Quality Assurance/Quality Control Plan

Refuse Hideaway Landfill Groundwater Sampling Project

WDNR Project I.D.: 22-323-33

Cedar Project I.D.: 06719-0001-301-01

Wisconsin Department of Natural Resources

Madison, Wisconsin

April 2022

Prepared by:

Cedar Corporation

Quality Assurance/Quality Control Plan

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List of Abbreviations

Cedar	Cedar Corporation
Plan	Quality Assurance/Quality Control Plan
QA	Quality Assurance
QC	Quality Control
Site	7562 Highway 14, Middleton WI
WDNR	Wisconsin Department of Natural Resources

1. Introduction

This Quality Assurance/Quality Control Plan (Plan) has been prepared on behalf of Wisconsin Department of Natural Resources (WDNR) by Cedar Corporation (Cedar) and has been developed for groundwater sampling at the site located at 7562 Highway 14, Middleton, Dane County, Wisconsin (Site). This Plan addresses quality assurance and quality control (QA/QC) for managing groundwater sampling activities following the WDNR Groundwater Sampling Field Manual (WDNR September 1996).

1.1 Purpose

The purpose of the Plan is to outline the sampling and documentation procedures utilized during groundwater sampling events. This Plan establishes the procedures to verify that consistently collecting quality and representative groundwater samples and measurements.

1.2 Scope

The following four elements are part of this Plan:

1. Groundwater elevations
2. Monitoring well purging
3. Private well purging
4. Sample collection
5. Documentation and reporting

This Plan is divided into four sections. Section 2 details the project team roles and responsibilities, Section 3 describes the purging and sampling procedures, and Section 4 discusses project documentation and reporting.

2. Responsibility and Authority

The responsibility and authority for the development and implementation of the QA program rests with Cedar and the WDNR. Cedar will perform the QA and QC. Project personnel are listed in Table 2-1.

Table 2-1

Project Construction Quality Assurance Personnel

Title	Name	Affiliation	Phone
Hydrogeologist	Cindy Koepke	WDNR	608-219-2181
Project Manager	Dan O'Connell	Cedar	920-785-7065
Assistant Project Manager	Quin Lenz	Cedar	920-785-7326
Technical Expertise	Mitch Evenson	Cedar	715-232-5728
QA/QC Review	Anna Beckman	Cedar	715-232-5754

This Plan is being conducted in accordance with the contract approved by the WDNR. In the event that changes are needed, the QA/QC plan will be resubmitted to the WDNR for review/approval.

2.1 Organizations Involved with Groundwater Monitoring

Cedar was retained for the groundwater sampling activities at the Site. Eurofins TestAmerica will be contracted for the sample analysis at the Site. The following organizations will be involved with the groundwater sampling duties.

Owner Representative:	Wisconsin Department of Natural Resources
Environmental Consultant:	Cedar Corporation
Laboratory Services:	Eurofins Test America Inc
QA/QC:	Cedar Corporation/WDNR

2.2 Project Meetings

Periodic meetings will be conducted by Cedar for the purposes listed below:

- Pre-sampling notification
- Sample result notification
- GEMS submittal

Each meeting type is described in more detail below. Unless otherwise noted, Cedar will be responsible for written documentation of project meeting minutes.

2.2.1 Pre-sampling Notification

Cedar and the WDNR and/or their representatives, will have a pre-sampling meeting. The purpose of this meeting is:

- Inform the WDNR the intended sampling dates
- Estimated time of private well data
- Estimated time of GEMS submittal

2.2.2 Sample Result Notification

Cedar will inform the WDNR on analytical results. The private well analytical will be submitted to the WDNR project manager within 48 hours of analytical receipt. The sample report and GEMS submittal will be submitted to the WDNR project manager within 4 weeks of receiving the analytical results.

2.2.3 GEMS Submittal

Cedar will submit the analytical results to the WDNR through GEMS. The WDNR project manager will be notified when the submittal is complete.

3. Low-Flow Groundwater Sampling Procurement, Preparation and Field Tasks Procedures

The purpose of this section is to provide procedures for gathering data for analytical evaluation of groundwater at the Refuse Hideaway Landfill Site. The procedures detailed in this section are the general guidelines used from the Wisconsin Department of Natural Resources Guidance PUBL-DG-038 96 – *Groundwater Sampling Field Manual* (September 1996). A blank well specific field sheet is attached to this QA/QC.

3.1 Equipment and Supplies

Below is a list of equipment and supplies that will be needed for the semi-annual groundwater monitoring events.

- Solinst water level meter (2)
- QED MP-50 Controller/Compressor (2)
- QED Sample Pro Pump 1.75" (1) – pump for deep wells without dedicated pumps
- QED 1 ¾ poly bladders (4) – new bladders for deep wells without dedicated pumps
- QED 1 ¾ Grab Plate ¼ x ¼ (1)
- Tubing Bonded Pol-Pol ¼ x ¼B (215 ft) – tubing for deep wells without dedicated bladder pumps, footage based on the well depth information for wells without dedicated pumps.
- Geopump peristalitic pump (1) – for shallow wells without dedicated pumps
- Poly tubing 0.17" ID x ¼" OD LDPE (400 ft) – tubing for shallow wells without dedicated bladder pumps, footage based on the well depth information for wells without dedicated pumps.
- Silicone tubing 0.19" ID x 0.39" OD (12 ft) – tubing for shallow wells without dedicated pumps
- 5-gallon buckets and purge tanks for purged groundwater
- YSI-DSF water quality meter (temperature, specific conductance, field pH) with flow cells (2)
- Calibration solution for YSI meters
- Disposable gloves, DI water, paper toweling, extra pens, etc.
- Well specific field sheets (48)
- Sample containers ordered through Eurofins Test America (see table below)
- One-person teams with field trucks (2) and ATV (1)

3.2 Laboratory Bottle Order and Shipping Information

Eurofins Test America provided the following:

- Preprinted/prepaid shipping labels direct to Eurofins Test America University Park, IL
- Trip blanks (4) and temperature blanks (4)

Table 3-1

Bottle Per Set	Preservative	Parameter
(3) 40 ml VOA vials	HCL	VOCs (SW846-8260)
(3) 40 ml VOA vials	HCL	VOCs (EPA 524.2)

- Pre-printed labels (example):
    - Client: (as appropriate)
    - Sample ID: ***Well ID_Date*** [example: P-8S_20220420]
    - Project/Location: ***Hideaway LF GW-Year Quarter Project #*** [example: Hideaway GW-2022 Q2 6719-0001]

    - Comments: (as appropriate)
    - Preservative: (as appropriate)
    - Collection Date/Time: (blank)
    - Collected By: (as appropriate)
    - Bottle Type: (as appropriate)
- Laboratory Contact Information:

  Eurofins TestAmerica
  University Park
  Sandie Fredrick, Project Manager
  2417 Bond Street
  University Park, IL 60484
  Phone: 920-261-1660
  Sandra.Fredrick@testamericainc.com
- Shipping
    - Samples will be shipped with at least 20 pounds of ice per cooler, chain of custody will be completed for each cooler, cooler will be tapped shut with a custody seal. Coolers will be shipped priority overnight to the lab.

3.3 Sample QA and QC Requirements

- Field duplicates
    - 1:10 [one team start at naming samples FD-1 and complete odd numbers/one team start at FD-2 and complete even numbers (for database purposes.)]
- Equipment blanks (collected from outside of pump for wells not using dedicated pump or bailer)
    - 1:10 [one team start at naming samples EB-1 and complete odd numbers/one team start at EB-2 and complete even numbers (for database purposes.)]
    - Equipment blanks are required for wells without dedicated pumps or tubing.
- Trip blanks
    - 1:VOC cooler (Label each TB unique for database purposes). All VOC samples in a shipment should be in the same cooler.

3.4 Measuring Static Water Level

- Measure the static water level for a well before purging, sampling or inserting any other instruments or devices into the well's water column.
- Collect water level measurements from all site wells within the same day.
- Collect water level measurements in the order of least contaminated to most contaminated wells (if known). Decontaminate the water level meter between each well.
- Read water level measurements to the nearest 0.01 foot from a permanently marked spot on the well casing.
- If using more than one measuring instrument, check the calibration of both instruments against the same well to ensure that they provide the same water

level measurements.

- After removing a water/airtight well cap, allow the water level in the well to stabilize. Take several measurements to ensure that the water level has stabilized.
- Bring along records of previous water level measurements taken on the well.

3.5 Purging and Sampling Procedures

The goal of purging is either to remove stagnant water from the well or prevent stagnant water from entering samples as you are collecting them. Stagnant water does not represent groundwater.

The goal of sampling is to collect unaltered samples that represent the physical and chemical composition of groundwater.

- Purge and sample wells in order of least to most contaminated. This is not necessary if equipment is dedicated or disposable.
- Decontaminate all equipment and accessories between use in each well. Store and transport all equipment in clean containers.
- Ensure that your equipment does not touch the ground or contaminated surfaces.
- Low-flow purging and sampling procedures
    - Slowly lower the pump to the middle of the well's screened area. A dedicated system is recommended. Securely connect the power cable and sample tubing to the controller box to the pumping equipment.
    - Connect the sample tubing to the water entry point of the closed flow-through cell.
    - Setup and calibrate all indicator parameter instruments and place each probe into its respective port of the closed flow-through cell.
    - Set the pump controller to the desired purging rate.
    - Record the purging start time and start purging the well at a rate of 1 L/min or less. During purging, the water level in the well should not decrease significantly and should stabilize after purging for a few minutes. If the water level continues to decline while purging, decrease the purging rate if possible. Record the purge rate as an average.
    - Purge the well until you have taken at least three consecutive readings spaced approximately 2 minutes apart or 0.5 well volumes or more apart. The readings must fall within the following ranges for the indicated parameters:
        - Dissolved oxygen: ±0.2 mg/L
        - Specific conductance: ±5.0 umhos/cm for values <1000 umhos/cm, ±10.0 umhos/cm for values >1000 umhos/cm
        - pH: ±0.1 pH units
        - Temperature: ±0.1°C
        - ORP (optional) ±30 mv
    - Or purge the well until the readings for indicator parameters listed above vary withing ±10% over three or more consecutive readings spaced approximately 2 minutes or 0.5 well volumes apart.
    - Record the final three stable readings for each indicator parameter on the well specific field sheet.
    - Record the volume purged, purging stop time, purged dry (Y/N), and any

problems or other notes while purging.
    - Purge water will be disposed of at the leachate collection tank at the landfill.
- Samples collected for VOCs will be conducted with the following procedures.
    - Open one set of sample containers immediately before filling.
    - Fill the sample container until the water forms a positive meniscus at the brim, then immediately replace the cap.
    - Invert the sample container and tap it lightly to check for bubbles. If bubbles are present, fill a new sample container and check for bubbles the same way.
    - Use waterproof labels. Write on them with a permanent, waterproof marker. Labels should include:
        - A unique sample number.
        - Site/project name.
        - Date and time sample collected.
        - Sample collectors initials.
        - Type of preservation added and analysis required.
    - Preserve samples within 15 minutes of collection and immediately place on ice.
    - Minimize the contact of extraneous contamination with sample containers and equipment. Common extraneous contaminants include perfumes, cosmetics, bug spray, suntan lotion, sharpie, spray lubricants, and engine fumes. Sample up wind or remove extraneous contaminants before opening containers and collecting samples.
- Keep complete and accurate records. Record all field information before proceeding to the next well.

3.6 Private Well Purging and Sampling Procedures

The goal of purging is to collect raw untreated groundwater samples from the water supply well.

- Water level elevations will not be collected on private water wells.
- Purge and collect samples from a sample tap as close to the well's pump as possible, before the water passes through any softener, heater, storage or pressure system, or tank. Document if you cannot collect a sample located before a water heater or treatment system.
- If possible, remove any aerators, filters or other devices from the tap before collecting any samples. If you must collect the sample from an outside tap, remove any hoses first.
- If you collect samples from a tap located before the pressure tank, first make sure the pup is activated and allow the water to run from the tap for at least two minutes – until the water is cold or for one full pump cycle.
- If you collect samples from a tap located after the pressure tank, first allow the water to run from the tap for at least five minutes – until the water is cold or for one full pump cycle. Run the water until the pressure tank and pump cycle the water two or three times. Document that you've collected samples from a tap located after the pressure tank.
- Collect the VOC samples as stated in section 3.5.
    - If the sampling tap has an aerator, filter or other device, remove it. Run the water for at least two minutes, until cold. Reduce the water flow to a thin

stream, then collect the VOC samples as described in section 3.5.

4. Documentation

Well specific field sheet will be completed for each monitoring well onsite. Forms and records will be reviewed by Cedar. The following information will be submitted to the WDNR after receiving the analytical results.

- Within 48 hours of receiving final lab results for private wells only, submit the lab results by email to the WDNR project manager.
    - This is to facilitate the WDNR notifying the private well owners and is a separate submittal from the report below.
- Within 4 weeks of receiving lab results for each round of sampling, submit a concise letter report to the Remediation & Redevelopment Program electronic submittal portal.
    - Notes on any field or laboratory deviations from the approved QA/QC Plan.
    - One set of laboratory analytical results for both monitoring and private wells.
    - The laboratory narrative.
    - Summary of all NR 140 Enforcement Standard and Preventative Action Limit exceedances, listed by well (identify private wells by address, not owner name).
    - Summary of all NR 140 Enforcement Standard and Preventative Action Limit exceedances, listed by parameter (identify private wells by address, not owner name).
    - Notes on any other issues or comments on the collection, transport, or analyses of the samples.
    - Details on any wells or equipment needing repairs.
    - Scanned field notes for that sampling round.
    - An itemized invoice for services performed along with a State of Wisconsin Invoice for Professional Services, following the format of the cost estimate/bid price sheet.
- Within 4 weeks of receiving the lab results, submit analytical results and groundwater elevation data in the data format required by the WDNR for the GEMS database directly to the WDNR's GEMS data manager. The CDs containing the data must be accompanied by a WDNR Environmental Monitoring Data Certification form and a summary of NR 140 Enforcement Standard and Preventive Action Limit exceedances.

4.1 Storage of Records

Final copies of field notes and reports will be maintained Cedar with a copy provided to the WDNR. Records will be stored for seven years following project completion.

5. Reference

Wisconsin Department of Natural Resources. *Guidance PUBL-DG-038* 96 – *Groundwater Sampling Field Manual.* September 1996.

Appendix

Blank Well Specific Field Sheet

WELL SPECIFIC FIELD SHEET - MONITORING WELLS (Sheet ___ of ___)

Facility/Project Name:_____ Date: _____
Section/Grid or Address:_____
License or Permit #:_____
Weather today and past weeks (precipitation):_____
Persons Sampling:_____

Well Name					
DNR Well ID No.					
Wis. Unique Well No. (WUWN)					
Damage to Well? (Y/N)					
Top of Casing or Reference Elevation (MSL)					
Depth to Water (to 0.01 ft)					
Groundwater Elevation (MSL)					
Depth to Well Bottom (ft)					
4 Well Volumes (gal. or liters)					
Purging Device; dedicated (D) or portable (PT)					
Purge Device Intake Depth (ft)					
Purging Time (start - stop)					
Average Purging Flow Rate (gpm or L/min)					
Volume Purged (gal. or liters)					
Purged Dry? (Y/N)					
Problems Purging? (Y/N)					
Sampling Device (D or PT)					
Sampler Intake Depth (ft)					
Average Sampling Flow Rate (gpm or L/min)					
Time Sample Collected					
Preservative (e.g., HCL)					
Field Temperature (C)					
Field Specific Conductance					

Time Measured					
Well Name					
Field pH (standard units)					
Time Measured					
Turbidity (NTUs or describe)					
Time Measured					
Dissolved Oxygen (mg/l)					
Time Measured					
Eh - redox potential (mv)					
Time Measured					
Color (describe - grey, etc)					
Odor (describe - pungent, etc)					
Sample Field Filtered? (Y/N)					
Time Samples Filtered					
Well Capped & Locked? (Y/N)					

Comments (Discuss well damage, purging or sampling problems, deviations from sampling plan, etc.):