976761

FOURTH FIVE-YEAR REVIEW REPORT
FOR
REFUSE HIDEAWAY LANDFILL SUPERFUND SITE
DANE COUNTY, WISCONSIN

Prepared by

U.S. Environmental Protection Agency
Region 5
Chicago, Illinois

7/26/2022

X Douglas Ballotti

Douglas Ballotti, Director
Superfund & Emergency Management Division
Signed by: DOUGLAS BALLOTTI

TABLE OF CONTENTS

LIST OF ABBREVIATIONS & ACRONYMS

ARARs	Applicable or Relevant and Appropriate Requirements
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COCs	Contaminants of Concern
DCA	Dichloroethane
DCE	Dichloroethene
EPA	United States Environmental Protection Agency
ES	Enforcement Standard, as provided for by Wisconsin Administrative Code NR140, (Groundwater Quality Standards)
ESD	Explanation of Significant Difference
FYR	Five-Year Review
gpm	gallons per minute
HI	Hazard Index
ICs	Institutional Controls
MCL	Maximum Contaminant Level
NCP	National Contingency Plan
NPL	National Priorities List
OU	Operable Unit
O&M	Operation and Maintenance
PCE	Tetrachloroethene
PFAS	Per- and poly-fluoroalkyl substances
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
POE	Point-Of-Entry groundwater treatment filter
ppb	parts per billion
ppm	parts per million
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RD/RA	Remedial Design/Remedial Action
RHL	Refuse Hideaway Landfill
RI/FS	Remedial Investigation/ Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SDWA	Safe Drinking Water Act
Site	Refuse Hideaway Landfill Superfund Site
THF	Tetrahydrofuran
TCE	Trichloroethylene or Trichloroethene
TBC	To-be-considered
UU/UE	Unlimited Use/Unrestricted Exposure
VC	Vinyl Chloride
VOCs	Volatile Organic Compounds
WDNR	Wisconsin Department of Natural Resources
yd^3	Cubic Yards

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fourth FYR for the Refuse Hideaway Landfill (RHL) Superfund Site (the "Site" or the "RHL Site"). The triggering action for this statutory review is the completion date of the third FYR on August 2, 2017. The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of one Site-wide operable unit (OU) which is addressed in this FYR. The Site-wide OU addresses source control and groundwater.

The Refuse Hideaway Landfill Superfund Site FYR was led by John V. Fagiolo, EPA Remedial Project Manager (RPM). An additional participant was Ms. Cynthia Koepke, Hydrogeologist with the Wisconsin Department of Natural Resources (WDNR). The potentially responsible party (PRP) implementing the remedy work under the Consent Decree (CD) "United States v. State of Wisconsin, et al.. W.D.Wisc., Civil No. 01-C-0394-S," is the State of Wisconsin (the State), and WDNR operates the remedy on the State's behalf. Although remedy operation and maintenance (O&M) is performed by WDNR, for this FYR WDNR was involved as the support agency. The review began on September 23, 2021 with a notification letter to WDNR.

Site Background

The Site covers approximately 23 acres, located in the SW 1/4, NW 1/4, Section 8, T7N, R8E portion of the Town of Middleton in Dane County, Wisconsin. The Site property is in a rural portion of the Town of Middleton, 2 miles west of the City of Middleton and 4 miles east of the Village of Cross Plains (see Figures l and 2 in Appendix B). The street address for the Site is approximately 7562 U.S. Highway 14.

Municipal, commercial, and industrial wastes were placed in the 1.2 million cubic yard landfill. The landfill operated for 14 years between 1974 and 1988. The landfill owner reported receiving a variety of commercial and industrial wastes including barrels of glue and paint, barrels of ink and ink washes, spray paint booth by-products and paint stripper sludge, and spill residues containing volatile organic compounds (VOCs). The landfill was designed with no liner, leaving the existing sandy soils and sandstone bedrock beneath the Site to attenuate any contaminants leaching from the Site. Site groundwater flows to the southwest.

In the immediate vicinity of the Site, water table, potentiometric surface configuration, and vertical gradient information confirm that Black Earth Creek to the south and east of the Site is not a regional divide, and the creek is not a major discharge point for groundwater in the area of the landfill. Groundwater flow is such that groundwater contaminants are not discharging into Black Earth Creek.

Current and reasonably anticipated future land use of the areas surrounding the Site is predominantly agricultural with a wetland area located southeast of the landfill. The two residences nearest the landfill are approximately 2,400 feet to the southwest, adjacent to U.S. Highway 14, with additional residences in the Deer Run Heights Subdivision located at least 4,800 feet to the southwest of the landfill. The State is not the owner of the real estate on which the landfill Site is located. However, the State performs the remedial action work and O&M of the remedy at the Site through WDNR as a Settling Performing Defendant. The Site property outside the fill boundary is occupied by a tenant to the Site landowner, an excavation contractor which uses this adjacent area for storage of trucks and construction equipment. For additional background information on the Site, see Table 8 in Appendix B which is a chronology of Site events.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Refuse Hideaway Landfill		
EPA ID: WID 980 610 604		
Region: 5	**State:** WI	**City/County:** City of Middleton, Dane County
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name (Federal or State Project Manager): John V. Fagiolo		
Author affiliation: EPA		
Review period: September 23, 2021 - April 1, 2022		
Date(s) of Site inspection: FYR Site inspection not conducted due to COVID-19 travel restrictions.		
Type of review: Statutory		
Review number: 4		
Triggering action date *(from SEMS)*: August 2, 2017		
Due date *(five years after triggering action date)*: August 2, 2022		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The primary contaminants of concern (COCs) shown in Table 1 are found in groundwater at the Site and are associated with the past improper waste disposal. An impermeable landfill cap previously installed by WDNR in 1990 addressed exposure to contaminated soil and waste fill materials. In 1991, WDNR also installed a landfill gas collection system. No VOCs were detected in surface water samples collected in 1989 from the drainage ditch south of the landfill and from Black Earth Creek in 1989. In 1992, the area south of the Site was drained and dredged, and accumulated sediment was removed by WDNR. This eliminated sediment as a pathway of concern. In 1995, surface water was not considered to be a pathway of concern. Accumulated sediments were also removed in 2020 as part of routine Site maintenance.

Because these systems were in place and effective and were upgraded and repaired by WDNR prior to the 1994 Remedial Investigation (RI) and the 1995 Feasibility Study (FS, see Documents 3 and 4 in Appendix A), the RI/FS included sampling and analysis only of Site landfill gas, leachate, and groundwater for target compound list constituents. Contaminants which might have been present in Site soil during landfilling operations were therefore not identified as COCs in the June 28, 1995 Record of Decision (ROD, see Document 5 in Appendix A). Further, the installed cap protects groundwater by preventing infiltration of precipitation, and the air pathway has been addressed with the installation and operation of the landfill gas collection and ground flare systems. However, as documented in the 1995 ROD, these landfill remedies need to remain in place and be maintained to continue to prevent these exposure pathways.

Substances that have been released at the Site in groundwater and that were determined to be COCs that needed to be addressed with response actions include:

Table 1: Contaminants of Concern

GROUNDWATER
Benzene
Bromomethane *
Chloroform *
1,2 Dichloroethane (1,2-DCA) *
cis-1,2 Dichloroethene (cis-l,2-DCE)
trans-1,2 Dichloroethene (trans-l,2-DCE) *
1,2-Dichloropropane
Tetrachloroethene (PCE)
Trichloroethene (TCE)
Vinyl Chloride (VC)
Iron *
Manganese *
Bis(2-ethylhexyl)phthalate *
Heptachlor *
4,4-DDT *

* Contaminant is no longer a COC as of the date of this FYR.

If no action were taken, exposure to COCs in drinking water above health-based levels would have occurred. The 1994-1995 RI/FS included a qualitative risk assessment which identified human health hazards posed by current as well as future potential exposures to Site-related contamination. The human health risk assessment developed for the Site and included in the RI considered and found exposure pathways risk for future residents or on-site workers through incidental ingestion, inhalation, and dermal contact with COCs for the Site in groundwater. The potential exposure routes from the domestic use of contaminated groundwater include ingestion, inhalation, and dermal contact. Residents using untreated contaminated groundwater could ingest contaminants when drinking water, inhale contamination released from the water during domestic uses (cooking, showering, etc.) and absorb contaminants through their skin while bathing and washing in contaminated water. Groundwater studies completed from 1991 to 1995 as part of Site characterization concluded the contaminant plume from the Site is limited to the upper 250 feet of the saturated zone.

During Site investigation work, the following VOCs were detected in the on-Site landfill gas: benzene, PCE, toluene, TCE, and VC. Landfill gas (consisting primarily of methane) has the potential to migrate from the Site and is a potential explosive hazard to persons living and/or working in buildings near the Site. Other toxic substances such as VOCs have the potential to co-migrate with landfill gas. It has been documented by WDNR in sampling and analysis reports since the 1998 Remedial Design (RD) report (see Document 2 in Appendix A) that the Site's landfill gas collection system successfully collects landfill gas and reduces the level of on-Site VOCs. In 1989 and 1990, private homes were monitored by WDNR for the presence of methane gas. The homes were each in excess of 1,600 feet from the landfill and no landfill gas was detected in any of the homes.

An ecological evaluation was performed in 1994 as part of the RI and found the risk posed to environmental receptors from the Site is low. There are no known endangered or threatened species or critical habitats on or near the Site.

Response Actions

During Site investigation work, three nearby private wells were discovered to have VOC impacts. Two of the wells had point-of-entry (POE) treatment systems installed by WDNR in 1990. Although groundwater data shows that these residences do not have unacceptable levels of contamination, WDNR continues to provide support for these two POE systems. The third well supplied a home and farm buildings that have been vacant since 1998 and have since been demolished. This FYR confirmed that this real estate remains vacant and that the third well is no longer in use.

In addition to the landfill closure implemented by the owner/operator in 1988, the main components of the RHL Site remedy had been previously installed by WDNR by 1991, including the landfill cap, the landfill gas/leachate collection system, and landfill gas flare system. Additionally in 1992, the area south of this Site was drained and dredged and accumulated sediment was removed by WDNR. The ROD issued on June 28, 1995 refined the remedy's requirements and provided for maintenance and potential future changes or additions to, or optimization of, the remedy. The 1995 ROD required the following remedial actions:

- Deed restrictions and zoning modifications;
- Warning signs posted around the perimeter of the property;
- Maintenance of the landfill cap, vegetation, and surface run-off controls;
- O&M of the existing landfill gas extraction and destruction system and of the leachate extraction and off-Site treatment and disposal system;
- Groundwater extraction and treatment of the most highly contaminated groundwater (greater than 200 ppb total VOCs) in the vicinity of the landfill with reinjection to enhance natural breakdown of contaminants; Water would be treated to meet discharge standards and would be reinjected into the aquifer upgradient of the landfill to stimulate in-situ biodegradation;
- Groundwater monitoring on and near the Site;
- Maintenance of the existing POE system at two private wells; and
- Installation of a POE system for any private well exhibiting contaminants with concentrations exceeding Wisconsin Administrative Code NR 140 Enforcement Standards (ESs) which are equivalent to or more stringent than Federal Maximum Contaminant Levels (MCLs).

The remedial action objectives (RAOs) required by the 1995 ROD are:

- Prevent direct contact with landfill contents;
- Minimize contaminant leaching to groundwater;
- Prevent the migration of landfill gas;
- Control surface water run-off and erosion;
- Attain compliance with all identified Federal and State Applicable or Relevant and Appropriate Requirements (ARARs);
- Attain Wisconsin Administrative Code NR 140 Preventative Action Limits (PALs) for all groundwater impacted by the RHL at and beyond the landfill boundary;
- Reduce the potential for exposure to contaminants in groundwater; and,
- Provide potable water to residences with contaminated water.

The September 30, 1998 Explanation of Significant Differences (ESD) document (see Document 7 in Appendix A) explained and documented that it was not necessary to implement the groundwater extraction and treatment component of the selected remedy based on 1998 collected groundwater data. Sampling conducted in early 1998 as part of the RD demonstrated that groundwater contamination had decreased below the 1995 ROD action level of 200 ppb total VOCs underneath the landfill.

On June 22, 2012, EPA issued a second ESD that documents the decision to have the Wisconsin Groundwater Quality ESs as the RAOs and cleanup goals for the Site (see Document 11 in Appendix A). The 1995 ROD required Wisconsin Administrative Code NR 140 PALs as the RAOs or cleanup goals, and the 2012 ESD explained and documented that attainment of PALs would no longer be required.

For this Site, cleanup levels in groundwater were based on achieving a carcinogenic risk level of approximately $1x10^{-4}$ to $1x10^{-6}$ and a non-carcinogenic Hazard Index (HI) of 1 in both future

residential and industrial use scenarios. The standard used for selecting COCs for groundwater is the WDNR NR 140 ES. This is a health-based standard developed for each of the contaminants in groundwater by the Wisconsin Department of Health Services and WDNR to be protective of human health. These State groundwater goals are consistent with the NCP Section 300.430(a)(1)(iii)(F), which states that EPA expects to return groundwater at the Site to beneficial use wherever practicable. The cleanup goals for the groundwater COCs in the contaminant plume are the ESs identified in Table 2 below:

Table 2: Groundwater Cleanup Goals

GROUNDWATER CONTAMINANT	GROUNDWATER CLEANUP GOAL (ppb)
Benzene	5
Bromomethane	*
Chloroform	6
1,2 Dichloroethane (1,2-DCA)	5
cis-1,2 Dichloroethene (cis-l,2-DCE)	70
trans-1,2 Dichloroethene (trans-l,2-DCE)	100
1,2-Dichloropropane	5
Tetrachloroethene (PCE)	5
Trichloroethene (TCE)	5
Vinyl Chloride (VC)	0.2
Iron	300 **
Manganese	50 **
Bis(2-ethylhexyl)phthalate	*
Heptachlor	*
4,4-DDT	*

* Contaminant is no longer present at the Site.
** Iron and Manganese are no longer analyzed because of naturally occurring high concentrations of these elements in groundwater adjacent to the Site.

Status of Implementation

The CD for remedial action, which was entered in U.S. District Court on August 31, 2001, defined the State as the Settling Performing Party (see Document 9 in Appendix A). As required by the CD, WDNR on behalf of the State is successfully implementing all components of this remedy. In 1990 and 1998, WDNR completed repairs and upgrades to the landfill cap installed by the landfill owner in 1988. From November 1990 to August 1991, WDNR installed the landfill gas collection, landfill gas flare, and leachate collection systems. EPA signed the Preliminary Closeout Report on September 30, 1998, when components of the remedy were substantially complete (see Document 8 in Appendix A). The Site achieved Site Wide Ready for Anticipated Use status on September 15, 2014, after Institutional Controls (ICs) in the form of continuing obligations were implemented by WDNR on behalf of the State (see Document 13 in Appendix A). See Institutional Controls Section below for further details.

During this FYR period, monitoring data was collected annually since 2017 to continue to assess progress towards achieving groundwater cleanup goals and RAOs and the effectiveness of the implemented remedy components. See the Data Review section of this FYR report for a discussion of the monitoring data and conclusions based on the data. There is no known use of any groundwater which may contain contaminants at concentrations above acceptable levels by Site occupants or by any commercial enterprises or residents located or living near the Site. For additional information on Site activities, see Table 8 in Appendix B which is a chronology of Site events. Additional information can also be found on the Site's web page: www.epa.gov/superfund/refuse-hideaway-landfill.

Institutional Controls

The 1995 ROD requires deed restrictions and zoning modifications intended to prohibit: (1) excavation of soil, (2) construction on-Site, (3) groundwater extraction, and (4) interference with the remedy. Continuing obligations are enforceable ICs as authorized by s. 292.12, Wis. Stats. and can be established instead of proprietary deed restrictions on properties. On December 16, 2013, WDNR established continuing obligations for this Site which run with the property and apply to future property owners. In 2016, WDNR developed revisions to the Site O&M Plan for long term stewardship of the Site-specific continuing obligations (see Document 14 in Appendix A). Information on the Site's continuing obligations has been placed in the publicly accessible Wisconsin Remediation and Redevelopment Database (WRRD). The database is located at the web page: http://dnr.wi.gov/topic/Brownfields/wrrd.html.

Through regular Site visits for maintenance and repair, WDNR has observed that no new residential development near the Site has occurred since the last FYR in 2017. Because Site groundwater flows to the southwest, any private wells in areas to the north and east are, and will be, located up-gradient of the existing contamination. WDNR established a special drinking water supply well casing requirement which compels well drillers proposing to drill a new water supply well within the area surrounding the Site and downgradient to the southwest of the Site to contact WDNR for a specific well casing depth requirement to avoid the zone of potentially contaminated groundwater.

A map showing the approximate areas in which the ICs apply is included in Appendix B as Figure 6. Table 3 below summarizes implemented ICs for the Site.

Table 3: Summary of Required Institutional Controls **Refuse Hideaway Landfill Superfund Site; Middleton, Wisconsin**					
Media, Engineered Controls and Areas that do not support UU/UE for Current Conditions	**ICs Needed**	**ICs Called for in the Decision Documents**	**Impacted Parcel(s)**	**IC Objective**	**Title of IC Instrument Implemented (or planned)**
Media: On-Site waste fill materials and soil contamination. Engineered Controls: Multi-media landfill cap, and landfill gas and leachate collection systems. Site fencing and signage. Protective cover in areas known to have waste fill material underneath. Areas that Do Not Support UU/UE Based on Current Conditions: Site Property as shown in Figures 3 and 4 (see Appendix B).	Yes.	Yes.	The Site (approx. 23 acres).	IC Objectives are to: - Prevent the Site Property from being used in any manner that would interfere with any aspect of the work performed under and required by the ROD and CD. - Restricts use of land within the Site property boundary and assures integrity of landfill cap, landfill gas and leachate collection system, ground flare, and any other remedy components. - Limit well installation to prevent landfill cap breaches. - Prevent landfill cap breaches or any other activity on-Site that could cause erosion, cracking, sliding, or settlement of cap or other cap breaches. - Notify EPA within thirty 30 days of any event or action that constitutes a breach of the activity and use limitations of the Site Property.	**Implemented on December 16, 2013:** "Approval of Remedial Actions with continuing obligations, Refuse Hideaway Landfill, Middleton WI." WDNR BRRTS Activity #: 02-13-000849, FID # 113112010. Information on the Site's continuing obligations has been placed in the WDNR's publicly accessible database located at http://dnr.wi.gov/topic/Brownfields/wrrd.html. WDNR is authorized to enforce State statutes, Wisconsin Administrative Codes NR 700-736, Act 418, and s.292.12, Wis. Stats., regarding long-term effectiveness.
Media: Groundwater underlying the source property/landfill. Engineered Controls: Groundwater monitoring	Yes.	Yes.	The Site	IC Objectives are to: - Prevent any consumptive or other use of the groundwater underlying the source property/landfill.	**Implemented on December 16, 2013:** "Approval of Remedial Actions with continuing obligations, Refuse Hideaway Landfill,"

Table 3: Summary of Required Institutional Controls Refuse Hideaway Landfill Superfund Site; Middleton, Wisconsin					
Media, Engineered Controls and Areas that do not support UU/UE for Current Conditions	**ICs Needed**	**ICs Called for in the Decision Documents**	**Impacted Parcel(s)**	**IC Objective**	**Title of IC Instrument Implemented (or planned)**
program to track attenuation of contaminants in groundwater. Areas that Do Not Support UU/UE Based on Current Conditions: Site Property as shown in Figures 3 and 4 (see Appendix B).				- Limit well installation to prevent landfill cap breaches. - Prevent landfill cap breaches or any other activity on-Site that could cause erosion, cracking, sliding, or settlement of cap or other cap breaches. - Notify EPA within thirty 30 days of any event or action that constitutes a breach of the activity and use limitations of the Site landfill property.	Middleton WI. WDNR BRRTS Activity #: 02-13-000849, FID # 113112010. Information on the Site's continuing obligations has been placed in the WDNR's publicly accessible database, located at: http://dnr.wi.gov/topic/Brownfields/wrrd.html. WDNR is authorized to enforce State statutes, Wisconsin Administrative Codes NR 700-736, Act 418, and s.292.12, Wis. Stats., regarding long-term effectiveness. All proposed new wells within a 1,200-foot radius of the Site are required to have WDNR and Public Health Madison and Dane County approval before installation.
Media: Contaminated groundwater downgradient or nearby the source property/landfill.	Yes.	Yes.	Parcels Adjacent to the site source property/landfill.	IC Objectives are to: - Prohibit use of untreated groundwater that contains site-related contaminants at levels above Wisconsin ESs.	**Implemented:** WDNR is authorized to enforce State statutes, Wisconsin Administrative Codes NR 700-736, Act 418, and

Table 3: Summary of Required Institutional Controls **Refuse Hideaway Landfill Superfund Site; Middleton, Wisconsin**					
Media, Engineered Controls and Areas that do not support UU/UE for Current Conditions	**ICs Needed**	**ICs Called for in the Decision Documents**	**Impacted Parcel(s)**	**IC Objective**	**Title of IC Instrument Implemented (or planned)**
Engineered Controls: Point of Entry Treatment Systems (if and where needed) and annual sampling and analysis. Areas that Do Not Support UU/UE Based on Current Conditions: Contaminated groundwater downgradient or nearby the source property/landfill with site-related COCs above Wisconsin ES cleanup goals.				- Regulate well installation within a 1,200-foot radius of the Site to prevent use of untreated groundwater that contains contaminants at levels above Wisconsin ESs. - Notify EPA within thirty 30 days of any event or action that constitutes a breach of the activity and use limitations of the Site Property.	s.292.12, Wis. Stats., regarding long-term effectiveness. All proposed new wells within a 1,200-foot radius of the Site, including areas to the southwest of the Site, are required to have WDNR and Public Health Madison and Dane County approval before installation.

Current Compliance: There are currently no known uses of the Site considered inconsistent with the objectives to be achieved by the implemented ICs. Access to the landfill property is restricted by a fence and a locked gate. Based on a December 3, 2021 Site inspection by the WDNR Project Manager, and discussions with WDNR, EPA is not aware of uses of the Site or media uses which are inconsistent with the stated ICs objectives. Within reports of groundwater data provided each year since the last FYR in 2017, WDNR noted to EPA that: the Site was inspected to ensure no inconsistent uses with ICs have occurred, and ICs remain in place and are effective.

Long-Term Stewardship (LTS): LTS of ICs can be ensured by continually maintaining and monitoring effective ICs. To help ensure that the ICs are effective and that appropriate LTS procedures are in place, IC inspection and monitoring procedures have been developed and have been added to the Site's O&M Plan. Specifically, a separate section of the O&M Plan includes: current and reasonably anticipated future land uses for the Site, property ownership/occupancy information, contact information for all parties involved with the Site, contact information for federal, state, and local governments, Site and remedy descriptions and maps, descriptions of the implemented and recorded ICs, reporting procedures and frequency, location of records, enforcement triggering events and required time frames, notification procedures and contacts, ICs modification and termination procedures, copies of the recorded ICs, and a contingency plan. Long-term protectiveness requires continued compliance with land and groundwater use restrictions, and including these LTS procedures in the O&M Plan confirms that the ICs are to be maintained and monitored. Regular annual reporting to EPA certifies that the Site and surrounding areas are inspected to ensure no inconsistent uses have occurred and that ICs remain in place and are effective.

ICs Follow up Actions Needed: Based on discussions with WDNR and review of site documents and reports, no additional follow up actions are needed for ICs.

System Operation/Operation and Maintenance

O&M requirements for the Site are detailed in the O&M Plan, last revised in May 2016, and reviewed for this FYR (see Document 14 in Appendix A). There have been no changes to O&M requirements since the last FYR. WDNR oversees an environmental contractor that performs remedy repair, upkeep, and O&M of the gas and leachate systems and the landfill cover. Every two weeks, WDNR's contractor inspects the following systems and performs routine maintenance and repairs (when necessary) of the following: blower/flare control panel station, leachate tank, gas and leachate branch monitoring stations, effluent stack, and the blower inlet pipe. Additional remedy components that receive similar attention on a monthly, quarterly, and annual basis include gas/leachate extraction wells, gas probes, well pumps/controls, buried control valves, the air compressor (valves, oil change, etc.), the pneumatic system, blower, air dryer desiccant, condensate drip legs, system cleanouts, tank load-out station, Site padlocks, and the landfill surface (including fencing).

In 2020 and 2021, on behalf of the State, WDNR completed repairs to the landfill cap, stormwater drainage features, landfill gas collection system, and leachate collection system. The following remedy components received upgrades and repair:

- landfill cover:
    - removal of dense vegetation, brush, and trees on sections of the cap and at the cap boundary;
    - filling of depressions to create a positive drainage off the landfill cover;
    - seeding of disturbed and unvegetated areas; and
    - fence improvements at the northern site entrance and eastern access road.

- Site stormwater control:
    - removal of sediment from sedimentation basins;
    - repair of sedimentation basin outfalls;
    - repair of eastern and western drainage ditches to create positive drainage; and
    - removal of dense vegetation, brush, and trees adjacent to the drainage ditches.

- leachate extraction system:
    - installation and start-up of equipment including new extraction pumps, control equipment, and a new air compressor;
    - replacement of electrical components including the tank high-level alarm; and
    - repair and replacement of leachate conveyance piping.

- landfill gas extraction system:
    - installation and start-up of equipment for gas extraction including a new blower and control equipment;
    - repairs to bring landfill gas to a common vent stack; and
    - repair and replacement of landfill gas conveyance lines.

All upgrades and repairs were satisfactorily completed and immediately improved remedy operation by improving: cap impermeability, precipitation drainage, leachate extraction, and landfill gas extraction and destruction. All upgrades and repairs remain in very good condition.

Based on reporting by WDNR, the condition of the Site has been good during this FYR period with no inordinate issues. There have not been any occurrences of willful damage, vandalism, or unauthorized entry during this FYR period. WDNR continually identifies optimization opportunities and has implemented performance improvement through effective O&M. The Site remedy has operated for decades with continual optimization. As such, there are few additional optimization opportunities for this Site.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the August 2, 2017 FYR report, as well as the recommendations from that FYR and the current status of those recommendations.

Table 4: Protectiveness Determinations/Statements from the 2017 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1 (Site-wide)	Short Term Protective	The remedy at the Refuse Hideaway Landfill Superfund Site currently protects human health and the environment. The landfill cap and gas collection and flare systems are in place and operating properly; there is no evidence of a cap breach; the existing use of the RHL Site property is consistent with the objectives of the landfill cap and land use restrictions; and there is no evidence of unacceptable levels of groundwater contaminants away from the Site property or unacceptable groundwater use in the area of the plume. Land and groundwater use restrictions: prohibit interference with the hazardous waste cap; prohibit residential, commercial, or any other use that would allow human exposure; and restrict use of the groundwater until groundwater cleanup standards are achieved throughout the plume area. However, in order for the remedy to be protective in the long-term, the following action needs to be taken to ensure protectiveness: procure design and construction services to revise Site piping in strategic areas to improve collection and flow of landfill leachate and gas. The remedy must achieve groundwater cleanup standards throughout the plume area. Ongoing extraction and attenuation of contaminants in leachate and groundwater is expected to meet the groundwater cleanup standards in the long-term, and continued operation of the remedy and monitoring of groundwater is necessary until cleanup standards are achieved.

Table 5: Status of Recommendations from the 2017 FYR

OU	Issue	Recommendations/ Follow-up Actions	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1 (Site-Wide)	Some lengths of leachate/landfill gas piping have settled and need to be excavated and re-graded.	Procure design and construction services to revise Site piping in strategic areas to improve collection and flow.	Completed.	A contractor was procured in 2019 and repairs were completed from 2020 through 2021. WDNR is investigating the potential for passive venting of landfill gas.	9/8/21

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A public notice was made available through publication in the local newspaper the *Middleton Times-Tribune* on February 3, 2022 stating that there was a FYR and inviting the public to submit any comments to EPA. The notice is included as Figure 7 of Appendix B of this report. No public comments regarding the FYR were received. The results of the review and the report will be made available on EPA's web page: www.epa.gov/superfund/refuse-hideaway-landfill and at the Site information repository located at:

Middleton Public Library
7425 Hubbard Avenue
Middleton, Wisconsin 53562

The Administrative Record may also be reviewed at the Middleton Public Library and:

U.S. EPA, Region 5
Superfund Records Center, 7th Floor
77 West Jackson Boulevard
Chicago, Illinois 60604

Other than discussions with WDNR, no interviews were conducted for this FYR. Most of the area surrounding the Site is agricultural. The nearest downgradient residences are approximately 2,400 feet to the southwest. These residences use private wells as their drinking water source and have POE filter systems managed by WDNR. Use of the Site property and adjacent real estate is monitored by WDNR, who maintains continuing obligations as ICs. No private wells in the area of the Site exceed ES cleanup standards and the plume of contamination in Site groundwater is not expanding or migrating unacceptably. Contractors for WDNR who perform work (such as leachate and gas collection system maintenance) are on Site at least monthly, providing additional visual observation and reporting of any irregularities on Site. Through this regular interaction, EPA and WDNR are informed of community issues and any Site problems or concerns. Therefore, EPA and WDNR did not conduct additional interviews for this FYR.

Data Review

As a part of the FYR, EPA reviewed annual groundwater monitoring data collected by WDNR between 2017 and 2021 to assess whether contaminant concentrations at the Site were stable and/or trending downward (see Documents 17, 18, 21, 23, and 24 in Appendix A). Table 6 in Appendix B provides a summary of Site groundwater data results in chronological order. The data summarized by Table 6 shows that with few exceptions that are described below, concentrations of contaminants in groundwater are relatively unchanged or declining since the last FYR. Figure 4 in Appendix B shows the approximate locations of sampling locations. Groundwater elevations at and near the Site measured over the past five years confirm a south/ southwest flow direction. Concentration trends for contaminants at specific sampling locations are discussed below.

Well location P-08S shows exceedances of tetrahydrofuran (THF) at 120 ppb (ES: 50 ppb), and VC at 2.5 ppb (ES: 0.2 ppb). P-09D shows THF at 78 ppb (ES: 50 ppb). THF was not identified as a COC in the ROD but was discovered during the 1998 RD and has been included in all subsequent groundwater monitoring events. The P-08 and P-09 well locations are in an area of the Site that contains the main source of contaminants. Slight increases in contaminant concentrations at these two locations since the last FYR may be attributable to the reduced effectiveness of the leachate collection system wells and piping due to settling and shifting of soil. This problem was corrected in 2021, and it is anticipated that contaminant concentrations should decrease in subsequent sampling events.

Well P-16D, located on the southwestern edge of the landfill source area, has THF at 67 ppb and VC at 0.3 ppb, but these concentrations are consistent with annual results at this location since 1998. Well P-18S, located on the northeastern edge of the landfill source area, has a slight exceedance of tetrachloroethene (PCE) at 8 ppb (ES: 5 ppb) but this result is consistent with data at this location since 1998, fluctuating slightly with each annual sampling event. These exceedances of the ES have been at the landfill source area of the Site and have not been significantly higher than the ES cleanup goal.

Well location P-21D, in the southwest corner of the landfill source area, has shown an exceedance of THF at 200 ppb (ES: 50 ppb) and a slight exceedance of VC at 1.5 ppb (ES: 0.2 ppb). Similar to the P-08 and P-09 locations, the concentration of THF has been increasing at this location because leachate collection piping has recently been in disrepair. As the piping was repaired in 2021, it is expected that both of these contaminants will decrease in subsequent sampling events.

P-22E, located approximately 800 feet upstream of the nearest residences to the Site, had PCE at 15 ppb, slightly above the ES. However, data for this location fluctuates slightly with each annual sampling event since 2005. The residences have POE systems. P-26S just north of the northern boundary of the landfill source area showed a slight exceedance of PCE at 8.5 ppb (over the ES of 5 ppb) for the past two annual sampling events. These results are consistent with results over the past 15 years, and levels of PCE at this location are consistent and stable. P-27D, located just west of the western boundary of the landfill source area, continues to show an exceedance of PCE at 16 ppb, however this result is consistent with results since 2010 and the level of this contaminant is stable.

Groundwater flow at the Site indicates that contaminated groundwater has the potential to flow through the wells in the Deer Run Heights neighborhood, located approximately one mile west-southwest of the Site. Selected wells in the Deer Run Heights neighborhood are sampled semi-annually. No VOCs have been detected in these wells. In addition, two “sentinel” groundwater monitoring wells located up-gradient from Deer Run Heights are monitored semi-annually and consistently have not shown detectable levels of VOCs.

In 2019, WDNR sampled a subset of monitoring and private wells for per- and poly-fluoroalkyl substances (PFAS). PFAS compounds were found at several locations within the landfill source area at low levels. The State of Wisconsin has proposed a drinking water standard of 70 parts per trillion (ppt, or nanograms of contaminant per liter of water) for the combined total perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). EPA has recommended

regional screening levels of 60 ppt for PFOA and 40 ppt for PFOS based on a hazard quotient of 1. No PFOS was detected in any of the samples, and while PFOA was found in several samples, it was below the proposed standards and regional screening level. WDNR is evaluating the need for further sampling for this contaminant. 1,1,1-Trichloroethane has not been detected at the Site for over 15 years and historically was present in only trace amounts. In addition, TCE concentrations at the Site are closely watched by WDNR, and TCE is present at low levels and continues to decline. For these reasons, 1,4-Dioxane is not expected to be present (based on the frequent association between the two contaminants); however, EPA may elect in the future to require sampling to confirm the absence of 1,4-Dioxane. WDNR evaluates emerging contaminants as new research and data becomes available and will plan for sampling the Site's monitoring network for additional parameters if appropriate.

Results of annual gas monitoring from 2016 to 2021 (see Documents 17, 18, 21, 23, and 24 in Appendix A) have shown no detection of any landfill gas in gas probes along the perimeter of the Site, confirming that no landfill gas could enter buildings near the Site. Figure 5 in Appendix B shows the locations of landfill gas collection wells and perimeter gas probes. Using 2021 data for other contaminants in groundwater at residences, EPA used the Vapor Intrusion Screening Level tool available at https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator. A screening of these low levels of contaminants for the potential of vapor intrusion confirms previous years' findings that there is no possibility of a vapor intrusion exposure pathway into any building near the Site.

Other than the results noted above, there have been no inordinate exceedances over the last two FYR periods. In general, contaminant levels noted above are steady and all other contaminants have been under cleanup goals since the last FYR. As noted in Tables 1 and 2, many COCs are no longer present. Sampling and analysis results from the nearest residences show no exceedances of the ES cleanup standard for any contaminant. Exceedances of performance standards for groundwater in the sampling locations described above do not call the remedy protectiveness into question because sentinel wells outside the Site boundary are not showing significant exceedances or have stable concentrations over this FYR period. The remedy has successfully reduced infiltration of precipitation through waste fill materials, resulting in a relatively stable, non-migrating, contaminant plume. Operation of this remedy must continue in order to prevent additional migration of contaminants toward the residences nearest to the Site.

Site Inspection

The EPA RPM did not conduct a FYR Site inspection due to COVID-19 travel restrictions. The Site was visited by the WDNR Project Coordinator Cynthia Koepke on December 3, 2021. WDNR observed the Site property and no damage to monitoring wells was noted. The Site landfill area real estate and surrounding areas were found to be in good condition and there were no signs of unacceptable erosion, no unacceptable disturbance of contaminated soil, and no unacceptable discarding of materials or wastes. There were no signs of any vandalism or other disturbances. Also, no Site uses which are inconsistent with the implemented ICs were noted. A more detailed FYR Site inspection will be conducted by EPA when feasible to complete the Site Inspection Checklist with photos for inclusion in site files and to confirm these above

observations. This follow-up Site inspection has been included in the "Other Findings" portion of this FYR.

V. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents?

Yes. This review and WDNR's December 3, 2021 Site inspection confirm that the remedy is functioning as intended by the June 28, 1995 ROD, the September 30, 1998 and June 22, 2012 ESDs, and that there have been no changes since the last FYR that would affect the protectiveness of the remedy. The RAOs from the 1995 ROD and 2012 ESD were initially addressed through the WDNR's remedy implementation in 1991 of the landfill cap, the landfill gas/leachate collection system, and landfill gas flare system, and these remedy components are currently being operated and maintained as intended. Current sampling results from this FYR period for groundwater shows no evidence that the plume of contamination has expanded or that nearby residences have any exceedances of contaminants above their groundwater cleanup levels. Exceedances of cleanup levels for groundwater that have occurred since 2017 do not call the remedy protectiveness into question because contaminant concentrations are still stable compared to prior years. Exceedances of ESs are mainly in areas where groundwater is not being used. Nearby residences that use groundwater which has the potential to exceed ESs have POE systems in place. Tables 1 and 2 summarize those COCs that have successfully achieved ES cleanup goals. By removing VOCs through the landfill gas and leachate collection systems, the quality of Site groundwater is improved. Annual monitoring for landfill gas in soil is conducted at 64 gas probes around and outside of the landfill and one ambient air monitoring location within the nearest building adjacent to the Site. Data reports from the operation of the landfill gas and leachate collection systems have been reviewed and it has been confirmed that the system continues to effectively remove VOCs. Although VOCs are still being detected in unfiltered water at the Site, sampling and analysis data over the past 21 years shows a reduction in concentrations of VOCs in groundwater. Since cleanup goals for contaminants in groundwater have not yet been achieved and maintained, monitoring is still necessary and must continue.

Operation of this remedy must continue in order to prevent additional migration of contaminants toward nearby residences. WDNR's observations and reports during this FYR period indicate that the landfill remedy systems are functioning as designed, that monitoring wells are well maintained, and Site housekeeping is clean and neat. O&M at this Site appears to be functional, well run, and effective at running the remedy. Continued O&M has maintained this status, confirmed by chemical and hydraulic data collected since 2017 from wells on and near the Site. In 2020 and 2021 repairs to the landfill cap, stormwater drainage features, landfill gas collection system, and leachate collection system were satisfactorily completed. Upgrades and repairs remain in very good condition and immediately improved remedy operation by improving: cap impermeability, precipitation drainage, leachate extraction, and landfill gas extraction and destruction.

There are use restrictions through ICs in place for affected groundwater and on the landfill property. Continuing obligations, enforceable as authorized by s. 292.12, Wis. Stats., were established at the Site on December 16, 2013. These run with the property and apply to future

property owners. WDNR has established a special drinking water supply well casing requirement for any new wells to avoid the zone of potentially contaminated groundwater. Physical barriers such as site fencing and signage are in place to prevent trespassing and are in good condition. Further, LTS of ICs is ensured by implementation of Site-specific continuing obligations procedures required by the Site O&M Plan for monitoring and maintaining ICs. In each annual report to EPA during this FYR period, WDNR has certified there have been no violations of any restrictions on the use of the real estate and groundwater at and near the Site. The specific restrictions required by the December 16, 2013 continuing obligations document are summarized in Table 3 above.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Yes. The exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection are still valid. Land and groundwater use at the Site is still consistent with the assumptions used to determine where cleanup would be performed. There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. There have been no changes in expected land use at or near the Site, nor changes in human health exposure assumptions. No new residential development has occurred since the last FYR in 2017. There have been no changes in standards or to-be-considereds (TBCs) for cleanup of Site contaminants since the 2012 ESD. Since the 2017 FYR, there have been no newly identified contaminants other than PFAS or unanticipated toxic byproducts. Toxicity information and risk assessment methodologies used in the Site's remedy decision have not changed. WDNR sampled a limited number of groundwater monitoring wells and private wells for PFAS in 2019. PFAS compounds in monitoring and private wells were either not detected or below their proposed NR 140 standards and EPA's regional screening levels. WDNR is evaluating the need for further sampling for PFAS to determine if these contaminants are site-related and need to be addressed.

As discussed in the 2012 and 2017 FYRs, the distant nature of the nearest residences and vapor intrusion screenings using groundwater information concluded that there is no threat of vapor intrusion at this Site or to nearby buildings. Using 2021 groundwater sampling results which have shown no inordinate contaminant concentration increases since the last FYR, screening of these low levels of contaminants for the potential of vapor intrusion confirms that this status has not changed since the last FYR.

In this FYR, EPA did not identify any new potential exposure pathways that would result in an unacceptable risk to human health or the environment. Since the 2017 FYR, sampling data has shown contaminants in Site groundwater consistent with previous results. However, other than the residences with POE systems, there are no groundwater wells used for human consumption in Site areas where contamination is present, and therefore there is no complete exposure pathway with groundwater. The ecological risk assessment completed at this Site concluded that the Site was not adversely impacting ecological receptors. This FYR has confirmed there have been no changes in the Site or the implemented remedy that may have changed this status.

With continued operation of the Site remedy and the existing POE units, groundwater does not currently pose a public health hazard to nearby residents who obtain their drinking water from

private wells.

Changes in Standards and To Be Considered. No new information has called into question the risk-based RAOs. Standards, ARARs and/or TBCs were the basis for the groundwater cleanup goals. ARARs that were identified in the ROD that have been evaluated but not yet achieved include those established by the Safe Drinking Water Act (SDWA) MCLs and Wisconsin ESs. There have been no changes in these ARARs and no new standards or TBCs that may affect the protectiveness of the remedy since the time of remedy selection.

Changes in Exposure Pathways. The exposure assumptions used to develop the Human Health Risk Assessment included exposure to contaminated groundwater for future inhabitants through ingestion and dermal contact pathways, and exposure to contaminated soils for future workers through surface and subsurface soil contaminants (0-10 feet below ground surface) through incidental ingestion, inhalation, and dermal contact pathways. There is no new information that would support a change to the exposure assumptions.

Changes in Toxicity and Other Contaminant Characteristics. There have been no changes in the toxicity factors for the COCs that were used in the baseline risk assessment. The assumptions used in the risk assessment are considered to be conservative and reasonable in evaluating risk and developing risk-based cleanup levels.

Changes in Risk Assessment Methods. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

Expected Progress Towards Meeting RAOs. The remedy is progressing, but Site groundwater data still shows contaminants at concentrations that exceed the cleanup goals. Also, even though contaminants in Site groundwater have been attenuating and show a general decline in concentrations, the expected time period to attain groundwater cleanup goals is uncertain.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. There have been no climate-related effects or natural disasters such as changes in river levels, inordinate changes in precipitation or temperature, or increased risk of floods that adversely impacted the Site remedy. No other events have affected the protectiveness of the remedy, and there is no other information that calls into question the short-term protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
None

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 1 (Site-wide)	**Issue Category: Monitoring**			
	Issue: Some PFAS compounds were detected in wells near the landfill but at levels below currently proposed NR 140 standards. It is uncertain whether these detections are attributable to the source property/landfill area.			
	Recommendation: Evaluate the need for further sampling for PFAS and update the Site monitoring program accordingly including additional monitoring if necessary.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	WDNR	EPA	December 31, 2023

OTHER FINDINGS

In addition, the following recommendation was identified during the FYR and may improve performance of the remedy and improve management of O&M, but does not affect current nor future protectiveness: EPA should complete a more detailed FYR Site inspection when feasible to verify current Site conditions and complete a Site Inspection Checklist with photos to include in the Site files.

VII. PROTECTIVENESS STATEMENT

OU1 and Sitewide Protectiveness Statement
Protectiveness Determination: Short-term Protective
Protectiveness Statement: The remedy at the Refuse Hideaway Landfill Superfund Site currently protects human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled, have been eliminated, or have otherwise been shown not to be present. The installation of landfill cap, leachate collection, and landfill gas collection and treatment systems to eliminate the source of contamination have achieved the remedial objectives to reduce the migration of contaminants to groundwater and surface water and prevent direct contact with (or ingestion of) waste fill materials or contaminated soil in the landfill. There is no current groundwater use at the landfill portion of the Site and nearby residences use effective POE drinking water filters. Continuing obligations on the Site property have been implemented to prevent unacceptable future use or exposures in the near term. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: Evaluate the need for further sampling for PFAS and update the Site monitoring program accordingly including additional monitoring if needed.

VIII. NEXT REVIEW

The next FYR report for the Refuse Hideaway Landfill Superfund Site is required five years from the completion date of this review.

APPENDIX A: REFERENCE LIST
Refuse Hideaway Landfill Superfund Site
Fourth Five-Year Review

RHL Site documents reviewed in preparation of this five-year review report include the following:

1. "Special Consent Order SOD-88-02A from WDNR relating to the closure and monitoring of the Refuse Hideaway Landfill," dated May 2, 1988.

2. "Predesign and Additional Studies Report: Refuse Hideaway Landfill," dated July 1998.

3. "Remedial Investigation Report, Refuse Hideaway Landfill, Middleton, Wisconsin,", dated September 12, 1994.

4. "Feasibility Study Report, Refuse Hideaway Landfill, Middleton, Wisconsin," dated February 6, 1995.

5. Record of Decision, dated June 28, 1995.

6. Administrative Order on Consent, dated April 8, 1997.

7. Explanation of Significant Differences, dated September 30, 1998.

8. Preliminary Closeout Report, dated September 30, 1998.

9. Consent Decree for Remedial Action; United States v. State of Wisconsin, et al.. W.D.Wisc., Civil No. 01-C-0394-S, dated August 31, 2001.

10. First Five-Year Review Report, dated September 18, 2007.

11. Explanation of Significant Differences, dated June 22, 2012.

12. Second Five-Year Review Report, dated August 29, 2012.

13. "Superfund Property Reuse Evaluation Checklist For Reporting the Sitewide Ready-For-Anticipated Use GPRA Measure," dated September 15, 2014.

14. "Refuse Hideaway Landfill Operation and Maintenance Manual; Landfill Gas & Leachate Extraction System," dated May 2016.

15. "Refuse Hideaway Landfill; State of Wisconsin Department of Natural Resources 2014 Annual Report," dated April 21, 2017.

16. Third Five-Year Review Report, dated August 2, 2017.

17. 2017/2018 Annual Reports for Refuse Hideaway Landfill, WID9806l060; (File Ref: 02-13-000849), WDNR, dated February 19, 2019.

18. Letter from TRC to WDNR entitled "Refuse Hideaway Landfill, BRRTS #02-13-000849; May 2019 Groundwater Monitoring Data Transmittal," dated July 12, 2019.

19. "Monitoring Well and Gas Probe Repairs and Upgrades Work Plan; Refuse Hideaway Landfill Town of Middleton, Dane County, WI," TRC, dated November 2019.

20. "Current Conditions Evaluation Report; Refuse Hideaway Landfill; Town of Middleton, Dane County, WI," TRC, dated December 2019.

21. 2019 Annual Report for Refuse Hideaway Landfill, WID980610604 (File Ref: 02-13-000849), dated January 30, 2020.

22. "Monitoring Well and Gas Probe Repairs and Upgrades Documentation Report; Refuse Hideaway Landfill; Town of Middleton, Dane County, WI," dated August 2020.

23. 2020 Annual Report for Refuse Hideaway Landfill, WID980610604 (File Ref: 02-13-000849), dated January 26, 2021.

24. Letter from TRC to WDNR entitled "Refuse Hideaway Landfill, BRRTS #02-13-000849; May 2021 Groundwater Monitoring Data Transmittal," dated August 6, 2021.

25. Letter from TRC to WDNR entitled "Refuse Hideaway Landfill; December 2021 Landfill Gas Monitoring Results," dated December 17, 2021.

26. "Construction Oversight and Construction Completion Report – Refuse Hideaway Landfill – Source Control Systems Repair and Upgrades," dated February 18, 2022.

APPENDIX B: FIGURES AND TABLES

<u>FIGURE 1:</u> Site Location Map;
State of Wisconsin

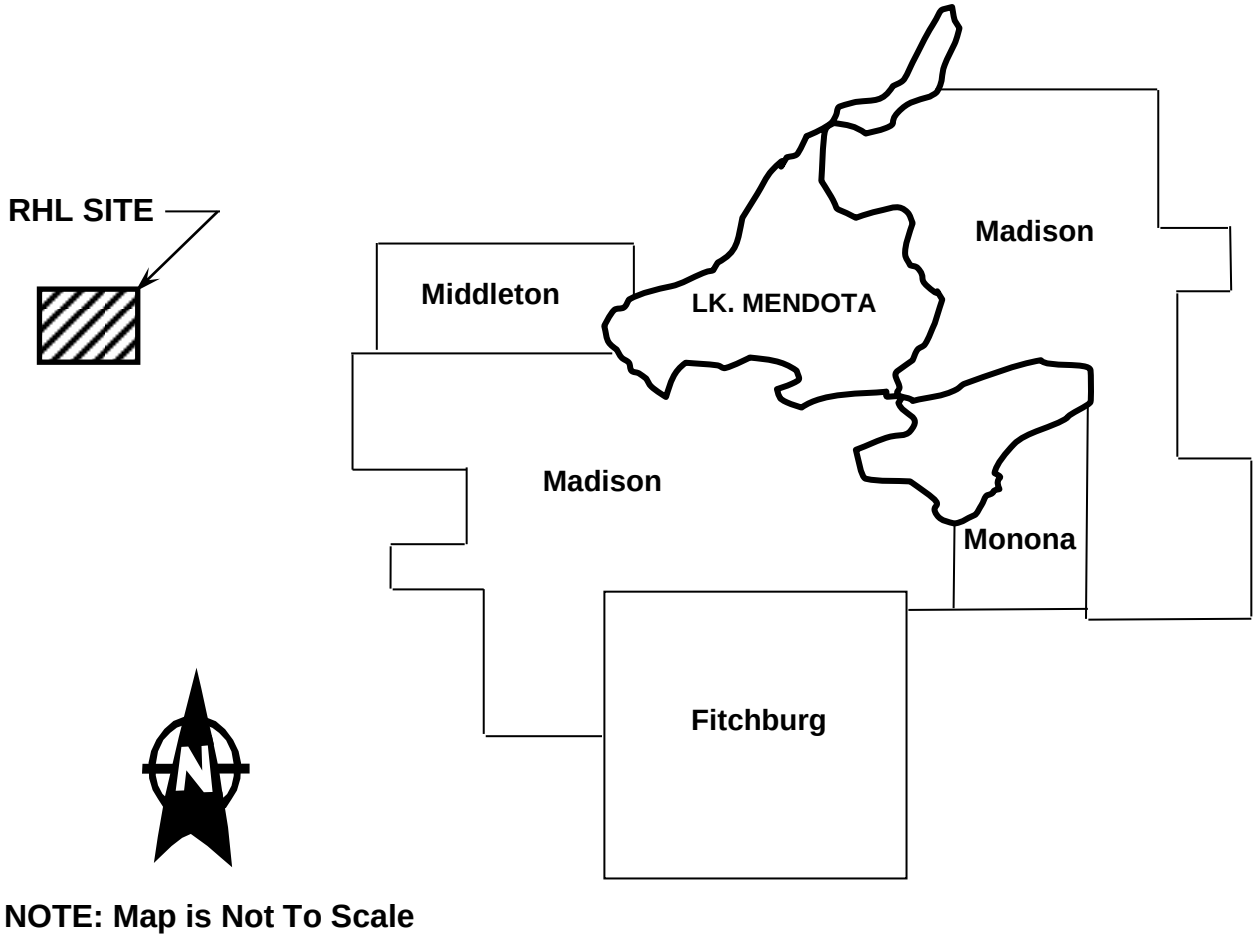


FIGURE 2: - Site Location Map (Local)

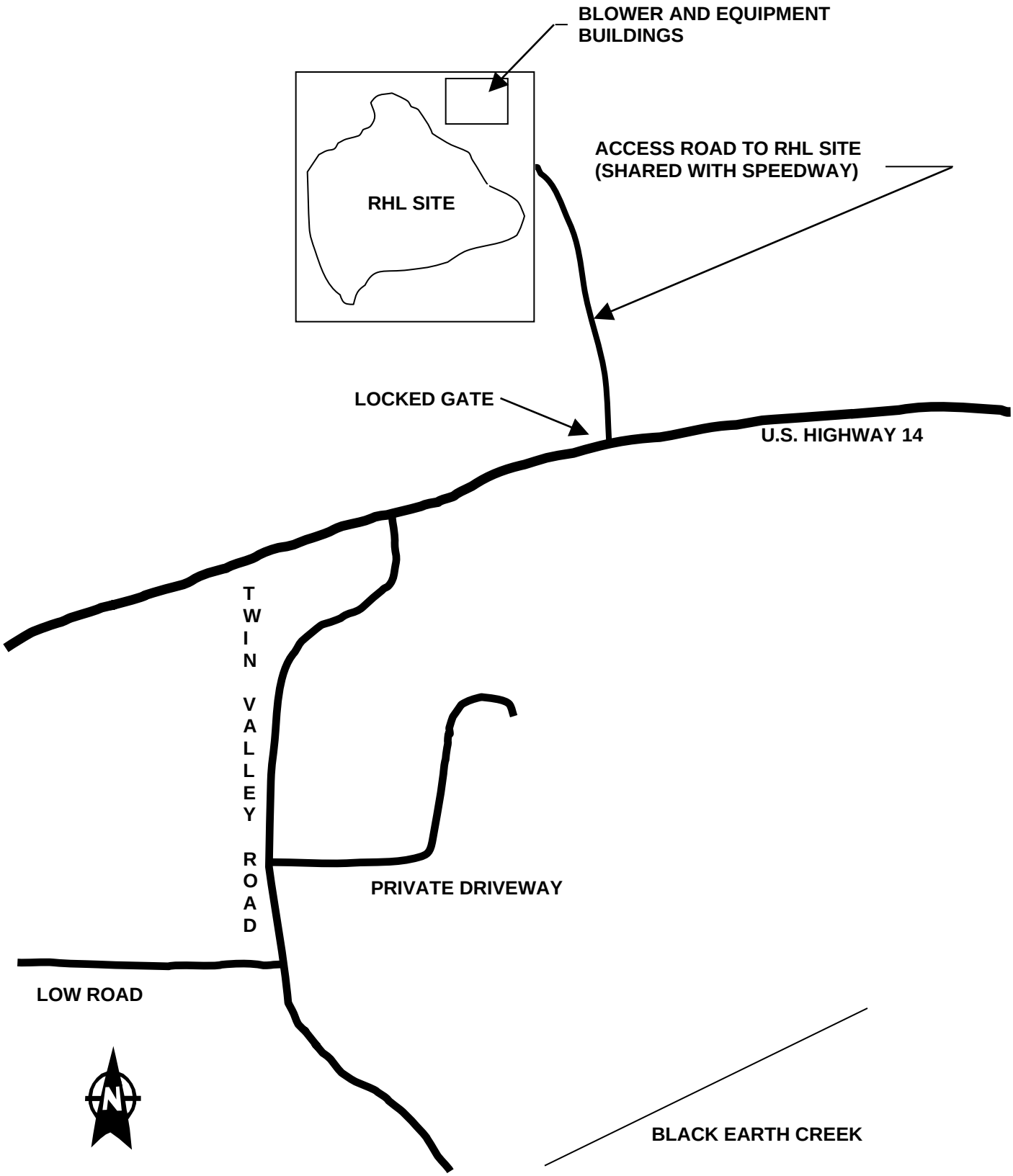


FIGURE 3: Site Layout
NOTE: NOT TO SCALE

NOTES:

1. P-29 is approx. 900 feet northwest of the site boundary. P-26 is approx. 150 ft. northwest of the site boundary.

2. P-34 is approx. 1000 ft. north of the site boundary. P-28 is approx. 100 ft. north of the site boundary.

3. P-20 is approx. 800 ft. east of the site boundary. P-23 is approx. 300 ft. east of the site boundary.

4. P-27 is approx. 200 ft. west of the site boundary. P-25 is approx. 400 ft. south of the site boundary. Residential wells are approx. 2200 ft. southwest of the site boundary.

5. P-40 is approx. 3500 ft. southwest of the site boundary. P-31 is approx. 3000 ft. southwest of the site boundary. P-22 is approx. 1500 ft. southwest of the site boundary.

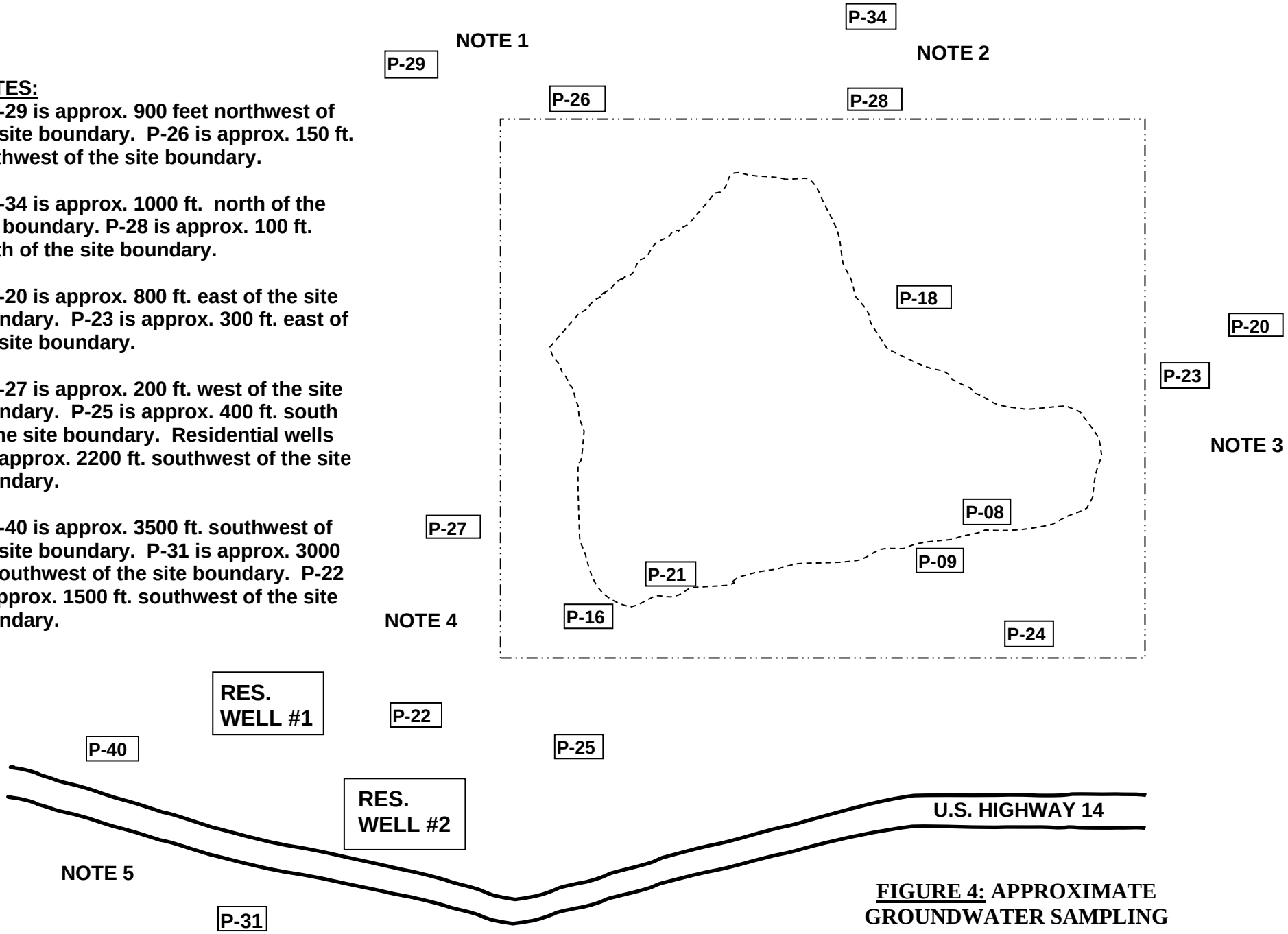


FIGURE 4: APPROXIMATE GROUNDWATER SAMPLING LOCATIONS (Not To Scale)

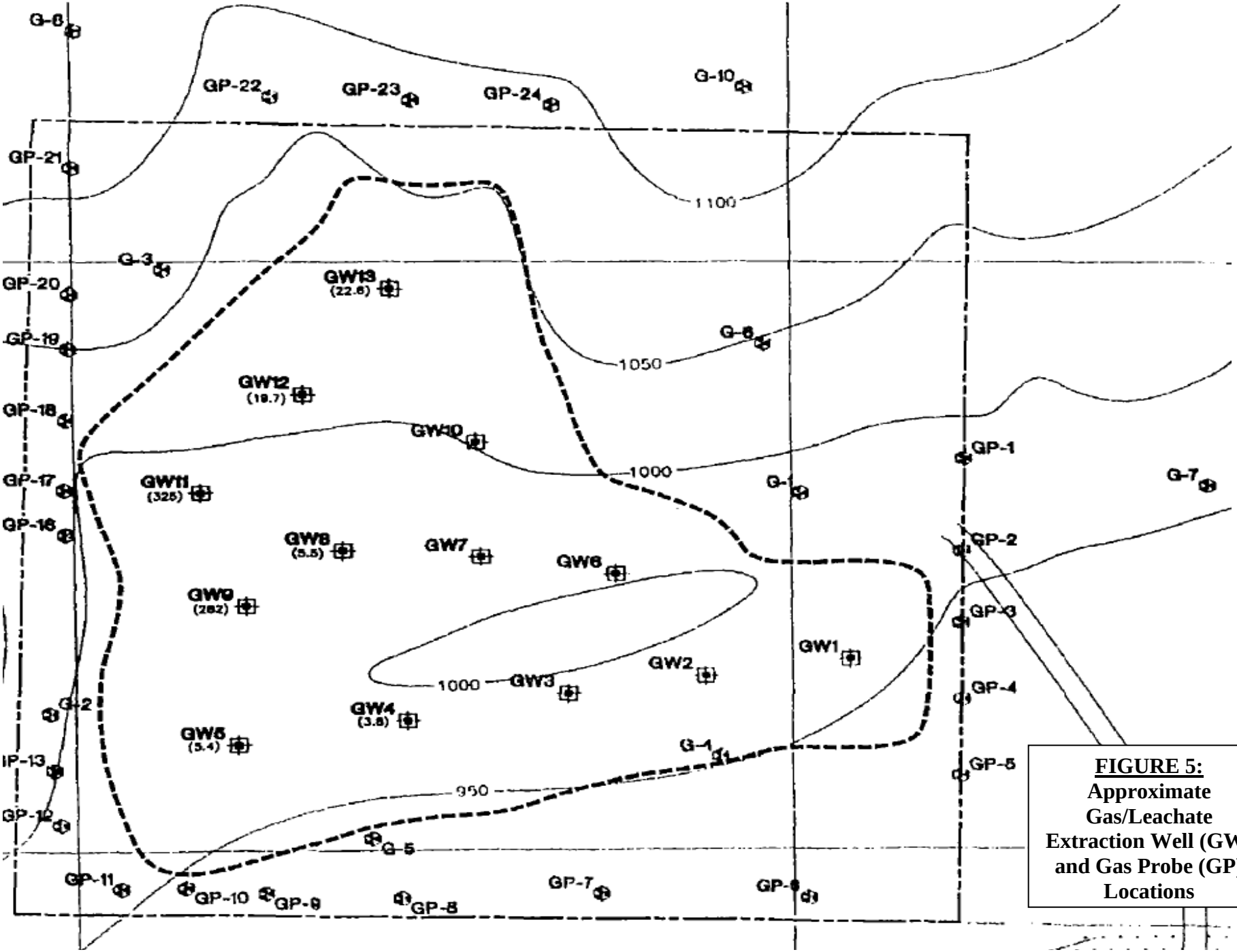
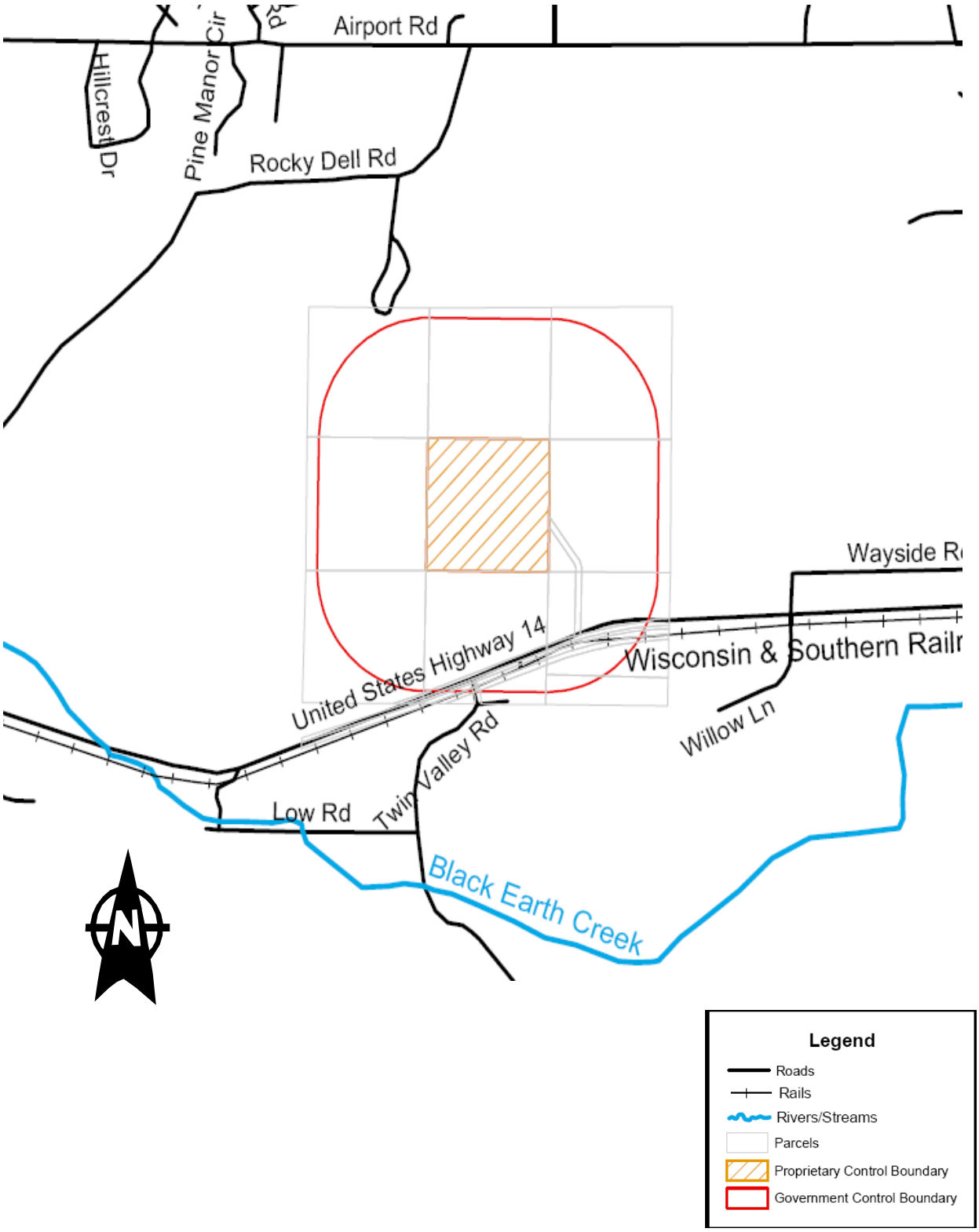
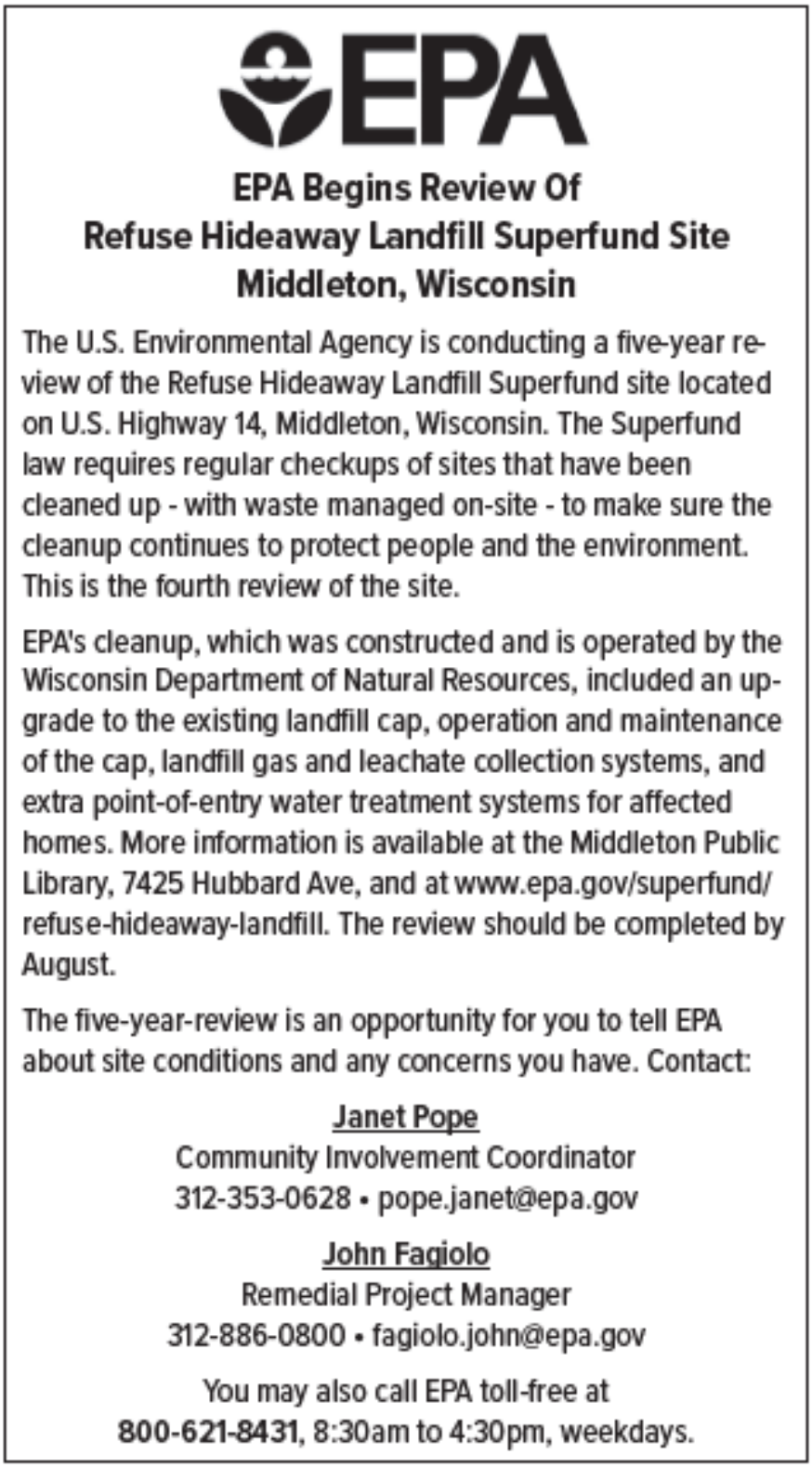


FIGURE 5:
Approximate Gas/Leachate Extraction Well (GW) and Gas Probe (GP) Locations

FIGURE 6: Approximate Institutional Control Area; Refuse Hideaway Landfill Superfund Site.
NOTE: Figure is not to scale.





EPA

EPA Begins Review Of Refuse Hideaway Landfill Superfund Site Middleton, Wisconsin

The U.S. Environmental Agency is conducting a five-year review of the Refuse Hideaway Landfill Superfund site located on U.S. Highway 14, Middleton, Wisconsin. The Superfund law requires regular checkups of sites that have been cleaned up - with waste managed on-site - to make sure the cleanup continues to protect people and the environment. This is the fourth review of the site.

EPA's cleanup, which was constructed and is operated by the Wisconsin Department of Natural Resources, included an upgrade to the existing landfill cap, operation and maintenance of the cap, landfill gas and leachate collection systems, and extra point-of-entry water treatment systems for affected homes. More information is available at the Middleton Public Library, 7425 Hubbard Ave, and at www.epa.gov/superfund/refuse-hideaway-landfill. The review should be completed by August.

The five-year-review is an opportunity for you to tell EPA about site conditions and any concerns you have. Contact:

Janet Pope
Community Involvement Coordinator
312-353-0628 • pope.janet@epa.gov

John Fagiolo
Remedial Project Manager
312-886-0800 • fagiolo.john@epa.gov

You may also call EPA toll-free at
800-621-8431, 8:30am to 4:30pm, weekdays.

FIGURE 7: Five-Year Review Advertisement.
Refuse Hideaway Landfill Superfund Site.
Fourth Five-Year Review

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI

Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
P-08S [3]	Tetrachloroethene [5]	1991	7 *	5
		1998	2.5	
		2006	1.3	
		2008	0.83	
		2010	0.77	
		2015	DNE [1]	
		2019	0.66	
		2020	0.92	
		2021	1.2	
	Vinyl Chloride	1991	DNE	0.2
		2006	DNE	
		2008	1.6 *	
		2010	0.22 *	
		2015	DNE	
		2019	1.1*	
		2020	3.4 *	
		2021	2.5 *	
	Benzene	1998	DNE	5
		2006	DNE	
		2008	DNE	
		2010	DNE	
		2015	DNE	
		2019	1.6	
		2020	1.2	
		2021	0.78	
	Trichloroethene	1988	DNE	5
		2006	DNE	
		2008	DNE	
		2010	0.68	
		2015	DNE	
		2019	1.2	
		2020	1.6	
		2021	1.7	
	Tetrahydrofuran	2013	15.7	50
		2019	69 *	
		2020	91 *	
		2021	120 *	
	cis -1,2-Dichloroethene	1998	DNE	70
		2006	DNE	
		2008	DNE	
		2010	DNE	
		2015	DNE	
		2019	7.8 *	
		2020	16 *	
		2021	13 *	
P-08D [4]	Trichloroethene	1998	1.6	5
		2006	0.91	
		2008	DNE	
		2010	DNE	
		2015	DNE	

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI

Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
P-08D (cont'd.)	Trichloroethene (cont'd.)	2019	DNE	5
		2020	DNE	
		2021	DNE	
	Tetrachloroethene	1988	DNE	5
		1991	DNE	
		1998	DNE	
		2006	DNE	
		2008	0.68	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
P-09S	Tetrachloroethene	1988	70 *	5
		1991	16 *	
		1998	2.9	
		2006	0.93	
		2008	0.81	
		2010	0.62	
		2015	0.71	
		2019	1	
		2020	1.9	
		2021	2.1	
	Tetrahydrofuran	2019	140 *	50
		2020	200 *	
		2021	170 *	
P-09D	1,2- Dichloropropane	1998	2.8	5 5
		2006	1.7	
		2008	2.0	
		2010	1.2	
		2015	DNE	
		2019	1.3	
		2020	0.5	
		2021	DNE	
	Benzene	1998	3.3	5
		2006	1.4	
		2008	2.9	
		2010	2.4	
		2015	0.71	
		2019	2.9	
		2020	2.3	
		2021	2.9	
	Trichloroethene	1988	36 *	5
		2006	0.94	

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI

Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
P-09D (cont'd.)	Trichloroethene (cont'd.)	2008	1.4	5
		2010	0.76	
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
	Vinyl Chloride	1991	32 *	0.2
		2006	0.9	
		2008	0.73	
		2010	0.27	
		2015	DNE	
		2019	0.59 *	
		2020	0.43 *	
		2021	DNE	
	Tetrahydrofuran	1998	DNE	50
		2006	DNE	
		2008	56 *	
		2015	51.1 *	
		2019	88 *	
		2020	51 *	
		2021	78 *	
P-16S	Dichloromethane [6]	1988	1.0	5
		2006	1.2	
		2008	DNE	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020		
		2021	DNE	
P-16D	1,2-Dichloropropane	1998	1.2	5
		2006	0.78	
		2008	0.77	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
	Benzene	1998	6.1 *	5
		2006	2.3	
		2008	2.6	
		2010	1.5	
		2015	1.8	
		2019	1.3	

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI

Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
P-16D (cont'd.)	Benzene (cont'd.)	2020	1.0	
		2021	2.0	
	Dichloromethane	1998	1.0	5
		2006	1.2	
		2008	DNE	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
	Trichloroethene	1998	11 *	5
		2006	2.5	
		2008	0.68	
		2010	DNE	
		2015	0.52	
		2019	0.5	
		2020	0.5	
		2021	0.61	
	Vinyl Chloride	1998	7.1 *	0.2
		2006	1.3 *	
		2008	0.5 *	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020	0.29 *	
		2021	0.3 *	
	Tetrahydrofuran	1998	DNE	50
		2006	DNE	
		2008	89 *	
		2010	DNE	
		2015	80.4 *	
		2019	51 *	
		2020	68 *	
		2021	67 *	
P-17S	1,2-Dichloropropane	1998	DNE	5
		2006	DNE	
		2008	1.2	
		2010	0.68	
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
	Benzene	1998	DNE	5
		2006	DNE	
		2008	DNE	
		2010	DNE	

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI

Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
P-17S (cont'd)	Benzene (cont'd.)	2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
	cis -1,2-Dichloroethene	1998	DNE	70
		2006	DNE	
		2008	65	
		2010	19	
		2015	16.6	
		2019	DNE	
		2020	DNE	
		2021	DNE	
	Tetrachloroethene	1998	DNE	5
		2006	DNE	
		2008	5.7 *	
		2010	4	
		2015	5.1	
		2019	1.1	
		2020	2.1	
		2021	2.3	
	Trichloroethene	1998	DNE	5
		2006	DNE	
		2008	7.5 *	
		2010	3.5	
		2015	1.8	
		2019	DNE	
		2020	DNE	
		2021	DNE	
	Vinyl Chloride	1998	DNE	0.2
		2006	DNE	
		2008	6.1 *	
		2010	0.51 *	
		2015	0.77	
		2019	DNE	
		2020	DNE	
		2021	DNE	
P-18S	Tetrachloroethene	1998	11 *	5
		2006	7.8 *	
		2008	12 *	
		2010	5.3 *	
		2015	11 *	
		2019	7.6 *	
		2020	8.4 *	
		2021	8 *	
	Trichloroethene	1998	2.2	5
		2006	1.4	
		2008	1.9	

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI

Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
P-18S (cont'd.)	Trichloroethene	2010	0.92	
		2015	1.0	
		2019	1	
		2020	0.73	
		2021	0.69	
P-20SR [7]	Tetrachloroethene	1998	3.7	
		2006	2.6	
		2008	1.5	
		2010	2.1	
		2015	2.7	5
		2019	1.5	
		2020	1.8	
		2021	1.4	
P-21D	1,2-Dichloropropane	1998	2.1	
		2006	0.54	
		2008	DNE	
		2010	DNE	
		2015	DNE	5
		2019	DNE	
		2020	0.44	
		2021	DNE	
	Benzene	1998	1.8	
		2006	0.66	
		2008	DNE	
		2010	1.1	
		2015	DNE	5
		2019	4.6	
		2020	3.8	
		2021	3.3	
	cis 1,2-Dichloroethene	1998	120 *	
		2006	27	
		2008	12	
		2010	10	
		2015	DNE	70
		2019	12	
		2020	6.1	
		2021	DNE	
	Dichloromethane	1988	3.7	
		2006	1	
		2008	DNE	
		2010	DNE	
		2015	DNE	5
		2019	DNE	

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI

Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
P-21D (cont'd.)	Dichloromethane (cont'd.)	2020	DNE	5
		2021	DNE	
	Vinyl Chloride	1998	16 *	0.2
		2006	3.1 *	
		2008	4.1 *	
		2010	3.1 *	
		2015	DNE	
		2019	3 *	
		2020	3.7 *	
		2021	1.5 *	
	Tetrahydrofuran	1998	DNE	50
		2006	DNE	
		2008	DNE	
		2010	DNE	
		2015	59 *	
		2019	210 *	
		2020	210 *	
		2021	200 *	
P-22S	Tetrachloroethene	1998	2.9	5
		2006	0.68	
		2008	DNE	
		2010	1.9	
		2015	3.0	
		2019	DNE	
		2020	DNE	
		2021	DNE	
	Trichloroethene	2005	DNE	5
		2006	DNE	
		2008	DNE	
		2010	DNE	
		2015	0.87	
		2019	DNE	
		2020	DNE	
		2021	DNE	
P-22E	Tetrachloroethene	2005	1.31	5
		2006	3.9	
		2008	6.2 **	
		2010	1.2	
		2015	8.5 **	
		2019	11 **	
		2020	6.7 **	
		2021	15 **	
	Trichloroethene	2005	0.62	5
		2006	1.1	

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI

Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
P-22E (cont'd.)	Trichloroethene (cont'd.)	2008	DNE	
		2010	0.59	
		2015	1.5	
		2019	1.7	
		2020	1.6	
		2021	2.6	
P-22D	Tetrachloroethene	1998	6.4 **	
		2005	2.4	
		2006	3.1	
		2008	3.0	
		2010	3.3	5
		2015	1.6	
		2019	1.7	
		2020	2.2	
		2021	2.4	
	Trichloroethene	1998	1.8	
		2005	0.65	
		2006	0.66	
		2008	0.73	
		2010	0.7	5
		2015	DNE	
		2019	DNE	
		2020	0.6	
		2021	0.64	
P-23S	Tetrachloroethene	1998	4.6	
		2006	1.6	
		2008	3.6	
		2010	4.6	5
		2015	0.6	
		2019	3.0	
		2020	2.2	
		2021	1.8	
P-23D	Tetrachloroethene	1988	2.3	
		2006	1	
		2008	0.9	
		2010	0.68	5
		2015	DNE	
		2019	DNE	
		2020	0.62	
		2021	0.53	
P-24E	Vinyl Chloride	2004	4.1 *	
		2006	5.7 *	
		2008	2.1 *	0.2
		2010	1.1 *	
		2015	DNE	

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI

Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
P-24E (cont'd.)	Vinyl Chloride	2019	3.4 *	
		2020	3.3 *	
		2021	2.7 *	
P-24D	Vinyl Chloride	1998	2.2 *	0.2
		2006	3.2 *	
		2008	1.4 *	
		2010	4.8 *	
		2015	8.9 *	
		2019	5.6 *	
		2020	1.0 *	
		2021	0.59 *	
P-25D	Tetrachloroethene	1998	DNE	5
		2006	DNE	
		2008	0.97	
		2010	1.9	
		2015	0.63	
		2019	1.9	
		2020	1.4	
		2021	1.7	
	Trichloroethene	1998	DNE	5
		2006	DNE	
		2008	1.5	
		2009	0.87	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
	Vinyl Chloride	1998	DNE	0.2
		2006	DNE	
		2008	0.59 **	
		2009	DNE	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
P-26S	Tetrachloroethene	1998	33 **	5
		2006	16 **	
		2008	6.4 **	
		2010	8.8 **	
		2015	0.78	
		2019	DNE	

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI

Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
P-26S (cont'd.)	Tetrachloroethene (cont'd.)	2020	9.8 **	5
		2021	8.5 **	
	Trichloroethene	1998	5.1 **	5
		2006	2.3	
		2008	0.77	
		2010	8.1 **	
		2015	DNE	
		2019	DNE	
		2020	0.81	
		2021	0.72	
	Vinyl Chloride	1998	4 **	0.2
		2006	0.56 **	
		2008	0.31 **	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
P-26D	Tetrachloroethene	1998	17	5
		2006	1.8	
		2008	1.5	
		2010	1.7	
		2015	DNE	
		2019	DNE	
		2020		
		2021	DNE	
	Vinyl Chloride	1998	DNE	0.2
		2006	DNE	
		2008	0.44 **	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020		
		2021	DNE	
P-27S	Tetrachloroethene	1998	30 **	5
		2006	10 **	
		2008	6.6 **	
		2009	6.7 **	
		2010	12 **	
		2015	3.5	
		2019	3	
		2020	2.8	
		2021	3.1	
	Vinyl Chloride	1998	4 **	0.2
		2006	0.56 **	

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI
Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
P-27S (cont'd.)	Vinyl Chloride	2008	DNE	
		2009	DNE	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
	Trichloroethene	1998	4.7	
		2006	1.7	
		2008	1.0	
		2009	1.0	
		2010	1.2	5
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
P-27D	Tetrachloroethene	2006	10	
		2008	33 **	
		2010	26 **	5
		2015	19.3 **	
		2019	DNE	
		2020	13 **	5
		2021	16 **	
	Trichloroethene	1998	8.4 **	
		2006	2.1	
		2008	5.7 **	
		2010	4.7	5
		2015	2.8	
		2019	DNE	
		2020	2.6	
		2021	2.9	
P-28S	Tetrachloroethene	1998	DNE	
		2006	DNE	
		2008	33 **	
		2009	4.8	
		2010	1.4	5
		2015	1.5	
		2019	1.2	
		2020	1.8	
		2021	0.76	
P-29S	Chloromethane	1994	0.6	
		2006	0.32	5
		2008	DNE	

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI
Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
P-29S (cont'd.)	Chloromethane	2009	DNE	5
		2010	0.32	
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
	Tetrachloroethene	1998	0.9	5
		2006	0.75	
		2008	1.6	
		2010	1.1	
		2015	DNE	
		2019	DNE	
		2020	0.54	
		2021	0.59	
P-31IA	Tetrachloroethene	1998	13 **	5
		2006	4.8	
		2008	5.4 **	
		2010	5.0	
		2015	4.0	
		2019	DNE	
		2020	1.8	
		2021	1.2	
	Trichloroethene	1998	3.3	5
		2006	1.4	
		2008	1.8	
		2009	2.1	
		2010	1.7	
		2011	1.6	
		2013	1	
		2014	1.1	
		2015	1.0	
		2019	DNE	
		2020	0.75	
		2021	0.67	
P-31IB	Tetrachloroethene	1998	13	5
		2006	5.3 **	
		2008	4.6	
		2010	4.7	
		2015	3.3	
		2019	DNE	
		2020	3.6	
		2021	1.5	

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI

Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
P-31IB (cont'd.)	Trichloroethene	1998	3.6	5
		2006	1.6	
		2008	1.7	
		2010	1.6	
		2015	0.8	
		2019	DNE	
		2020	1.2	
		2021	0.87	
P-34S	Dichloromethane	1995	2	5
		2006	1.9	
		2008	DNE	
		2010	DNE	
		2011	DNE	
		2013	DNE	
		2014	DNE	
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
P-40I	Tetrachloroethene	1998	9.2	5
		2006	4.6	
		2008	6.3 **	
		2010	4.5	
		2015	5.3	
		2019	3.2	
		2020	2.1	
		2021	2.6	
	Trichloroethene	1998	2.5	5
		2006	1.3	
		2008	1.6	
		2010	1.1	
		2015	1.1	
		2019	0.68	
		2020	0.5	
		2021	0.65	
Residential Well #1 [8]	Dichloromethane	1996	0.14	5
		2006	4.1	
		2008	DNE	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	

Table 6: Summary of Groundwater Data[1]: Refuse Hideaway Landfill Middleton, WI

Asterisk (*) results are ES exceedances in landfill source areas; double asterisk (**) are ES exceedances at non-landfill areas.

Well Number	Contaminant [2]	Year	Concentration (ug/L, or ppb)	Health Based Cleanup Standard (WI ES, ppb)
Residential Well #1 (cont'd.)	Tetrachloroethene	1998	9.2 **	5
		2006	4.6	
		2008	6.3 **	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020	3.1	
		2021	3.3	
	Trichloroethene	1998	DNE	5
		2006	DNE	
		2008	1.7	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020	1.2	
		2021	1.2	
Residential Well #2 [8]	Chloromethane	2004	DNE	5
		2006	DNE	
		2008	DNE	
		2010	DNE	
		2015	DNE	
		2019	DNE	
		2020	DNE	
		2021	DNE	
	Tetrachloroethene	2004	3.3	5
		2006	2.9	
		2008	2.9	
		2009	3.5	
		2010	3.2	
		2015	2.9	
		2019	DNE	
		2020	2.0	
		2021	2.2	
	Trichloroethene	2004	0.85	5
		2006	0.63	
		2008	0.63	
		2010	0.68	
		2015	0.67	
		2019	DNE	
		2020	0.52	
		2021	0.55	

TABLE 6 FOOTNOTES

1 The summary of groundwater data is for contaminants that continue to be present at potentially unacceptable levels, shown in annual reports. DNE: "Did Not Exceed" the cleanup standard. Figure 4 shows the sampling locations.

2 Contaminants listed are the only contaminants of concern remaining at or near the Site. Data collected since 1998 has shown that other contaminants no longer pose any further threat. Approximately 70 contaminants are analyzed for twice a year at on- and off-site wells. Table 6 shows only those contaminants that are still present at the Site.

3 Wells with S designations have screens at shallow depths.

4 Wells with D designations have screens at deeper depths.

5 Tetrachloroethene is Perchloroethylene (PCE).

6 Dichloromethane is Methylene Chloride.

7 Wells with E, I, and R designations are monitoring wells that have been replaced since 1988.

8 These wells are at residences that may have had Point of Entry Water Treatment Systems. Specific locations cannot be shown in Table 6 because of personally identifiable information.

Table 7
Summary of Landfill Leachate Production
Refuse Hideaway Landfill
Middleton, Wisconsin

Year	Gallons of Leachate Collected
2017	201,223
2018	53,679 *
2019	42,993 *
2020	39,878 *
2021	466,027
Total	1,104,026

Notes:

1. Volume of leachate produced is dependent on seasonal weather conditions and precipitation.

*2. Reduced collection totals were due to pump and air compressor operational decline. Repair of this equipment was complete by early 2021.

Table 8: Chronology of Refuse Hideaway Landfill Site Events

Event	Date
1974 to 1988	The RHL Site operated as a landfill, accepting a variety of commercial and industrial wastes, including barrels of glue and paint, barrels of ink and ink washes, spray paint booth by-products and paint stripper sludge, and spill residues containing VOCs.
December 6, 1985	A Notice of Violation is issued by WDNR to John DeBeck for recurring violations of solid waste disposal regulations.
May 2, 1988	WDNR issues Special Consent Order SOD-88-02A to John DeBeck relating to the closure and monitoring of the Refuse Hideaway Landfill (Lic. # 01953). The Special Consent Order specified the minimum requirements for closure of the landfill.
December 30, 1988	Special Consent Order SOD-88-02A is entered in court.
January 1989	John DeBeck declares bankruptcy.
March 17, 1989	Dane County Circuit Court issues a Contempt Order to John DeBeck for failure to comply with the Special Consent Order.
September 1989	Using the State of Wisconsin Environmental Fund, WDNR hires a contractor to undertake investigation work at the Site with the eventual goal of controlling Site contamination.
November 1989	WDNR begins a series of public meetings to notify the community and discuss its investigation and cleanup work.
July 1990	Emergency landfill cap erosion control measures are implemented.
November 1990	Installation of wells for gas and leachate extraction begins.
March/April 1991	The State of Wisconsin issues Special Notice and Information Request Letters to Potentially Responsible Parties (PRPs).
August 1, 1991	Installation of the landfill gas/leachate collection and landfill gas flare systems is complete and begins operating.
September 3, 1991	After attempting to secure an agreement with the group of PRPs to undertake a Remedial Investigation/Feasibility Study (RI/FS) at RHL, WDNR nominates the Site for EPA's Superfund National Priorities List (NPL) of hazardous waste sites.
October 14, 1992	RHL Site was declared "final" on EPA's NPL.
February 17, 1993	EPA issues a General Notice Of Liability; CERCLA Section 122(a) Determination Letter to Site PRPs.
April 1993	A Cooperative Agreement was signed between the Agencies defining WDNR as lead agency for the RI/FS.
October 1993	WDNR secures a consultant and the RI/FS begins.
September 12, 1994	The RI is completed.
February 6, 1995	The FS is completed and WDNR requests public comment on potential remedy alternatives.
June 28, 1995	A ROD is issued that selects a remedy requiring: deed restrictions; perimeter signs; maintenance of the existing landfill cap; O&M of the existing gas/leachate collection system with flare; monitoring of groundwater wells and private homes; groundwater extraction with treatment and reinjection; maintenance of point-of-entry (POE) treatment units at two homes down-gradient of the landfill; and installation of new POE units as needed.
April 8, 1997	An Administrative Order on Consent (AOC) is signed with PRPs for performance of the Remedial Design and O&M activities at the Site.

Event	Date
July 1, 1998	The Remedial Design was completed which demonstrated that groundwater contamination had decreased below 1995 ROD action levels. This permitted discontinuation of the groundwater extraction and treatment component of the selected remedy.
September 30, 1998	EPA completed an Explanation of Significant Differences (ESD) to document that (based on the 1998 groundwater data) it is not necessary to implement groundwater extraction and treatment.
September 30, 1998	EPA issues a Preliminary Closeout Report that documented the completion of construction activities consisting of soil cap upgrade, repair/maintenance of the existing gas/leachate collection system, and the installation and maintenance of POE treatment units at two homes.
May 25, 2000	EPA issues a Special Notice letter to Site PRPs to undertake the remaining remedial action work at the Site.
August 31, 2001	The Consent Decree (CD) for remedial action is entered in U.S. District Court (Western District of Wisconsin) between U.S. EPA and the State of Wisconsin. The State, as the Settling Performing Party, has certain obligations that will be implemented by WDNR. Other PRPs' monetary settlements will be used by WDNR for the remediation at the Site. EPA retains some settlement funds as contingency.
September 1, 2001	As required by the CD, WDNR starts to develop documents specifying the manner in which the Settling Performing Party will perform the remedial action. These effectively serve as the Remedial Design.
September 19, 2002	EPA approves sampling and analysis documents, a health and safety plan, and an operation and maintenance plan, making this the effective date of the remedial action start.
September 18, 2007	The first Five-Year Review Report for the RHL Site is signed.
January 3, 2012	The second five-year review process for the RHL Site is started.
April 17, 2012	The Site inspection for the second five-year review is completed.
June 22, 2012	EPA issues a second ESD that documents the decision to make the Wisconsin Groundwater Quality ESs the cleanup goals for the Site.
August 29, 2012	The second Five-Year Review Report for the RHL Site is signed.
December 16, 2013	Approval of Remedial Actions with Continuing Obligations is provided by WDNR's Remediation & Redevelopment Program. (Institutional Controls).
September 15, 2014	Site Wide Ready for Anticipated Use status is achieved.
October 16, 2016	The third five-year review process for the RHL Site is started.
May 23, 2017	The Site inspection for the third five-year review is performed.
August 2, 2017	The third Five-Year Review Report for the RHL Site is signed.
June 2019	WDNR awards a contract to assess the remedy and recommend repairs.
December 2019	Current Conditions Evaluation Report for the remedy is completed.
August to September 2020	WDNR finalizes plans for remedy repairs and upgrades and completes the bidding process to hire a construction contractor.
November 2020	Mobilization of contractor for remedy repairs consisting of repairs and upgrades to: the landfill cap, drainage features, and the leachate and landfill gas systems.
September 8, 2021	Completion of remedy repairs is certified.
September 23, 2021	Fourth Five-Year Review begins.