J***	<0.14	--	--	<0.14	--	--	<0.14	<0.14	<0.14	<0.14	<0.37	--	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	--	--	<0.18	--	--	<0.18	<0.18	<0.18	<0.18	<0.39	--	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.87	<0.87	<0.87	<0.87	<0.87	--	--	<0.87	--	--	<0.87	<0.87	<0.87	<0.87	<0.27	--	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	1	<1	<1	<1	<1	<1	<1	<1	<4	<1	<0.2	<0.2	<0.2	<0.2	<0.2	--	--	<0.2	--	--	<0.2	<0.2	<0.2	<0.2	<0.23	--	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.47	***1.77 J***	***1.32 J***	***1.14 J***	<0.47	--	--	<0.47	--	--	<0.47	<1.04	<1.04	<1.04	<2.1	--	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.2	<0.2	<0.2	<0.2	<0.2	--	--	<0.2	--	--	<0.2	<0.2	<0.2	<0.2	<2	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.22	<0.22	<0.22	<0.22	<0.22	--	--	<0.22	--	--	<0.22	<0.22	<0.22	<0.22	<2.1	--	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
Acetone	µg/L	6300	1.79	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	***3.65 J***	<1.79	***2.76 J***	***3.46 J***	<1.79	--	--	<1.79	--	--	<1.79	<1.79	<1.79	***1.96 J***	<3.1	--	<3.1	***4.25 J***	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1
Acrylonitrile	µg/L	0.32	0.53	5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.53	<0.53	<0.53	<0.53	<0.53	--	--	<0.53	--	--	<0.53	<0.53	<0.53	<0.53	<2.2	--	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
Benzene	µg/L	5	0.11	0.5	<0.5	***0.52***	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.11	***0.17 J***	<0.11	<0.11	<0.11	--	--	<0.11	--	--	<0.11	<0.11	<0.11	<0.11	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.12	<0.12	<0.12	<0.12	<0.12	--	--	<0.12	--	--	<0.12	<0.12	<0.12	<0.12	<0.54	--	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	1	<1	<1	<1	<10	<5	<1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	--	--	<0.12	--	--	<0.12	<0.12	<0.12	<0.12	<0.39	--	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
Bromomethane	µg/L	10	0.22	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.22	<0.22	<0.22	<0.22	<0.22	--	--	<0.22	--	--	<0.22	<0.22	<0.22	<0.22	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	1	<1	<1	<1	<10	<5	<1	<10	<1	<1	<0.15	<0.15	<0.15	<0.15	<0.15	--	--	<0.15	--	--	<0.15	<0.15	<0.15	<0.15	<0.45	--	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	2	<2	<2	<2	<5	<4	<4	<5	<2	<2	<0.24	<0.24	<0.24	<0.24	<0.24	--	--	<0.24	--	--	<0.24	<0.24	<0.24	<0.24	<0.65	--	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	--	--	<0.19	--	--	<0.19	<0.19	<0.19	<0.19	<0.4	--	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	***0.24 J***	<0.15	<0.15	<0.15	<0.15	--	--	<0.15	--	--	<0.15	<0.15	<0.15	<0.15	<0.79	--	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.31	***0.41 J***	<0.31	<0.31	<0.31	--	--	<0.31	--	--	<0.31	<0.31	<0.31	<0.31	<0.61	--	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.13	<0.13	<0.13	<0.13	<0.13	--	--	<0.13	--	--	<0.13	<0.13	<0.13	<0.13	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<0.15	<0.15	<0.15	<0.15	<0.15	--	--	<0.15	--	--	<0.15	<0.15	<0.15	<0.15	<0.25	--	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	5	<5	<5	<5	<50	<5	<5	<5	<5	<5	<0.2	<0.2	<0.2	<0.2	<0.2	--	--	<0.2	--	--	<0.2	<0.2	<0.2	<0.2	<0.75	--	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	--	--	<0.18	--	--	<0.18	<0.18	<0.18	<0.18	<0.33	--	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.17	<0.17	***0.18 J***	<0.17	<0.17	--	--	<0.17	--	--	<0.17	***0.213 J***	<0.17	***0.573 J***	<1.7	--	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	--	--	<0.21	--	--	<0.21	<0.21	<0.21	<0.21	<0.31	--	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	10	<50	<10	<10	<10	<50	<10	<20	<10	<10	<0.8	<0.8	<0.8	<0.8	<0.8	--	--	<0.8	--	--	<0.8	<0.8	<0.8	<0.8	<7	--	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
Styrene	µg/L	100	0.1	1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.37	--	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	***0.435 J***	<0.37	<0.37	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	--	--	<0.18	--	--	<0.18	<0.18	<0.18	<0.18	<0.48	--	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48
Toluene	µg/L	1000	0.15	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.15	<0.15	<0.15	<0.15	<0.15	--	--	<0.15	--	--	<0.15	<0.15	<0.15	<0.15	<0.43	--	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	--	--	<0.21	--	--	<0.21	<0.21	<0.21	<0.21	<0.27	--	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<0.22	<0.22	<0.22	<0.22	<0.22	--	--	<0.22	--	--	<0.22	<0.22	<0.22	<0.22	<0.56	--	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	--	--	<0.13	--	--	<0.13	<0.13	<0.13	<0.13	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	5	<5	<5	<5	<50	<5	<5	<5	<5	<5	<0.14	<0.14	<0.14	<0.14	<0.14	--	--	<0.14	--	--	<0.14	<0.14	<0.14	<0.14	<0.78	--	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	--	--	<0.19	--	--	<0.19	<0.19	<0.19	<0.19	<0.43	--	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	4	<4	<4	<4	<5	<4	<4	<4	<4	<4	<0.17	<0.17	<0.17	<0.17	<0.17	--	--	<0.17	--	--	<0.17	<0.17	<0.17	<0.17	<0.38	--	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.28	<0.28	<0.28	<0.28	<0.28	--	--	<0.28	--	--	<0.28	<0.28	<0.28	<0.28	<1.3	--	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	10	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.74	<0.74	<0.74	<0.74	<0.74	--	--	<0.74	--	--	<0.74	<0.74	<0.74	<0.74	<2.5	--	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	***0.12 J***	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.6	--	<0.6	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Xylenes	µg/L	10000	0.13	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.13	<0.13	<0.13	<0.13	<0.13	--	--	<0.13	--	--	<0.13	<0.13	<0.13	<0.13	<0.4	--	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location GU-2

Parameter Name	Units	GPS	DL	Jun-18	Aug-18	Oct-18	Jun-19	Aug-19	Nov-19	Jul-20	Nov-20	Jun-21	Sep-21	Mar-22	Sep-22	Nov-23
Appendix I Inorganics																
Total Suspended Solids	mg/L	NS	0.581	***20***	***72***	***23.1***	***1.13 J***	***1.5 J***	***4.62***	***22.8***	***4700***	Dry	***117***	***74***	***2.63***	Dry
Turbidity, Field	NTU	NS	NS	***14.11***	***97.82***	***60.25***	***15.12***	***11.74***	***9.87***	***10.21***	***200***	--	***287.3***	***48.9***	***8.29***	--
Turbidity, Lab	NTU	NS	0.4	***57.5***	***180***	***67***	***3.08***	***3.54***	***12.9***	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	<0.42	<0.42	<0.42	<1.32	<1.32	<0.53	<0.51	***3.75 J***	--	***3.29***	***3.05***	<0.69	--
Antimony, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	***8.67***	***7.76***	***2.77***	***1.07***	***0.931 J***	<0.75	<0.88	***345***	--	***10.1***	***3.94***	***1.25 J***	--
Arsenic, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	***294***	***530***	***276***	***173***	***199***	***172***	***93.6***	***2300***	--	***108***	***117***	***251***	--
Barium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	<0.19	<0.19	<0.19	<0.53	<0.53	<0.27	<0.27	<1.08	--	<0.27	***1.08***	<0.27	--
Beryllium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	<0.06	<0.06	<0.06	<0.167	<0.167	<0.039	<0.049	***0.644***	--	<0.051	***0.075 J***	<0.055	--
Cadmium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	<0.76	<0.76	<0.76	<1.14	<1.14	<0.98	<1.1	***8.83 J***	--	***10.2***	***3.18 J***	<1.1	--
Chromium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	***6.19***	***7.06***	***8.54***	***0.649 J***	***0.538 J***	***0.699***	***0.339 J***	***25.3***	--	***7.22***	***3.05***	***0.786***	--
Cobalt, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	<1.6	<1.6	<1.6	<0.497	<0.497	<2	<1.5	***17.2 J***	--	***3.01 J***	***8.77***	<1.8	--
Copper, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	***0.308 J***	***0.305 J***	<0.25	<0.186	<0.186	<0.27	***0.565***	***8.09***	--	***0.494 J***	***3.57***	<0.24	--
Lead, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	***11.3***	***12***	***31.4***	***5.16***	***4.7***	***4.9 J***	<1.9	***43.9***	--	***81.5***	***11.6***	***6.52***	--
Nickel, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	<0.9	<0.9	<0.9	<0.982	<0.982	<1	<1	<4	--	***1.07 J***	***4.12 J***	<0.96	--
Selenium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	<0.3	<0.3	<0.3	<0.115	<0.115	<0.37	<0.37	<1.48	--	<0.42	***0.909 J***	<0.49	--
Silver, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	<0.17	<0.17	<0.17	<0.57	<0.57	<0.27	<0.26	<1.04	--	<0.26	***3.16***	<0.26	--
Thallium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	***0.527 J***	<0.52	<0.52	***2.53 J***	<2.15	<0.82	***1.63 J***	***21.7***	--	***2.6 J***	***4.24 J***	<1.1	--
Vanadium, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	<10	<10	<10	<6.92	<6.92	<10	<10	***97.5***	--	***41.3***	***20.3***	<10	--
Zinc, Dissolved	µg/L	NS	NS	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<3.8	<0.38	<0.38	--
1,1,1-Trichloroethane	µg/L	200	0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<1.9	<0.19	<0.19	--
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<4.7	<0.47	<0.47	--
1,1,2-Trichloroethane	µg/L	5	0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<4.5	<0.45	<0.45	--
1,1-Dichloroethane	µg/L	140	0.21	***0.517 J***	<0.22	<0.22	<0.22	***0.314 J***	***0.28 J***	<0.22	<0.22	--	<2.2	<0.22	<0.22	--
1,1-Dichloroethylene	µg/L	7	0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<5.6	<0.56	<0.56	--
1,2,3-Trichloropropane	µg/L	0.0058	0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<5.9	<0.59	<0.59	--
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<12	<1.2	<1.2	--
1,2-Dibromoethane	µg/L	0.05	0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<3.4	<0.34	<0.34	--
1,2-Dichlorobenzene	µg/L	600	0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<3.7	<0.37	<0.37	--
1,2-Dichloroethane	µg/L	5	0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<3.9	<0.39	<0.39	--
1,2-Dichloropropane	µg/L	5	0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<2.7	<0.27	<0.27	--
1,4-Dichlorobenzene	µg/L	75	0.2	***2.22***	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	***0.263 J***	--	<2.3	<0.23	<0.23	--
2-Butanone	µg/L	4000	1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	***27.9 J***	<2.1	<2.1	--
2-Hexanone	µg/L	NS	0.2	<2	<2	<2	<2	<2	<2	<2	<2	--	<20	<2	<2	--
4-Methyl-2-pentanone	µg/L	560	0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<21	<2.1	<2.1	--
Acetone	µg/L	6300	1.79	***8.43 J***	***7.35 J***	***3.17 J***	***3.8 J***	<3.1	<3.1	<3.1	***13.2***	--	***90 J***	***47***	<3.1	--
Acrylonitrile	µg/L	0.32	0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<22	<2.2	<2.2	--
Benzene	µg/L	5	0.11	***4.3***	***0.222 J***	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<2.2	<0.22	<0.22	--
Bromochloromethane	µg/L	90	0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<5.4	<0.54	<0.54	--
Bromodichloromethane	µg/L	80	0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<3.9	<0.39	<0.39	--
Bromomethane	µg/L	10	0.22	<1.1	<1.1	<1.1	***1.97 J***	<1.1	<1.1	<1.1	<1.1	--	<11	<1.1	<1.1	--
Carbon disulfide	µg/L	700	0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<4.5	<0.45	<0.45	--
Carbon Tetrachloride	µg/L	5	0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<6.5	<0.65	<0.65	--
Chlorobenzene	µg/L	100	0.19	***2.33***	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<4	<0.4	<0.4	--
Chloroethane	µg/L	2800	0.15	***0.912 J***	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<7.9	<0.79	<0.79	--
Chloromethane	µg/L	NS	0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<6.1	<0.61	<0.61	--
cis-1,2-Dichloroethylene	µg/L	70	0.13	***0.628 J***	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<2.1	<0.21	<0.21	--
cis-1,3-Dichloropropene	µg/L	NS	0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<2.5	<0.25	<0.25	--
Dibromochloromethane	µg/L	80	0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<7.5	<0.75	<0.75	--
Dibromomethane	µg/L	70	0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<3.3	<0.33	<0.33	--
Dichloromethane	µg/L	5	0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<17	<1.7	<1.7	--
Ethylbenzene	µg/L	700	0.21	***5.2***	***0.427 J***	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<3.1	<0.31	<0.31	--
Iodomethane	µg/L	NS	0.8	<7	<7	<7	<7	<7	<7	<7	<7	--	<70	<7	<7	--
Styrene	µg/L	100	0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<3.7	<0.37	<0.37	--
Tetrachloroethylene	µg/L	5	0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<4.8	<0.48	<0.48	--
Toluene	µg/L	1000	0.15	***30***	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	***7.58 J***	<0.43	<0.43	--
Trans-1,2-dichloroethylene	µg/L	100	0.21	***0.971 J***	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<2.7	<0.27	<0.27	--
trans-1,3-Dichloropropene	µg/L	NS	0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<5.6	<0.56	<0.56	--
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<11	<1.1	<1.1	--
Tribromomethane	µg/L	80	0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<7.8	<0.78	<0.78	--
Trichloroethylene	µg/L	5	0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<4.3	<0.43	<0.43	--
Trichlorofluoromethane	µg/L	2000	0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<3.8	<0.38	<0.38	--
Trichloromethane	µg/L	80	0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<13	<1.3	<1.3	--
Vinyl Acetate	µg/L	NS	0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<25	<2.5	<2.5	--
Vinyl Chloride	µg/L	2	0.1	***1.47***	<0.6	<0.6	<0.18	<0.18	<0.18	<0.18	<0.18	--	<1.8	<0.18	<0.18	--
Xylenes	µg/L	10000	0.13	***14.2***	***1.02 J***	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	***8.65 J***	<0.4	<0.4	--

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

BEDROCK

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-11

Parameter Name	Units	GPS	Oct-07	Jan-08	Apr-08	Jul-08	Dec-09	Feb-10	Feb-11	Apr-11	Aug-11	Apr-12	Oct-12	Apr-13	Nov-13	May-14	Nov-14	May-15	Sep-15	Nov-16	Nov-17	Jun-18	Oct-18	Dec-18	Jun-19	Jul-20	Nov-20	Jun-21	Aug-21	Sep-21	Mar-22	Jun-22	Sep-22	Jun-23	Jul-24	Nov-24
Appendix I Inorganics																																				
Total Suspended Solids	mg/L	NS	--	--	--	--	--	--	--	--	--	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	***2.13***	<0.638	Dry	Dry	Dry	***1.5 J***	<0.638	Dry	Dry	Dry	<0.638	<0.638	<1.39	Dry
Turbidity, Field	NTU	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***2.729***	***0.26***	--	--	--	***1.3***	***2.57***	--	--	--	***6.43***	***1.75***	***1.01***	--
Turbidity, Lab	NTU	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***1.2***	<0.4	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	<6	<6	<6	<6	<6	<6	<6	<6	<6	***2.55 J***	***0.41 J***	--	--	--	--	--	--	--	--	--	<0.42	--	--	--	--	<1.1	--	--	--	--	<0.69	<1	<1	--
Antimony, Dissolved	µg/L	NS	--	--	--	--	<6	<6	<6	<6	<6	<1.45	***0.15 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	***1.66***	***4.52***	<1	***5.88***	***1.61***	<1	<2	<4	<1	***0.251 J***	***1.62***	--	--	--	--	--	--	--	--	--	<0.57	--	--	--	--	<0.75	--	--	--	--	<0.75	<0.53	<0.53	--
Arsenic, Dissolved	µg/L	NS	--	--	--	--	***2.57***	<1	<2	<2	<2	<0.216	***1.16***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	***47.4***	***61.9***	***51.7***	***40.8***	***74.1***	***42***	***23.2***	***31.9***	***23.2***	***33.3***	***35.2***	--	--	--	--	--	--	--	--	--	***16.9***	--	--	--	--	***18.7***	--	--	--	--	***17.7***	***15.4***	***14.3***	--
Barium, Dissolved	µg/L	NS	--	--	--	--	***53.7***	***34.2***	***23.1***	***27***	***25.4***	***29.5***	***33.8***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	<1	<1	<1	***1.22***	<1	<1	<1	<1	<1	<0.079	***0.06 J***	--	--	--	--	--	--	--	--	--	<0.19	--	--	--	--	<0.27	--	--	--	--	<0.27	<0.33	<0.33	--
Beryllium, Dissolved	µg/L	NS	--	--	--	--	<1	<1	<1	<1	<1	<0.079	<0.0178	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.229	***0.15 J***	--	--	--	--	--	--	--	--	--	<0.06	--	--	--	--	<0.051	--	--	--	--	***0.056 J***	<0.1	<0.1	--
Cadmium, Dissolved	µg/L	NS	--	--	--	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.229	<0.064	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	<20	<20	***29.4***	<20	<20	<20	<20	<20	<20	<1.81	***1.61 J***	--	--	--	--	--	--	--	--	--	***0.795 J***	--	--	--	--	<1.1	--	--	--	--	<1.1	<1.1	<1.2	--
Chromium, Dissolved	µg/L	NS	--	--	--	--	<20	<20	<20	<20	<20	<1.81	***0.46 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	2.1	<20	<20	<20	<20	<20	<20	<20	<20	<20	***2.97 J***	***2.17***	--	--	--	--	--	--	--	--	--	***7.89***	***2.57***	--	--	--	***0.285 J***	--	--	--	--	***0.244 J***	<0.17	<0.17	--
Cobalt, Dissolved	µg/L	NS	--	--	--	--	<20	<20	<20	<20	<20	<1.55	***0.35 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	<20	<20	<20	<20	<20	<20	<20	***27.7***	***25***	***5.62 J***	***7.42***	--	--	--	--	--	--	--	--	--	<1.6	--	--	--	--	<1.4	--	--	--	--	<1.8	<1.8	<1.8	--
Copper, Dissolved	µg/L	NS	--	--	--	--	<20	<20	<20	***29.6***	***26.6***	<1.51	***2.31***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	<4	***4.4***	<4	***5.38***	<4	***4.39***	<4	<4	<4	***1.7 J***	***2.64***	--	--	--	--	--	--	--	--	--	<0.25	--	--	--	--	<0.21	--	--	--	--	<0.24	<0.24	<0.26	--
Lead, Dissolved	µg/L	NS	--	--	--	--	***4.18***	<4	<4	<4	<4	<0.804	***0.04 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	<50	<50	***50.3***	<50	<50	<50	<50	<50	<50	***31.9 J***	***29.3***	--	--	--	--	--	--	--	--	--	***43.3***	***35.1***	--	--	--	***34.1***	***22.6***	--	--	--	***30.2***	***21.6***	***16.3***	--
Nickel, Dissolved	µg/L	NS	--	--	--	--	<50	<50	<50	<50	<50	***30.2 J***	***24.1***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	<5	<5	<5	<5	<5	<10	<5	<5	<5	<0.7	<0.297	--	--	--	--	--	--	--	--	--	<0.9	--	--	--	--	***2.51 J***	--	--	--	--	***2.87 J***	***2.16 J***	***1.91 J***	--
Selenium, Dissolved	µg/L	NS	--	--	--	--	<5	<5	<5	<5	<5	<0.7	<0.297	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.7	<0.027	--	--	--	--	--	--	--	--	--	<0.3	--	--	--	--	<0.42	--	--	--	--	<0.49	<0.5	<0.5	--
Silver, Dissolved	µg/L	NS	--	--	--	--	<20	<20	<20	<20	<20	<1.7	<0.027	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.288	***0.04 J***	--	--	--	--	--	--	--	--	--	<0.17	--	--	--	--	<0.26	--	--	--	--	<0.26	<0.26	<0.57	--
Thallium, Dissolved	µg/L	NS	--	--	--	--	<2	<2	<2	<2	<2	<0.288	<0.0087	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	<50	<50	<50	<50	<50	<50	<50	<50	<50	***5.57 J***	***1.6***	--	--	--	--	--	--	--	--	--	<0.52	--	--	--	--	<1.1	--	--	--	--	<1.1	<1.1	<1.1	--
Vanadium, Dissolved	µg/L	NS	--	--	--	--	<50	<50	<50	<50	<50	***2.86 J***	<0.94	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	***134***	<20	***61.6***	***31.8***	***177***	***28.8***	***92.9***	***23.5***	***28.3***	***32.1***	***40.7***	--	--	--	--	--	--	--	--	--	***119***	***82.8***	--	--	--	***140***	***70.1***	--	--	--	***146***	***98.5***	***60***	--
Zinc, Dissolved	µg/L	NS	--	--	--	--	***131***	***20.6***	***89.3***	<20	<20	***37.6***	***25.1***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																																				
1,1,1,2-Tetrachloroethane	µg/L	70	<1	<1	<1	<1	<5	<2	<2	<1	<1	<0.21	<0.21	--	--	--	--	--	--	--	--	--	<0.38	--	--	--	--	<0.38	--	--	--	--	<0.38	<0.38	<0.38	--
1,1,1-Trichloroethane	µg/L	200	<1	<1	<1	<1	<10	<1	<1	<1	<1	<0.12	<0.12	--	--	--	--	--	--	--	--	--	<0.19	--	--	--	--	<0.19	--	--	--	--	<0.19	<0.19	<0.19	--
1,1,2,2-Tetrachloroethane	µg/L	0.3	<1	<1	<1	<1	<1	<2	<1	<1	<1	<0.1	<0.1	--	--	--	--	--	--	--	--	--	<0.47	--	--	--	--	<0.47	--	--	--	--	<0.47	<0.47	<0.47	--
1,1,2-Trichloroethane	µg/L	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.12	<0.12	--	--	--	--	--	--	--	--	--	<0.45	--	--	--	--	<0.45	--	--	--	--	<0.45	<0.45	<0.45	--
1,1-Dichloroethane	µg/L	140	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	--	--	--	--	--	--	--	--	--	<0.22	--	--	--	--	<0.22	--	--	--	--	<0.22	<0.22	<0.22	--
1,1-Dichloroethylene	µg/L	7	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.15	<0.15	--	--	--	--	--	--	--	--	--	<0.56	--	--	--	--	<0.56	--	--	--	--	<0.56	<0.56	<0.56	--
1,2,3-Trichloropropane	µg/L	0.006	<1	<1	<1	<1	<1	<2	<1	<1	<1	<0.19	<0.19	--	--	--	--	--	--	--	--	--	<0.59	--	--	--	--	<0.59	--	--	--	--	<0.59	<0.59	<0.59	--
1,2-Dibromo-3-chloropropane	µg/L	0.2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.12	<0.12	--	--	--	--	--	--	--	--	--	<1.2	--	--	--	--	<1.2	--	--	--	--	<1.2	<1.2	<1.2	--
1,2-Dibromoethane	µg/L	0.05	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	--	--	--	--	--	--	--	--	--	<0.34	--	--	--	--	<0.34	--	--	--	--	<0.34	<0.34	<0.34	--
1,2-Dichlorobenzene	µg/L	600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.14	<0.14	--	--	--	--	--	--	--	--	--	<0.37	--	--	--	--	<0.37	--	--	--	--	<0.37	<0.37	<0.37	--
1,2-Dichloroethane	µg/L	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	--	--	--	--	--	--	--	--	--	<0.39	--	--	--	--	<0.39	--	--	--	--	<0.39	<0.39	<0.39	--
1,2-Dichloropropane	µg/L	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.87	<0.87	--	--	--	--	--	--	--	--	--	<0.27	--	--	--	--	<0.27	--	--	--	--	<0.27	<0.27	<0.27	--
1,4-Dichlorobenzene	µg/L	75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<0.2	--	--	--	--	--	--	--	--	--	<0.23	--	--	--	--	<0.23	--	--	--	--	<0.23	<0.23	<0.23	--
2-Butanone	µg/L	4000	<10	<10	<10	<10	<10	<10	<10	<10	<10	***2.29 J***	<0.47	--	--	--	--	--	--	--	--	--	<2.1	--	--	--	--	<2.1	--	--	--	--	<2.1	<2.1	***2.49 J***	--
2-Hexanone	µg/L	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.2	<0.2	--	--	--	--	--	--	--	--	--	<2	--	--	--	--	<2	--	--	--	--	<2	<2	<2	--
4-Methyl-2-pentanone	µg/L	560	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.22	<0.22	--	--	--	--	--	--	--	--	--	<2.1	--	--	--	--	<2.1	--	--	--	--	<2.1	<2.1	<2.1	--
Acetone	µg/L	6300	<10	<10	<10	<10	<10	<10	<10	<10	<10	***3.82 J***	<1.79	--	--	--	--	--	--	--	--	--	<3.1	--	--	--	--	<3.1	--	--	--	--	<3.1	<3.1	<3.1	--
Acrylonitrile	µg/L	0.32	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.53	<0.53	--	--	--	--	--	--	--	--	--	<2.2	--	--	--	--	<2.2	--	--	--	--	<2.2	<2.2	<2.2	--
Benzene	µg/L	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.11	<0.11	--	--	--	--	--	--	--	--	--	<0.22	--	--	--	--	<0.22	--	--	--	--	<0.22	<0.22	<0.22	--
Bromochloromethane	µg/L	90	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.12	<0.12	--	--	--	--	--	--	--	--	--	<0.54	--	--	--	--	<0.54	--	--	--	--	<0.54	<0.54	<0.54	--
Bromodichloromethane	µg/L	80	<1	<1	<1	<1	<5	<1	<1	<1	<1	<0.12	<0.12	--	--	--	--	--	--	--	--	--	<0.39	--	--	--	--	<0.39	--	--	--	--	<0.39	<0.39	<0.39	--
Bromomethane	µg/L	10	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.22	<0.22	--	--	--	--	--	--	--	--	--	<1.1	--	--	--	--	<1.1	--	--	--	--	<1.1	<1.1	<1.1	--
Carbon disulfide	µg/L	700	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.15	***0.78 J***	--	--	--	--	--	--	--	--	--	<0.45	--	--	--	--	<0.45	--	--	--	--	<0.45	<0.45	<0.45	--
Carbon Tetrachloride	µg/L	5	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.24	<0.24	--	--	--	--	--	--	--	--	--	<0.65	--	--	--	--	<0.65	--	--	--	--	<0.65	<0.65	<0.65	--
Chlorobenzene	µg/L	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	--	--	--	--	--	--	--	--	--	<0.4	--	--	--	--	<0.4	--	--	--	--	<0.4	<0.4	<0.4	--
Chloroethane	µg/L	2800	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.15	<0.15	--	--	--	--	--	--	--	--	--	<0.79	--	--	--	--	<0.79	--	--	--	--	<0.79	<0.79	<0.79	--
Chloromethane	µg/L	NS	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.31	***0.31 J***	--	--	--	--	--	--	--	--	--	<0.61	--	--	--	--	<0.61	--	--	--	--	<0.61	<0.61	<0.61	--
cis-1,2-Dichloroethylene	µg/L	70	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.13	<0.13	--	--	--	--	--	--	--	--	--	<0.21	--	--	--	--	<0.21	--	--	--	--	<0.21	<0.21	<0.21	--
cis-1,3-Dichloropropene	µg/L	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.15	<0.15	--	--	--	--	--	--	--	--	--	<0.25	--	--	--	--	<0.25	--	--	--	--	<0.25	<0.25	<0.25	--
Dibromochloromethane	µg/L	80	<5	<5	<5	<5	<10	<5	<5	<5	<5	<0.2	<0.2	--	--	--	--	--	--	--	--	--	<0.75	--	--	--	--	<0.75	--	--	--	--	<0.75	<0.75	<0.75	--
Dibromomethane	µg/L	70	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	--	--	--	--	--	--	--	--	--	<0.33	--	--	--	--	<0.33	--	--	--	--	<0.33	<0.33	<0.33	--
Dichloromethane	µg/L	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.17	<0.17	--	--	--	--	--	--	--	--	--	<1.7	--	--	--	--	<1.7	--	--	--	--	<1.7	<1.7	<1.7	--
Ethylbenzene	µg/L	700	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	--	--	--	--	--	--	--	--	--	<0.31	--	--	--	--	<0.31	--	--	--	--	<0.31	<0.31	<0.31	--
Iodomethane	µg/L	NS	<10	<10	<10	<10	<20	<10	<20	<10	<10	<0.8	<0.8	--	--	--	--	--	--	--	--	--	<7	--	--	--	--	<7	--	--	--	--	<7	<7	<7	--
Styrene	µg/L	100	<1	<1	<1	<1	<2	<2	<1	<1	<1	<0.1	<0.1	--	--	--	--	--	--	--	--	--	<0.37	--	--	--	--	<0.37	--	--	--	--	<0.37	<0.37	<0.37	--
Tetrachloroethylene	µg/L	5	<1	<1	<1	<1	<1	<2	<1	<1	<1	<0.18	<0.18	--	--	--	--	--	--	--	--	--	<0.48	--	--	--	--	<0.48	--	--	--	--	<0.48	<0.48	<0.48	--
Toluene	µg/L	1000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.15	<0.15	--	--	--	--	--	--	--	--	--	<0.43	--	--	--	--	<0.43	--	--	--	--	<0.43	<0.43	<0.43	--
Trans-1,2-dichloroethylene	µg/L	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	--	--	--	--	--	--	--	--	--	<0.27	--	--	--	--	<0.27	--	--	--	--	<0.27	<0.27	<0.27	--
trans-1,3-Dichloropropene	µg/L	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.22	<0.22	--	--	--	--	--	--	--	--	--	<0.56	--	--	--	--	<0.56	--	--	--	--	<0.56	<0.56	<0.56	--
trans-1,4-Dichloro-2-butene	µg/L	1.8	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	--	--	--	--	--	--	--	--	--	<1.1	--	--	--	--	<1.1	--	--	--	--	<1.1	<1.1	<1.1	--
Tribromomethane	µg/L	80	<5	<5	<5	<5	<10	<5	<5	<5	<5	<0.14	<0.14	--	--	--	--	--	--	--	--	--	<0.78	--	--	--	--	<0.78	--	--	--	--	<0.78	<0.78	<0.78	--
Trichloroethylene	µg/L	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	--	--	--	--	--	--	--	--	--	<0.43	--	--	--	--	<0.43	--	--	--	--	<0.43	<0.43	<0.43	--
Trichlorofluoromethane	µg/L	2000	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.17	<0.17	--	--	--	--	--	--	--	--	--	<0.38	--	--	--	--	<0.38	--	--	--	--	<0.38	<0.38	<0.38	--
Trichloromethane	µg/L	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.28	<0.28	--	--	--	--	--	--	--	--	--	<1.3	--	--	--	--	<1.3	--	--	--	--	<1.3	<1.3	<1.3	--
Vinyl Acetate	µg/L	NS	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.74	<0.74	--	--	--	--	--	--	--	--	--	<2.5	--	--	--	--	<2.5	--	--	--	--	<2.5	<2.5	<2.5	--
Vinyl Chloride	µg/L	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	<0.1	--	--	--	--	--	--	--	--	--	<0.6	--	--	--	--	<0.18	--	--	--	--	<0.18	<0.18	<0.18	--
Xylenes	µg/L	10000	<3	<3	<3	<3	<6	<3	<3	<3	<3	<0.13	<0.13	--	--	--	--	--	--	--	--	--	<0.4	--	--	--	--	<0.4	--	--	--	--	<0.4	<0.4	<0.4	--

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-11

Parameter Name	Units	GPS	Jun-23	Jul-24
Alcohols/Gycols by GC				
Acetonitrile	µg/L	NS	<0.57	<2600
Isobutanol	µg/L	2100	<0.55	<2400
Herbicides (GC)				
2,4,5-T	µg/L	70	<0.16	<0.0923
2,4-D	µg/L	70	<0.341	<0.355
Silvex (2,4,5-TP)	µg/L	50	<0.0928	<0.0312
Inorganics				
Cyanide	µg/L	200	<4.3	<3.5
Mercury	µg/L	2	<0.00014	<0.11
Sulfide	µg/L	NS	<231	<1410
Tin	µg/L	4200	<2.3	<2.3
PCBs (EPA Method 8082)				
PCB-1016	µg/L	NS	<0.202	<0.767
PCB-1221	µg/L	NS	<0.202	<0.767
PCB-1232	µg/L	NS	<0.202	<0.767
PCB-1242	µg/L	NS	<0.202	<0.767
PCB-1248	µg/L	NS	<0.131	<0.646
PCB-1254	µg/L	NS	<0.131	<0.646
PCB-1260	µg/L	NS	<0.131	<0.646
Pesticides (EPA Method 8081A)				
4,4'-DDD	µg/L	0.73	<0.0321	<0.0234
4,4'-DDE	µg/L	0.51	<0.0321	<0.0281
4,4'-DDT	µg/L	0.51	<0.05	<0.0187
Aldrin	µg/L	0.01	<0.0381	<0.0206
alpha-BHC	µg/L	0.028	<0.0345	<0.00936
beta-BHC	µg/L	0.042	<0.044	<0.0393
Chlordane	µg/L	2	<0.964	<0.365
delta-BHC	µg/L	2.1	<0.0321	<0.0299
Dieldrin	µg/L	0.011	<0.031	<0.0197
Endosulfan I	µg/L	42	<0.0393	<0.0262
Endosulfan II	µg/L	42	<0.0345	<0.0243
Endosulfan sulfate	µg/L	NS	<0.0357	<0.0168
Endrin	µg/L	2	<0.031	<0.0262
Endrin aldehyde	µg/L	2.1	<0.0345	<0.0253
gamma-BHC (Lindane)	µg/L	0.2	<0.0429	<0.00936
Heptachlor	µg/L	0.4	<0.0393	<0.0215
Heptachlor epoxide	µg/L	0.2	<0.0345	<0.0299
Methoxychlor	µg/L	40	<0.0488	<0.0299
Toxaphene	µg/L	3	<0.821	<0.936
Semivolatile Organics by GC/MS				
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<0.614	<0.675
1,3,5-Trinitrobenzene	µg/L	NS	<2.61	<2.88
1,3-Dinitrobenzene	µg/L	1	<3.64	<4
1,4-Naphthoquinone	µg/L	NS	<4.09	<4.5
1,4-Phenylenediamine	µg/L	NS	<2.16	<2.38
1-Naphthylamine	µg/L	NS	<2.84	<3.13
2,3,4,6-Tetrachlorophenol	µg/L	NS	<6.02	<6.63
2,4,5-Trichlorophenol	µg/L	700	<6.02	<6.63
2,4,6-Trichlorophenol	µg/L	16	<5.68	<6.25
2,4-Dichlorophenol	µg/L	20	<0.966	<1.06
2,4-Dimethylphenol	µg/L	100	<0.659	<0.725
2,4-Dinitrophenol	µg/L	14	<14.8	<16.3
2,4-Dinitrotoluene	µg/L	0.25	<7.27	<8
2,6-Dichlorophenol	µg/L	NS	<0.784	<0.863
2,6-Dinitrotoluene	µg/L	0.26	<0.591	<0.65
2-Acetylaminofluorene	µg/L	NS	<3.07	<3.38
2-Chloronaphthalene	µg/L	560	<0.727	<0.8
2-Chlorophenol	µg/L	40	<0.614	<0.675
2-Methylnaphthalene	µg/L	28	<0.67	<0.738
2-Methylphenol (o-Cresol)	µg/L	35	<0.739	<0.813
2-Naphthylamine	µg/L	0.097	<2.39	<2.63
2-Nitroaniline	µg/L	NS	<6.7	<7.38
2-Nitrophenol	µg/L	NS	<7.73	<8.5
3,3'-Dichlorobenzidine	µg/L	0.39	<1.59	<1.75
3,3'-Dimethylbenzidine	µg/L	NS	<1.7	<1.88
3/4-Methylphenol	µg/L	70	<0.795	<0.875
3-Methylcholanthrene	µg/L	NS	<0.364	<0.4
3-Nitroaniline	µg/L	NS	<3.07	<3.38
4,6-Dinitro-2-methylphenol	µg/L	NS	<7.84	<8.63
4-Aminobiphenyl	µg/L	0.0083	<2.5	<2.75
4-Bromophenyl phenyl ether	µg/L	NS	<0.795	<0.875
4-Chloro-3-methylphenol	µg/L	700	<0.955	<1.05
4-Chloroaniline	µg/L	28	<0.705	<0.775
4-Chlorophenyl phenyl ether	µg/L	NS	<0.784	<0.863
4-Nitroaniline	µg/L	NS	<1.48	<1.63
4-Nitrophenol	µg/L	60	<8.64	<9.5
5-Nitro-o-toluidine	µg/L	NS	<3.18	<3.5
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<2.16	<2.38
Acenaphthene	µg/L	420	<0.727	<0.8
Acenaphthylene	µg/L	210	<0.818	<0.9
Acetophenone	µg/L	NS	<0.784	<0.863
Anthracene	µg/L	2100	<0.989	<1.09
Benzo (a) anthracene	µg/L	0.24	<0.966	<1.06
Benzo (a) pyrene	µg/L	0.2	<9.2	<10.1
Benzo (b) fluoranthene	µg/L	0.24	<5.57	<6.13
Benzo (g,h,i) perylene	µg/L	21	<7.16	<7.88
Benzo (k) fluoranthene	µg/L	2.4	<2.5	<2.75
Benzyl alcohol	µg/L	700	<1.48	<1.63
Bis(2-chloroethoxy)methane	µg/L	NS	<0.864	<0.95
Bis(2-chloroethyl)ether	µg/L	0.16	<0.932	<1.03
Bis(2-chloroisopropyl) ether	µg/L	300	<0.614	<0.675
Bis(2-ethylhexyl)phthalate	µg/L	6	<6.25	<6.88
Butyl benzyl phthalate	µg/L	140	<6.14	<6.75
Chlorobenzilate	µg/L	NS	<4.09	<4.5
Chrysene	µg/L	24	<0.989	<1.09
Diallate (cis or trans)	µg/L	NS	<4.55	<5
Dibenzo (a,h) anthracene	µg/L	0.024	<4.43	<4.88
Dibenzofuran	µg/L	7	<0.841	<0.925
Diethyl phthalate	µg/L	5600	<1.93	<2.13
Dimethoate	µg/L	1.4	<4.09	<4.5
Dimethyl phthalate	µg/L	NS	<1.14	<1.25
Di-n-butyl phthalate	µg/L	700	<6.36	<7
Di-n-octyl phthalate	µg/L	140	<7.95	<8.75
Dinoseb	µg/L	7	<2.73	<3
Diphenylamine	µg/L	180	<6.82	<7.5
Disulfoton	µg/L	0.7	***4.14 J***	<3
Ethyl Methanesulfonate	µg/L	NS	<4.09	<4.5
Famphur	µg/L	NS	<4.32	<4.75
Fluoranthene	µg/L	280	<1.93	<2.13
Fluorene	µg/L	280	<0.898	<0.988
Hexachlorobenzene	µg/L	1	<0.795	<0.875
Hexachlorobutadiene	µg/L	1	<0.977	<1.08
Hexachlorocyclopentadiene	µg/L	50	<5.8	<6.38
Hexachloroethane	µg/L	1	<1.1	<1.21
Hexachloropropene	µg/L	NS	<2.95	<3.25
Indeno (1,2,3-cd) pyrene	µg/L	0.24	<4.77	<5.25
Isodrin	µg/L	NS	<5.34	<5.88
Isophorone	µg/L	100	<1.06	<1.16
Isosafrole	µg/L	NS	<2.61	<2.88
Kepone	µg/L	NS	<1.14	<1.25
Methapyrilene	µg/L	NS	<0.864	<0.95
Methyl Methanesulfonate	µg/L	1.8	<3.75	<4.13
Nitrobenzene	µg/L	14	<0.909	<1
N-Nitrosodiethylamine	µg/L	NS	<3.86	<4.25
N-Nitrosodimethylamine	µg/L	0.0034	<0.818	<0.9
N-Nitrosodi-n-butylamine	µg/L	0.032	<4.43	<4.88
N-Nitrosodi-n-propylamine	µg/L	NS	<1.05	<1.15
N-Nitrosodiphenylamine	µg/L	36	<0.852	<0.938
N-Nitrosomethylethylamine	µg/L	0.008	<5.57	<6.13
N-Nitrosopiperidine	µg/L	NS	<3.07	<3.38
N-Nitrosopyrrolidine	µg/L	0.083	<4.09	<4.5
O,O,O-Triethyl phosphorothioate	µg/L	NS	<3.64	<4
o-Toluidine	µg/L	11	<3.3	<3.63
p-(Dimethylamino)azobenzene	µg/L	NS	<2.5	<2.75
Parathion-ethyl	µg/L	NS	<2.5	<2.75
Parathion-methyl	µg/L	1	<2.61	<2.88
Pentachlorobenzene	µg/L	NS	<3.18	<3.5
Pentachloronitrobenzene	µg/L	NS	<6.59	<7.25
Pentachlorophenol	µg/L	1	<10.9	<12
Phenacetin	µg/L	NS	<2.16	<2.38
Phenanthrene	µg/L	210	<0.898	<0.988
Phenol	µg/L	2000	<1.25	<1.38
Phorate	µg/L	1.4	<3.64	<4
Pronamide	µg/L	5	<3.07	<3.38
Pyrene	µg/L	210	<0.898	<0.988
Safrole	µg/L	NS	<3.18	<3.5
Thionazin	µg/L	NS	<3.98	<4.38
Volatile Organic Compounds				
1,1-Dichloropropene	µg/L	NS	<0.43	<0.43
1,2,4-Trichlorobenzene	µg/L	70	<0.75	<0.75
1,3-Dichlorobenzene	µg/L	600	<0.3	<0.3
1,3-Dichloropropane	µg/L	NS	<0.4	<0.4
2,2-Dichloropropane	µg/L	NS	<0.69	<0.69
Acrolein	µg/L	NS	<3.6	<3.6
Allyl chloride	µg/L	NS	<0.7	<0.7
Chloroprene	µg/L	NS	<0.23	<0.23
Dichlorodifluoromethane	µg/L	1000	<0.25	<0.25
Ethyl Methacrylate	µg/L	NS	<0.68	<0.68
Methacrylonitrile	µg/L	NS	<3.3	<3.3
Methyl Methacrylate	µg/L	NS	<0.76	<0.76
Naphthalene	µg/L	100	<3	<3
Propionitrile	µg/L	NS	<3.4	<3.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-18

Parameter Name	Units	GPS	Jul-24	Aug-24	Dec-24
Appendix I Inorganics					
Total Suspended Solids	mg/L	NS	<1.39	***5.88***	***5.33***
Turbidity, Field	NTU	NS	***6.4***	***2.65***	***1.54***
Turbidity, Lab	NTU	NS	--	--	--
Antimony	µg/L	6	<1	<1	<1
Antimony, Dissolved	µg/L	NS	--	--	--
Arsenic	µg/L	10	<0.53	<0.53	<0.53
Arsenic, Dissolved	µg/L	NS	--	--	--
Barium	µg/L	2000	***60.5***	***69.2***	***76.2***
Barium, Dissolved	µg/L	NS	--	--	--
Beryllium	µg/L	4	<0.33	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	--	--	--
Cadmium	µg/L	5	<0.1	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	--	--	--
Chromium	µg/L	100	<1.2	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	--	--	--
Cobalt	µg/L	2.1	<0.17	<0.17	<0.17
Cobalt, Dissolved	µg/L	NS	--	--	--
Copper	µg/L	1300	***2.72 J***	<1.8	<1.8
Copper, Dissolved	µg/L	NS	--	--	--
Lead	µg/L	15	<0.26	<0.26	<0.26
Lead, Dissolved	µg/L	NS	--	--	--
Nickel	µg/L	100	<2.1	<2.1	<2.1
Nickel, Dissolved	µg/L	NS	--	--	--
Selenium	µg/L	50	<1.4	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	--	--	--
Silver	µg/L	100	<0.5	<0.5	<0.5
Silver, Dissolved	µg/L	NS	--	--	--
Thallium	µg/L	2	<0.57	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	--	--	--
Vanadium	µg/L	35	<1.1	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	--	--	--
Zinc	µg/L	2000	<9.7	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	--	--	--
Appendix I Organics					
1,1,1,2-Tetrachloroethane	µg/L	70	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	<0.45	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	<0.22	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	<0.37	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	<0.39	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	<0.23	<0.23	<0.23
2-Butanone	µg/L	4000	<2.1	<2.1	<2.1
2-Hexanone	µg/L	NS	<2	<2	<2
4-Methyl-2-pentanone	µg/L	560	<2.1	<2.1	<2.1
Acetone	µg/L	6300	<3.1	<3.1	<3.1
Acrylonitrile	µg/L	0.32	<2.2	<2.2	<2.2
Benzene	µg/L	5	<0.22	<0.22	<0.22
Bromochloromethane	µg/L	90	<0.54	<0.54	<0.54
Bromodichloromethane	µg/L	80	<0.39	<0.39	<0.39
Bromomethane	µg/L	10	<1.1	<1.1	<1.1
Carbon disulfide	µg/L	700	<0.45	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	<0.65	<0.65	<0.65
Chlorobenzene	µg/L	100	<0.4	<0.4	<0.4
Chloroethane	µg/L	2800	<0.79	<0.79	<0.79
Chloromethane	µg/L	NS	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	<0.25	<0.25	<0.25
Dibromochloromethane	µg/L	80	<0.75	<0.75	<0.75
Dibromomethane	µg/L	70	<0.33	<0.33	<0.33
Dichloromethane	µg/L	5	<1.7	<1.7	<1.7
Ethylbenzene	µg/L	700	<0.31	<0.31	<0.31
Iodomethane	µg/L	NS	<7	<7	<7
Styrene	µg/L	100	<0.37	<0.37	<0.37
Tetrachloroethylene	µg/L	5	<0.48	<0.48	<0.48
Toluene	µg/L	1000	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	<1.1	<1.1	<1.1
Tribromomethane	µg/L	80	<0.78	<0.78	<0.78
Trichloroethylene	µg/L	5	<0.43	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	<0.38	<0.38	<0.38
Trichloromethane	µg/L	80	<1.3	<1.3	<1.3
Vinyl Acetate	µg/L	NS	<2.5	<2.5	<2.5
Vinyl Chloride	µg/L	2	<0.18	<0.18	<0.18
Xylenes	µg/L	10000	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-19/19R

Parameter Name	Units	GPS	Oct-07	Jan-08	Apr-08	Jul-08	Oct-08	Apr-09	Jul-09	Oct-09	Dec-09	Feb-10	Apr-10	Oct-10	Apr-11	Oct-11	Apr-12	Oct-12	Apr-13	Nov-13	May-14	Oct-14	May-15	Sep-15	Apr-16	Nov-16	May-17	Nov-17	Jun-18	Oct-18	Jun-19	Aug-19	Nov-19	Jun-20	Aug-20	Nov-20	May-21	Begin MW-19R Sep-21	Dec-21	Mar-22	Jun-22	Aug-22	Dec-22	Jun-23	Nov-23	Jun-24	Dec-24
Appendix I Inorganics																																															
Total Suspended Solids	mg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***6.5***	***1.63 J***	Lab Error	***0.75 J***	***2.63***	***1.75 J***	<0.581	***0.875 J***	***3.25***	***3.38***	***4 J***	***5.5***	***5.75***	***5.5***	***6.75***	***7.25***	***182***	***31***	***834***	***15***	***12.8***	***10.8***	***109***	***10.5***	<1.39	***12.1***
Turbidity, Field	NTU	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***2.902***	***1.607***	***2.068***	***1.81***	***1.181***	***1.749***	***1.279***	***0.8054***	***2.672***	***41.63***	***33.13***	***1.41***	***0.73***	***1.62***	***0.42***	***1.8***	***211.8***	***35.69***	***1087.7***	***16.55***	***37.85***	***5.84***	***45.94***	***12.44***	***1.47***	***5.64***
Turbidity, Lab	NTU	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	***3.8***	***1***	Lab Error	***0.6 J***	***3.3***	***0.6 J***	<0.4	***0.8 J***	***1.3***	***7.29***	***18.4***	***3.44***	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<2.73	<1.45	<0.6	***0.0641 J***	<0.0541	<0.4	<0.161	<0.161	<0.161	<0.237	<0.237	<0.185	<0.185	<0.42	<0.42	<1.32	<1.32	<0.53	<0.51	<2.04	<0.51	<1.1	<1.1	<1.1	<0.69	<0.69	<0.69	<0.69	<1	<1	<1	<1
Antimony, Dissolved	µg/L	NS	--	--	--	--	--	--	<6	<6	<6	<6	<6	<6	<6	<2.73	<1.45	<0.12	<0.0541	<0.0541	<0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.6	***0.666 J***	***4.45 J***	***1.18***	***1.01***	***0.42 J***	<0.945	<0.945	<0.945	<0.672	<0.672	<0.505	<0.505	<0.57	<0.57	***1.55***	***1.89***	***1.77 J***	***2.01***	***9.23***	***2.47***	***2.48***	<0.75	<0.75	***1.05 J***	<0.75	<0.75	<0.75	<0.53	<0.53	<0.53	<0.53
Arsenic, Dissolved	µg/L	NS	--	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<0.47	<0.216	<0.73	***0.976 J***	<0.544	<0.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	***173***	***155***	***170***	***152***	***145***	***149***	***128***	***127***	***160***	***138***	***139***	***165***	***126***	***140***	***201***	***152***	***165***	***192***	***154***	***179***	***142***	***149***	***153***	***171***	***162***	***156***	***156***	***156***	***528***	***554***	***554***	***572***	***2080***	***498***	***616***	***190***	***100***	***139***	***72.3***	***168***	***152***	***82.4***	***84.1***	***58.4***	***96.3***
Barium, Dissolved	µg/L	NS	--	--	--	--	--	--	***130***	***122***	***143***	***131***	***127***	***120***	***146***	***145***	***149***	***156***	***163***	***193***	***153***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.051	<0.079	<0.089	<0.0696	<0.0696	<0.08	<0.039	<0.039	***0.04 J***	<0.221	<0.221	<0.125	<0.125	<0.19	<0.19	<0.53	<0.53	<0.27	<0.27	<1.08	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	--	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<0.051	<0.079	<0.0178	<0.0696	<0.0696	<0.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	<0.32	<0.106	<0.106	<0.1	<0.112	<0.112	<0.112	<0.0351	<0.0351	<0.0441	<0.0441	<0.06	<0.06	<0.167	<0.167	<0.039	<0.049	<0.196	<0.049	<0.051	<0.051	<0.051	***0.12***	<0.055	<0.055	<0.055	<0.1	<0.1	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	--	--	--	--	--	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.124	<0.229	<0.064	<0.106	<0.106	<0.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.81	***3 J***	<1.95	***0.703 J***	<0.418	***1.07 J***	<1.24	<1.24	<1.24	<0.355	<0.355	<0.729	<0.729	<0.76	<0.76	<1.14	<1.14	<0.98	<1.1	<4.4	<1.1	<1.1	<1.1	<1.1	***4.31 J***	<1.1	***2.99 J***	<1.1	<1.1	<1.1	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	--	--	--	--	--	--	<20	<20	<20	<20	<20	<20	<20	<1.81	***1.81 J***	<0.39	<0.418	<0.418	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	2.1	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.55	<1.55	<0.075	***0.279 J***	***0.617***	***0.1 J***	***0.364 J***	<0.0528	***0.093 J***	<0.0274	<0.0274	<0.0453	<0.0453	<0.061	<0.061	***3.08***	***2.11***	***2.38***	***1.51***	***5.62***	***1.8***	***1.49***	***1.43***	***0.624***	***3.4***	***0.363 J***	<0.19	<0.19	***0.49 J***	<0.17	<0.17	***0.284 J***
Cobalt, Dissolved	µg/L	NS	--	--	--	--	--	--	<20	<20	<20	<20	<20	<20	<20	<1.55	<1.55	***0.12 J***	***0.195 J***	***0.55***	***0.081 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	***7.14 J***	***8.01 J***	<0.6	***1.65***	***2.22***	<0.56	<0.485	<0.485	<0.485	<1.22	<1.22	<2.19	<2.19	<1.6	<1.6	***1.07 J***	<0.497	<2	<1.5	<6	<1.5	<1.4	<1.4	<1.4	***7.64***	<1.8	<1.8	<1.8	***3.19 J***	<1.8	<1.8	<1.8
Copper, Dissolved	µg/L	NS	--	--	--	--	--	--	<20	<20	<20	<20	<20	<20	<20	***8.4 J***	<1.51	***0.51***	***2.68***	***0.803***	<0.56	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<1	***3.17 J***	<0.145	***1.17***	***0.594***	***0.468 J***	***0.171 J***	<0.0967	***0.102 J***	<0.211	<0.211	<0.324	<0.324	<0.25	<0.25	***0.197 J***	<0.186	<0.27	***0.126 J***	***0.788 J***	***0.147 J***	<0.21	***0.581***	***0.268 J***	***3.25***	<0.24	<0.24	<0.24	<0.24	<0.24	<0.26	<0.26
Lead, Dissolved	µg/L	NS	--	--	--	--	--	--	<4	<4	<4	<4	<4	<4	<4	<1	<0.804	<0.029	<0.207	<0.207	<0.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<2.58	***3.32 J***	***1.75 J***	***3.97***	***6.31***	***0.969 J***	***1.14 J***	***0.662 J***	***0.775 J***	<1.53	<1.53	<0.929	<0.929	<1	<1	***18.8***	***10.1***	***10.5***	***9.23***	***37.6***	***13.8***	***12.2***	***2.91 J***	***2.06 J***	***6.52***	<1.9	<1.9	<1.9	<1.9	<1.9	<2.1	<2.1
Nickel, Dissolved	µg/L	NS	--	--	--	--	--	--	<50	<50	<50	<50	<50	<50	<50	***2.65 J***	***2.9 J***	***1.46***	***2.85***	***4.61***	***1.98 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.69	<0.7	<1.48	<1.46	<1.46	<0.7	<3.34	<3.34	<3.34	<0.63	<0.63	<0.928	<0.928	<0.9	<0.9	<0.982	<0.982	<1	<1	<4	<1	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96	<1.4	<1.4	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	--	--	--	--	--	--	<5	<5	<5	<5	<5	<5	<5	<1.69	<0.7	<0.297	<1.46	<1.46	<0.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<1.7	<1.7	<0.135	<0.0789	<0.0789	<0.033	<0.042	<0.042	***0.122 J***	<0.153	<0.153	<0.14	***0.152 J***	<0.3	<0.3	<0.115	<0.115	<0.37	<0.37	<1.48	<0.37	<0.42	<0.42	<0.42	<0.49	<0.49	<0.49	***1.24***	<0.5	<0.5	<0.5	<0.5
Silver, Dissolved	µg/L	NS	--	--	--	--	--	--	<20	<20	<20	<20	<20	<20	<20	<1.7	<1.7	<0.027	<0.0789	<0.0789	<0.033	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.84	<0.288	<0.0435	<0.0267	<0.0267	<0.05	<0.0325	<0.0325	<0.0325	<0.0255	<0.0255	<0.0644	<0.0644	<0.17	<0.17	<0.57	<0.57	<0.27	<0.26	<1.04	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	--	--	--	--	--	--	<2	<2	<2	<2	<2	<2	<2	<0.84	<0.288	<0.0087	<0.0267	<0.0267	<0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<2.1	<2.1	<4.7	<0.833	<0.833	<0.5	<0.449	<0.449	<0.449	<0.255	<0.255	<0.84	<0.84	<0.52	<0.52	<2.15	<2.15	<0.82	<0.85	<3.4	<0.85	<1.1	<1.1	<1.1	***3.49 J***	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	--	--	--	--	--	--	<50	<50	<50	<50	<50	<50	<50	<2.1	<2.1	<0.94	<0.833	<0.833	***0.598 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	***39.7***	<20	***23.2***	<20	<20	***21.6***	***20.7***	<20	***62.7***	<20	<20	***22.5***	<20	<9.11	***32.5***	<4.6	***2.22 J***	<0.625	<2	<6.95	<6.95	<6.95	<5.21	<5.21	<11.5	<11.5	<10	<10	<6.92	***7.96 J***	<10	<10	<40	<10	<10	<10	<10	<10	<10	<10	<10	<6.4	<6.4	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	--	--	--	--	--	--	***23.1***	***20.2***	***39.7***	<20	<20	***20.1***	<20	<9.11	***23.4***	<0.92	***5.55***	<0.625	***2.77 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																																															
1,1,1,2-Tetrachloroethane	µg/L	70	<1	<1	<1	<1	<1	<1	<1	<1	<5	<2	<10	<5	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<5	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.22	<0.22	***0.908 J***	***0.736 J***	***0.551 J***	***0.551 J***	***0.687 J***	***0.892 J***	***0.74 J***	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.37	<0.37	<0.37	***0.394 J***	***0.445 J***	***0.477 J***	<0.37	<0.37	***0.715 J***	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.39	<0.39	***0.786 J***	***0.522 J***	***0.42 J***	<0.39	***0.431 J***	<0.39	***0.621 J***	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.23	<0.23	<0.23	<0.23	***0.566 J***	***0.495 J***	***0.361 J***	<0.23	***0.563 J***	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
2-Butanone	µg/L	4000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.47	***1.1 J***	<0.47	<0.47	<0.47	***2.38 J***	<0.47	<0.47	<0.47	<0.47	<1.04	<1.04	<1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
2-Hexanone	µg/L	NS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
4-Methyl-2-pentanone	µg/L	560	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
Acetone	µg/L	6300	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.79	***2.08 J***	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	<1.79	***2.22 J***	<3.1	<3.1	***4.52 J***	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	***10.3***	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1
Acrylonitrile	µg/L	0.32	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
Benzene	µg/L	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.22	<0.22	***13***	***7.29***	***6.8***	***4.27***	***4.11***	***6***	***4.33***	***0.467 J***	<0.22	***0.394 J***	<0.22	<0.22	***0.343 J***	<0.22	***0.445 J***	<0.22	***0.235 J***
Bromochloromethane	µg/L	90	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54
Bromodichloromethane	µg/L	80	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<10	<1	<1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
Bromomethane	µg/L	10	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<0.22	<0.22	***0.32 J***	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<1.1	<1.1	<1.1	***1.47 J***	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Carbon disulfide	µg/L	700	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<1	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	***0.914 J***	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<5	<5	<2	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65
Chlorobenzene	µg/L	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.4	<0.4	***2.06***	***2.31***	***2.51***	***2.3***	***1.88***	***2.03***	***2.72***	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chloroethane	µg/L	2800	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	***0.15 J***	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79
Chloromethane	µg/L	NS	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Dibromochloromethane	µg/L	80	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<50	<5	<5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75
Dibromomethane	µg/L	70	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Dichloromethane	µg/L	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Ethylbenzene	µg/L	700	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Iodomethane	µg/L	NS	<10	<10	<10	<10	<10	<20	<50	<10	<20	<10	<10	<20	<10	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
Styrene	µg/L	100	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
Tetrachloroethylene	µg/L	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<0.18	<0.18	<0.18	<0.18	<0.18	***0.471 J***	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48
Toluene	µg/L	1000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.15	<0.15	<0.15	***0.266 J***	<0.15	<0.15	<0.15	<0.15	<0.15	***0.255 J***	<0.15	<0.15	<0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	***0.431 J***	<0.43	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<10	<5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Tribromomethane	µg/L	80	<5	<5	<5	<5	<5	<20	<5	<5	<10	<5	<50	<5	<5	<0.14	<0.14	<0.14	***0.145 J***	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78
Trichloroethylene	µg/L	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<5	<4	<4	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
Trichloromethane	µg/L	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Vinyl Acetate	µg/L	NS	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Vinyl Chloride	µg/L	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.6	<0.6	<0.18	***0.218 J***	<0.18	<0.18	<0.18	<0.18	***0.202 J***	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Xylenes	µg/L	10000	<3	<3	<3	<3	<3	<3	<3	<3	<6	<3	<3	<3	<3	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-19-19R

Parameter Name	Units	GPS	Nov-19	Jun-20	Aug-20	Nov-20	May-21	Start MW-19R Dec-21
Alcohols/Gycols by GC								
Acetonitrile	µg/L	NS	<126	<404	--	--	<404	--
Isobutanol	µg/L	2100	<177	<553	--	--	<553	--
Herbicides (GC)								
2,4,5-T	µg/L	70	<0.523	<0.462	--	--	<0.495	--
2,4-D	µg/L	70	<0.562	<0.496	--	--	<0.532	--
Silvex (2,4,5-TP)	µg/L	50	<0.349	<0.308	--	--	<0.331	--
Inorganics								
Cyanide	µg/L	200	<5	<5	--	--	<5.3	--
Mercury	µg/L	2	<0.1	<0.1	--	--	<0.15	--
Sulfide	µg/L	NS	<231	***2970***	<10000	<1000	<10000	<231
Tin	µg/L	4200	<1.8	<2.4	--	--	<3	--
PCBs (EPA Method 8082)								
PCB-1016	µg/L	NS	<0.0467	<0.277	--	--	<0.31	--
PCB-1221	µg/L	NS	<0.172	<0.277	--	--	<0.31	--
PCB-1232	µg/L	NS	<0.118	<0.277	--	--	<0.31	--
PCB-1242	µg/L	NS	<0.14	<0.277	--	--	<0.31	--
PCB-1248	µg/L	NS	<0.118	<0.223	--	--	<0.25	--
PCB-1254	µg/L	NS	<0.0989	<0.223	--	--	<0.25	--
PCB-1260	µg/L	NS	<0.0473	<0.223	--	--	<0.25	--
Pesticides (EPA Method 8081A)								
4,4'-DDD	µg/L	0.73	<0.00191	<0.00191	--	--	<0.01	--
4,4'-DDE	µg/L	0.51	<0.00223	***0.00438 J***	--	--	<0.0101	--
4,4'-DDT	µg/L	0.51	***0.00459 J***	<0.00404	--	--	<0.0143	--
Aldrin	µg/L	0.01	<0.00479	***0.0054 J***	--	--	<0.0143	--
alpha-BHC	µg/L	0.028	<0.00181	<0.00181	--	--	<0.0119	--
beta-BHC	µg/L	0.042	<0.00511	***0.00714 J***	--	--	<0.0155	--
Chlordane	µg/L	2	<0.0681	<0.0681	--	--	<0.262	--
delta-BHC	µg/L	2.1	<0.00245	<0.00245	--	--	<0.0179	--
Dieldrin	µg/L	0.011	***0.00375 J***	<0.00213	--	--	<0.0143	--
Endosulfan I	µg/L	42	***0.00496 J***	<0.00213	--	--	<0.0131	--
Endosulfan II	µg/L	42	***0.00531 J***	<0.00202	--	--	<0.00964	--
Endosulfan sulfate	µg/L	NS	<0.00266	<0.00266	--	--	<0.01	--
Endrin	µg/L	2	***0.00287 J***	<0.00202	--	--	<0.0119	--
Endrin aldehyde	µg/L	2.1	<0.00777	<0.00777	--	--	<0.0114	--
gamma-BHC (Lindane)	µg/L	0.2	<0.00202	<0.00202	--	--	<0.0167	--
Heptachlor	µg/L	0.4	<0.00277	<0.00277	--	--	<0.0143	--
Heptachlor epoxide	µg/L	0.2	***0.00813 J***	<0.00649	--	--	<0.0108	--
Methoxychlor	µg/L	40	<0.00223	<0.00223	--	--	<0.0167	--
Toxaphene	µg/L	3	<0.0617	<0.0617	--	--	<0.488	--
Semivolatile Organics by GC/MS								
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<0.148	<1.72	--	--	<1.88	--
1,3,5-Trinitrobenzene	µg/L	NS	<1.35	<1.4	--	--	<1.53	--
1,3-Dinitrobenzene	µg/L	1	<1.07	<1.08	--	--	<1.18	--
1,4-Naphthoquinone	µg/L	NS	<0.381	<1.05	--	--	<1.15	--
1,4-Phenylenediamine	µg/L	NS	<8.89	<0.538	--	--	<0.588	--
1-Naphthylamine	µg/L	NS	<0.254	<0.946	--	--	<1.04	--
2,3,4,6-Tetrachlorophenol	µg/L	NS	<0.529	<1.06	--	--	<1.16	--
2,4,5-Trichlorophenol	µg/L	700	<0.741	<1.18	--	--	<1.29	--
2,4,6-Trichlorophenol	µg/L	16	<0.741	<1.29	--	--	<1.41	--
2,4-Dichlorophenol	µg/L	20	<0.328	<1.18	--	--	<1.29	--
2,4-Dimethylphenol	µg/L	100	<0.222	<1.08	--	--	<1.18	--
2,4-Dinitrophenol	µg/L	14	<2.73	<6.13	--	--	<6.71	--
2,4-Dinitrotoluene	µg/L	0.25	<0.487	<1.18	--	--	<1.29	--
2,6-Dichlorophenol	µg/L	NS	<0.233	<1.18	--	--	<1.29	--
2,6-Dinitrotoluene	µg/L	0.26	<0.254	<1.18	--	--	<1.29	--
2-Acetylaminofluorene	µg/L	NS	<1.31	<1.29	--	--	<1.41	--
2-Chloronaphthalene	µg/L	560	<0.243	<1.4	--	--	<1.53	--
2-Chlorophenol	µg/L	40	<0.159	<1.18	--	--	<1.29	--
2-Methylnaphthalene	µg/L	28	<0.201	<1.4	--	--	<1.53	--
2-Methylphenol (o-Cresol)	µg/L	35	<0.19	<1.08	--	--	<1.18	--
2-Naphthylamine	µg/L	0.097	<0.233	<0.925	--	--	<1.01	--
2-Nitroaniline	µg/L	NS	<1.31	<1.29	--	--	<1.41	--
2-Nitrophenol	µg/L	NS	<1.02	<1.72	--	--	<1.88	--
3,3'-Dichlorobenzidine	µg/L	0.39	<0.857	<1.94	--	--	<2.12	--
3,3'-Dimethylbenzidine	µg/L	NS	<0.222	<2.15	--	--	<2.35	--
3/4-Methylphenol	µg/L	70	<0.19	<0.817	--	--	<0.894	--
3-Methylcholanthrene	µg/L	NS	<0.942	<2.69	--	--	<2.94	--
3-Nitroaniline	µg/L	NS	<0.614	<1.08	--	--	<1.18	--
4,6-Dinitro-2-methylphenol	µg/L	NS	<2.35	<2.69	--	--	<2.94	--
4-Aminobiphenyl	µg/L	0.0083	<0.317	<1.03	--	--	<1.13	--
4-Bromophenyl phenyl ether	µg/L	NS	<0.307	<2.04	--	--	<2.24	--
4-Chloro-3-methylphenol	µg/L	700	<0.275	<1.02	--	--	<1.12	--
4-Chloroaniline	µg/L	28	<0.159	<1.29	--	--	<1.41	--
4-Chlorophenyl phenyl ether	µg/L	NS	<0.265	<1.4	--	--	<1.53	--
4-Nitroaniline	µg/L	NS	<0.339	<1.83	--	--	<2	--
4-Nitrophenol	µg/L	60	<1.46	<2.69	--	--	<2.94	--
5-Nitro-o-toluidine	µg/L	NS	<0.18	<3.33	--	--	<3.65	--
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<0.265	<0.989	--	--	<1.08	--
Acenaphthene	µg/L	420	<0.317	<1.4	--	--	<1.53	--
Acenaphthylene	µg/L	210	<0.614	<1.4	--	--	<1.53	--
Acetophenone	µg/L	NS	<0.37	<3.23	--	--	<3.53	--
Anthracene	µg/L	2100	<0.18	<1.18	--	--	<1.29	--
Benzo (a) anthracene	µg/L	0.24	<0.36	<1.18	--	--	<1.29	--
Benzo (a) pyrene	µg/L	0.2	<1.34	<1.61	--	--	<1.76	--
Benzo (b) fluoranthene	µg/L	0.24	<1.06	<1.29	--	--	<1.41	--
Benzo (g,h,i) perylene	µg/L	21	<1.4	<1.72	--	--	<1.88	--
Benzo (k) fluoranthene	µg/L	2.4	<0.603	<1.29	--	--	<1.41	--
Benzyl alcohol	µg/L	700	<0.635	<1.18	--	--	<1.29	--
Bis(2-chloroethoxy)methane	µg/L	NS	<0.275	<1.18	--	--	<1.29	--
Bis(2-chloroethyl)ether	µg/L	0.16	<0.201	<1.18	--	--	<1.29	--
Bis(2-chloroisopropyl) ether	µg/L	300	<0.19	<1.29	--	--	<1.41	--
Bis(2-ethylhexyl)phthalate	µg/L	6	<2.46	<2.8	--	--	<3.06	--
Butyl benzyl phthalate	µg/L	140	<1.62	<1.61	--	--	<1.76	--
Chlorobenzilate	µg/L	NS	<0.222	<3.12	--	--	<3.41	--
Chrysene	µg/L	24	<0.328	<1.18	--	--	<1.29	--
Diallate (cis or trans)	µg/L	NS	<0.243	<1.4	--	--	<1.53	--
Dibenzo (a,h) anthracene	µg/L	0.024	<1.94	<2.04	--	--	<2.24	--
Dibenzofuran	µg/L	7	<0.254	<1.29	--	--	<1.41	--
Diethyl phthalate	µg/L	5600	***1.65 J***	<1.18	--	--	***2.1 J***	--
Dimethoate	µg/L	1.4	<0.286	<1.08	--	--	<1.18	--
Dimethyl phthalate	µg/L	NS	<2.32	<2.69	--	--	<2.94	--
Di-n-butyl phthalate	µg/L	700	<1.22	<1.29	--	--	<1.41	--
Di-n-octyl phthalate	µg/L	140	<2.8	<3.23	--	--	<3.53	--
Dinoseb	µg/L	7	<0.455	<0.538	--	--	<0.588	--
Diphenylamine	µg/L	180	<0.698	<0.946	--	--	<1.04	--
Disulfoton	µg/L	0.7	<0.307	<0.688	--	--	<0.753	--
Ethyl Methanesulfonate	µg/L	NS	<0.159	<0.538	--	--	<0.588	--
Famphur	µg/L	NS	<0.497	<0.688	--	--	<0.753	--
Fluoranthene	µg/L	280	<0.72	<1.01	--	--	<1.11	--
Fluorene	µg/L	280	<0.307	<1.4	--	--	<1.53	--
Hexachlorobenzene	µg/L	1	<0.286	<1.51	--	--	<1.65	--
Hexachlorobutadiene	µg/L	1	<0.18	<1.29	--	--	<1.41	--
Hexachlorocyclopentadiene	µg/L	50	<2	<2.26	--	--	<2.47	--
Hexachloroethane	µg/L	1	<0.148	<1.4	--	--	<1.53	--
Hexachloropropene	µg/L	NS	<1.74	<1.72	--	--	<1.88	--
Indeno (1,2,3-c,d) pyrene	µg/L	0.24	<1.56	<2.15	--	--	<2.35	--
Isodrin	µg/L	NS	<0.402	<0.624	--	--	<0.682	--
Isophorone	µg/L	100	<0.233	<1.06	--	--	<1.16	--
Isosafrole	µg/L	NS	<0.19	<0.538	--	--	<0.588	--
Kepone	µg/L	NS	<0.254	<1.94	--	--	<2.12	--
Methapyrilene	µg/L	NS	<1.44	<2.04	--	--	<2.24	--
Methyl Methanesulfonate	µg/L	1.8	<0.148	<0.538	--	--	<0.588	--
Nitrobenzene	µg/L	14	<0.317	<1.18	--	--	<1.29	--
N-Nitrosodiethylamine	µg/L	NS	<0.317	<0.538	--	--	<0.588	--
N-Nitrosodimethylamine	µg/L	0.0034	<0.201	<0.978	--	--	<1.07	--
N-Nitrosodi-n-butylamine	µg/L	0.032	<0.307	<0.538	--	--	<0.588	--
N-Nitrosodi-n-propylamine	µg/L	NS	<0.275	<1.08	--	--	<1.18	--
N-Nitrosodiphenylamine	µg/L	36	<0.698	<1.02	--	--	<1.12	--
N-Nitrosomethylethylamine	µg/L	0.008	<0.212	<1.4	--	--	<1.53	--
N-Nitrosopiperidine	µg/L	NS	<0.159	<0.538	--	--	<0.588	--
N-Nitrosopyrrolidine	µg/L	0.083	<0.243	<0.538	--	--	<0.588	--
O,O,O-Triethyl phosphorothioate	µg/L	NS	<0.254	<0.538	--	--	<0.588	--
o-Toluidine	µg/L	11	<0.19	<0.72	--	--	<0.788	--
p-(Dimethylamino)azobenzene	µg/L	NS	<0.254	<0.839	--	--	<0.918	--
Parathion-ethyl	µg/L	NS	<0.19	<1.72	--	--	<1.88	--
Parathion-methyl	µg/L	1	<0.159	<0.806	--	--	<0.882	--
Pentachlorobenzene	µg/L	NS	<0.233	<0.624	--	--	<0.682	--
Pentachloronitrobenzene	µg/L	NS	<0.349	<0.538	--	--	<0.588	--
Pentachlorophenol	µg/L	1	<2.46	<2.47	--	--	<2.71	--
Phenacetin	µg/L	NS	<0.593	<1.94	--	--	<2.12	--
Phenanthrene	µg/L	210	<0.635	<1.18	--	--	<1.29	--
Phenol	µg/L	2000	<2.54	<2.58	--	--	<2.82	--
Phorate	µg/L	1.4	<0.18	<0.538	--	--	<0.588	--
Pronamide	µg/L	5	<0.275	<0.538	--	--	<0.588	--
Pyrene	µg/L	210	<0.275	<1.51	--	--	<1.65	--
Safrole	µg/L	NS	<0.212	<0.538	--	--	<0.588	--
Thionazin	µg/L	NS	<0.328	<0.817	--	--	<0.894	--
Volatile Organic Compounds								
1,1-Dichloropropene	µg/L	NS	<0.43	<0.43	--	--	<0.43	--
1,2,4-Trichlorobenzene	µg/L	70	<0.75	<0.75	--	--	<0.75	--
1,3-Dichlorobenzene	µg/L	600	<0.3	<0.3	--	--	<0.3	--
1,3-Dichloropropane	µg/L	NS	<0.4	<0.4	--	--	<0.4	--
2,2-Dichloropropane	µg/L	NS	<0.69	<0.69	--	--	<0.69	--
Acrolein	µg/L	NS	<3.6	<3.6	--	--	<3.6	--
Allyl chloride	µg/L	NS	<0.7	<0.7	--	--	<0.7	--
Chloroprene	µg/L	NS	<0.23	<0.23	--	--	<0.23	--
Dichlorodifluoromethane	µg/L	1000	<0.25	<0.25	--	--	<0.25	--
Ethyl Methacrylate	µg/L	NS	<0.68	<0.68	--	--	<0.68	--
Methacrylonitrile	µg/L	NS	<3.3	<3.3	--	--	<3.3	--
Methyl Methacrylate	µg/L	NS	<0.76	<0.76	--	--	<0.76	--
Naphthalene	µg/L	100	<3	<3	--	--	<3	--
Propionitrile	µg/L	NS	<3.4	<3.4	--	--	<3.4	--

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-22

Parameter Name	Units	GPS	Jun-19	Aug-19	Nov-19	Jun-20	Aug-20	Nov-20	Jun-21	Sep-21	Mar-22	Aug-22	Jun-23	Nov-23	Jun-24	Dec-24
Appendix I Inorganics																
Total Suspended Solids	mg/L	NS	***1.13 J***	***2.5***	***3.5***	***2.75***	***4.13***	***2.88***	***2.75***	***2.25***	***2.5***	***5.88***	<0.638	***2.25***	***1.88***	***7.25***
Turbidity, Field	NTU	NS	***3.48***	***4.86***	***2.44***	***2.14***	***8.57***	***0.98***	***1.5***	***3.38***	***1.23***	***9.48***	***1.06***	***0.9***	***1.83***	***9.18***
Turbidity, Lab	NTU	NS	***1.08***	***3.13***	***5***	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	<1.32	<1.32	<0.53	<0.51	<0.51	***1.23***	<1.1	<1.1	<0.69	<0.69	<1	<1	<1	<1
Antimony, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	***1.16***	***0.899 J***	<0.75	<0.88	<0.88	<0.88	***0.872 J***	<0.75	<0.75	<0.75	***0.618 J***	***0.834 J***	***0.801 J***	***0.864 J***
Arsenic, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	***146***	***176***	***161***	***144***	***174***	***154***	***147***	***151***	***133***	***156***	***148***	***159***	***137***	***146***
Barium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	<0.53	<0.53	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	<0.167	<0.167	<0.039	<0.049	<0.049	<0.049	***0.056 J***	<0.051	<0.055	***0.057 J***	<0.1	<0.1	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	<1.14	<1.14	<0.98	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	2.1	<0.402	<0.402	***0.099 J***	<0.091	***0.115 J***	<0.091	***0.122 J***	<0.19	<0.19	<0.19	<0.17	<0.17	<0.17	<0.17
Cobalt, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	<0.497	<0.497	<2	<1.5	<1.5	<1.5	<1.4	<1.4	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Copper, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	<0.186	<0.186	<0.27	<0.11	***0.207 J***	***0.121 J***	<0.21	<0.21	<0.24	<0.24	<0.24	<0.24	<0.26	***0.293 J***
Lead, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	***6.61***	***8.64***	***9.21***	***7.25***	***9.85***	***9.21***	***6.72***	***7.71***	***5.54***	***7.64***	***4.45 J***	***9.26***	***6.65***	***7.63***
Nickel, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	<0.982	<0.982	<1	<1	<1	<1	<0.96	<0.96	<0.96	<0.96	<1.4	<1.4	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	<0.115	<0.115	<0.37	<0.37	<0.37	<0.37	<0.42	<0.42	<0.49	<0.49	<0.5	<0.5	<0.5	<0.5
Silver, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	<0.57	<0.57	<0.27	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	***2.67 J***	<2.15	<0.82	<0.85	<0.85	***0.923 J***	<1.1	<1.1	***1.49 J***	<1.1	<1.1	<1.1	<1.1	<1.1
Vanadium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	***11 J***	***11.7 J***	<10	<10	<10	<10	<10	<10	<10	<10	***9.53 J***	***9.94 J***	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																
1,1,1,2-Tetrachloroethane	µg/L	70	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
2-Butanone	µg/L	4000	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	***2.52 J***	<2.1
2-Hexanone	µg/L	NS	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
4-Methyl-2-pentanone	µg/L	560	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
Acetone	µg/L	6300	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1
Acrylonitrile	µg/L	0.32	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
Benzene	µg/L	5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
Bromochloromethane	µg/L	90	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54
Bromodichloromethane	µg/L	80	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
Bromomethane	µg/L	10	***1.91 J***	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Carbon disulfide	µg/L	700	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65
Chlorobenzene	µg/L	100	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chloroethane	µg/L	2800	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79
Chloromethane	µg/L	NS	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Dibromochloromethane	µg/L	80	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75
Dibromomethane	µg/L	70	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Dichloromethane	µg/L	5	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Ethylbenzene	µg/L	700	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Iodomethane	µg/L	NS	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
Styrene	µg/L	100	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
Tetrachloroethylene	µg/L	5	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48
Toluene	µg/L	1000	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Tribromomethane	µg/L	80	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78
Trichloroethylene	µg/L	5	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
Trichloromethane	µg/L	80	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Vinyl Acetate	µg/L	NS	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Vinyl Chloride	µg/L	2	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Xylenes	µg/L	10000	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Well MW-35

Parameter Name	Units	GPS	Nov-19	Feb-20	Jul-20	Aug-20	Nov-20	Jun-21	Sep-21	Mar-22	Sep-22	Jun-23	Nov-23	Jul-24	Sep-24	Dec-24
Appendix I Inorganics																
Total Suspended Solids	mg/L	NS	***2.13***	***7***	***7.13***	***14.5***	***3.25***	***3.5***	***4.62***	***6.67***	***10.3***	***6.63***	***7***	***5.25***	***2.25***	***3.31***
Turbidity, Field	NTU	NS	***0.76***	***23.84***	***20.64***	***43.11***	***5.4***	***1.29***	***4.86***	***4.68***	***8.58***	***13.82***	***1.38***	***2.25***	***3.58***	***14.84***
Turbidity, Lab	NTU	NS	***3.55***	--	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	<0.53	<0.58	<0.51	<0.51	<0.51	<1.1	<1.1	<0.69	<0.69	<1	<1	<1	--	<1
Antimony, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	<0.75	<0.88	<0.88	<0.88	<0.88	<0.75	<0.75	***1.01 J***	***1.13 J***	***0.761 J***	***1.73 J***	***0.767 J***	--	***1.09 J***
Arsenic, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	***326***	***294***	***337***	***288***	***278***	***276***	***301***	***316***	***345***	***264***	***467***	***280***	--	***186***
Barium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33	--	<0.33
Beryllium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	<0.039	<0.039	<0.049	<0.049	<0.049	<0.051	<0.051	<0.055	<0.055	<0.1	<0.1	<0.1	--	<0.1
Cadmium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	<0.98	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.2	--	<1.2
Chromium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	2.1	***8.27***	***6.6***	***7.03***	***5.98***	***5.97***	***5.51***	***6.33***	***6.39***	***6.74***	***5.33***	***10.8***	***4.96***	--	***1.98***
Cobalt, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	<2	<3.2	<1.5	<1.5	<1.5	<1.4	<1.4	<1.8	<1.8	<1.8	<1.8	<1.8	--	<1.8
Copper, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	<0.27	<0.27	<0.11	<0.11	<0.11	<0.21	<0.21	<0.24	<0.24	<0.24	<0.24	<0.26	--	<0.26
Lead, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	***27.4***	***23.2***	***27.9***	***22***	***19.5***	***18.8***	***22.5***	***24.9***	***26.5***	***18.7***	***32.7***	***17.6***	--	***11.8***
Nickel, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	<1	<1	<1	<1	<1	<0.96	<0.96	<0.96	<0.96	<1.4	<1.4	<1.4	--	<1.4
Selenium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	<0.37	<0.37	<0.37	<0.37	<0.37	<0.42	<0.42	<0.49	***0.759 J***	<0.5	<0.5	<0.5	--	<0.5
Silver, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	***0.386 J***	***0.304 J***	***0.357 J***	***0.339 J***	***0.273 J***	***0.307 J***	***0.34 J***	***0.361 J***	***0.408 J***	***0.337 J***	***0.371 J***	***1.14***	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	<0.82	<0.82	<0.85	<0.85	<0.85	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1
Vanadium, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<6.4	<6.4	<9.7	--	<9.7
Zinc, Dissolved	µg/L	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																
1,1,1,2-Tetrachloroethane	µg/L	70	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38
1,1,1-Trichloroethane	µg/L	200	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47
1,1,2-Trichloroethane	µg/L	5	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45
1,1-Dichloroethane	µg/L	140	<0.22	<0.22	***0.684 J***	***0.522 J***	***0.592 J***	***0.582 J***	***0.448 J***	***0.545 J***	***0.52 J***	<0.22	***0.557 J***	***0.365 J***	--	***0.338 J***
1,1-Dichloroethylene	µg/L	7	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2
1,2-Dibromoethane	µg/L	0.05	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34
1,2-Dichlorobenzene	µg/L	600	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37
1,2-Dichloroethane	µg/L	5	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39
1,2-Dichloropropane	µg/L	5	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27
1,4-Dichlorobenzene	µg/L	75	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23
2-Butanone	µg/L	4000	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1
2-Hexanone	µg/L	NS	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2
4-Methyl-2-pentanone	µg/L	560	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1
Acetone	µg/L	6300	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	--	<3.1
Acrylonitrile	µg/L	0.32	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2
Benzene	µg/L	5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22
Bromochloromethane	µg/L	90	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54
Bromodichloromethane	µg/L	80	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39
Bromomethane	µg/L	10	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1
Carbon disulfide	µg/L	700	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45
Carbon Tetrachloride	µg/L	5	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65
Chlorobenzene	µg/L	100	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4
Chloroethane	µg/L	2800	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79
Chloromethane	µg/L	NS	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61
cis-1,2-Dichloroethylene	µg/L	70	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21
cis-1,3-Dichloropropene	µg/L	NS	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25
Dibromochloromethane	µg/L	80	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75
Dibromomethane	µg/L	70	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33
Dichloromethane	µg/L	5	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7
Ethylbenzene	µg/L	700	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31
Iodomethane	µg/L	NS	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	--	<7
Styrene	µg/L	100	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37
Tetrachloroethylene	µg/L	5	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48
Toluene	µg/L	1000	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43
Trans-1,2-dichloroethylene	µg/L	100	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27
trans-1,3-Dichloropropene	µg/L	NS	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1
Tribromomethane	µg/L	80	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78
Trichloroethylene	µg/L	5	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43
Trichlorofluoromethane	µg/L	2000	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38
Trichloromethane	µg/L	80	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3
Vinyl Acetate	µg/L	NS	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5
Vinyl Chloride	µg/L	2	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18
Xylenes	µg/L	10000	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix II Results
Monitoring Well MW-35

Parameter Name	Units	GPS	Nov-20	Jun-21
Alcohols/Gycols by GC				
Acetonitrile	µg/L	NS	<404	<404
Isobutanol	µg/L	2100	<553	<553
Herbicides (GC)				
2,4,5-T	µg/L	70	<0.544	<0.571
2,4-D	µg/L	70	<0.584	<0.613
Silvex (2,4,5-TP)	µg/L	50	<0.363	<0.381
Inorganics				
Cyanide	µg/L	200	<5	<5.3
Mercury	µg/L	2	<0.1	<0.15
Sulfide	µg/L	NS	<10000	<231
Tin	µg/L	4200	<2.4	<3
PCBs (EPA Method 8082)				
PCB-1016	µg/L	NS	<0.317	<0.325
PCB-1221	µg/L	NS	<0.317	<0.325
PCB-1232	µg/L	NS	<0.317	<0.325
PCB-1242	µg/L	NS	<0.317	<0.325
PCB-1248	µg/L	NS	<0.256	<0.263
PCB-1254	µg/L	NS	<0.256	<0.263
PCB-1260	µg/L	NS	<0.256	<0.263
Pesticides (EPA Method 8081A)				
4,4'-DDD	µg/L	0.73	***0.00285 J***	<0.0105
4,4'-DDE	µg/L	0.51	<0.00256	<0.0106
4,4'-DDT	µg/L	0.51	<0.00463	<0.015
Aldrin	µg/L	0.01	<0.00549	<0.015
alpha-BHC	µg/L	0.028	<0.00207	<0.0125
beta-BHC	µg/L	0.042	<0.00585	<0.0163
Chlordane	µg/L	2	<0.078	<0.275
delta-BHC	µg/L	2.1	***0.00447 J***	<0.0188
Dieldrin	µg/L	0.011	<0.00244	<0.015
Endosulfan I	µg/L	42	<0.00244	<0.0138
Endosulfan II	µg/L	42	<0.00232	<0.0101
Endosulfan sulfate	µg/L	NS	<0.00305	<0.0105
Endrin	µg/L	2	<0.00232	<0.0125
Endrin aldehyde	µg/L	2.1	<0.0089	<0.012
gamma-BHC (Lindane)	µg/L	0.2	<0.00232	<0.0175
Heptachlor	µg/L	0.4	<0.00317	<0.015
Heptachlor epoxide	µg/L	0.2	<0.00744	<0.0114
Methoxychlor	µg/L	40	<0.00256	<0.0175
Toxaphene	µg/L	3	<0.0707	<0.513
Semivolatile Organics by GC/MS				
1,2,4,5-Tetrachlorobenzene	µg/L	2.1	<1.88	<1.93
1,3,5-Trinitrobenzene	µg/L	NS	<1.53	<1.57
1,3-Dinitrobenzene	µg/L	1	<1.18	<1.2
1,4-Naphthoquinone	µg/L	NS	<1.15	<1.18
1,4-Phenylenediamine	µg/L	NS	<0.588	<0.602
1-Naphthylamine	µg/L	NS	<1.04	<1.06
2,3,4,6-Tetrachlorophenol	µg/L	NS	<1.16	<1.19
2,4,5-Trichlorophenol	µg/L	700	<1.29	<1.33
2,4,6-Trichlorophenol	µg/L	16	<1.41	<1.45
2,4-Dichlorophenol	µg/L	20	<1.29	<1.33
2,4-Dimethylphenol	µg/L	100	<1.18	<1.2
2,4-Dinitrophenol	µg/L	14	<6.71	<6.87
2,4-Dinitrotoluene	µg/L	0.25	<1.29	<1.33
2,6-Dichlorophenol	µg/L	NS	<1.29	<1.33
2,6-Dinitrotoluene	µg/L	0.26	<1.29	<1.33
2-Acetylaminofluorene	µg/L	NS	<1.41	<1.45
2-Chloronaphthalene	µg/L	560	<1.53	<1.57
2-Chlorophenol	µg/L	40	<1.29	<1.33
2-Methylnaphthalene	µg/L	28	<1.53	<1.57
2-Methylphenol (o-Cresol)	µg/L	35	<1.18	<1.2
2-Naphthylamine	µg/L	0.097	<1.01	<1.04
2-Nitroaniline	µg/L	NS	<1.41	<1.45
2-Nitrophenol	µg/L	NS	<1.88	<1.93
3,3'-Dichlorobenzidine	µg/L	0.39	<2.12	<2.17
3,3'-Dimethylbenzidine	µg/L	NS	<2.35	<2.41
3/4-Methylphenol	µg/L	70	<0.894	<0.916
3-Methylcholanthrene	µg/L	NS	<2.94	<3.01
3-Nitroaniline	µg/L	NS	<1.18	<1.2
4,6-Dinitro-2-methylphenol	µg/L	NS	<2.94	<3.01
4-Aminobiphenyl	µg/L	0.0083	<1.13	<1.16
4-Bromophenyl phenyl ether	µg/L	NS	<2.24	<2.29
4-Chloro-3-methylphenol	µg/L	700	<1.12	<1.14
4-Chloroaniline	µg/L	28	<1.41	<1.45
4-Chlorophenyl phenyl ether	µg/L	NS	<1.53	<1.57
4-Nitroaniline	µg/L	NS	<2	<2.05
4-Nitrophenol	µg/L	60	<2.94	<3.01
5-Nitro-o-toluidine	µg/L	NS	<3.65	<3.73
7,12-Dimethylbenz (a) anthracene	µg/L	NS	<1.08	<1.11
Acenaphthene	µg/L	420	<1.53	<1.57
Acenaphthylene	µg/L	210	<1.53	<1.57
Acetophenone	µg/L	NS	<3.53	<3.61
Anthracene	µg/L	2100	<1.29	<1.33
Benzo (a) anthracene	µg/L	0.24	<1.29	<1.33
Benzo (a) pyrene	µg/L	0.2	<1.76	<1.81
Benzo (b) fluoranthene	µg/L	0.24	<1.41	<1.45
Benzo (g,h,i) perylene	µg/L	21	<1.88	<1.93
Benzo (k) fluoranthene	µg/L	2.4	<1.41	<1.45
Benzyl alcohol	µg/L	700	<1.29	<1.33
Bis(2-chloroethoxy)methane	µg/L	NS	<1.29	<1.33
Bis(2-chloroethyl)ether	µg/L	0.16	<1.29	<1.33
Bis(2-chloroisopropyl) ether	µg/L	300	<1.41	<1.45
Bis(2-ethylhexyl)phthalate	µg/L	6	<3.06	<3.13
Butyl benzyl phthalate	µg/L	140	<1.76	<1.81
Chlorobenzilate	µg/L	NS	<3.41	<3.49
Chrysene	µg/L	24	<1.29	<1.33
Diallate (cis or trans)	µg/L	NS	<1.53	<1.57
Dibenzo (a,h) anthracene	µg/L	0.024	<2.24	<2.29
Dibenzofuran	µg/L	7	<1.41	<1.45
Diethyl phthalate	µg/L	5600	<1.29	<1.33
Dimethoate	µg/L	1.4	<1.18	<1.2
Dimethyl phthalate	µg/L	NS	<2.94	<3.01
Di-n-butyl phthalate	µg/L	700	<1.41	<1.45
Di-n-octyl phthalate	µg/L	140	<3.53	<3.61
Dinoseb	µg/L	7	<0.588	<0.602
Diphenylamine	µg/L	180	<1.04	<1.06
Disulfoton	µg/L	0.7	<0.753	<0.771
Ethyl Methanesulfonate	µg/L	NS	<0.588	<0.602
Famphur	µg/L	NS	<0.753	<0.771
Fluoranthene	µg/L	280	<1.11	<1.13
Fluorene	µg/L	280	<1.53	<1.57
Hexachlorobenzene	µg/L	1	<1.65	<1.69
Hexachlorobutadiene	µg/L	1	<1.41	<1.45
Hexachlorocyclopentadiene	µg/L	50	<2.47	<2.53
Hexachloroethane	µg/L	1	<1.53	<1.57
Hexachloropropene	µg/L	NS	<1.88	<1.93
Indeno (1,2,3-cd) pyrene	µg/L	0.24	<2.35	<2.41
Isodrin	µg/L	NS	<0.682	<0.699
Isophorone	µg/L	100	<1.16	<1.19
Isosafrole	µg/L	NS	<0.588	<0.602
Kepone	µg/L	NS	<2.12	<2.17
Methapyrilene	µg/L	NS	<2.24	<2.29
Methyl Methanesulfonate	µg/L	1.8	<0.588	<0.602
Nitrobenzene	µg/L	14	<1.29	<1.33
N-Nitrosodiethylamine	µg/L	NS	<0.588	<0.602
N-Nitrosodimethylamine	µg/L	0.0034	<1.07	<1.1
N-Nitrosodi-n-butylamine	µg/L	0.032	<0.588	<0.602
N-Nitrosodi-n-propylamine	µg/L	NS	<1.18	<1.2
N-Nitrosodiphenylamine	µg/L	36	<1.12	<1.14
N-Nitrosomethylethylamine	µg/L	0.008	<1.53	<1.57
N-Nitrosopiperidine	µg/L	NS	<0.588	<0.602
N-Nitrosopyrrolidine	µg/L	0.083	<0.588	<0.602
O,O,O-Triethyl phosphorothioate	µg/L	NS	<0.588	<0.602
o-Toluidine	µg/L	11	<0.788	<0.807
p-(Dimethylamino)azobenzene	µg/L	NS	<0.918	<0.94
Parathion-ethyl	µg/L	NS	<1.88	<1.93
Parathion-methyl	µg/L	1	<0.882	<0.904
Pentachlorobenzene	µg/L	NS	<0.682	<0.699
Pentachloronitrobenzene	µg/L	NS	<0.588	<0.602
Pentachlorophenol	µg/L	1	<2.71	<2.77
Phenacetin	µg/L	NS	<2.12	<2.17
Phenanthrene	µg/L	210	<1.29	<1.33
Phenol	µg/L	2000	<2.82	<2.89
Phorate	µg/L	1.4	<0.588	<0.602
Pronamide	µg/L	5	<0.588	<0.602
Pyrene	µg/L	210	<1.65	<1.69
Safrole	µg/L	NS	<0.588	<0.602
Thionazin	µg/L	NS	<0.894	<0.916
Volatile Organic Compounds				
1,1-Dichloropropene	µg/L	NS	<0.43	<0.43
1,2,4-Trichlorobenzene	µg/L	70	<0.75	<0.75
1,3-Dichlorobenzene	µg/L	600	<0.3	<0.3
1,3-Dichloropropane	µg/L	NS	<0.4	<0.4
2,2-Dichloropropane	µg/L	NS	<0.69	<0.69
Acrolein	µg/L	NS	<3.6	<3.6
Allyl chloride	µg/L	NS	<0.7	<0.7
Chloroprene	µg/L	NS	<0.23	<0.23
Dichlorodifluoromethane	µg/L	1000	<0.25	<0.25
Ethyl Methacrylate	µg/L	NS	<0.68	<0.68
Methacrylonitrile	µg/L	NS	<3.3	<3.3
Methyl Methacrylate	µg/L	NS	<0.76	<0.76
Naphthalene	µg/L	100	<3	<3
Propionitrile	µg/L	NS	<3.4	<3.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

SURFACE WATER

Winneshiek County Landfill
Appendix I Results
Monitoring Location SW-1

Parameter Name	Units	GPS	DL	RL	Apr-12	Oct-12	Apr-13	Jun-13	Aug-13	Jun-14	Nov-14	May-15	Sep-15	Apr-16	Nov-16	May-17	Nov-17	Jun-18	Oct-18	Jun-19	Nov-19	Jul-20	Nov-20	Jun-21	Sep-21	Mar-22	Jun-22	Aug-22	Jun-23	Aug-23	Jun-24
Appendix I Inorganics																															
Total Suspended Solids	mg/L	NS	0.581	1.88	--	--	--	--	--	--	***3.17***	***23***	Dry	***17.6***	***28.7***	***15***	***8.25***	***7.5***	***5.63***	***22.6***	***11.1***	***20***	***6.25***	***35***	***12.7***	***824***	***11.5***	***2.25***	***19.3***	***276***	***4.75***
Turbidity, Field	NTU	NS	NS	NS	--	--	--	--	--	--	***6.13***	***1.26***	--	--	***8.67***	***16.32***	***11.79***	***12.57***	***2.859***	***28.11***	***8.21***	***11.29***	***17.05***	***26.39***	***14.23***	***984.3***	***12.11***	***18.73***	***28***	***143.7***	***19.74***
Turbidity, Lab	NTU	NS	0.4	1	--	--	--	--	--	--	***1***	***1.7***	--	***7.1***	***11.5***	***1.2***	***4***	***2.6***	***1.2***	***8.46***	***6.01***	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	1	<1.45	Dry	***0.0822 J***	***1.03 J***	***0.0839 J***	<0.119	<0.161	<0.161	--	<0.237	<0.237	<0.185	<0.185	<0.42	<0.42	<1.32	<0.53	<0.51	<0.51	<1.1	<1.1	<0.69	<0.69	<0.69	<1	--	<1
Antimony, Dissolved	µg/L	NS	NS	NS	<1.45	--	***0.0666 J***	<0.271	***0.0738 J***	<0.119	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	2	<0.216	--	***1.5***	<2.72	***0.655 J***	<0.397	<0.945	<0.945	--	<0.672	<0.672	<0.505	<0.505	<0.57	<0.57	***0.769 J***	<0.75	<0.88	<0.88	***0.951 J***	<0.75	***2.54***	<0.75	<0.75	***0.685 J***	--	<0.53
Arsenic, Dissolved	µg/L	NS	NS	NS	<0.216	--	***1.15***	<2.72	***0.682 J***	***0.406 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	2	***117***	--	***104***	***122***	***128***	***122***	***136***	***116***	--	***124***	***134***	***115***	***143***	***139***	***120***	***121***	***136***	***113***	***127***	***121***	***129***	***201***	***123***	***112***	***110***	--	***103***
Barium, Dissolved	µg/L	NS	NS	NS	***119***	--	***90.6***	***122***	***110***	***124***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	1	<0.079	--	<0.0696	<0.348	<0.0696	<0.0142	<0.039	<0.039	--	<0.221	<0.221	<0.125	<0.125	<0.19	<0.19	<0.53	<0.27	<0.27	<0.27	<0.27	<0.27	***0.497 J***	<0.27	<0.27	<0.33	--	<0.33
Beryllium, Dissolved	µg/L	NS	NS	NS	<0.079	--	<0.0696	<0.348	<0.0696	<0.0142	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.044	0.5	<0.229	--	<0.106	<0.53	<0.106	<0.108	<0.112	<0.112	--	<0.0351	<0.0351	<0.0441	<0.0441	<0.06	<0.06	<0.167	<0.039	<0.049	<0.049	***0.103***	<0.051	***0.22***	<0.055	<0.055	***0.228***	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	NS	<0.229	--	<0.106	<0.53	<0.106	<0.108	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	5	<1.81	--	<0.418	***3.84 J***	***0.697 J***	<1.37	<1.24	<1.24	--	<0.355	<0.355	<0.729	<0.729	<0.76	<0.76	***1.28 J***	<0.98	<1.1	<1.1	***1.87 J***	<1.1	***1.63 J***	<1.1	<1.1	<1.1	--	<1.2
Chromium, Dissolved	µg/L	NS	NS	NS	<1.81	--	<0.418	***3.34 J***	***0.565 J***	<1.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.045	0.5	<1.55	--	***0.728***	***1.08 J***	***1.11***	***0.437 J***	***0.085 J***	***0.177 J***	--	***0.156 J***	***0.328 J***	***0.121 J***	***0.204 J***	***0.218 J***	***0.107 J***	<0.402	***0.264 J***	***0.327 J***	***0.153 J***	***0.787***	<0.19	***4.36***	***0.244 J***	<0.19	***0.411 J***	--	<0.17
Cobalt, Dissolved	µg/L	NS	NS	NS	<1.55	--	***0.636***	***0.873 J***	***0.468 J***	***0.35 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	5	***1.94 J***	--	***3.54***	***2.02 J***	***4.71***	***1.08***	***0.508 J***	***0.677 J***	--	<1.22	***1.43 J***	<2.19	<2.19	<1.6	<1.6	<0.497	<2	<1.5	<1.5	***1.84 J***	<1.4	***11.5***	<1.8	<1.8	<1.8	--	<1.8
Copper, Dissolved	µg/L	NS	NS	NS	<1.51	--	***2.5***	<0.85	***3.56***	***1.42***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	0.5	<0.804	--	<0.207	<1.04	***1.63***	***0.123 J***	<0.0967	***0.232 J***	--	<0.211	***0.32 J***	<0.324	<0.324	<0.25	<0.25	***0.644***	<0.27	***0.531***	***0.142 J***	***0.886***	<0.21	***7.08***	***0.24 J***	<0.24	***0.617***	--	<0.26
Lead, Dissolved	µg/L	NS	NS	NS	<0.804	--	<0.207	<1.04	<0.207	<0.084	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	5	<2.58	--	***3.7***	***4.5***	***3.35***	***2.12 J***	<0.581	<0.581	--	<1.53	<1.53	<0.929	<0.929	***1.07 J***	<1	***1.06 J***	<1.7	<1.9	<1.9	<1.9	<1.9	***7.85***	<1.9	<1.9	<1.9	--	<2.1
Nickel, Dissolved	µg/L	NS	NS	NS	<2.58	--	***2.87***	***11.5***	***6.08***	***4.85 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	5	<0.7	--	<1.46	<7.3	<1.46	<1.79	<3.34	<3.34	--	***0.916 J***	<0.63	<0.928	<0.928	<0.9	<0.9	<0.982	<1	<1	<1	***1.9 J***	<0.96	***0.966 J***	<0.96	<0.96	***1.77 J***	--	<1.4
Selenium, Dissolved	µg/L	NS	NS	NS	<0.7	--	<1.46	<7.3	<1.46	<1.79	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	1	<1.7	--	<0.0789	<0.395	<0.0789	<0.0396	<0.042	***0.063 J***	--	<0.153	<0.153	<0.14	<0.14	<0.3	<0.3	<0.115	<0.37	<0.37	<0.37	<0.42	<0.42	<0.49	<0.49	<0.49	***1.36***	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	NS	<1.7	--	<0.0789	<0.395	<0.0789	<0.0396	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.064	1	<0.288	--	***0.0338 J***	***0.141 J***	***0.0478 J***	<0.0353	<0.0325	<0.0325	--	<0.0255	<0.0255	<0.0644	<0.0644	<0.17	<0.17	<0.57	<0.27	<0.26	<0.26	***2.13***	<0.26	***0.281 J***	<0.26	<0.26	***4.67***	<0.26	<0.57
Thallium, Dissolved	µg/L	NS	NS	NS	<0.288	--	<0.0267	***0.502***	***0.0869 J***	<0.0353	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	5	<2.1	--	<0.833	<4.17	***1.59***	***2.37 J***	***0.512 J***	***0.716 J***	--	***0.495 J***	***0.645 J***	<0.84	***1.39 J***	***0.778 J***	***0.646 J***	***3.82 J***	***1.24 J***	***1.41 J***	<0.85	***4.3 J***	<1.1	***7.59***	<1.1	<1.1	<1.1	--	<1.1
Vanadium, Dissolved	µg/L	NS	NS	NS	***2.15 J***	--	<0.833	<4.17	<0.833	***0.671 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	20	***14.2 J***	--	<0.625	<3.13	***12.2***	<6.95	<6.95	<6.95	--	<5.21	<5.21	<11.5	<11.5	<10	<10	***12.9 J***	<10	<10	<10	<10	<10	***20.7***	<10	<10	<6.4	--	<9.7
Zinc, Dissolved	µg/L	NS	NS	NS	***10.4 J***	--	***0.953 J***	<3.13	***7.74***	<6.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																															
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	1	<0.21	Dry	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	1	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	1	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	1	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45
1,1-Dichloroethane	µg/L	140	0.21	1	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	2	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56
1,2,3-Trichloropropane	µg/L	0.006	0.19	1	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	5	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.12	<0.5	--	<0.5	<0.5	<0.5	<0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	1	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	1	<0.14	--	***0.4 J***	<0.14	<0.14	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37
1,2-Dichloroethane	µg/L	5	0.18	1	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39
1,2-Dichloropropane	µg/L	5	0.87	1	<0.87	--	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	--	<0.87	<0.87	<0.87	<0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	1	<0.2	--	***0.38 J***	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2	<0.2	<0.2	<0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23
2-Butanone	µg/L	4000	1.04	10	***1.15 J***	--	***1.32 J***	***1.17 J***	<0.47	***2.34 J***	<0.47	<0.47	--	<0.47	<1.04	<1.04	<1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1
2-Hexanone	µg/L	NS	0.2	10	<0.2	--	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2	<0.2	<0.2	<0.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2
4-Methyl-2-pentanone	µg/L	560	0.22	10	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1
Acetone	µg/L	6300	1.79	10	<1.79	--	***2.19 J***	<1.79	<1.79	***3.85 J***	<1.79	<1.79	--	<1.79	<1.79	<1.79	***2.88 J***	***3.12 J***	<3.1	***4.55 J***	<3.1	<3.1	<3.1	***3.45 J***	<3.1	<3.1	<3.1	<3.1	***3.3 J***	--	<3.1
Acrylonitrile	µg/L	0.32	0.53	5	<0.53	--	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	--	<0.53	<0.53	<0.53	<0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2
Benzene	µg/L	5	0.11	0.5	<0.11	--	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	--	<0.11	<0.11	<0.11	<0.11	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22
Bromochloromethane	µg/L	90	0.12	5	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54
Bromodichloromethane	µg/L	80	0.12	1	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39
Bromomethane	µg/L	10	0.22	4	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1
Carbon disulfide	µg/L	700	0.15	1	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45
Carbon Tetrachloride	µg/L	5	0.24	2	<0.24	--	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	--	<0.24	<0.24	<0.24	<0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65
Chlorobenzene	µg/L	100	0.19	1	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4
Chloroethane	µg/L	2800	0.15	4	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79
Chloromethane	µg/L	NS	0.31	3	<0.31	--	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	<0.31	<0.31	<0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	1	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	5	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25
Dibromochloromethane	µg/L	80	0.2	5	<0.2	--	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2	<0.2	<0.2	<0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75
Dibromomethane	µg/L	70	0.18	1	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33
Dichloromethane	µg/L	5	0.17	5	<0.17	--	<0.17	***0.391 J***	<0.17	<0.17	<0.17	<0.17	--	<0.17	<0.17	<0.17	<0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7
Ethylbenzene	µg/L	700	0.21	1	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31
Iodomethane	µg/L	NS	0.8	10	<0.8	--	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	--	<0.8	<0.8	<0.8	<0.8	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	--	<7
Styrene	µg/L	100	0.1	1	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37
Tetrachloroethylene	µg/L	5	0.18	1	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48
Toluene	µg/L	1000	0.15	1	<0.15	--	<0.15	***0.654 J***	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	***0.475 J***	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	1	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	5	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	10	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1
Tribromomethane	µg/L	80	0.14	5	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78
Trichloroethylene	µg/L	5	0.19	1	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	4	<0.17	--	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	--	<0.17	<0.17	<0.17	<0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38
Trichloromethane	µg/L	80	0.28	1	<0.28	--	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	--	<0.28	<0.28	<0.28	<0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3
Vinyl Acetate	µg/L	NS	0.74	10	<0.74	--	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	--	<0.74	<0.74	<0.74	<0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5
Vinyl Chloride	µg/L	2	0.1	1	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.6	<0.6	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18
Xylenes	µg/L	10000	0.13	3	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location SW-2

Parameter Name	Units	GPS	DL	RL	Dec-11	Feb-12	Apr-12	Jun-12	Aug-12	Oct-12	Apr-13	Nov-13	Jun-14	Nov-14	May-15	Sep-15	Apr-16	Nov-16	May-17	Nov-17	Jun-18	Oct-18	Jun-19	Nov-19	Jul-20	Nov-20	Jun-21	Sep-21	Mar-22	Jun-22	Aug-22	Jun-23	Aug-23	Nov-23	Jun-24	Dec-24
Appendix I Inorganics																																				
Total Suspended Solids	mg/L	NS	0.581	1.88	--	--	--	--	--	--	--	--	--	***15.7***	***79.7***	Dry	***17.1***	***16.3***	***20.5***	***10.2***	***13.4***	***11***	***31.5***	***6.25***	***1.75 J***	***6.75***	***10.3***	***17.4***	***564***	***63.8***	***6.38***	***37.9***	***17***	***4.88***	***24.1***	***4.67 J***
Turbidity, Field	NTU	NS	NS	NS	--	--	--	--	--	--	--	--	--	***18.36***	***59.63***	--	--	***16.24***	***33.21***	***28.49***	***14.11***	***8.81***	***28.63***	***10.11***	***21.23***	***18.91***	***21.23***	***19.32***	***1009.4***	***13.24***	***26.43***	***22.39***	***28.3***	***23.11***	***12.79***	***4.76***
Turbidity, Lab	NTU	NS	0.4	1	--	--	--	--	--	--	--	--	--	***4.8***	***9.1***	--	***10.2***	***11.3***	***4.8***	***2.8***	***7.2***	***5.2***	***11.7***	***5.34***	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	µg/L	6	0.185	1	<2.73	<0.12	<1.45	<0.12	<0.12	<0.12	***0.227 J***	<0.0541	<0.119	<0.161	<0.161	--	<0.237	<0.237	<0.185	<0.185	<0.42	<0.42	<1.32	<0.53	<0.51	<0.51	<1.1	<1.1	<0.69	<0.69	<0.69	<1	--	<1	<1	<1
Antimony, Dissolved	µg/L	NS	NS	NS	<2.73	<0.12	<1.45	<0.12	<0.12	<0.12	***0.251 J***	<0.0541	<0.119	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	2	<0.6	<0.73	<0.216	***1.05 J***	***0.98 J***	***1.13***	***1.73***	***0.587 J***	***2.99 J***	<0.945	<0.945	--	<0.672	<0.672	<0.505	***0.743 J***	<0.57	<0.57	***0.877 J***	<0.75	***1.02 J***	<0.88	<0.75	<0.75	***1.52 J***	***0.806 J***	<0.75	***0.84 J***	--	***0.591 J***	***0.627 J***	<0.53
Arsenic, Dissolved	µg/L	NS	NS	NS	<0.47	***1.16***	<0.216	***0.97***	<0.73	***0.74 J***	***1.8***	***1.14***	***0.798 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	µg/L	2000	1.04	2	***125***	***141***	***111***	***151***	***144***	***150***	***114***	***131***	***105***	***117***	***105***	--	***128***	***100***	***60.5***	***104***	***98.5***	***99.8***	***91.8***	***104***	***195***	***96.2***	***90***	***107***	***156***	***110***	***89.7***	***101***	--	***94.1***	***104***	***110***
Barium, Dissolved	µg/L	NS	NS	NS	***118***	***130***	***118***	***137***	***147***	***155***	***115***	***139***	***84.6***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	1	<0.051	***0.03 J***	<0.079	***0.04 J***	***0.02 J***	***0.03 J***	<0.0696	<0.0696	<0.0142	<0.039	***0.15 J***	--	<0.221	<0.221	<0.125	<0.125	<0.19	<0.19	<0.53	<0.27	<0.27	<0.27	<0.27	<0.27	***0.321 J***	<0.27	<0.27	<0.33	--	<0.33	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	NS	<0.051	<0.0178	<0.079	<0.0178	<0.0178	<0.0178	<0.0696	<0.0696	<0.0142	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	µg/L	5	0.044	0.5	<0.124	<0.064	<0.229	<0.064	<0.064	***0.07 J***	<0.106	<0.106	<0.108	<0.112	<0.112	--	<0.0351	<0.0351	<0.0441	<0.0441	<0.06	<0.06	<0.167	<0.039	***0.05 J***	<0.049	<0.051	<0.051	***0.181***	<0.055	<0.055	***0.157 J***	--	<0.1	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	NS	<0.124	<0.064	<0.229	<0.064	<0.064	***0.08 J***	<0.106	<0.106	<0.108	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	µg/L	100	0.729	5	<1.81	<0.39	<1.81	<0.39	***0.5 J***	***0.59 J***	***0.697 J***	<0.418	<1.37	<1.24	***1.74 J***	--	<0.355	<0.355	<0.729	***2.56 J***	<0.76	***0.781 J***	***1.61 J***	<0.98	<1.1	<1.1	<1.1	<1.1	***1.26 J***	***1.73 J***	<1.1	<1.1	--	<1.1	<1.2	<1.2
Chromium, Dissolved	µg/L	NS	NS	NS	<1.81	<0.39	<1.81	***0.71 J***	<0.39	<0.39	<0.418	<0.418	<1.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.045	0.5	<1.55	***0.77***	<1.55	***0.94***	***0.44 J***	***0.44 J***	***0.805***	***0.653***	***0.953 J***	***0.414 J***	***0.753***	--	***0.24 J***	***0.193 J***	<0.0453	***0.247 J***	***0.22 J***	***0.235 J***	<0.402	***0.171 J***	***0.495 J***	***0.174 J***	***0.302 J***	***0.361 J***	***3.17***	***0.693***	***0.212 J***	***0.622***	--	<0.17	***0.388 J***	***0.237 J***
Cobalt, Dissolved	µg/L	NS	NS	NS	<1.55	***0.99***	<1.55	***0.35 J***	***0.37 J***	***0.31 J***	***0.742***	***0.699***	***0.367 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	µg/L	1300	2.19	5	***8.34 J***	***2.62***	<1.51	***2***	***1.36***	***1.29***	***4.78***	***1.36***	***2.47***	***0.591 J***	***1.67 J***	--	<1.22	<1.22	<2.19	<2.19	<1.6	<1.6	<0.497	<2	<1.5	<1.5	<1.4	<1.4	***6.76***	<1.8	<1.8	<1.8	--	<1.8	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	NS	***7.81 J***	***4***	<1.51	***1.9***	***3.13***	***1.11***	***3.41***	***1.63***	***1.55***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	µg/L	15	0.324	0.5	<1	***0.66***	<0.804	***1.25***	***0.83***	***0.4 J***	<0.207	<0.207	<0.42	***0.32 J***	***1.08***	--	***0.251 J***	***0.237 J***	<0.324	<0.324	<0.25	***0.354 J***	***0.721***	***0.765***	<0.11	***0.158 J***	***0.238 J***	***0.308 J***	***5.3***	***0.939***	<0.24	***0.867***	--	<0.24	***0.583***	<0.26
Lead, Dissolved	µg/L	NS	NS	NS	<1	***0.2 J***	<0.804	***0.03 J***	<0.029	<0.029	<0.207	<0.207	<0.084	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	µg/L	100	0.929	5	<2.58	***5.56***	<2.58	***3.86***	***3.2***	***3.65***	***4.75***	***4.27***	***1.14 J***	***0.969 J***	***2.54 J***	--	<1.53	<1.53	<0.929	***0.982 J***	<1	<1	***1.35 J***	<1.7	***3.03 J***	<1.9	<1.9	<1.9	***6.59***	<1.9	<1.9	<1.9	--	<1.9	<2.1	***3.27 J***
Nickel, Dissolved	µg/L	NS	NS	NS	***3.02 J***	***9.6***	***3.45 J***	***4.14***	***5.38***	***2.57***	***4.55***	***4.87***	***1.47 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	µg/L	50	0.928	5	<1.69	<0.297	<0.7	<0.297	<0.297	<0.297	<1.46	***1.66 J***	<1.79	<3.34	<3.34	--	***0.771 J***	<0.63	<0.928	<0.928	<0.9	<0.9	<0.982	<1	<1	<1	***1.28 J***	<0.96	<0.96	<0.96	<0.96	***1.58 J***	--	<1.4	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	NS	<1.69	<0.297	<0.7	<0.297	***0.73 J***	<0.297	<1.46	<1.46	<1.79	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	µg/L	100	0.14	1	<1.7	<0.027	<1.7	<0.027	<0.027	<0.027	<0.0789	<0.0789	<0.0396	<0.042	***0.062 J***	--	<0.153	<0.153	<0.14	<0.14	<0.3	<0.3	<0.115	<0.37	<0.37	<0.37	<0.42	<0.42	<0.49	<0.49	<0.49	***1.43***	<0.5	<0.5	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	NS	<1.7	<0.027	<1.7	<0.027	<0.027	<0.027	<0.0789	<0.0789	<0.0396	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	µg/L	2	0.064	1	<0.84	<0.0087	<0.288	<0.0087	***0.02 J***	<0.0087	***0.0329 J***	<0.0267	<0.0353	<0.0325	***0.037 J***	--	<0.0255	<0.0255	<0.0644	<0.0644	<0.17	<0.17	<0.57	<0.27	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	***3.93***	***0.279 J***	<0.26	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	NS	<0.84	<0.0087	<0.288	<0.0087	***0.02 J***	***0.01 J***	***0.0278 J***	<0.0267	<0.0353	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	5	<2.1	***0.94 J***	***2.16 J***	***1.12***	<0.94	<0.94	***0.942 J***	<0.833	***2.44 J***	***1.28 J***	***3.53 J***	--	***0.571 J***	***0.769 J***	<0.84	***1.49 J***	***1.27 J***	***1.34 J***	***4.5 J***	***0.951 J***	<0.85	***1.3 J***	***2.31 J***	***1.44 J***	***5.45***	***3.84 J***	***1.19 J***	***1.52 J***	--	***1.11 J***	***2.14 J***	<1.1
Vanadium, Dissolved	µg/L	NS	NS	NS	<2.1	***1.51***	<2.1	***1.17***	<0.94	<0.94	<0.833	<0.833	***1.23***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	20	<9.11	***11.6***	***18.7 J***	***6.37***	***8.31***	***4.68 J***	***5.62***	<0.625	***33.9***	<6.95	***6.97 J***	--	<5.21	<5.21	<11.5	<11.5	<10	<10	***12 J***	<10	<10	<10	<10	<10	***16.7 J***	<10	<10	<6.4	--	<6.4	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	NS	<9.11	***6.92***	***12.2 J***	<0.92	<0.92	***2.56 J***	***4.23 J***	<0.625	***6.99 J***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Appendix I Organics																																				
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	--	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	2	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.006	0.19	1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	--	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	5	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.5	--	<0.5	<0.5	<0.5	<0.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	--	<1.2	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	--	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	1	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	***0.147 J***	<0.14	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	1	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	--	<0.87	<0.87	<0.87	<0.87	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2	<0.2	<0.2	<0.2	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	--	<0.23	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	10	***1.24 J***	<0.47	***1.21 J***	<0.47	<0.47	<0.47	***8.7 J***	<0.47	***1.99 J***	<0.47	<0.47	--	<0.47	<1.04	<1.04	<1.04	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2	<0.2	<0.2	<0.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	10	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	--	<2.1	<2.1	<2.1
Acetone	µg/L	6300	1.79	10	<1.79	***2.37 J***	***3.08 J***	<1.79	***3.15 J***	<1.79	***15.8***	<1.79	***4 J***	<1.79	<1.79	--	***2.59 J***	<1.79	<1.79	***2.82 J***	***4.04 J***	<3.1	***4.43 J***	<3.1	<3.1	<3.1	***7.5 J***	***4.22 J***	***3.73 J***	<3.1	<3.1	***5 J***	--	<3.1	***3.68 J***	<3.1
Acrylonitrile	µg/L	0.32	0.53	5	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	--	<0.53	<0.53	<0.53	<0.53	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	--	<2.2	<2.2	<2.2
Benzene	µg/L	5	0.11	0.5	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	--	<0.11	<0.11	<0.11	<0.11	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	5	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	<0.54	--	<0.54	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	1	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--	<0.12	<0.12	<0.12	<0.12	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	--	<0.39	<0.39	<0.39
Bromomethane	µg/L	10	0.22	4	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	***0.25 J***	<0.22	***0.249 J***	--	<0.22	<0.22	<0.22	<0.22	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	1	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	--	<0.45	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	2	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	--	<0.24	<0.24	<0.24	<0.24	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	--	<0.65	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	4	***0.18 J***	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	--	<0.79	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	3	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	***0.507 J***	<0.31	<0.31	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	--	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	5	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	--	<0.25	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2	<0.2	<0.2	<0.2	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	--	<0.33	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	5	<0.17	***0.78 J***	<0.17	<0.17	***0.21 J***	***0.62 J***	<0.17	<0.17	<0.17	<0.17	<0.17	--	<0.17	<0.17	<0.17	<0.17	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	--	<1.7	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	--	<0.31	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	10	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	--	<0.8	<0.8	<0.8	<0.8	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	--	<7	<7	<7
Styrene	µg/L	100	0.1	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	1	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	--	<0.48	<0.48	<0.48
Toluene	µg/L	1000	0.15	1	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	***0.597 J***	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	1	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	--	<0.22	<0.22	<0.22	<0.22	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	--	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	10	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	5	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	--	<0.78	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	1	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	--	<0.19	<0.19	<0.19	<0.19	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	--	<0.43	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	4	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	--	<0.17	<0.17	<0.17	<0.17	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	--	<0.38	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	1	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	--	<0.28	<0.28	<0.28	<0.28	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	--	<1.3	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	10	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	<0.74	--	<0.74	<0.74	<0.74	<0.74	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.6	<0.6	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	--	<0.18	<0.18	<0.18
Xylenes	µg/L	10000	0.13	3	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	--	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Monitoring Location SW-5

Parameter Name	Units	GPS	DL	RL	Jun-23	Aug-23	Nov-23	Jan-24	Jun-24	Dec-24
Appendix I Inorganics										
Total Suspended Solids	mg/L	NS	0.581	1.88	***10.4***	***19***	***5.63***	***1.75 J***	***37***	<3.7
Turbidity, Field	NTU	NS	NS	NS	***20.19***	***18.23***	***18.21***	***5.29***	***17.89***	***4.78***
Turbidity, Lab	NTU	NS	0.4	1	--	--	--	--	--	--
Antimony	µg/L	6	0.185	1	<1	--	<1	<1	<1	<1
Antimony, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Arsenic	µg/L	10	0.505	2	***0.745 J***	--	***0.582 J***	***0.569 J***	***0.764 J***	<0.53
Arsenic, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Barium	µg/L	2000	1.04	2	***91.4***	--	***90***	***87.1***	***70.1***	***87.2***
Barium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Beryllium	µg/L	4	0.125	1	<0.33	--	<0.33	<0.33	<0.33	<0.33
Beryllium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Cadmium	µg/L	5	0.0441	0.5	<0.1	--	<0.1	<0.1	<0.1	<0.1
Cadmium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Chromium	µg/L	100	0.729	5	<1.1	--	<1.1	<1.1	***1.27 J***	<1.2
Chromium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Cobalt	µg/L	3.4	0.0453	0.5	***0.287 J***	--	***0.181 J***	<0.17	***0.679***	<0.17
Cobalt, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Copper	µg/L	1300	2.19	5	<1.8	--	<1.8	<1.8	<1.8	<1.8
Copper, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Lead	µg/L	15	0.324	0.5	***0.388 J***	--	<0.24	<0.24	***0.689***	<0.26
Lead, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Nickel	µg/L	100	0.929	5	<1.9	--	<1.9	<1.9	***2.33 J***	<2.1
Nickel, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Selenium	µg/L	50	0.928	5	***1.51 J***	--	<1.4	<1.4	<1.4	<1.4
Selenium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Silver	µg/L	100	0.14	1	***1.54***	<0.5	<0.5	<0.5	<0.5	<0.5
Silver, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Thallium	µg/L	2	0.0644	1	<0.26	--	<0.26	<0.26	<0.57	<0.57
Thallium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Vanadium	µg/L	35	0.84	5	<1.1	--	***1.61 J***	<1.1	***2.4 J***	<1.1
Vanadium, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Zinc	µg/L	2000	11.5	20	<6.4	--	<6.4	<6.4	<9.7	<9.7
Zinc, Dissolved	µg/L	NS	NS	NS	--	--	--	--	--	--
Appendix I Organics										
1,1,1,2-Tetrachloroethane	µg/L	70	0.21	1	<0.38	--	<0.38	<0.38	<0.38	<0.38
1,1,1-Trichloroethane	µg/L	200	0.12	1	<0.19	--	<0.19	<0.19	<0.19	<0.19
1,1,2,2-Tetrachloroethane	µg/L	0.3	0.1	1	<0.47	--	<0.47	<0.47	<0.47	<0.47
1,1,2-Trichloroethane	µg/L	5	0.12	1	<0.45	--	<0.45	<0.45	<0.45	<0.45
1,1-Dichloroethane	µg/L	140	0.21	1	<0.22	--	<0.22	<0.22	<0.22	<0.22
1,1-Dichloroethylene	µg/L	7	0.15	2	<0.56	--	<0.56	<0.56	<0.56	<0.56
1,2,3-Trichloropropane	µg/L	0.0058	0.19	1	<0.59	--	<0.59	<0.59	<0.59	<0.59
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.5	5	<1.2	--	<1.2	<1.2	<1.2	<1.2
1,2-Dibromoethane	µg/L	0.05	0.13	1	<0.34	--	<0.34	<0.34	<0.34	<0.34
1,2-Dichlorobenzene	µg/L	600	0.14	1	<0.37	--	<0.37	<0.37	<0.37	<0.37
1,2-Dichloroethane	µg/L	5	0.18	1	<0.39	--	<0.39	<0.39	<0.39	<0.39
1,2-Dichloropropane	µg/L	5	0.87	1	<0.27	--	<0.27	<0.27	<0.27	<0.27
1,4-Dichlorobenzene	µg/L	75	0.2	1	<0.23	--	<0.23	<0.23	<0.23	<0.23
2-Butanone	µg/L	4000	1.04	10	<2.1	--	<2.1	<2.1	<2.1	<2.1
2-Hexanone	µg/L	NS	0.2	10	<2	--	<2	<2	<2	<2
4-Methyl-2-pentanone	µg/L	560	0.22	10	<2.1	--	<2.1	<2.1	<2.1	<2.1
Acetone	µg/L	6300	1.79	10	<3.1	--	<3.1	<3.1	***5.15 J***	<3.1
Acrylonitrile	µg/L	0.32	0.53	5	<2.2	--	<2.2	<2.2	<2.2	<2.2
Benzene	µg/L	5	0.11	0.5	<0.22	--	<0.22	<0.22	<0.22	<0.22
Bromochloromethane	µg/L	90	0.12	5	<0.54	--	<0.54	<0.54	<0.54	<0.54
Bromodichloromethane	µg/L	80	0.12	1	<0.39	--	<0.39	<0.39	<0.39	<0.39
Bromomethane	µg/L	10	0.22	4	<1.1	--	<1.1	<1.1	<1.1	<1.1
Carbon disulfide	µg/L	700	0.15	1	<0.45	--	<0.45	<0.45	<0.45	<0.45
Carbon Tetrachloride	µg/L	5	0.24	2	<0.65	--	<0.65	<0.65	<0.65	<0.65
Chlorobenzene	µg/L	100	0.19	1	<0.4	--	<0.4	<0.4	<0.4	<0.4
Chloroethane	µg/L	2800	0.15	4	<0.79	--	<0.79	<0.79	<0.79	<0.79
Chloromethane	µg/L	NS	0.31	3	<0.61	--	<0.61	<0.61	<0.61	<0.61
cis-1,2-Dichloroethylene	µg/L	70	0.13	1	<0.21	--	<0.21	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	µg/L	NS	0.15	5	<0.25	--	<0.25	<0.25	<0.25	<0.25
Dibromochloromethane	µg/L	80	0.2	5	<0.75	--	<0.75	<0.75	<0.75	<0.75
Dibromomethane	µg/L	70	0.18	1	<0.33	--	<0.33	<0.33	<0.33	<0.33
Dichloromethane	µg/L	5	0.17	5	<1.7	--	<1.7	<1.7	<1.7	<1.7
Ethylbenzene	µg/L	700	0.21	1	<0.31	--	<0.31	<0.31	<0.31	<0.31
Iodomethane	µg/L	NS	0.8	10	<7	--	<7	<7	<7	<7
Styrene	µg/L	100	0.1	1	<0.37	--	<0.37	<0.37	<0.37	<0.37
Tetrachloroethylene	µg/L	5	0.18	1	<0.48	--	<0.48	<0.48	<0.48	<0.48
Toluene	µg/L	1000	0.15	1	<0.43	--	<0.43	<0.43	<0.43	<0.43
Trans-1,2-dichloroethylene	µg/L	100	0.21	1	<0.27	--	<0.27	<0.27	<0.27	<0.27
trans-1,3-Dichloropropene	µg/L	NS	0.22	5	<0.56	--	<0.56	<0.56	<0.56	<0.56
trans-1,4-Dichloro-2-butene	µg/L	1.8	0.13	10	<1.1	--	<1.1	<1.1	<1.1	<1.1
Tribromomethane	µg/L	80	0.14	5	<0.78	--	<0.78	<0.78	<0.78	<0.78
Trichloroethylene	µg/L	5	0.19	1	<0.43	--	<0.43	<0.43	<0.43	<0.43
Trichlorofluoromethane	µg/L	2000	0.17	4	<0.38	--	<0.38	<0.38	<0.38	<0.38
Trichloromethane	µg/L	80	0.28	1	<1.3	--	<1.3	<1.3	<1.3	<1.3
Vinyl Acetate	µg/L	NS	0.74	10	<2.5	--	<2.5	<2.5	<2.5	<2.5
Vinyl Chloride	µg/L	2	0.1	1	<0.18	--	<0.18	<0.18	<0.18	<0.18
Xylenes	µg/L	10000	0.13	3	<0.4	--	<0.4	<0.4	<0.4	<0.4

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Manhole MH 1

Parameter Name	Units	GPS	Aug-22	Nov-23
Appendix I Inorganics				
Total Suspended Solids	mg/L	NS	***3.5***	Dry
Turbidity, Field	NTU	NS	0	--
Turbidity, Lab	NTU	NS	--	--
Antimony	µg/L	6	***0.91 J***	--
Antimony, Dissolved	µg/L	NS	--	--
Arsenic	µg/L	10	<0.75	--
Arsenic, Dissolved	µg/L	NS	--	--
Barium	µg/L	2000	***200***	--
Barium, Dissolved	µg/L	NS	--	--
Beryllium	µg/L	4	<0.27	--
Beryllium, Dissolved	µg/L	NS	--	--
Cadmium	µg/L	5	***0.101***	--
Cadmium, Dissolved	µg/L	NS	--	--
Chromium	µg/L	100	<1.1	--
Chromium, Dissolved	µg/L	NS	--	--
Cobalt	µg/L	2.1	***0.481 J***	--
Cobalt, Dissolved	µg/L	NS	--	--
Copper	µg/L	1300	<1.8	--
Copper, Dissolved	µg/L	NS	--	--
Lead	µg/L	15	<0.24	--
Lead, Dissolved	µg/L	NS	--	--
Nickel	µg/L	100	***8.86***	--
Nickel, Dissolved	µg/L	NS	--	--
Selenium	µg/L	50	<0.96	--
Selenium, Dissolved	µg/L	NS	--	--
Silver	µg/L	100	<0.49	--
Silver, Dissolved	µg/L	NS	--	--
Thallium	µg/L	2	<0.26	--
Thallium, Dissolved	µg/L	NS	--	--
Vanadium	µg/L	35	<1.1	--
Vanadium, Dissolved	µg/L	NS	--	--
Zinc	µg/L	2000	<10	--
Zinc, Dissolved	µg/L	NS	--	--
Appendix I Organics				
1,1,1,2-Tetrachloroethane	µg/L	70	<0.38	--
1,1,1-Trichloroethane	µg/L	200	<0.19	--
1,1,2,2-Tetrachloroethane	µg/L	0.3	<0.47	--
1,1,2-Trichloroethane	µg/L	5	<0.45	--
1,1-Dichloroethane	µg/L	140	***0.577 J***	--
1,1-Dichloroethylene	µg/L	7	<0.56	--
1,2,3-Trichloropropane	µg/L	0.0058	<0.59	--
1,2-Dibromo-3-chloropropane	µg/L	0.2	<1.2	--
1,2-Dibromoethane	µg/L	0.05	<0.34	--
1,2-Dichlorobenzene	µg/L	600	<0.37	--
1,2-Dichloroethane	µg/L	5	<0.39	--
1,2-Dichloropropane	µg/L	5	<0.27	--
1,4-Dichlorobenzene	µg/L	75	***0.802 J***	--
2-Butanone	µg/L	4000	<2.1	--
2-Hexanone	µg/L	NS	<2	--
4-Methyl-2-pentanone	µg/L	560	<2.1	--
Acetone	µg/L	6300	<3.1	--
Acrylonitrile	µg/L	0.32	<2.2	--
Benzene	µg/L	5	***0.513***	--
Bromochloromethane	µg/L	90	<0.54	--
Bromodichloromethane	µg/L	80	<0.39	--
Bromomethane	µg/L	10	<1.1	--
Carbon disulfide	µg/L	700	<0.45	--
Carbon Tetrachloride	µg/L	5	<0.65	--
Chlorobenzene	µg/L	100	***0.989 J***	--
Chloroethane	µg/L	2800	<0.79	--
Chloromethane	µg/L	NS	<0.61	--
cis-1,2-Dichloroethylene	µg/L	70	<0.21	--
cis-1,3-Dichloropropene	µg/L	NS	<0.25	--
Dibromochloromethane	µg/L	80	<0.75	--
Dibromomethane	µg/L	70	<0.33	--
Dichloromethane	µg/L	5	***1.8 J***	--
Ethylbenzene	µg/L	700	<0.31	--
Iodomethane	µg/L	NS	<7	--
Styrene	µg/L	100	<0.37	--
Tetrachloroethylene	µg/L	5	<0.48	--
Toluene	µg/L	1000	<0.43	--
Trans-1,2-dichloroethylene	µg/L	100	<0.27	--
trans-1,3-Dichloropropene	µg/L	NS	<0.56	--
trans-1,4-Dichloro-2-butene	µg/L	1.8	<1.1	--
Tribromomethane	µg/L	80	<0.78	--
Trichloroethylene	µg/L	5	<0.43	--
Trichlorofluoromethane	µg/L	2000	<0.38	--
Trichloromethane	µg/L	80	<1.3	--
Vinyl Acetate	µg/L	NS	<2.5	--
Vinyl Chloride	µg/L	2	<0.18	--
Xylenes	µg/L	10000	<0.4	--

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Appendix I Results
Manhole MH-Cell 4-2

Parameter Name	Units	GPS	Aug-22	Jun-23	Nov-23
Appendix I Inorganics					
Total Suspended Solids	mg/L	NS	***110***	***300***	Dry
Turbidity, Field	NTU	NS	***185.13***	--	--
Turbidity, Lab	NTU	NS	--	--	--
Antimony	μg/L	6	***1.7 J***	***8.62 J***	--
Antimony, Dissolved	μg/L	NS	--	--	--
Arsenic	μg/L	10	***0.863 J***	***13.4***	--
Arsenic, Dissolved	μg/L	NS	--	--	--
Barium	μg/L	2000	***62.7***	***605***	--
Barium, Dissolved	μg/L	NS	--	--	--
Beryllium	μg/L	4	<0.27	<1.65	--
Beryllium, Dissolved	μg/L	NS	--	--	--
Cadmium	μg/L	5	***0.165***	<0.5	--
Cadmium, Dissolved	μg/L	NS	--	--	--
Chromium	μg/L	100	***7.7***	***36***	--
Chromium, Dissolved	μg/L	NS	--	--	--
Cobalt	μg/L	2.1	***2.17***	***15.5***	--
Cobalt, Dissolved	μg/L	NS	--	--	--
Copper	μg/L	1300	<1.8	<9	--
Copper, Dissolved	μg/L	NS	--	--	--
Lead	μg/L	15	***7.24***	***1.7 J***	--
Lead, Dissolved	μg/L	NS	--	--	--
Nickel	μg/L	100	***20***	***105***	--
Nickel, Dissolved	μg/L	NS	--	--	--
Selenium	μg/L	50	***0.998 J***	***7.08 J***	--
Selenium, Dissolved	μg/L	NS	--	--	--
Silver	μg/L	100	<0.49	***7.57***	--
Silver, Dissolved	μg/L	NS	--	--	--
Thallium	μg/L	2	<0.26	<1.3	--
Thallium, Dissolved	μg/L	NS	--	--	--
Vanadium	μg/L	35	***1.13 J***	***5.8 J***	--
Vanadium, Dissolved	μg/L	NS	--	--	--
Zinc	μg/L	2000	***25.1***	***105***	--
Zinc, Dissolved	μg/L	NS	--	--	--
Appendix I Organics					
1,1,1,2-Tetrachloroethane	μg/L	70	<0.38	<3.8	--
1,1,1-Trichloroethane	μg/L	200	<0.19	<1.9	--
1,1,2,2-Tetrachloroethane	μg/L	0.3	<0.47	<4.7	--
1,1,2-Trichloroethane	μg/L	5	<0.45	<4.5	--
1,1-Dichloroethane	μg/L	140	<0.22	<2.2	--
1,1-Dichloroethylene	μg/L	7	<0.56	<5.6	--
1,2,3-Trichloropropane	μg/L	0.0058	<0.59	<5.9	--
1,2-Dibromo-3-chloropropane	μg/L	0.2	<1.2	<12	--
1,2-Dibromoethane	μg/L	0.05	<0.34	<3.4	--
1,2-Dichlorobenzene	μg/L	600	<0.37	<3.7	--
1,2-Dichloroethane	μg/L	5	<0.39	<3.9	--
1,2-Dichloropropane	μg/L	5	<0.27	<2.7	--
1,4-Dichlorobenzene	μg/L	75	***1.55***	<2.3	--
2-Butanone	μg/L	4000	<2.1	<21	--
2-Hexanone	μg/L	NS	<2	<20	--
4-Methyl-2-pentanone	μg/L	560	***6.08 J***	<21	--
Acetone	μg/L	6300	***13.4***	<31	--
Acrylonitrile	μg/L	0.32	<2.2	<22	--
Benzene	μg/L	5	***1.71***	<2.2	--
Bromochloromethane	μg/L	90	<0.54	<5.4	--
Bromodichloromethane	μg/L	80	<0.39	<3.9	--
Bromomethane	μg/L	10	<1.1	<11	--
Carbon disulfide	μg/L	700	<0.45	<4.5	--
Carbon Tetrachloride	μg/L	5	<0.65	<6.5	--
Chlorobenzene	μg/L	100	***1.65***	<4	--
Chloroethane	μg/L	2800	***2.31 J***	<7.9	--
Chloromethane	μg/L	NS	<0.61	<6.1	--
cis-1,2-Dichloroethylene	μg/L	70	<0.21	<2.1	--
cis-1,3-Dichloropropene	μg/L	NS	<0.25	<2.5	--
Dibromochloromethane	μg/L	80	<0.75	<7.5	--
Dibromomethane	μg/L	70	<0.33	<3.3	--
Dichloromethane	μg/L	5	<1.7	<17	--
Ethylbenzene	μg/L	700	***8.11***	<3.1	--
Iodomethane	μg/L	NS	<7	<70	--
Styrene	μg/L	100	<0.37	<3.7	--
Tetrachloroethylene	μg/L	5	<0.48	<4.8	--
Toluene	μg/L	1000	***4.61***	<4.3	--
Trans-1,2-dichloroethylene	μg/L	100	<0.27	<2.7	--
trans-1,3-Dichloropropene	μg/L	NS	<0.56	<5.6	--
trans-1,4-Dichloro-2-butene	μg/L	1.8	<1.1	<11	--
Tribromomethane	μg/L	80	<0.78	<7.8	--
Trichloroethylene	μg/L	5	<0.43	<4.3	--
Trichlorofluoromethane	μg/L	2000	<0.38	<3.8	--
Trichloromethane	μg/L	80	<1.3	<13	--
Vinyl Acetate	μg/L	NS	<2.5	<25	--
Vinyl Chloride	μg/L	2	<0.18	<1.8	--
Xylenes	μg/L	10000	***14.9***	<4	--

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

NS = No standard

Winneshiek County Landfill
Analytical Results
Lagoon Bay 1

Parameter Name	Units	May-20	May-21	May-22	Apr-23
General Chemistry					
Ammonia (as N)	µg/L	***92600***	***725***	***40000***	***7630***
Biochemical Oxygen Demand	µg/L	***25100***	***9840***	***19000***	***10200***
Cyanide	µg/L	<5	<5.3	<4.3	<4.3
pH	SU	***8.6***	***8.7***	***8.2***	***8.9***
TOC Dup	µg/L	***112000***	***64800***	***83600***	***38100***
Total Dissolved Solids	µg/L	***2040000***	***1790000***	***1770000***	***840000***
Total Kjeldahl Nitrogen	µg/L	***111000***	***15500***	***46500***	***13200***
Total Suspended Solids	µg/L	--	***27000***	--	***26000***
Metals					
Arsenic	µg/L	***7.24***	***4.01***	***3.63***	***3.82***
Barium	µg/L	***90.1***	***29.6***	***51.1***	***29.1***
Cadmium	µg/L	<0.039	<0.051	<0.055	<0.1
Chromium	µg/L	***16.5***	***5.08***	***8.69***	***2.6 J***
Cobalt	µg/L	--	--	--	***2.4***
Copper	µg/L	***3.5 J***	***5.37***	***4.23 J***	***2.81 J***
Iron	µg/L	***1360***	***104***	***1260***	***216***
Lead	µg/L	***0.511***	<0.21	***0.371 J***	<0.24
Mercury	µg/L	<0.1	<0.15	<0.11	<0.14
Nickel	µg/L	***85.5***	***80.8***	***74.3***	***37.4***
Selenium	µg/L	***2.22 J***	***1.27 J***	***1.44 J***	<1.4
Silver	µg/L	<0.37	<0.42	<0.49	<0.5
Zinc	µg/L	***45.2***	***28.4***	***34.7***	***12.2 J***
Volatile Organic Compounds					
1,1,1-Trichloroethane	µg/L	<1.9	<1.9	<1.9	<0.19
1,1,2,2-Tetrachloroethane	µg/L	<4.7	<4.7	<4.7	<0.47
1,1,2-Trichloroethane	µg/L	<4.5	<4.5	<4.5	<0.45
1,1-Dichloroethane	µg/L	<2.2	<2.2	<2.2	<0.22
1,2,4-Trichlorobenzene	µg/L	<6.63	<0.538	<0.56	<2.8
1,2-Dichlorobenzene	µg/L	<6.63	<0.596	<0.62	<3.1
1,2-Dichloroethane	µg/L	<3.9	<3.9	<3.9	<0.39
1,2-Dichloropropane	µg/L	<2.7	<2.7	<2.7	<0.27
1,3-Dichlorobenzene	µg/L	<6.12	<0.615	<0.64	<3.2
1,3-Dichloropropene, Total	µg/L	<5.6	<5.6	<5.6	<0.56
1,4-Dichlorobenzene	µg/L	<6.63	<0.615	<0.64	<3.2
2-Chloroethylvinyl ether	µg/L	<17	<17	<17	<1.7
Benzene	µg/L	<2.2	<2.2	<2.2	<0.22
Bromodichloromethane	µg/L	<3.9	<3.9	<3.9	<0.39
Bromomethane	µg/L	<11	<11	<11	***1.49 J***
Carbon Tetrachloride	µg/L	<6.5	<6.5	<6.5	<0.65
Chlorobenzene	µg/L	<4	<4	<4	<0.4
Chloroethane	µg/L	<7.9	<7.9	<7.9	<0.79
Chloromethane	µg/L	<6.1	<6.1	<6.1	<0.61
cis-1,2-Dichloroethylene	µg/L	<2.1	<2.1	<2.1	***0.942 J***
Dibromochloromethane	µg/L	<7.5	<7.5	<7.5	<0.75
Dichloromethane	µg/L	<17	<17	<17	<1.7
Ethylbenzene	µg/L	<3.1	<3.1	<3.1	<0.31
Naphthalene	µg/L	<14.3	<5.87	<6.1	<30.5
Tetrachloroethylene	µg/L	<4.8	<4.8	<4.8	<0.48
Toluene	µg/L	<4.3	<4.3	<4.3	<0.43
trans-1,2-Dichloroethylene	µg/L	<2.7	<2.7	<2.7	<0.27
Tribromomethane	µg/L	<7.8	<7.8	<7.8	<0.78
Trichloroethylene	µg/L	<4.3	<4.3	<4.3	<0.43
Trichloromethane	µg/L	<13	<13	<13	<1.3
Vinyl chloride	µg/L	<1.8	<1.8	<1.8	<0.18
Semivolatile Organic Compounds					
2,4,5-Trichlorophenol	µg/L	<5.61	<5.1	<5.3	<26.5
2,4,6-Trichlorophenol	µg/L	<6.12	<4.81	<5	<25
2,4-Dichlorophenol	µg/L	<5.61	<0.817	<0.85	<4.25
2,4-Dimethylphenol	µg/L	<5.1	<0.558	<0.58	<2.9
2,4-Dinitrophenol	µg/L	<29.1	<12.5	<13	<65
2,4-Dinitrotoluene	µg/L	<5.61	<6.15	<6.4	<32
2,6-Dinitrotoluene	µg/L	<5.61	<0.5	<0.52	<2.6
2-Chloronaphthalene	µg/L	<6.63	<0.615	<0.64	<3.2
2-Chlorophenol	µg/L	<5.61	<0.519	<0.54	<2.7
2-Nitrophenol	µg/L	<8.16	<6.54	<6.8	<34
3,3'-Dichlorobenzidine	µg/L	<9.18	<1.35	<1.4	<7
4,6-Dinitro-2-methylphenol	µg/L	<12.8	<6.63	<6.9	<34.5
4-Bromophenyl phenyl ether	µg/L	<9.69	<0.673	<0.7	<3.5
4-Chloro-3-methylphenol	µg/L	<4.85	<0.808	<0.84	<4.2
4-Chlorophenyl phenyl ether	µg/L	<6.63	<0.663	<0.69	<3.45
4-Nitrophenol	µg/L	<12.8	<7.31	<7.6	<38
Acenaphthene	µg/L	<6.63	<0.615	<0.64	<3.2
Acenaphthylene	µg/L	<6.63	<0.692	<0.72	<3.6
Anthracene	µg/L	<5.61	<0.837	<0.87	<4.35
Benzo (a) anthracene	µg/L	<5.61	<0.817	<0.85	<4.25
Benzo (a) pyrene	µg/L	<7.65	<7.79	<8.1	<40.5
Benzo (b) fluoranthene	µg/L	<6.12	<4.71	<4.9	<24.5
Benzo (g,h,i) perylene	µg/L	<8.16	<6.06	<6.3	<31.5
Benzo (k) fluoranthene	µg/L	<6.12	<2.12	<2.2	<11
Benzoic acid	µg/L	<184	<16.3	<17	<85
Benzyl alcohol	µg/L	<5.61	<1.25	<1.3	<6.5
Bis(2-chloroethoxy)methane	µg/L	<5.61	<0.731	<0.76	<3.8
Bis(2-chloroethyl)ether	µg/L	<5.61	<0.788	<0.82	<4.1
Bis(2-chloroisopropyl) ether	µg/L	<6.12	<0.519	<0.54	<2.7
Bis(2-ethylhexyl)phthalate	µg/L	<13.3	<5.29	<5.5	<27.5
Butyl benzyl phthalate	µg/L	<7.65	<5.19	<5.4	<27
Chrysene	µg/L	<5.61	<0.837	<0.87	<4.35
Dibenzo (a,h) anthracene	µg/L	<9.69	<3.75	<3.9	<19.5
Dibenzofuran	µg/L	<6.12	<0.712	<0.74	<3.7
Diethyl phthalate	µg/L	<5.61	<1.63	<1.7	<8.5
Dimethyl phthalate	µg/L	<12.8	<0.962	<1	<5
Di-n-butyl phthalate	µg/L	<6.12	<5.38	<5.6	<28
Di-n-octyl phthalate	µg/L	<15.3	<6.73	<7	<35
Fluoranthene	µg/L	<4.8	<1.63	<1.7	<8.5
Fluorene	µg/L	<6.63	<0.76	<0.79	<3.95
Hexachlorobenzene	µg/L	<7.14	<0.673	<0.7	<3.5
Hexachlorobutadiene	µg/L	<6.12	<0.827	<0.86	<4.3
Hexachlorocyclopentadiene	µg/L	<10.7	<4.9	<5.1	<25.5
Hexachloroethane	µg/L	<6.63	<0.933	<0.97	<4.85
Indeno (1,2,3-cd) pyrene	µg/L	<10.2	<4.04	<4.2	<21
Isophorone	µg/L	<5.05	<0.894	<0.93	<4.65
Nitrobenzene	µg/L	<5.61	<0.769	<0.8	<4
N-Nitrosodi-n-propylamine	µg/L	<5.1	<0.885	<0.92	<4.6
N-Nitrosodiphenylamine	µg/L	<4.85	<0.721	<0.75	<3.75
Pentachlorophenol	µg/L	<11.7	<9.23	<9.6	<48
Phenanthrene	µg/L	<5.61	<0.76	<0.79	<3.95
Pyrene	µg/L	<7.14	<0.76	<0.79	<3.95
Pesticides					
4,4'-DDD	µg/L	<0.00957	<0.027	<0.027	<0.027
4,4'-DDE	µg/L	<0.0112	<0.027	<0.027	<0.027
4,4'-DDT	µg/L	<0.0202	<0.042	<0.042	<0.042
Aldrin	µg/L	<0.0239	<0.032	<0.032	<0.032
alpha-BHC	µg/L	<0.00904	<0.029	<0.029	<0.029
beta-BHC	µg/L	<0.0255	<0.037	<0.037	<0.037
Chlordane	µg/L	<0.34	<0.81	<0.81	<0.81
delta-BHC	µg/L	***0.0425 J***	<0.027	<0.027	<0.027
Dieldrin	µg/L	<0.0106	<0.026	<0.026	<0.026
Endosulfan I	µg/L	***0.429***	<0.033	***0.234***	<0.033
Endosulfan II	µg/L	***0.018 J***	<0.029	<0.029	<0.029
Endosulfan sulfate	µg/L	***0.0196 J***	<0.03	<0.03	<0.03
Endrin	µg/L	<0.0101	<0.026	<0.026	<0.026
Endrin aldehyde	µg/L	<0.0388	<0.029	<0.029	<0.029
gamma-BHC (Lindane)	µg/L	<0.0101	<0.036	<0.036	<0.036
Heptachlor	µg/L	<0.0138	<0.033	<0.033	<0.033
Heptachlor epoxide	µg/L	<0.0324	<0.029	<0.029	<0.029
PCBs					
PCB-1016	µg/L	<0.277	<0.17	<0.17	<0.17
PCB-1221	µg/L	<0.277	<0.17	<0.17	<0.17
PCB-1232	µg/L	<0.277	<0.17	<0.17	<0.17
PCB-1242	µg/L	<0.277	<0.17	<0.17	<0.17
PCB-1248	µg/L	<0.223	<0.11	<0.11	<0.11
PCB-1254	µg/L	<0.223	<0.11	<0.11	<0.11
PCB-1260	µg/L	<0.223	<0.11	<0.11	<0.11

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.

Winneshiek County Landfill
Analytical Results
Lagoon Bay 2

Parameter Name	Units	May-20	May-21	Nov-21	May-22	Apr-23
General Chemistry						
Ammonia (as N)	µg/L	***168000***	***97900***	***18900***	***91200***	***69300***
Biochemical Oxygen Demand	µg/L	***109000***	***19600***	***42700***	***24700***	***42800***
Cyanide	µg/L	<5	<5.3	<5.3	<4.3	<4.3
pH	SU	***8.1***	***8.4***	***8.3***	***8.7***	***8.3***
TOC	µg/L	--	--	***95500***	--	--
TOC Dup	µg/L	***174000***	***105000***	--	***78900***	***65000***
Total Dissolved Solids	µg/L	***2640000***	***2270000***	***2140000***	***1930000***	***1570000***
Total Kjeldahl Nitrogen	µg/L	***189000***	***109000***	***31900***	***97000***	***80100***
Total Dissolved Solids	µg/L	--	--	***2140000***	***1930000***	***1570000***
Total Suspended Solids	µg/L	--	***14700***	--	--	***57000***
Metals						
Arsenic	µg/L	***7.13***	***5.66***	***4.13***	***4.73***	***4.1***
Barium	µg/L	***119***	***57.7***	***75.4***	***98.6***	***99.1***
Cadmium	µg/L	***0.05 J***	<0.051	<0.051	<0.055	<0.1
Chromium	µg/L	***34.7***	***12.7***	***10.6***	***12.6***	***8.83***
Cobalt	µg/L	--	--	--	--	***6.78***
Copper	µg/L	***5.82***	***4.01 J***	***2.97***	***6.82***	***2.93 J***
Iron	µg/L	***4680***	***905***	***1260***	***2980***	***1750***
Lead	µg/L	***1.17***	***0.218 J***	***0.687***	***0.775***	<0.24
Mercury	µg/L	<0.1	<0.15	<0.15	<0.11	<0.14
Nickel	µg/L	***98.4***	***106***	***94.5***	***79.1***	***56.7***
Selenium	µg/L	***2.79 J***	***1.83 J***	***1.67***	***1.83 J***	<1.4
Silver	µg/L	<0.37	<0.42	<0.42	***0.604 J***	<0.5
Zinc	µg/L	***107***	***42.3***	***37.5***	***72.4***	***35.1***
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/L	<1.9	<1.9	<1.9	<1.9	<0.19
1,1,2,2-Tetrachloroethane	µg/L	<4.7	<4.7	<4.7	<4.7	<0.47
1,1,2-Trichloroethane	µg/L	<4.5	<4.5	<4.5	<4.5	<0.45
1,1-Dichloroethane	µg/L	<2.2	<2.2	<2.2	<2.2	<0.22
1,2,4-Trichlorobenzene	µg/L	<6.63	<0.56	<2.8	<2.69	<2.69
1,2-Dichlorobenzene	µg/L	<6.63	<0.62	<3.1	<2.98	<2.98
1,2-Dichloroethane	µg/L	<3.9	<3.9	<3.9	<3.9	<0.39
1,2-Dichloropropane	µg/L	<2.7	<2.7	<2.7	<2.7	<0.27
1,3-Dichlorobenzene	µg/L	<6.12	<0.64	<3.2	<3.08	<3.08
1,3-Dichloropropene, Total	µg/L	<5.6	<5.6	<5.6	<5.6	<0.56
1,4-Dichlorobenzene	µg/L	<6.63	<0.64	<3.2	<3.08	<3.08
2-Chloroethylvinyl ether	µg/L	<17	<17	<17	<17	<1.7
Benzene	µg/L	<2.2	<2.2	***7.23***	<2.2	<0.22
Bromodichloromethane	µg/L	<3.9	<3.9	<3.9	<3.9	<0.39
Bromomethane	µg/L	<11	<11	<11	<11	<1.1
Carbon Tetrachloride	µg/L	<6.5	<6.5	<6.5	<6.5	<0.65
Chlorobenzene	µg/L	<4	<4	<4	<4	<0.4
Chloroethane	µg/L	<7.9	<7.9	<7.9	<7.9	<0.79
Chloromethane	µg/L	<6.1	<6.1	<6.1	<6.1	<0.61
cis-1,2-Dichloroethylene	µg/L	<2.1	<2.1	<2.1	<2.1	***0.734 J***
Dibromochloromethane	µg/L	<7.5	<7.5	<7.5	<7.5	<0.75
Dichloromethane	µg/L	<17	<17	<17	<17	<1.7
Ethylbenzene	µg/L	<3.1	<3.1	***5.91***	<3.1	<0.31
Naphthalene	µg/L	<14.3	<6.1	<30.5	<29.3	<29.3
Tetrachloroethylene	µg/L	<4.8	<4.8	<4.8	<4.8	<0.48
Toluene	µg/L	<4.3	<4.3	***39.1***	<4.3	<0.43
trans-1,2-Dichloroethylene	µg/L	<2.7	<2.7	<2.7	<2.7	<0.27
Tribromomethane	µg/L	<7.8	<7.8	<7.8	<7.8	<0.78
Trichloroethylene	µg/L	<4.3	<4.3	<4.3	<4.3	<0.43
Trichloromethane	µg/L	<13	<13	<13	<13	<1.3
Vinyl chloride	µg/L	<1.8	<1.8	<1.8	<1.8	<0.18
Semivolatile Organic Compounds						
2,4,5-Trichlorophenol	µg/L	<5.61	<5.3	<26.5	<25.5	<25.5
2,4,6-Trichlorophenol	µg/L	<6.12	<5	<25	<24	<24
2,4-Dichlorophenol	µg/L	<5.61	<0.85	<4.25	<4.09	<4.09
2,4-Dimethylphenol	µg/L	<5.1	<0.58	<2.9	<2.79	<2.79
2,4-Dinitrophenol	µg/L	<29.1	<13	<65	<62.5	<62.5
2,4-Dinitrotoluene	µg/L	<5.61	<6.4	<32	<30.8	<30.8
2,6-Dinitrotoluene	µg/L	<5.61	<0.52	<2.6	<2.5	<2.5
2-Chloronaphthalene	µg/L	<6.63	<0.64	<3.2	<3.08	<3.08
2-Chlorophenol	µg/L	<5.61	<0.54	<2.7	<2.6	<2.6
2-Nitrophenol	µg/L	<8.16	<6.8	<34	<32.7	<32.7
3,3'-Dichlorobenzidine	µg/L	<9.18	<1.4	<7	<6.73	<6.73
4,6-Dinitro-2-methylphenol	µg/L	<12.8	<6.9	<34.5	<33.2	<33.2
4-Bromophenyl phenyl ether	µg/L	<9.69	<0.7	<3.5	<3.37	<3.37
4-Chloro-3-methylphenol	µg/L	<4.85	<0.84	<4.2	<4.04	<4.04
4-Chlorophenyl phenyl ether	µg/L	<6.63	<0.69	<3.45	<3.32	<3.32
4-Nitrophenol	µg/L	<12.8	<7.6	<38	<36.5	<36.5
Acenaphthene	µg/L	<6.63	<0.64	<3.2	<3.08	<3.08
Acenaphthylene	µg/L	<6.63	<0.72	<3.6	<3.46	<3.46
Anthracene	µg/L	<5.61	<0.87	<4.35	<4.18	<4.18
Benzo (a) anthracene	µg/L	<5.61	<0.85	<4.25	<4.09	<4.09
Benzo (a) pyrene	µg/L	<7.65	<8.1	<40.5	<38.9	<38.9
Benzo (b) fluoranthene	µg/L	<6.12	<4.9	<24.5	<23.6	<23.6
Benzo (g,h,i) perylene	µg/L	<8.16	<6.3	<31.5	<30.3	<30.3
Benzo (k) fluoranthene	µg/L	<6.12	<2.2	<11	<10.6	<10.6
Benzoic acid	µg/L	<184	<17	<85	<81.7	<81.7
Benzyl alcohol	µg/L	<5.61	<1.3	<6.5	<6.25	<6.25
Bis(2-chloroethoxy)methane	µg/L	<5.61	<0.76	<3.8	<3.65	<3.65
Bis(2-chloroethyl)ether	µg/L	<5.61	<0.82	<4.1	<3.94	<3.94
Bis(2-chloroisopropyl) ether	µg/L	<6.12	<0.54	<2.7	<2.6	<2.6
Bis(2-ethylhexyl)phthalate	µg/L	<13.3	<5.5	<27.5	<26.4	<26.4
Butyl benzyl phthalate	µg/L	<7.65	<5.4	<27	<26	<26
Chrysene	µg/L	<5.61	<0.87	<4.35	<4.18	<4.18
Dibenzo (a,h) anthracene	µg/L	<9.69	<3.9	<19.5	<18.8	<18.8
Dibenzofuran	µg/L	<6.12	<0.74	<3.7	<3.56	<3.56
Diethyl phthalate	µg/L	<5.61	<1.7	<8.5	<8.17	<8.17
Dimethyl phthalate	µg/L	<12.8	<1	<5	<4.81	<4.81
Di-n-butyl phthalate	µg/L	<6.12	<5.6	<28	<26.9	<26.9
Di-n-octyl phthalate	µg/L	<15.3	<7	<35	<33.7	<33.7
Fluoranthene	µg/L	<4.8	<1.7	<8.5	<8.17	<8.17
Fluorene	µg/L	<6.63	<0.79	<3.95	<3.8	<3.8
Hexachlorobenzene	µg/L	<7.14	<0.7	<3.5	<3.37	<3.37
Hexachlorobutadiene	µg/L	<6.12	<0.86	<4.3	<4.13	<4.13
Hexachlorocyclopentadiene	µg/L	<10.7	<5.1	<25.5	<24.5	<24.5
Hexachloroethane	µg/L	<6.63	<0.97	<4.85	<4.66	<4.66
Indeno (1,2,3-cd) pyrene	µg/L	<10.2	<4.2	<21	<20.2	<20.2
Isophorone	µg/L	<5.05	<0.93	<4.65	<4.47	<4.47
Nitrobenzene	µg/L	<5.61	<0.8	<4	<3.85	<3.85
N-Nitrosodi-n-propylamine	µg/L	<5.1	<0.92	<4.6	<4.42	<4.42
N-Nitrosodiphenylamine	µg/L	<4.85	<0.75	<3.75	<3.61	<3.61
Pentachlorophenol	µg/L	<11.7	<9.6	<48	<46.2	<46.2
Phenanthrene	µg/L	<5.61	<0.79	<3.95	<3.8	<3.8
Pyrene	µg/L	<7.14	<0.79	<3.95	<3.8	<3.8
Pesticides						
4,4'-DDD	µg/L	***0.084 J***	<0.027	<0.027	***<0.027 J***	<0.0265
4,4'-DDE	µg/L	<0.021	<0.027	<0.027	<0.027	<0.0265
4,4'-DDT	µg/L	<0.038	<0.042	<0.042	<0.042	<0.0412
Aldrin	µg/L	<0.045	<0.032	<0.032	<0.032	<0.0314
alpha-BHC	µg/L	<0.017	<0.029	<0.029	<0.029	<0.0284
beta-BHC	µg/L	<0.048	***0.0852***	***0.0669***	<0.037	<0.0363
Chlordane	µg/L	<0.64	<0.81	<0.81	<0.81	<0.794
delta-BHC	µg/L	<0.023	<0.027	<0.027	***0.0447 J***	<0.0265
Dieldrin	µg/L	<0.02	<0.026	<0.026	<0.026	<0.0255
Endosulfan I	µg/L	***0.569***	***0.378***	***0.111***	***0.231***	<0.0324
Endosulfan II	µg/L	***0.0337 J***	<0.029	<0.029	<0.029	<0.0284
Endosulfan sulfate	µg/L	<0.025	<0.03	<0.03	<0.03	<0.0294
Endrin	µg/L	<0.019	<0.026	<0.026	<0.026	<0.0255
Endrin aldehyde	µg/L	<0.073	<0.029	<0.029	<0.029	<0.0284
gamma-BHC (Lindane)	µg/L	<0.019	<0.036	<0.036	<0.036	<0.0353
Heptachlor	µg/L	<0.026	<0.033	<0.033	<0.033	<0.0324
Heptachlor epoxide	µg/L	<0.061	<0.029	<0.029	<0.029	<0.0284
PCBs						
PCB-1016	µg/L	<0.52	<0.17	<0.17	<0.17	<0.167
PCB-1221	µg/L	<0.52	<0.17	<0.17	<0.17	<0.167
PCB-1232	µg/L	<0.52	<0.17	<0.17	<0.17	<0.167
PCB-1242	µg/L	<0.52	<0.17	<0.17	<0.17	<0.167
PCB-1248	µg/L	<0.42	<0.11	<0.11	<0.11	<0.108
PCB-1254	µg/L	<0.42	<0.11	<0.11	<0.11	<0.108
PCB-1260	µg/L	<0.42	<0.11	<0.11	<0.11	<0.108

Detections at or above the RL are shown in bold italics on gray background.

Detections greater than the MDL but less than the RL are shown in bold italics on white background with a J.