

COVER PAGE

Site Number: 0978020001
Site Name: Zion Site 1 Phase A Landfill
Category: 24D RCRA Permits Administrative Record
Document Date: 09/25/2025
Permit ID:
Permit Log: B-23R2

Volume 3 of 7

THIS PAGE FOR IMAGING PURPOSES

ADMINISTRATIVE RECORD

for

Zion Site 1 Landfill, Phase A

0978020001 – Lake County

ILD980700728

Log No. B-23R2

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for

Volume 2 of 4

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IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

OCT 21 2025

REVIEWER: MED



BFI Waste Systems of North America, LLC.
26W580 Schick Road
Hanover Park, IL 60133

May 6, 2021

Illinois EPA
Bureau of Land, Division of Land Pollution Control
Permit Section
1021 North Grand Ave. East
Springfield, IL 62794-9276
Attn: Permit Section Manager

Re: RCRA Part B Post-Closure Permit Renewal Application
0978020001 - Lake County
Zion Site 1 Landfill
ILD980700728
Log No. B-23R2

RECEIVED
MAY 10 2021
IEPA-BOL
PERMIT SECTION

To Whom It May Concern,

Enclosed, please find four copies of the above referenced permit application that are being submitted on behalf of permittee, operator, BFI Waste Systems of North America, LLC. The original signed forms contained in Appendix A-1 (Part A Application and LPC-PA23 Forms) and Appendix A-2 (39i Forms) are being submitted to the above address under separate cover.

If you have any questions concerning this submittal, feel free to contact me at (224) 970-1129 or JHitzeroth@republicservices.com.

Sincerely,
BFI Waste Systems of North America, LLC

A handwritten signature in black ink, appearing to read "James Hitzeroth", written over a horizontal line.

James Hitzeroth

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUN 27 2025

REVIEWER: MED

Enclosure: Four Copies of RCRA Part B Post-Closure Permit Renewal Application

Cc: James Blough, USEPA (w/ 1 copy of Application)
Illinois EPA Des Plaines Regional Office (w/ 1 copy of Application)

File 0120-037-01-05
May 6, 2021, Revised June 2025

RCRA PART B POST-CLOSURE PERMIT RENEWAL APPLICATION ZION SITE 1, PHASE A LANDFILL

VOLUME I

**IEPA Site No. 0978020001
ILD 980700728**

Prepared For:

BFI Waste Systems of North America, LLC
26 West 580 Schick Rd.
Hanover Park, IL 60103

PREPARED BY



**RCRA PART B POST-CLOSURE
PERMIT RENEWAL APPLICATION
ZION SITE 1 PHASE A LANDFILL**

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A. FORMS, CERTIFICATIONS, CONFIDENTIALITY, PUBLIC INVOLVEMENT

A.1 RCRA Part A Application Form

A Part A Application is included in **Appendix A-1**. The Part A application has been signed by the facility Owner and Operator.

A.2 Certification Using the LPC-PA23 Form

A completed LPC-PA23 form is also provided in **Appendix A-1**, also signed by the Owner and Operator.

A.2.1 Facility Certification

The appropriate certification statement signed by the facility Owner and Operator is included on the LPC-PA23 Form, which is presented in **Appendix A-1**.

A.2.2 Technical Information Certification

The certification of the technical information presented in this application is included on the LPC-PA23 Form, which is presented in **Appendix A-1**.

A.2.3 39i Certification

The 39i Certifications for the facility Owner and Operator are presented in **Appendix A-2**. As the owner and operator are different entities, a separate form is provided for both the Owner (Zion Landfill, Inc.) and Operator (BFI Waste Systems of North America, LLC).

A.3 Public Disclosure Exemption Claims and Trade Secret Claims

Section A.3 is not applicable because the owner/operator:

- Is not requesting a public disclosure exemption;
- Is not invoking a trade secret claim; or
- Is not asserting that any portion of the submittal is regarded as privileged in relation to this application.

A.3.1 No Information Claimed Exempt from Public Disclosure

No information in this application is claimed exempt from public disclosure. Therefore subsections A.3.2, A.3.3, and A.3.4 are not applicable.

A.4 Public Participation: Facility Mailing List & Information Repositories

A.4.1 Facility Mailing List

A Facility Mailing List has been established that includes a list of entities who must be notified of permit-related activities. The most recent version of the Facility Mailing List (obtained from Illinois EPA in April 2021) is included in **Appendix A-3**.

The list will be updated and resubmitted to the Illinois EPA as needed to include individuals who have interacted with the facility, such as: respondents to mailings and those attending public meetings when a permit modification is requested. If mail to contacts on the Facility Mailing list is returned, then those contacts will be removed. Illinois EPA will review and approve all updates prior to using an updated mailing list.

A.4.2 Identification of Repository

A copy of this Permit Renewal Application has been placed on file at the following locations:

Zion-Benton Public Library
2400 Gabriel Ave.
Zion, IL 60099
Ph: (847) 872-4680

The library hours for limited lobby service currently are:

Mon, Wed, Th: 10 AM – 6 PM
Tue: 10 AM- 7 PM
Sat: 10 AM – 5 PM

Office of County Board Chair
Lake Co. Board Office
18 North County Street
Waukegan, IL 60085

Contact info:
Ms. Sandy Hart
Lake County Board Chair
Ph: (847) 377-2300
Business hours are: 8:30 AM – 4:30 PM (M-F).

A.4.3 Contents of Repository

The above repositories contain a copy of this Permit Renewal Application. If revisions are made to this application after review by Illinois EPA, then the additional information will also be added to the repository.

A.4.4 Public Notice of Repository Availability

Together with the submission of this application to Illinois EPA, a notice has been sent to the facility mailing list including the following information:

1. Identification and address of the facility and the hazardous waste management operations that the permit application addresses;
2. A statement that the permit application materials have been prepared and are available for community members to review and copy at the repositories;
3. The location and business hours of the repositories;
4. A statement that the applicant will update the repository materials periodically during the Illinois EPA's review of the permit application;
5. The name, address and telephone number of the applicant's contact person to address questions regarding the application or to be added to the facility's mailing list for future permit activities; and
6. The following statement: "For general information on the hazardous waste management permit program in Illinois, please contact: the Illinois EPA RCRA Community Involvement Coordinator".

This notice was made no later than the date the permit application was submitted to the Illinois EPA. A copy of the notice distributed to the above referenced facility mailing list is provided in **Appendix A-3**. The notice was sent via certified mail.

B. FACILITY DESCRIPTION

B.1 General Facility Description

The most recent version of the effective Hazardous Waste Management RCRA Post-Closure Permit (Permit) issued by the Illinois EPA Bureau of Land is Mod No. 7, dated March 12, 2018. Permit Modification No. 7 references the permit conditions contained in the eight sections and two attachments issued by Illinois EPA in the Permit dated July 28, 2015. A copy of the effective facility Permit (including both the March 12, 2018 and July 28, 2015 versions of the document) are presented in **Appendix B-1**.

A description of the facility is provided in Section I of the Hazardous Waste Management RCRA Post Closure Permit Log No. B-23R (Permit). The following general facility description summary is based on information contained in Section I of the effective Permit. A General Facility Layout is provided as **Figure B-1**.

The original waste disposal permit for the facility was issued to Browning-Ferris Industries to operate a 59-acre solid waste disposal facility at the location now known as Zion Site 1 Landfill in October 1976. The waste disposal area comprised approximately 40 acres. This permit was issued before the effective date of the RCRA hazardous waste regulations. The RCRA hazardous waste regulations became effective in November 1980 and the Zion Site 1 Landfill operated under RCRA hazardous waste interim standards from 1980 until the first RCRA disposal permit was issued by Illinois EPA in April 1988.

During operation, the above 40-acre waste disposal facility received mainly non-hazardous waste, but some hazardous waste was disposed in the unit currently known as Site 1, Phase A. BFI ceased disposing hazardous waste in this unit in 1990. Closure activities were completed for Site 1, Phase A in 1997 and BFI certified completion of closure on February 10, 1998.

Ten acres of the initially permitted Zion Landfill Site 1 were re-permitted by Illinois EPA for disposal of only non-hazardous waste on June 24, 1994. This portion of the facility came to be known as the Zion Landfill Site 1, Phase B, which is unrelated to this permit renewal application. This landfilling operation occurred in two cells: Cell 1, consisting of approximately 4.9 acres and Cell 2, consisting of approximately 4.7 acres. Non-hazardous waste was disposed in these units from 1994 until 1996. Closure activities for both cells were completed in 1998 and Illinois EPA approved the certification of closure of these units on August 28, 1998.

The remaining approximately 10 acres of the originally permitted 59-acre facility house ancillary equipment and structures associated with the Site 1, Phase A and B landfills, including:

- Tanks and associated loading areas used to manage the collected leachate before it is sent off-site for treatment; and
- Blowers, flare, and gas to energy station associated with the gas management system at the facility.

The area to the east of Site 1, Phase A (Site 1A) is a permitted operating non-hazardous waste landfill currently owned and operated by GFL Environmental. (this facility is also unrelated to this permit renewal application). Zion Landfill, Inc. is the entity that owns the Zion Landfill Site 1, however as the operator, BFI has retained the post-closure care responsibilities for the Zion Landfill Site 1A (RCRA unit) and Site 1B (non-hazardous unit).

B.1.1 Operation of the Facility

The Zion Landfill is located at 9th Street and Green Bay Road within the City limits of Zion, Lake County, Illinois. The closed hazardous waste landfill identified as the Zion Landfill Site 1A is in Benton Township.

The activities included in the Hazardous Waste Management RCRA Post-Closure Permit that are the subject of this Permit Renewal Application (i.e., Site 1, Phase A) occur on approximately 49 acres. Most of the surrounding acreage is utilized for non-hazardous solid waste disposal-related activities, including the following:

- Site 1, Phase B, which is comprised of two cells (Cell No. 1 and Cell No. 2) that contain non-hazardous waste (no hazardous waste), which are also closed, as described above; and
- Site 2, which also contains only solid waste (no hazardous waste), in which the western portion is closed, but the eastern portion is still active and currently owned and operated by GFL Environmental.

A legal description of the facility developed and certified by a professional land surveyor licensed to practice in Illinois is presented in **Appendix B-2**. The Tax Property Identification Numbers of the land which comprises the facility is 03-12-200-016 and 04-07-200-013.

B.1.2 Hazardous Waste Management Units at the Facility

Prior to 1991, the Zion Landfill commercially accepted RCRA hazardous waste into the section permitted for this activity (Site 1A). The disposal footprint for Site 1A is approximately 40 acres. The hazardous wastes disposed at the facility originated from a range of business and industry including manufacturing, petrochemical, steel, utilities, and government. No hazardous waste has been accepted into Site 1 Phase A since 1990 and the Site 1 Phase A landfill has been closed since 1998. According to Permit Condition III.A, the permittee must continue to provide post-closure care for Site 1A until at least February 9, 2028.

B.1.3 Solid Waste Management Units at the Facility

No solid waste management units that are currently subject to RCRA Corrective Action have been identified at the facility to date.

B.2 Topographic Map

B.2.1 Facility + 1 Mile

Figure B-2 is a 2018 USGS topographic map including areas within 1 mile around the closed Site 1A RCRA unit. This map depicts the boundary of the Site 1A facility and the surrounding land uses.

The site is located within the City of Zion limits. Other former waste disposal units associated with the Zion Landfill are located to the east and west of the Zion Landfill Site 1A. The former waste disposal areas immediately bordering Site 1A are also closed and have also received final cover. The Shepherds Crook Golf Course is located north and west of Site 1A. Property south of Site 1A is presently used for agricultural purposes, while residential land use is present to the southeast of Site 1A.

B.2.2 Facility + 1,000 Feet

Figure B-3 is the 2020 topographic map of the facility, along with areas surrounding the facility. This map is at a scale of 1 inch equals 200 feet, with a contour interval that is sufficient to show the pattern of surface water flow in the vicinity of and from the Zion Landfill Site 1A. Additional drawings showing other site features are provided elsewhere in this Permit Renewal Application.

The above map contains the following, as required by 35 IAC 703.183(s):

- Map orientation, date, and scale;

- Legal boundary of the facility;
- Surrounding land uses (included on **Figure B-2**);
- Access controls;
- Buildings and structures;
- Storm drains, sewers, sanitary and process;
- Waste injection or groundwater withdrawal wells;
- Run-on/run-off control systems
- Fire control facilities (i.e. fire extinguishers);
- Wind rose (provided separately as **Appendix B-3**);
- Hazardous waste management units;
- Applicable equipment; and
- Surface waters, including intermittent streams.

The following items are listed in 35 IAC 703.183(s), but not applicable to the Zion Site 1A facility and therefore not shown on either **Figure B-2** or **Figure B-3**:

- Areas in the 100 year flood plain (neither the facility, nor areas within 1,000 feet of the facility are located within the 100 year flood plain – see letter from FEMA in **Appendix B-4**);
- Flood control or drainage barriers; and
- Solid waste management units (SWMUs). No SWMUs have been identified at the facility.

B.3 Location Standards

B.3.1 Seismic Standard

Nothing has changed relative to the seismic standards described in the originally approved RCRA Part B Permit Application prepared prior to issuance of the 1988 permit. Therefore, no additional information is provided in this Application and no permit modifications are requested relative to the seismic standards.

B.3.2 Floodplain Standard

Appendix B-4 contains an April 24, 1996 letter from the Federal Emergency Management Agency (FEMA) reflecting that the site is not located within the limits of a 100-year floodplain area. The FEMA map included in the original Part B Permit Application showed a small area approximately 400-feet north and a larger around approximately 1,600 feet east of the Site 1 Phase A landfill as

being A Zones which are considered flood hazards. The updated FEMA map has removed these A Zones. The latest available FIRM maps from FEMA (confirming that the site is not located within a 100-year floodplain) are dated 2013 and are also included in **Appendix B-4**.

B.3.3 Facilities in the 100-year Floodplain

As the facility is not located within the 100-year floodplain, this section and subsections are not applicable.

B.4 Operating Record

The operating record will include results of post-closure groundwater sampling, analyses, and statistical evaluation; inspection reports; training records; leachate removal records; and annual reports. The operating record will be retained at the facility or a secure location at another office of the owner or operator.

According to 35 IAC 724.173, the operating record is to be kept at the facility and various information is to be recorded as it becomes available and maintained in this operating record for three years (unless otherwise provided in the above regulation). For this facility, BFI is the operator, but a separate independent entity (GFL) is owner of the Zion Landfill property and operator of Site 2. BFI does not own any buildings at the facility that are suited for storing Site 1 Phase A's operating record. Thus, it is not possible for the operator to maintain a physical operating record at the physical facility. As an alternative, the operating record is stored at the BFI office in Hanover Park, Illinois (less than 60 miles from the Zion Landfill). This office is where BFI personnel responsible for operation of Site 1 Phase A are based. Keeping the operating record here allows BFI personnel to access it as needed and to keep the records complete and current. The operator may also keep certain operating record items electronically to minimize paper usage.

C. GROUNDWATER MONITORING

C.1 Exemption from Groundwater Protection Requirement

A waiver from the 35 IAC 724, Subpart F groundwater monitoring requirements is not being requested. Therefore, this section is not applicable.

C.1.1 Waste Piles

A waiver from the 35 IAC 724, Subpart F groundwater monitoring requirements is not being requested. Therefore, this section is not applicable.

C.1.2 Landfill

A waiver from the 35 IAC 724, Subpart F groundwater monitoring requirements is not being requested. Therefore, this section is not applicable.

C.1.3 No Migration

A waiver from the 35 IAC 724, Subpart F groundwater monitoring requirements is not being requested. Therefore, this section is not applicable.

C.2 Interim Status Groundwater Monitoring Data

The permittee has submitted regular quarterly and annual groundwater monitoring reports to Illinois EPA in accordance with prior permits. Copies of these reports, as well as interim status groundwater monitoring reports are contained in the operating record, as well as Illinois EPA files. Due to the significant volume of these historical reports and consistent with the most recent permit renewal application, they have not been reproduced for this Permit Renewal Application.

Many of the original permitted wells were damaged during various prior landfill construction activities. In 1991, low level volatile organic constituents (VOCs) were detected in some of these wells. The permittee notified Illinois EPA of the situation and initiated several investigations. The conclusion of the investigations, which were submitted to Illinois EPA, was that the source of the contamination was landfill gas. Damaged wells and wells that had gone dry due to construction activities were acting as conduits for the gas. To address the issue, in March 1992, the permittee submitted a Class 3 Modification proposing corrective action which included the construction of an active gas extraction system at the site. The gas extraction system was approved under a

Temporary Authorization on July 16, 1996. The system was installed in 1997 and certified in 1998. Technical details pertaining to this system are discussed below in Section E.5.

Other actions taken in response to the 1991 VOC detections included replacing damaged wells. Several wells were replaced in 1992 and 1993 in accordance with Illinois EPA approvals. In March 2000, damaged wells A129 and G139 were replaced with R129 and A139 respectively.

C.3 Historical Hydrogeological Summary

Throughout the history of the Zion Landfill, including both solid and hazardous waste programs, at least 30 subsurface investigations have been conducted for various purposes, including hydrogeologic exploration and piezometer/monitoring well installation. Since 1975, over 250 borings, piezometers, gas probes, monitoring wells, and replacement wells have been drilled and/or installed on the combined properties of the facility. Approximately 300 additional holes have been dug for trench probe inspections on Sites 1 and 2.

The initial hydrogeologic report for Site 1 was prepared by Soil Testing Services, Inc. (STS, 1975). It was based on ten soil borings installed in November 1974. Using that data and data from ten additional borings in the eastern portion of the site, James Douglas Andrews, P.E., Environmental Engineering, Inc., prepared additional reports as part of the 1980 Application for Permit (Andrews, 1980; STS, 1980). These reports discussed various aspects of hydrogeological conditions below the facility.

In late 1983 and early 1984, hydrogeologic investigations were conducted by Wehran Engineering and Recra Research, Inc. to further develop site-specific information that was used in the original RCRA Part B Permit Application. The Recra Research report was included in the original application.

After these investigations, borings have been installed to place or replace monitoring wells and piezometers. Further, hydrogeologic studies have been conducted on portions of the landfill lying north, west, and east of Site 1A to satisfy various solid waste permitting requirements.

In 1995, in preparation for a solid waste landfill expansion, Roberta Jennings & Belinda Staurowsky – Consulting Hydrogeologists integrated all previous investigations at the site into one inclusive report. Although the primary focus of the report was the expansion area east of the Zion Site 1A Landfill, the report also summarized the Site 1A features. The hydrogeologic discussion from the report and key figures and tables are provided in **Appendix C-1. Appendix**

C-1 contains a drawing (No. 31) from the Jennings report showing the average groundwater flow beneath the property. The drawing was developed using groundwater elevations from several years. A summary of the hydrogeologic investigations conducted at the site is also provided in **Appendix C-1**.

The Jennings report indicates the hydrogeologic conditions beneath the site are substantially the same as described in the original Part B Permit Application. Following is a summary of the conditions.

- Natural ground surface elevation at the site ranges from approximately 720 feet mean sea level (MSL) to 760 feet MSL.
- The uppermost aquifer unit is the glacial till. The unit is approximately 100 feet thick and consists of a weathered portion and unweathered portion. The weathered portion ranges in thickness from about 10 to 20 feet, including approximately two feet of topsoil. Below the weathered portion lies 80 to 90 feet of unweathered clay soil.
- Within the glacial tills are isolated, discontinuous lenses of silts and silty clayey sands, which are interpreted as interglacial lacustrofluvial deposits. In general, when these intra-till sorted sediments are present, they are encountered between 20 to 60 feet below the ground surface.
- The intra-till sorted sediments do not constitute an aquifer. However, because the sediments are more permeable than the surrounding till, the intra-till sorted sediment units are monitored as potential contaminant pathways. Based on the hydraulic conductivities, these sediments do not meet the requirements of 35 IAC 620.210 for Class I, Potable Resource Groundwater. The hydraulic gradients through these sediments are predominantly vertical, with horizontal flow negligible, except to and from an intercepting well or where sorted sediments intersect a surface boundary such as the wall of an excavation.
- Locally continuous interglacial sand is continuous beneath the landfill at approximately 100 feet. Beneath Site 1A, this sand layer is approximately 20 to 50 feet thick. This zone has been referred to historically and herein as the "shallow drift aquifer".
- The shallow drift aquifer is the uppermost aquifer underlying the site for purposes of this application. This aquifer is in the interglacial sand deposits. This unit meets the definition of 35 IAC 620.210 for Class I, Potable Resource Groundwater. Vertical flow predominates, although horizontal flow is also present. The horizontal flow beneath Site 1A is complex. Water flows toward the center of the site from both the northwest and southeast and then flows downgradient to the east-northeast. This approximates the geologic structure beneath the site that appears to include a stream channel deposit near the center of the site.

- Beneath the sand layer lies an unconsolidated material consisting of interfingering dense clay, silty clay/clayey silt, sandy clay, clayey sand and fine silty sand. In general, this material has a higher percentage of coarser grained material than the upper till unit.
- A second sand unit is encountered at approximately 150 feet below ground surface. This sand layer is approximately 15 to 60 feet thick.
- Bedrock is encountered at approximately 200 to 225 feet below ground surface.

A summary of the hydraulic properties of various soil units beneath the Zion Site 1A Landfill is presented below.

Glacial Till

| Property | Approximate Value | Source of Data |
|------------------------|--|--|
| Particle Size Analysis | Clay: aprox. 39% Silt: aprox. 42% Sand: aprox. 19% | Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995 |
| Porosity | 30% | Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995 |
| Hydraulic Conductivity | 2.80×10^{-8} cm/sec (recompacted) 2.65×10^{-8} cm/sec (mean value for site) | Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995 |

Intratill Sediments

| Property | Approximate Value | Source of Data |
|----------------|--------------------------|--|
| Porosity | 40% | Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995 |
| Transmissivity | 0.09 to 53.18 gal/day/ft | Report of Hydrogeological Investigations: Zion Sanitary |

| | | |
|------------------------|---|--|
| | | Landfill – Jennings & Staurowsky, 1995 |
| Hydraulic Conductivity | 3.66×10^{-5} cm/sec (geometric mean) | Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995 |

Interglacial Sand / Shallow Drift Aquifer

| Property | Approximate Value | Source of Data |
|------------------------|---|--|
| Porosity | 25-50% | Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995 |
| Transmissivity | < 1 to > 12,000 gal/day/ft | Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995 |
| Hydraulic Conductivity | 3.97×10^{-4} cm/sec (geometric mean) | Report of Hydrogeological Investigations: Zion Sanitary Landfill – Jennings & Staurowsky, 1995 |
| General Flow Direction | Generally to the East | Four quarters of potentiometric contour maps from 1995 and 2009 and 2019/2020 |
| Rate | 1.02 ft./year (average over 4 quarters) | Four quarters of groundwater elevation contour maps from 1995 |

C.4 Topographic Map Requirements

In accordance with 35 IAC 703.183(s), the topographic map is included as **Figure B-3**. A legal description of the Site 1A property boundary is included in **Appendix B-2**. The following information referenced in the above regulation is provided elsewhere in the application as follows:

- The wind rose for the area is provided in **Appendix B-3**;

- There is no 100 year flood plain located within 1,000 feet of the facility (see documentation from FEMA in **Appendix B-4**);
- Surrounding land uses are shown on **Figure B-2** (Site Location/Surrounding Land Use Map);
- Injection and withdrawal wells are shown on **Figure C-1** (Groundwater Monitoring Network) and maps included in **Appendix C-1**; and
- Streams and surface waters are shown on **Figure B-2** (Site Location/Surrounding Land Use Map).

The topographic map shows the waste management area and property boundary. The location of the groundwater monitoring wells is also provided on **Figure B-3**.

The point of compliance is shown on **Figure C-1**. The point of compliance is specified by Illinois EPA and is the point at which the groundwater protection standard applies and at which monitoring is conducted. The groundwater protection standard is based upon the greater of the statistical background value as calculated by the methods included herein or the 35 IAC 620 Class I Groundwater Quality Standard, or two times the PQL (depending upon the frequency of detection in the background data). The point of compliance is a vertical surface located at the hydraulically downgradient limit of the waste management area that extends downward into the uppermost aquifer underlying the regulated units.

The general groundwater flow direction in the shallow drift aquifer is from west to east, with a slight component to the northeast over the southern portion of Site 1A. Thus, monitoring wells to the west of Site 1A are considered upgradient and wells to the east are downgradient. However, locally groundwater flow can be to the north and south. Historical groundwater elevation contour maps from 2009, as well as more recent contour maps from 2020 are included in **Appendix C-2**. These maps confirm that the current groundwater flow direction in the shallow drift aquifer is consistent with the historic data.

C.5 Contaminant Plume Description

This section is not applicable. No plume of contamination from the Zion Site 1A Landfill has been identified.

C.6 Detection Monitoring Program

Detection monitoring remains the most appropriate groundwater monitoring program for Site 1A. The Detection Monitoring Program will consist of sampling groundwater monitoring wells in

the shallow drift aquifer at least twice per year throughout the remainder of the post-closure care period. The “shallow drift aquifer” is the uppermost continuous aquifer beneath the facility.

Another shallower zone that yields water has been monitored throughout the current Part B permit period. Consistent with historical practices, this zone is also proposed to be monitored as part of the post-closure groundwater monitoring program proposed herein. This “shallow zone” program is also described below.

C.6.1 Indicator Parameters, Waste Constituents, Reaction Products Monitored

A list of indicator parameters has been historically monitored in the groundwater based on the wastes previously accepted for disposal at the Site 1A facility. These parameters were selected because they are persistent, detectable/quantifiable, mobile, not highly biodegradable, and generally do not exist naturally in groundwater. In addition, most of these constituents have an established 35 IAC 620 Groundwater Quality Standard.

A summary of the hazardous waste codes historically received at the Site 1A facility, along with a description that includes the basis for listing is provided on **Table C-1**. As shown in **Table C-1**, the list of indicator parameters is representative of the chemical characteristics of the hazardous waste codes historically disposed at the facility.

The indicator parameters represent families of constituents as follows:

Volatile Organics: A series of volatile organic compounds (VOCs) will be included as indicator parameters. VOCs do not occur naturally, but are prominent in the wastes historically disposed at Site 1A and in landfill leachate and therefore represent appropriate indicator parameters. VOCs are the most common constituent related to the specific hazardous waste codes that were historically disposed in the landfill. The suite of VOCs selected is representative of a typical SW-846 8260 scan. The list of specific VOCs included is provided in **Table C-2**.

Please note that the Storet number listed in the existing permit for 1,2-Dichloropropane is presently listed as 31541. However, to be consistent with the solid waste facility permits (for Site 1 Phase B and Site 2), please modify this Storet number to 34541.

Metals and Cyanide: A series of metals representative of the historic hazardous wastes disposed at the facility will also be monitored on a regular basis, along with cyanide. Two sets of samples will be analyzed for metals. One sample container will not be filtered and the results from this

container are considered to represent total metals. Another container will be filtered in the field with a 0.45 micron filter and therefore will be considered dissolved analysis. Significant concentrations of these metals generally do not occur naturally and therefore metals also represent quality indicator parameters. The specific metals selected are based upon the basis for listing the hazardous wastes that had historically been disposed at Site 1A. The list of specific metals included is provided in **Table C-2**.

In addition to the above indicator parameters, various field parameters will also be monitored, including specific conductance, pH, temperature, and turbidity. The primary purpose for collecting this data is to evaluate when the purge process can terminate and groundwater samples can be collected. Therefore, statistical comparisons between upgradient and downgradient concentrations will not be conducted for these field parameters.

C.6.2 General Monitoring Program Requirements

A groundwater detection monitoring program will be implemented to monitor groundwater beneath the facility. The uppermost aquifer monitored beneath the facility is the shallow drift aquifer.

The point of compliance is defined as the vertical surface located at the hydraulically downgradient limit of the landfill that extends down into the uppermost aquifer underlying the landfill. The point of compliance is shown on **Figure C-1**.

Shallow Drift Aquifer

The proposed groundwater monitoring system is shown on **Figure C-1**. Well locations are based on their position with respect to groundwater flow lines. In general, upgradient wells are located to the west of Site 1A. Upgradient wells are selected to be representative of groundwater that is unimpacted by Site 1A. Downgradient wells are located to the east. The point of compliance is formed by these downgradient wells. Additional monitoring wells on either side of the point of compliance (to the north and south) are in a sidegradient position relative to groundwater flow. These sidegradient wells are included in the groundwater monitoring system as a precaution to account for potential dispersion.

Shallow Zone

Throughout the current Part B permit period, the permittee has monitored shallow zone monitoring wells. The shallow zone is located approximately 50-70 feet above the shallow drift

aquifer discussed above. The interglacial deposits where the shallow zone wells are screened are discontinuous. There are no known water wells in the area using water from this unit. The purpose of the shallow zone wells is to serve as an early warning system to detect potential leaks before constituents could potentially migrate to the deeper uppermost aquifer (i.e., the shallow drift aquifer).

C.6.3 Groundwater Monitoring System

A summary of the construction detail for the proposed groundwater monitoring wells is provided in **Table C-3**. This table identifies the well designations, coordinates, ground surface elevation, inside casing elevation, screen interval, bottom of well elevation, internal casing material, internal casing diameter, geologic formation monitored, and date installed. **Figure C-1** shows the location of these wells.

C.6.4 Description of Sampling and Analysis Procedures

The following sampling and analysis procedures will be followed for monitoring wells screened in both the shallow draft aquifer and the shallow zone.

Pre-Sampling Preparation

Preparation for a successful sampling event must begin in advance of field sampling operations. In as much as possible, sampling events will be scheduled at least 2-3 weeks in advance of the sampling event. This will allow time for the preparation and assembly of sampling equipment, sampling bottles, labels, chain of custody forms, and paperwork. Prior to sampling, monitoring equipment will be assembled and carefully inspected to ensure proper working order and supply. Worn or discolored equipment will be replaced or repaired. Batteries for field meters will be checked and if necessary, replaced.

The expiration date of the calibration buffers will be checked. If expired, fresh buffers will be obtained. The field meters will be calibrated and evaluated for drift and stability. The supply of incidental sampling equipment, including the 0.45 micron filters will be evaluated.

The laboratory performing the groundwater analysis shall supply the necessary coolers, pre-cleaned containers, trip blanks, chemical preservatives, labels, custody seals, chain-of-custody and shipping forms. Sample containers need to be constructed of a material compatible and non-reactive with the material it is to contain. Adequate instructions to the laboratory must be given in advance of each monitoring event. Details concerning changes to the monitoring plan and/or

procedures will be given to the laboratory in writing prior to the field sampling personnel arriving on the site. A specific contact person shall be established at both the facility and contract laboratory for communication between the two parties.

Although every effort will be made to adhere to established schedules, sampling schedules are subject to change based on factors such as weather. No sampling will occur during inclement weather conditions (i.e., when precipitation in the form of rain or snow will potentially contaminate samples, when winds are high enough to cause blowing dust and other materials to uncontrollably contaminate samples, or when the weather is so cold that it interferes with the operation of equipment or the sampling crew's ability to exercise effective quality control). The decision to postpone or delay a sampling event will be at the discretion of the Project Manager and will be reported to the Illinois EPA if such a delay extends beyond the permitted time-frame.

Water Level and Well Depth Measurements

Water levels will be measured at the monitoring wells and recorded. The depth below ground of wells that do not have a dedicated pump will be measured on an annual basis. The depth below ground of wells having a dedicated pump will be measured every five years or whenever it is pulled.

Groundwater Purging

Dedicated purge and sampling equipment serves to minimize potential cross-contamination between wells. Groundwater samples are extracted using individual dedicated submersible pumps. If dedicated sampling equipment is not functional for a sampling event, the affected well(s) will be sampled with a disposable bailer or with equipment that has been decontaminated in the field prior to the sampling event.

Groundwater will be purged prior to sampling such that the water level is not lowered to within the screen interval. Wells installed in poorly productive horizons will be purged until the water level is lowered to immediately above the well screen.

A total of three well volumes of groundwater will be purged from each well, if possible. Less volume will be purged from wells in which the static water level lies close to or within the screen interval or that recharge slowly.

The temperature, pH, and specific conductance of groundwater will be monitored regularly during purging and the results recorded.

Groundwater purged from detection monitoring wells will be directed into the adjacent perimeter stormwater ditch or disposed of on the ground within the waste limits. Groundwater purged from wells undergoing compliance monitoring and/or corrective action will be containerized and disposed with leachate.

Sample Collection

Upon arrival at the well location, observe and record the condition of the well and its surrounding area on a field information form. Carefully observe each well or piezometer for signs of deterioration or other problems (e.g. rusted or broken locks, crumbling or cracked surface pad, missing well cap, standing water, etc.). If problems are observed, report the problem to appropriate personnel. **Figure C-2** is a sample Groundwater Sampling Form. The actual format of this form may change during the life of the permit. Alternate forms may be used, if the same basic information is provided. Also, electronic forms may be utilized.

Groundwater will be sampled following purging. The pump rate will be maintained at approximately 100 ml/minute or less prior to sample collection. The groundwater level will not be lowered to within the screen interval during sampling. Field measurements for pH, specific conductance, and temperature will be performed and recorded. Samples will be containerized in order of volatility, as listed below.

Samples will be collected in the following order:

- Field parameters,
- Volatile Organics (VOCs),
- Total metals,
- Dissolved metals, and
- Inorganics.

When sampling for VOCs, care must be exercised to minimize loss of the volatile organic compounds. Precautionary measures to be taken include:

- Drawing VOC samples slowly from the dedicated tubing. The sample container should be tilted slightly and the sample will be released slowly and allowed to run down the side of the container in a manner which minimizes sample agitation or aeration.

- Fill bottles to capacity with sample and eliminate air bubbles. This is done by overfilling the container to a point where the liquid meniscus is above the top of the container. Tightly cap container. Invert container after capping and tap to visually examine for air bubbles. Should air be detected, refill with new sample until a "zero headspace" sample is obtained.

Each piece of down hole equipment, including: submersible pumps and tubing are presently dedicated to a specific well. Filtering will be performed in-line, as the groundwater is removed from each well. Therefore, the need for decontamination of non-dedicated equipment will be minimal.

Sample Preservation and Shipment Procedures

Since multiple analyses will be required, different types of containers and preservatives will be necessary. Multiple pre-labeled containers will be supplied by the laboratory for each sampling point. The appropriate preservatives will be attached to the bottle in small vials or will have been added to each container (as required) during sample preparation by the analytical laboratory. Sample preservation should be performed immediately upon sample collection.

The sample containers and chemical preservatives to be utilized for the indicator parameters will be as follows:

| Parameter Group | Container | Preservative |
|------------------------------|---|----------------------------|
| VOCs | 40 mL glass vials w/ no headspace | HCl to pH < 2 |
| Metals (total and dissolved) | 500 mL plastic (sample unfiltered for total metals and filtered for dissolved metals) | HNO ₃ to pH < 2 |
| Cyanide | 500 mL plastic | NaOH to pH > 12 |

Immediately after collection, bottles will be placed in coolers with ice. Samples will be maintained at approximately 4-6°C. The samples will be sent to the laboratory and will arrive (at the laboratory) within 48 hours of collection. The temperature inside the coolers containing the samples will be verified upon receipt of the coolers.

Chain of Custody Procedures

At the time each sample is taken, a chain-of-custody record will be completed and sent to the laboratory, along with the groundwater samples. **Figure C-3** is a sample chain-of-custody form. The format for this form is expected to change from time to time during the life of the permit. Alternate forms may be utilized, if the same basic information is provided.

Upon transfer of sample possession to subsequent custodians, the chain-of-custody record will be signed by the person taking custody of the sample container and the person giving up custody. Upon receipt of samples at the laboratory, the date and time of arrival will be noted on the chain-of-custody records. The laboratory receiver will verify that the seal is intact, if present, and custody has not been broken. The shipping container seal will then be broken. The chain-of-custody records will be included in the analytical report prepared by the laboratory.

As part of the chain-of-custody procedure, each sample container will be labeled with the sample identification and the parameter to be analyzed.

Quality Control Samples

Field blanks and trip blanks may be used to assess the integrity of the sampling and shipping process. At a minimum, one trip blank will be included for each cooler containing samples to be analyzed for volatile organics. Trip blanks will only be analyzed for VOCs. If the samplers have reason to suspect ambient contamination during sampling, a field blank will be analyzed for the same list of parameters using the same analytical methods as used for the groundwater samples. The blank results will be provided in the laboratory reports for the groundwater event.

Analytical Procedures

From time to time during the post-closure care period, the permittee may contract analytical services from various laboratories. In general, a single laboratory will perform analysis for one or more full calendar year(s). Each contracted laboratory will be required to provide a copy of its Laboratory Quality Control Procedures, which will be maintained by the permittee and will be available for review by Illinois EPA inspectors, upon request.

When matrix conditions within a sample allow, the practical quantitation limit (PQL) for each indicator parameter will be at least equal to the Class I groundwater quality standard listed in 35 IAC 620. The PQL is defined in 35 IAC 724.197(i)(5) as the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory

operating conditions that are available to the facility. The PQL utilized will be identified on the analytical reports provided by the laboratory. Occasionally, PQLs may vary due to interferences, changes in laboratory procedures, or other factors.

The analytical methods for the indicator parameters proposed in the detection groundwater monitoring program will be as follows:

| | |
|---|--------------|
| VOCs: | SW-846 8260 |
| Total and Dissolved Ba, Cd, Cr, Pb, Ni: | SW-846 6010B |
| Total and Dissolved Hg: | SW-846 7470A |
| Cyanide: | SW-846 9012 |

Analytical methods will be in accordance with the latest promulgated version of USEPA's "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods-SW-846 Third Edition, Final Update III, Revision 4". If the specific methods listed above are updated or if a new method is promulgated, then the updated method may be utilized.

C.6.5 Evaluation of Groundwater Surface

Shallow Drift Aquifer

Groundwater elevations will be measured when groundwater samples are collected. Prior to groundwater purging and sample withdrawal, an accurate depth to water-level measurement will be taken with a portable, conventional static water level indicator. The depth to water level meter will be properly decontaminated prior to the first measurement and after each measurement has been recorded for each well. The water level measurements will be recorded and a groundwater elevation contour map will be developed.

Shallow Zone

While groundwater elevations will be measured on a regular basis at wells screened in the shallow zone using the same procedures as above, a groundwater elevation contour map will not be developed for the shallow zone because this unit is discontinuous.

C.6.6 Background Quality

Background groundwater quality has been previously evaluated for both the shallow drift aquifer and shallow zone based upon the previously approved statistical procedures contained in the prior permit renewal application and the current effective Permit. The background values for the List G1 parameters were approved by Illinois EPA with Permit Modification Log # B-23R-M-1 and

are listed in Section IV to the current effective Permit (see **Appendix B-1**). Background values for List G2 parameters were approved by Illinois EPA with Permit Modification Log # B-23R-M-3 and are also listed in Section IV to the current effective Permit.

No revisions to the currently approved background values are being sought as part of this Permit Renewal Application. However, a typographical error is believed to be included in the existing permit regarding the background values listed for cyanide (dissolved) and cyanide (total). The background values for both constituents are listed as 0.005 ug/L. However, prior documentation submitted to Illinois EPA indicates that the background value for both these constituents should be 5 ug/L, not 0.005 ug/L. Alternatively, the background values could be listed as 0.005 mg/L. The laboratory is unable to report to 0.005 ug/L under existing SW-846 analytical methods.

C.6.7 Statistical Evaluations

Shallow Drift Aquifer

The prediction limit statistical method previously calculated, reviewed, and approved by the Illinois EPA remains appropriate. The prediction limit method is referenced in 35 Ill. Adm. Code 724.197(h)(3) and in various guidance documents on statistical analysis of groundwater quality data published by the USEPA, including the Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance, dated March, 2009.

Background groundwater quality values have been developed for each indicator parameter. Interwell statistical procedures are being applied to the shallow drift aquifer and therefore, the background data is obtained from the upgradient wells screened in the shallow drift aquifer. The prediction limit test using the 0.01 level of significance (i.e., 99% confidence) will be the statistical method applied.

The appropriate methodology for calculating the prediction limit is based upon the normality characteristics of the background data. Normality testing has been performed on the background dataset. Data from each of the upgradient wells was pooled for subsequent statistical evaluation. Based on the Shapiro-Wilk normality tests, the data was separated according to data normality or percentage of data below the PQL. The intrawell prediction limits for normally distributed parameters was calculated according to the methods in ASTM, 2005. This method provides for prediction limit calculations based on the number of background values, the number of future observations, and the false positive rate. The prediction limit approach utilizes verification

sampling to differentiate statistically significant increases from false positive errors. The prediction limit for normally distributed constituents is calculated as follows:

$$\bar{x} + s * \sqrt{1 + \frac{1}{n}} * t_{[n-1, \alpha]}$$

Where:

- α is the false positive rate for each individual test (i.e., 0.01);
- $t_{[n-1, \alpha]}$ is the one sided $(1-\alpha)$ 100 % point of Student's t distribution on $n-1$ degrees of freedom (see Table in **Appendix C-3**);
- \bar{x} is the mean of the data set;
- s is the standard deviation of the background data set; and
- n is the total number of background measurements (pooled from each of the upgradient wells).

Prediction limits for lognormally distributed data were calculated using natural logarithms of the original data. For presentation purposes, after calculation of the prediction limit, the natural logarithm prediction limits are converted back to original units.

In accordance with USEPA, 1992, the prediction limits for background data that was neither normally nor lognormally distributed were calculated using nonparametric procedures. The nonparametric prediction limits were established as the maximum detected concentration in the pooled background database. Also, parameters with greater than 50% of the background data reported below the PQL will be considered to have an indeterminate distribution. In this case, the background levels will be based on nonparametric prediction limits (i.e., the highest concentration in the pooled background data set).

Lastly, the background levels for constituents with 100 percent of the data reported below the PQL will be established based on the practical quantitation limit (PQL) for the referenced SW 846 Method.

Shallow Zone

The same statistical procedure has been applied to data collected from wells screened in the shallow zone. The only difference is that background data from each individual well was utilized for purposes of computing the background prediction limits, rather than the pooled background data from upgradient wells, as was the case for the shallow drift aquifer.

C.6.8 Statistically Significant Increases

Shallow Drift Aquifer

The procedures for evaluating for a preliminary statistically significant increase are based upon whether the indicator parameter is present in the background data set or not.

If a parameter is present in the background data, then the following procedures will apply.

The data obtained from point of compliance wells will be compared to the background prediction limit established as discussed above or the 35 IAC 620, Class I Groundwater Quality Standard, whichever is greater, each time groundwater quality is evaluated at the point of compliance.

If a parameter is not present in the background data, then the following procedures will apply.

A preliminary statistically significant increase will be identified if either of the following conditions are noted:

1. The measured concentration of a single constituent is greater than two times the PQL; or
2. The measured concentration of two (2) or more constituents is greater than the PQL for each constituent.

If a preliminary statistically significant change is noted, the permittee has the option of declaring the preliminary increase a confirmed increase without performing verification sampling or may initiate verification procedures to evaluate whether the increase will be considered confirmed. The verification procedures will include collection of another sample from the specific well(s) for the specific parameter(s) exhibiting the preliminary statistically significant increase. The verification sample will be collected within 45 days of receipt of the laboratory report that indicates a preliminary exceedance.

Collection, preservation, and analysis of the resample will be carried out in a manner as described above. Only wells and/or parameters exhibiting a preliminary statistical increase will be included in the scope of the verification sampling. The results of the resampling will be compared to the appropriate standard described above. If the resample results are equal to or less than the above standard, then detection monitoring will continue. If the second round of sampling and analysis confirms the initial findings, the permittee may declare a confirmed increase, or has the option of further evaluating the validity of the statistics using the trend analysis approach described below.

Certain naturally occurring parameters (such as certain metals) show considerable fluctuation at individual wells and at different times (both annual due to seasonal fluctuations and over longer periods of time). While routine statistical evaluation of these parameters sometimes indicate a significant change has occurred, in actuality, there has been no impact from the landfill. Rather, the change is a naturally occurring phenomena. Trends will be maintained for these parameters and the trends may be used to demonstrate the change is normal as evidenced by natural fluctuations over time.

The specific trend evaluation performed in this situation will be the Mann-Kendall Test. The Mann-Kendall test can evaluate both upward and downward trends. The Mann-Kendall Test Statistic is the difference in the number of increasing values and the number of decreasing values in the database. The test statistic, along with the sample size (n), will be used to calculate the corresponding probability of the trend being true. If the test statistic (S) is less than zero (i.e., the total number of negatives is greater than the total number of positives), then an overall downward trend is present. If the test statistic is greater than zero (i.e., the total number of positives is greater than the total number of negatives), then an upward trend is present. A description of the test methodology and assumptions associated with the Mann-Kendall Test is presented below.

The Mann-Kendall Test requires no distributional assumptions, but does require insertion of the reporting limit (i.e., the PQL) where the concentration was reported as not detected. Trend testing will be performed at a Type I error rate of 0.01 (i.e., 99% confidence). This provides a sufficient level of confidence for individual tests. Example calculations utilizing the Mann-Kendall Test are provided in both Gibbons (1994) and Gilbert (1987) and are also included within **Appendix C-3**.

The procedure for the Mann-Kendall test is as follows:

1. Order the data by sampling date: x_1, x_2, \dots, x_n , where x_i is the measured value on occasion i .
2. Record the signs of each of the N' possible differences $x_{i'} - x_i$, where $i' > i$. For example, let:

$$\text{sgn}(x_{i'} - x_i) = \begin{matrix} 1 & \text{if } x_{i'} - x_i > 0 \\ 0 & \text{if } x_{i'} - x_i = 0 \\ -1 & \text{if } x_{i'} - x_i < 0 \end{matrix}$$

3. The Mann-Kendall statistic is then computed as:

$$S = \sum_{i=1}^{n-1} \sum_{j=i+1}^n \text{sgn}(x_j - x_i)$$

which is the number of positive differences minus the number of negative differences.

Values of S , n , and the associated probability for the test of $S=0$ for values of n up to ten are given in Table 9.4 of Gibbons (1994), which is also provided in **Appendix C-3**. For values of n greater than ten, refer to Table A.21 in Hollander and Wolfe (1973), which is also provided in **Appendix C-3**. A significance level of 0.01 will be utilized. If the probability obtained from either Table 9.4 of Gibbons (1994) or Table A.21 of Hollander and Wolfe (1973) is less than 0.01, then the data set will be considered to have a statistically significant trend.

If trend analyses fail to show a pattern indicating a statistically significant upward trend, routine detection monitoring will continue.

If trend analyses show a statistically significant upward trend for the specific indicator parameter at a specific well, then it will be concluded that a statistically significant increase has occurred (in the affected well). Upon this conclusion, the permittee will notify Illinois EPA in writing within seven (7) business days indicating the affected well(s) and the parameter(s).

Unless the permittee pursues an alternate source demonstration as described below, within the specified timeframe, upon identification of a confirmed statistically significant increase, all point of compliance wells will be sampled and analyzed for the parameters listed in 35 IAC 724 Appendix I (Appendix I). If any Appendix I parameters are detected, additional sampling/analysis for the detected parameter(s) will be performed within 30 days of receipt of the final laboratory data from the initial Appendix I event. The permittee will subsequently prepare a Class 3 Permit Modification to propose a Compliance Monitoring Program for the point of compliance wells, which will be based on the results from the Appendix I sampling event(s). This Class 3 Modification application will be submitted within 120 days of receipt of the final laboratory data from the Appendix I resample event. The application must include the following information:

- A) An identification of the concentration of any constituent in Appendix I detected in the groundwater at each monitoring well at the compliance point;
- B) Any proposed changes to the groundwater monitoring system at the facility necessary to meet the requirements of Section 724.199;

- C) Any proposed additions or changes to the monitoring frequency, sampling and analysis procedures or methods, or statistical methods used at the facility necessary to meet the requirements of Section 724.199;
- D) For each hazardous constituent detected at the compliance point, a proposed concentration limit under Section 724.194(a)(1) or (a)(2), or a notice of intent to seek an alternate concentration limit under Section 724.194(b).

As an alternative to performing the above Appendix I sampling, the permittee also has the option of demonstrating that the confirmed statistically significant increase is from a source other than the landfill or the increase resulted from an error in sampling, analysis, or evaluation. In this instance, the permittee will proceed as follows:

1. Notify the Illinois EPA in writing that they intend to make this demonstration. This notification must be submitted to the Illinois EPA within seven (7) days of the date that the increase is discovered;
2. Submit a report to the Illinois EPA which demonstrates that a source other than a regulated unit caused the increase, or that the increase resulted from error in sampling, analysis, or evaluation. This report must be submitted within ninety (90) days of the date that the increase is discovered;
3. Submit to the Illinois EPA an application to make any appropriate changes to the Groundwater Detection Monitoring Program (if any). This application must be submitted within ninety (90) days of the date that the increase is discovered;
4. Continue to monitor in accordance with the detection monitoring program at the facility.

If the above demonstration is denied by the Illinois EPA, then the permittee would then be obligated to perform the Appendix I sampling referenced above. In addition, the permittee is not relieved of the requirement to submit a permit modification to begin a compliance groundwater monitoring program, unless the above demonstration successfully shows that the source of the statistical increase was related to a source other than the regulated unit or the increase resulted from error in sampling, analysis, or evaluation.

Shallow Zone

The procedures for evaluating for a statistically significant increase in the shallow zone will be the same as the procedures implemented for the shallow drift aquifer, except that the statistical analysis will be performed on an intrawell basis, rather than an interwell basis.

C.7 Compliance Monitoring Program

As discussed above, no documented impacts have been identified in the groundwater to date and the facility is implementing a detection groundwater monitoring program. Therefore, a compliance monitoring program is not required and this section is not applicable.

C.7.1 Description of the Monitoring Program

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.1.1 Waste Description

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.1.2 Concentration Limits

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.1.3 Compliance Point

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.1.4 Compliance Period

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.2 Alternate Concentration Limits

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.2.1 Adverse Effects on Groundwater Quality

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.2.2 Potential Adverse Effects Hydraulically Connected Surface Water

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.3 General Monitoring Program Requirements

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.4 Groundwater Monitoring System

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.5 Description of Sampling and Analysis Procedures

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.6 Background Quality

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.7 Statistical Evaluations

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.8 Evaluation of Groundwater Surface

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.9 Annual Appendix I

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.7.10 Statistically Significant Increases

As indicated above immediately under the heading Section C.7, a compliance monitoring program is not required. Thus, this subsection is not applicable.

C.8 Corrective Action Program

As mentioned above, presence of hazardous constituents has not been identified in the groundwater. Therefore, a corrective action program is not required, and this section and all subsections are not applicable.

C.8.1 Description of Corrective Action Program

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.1.1 Characterization of Contaminated Groundwater

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.1.2 Concentration Limits

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.1.3 Compliance Point

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.1.4 Compliance Period

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.1.5 Construction Detail

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.1.6 Effectiveness of Corrective Action

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.2 Alternate Concentration Limits

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.2.1 Adverse Effects on Groundwater Quality

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.2.2 Potential Adverse Effects on Hydraulically Connected Surface Water

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.3 Corrective Action Plan

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4 Groundwater Monitoring Program

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.1 General Monitoring Program Requirements

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.2 Groundwater Monitoring System

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.3 Description of Sampling and Analysis Procedures

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.4 Background Quality

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.5 Statistical Evaluations

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.6 Evaluation of Groundwater Surface

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.7 Extension of Compliance Period

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.8 Effectiveness of Corrective Action

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.8.4.9 Evaluation of the Corrective Action Program

As indicated above immediately under the heading Section C.8, a corrective action program is not required. Thus, this subsection is not applicable.

C.9 Reporting Requirements

Groundwater monitoring, testing, and analytical data obtained as part of the Detection Monitoring Program described above will be compiled in the facility operating record. The data will include all computations, calculations, and related statistical evaluations.

The groundwater samples will be collected to meet the requirements of the Detection Groundwater Monitoring Program described above. The applicable data will be submitted to the Illinois EPA in accordance with the following schedule:

| Samples to be Collected During The Months of | Results Submitted to the Illinois EPA by the Following | Parameters |
|--|--|---------------------------|
| April – May | July 15 | VOCs, Metals, and Cyanide |
| October – November | January 15 | VOCs |

Groundwater surface elevation data and the field parameters (pH, specific conductance, temperature, and turbidity) shall be collected each sampling event and submitted to the Illinois EPA in accordance with the schedule included in the above table. The groundwater flow rate and direction in the shallow drift aquifer will be reported annually by July 15 each year.

The Permittee shall report the surveyed elevation of the top of the well casing “stick-up”, referenced to MSL in accordance with the following schedule:

1. For wells identified in **Table C-3**, every five years (during the annual sampling event); or at the request of the Illinois EPA; or whenever the elevation changes.
2. For any new wells, at the time of installation and reported in the as-built diagrams, subsequent measurements shall be made every five years (during the annual sampling event), or at the request of the Illinois EPA, or whenever the elevation changes.

Elevation of the bottom of each monitoring well, as referenced to MSL, is to be reported every five years or more frequently, if the dedicated pumps are removed from the monitoring wells for maintenance. This measurement shall be taken during the annual sampling event.

D. PROCEDURES TO PREVENT HAZARDS

D.1 Security

D.1.1 Waiver From Security Requirements

A waiver from applicable security requirements is not being sought, therefore this section is not applicable.

D.1.2 Restricting Entry to the Facility

Since the facility is closed and regularly undergoing post-closure care and maintenance, the activities near the unit will be minimal. Activities will be limited to those inspection, monitoring and repair/maintenance activities necessary during post-closure. The individuals involved in these planned activities will be aware of the hazardous nature of the closed site. The potential for exposure to hazardous waste or hazardous waste constituents to unknowing persons or livestock will be minimal, since no wastes are exposed.

Multiple security controls deter unknowing and unauthorized entry to the site. The perimeter of the facility is fenced to control entry. The fence is routinely inspected, and repairs are made as necessary to maintain an adequate barrier. Traffic enters and exits the Zion 1A Landfill through the main gate on Green Bay Road. When the site is open, this gate is continuously monitored. The gate is locked when the site is closed. Other gates, located along 9th Street and onto Kenosha Road (see **Figure B-2**), are kept locked and are only opened by permittee personnel for planned (e.g. construction, leachate removal) or emergency activities.

Because of normal wear, it is anticipated that annual maintenance will be required to provide a functional security system. Therefore, fencing repair and replacement will be performed on an as-needed basis. Chains, locks and signs will be checked at least annually to assess whether replacement or maintenance is needed.

Finally, because the solid waste landfill on the eastern side of the property will continue to be active throughout much of the hazardous waste unit's post-closure care period, site personnel will be present for a great portion of each operating day. The presence of trained, attentive employees will provide added security for the closed Site 1A facility.

D.1.3 Warning Signs

Signs are posted at all gates to the facility. Additional signs are located along the perimeter of the Site 1A facility. The signs, which have been created to be legible from 25-feet, contain the following information:

DANGER – UNAUTHORIZED PERSONNEL KEEP OUT

Signs that are not be legible from a distance of 25 feet will be replaced on an as needed basis.

D.2 Equipment Requirements

D.2.1 Waiver

The permittee is not requesting a waiver of the preparedness and prevention requirements of Subpart C of 35 IAC 724.

D.2.2 Internal Communications

Because the facility is closed and no longer receiving hazardous waste, the equipment maintained on-site to prevent hazards is relatively minimal. Buildings are equipped with methane detectors. The primary means of internal and external communication on-site during the post-closure period is by cell phone. Personnel performing post-closure compliance activities at Site 1A will have a cell phone with them. Fire extinguishers are provided in buildings maintained by the owner and on construction equipment.

D.2.3 External Communications

When post-closure activities are required on-site, the staff performing the work carry cell phones, which can be used in the event of an emergency.

D.2.4 Emergency Response Equipment

A fire extinguisher is located in the area of the secondary containment tank and blower building. Spill control and decontamination equipment are also stored in a building located near the tank.

The facility owner maintains supplies of other emergency equipment on-site. This equipment includes, but is not limited to, the following:

1. Additional fire extinguishers located throughout each building at the facility, around fuel storage areas, and on mobile landfill equipment.
2. Landfill equipment capable of moving and placing earth material.

For emergency communication, cell phones are used. These devices are not kept on-site and is instead maintained by individual contractor/operator employees.

D.2.5 Water for Fire Control

According to 35 IAC 724.132, facilities must be equipped with certain emergency preparedness equipment “unless the owner or operator demonstrates to the Agency that none of the hazards posed by waste handled at the facility could require a particular kind of equipment specified below.” Item d of 724.132 is “Water at adequate volume and pressure to supply water hose streams, or foam producing equipment, or automatic sprinklers or water spray systems.

The only waste handled at Site 1 Phase A is landfill leachate, which is aqueous and not flammable (as documented by historical analytical data). All the waste in Site 1 Phase A is safely contained under the final cover, thus, it is not susceptible to ignition from lightning strikes or other sources such as sparks from passing heavy equipment.

The gas collection system in Site 1 Phase A is carefully managed to prevent oxygen intrusion into the waste mass, and without oxygen combustion cannot occur. If, in the very unlikely event that the waste did begin to combust, industry-best practice is to smother the combusting waste with soil, not apply water. A stockpile of daily cover soil that can be used to smother a waste fire is maintained by the operating solid waste landfill.

For these reasons, a supply of water for firefighting at Site 1 Phase A is not necessary and the application does not need to address the amount of water in the retention basin.

D.2.6 Personal Protective Equipment

There are a number of general safety rules to ensure safe operations. Employees and contractors are required to wear applicable personal protective equipment while performing their work. The operator does not maintain any buildings at the site that are suitable for storing equipment, therefore, PPE for contractors will be provided by their employer and by BFI for their employees. At a minimum, a high visibility shirt or vest and work boots with a safety toe are required. Smoking on-site is restricted. Contractors performing post-closure services at the site will be provided a fact sheet concerning the nature of the landfill. A sample contractor handout is provided in **Appendix D-1**.

D.2.7 Testing & Maintenance of Emergency Equipment

As described above, the facility is not regularly staffed with personnel and personnel performing the various required post-closure tasks carry cellular telephones for communication. There has been strong cellular service at the facility for many years. Individuals use cell phones throughout the day, so the cell phones are assessed regularly to ensure they are operating properly. Therefore, there is no need for maintenance of facility communications systems.

Emergency equipment maintained at the closed landfill includes fire extinguishers. Except for the fire extinguisher located near the blower building, the operator has no buildings on-site suitable for housing fire extinguishers. However, fire extinguishers are kept in buildings occupied by the owner.

Contractors are required to provide first aid kits to their employees and ensure that they are properly stocked, and expiration dates are current.

D.2.7.1 Equipment Testing

Fire extinguishers are maintained by the owner and operator in accordance with the manufacturer's recommendations.

D.2.7.2 Schedule

See Section D.2.7.1.

D.2.8 Equipment and Power Failure

In the event of a power outage, the leachate extraction pumps within the landfill would cease operation. The automated pumps will operate again, once power has been restored. Portable generators are also available, should auxiliary power be necessary. Potential issues related to operation of the leachate pumps will be identified and corrected in accordance with the inspection requirements described in Section D.3 below.

D.3 Inspection Requirements

Regular maintenance and inspections are performed to preserve the proper functioning of the facility. Depending upon the results from the inspections, maintenance activities may be performed on such things as fence/gates, office buildings, interior roads, utilities, the groundwater monitoring system, and the leachate/gas collection system.

During post-closure care and maintenance, routine inspections will be conducted on the schedule described below in Section D.3.1. Findings made during each inspection will be recorded on the appropriate post-closure inspection log. Copies of the inspection logs will be made part of the operating record and will be kept at the facility or within the facility post-closure files kept at the offices of the post-closure contact. Documentation of repairs performed or replacements required to properly maintain the site will be kept in the inspection logs.

D.3.1 Inspection Log

Throughout the post-closure period, inspections will be conducted to verify that systems supporting the closed facility are functioning properly. The systems specific to the closed hazardous waste landfill include the final cap, the groundwater monitoring network, and the leachate/gas collection system, including the leachate accumulation tank.

Copies of the Post-Closure Inspection Log Forms in **Appendix D-2**. The forms include the date and time of each inspection, the name of inspector, notation of the observations made, and date of required repairs or remedial actions. Alternate documentation forms/spreadsheets may be utilized, if the information listed below is provided.

The following items will be regularly inspected:

Weekly Basis:

Items related to 90-day Leachate Accumulation Tank will be inspected on a weekly basis. According to 35 IAC 725.295, the default inspection frequency under 35 IAC 725 Subpart J for each of the following items is at least once each operating day:

- Overfill/spill control equipment to ensure that it is in good working order;
- Above ground portions of the tank system, to detect corrosion or releases of waste;
- The construction materials and area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system to detect erosion or signs of releases; and
- Data from release detection equipment.

While the default inspection frequency for a 90-day leachate accumulation tank is at least once each operating day pursuant to 35 IAC 725 Subpart J, a weekly inspection frequency may be implemented if: 1) the tank uses leak detection equipment to alert facility personnel to leaks, or 2) the facility implements established workplace practices to ensure leaks are promptly

identified. As described below in Section E.3.3, leak detection equipment has been installed to monitor the leachate level in the tank, which can be monitored remotely over a web-based platform. This equipment also provides notice of potential leaks, in the form of alarm notifications. Consequently, a weekly inspection frequency will be implemented for the 90-day leachate accumulation tank.

If the leak detection system is not functional, then the following workplace practices will be employed to justify implementation of a weekly inspection frequency:

- The liquid level in the tank will be monitored on a daily basis using the on-line remote monitoring system;
- The daily leachate level will be recorded on a log. The log will also indicate whether any leachate was pumped from the tank that day; and
- In the absence of known pumping from the tank into the tanker truck that transports the leachate to the treatment facility, if the leachate level remains either steady or increasing, then the integrity of the tank will be deemed intact. If the level in the tank is found to be decreasing over 2 consecutive days without the scheduled pumping to the tanker truck, then the permittee will perform an inspection of the tank within 24 hours and take necessary steps to address a leak, if the primary tank is found to be compromised.

The following items will be inspected on a Monthly Basis:

- Gas Collection and Control System (GCSS)
- Leachate Collection System (LCS)

The following items will be inspected on a Quarterly Basis:

- Site security
- Vegetation, run-off, erosion
- Runoff control & spill prevention
- Leachate collection system
- Gas collection system
- Blower building

The groundwater monitoring system will be inspected on a Semi-Annual basis.

D.3.1.1 Types of Problems

An unsatisfactory observation during an inspection will initiate a response. The response time and effort will depend on the severity of the condition(s) noted. The problem component will be repaired to a condition suitable to function as it was intended.

The following identifies the types of problems (i.e., malfunctions or deterioration) the inspector will assess during inspections.

Security Devices

The perimeter fencing, entrance gate, locks and signs used to prevent unauthorized access to the closed facility will be inspected for evidence of damage.

Vegetation/Runoff

Cover vegetation and surrounding on-site vegetation will be inspected for evidence of vegetative stress or excessive bare vegetation that could result in erosion issues. The slopes and drainage ditches will also be inspected for evidence of erosion obstruction or discoloration.

Groundwater Monitoring Wells

Groundwater monitoring wells will be inspected for security (locking caps) and evidence of physical damage to the protective casing or surface grouting on an annual basis.

Final Cover

The final cover will be inspected for evidence of cracking, subsidence and/or ponding of stormwater, erosion, presence of burrowing animals or deep-rooted vegetation (such as small saplings or bushes), presence of large areas of dead vegetation, continuity of vegetation, and evidence of discoloration or leachate penetration.

If standing water on the Site 1 Phase A cap becomes a persistent issue within certain areas of the cap (i.e., due to settlement, subsidence, or displacement), the permittee has the option of addressing it in either of following manners:

1. Install additional clay/topsoil and reseed; or
2. Implement the following modified design.

The second option will be to install a tile drainage system above the liner and below the vegetative cover. Cap maintenance activities are conducted at the facility on a routine basis. However, due to the natural settlement of waste within the landfill, various points/pockets on the final cover may settle at a differential rate. This settlement may cause some locations to have a lower elevation that may not allow accumulated precipitation to immediately run off to the storm water detention system. This ponding can remain until evaporation occurs. If needed, the following final cover design revisions are expected to allow expedited removal of the surface rain water through a field type drain tile system.

A drainage tile will be installed in the lower elevation of identified depressions and channeled to an area down slope for discharge. The perforated tile will remove the impounded water at a faster rate than evaporation and maintain a dryer cap in the depressed area. As the drainage tile system drains the water, some visual ponding may be observed. The typical corrective action of adding soil and reseeding can create additional settlement and damage to the vegetative cover due to increased weight and ponding can quickly be reestablished. The approach outlined should remove the impounded water through natural drainage over time and cause minimal cap disturbance and vegetative destruction.

The proposed drainage tile system, along with ongoing inspection and maintenance activities on the final cover will allow for the preservation of the liner and vegetative cover throughout the post-closure period.

The type of final cover vegetation utilized at the Zion Site 1 Phase A facility is predominantly a mixture of grasses, including rye fescue, alfalfa, and sweet clover. To maintain the final cover, it will be mowed a minimum of once annually throughout the post-closure period, or as needed.

If cover maintenance activities are conducted or stressed vegetation is observed, it is expected that periodic reseeding and mulching will be necessary to maintain sufficient vegetation. Areas that require reseeding, mulching, and fertilizing will be performed by qualified personnel. A balanced fertilizer and straw mulch will be employed to assist in establishing vegetation.

Leachate Collection System

Areas that will be specifically monitored include collection pipes, extraction wells, pneumatic pumps, leachate storage tank, and loadout pad, and control panels. Visible piping will be visually inspected to ensure there are no cracks or other integrity issues. The pumps will be monitored

to ensure that they are operational. This will include confirmation that the airline is connected, investigation of the leachate levels in the wells, and inspection of the counter measurement on the pump. The counter measurement will indicate the number of strokes on the pump. A low number of strokes since the last visit plus an elevated leachate level could suggest that the pump has not been operating properly.

If silting or settlement has occurred within the extraction wells, an evaluation will be made of the ability of the well to function as an extraction point. If it is determined that the well can no longer function properly, a new extraction point will be designated and reported to the IEPA.

Extraction pumps will be removed, inspected, cleaned and tested, but only on an as-needed basis. At the same time, depth of the well measurements will be taken to evaluate whether differential settlement or silting has occurred. Silting or settlement will be addressed in a manner appropriate with the degree to which its intended operation is affected. These inspections will be performed on each well individually to allow continued operation of the leachate collection system. Leachate extraction pumps will be replaced if repair becomes unfeasible or impractical.

The facility has constructed a concrete load-out pad adjacent to the existing storage tank containment area. The load-out pad provides spill control during the pumping of leachate from the storage tank. The floor of the concrete pad is sloped to the center of the pad and to a trap drain located on the side of the load-out pad. A trap drain was installed for the routing of spilled material and/or stormwater to a dual-contained fiberglass sump that routes the liquid back to the storage tank. The concrete load-out pad will be inspected for evidence of cracks and the trap drain and sump system will be inspected for evidence of leaks, corrosion and overall integrity.

Cover Elevation Reference Points

The final cover elevation reference points (i.e., survey control points) will be inspected for structural integrity. These reference points may be surveyed periodically during post-closure to assess the degree of subsidence and/or differential settlement that may occur during post-closure (if visual evidence of subsidence and/or differential settlement is observed).

Gas Extraction System

During operation of the gas collection system, inspections of various components of the system will be performed to verify proper operation. The following types of problems will be evaluated during inspections:

- Leaking regulators;
- Leaking airlines;
- Leaky compressor;
- Power issues; and
- Functionality of condensate pumps.

D.3.1.2 Inspection Frequency

The frequency for inspections is listed above in Section D.3.1.1.

D.3.2 Repair Log

An unsatisfactory observation of the conditions will initiate a response. The response time and effort will depend on the severity of the unsatisfactory condition and include such things as:

1. Application, compaction, and grading of clay soils in areas of poor drainage, differential settling, and erosion or installation of the drainage tile system discussed above.
2. Removal of accumulations of sediment and debris from drainage ditches and monitoring wells.
3. Reseeding and mulching in areas of cover vegetation failure.
4. Containment and management of surface contamination and repair of final cover.
5. Replacement or repair of structures and equipment (i.e., monitoring wells or leachate/gas extraction wells and ancillary equipment).

If repairs are required based on results from inspections, they will be documented, including:

1. The item needing repair;
2. The problem identified during the inspection needing repair;
3. Date the inspection occurred;
4. Name of the person conducting the inspection;
5. Name of the person making the repair;
6. Date of repair;
7. Efforts associated with making the repair;
8. Other appropriate comments (if applicable).

Response to observations of unsatisfactory conditions will be described on a Repair Log after remedial action has been completed. An example log is contained in **Appendix D-2**. An alternate format may be utilized, if the same information is documented.

D.3.3 24 Hour Reporting

If an item noted during an inspection reveals any noncompliance with the permit which may endanger human health or the environment, then 1) the appropriate information will be reported to Illinois EPA within 24 hours from the time the Permittee becomes aware of the circumstances and 2) provide a written description of the incident within 5 days of the time the Permittee became aware of the circumstances.

D.3.4 Notification Requirements for Repairs

To expedite the implementation of minor improvements, replacements and repairs to the landfill and to streamline the permitting process, the following notification and approval process is proposed. This language was included in the 2009 permit renewal application and was approved.

Category 1 – Automatic Implementation With Subsequent Notice To Illinois EPA

The first category of activities will be implemented automatically without prior notification to Illinois EPA. This category will include adjustments to the number or location of leachate extraction pumps. It could include repositioning pumps either horizontally to different leachate extraction points or vertically within the same extraction point. For the activity to qualify in this category, the number of pumps must either remain constant or increase. If the number of pumps is to be reduced, then the Category 3 procedures would apply.

A letter or report documenting the revisions made will be provided to the Illinois EPA within 60 days of the implementation of the revisions and also inserted in the operating record.

Category 2 – Automatic Implementation After Providing Notice To Illinois EPA

This category includes activities intended to maintain or enhance the leachate and/or gas piping to increase the removal efficiency. It might include the installation of new forcemain or other piping. These types of activities will be implemented after providing Illinois EPA with typically seven days advance notice in writing. This notice will describe the general nature of the intended activities. If the new forcemain or other piping will result in a reduction in leachate and/or gas removal, it will be subject to the Category 3 procedures.

A construction quality assurance (CQA) Report will be provided to the Illinois EPA within 90 days after the completion of the construction in the field. The CQA Report will be required to include such information as details concerning the lines that were replaced, including material, size of piping, depth, backfill material.

The CQA Report will also be signed and stamped by a professional engineer licensed in the state of Illinois.

Category 3 – Illinois EPA Approval Needed Through Standard Permit Modification Before Proceeding

All other activities not falling into Category 1 or 2 above will require the permittee to follow the standard permit modification procedures, including the temporary authorization process. The proposed revisions will need to be reviewed and approved by the Illinois EPA prior to implementation.

E. POST-CLOSURE REQUIREMENTS

E.1 Information Regarding the Unit Closed as a Landfill

The two fundamental aspects of the design of an appropriate leachate or gas management system in a closed landfill are: (1) the geology/hydrogeology around and beneath the landfill; and (2) landfill construction. The following sections provide information pertaining to the above topics.

E.1.1 General Information Regarding Unit to Receive Post-Closure Care

A scaled drawing showing the location and boundaries of the Zion Landfill Site 1A is included in this Post-Closure Permit Renewal Application as **Figure B-3**. A certified copy of the survey plat and post-closure notice previously filed with the Lake County Recorder are presented in **Appendix E-1**.

Prior to 1991, the Zion Landfill Site 1, Phase A facility accepted hazardous waste for disposal. The landfill closure was performed and a closure certification report was submitted to the Illinois EPA in February 1998. Based upon prior communications with Illinois EPA and according to the Effective Permit, February 1998 is considered the beginning of the 30-year post-closure period for Site 1A.

The Zion Site 1 Phase A has been certified closed by the Illinois EPA, so no Closure Plan is required or included in this Post-Closure Permit Renewal Application. The following sections present the applicable information relevant to the continued implementation of an effective post-closure program at a closed landfill.

E.1.2 Geology and Hydrogeology Around/Beneath the Unit

A description of the geology and hydrogeology around/beneath the unit is presented above in Section C.3 (Historical Hydrogeological Summary).

E.1.3 Characterization of Waste/Contaminated Soil Present in the Landfill Unit

Site 1 Phase A accepted hazardous wastes from a variety of industries, including manufacturing, petrochemical, steel, and utilities. The hazardous characteristics of the wastes accepted included heavy metals and corrosivity. Some waste materials are considered hazardous by default due to the generation process. The facility accepted some of these "listed" wastes as well. Examples of listed wastes accepted include wastewater treatment sludges from electroplating operations;

various solvents used in degreasing; pesticides; laboratory chemicals; and emission control dust from steel production. Much of the hazardous waste managed at the Zion Landfill's Site 1A was from clean-up activities and generally consisted of soil contaminated with lower concentrations of hazardous constituents.

Zion Landfill Site 1A was a co-disposal landfill. Co-disposal, a common practice at that time, disposed of both hazardous waste and solid waste in the same landfill. The quantity of hazardous waste compared to the total quantity of solid, non-hazardous, municipal waste accepted in Site 1 Phase A was relatively small.

E.1.4 Initial Closure Activities

As described below in further detail in Section E.1.5, the Zion Landfill Site 1A was closed in-place with the installation of a final cover system. Large volumes of landfilled waste materials/contaminated soil were not removed as part of initial closure activities. Further, the landfilled wastes did not require stabilization, nor significant quantities of structural fill to establish final contours. The final cover system was installed as described below.

E.1.5 Details Associated with the Closed Unit

The Zion Landfill Site 1, Phase A was the first known portion of the property developed for waste disposal. The first known land permit allowing development of a waste disposal facility was issued in 1975. Although facility files have been searched to locate detailed documentation pertaining to construction of the Site 1A landfill, due to the age of the facility and the scope of the regulations relative to record keeping during landfill construction that occurred in the 1970s, detailed construction completion reports have not been identified. However, various engineering cross sections illustrating the bottom of the landfill have been located. These cross sections indicate "excavation limits" believed to represent the bottom of the landfill. A copy of these cross sections is provided in **Appendix E-2**.

According to these cross sections, the bottom of the landfill is located at an elevation of approximately 750 ft. MSL at the northern portions, sloping to 730 ft. MSL. at the southern end of Site 1A. These drawings also indicate that the sidewalls were built at a 2:1 slope.

Based on the knowledge of the current landfill staff, Site 1A was constructed of a 10-foot thick in-situ clay liner. Two leachate collection trenches were installed. These trenches trend north-south and are connected on the south end of Site 1A. The trenches run from the south end

approximately half way to the north border of Site 1A. Due to the timeframe that these features were installed, no construction details are available.

The following cut-off walls/slurry walls have also been installed:

1. A clay division berm was installed along the east border of Site 1A to separate Site 1A from the adjacent (non-hazardous) Site 2 facility; and
2. A slurry wall was installed along the east and south portions of Site 1A to cut off shallower sand seams.

Additional details pertaining to the above features are presented in the following sections.

The clay division berm was constructed in several different phases as follows:

An approximately 1,200-foot long portion of the berm was constructed in September-October 1991. Fill materials utilized for construction generally consisted of a mixture of gray silty clay obtained from an on-site borrow area. The clayey soil was placed in 6 inch compacted lifts. The total volume of clay soil placed during this phase of the project was approximately 17,500 in-place cubic yards. Construction activities during this phase are documented in the report entitled, Construction Documentation, Winthrop Harbor Clay Division Berm, dated October 1991, prepared by Donohue & Associates, Inc. A copy of this report is included as **Appendix E-3A**.

An approximately 680-foot long section of the clay division berm was installed from May 6 to May 29, 1992. Fill materials utilized for construction generally consisted of a mixture of gray silty clay obtained from on-site borrow areas. The clayey soil was placed in 6 inch compacted lifts. The total volume of clay placed during this phase of the project was 10,170 in-place cubic yards. Construction activities during this phase of the project are documented in the report entitled, Construction Documentation Winthrop Harbor Clay Division Berm Stations 11700N to 12380N Constructed May 6-29, 1992, prepared by SEC Donohue Inc. A copy of this report is included as **Appendix E-3B**.

An approximately 1,120-foot long portion of the clay division berm was installed from May 6 to June 2, 1992. This portion of the clay berm was constructed from the north end of the existing clay berm at Station 11700N, in a southerly direction to approximately Station 10580N. Fill materials utilized for construction generally consisted of a mixture of gray silty clays obtained from on-site borrow areas. Lift thickness was approximately 6 inches compacted. The total

volume of clay soil placed during this phase of construction was approximately 14,153 in-place cubic yards. Construction activities during this phase are documented in the report entitled, Construction Documentation Winthrop Harbor Clay Division Berm Stations 10580 to 11700 Constructed May 6 – June 2, 1992, dated June 1992, prepared by SEC Donohue Inc. A copy of this report is included as **Appendix E-3C**.

Construction of an approximate 680-foot long portion of the clay division berm began on June 2, 1992. This portion of the clay berm was constructed from the north end of the clay berm described above at approximately station 11700N, then proceeding in a northerly direction to approximately Station 12380N. Fill materials utilized for the construction generally consisted of a mixture of gray silty clay obtained from on-site borrow areas. Lift thickness was approximately 6 inches compacted. The total volume of clay soil placed during this phase of construction was approximately 9,826 in-place cubic yards. Construction activities during this phase are documented in the report entitled, Construction Documentation, Winthrop Harbor Clay Division Berm, Stations 11700N to 12380N Constructed June 2-11, 1992, dated June 1992, prepared by SEC Donohue, Inc. A copy of this report is included as **Appendix E-3D**.

A 1,700 foot section of clay division berm was installed on top of the previously installed clay berm during September-October 1992. Fill materials utilized for construction generally consisted of a mixture of gray silty clays obtained from an on-site borrow area. Lift thickness was approximately 6 inches compacted. The total volume of clay soil placed during this phase of construction was approximately 12,827 in-place cubic yards. Construction activities during this phase of construction are documented in the report entitled, Construction Documentation, Winthrop Harbor Clay Division Berm Stations 10800N to 12500N Constructed September 15 – October 2, 1992, dated October 1992, prepared by SEC Donohue Inc. A copy of this report is included as **Appendix E-3E**.

A slurry cut off wall was installed along a portion of the east and south borders of Site 1A. The construction of this slurry cutoff wall took place in two phases. The primary purpose of this slurry trench cutoff wall was to cut off shallower sand seams in the soils along the east and south sections of Site 1A. This in turn, was intended to minimize seepage from shallow saturated sand seams during construction of the Site 1B landfill cells located to the west of Site 1A.

The first phase of the construction is documented in a report entitled, Construction Observation Report for the Winthrop Harbor Waste Management Facility Slurry Trench Cutoff Wall, dated February 1989, prepared by Foth & Van Dyke. A copy of this report is included in **Appendix E-3F**.

The second phase of construction is documented in a report entitled, Construction Observation Report For The Slurry Trench Cutoff Wall, Zion Waste Management Facility, Zion, Illinois, prepared by Mc Donald-Maas Associates, dated January 1991. A copy of this report is included in **Appendix E-3G**.

The above reports and drawings were prepared to demonstrate that construction was performed in substantial compliance with the design. The reports include trench slurry test results, backfill test results, photo documentation, Quality Assurance Manuals, laboratory test results for key-in materials, visual classification of the key-in material for the wall, and laboratory test results for backfill. The drawings depict conditions encountered during the construction of the slurry trench cutoff wall.

After receipt of waste materials ceased, a final cover system was installed at the facility. In 1993 and 1996, auger borings were performed on a 100-foot grid pattern to verify the thickness of clay cap material placed over Site 1A. The thickness of the clay capping material varied from 1.5 feet to 10 feet. Results from these borings were submitted to Illinois EPA with a letter dated May 3, 1996. A modified final cover design was presented to Illinois EPA within a Class 3 Permit Modification prepared by Ries Environmental, Inc., dated July 31, 1996. A copy of this permit modification is included as **Appendix E-4**. The permit modification includes cross sections showing the final cover design installed at the landfill (identified as "Proposed Final Cover" in the July 1996 permit modification) and the final cover design that was permitted prior to July 1996 for both the flatter top portions of the landfill and sideslopes. The revised final cover design presented in the above permit modification was approved in a letter from Illinois EPA dated March 6, 1997.

The installation of the final cover was completed in 1997 and consists of the following layers in ascending order:

- Minimum of two feet of compacted clay;
- 40 mil LLDPE geomembrane (over the upper, flatter portions of the landfill);
- Geocomposite (single-sided on top of landfill and double sided on the sideslopes);

- Protective soil layer generally comprised of a minimum of 2.5 feet of soil overlain by 6 inches of topsoil; and
- Vegetation layer.

The final cover system installation activities performed in 1997 are documented in the report entitled, Construction Acceptance Report For the Site 1 – Phase A Final Closure, Permit No. B-23-M-16, Zion Sanitary Landfill, Zion, Illinois, Dated February 1998, prepared by CQM, Inc. This report includes drawings and cross sections documenting the installation of the final cover system. As this report has previously been submitted to the Illinois EPA, due to its large size (it is comprised of a total of three bound volumes), only the narrative portion of this report is included herein (see **Appendix E-5**).

Various drainage ditches, swales, and diversion berms have also been installed to manage surface water flow around the facility. Details pertaining to these features are also presented in the Construction Acceptance Report referenced above.

E.2 Contact Person

The post-closure contact for the Zion Site 1 Phase A Landfill is:

Mr. Jim Hitzeroth
BFI Waste Systems of North America, LLC
26 West 580 Schick Road
Hanover Park, IL 60133
Phone: (224) 970-1129

The Illinois EPA post-closure permit and associated permit modifications will be maintained at the above location.

E.3 Operation of the Leachate Collection System

A leachate collection system has been installed at the Zion Site 1 Phase A Landfill. The following sections provide a description of the operation of the leachate collection system.

E.3.1 Quality of Leachate in the Leachate Collection System

Samples of leachate have historically been collected and analyzed in accordance with Permit Condition III.G.7. The leachate samples are collected on a rotating basis from EW-2, EW-6, EW-20, and EW-24. Pursuant to Permit Condition III.G.7, the leachate samples are collected annually and analyzed for the constituents listed in 35 Ill. Adm. Code 811, Appendix C., which include:

various inorganic constituents, metals, VOCs, Pesticides/PCBs, SVOCs, Herbicides, and Dioxins. The analytical results from the last several years of sampling are presented in **Appendix E-6**.

The leachate samples will be collected by personnel trained in sampling various environmental media, including groundwater and leachate. The samples will be collected in certified clean sample containers, with the appropriate quantity of chemical preservatives in accordance with SW-846, Test Methods for Evaluating of Solid Waste directly from the leachate extraction wells or tank, if needed. The sampling personnel will wear clean latex or nitrile gloves during sampling, so that representative samples are obtained and for the protection of the sampling staff. The samples will be placed in a cooler on ice immediately upon collection and submitted to an accredited analytical laboratory under standard chain of custody procedures. The samples will be analyzed pursuant to standard SW-846 Methods.

No changes to the current leachate sampling/analysis protocol contained in the current Effective Permit are being proposed.

E.3.2 Leachate Collection System Within the Landfill

In 2000, 23 leachate extraction air actuated pumps were installed on Site 1A to discharge leachate from the wells to the existing leachate management system. The pumps were connected to the air supply and leachate discharge piping via flexible hose. Operation of the pumps is controlled by a 1-inch diameter stainless steel ball valve on the air supply piping and a 1 ¼ inch diameter stainless steel ball valve on the leachate discharge piping. A needle valve installed on the air exhaust line from the pump can also be used to control pump operation. Specifications relating to these pumps are included within the Construction Acceptance Report, Site 1 Phase A Leachate Extraction System, Onyx Zion Landfill, IEPA Site No. 0978020001, RCRA Permit Log No. B-23-M-21, prepared by Weaver Boos & Gordon, Inc., dated September 27, 2000. A copy of this report is contained in **Appendix E-7**.

Immediately after closure of Site 1A in the late 1990s, leachate was transferred off-site by pumping directly from the manhole located on the southeast corner of Site 1 – Phase B. In 2000, a concrete pad and containment system was installed in the loadout area next to the leachate above ground storage tank located in the southwest corner of the site, near the landfill gas flare system. Details pertaining to the installation of this system are presented in the above report dated September 27, 2000.

Further upgrades to the leachate collection system performed in 2000 included the installation of additional leachate discharge piping and air supply line from the manhole to EW-21. Prior to that time, leachate was collected in the manhole, and to conduct off-site disposal operations, the tanker truck had to pull onto the landfill and pump the leachate directly out of the manhole. A pneumatic pumping system was installed in the manhole to allow the leachate to be pumped from the manhole to the existing leachate extraction system forcemain located adjacent to EW-21. This allowed the leachate to be collected in an above ground storage tank and unloaded on a concrete loadout containment pad. Additional details pertaining to these upgrades are provided on the drawing entitled, Site 1 – Phase A Forcemain Profile and Details included in **Appendix E-8**. Although these upgrades were installed in 2000, the Illinois EPA needed to approve the change to the permit before the change could be included in the permit. A Temporary Authorization request and Class 3 permit modification request was submitted to Illinois EPA, both dated February 24, 2003. The Temporary Authorization was approved by Illinois EPA in a letter dated May 10, 2006.

A cross-section of the manhole is included in **Appendix E-8**. Cleanouts were installed on the new forcemain line installed in 2006 on the northwest corner of Site 1B, Cell No. 2 and between the two above ground storage tanks.

In 2006, approximately 540 feet of leachate forcemain that routes leachate from Site 1A to the hazardous waste storage tank was replaced when efforts to jet out a clog in the line were unsuccessful. Prior to abandonment, the area around the witness pipe of the 6"/3" dual contained forcemain was excavated for cleaning. Northern Plant Services was contracted to jet out the forcemain. As the pipe was being cleaned, any liquids or solids removed were pumped into a tanker truck for disposal. After approximately six hours of jetting, a down-well camera was used to reveal that blockage was still present and deemed too hard to remove. After jetting attempts were complete, the 3" line was triple rinsed with clean water to remove any remaining loose material with the liquid being pumped into the on-site hazardous waste storage tank. A 6"/3" end cap was then welded onto each end of the pipe prior to backfilling over the now abandoned pipe.

The trench for the replacement forcemain was dug around the west side of the gas-to-energy building and in between two existing leachate storage tanks on the south side of the blower building. The trench was excavated approximately 4.5 feet deep.

The new leachate forcemain was constructed from dual-walled HPDE 6"/3" SDR 17/11 pipe. Pipe and fittings were butt-fusion welded in accordance with industry standards for HPDE pipe construction. Air pressure tests were conducted on the HDPE 6"/3" SDR 17/11 piping to verify the integrity of the butt-fusion welds and mechanical connections. After welding, the piping was pressurized to forty (40) pounds per square inch (psi) with an air compressor and maintained for a minimum duration of one (1) hour. WCG CQA personnel observed the air pressure testing.

The HDPE 6"/3" SDR 17/11 forcemain was placed in the trench. Prior to backfilling, the north end of the line was tied into the existing forcemain and the east end connected to the hazardous waste storage tank.

A cleanout was also installed where the new line tied into the existing line on the northwest corner of Site 1B, Cell No. 2. A report documenting the above construction activities dated July 11, 2006 was submitted to the Illinois EPA.

In 2007, the northern part of Site 1, Phase A was not moving leachate as efficiently as projected, so the leachate forcemain was extended. New leachate forcemain was installed within the final cover between EW-2 and EW-28. The new forcemain was tied into EW-10 to allow the removal of leachate from both the north and south sides of the unit. These upgrades to the leachate collection system were documented in a report entitled, Construction Acceptance Report, Improvements to Leachate Collection System, Zion Site 1, Phase A Landfill, dated December 2009, prepared by Weaver Boos Consultants. A copy of this report is contained in **Appendix E-9**.

A portion of the leachate forcemain piping which carried leachate from leachate extraction wells within Site 1 Phase A to the leachate accumulation tank was replaced in November 2010. The upgrades to the leachate collection system were implemented in response to a blockage discovered during a routine inspection in October 2010. Given that attempts to jet the line and remove the blockage were not successful, approximately 1,910 feet of replacement forcemain was installed. The replacement consisted of a dual-contained line serving extraction wells EW-20 through EW-28. The previous forcemain was disconnected and the lines capped. The CQA Report documenting this upgrade to the leachate collection system is presented in **Appendix E-10**.

A portion of leachate forcemain transmitting leachate from Site 1 Phase A across the northern boundary of Site 1 Phase B to the leachate accumulation tank was replaced in November 2015. These upgrades were implemented in response to restricted leachate flow discovered within a

section of east-west trending piping between Site 1B Cell No. 1 and Site 1B Cell No. 2. After repeated attempts at clearing the blockage(s) via jetting, it was decided that this section of approximately 625 feet of forcemain would be abandoned and replaced. The new leachate forcemain was constructed from 3" x 6" dual contained HDPE pipe. The CQA Report documenting these upgrades to the leachate collection system is presented in **Appendix E-11**. The documentation report was approved by Illinois EPA with the issuance of Permit Mod No. 6, dated June 23, 2016.

Another section of leachate forcemain was replaced in 2017 in response to the identification of a blockage that did not allow leachate to be transmitted from the closed landfill to the leachate accumulation tank. Approximately 320 feet of replacement leachate forcemain was installed, old forcemain piping was abandoned, and repairs were made to a leachate forcemain junction. The CQA Report documenting these upgrades to the leachate collection system is presented in **Appendix E-12**. The documentation report was approved by Illinois EPA with the issuance of Permit Mod No. 7, dated March 12, 2018.

A plan view of the leachate collection system as it is designed to date is included in **Appendix E-13**. The plan view details the existing leachate collection system, including the piping locations, leachate extraction wells, cleanouts, one manhole, leachate storage tank and loadout, and the blower building.

The facility is not subject to the requirements of 35 IAC 724.401(c), which include a top liner, composite bottom liner, and a leak detection system (LDS). Therefore, information pertaining to the requirements of 35 IAC 724.401(c) are not applicable to this Permit Renewal Application.

E.3.3 Leachate Collection System Outside Landfill

Leachate is extracted from wells by a submersible pump and drains to the manhole where it is pumped back into the forcemain to the 8,000 gallon dual-walled above ground tank (see **Figure E-1**). Gas condensate is routed to one of two condensate sumps and then pumped to the storage tank.

This tank is considered a 90 day accumulation tank under 35 IAC 722.117 (Conditions for Exemption for a Large Quantity Generator That Accumulates Hazardous Waste). This regulation allows a large quantity generator (LQG) to accumulate hazardous waste in a tank without a RCRA Permit, if:

1. The hazardous waste is only present in the tank for 90 days or less; and
2. The LQG complies with the applicable requirements of 35 IAC 725 Subpart J, except Closure and Post-Closure Care, Waste Analysis and comply with applicable requirements of Subparts AA, BB, and CC.

E.3.3.1 Leachate Tank – 90 Day Storage Requirement

The first condition for exemption of the above tank is the 90 day accumulation requirement. The landfill leachate accumulating in the tank can only remain in the tank for no more than 90 days pursuant to 35 IAC 722.117(a). The leachate collection system is designed to pump leachate from a collection sump into the accumulation tank whenever leachate levels reach a pre-determined level within the leachate extraction wells. Thus, leachate has the potential to flow continuously into the accumulation tank.

While the regulations do not offer explicit detail on how the 90 day requirement shall be maintained and documented for continuous flow process tanks, United States Environmental Protection Agency (USEPA) has offered written guidance on the subject. The following procedures included in a letter found on USEPA's RCRA On-Line Database (14763) from USEPA to National Paint and Coatings Association dated February 16, 2007 will be utilized to demonstrate compliance with the 90 day storage requirement. As stated in this letter:

...In the case of hazardous wastes flowing through tanks continuously, there is a means of demonstrating when a tank is 'emptied' within 90 days ... that would not require completely emptying the tank, and that may be more suitable for tanks with continuous flow. More specifically, a mass balance approach (i.e., turnover approach...) can be used for continuous flow tanks... The key parameters in this mass balance approach are the volume of the tank (e.g., 6,000 gallons), the daily throughput of hazardous waste (e.g., 300 gallons per day) and the time period the hazardous waste 'resides' in the tank. In this example, the hazardous waste entering the tank would have a residence time of 20 days (6,000 gallons/300 gallons per day = 20 days) and meet the requirement of [40 CFR 262.17(a)(2)] since the hazardous waste has been in the tank for less than 90 days [EPA's RCRA On-Line Database 14763].

The above letter from USEPA also discusses the types of records that a generator must maintain to demonstrate compliance with the 90-day time limit:

Large quantity generators accumulating hazardous wastes through a continuous flow process must also demonstrate that the hazardous waste has not been stored for more than 90 days. This may be achieved by use of inventory, or some form of accounting and monitoring data. For example, a generator could confirm that the volume of a tank has been emptied every 90 days by recording the results of monitoring equipment both entering and leaving the tank. This recordkeeping, in conjunction with the tank volume, would enable inspectors, as well as facility personnel to demonstrate compliance with [40 CFR 262.17(a)(2)].

The above guidance indicates that the quantity of leachate flowing into the tank should be kept in the operating record to allow for documentation of compliance with the 90 day accumulation requirement. To demonstrate compliance with the 90 Day Storage Requirement, the quantity of leachate in the tank will be tracked on the log contained in **Table E-2** attached. The information from the remote leachate level monitoring equipment installed on the leachate accumulation tank (described below in Section E.3.3.2) can be utilized to attain the data included on the form included as **Table E-2**. Alternately, facility personnel may attain the tank level data on-site. One entry will be made to the log each week. To comply with the 90 day storage requirement, a minimum of 8,000 gallons of leachate must flow through the tank on average, every 90 days.

E.3.3.2 Leachate Tank – Applicable Subpart J Requirements

The second condition for exemption of the above existing tank as stated in 35 IAC 722.117 is that the LQG must comply with the applicable requirements of Subpart J (35 IAC 725 – Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities). The following presents the major applicable Subpart J requirements, followed by a description of how compliance will be attained.

The Subpart J requirements are subdivided into requirements for “existing tanks” and “new tanks”. The 2019 amended regulations did not modify the definitions of “existing tank” and “new tank”. Under the original RCRA regs, tanks holding hazardous waste before the effective date of the original Subpart J regs (i.e., 1980-81) were deemed “interim status tanks”, while all other tanks needed a permit to hold hazardous waste. The RCRA regulations for hazardous waste tanks were significantly amended in 1986, when the terms “new” and “existing” tank were introduced. Under the 1986 amendments, “new” tanks were defined as tanks that started holding hazardous waste after the effective date of the 1986 rule (July 14, 1986). Based on the above regulations

and guidance, the Zion Site 1A leachate accumulation tank is considered a “new” tank, as it started accumulating hazardous waste in 2000.

Design/Installation of Tank

A new tank is to meet the design and installation standards of Subpart J, 35 IAC 725.292 - Design and Installation of New Tank Systems and Components. These standards require that the foundation, structural support, seams, connections, and pressure controls (if applicable) are adequately designed and that the tank system has sufficient structural strength, compatibility with the wastes to be stored or treated, and corrosion protection so that it will not collapse, rupture, or fail. Further, the owner or operator must obtain a written assessment reviewed and certified by a qualified Professional Engineer (P.E.), in accordance with 35 IAC 702.126(d), attesting that the system has sufficient structural integrity and is acceptable for the storing and treating of hazardous waste. The assessment performed by the P.E. must include the applicable information contained in 35 IAC 725.292.

To comply with the above requirements, a “Hazardous Waste Tank Assessment” was performed by a licensed P.E. in 2014. A copy of this report is attached as **Appendix E-14**. The following information is presented in this report:

- Introduction [40 CFR 264.192(a)];
- Design standards [264.192(a)(1)];
- Hazardous characteristics of the waste [264.192(a)(2)];
- Factors affecting the potential for corrosion [264.192 (a)(3)];
- Inspection during installation [264.192(b)];
- Tightness testing [264.192(d)];
- Ancillary equipment [264.192(e)];
- Containment and detection of releases [264.193], which indicates that the tank; and
- Certification Statement.

The above February 2014 Report from ST Environmental provides an assessment of the tank system. Section 9.0 of the above document certifies the following:

In accordance with the review conducted, the existing tank system has sufficient structural integrity and is acceptable for continued storage of the hazardous waste discussed herein in accordance with 40 CFR 264, Subpart J.

Thus, the February 2014 Report from ST Environmental satisfies the above requirement for a written tank assessment certified by a P.E.

Secondary Containment

Subpart J, 35 IAC 725.293 includes standards for containment and detection of releases. According to this regulation, the secondary containment system must be as follows:

- Designed, installed, and operated to prevent migration of wastes or accumulated liquid out of the system to the soil, groundwater, or surface water at any time during the use of the tank system; and
- Capable of detecting and collecting releases and accumulated liquids until the collected material is removed.

Additional information is presented in 35 IAC 725.293(c) providing more details as to how the above requirements are to be satisfied. According to 35 IAC 725.293(c), the secondary containment system must be at a minimum as follows:

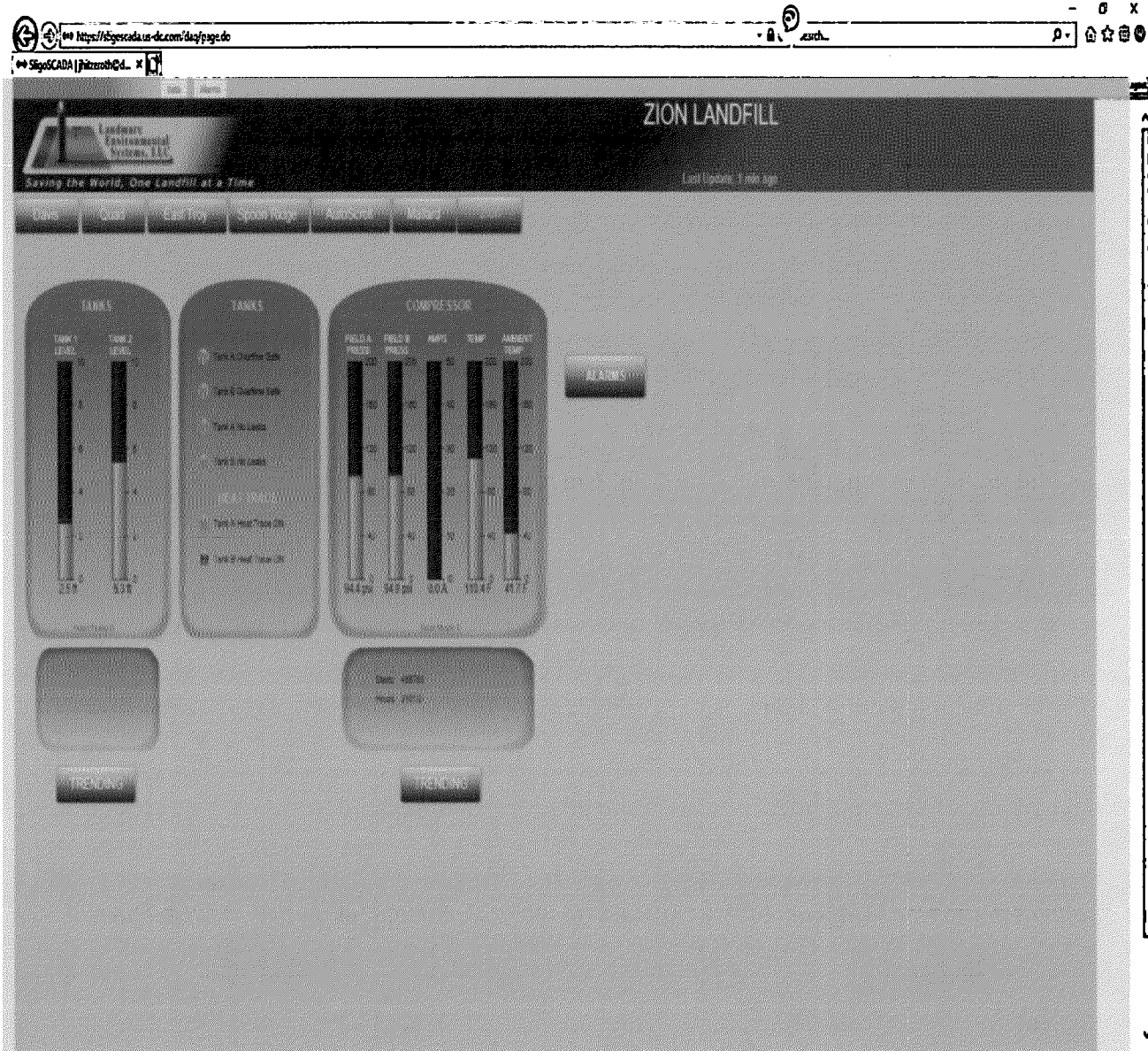
1. Constructed of or lined with materials compatible with the wastes to be placed in the tank system and of sufficient strength and thickness to prevent failure due to pressure gradients, physical contact with the waste to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;
2. Placed on a foundation or base capable of providing support to the secondary containment system and resistance to pressure gradients above and below the system and capable of preventing failure due to settlement, compression, or uplift;
3. Provided with a leak detection system that is designed and operated so that it will detect the failure of either the primary and secondary containment structure or any release of hazardous waste or accumulated liquid in the secondary containment system within 24 hours, or as otherwise provided in the RCRA permit if the operator has demonstrated to the Agency, by way of permit application, that the existing detection technology or site conditions will not allow detection of a release within 24 hours;
4. Sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills, or precipitation. Spilled or leaked waste and accumulated precipitation must be removed from the secondary containment system within 24 hours or as otherwise provided in the RCRA permit if the operator has demonstrated to the Agency, by way of permit application, that removal of the released waste or accumulated precipitation cannot be accomplished within 24 hours.

As documented in the engineer's report contained in **Appendix E-14**, the existing Zion Site 1A leachate tank complies with items 1, 2, and 4 above. Item 3 (leak detection) is discussed below.

Leak Detection System

Pursuant to 35 IAC 725.293(c)(3), the secondary containment system must be provided with a leak detection system meeting the requirements listed in Item 3 above. A remote monitoring system meeting the above requirements was installed at the leachate accumulation tank in 2020. This system allows the liquid level in the tank to be monitored remotely. One foot of leachate equates to approximately 1,000 gallons. The system also provides an automatic notification, if issues with the tank system are detected. A screen shot of the automated tank monitoring, as shown from the on-line platform, is presented below:

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The Site 1A tank is "Tank 1". The "Tank A Overflow Safe" indicator is tripped based on a sensor monitoring the overflow pipe from the tank to the secondary containment. The Tank A "No Leaks" indicator provides an alert based on a sensor located in between the dual tank wall containment if the interior wall is breached and liquid is detected in the space between the primary and secondary tank walls.

General Tank Operating Requirements

The leachate accumulation tank will be operated in accordance with 35 IAC 725.294. The contents of the tank will not cause the tank, its ancillary equipment or secondary containment system to rupture, leak, corrode, or otherwise fail. The permittee will also use appropriate controls and practices described herein to prevent spills and overflows from the tank or secondary containment systems, including the following:

- Spill prevention controls;
- Overfill prevention controls; and
- Maintenance of sufficient freeboard in the secondary containment area to prevent overtopping.

While no leaks or spills have occurred since the tank system was first utilized in 2000, if a leak or spill occurs, then the requirements of 35 IAC 725.296 would be followed. This includes notification of the Illinois EPA within 24 hours in the event of a release to the environment (i.e., a release not sufficiently contained by the secondary containment system). If the tank system is deemed unfit for use, it will be removed from service and the permittee will satisfy the following requirements:

- Flow of leachate into the tank will be ceased so that the cause of the release can be assessed;
- Leachate will be removed from the tank;
- A visual inspection of the release will be performed to prevent further migration and visibly contaminated soil or surface water will be removed and properly disposed;
- The appropriate notifications and reports will be performed or produced;
- The tank system will either be closed or repaired; and
- Major repairs will be certified.

Labeling/Marking of Tank

Under 35 IAC 722.117(a)(5)(B), the leachate accumulation tank is labeled with the words "Hazardous Waste".

The tank is also marked/labeled with an indication of the hazards of the contents. The leachate is not characteristically hazardous under RCRA, so will not be labeled as ignitable, corrosive, reactive, or toxic. Example labels may include, but are not limited to:

- Hazard communication consistent with Subpart E (Labeling) and Subpart F (Placarding) of 49 CFR 172; or
- A hazard statement or pictogram consistent with 29 CFR 1910.1200 (Hazard Communication); or
- A chemical hazard label consistent with NFPA 704.

To satisfy the above requirements, labels are present on the tank with the 4-Digit DOT Placard UN 3082 and Hazard Class 9, which signifies Environmentally Hazardous Substances, Liquid, N.O.S. This placard is recommended for frequently transported hazardous materials by truck, rail, or aircraft.

Emergency Procedures

The permittee will comply with the 35 IAC 722 Subpart M - Preparedness, Prevention and Emergency Procedures for LQGs. The applicable regulations state that the LQG must maintain and operate the tank in a manner that minimizes the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to the air, soil, or surface water which could threaten human health or the environment. To satisfy these requirements, various equipment is provided near the tank. It is described in Section D.2.

Leachate and gas condensate loadout is conducted on an as needed basis from a concrete loadout pad located near the tank. The 40-foot by 14-foot concrete pad includes footings at a depth of 4.5 feet and four foot deep concrete bearing walls. It is sloped to center where it drains through a floor drain. The pad provides spill control when transferring the contents of the on-site storage tank to the tanker trucks for off-site disposal. The floor of the pad drains to a sump which contains an automatic float-controlled pump that conveys liquid from the pad to the tank. The combined containment capacity of the pad, sump and vault is approximately 6,000 gallons, which is sufficient containment for an over-the-road tanker truck. Drawings of the storage tank design and drawings of the loadout pad are included as Figure 4 of 4 in the Construction Acceptance Report included in **Appendix E-7**.

The dual contained sump has an automatic float-controlled pump which conveys liquid to the hazardous waste tank. The pump has a manual shutoff system that is used when loading activities occur. This shutoff is used in the event of any emergency measures or repair activities.

When leachate from the tank is being transferred from the tank to the tanker for transportation to the treatment facility, personnel present will have a working cell phone with them. The tanker truck is loaded on a concrete load out pad that collects spilled liquids (if spills occur) in a sump and routes the liquid back to the tank. Therefore, the chance of a release to the environment during the transfer of leachate is remote.

A Contingency Plan has also been developed for the facility. The content of the Contingency Plan is based upon the requirements contained in 35 IAC 724 Subpart D, Sections 724.150 through 724.156. The Contingency Plan includes the attempts to make arrangements with local police, fire, and other emergency response personnel, taking into account the characteristics of the landfill leachate that accumulates in the tank. It will be implemented in the event of a fire, explosion, or release from the tank that could threaten human health or the environment.

According to 35 IAC 722.117(a)(7), training must be provided to facility personnel in two primary areas:

1. Hazardous waste management procedures; and
2. Emergency response (including Contingency Plan implementation).

The above training may be attained from either classroom instruction, online training (e.g., computer-based or electronic) or on-the-job training that teaches them to perform their duties in a way that ensures compliance with 35 IAC 722.117(a)(7). The training program will be led by a person trained in hazardous waste management procedures.

Facility personnel must successfully complete the training program presented herein within 6 months after the date of their employment, assignment to the facility, or assignment to a new position at the facility, whichever is later. Employees must not work in unsupervised positions until they have completed the training described herein. Facility personnel must take part in an annual review of the initial training program described herein.

Records documenting the above training on current personnel will be kept in the facility record until closure of the tank. Training records on former employees will be kept for at least three years from the date the employee last worked at the facility. The training program will include the elements described below.

Because the facility is a closed former hazardous waste landfill, operations occurring on-site are limited to occasional operation and maintenance (O&M) activities. Consequently, only two

permittee job positions have been assigned regular duties at the facility. The two job titles involved in performing on-going operation and maintenance activities associated with the leachate accumulation tank include:

- Environmental Technician, performed by site employee Roger Abel or his successor; and
- Environmental Manager, performed by BFI employee Jim Hitzeroth or his successor.

Job descriptions for these two job titles are presented in **Appendix E-16**. Both of the above job titles will receive the training described below.

Hazardous Waste Management Procedures Training:

This portion of the training program will be performed in a way that allows the facility to comply with the RCRA regulations. Although the likelihood of permittee employees directly contacting the landfill leachate is low, the training will allow workers to safely handle hazardous wastes, if needed. The training will cover hazardous waste management procedures relevant to the positions that the employees hold at the facility.

The landfill leachate accumulating in the tank is regularly pumped from the tank to tanker trucks. No direct contact with the leachate occurs during this process. However, if the need arises for direct contact with the leachate, then proper personal protective equipment (PPE) shall be utilized by employees.

Emergency Response Training:

The emergency response training provided to the above employees will include the Hazardous Waste Operations and Emergency Response (HAZWOPER) Training under 29 CFR 1910.120, including 40 hours of initial training and annual 8 hour refresher training. The 8 hour refresher training will satisfy the requirements for annual refresher training presented in 35 IAC 722.117(a)(7)(C). Emergency response training will also include training tailored more specifically towards the operation and maintenance activities performed related to the 90-day leachate accumulation tank. This facility-specific training will focus upon reviewing the contents of the Contingency Plan. An outline of the topics to be covered during the Contingency Plan training is as follows:

- Procedures to follow in case of a fire;
- Procedures to follow in case of an explosion;
- Procedures to follow in case of a release;

- Procedures to follow in case of an injury;
- Procedures to follow during site evacuation;
- Responsibilities of the Site Emergency Coordinator; and
- List of whom to call in an emergency.

E.3.4 Management of Leachate Collection System (LCS)

The leachate is collected from a series of extraction wells and ultimately routed to a leachate collection tank described in the section above. Leachate collected in the tank is regularly removed via tanker truck and transported to an off-site treatment facility. Piping and instrumentation diagrams are included in **Appendix E-13**.

As mentioned above in Section E.1.5, two leachate collection trenches were installed on the bottom of the Site 1A landfill. They trend north-south and drain towards the south end of Site 1A. Extraction wells are also used to extract landfill leachate. The vertical extraction wells gravity drain leachate to the manhole located southwest of Site 1A shown on the Sheets in **Appendix E-13**. From the manhole, the leachate is pumped into the forcemain that routes leachate to the above ground tank. The boring logs for the extraction wells are included in **Appendix E-17**. The Extraction Wellhead Details are included in the Figures section contained in the Construction Acceptance Report included herein as **Appendix E-7**.

A table detailing the following extraction well specifications is included as **Table E-1**:

- Northing/Easting coordinates;
- Bottom of landfill at each location;
- Total feet at drilling;
- Reported and measured well depth; and
- Depth to pump top and bottom.

As shown in this table, the bottom of the extraction wells are generally located near the bottom of the landfill and the pumps are typically set within one foot of the bottom of the extraction wells. The leachate extraction pumps are set to pump whenever liquid reaches the top of the pump (which are typically 3 feet long).

The quantity of leachate hauled from the accumulation tank will be kept in the operating record. The contents of the tank are unloaded and transported by a licensed hazardous waste transporter. During loading of the tanker trucks, the following procedures will be implemented:

- Trucks will be parked in the load out pad area as level as possible;
- Valves will be checked for tightness before removing caps from connections;
- All hose or pipe connections will be secure to prevent potential spills or leaks;
- During loading, pipes and hoses will be protected from traffic movement that could cause breakage or pulling on the lines;
- Supplies of absorbent materials and equipment will be available to control, contain and cleanup spills;
- The truck driver and/or facility personnel will be present during the loading process at all times; and
- Personnel involved in leachate loading operations will wear proper protective clothing.

The Site 1 Phase A leachate is currently transported off-site in 5,000 gallon tanker trucks by the following transporter:

ERC Midwest Carriers
360C South Curtis Rd.
West Allis, Wisconsin 53214
Transporter's ID No. UPW508337MN
USEPA Id No. WIR000140988
Illinois Special Waste Hauling Permit No.: 5363

Copies of the manifests for shipment of the hazardous waste offsite are maintained in the post-closure operating record. The manifests detail the date of shipment, amount hauled, hauling facility, and final treatment and/or disposal facility.

Currently the leachate is transported off-site to the following facility:

CID Recycling and Disposal Facility
P. O. Box 1309
138th and Interstate 94
Calumet City, Illinois 60409

The leachate (wastewater) generated from Site 1A is classified as a F039 listed hazardous waste. The CID facility is a licensed treatment, storage and disposal facility, and CID treats the leachate through a biological treatment method and removes the solids from the waste stream prior to disposal.

Another leachate transporter and/or disposal facility may be utilized in the future, so long as they have attained the proper licenses and permits.

The leachate level within the tank will also be monitored. As designed, the ball float within the leachate tank causes the leachate extraction system to automatically shut down when the leachate reaches a certain level within the tank. This measure was implemented to prevent the tanks from overflowing.

E.3.5 Summary of Leachate Management Program Conducted to Date

Post-closure operation and maintenance activities have been implemented at the Zion Site 1 Phase A Landfill over the duration of the existing effective Post-Closure Permit, which was first issued in 2011. Regular inspections and maintenance of the leachate collection system have occurred in accordance with the existing Post-Closure Permit. Historical documentation is maintained as part of the facility record.

CID Recycling & Disposal Facility is a permitted off-site treatment works that meets the requirements of 35 Illinois Administrative Code (IAC) 811.309(e)(1). CID is a permitted treatment facility, and wastewater discharges are required to meet the requirements of their water permit obtained pursuant to 35 IAC 309. The volume of leachate generated and transported off-site for disposal from the Site 1 Phase A unit (in gallons) since 2012 is as follows:

| | |
|-------|-----------------|
| 2012: | 198,617 gallons |
| 2013: | 197,371 gallons |
| 2014: | 190,080 gallons |
| 2015: | 125,115 gallons |
| 2016: | 152,662 gallons |
| 2017: | 154,940 gallons |
| 2018: | 232,624 gallons |
| 2019: | 235,622 gallons |
| 2020: | 176,763 gallons |

Copies of the manifests for shipment of the leachate off-site are maintained in the facility record. The manifests detail the date of shipment, amount hauled, hauling facility, and final treatment and/or disposal facility.

Documentation concerning the operation and maintenance inspections and maintenance regarding the leachate management program have been collected throughout the duration of the post-closure period. Maintenance issues related to the operation of the leachate extraction

system are regularly addressed as situations arise. Representative documentation from 2019 and 2020 are included in **Appendix E-18**.

E.4 Operation of Leak Detection System

As a leak detection system is not required at the facility due to the age of the facility, this section is not applicable.

E.5 Operation of the Gas Monitoring/Collection System

A dual leachate/gas extraction system has been installed at the facility. Also, five gas monitoring probes are positioned around the perimeter of Site 1A to monitor the subsurface for stray landfill gas. The following sections provide a discussion of the gas collection and monitoring system.

An air permit has been issued that covers the air emissions from the facility. The permitted gas system is operated in accordance with the air permit requirements.

E.5.1 Detailed Description of the Landfill Gas Collection System

Landfill gas is collected from within the boundary of Site 1A through a network of extraction wells (EW-1 through EW-28) and piping. The piping leads to a flare located south and west of Site 1A. The gas-to-energy plant that had operated at the facility has been decommissioned. The drawings in **Appendix E-19** provide additional details pertaining to the gas collection system.

The gas extraction wells within the boundary of Site 1A were installed in 1997 as part of closure activities. The installation of the extraction wells, as well as the other components of the gas collection system, is documented in the report entitled, Construction Acceptance Report, BFI Zion Landfill Site I/II Landfill Gas Extraction System, Lake County, Zion, Illinois, dated February 1998, prepared by RMT, Inc. Because this report has previously been submitted to the Illinois EPA, only the Table of Contents and narrative portion are included in this document (see **Appendix E-24**).

In late 2024, gas monitoring probe GMP-2, on the west side of Site 1A, was connected to the gas collection system via a new lateral extending from extraction well E-12A. This action was taken in response to detections of methane in GMP-2 and unsatisfactory efforts to eliminate those detections through adjusting vacuum at nearby gas wells. A replacement gas probe, GMP-2R, was installed west of GMP-2. After additional methane detections occurred at GMP-2R, eight small-diameter extraction wells were installed just beyond the waste limit on the west side of Site 1A. These were also connected to the gas extraction system via the new lateral from well

E-12A. The intent of the small-diameter wells was to create a vacuum curtain that would capture the small quantity of methane in the subsurface near probe GMP-2R. These actions were approved with the issuance of permit B-23R-M-8; M-9, dated May 6, 2025.

A plan view of the existing gas collection system is included in **Figures 2 and 3 in Appendix E-13.**

Condensate that collects within the header and lateral piping drains by gravity to a condensate sump located in the northwest corner of Site 1 Phase 1 or to the condensate knockout upstream of the flare. From these points it is pumped to the dual-contained less-than-90-day accumulation tank and transported offsite with the leachate accumulating from Site 1A. Copies of the manifests for the hazardous waste hauled off site will be kept in the facility record.

A description of the machinery, compressors, flare, piping, and appurtenances is included within the Construction Acceptance Report referenced above and provided as **Appendix E-24.** Specifically, this report includes:

- Photographic documentation related to the gas collection system;
- Extraction well boring logs and construction details;
- Air pressure test results;
- Soil test results;
- Survey data;
- Daily field notes;
- Condensate tank information; and
- Blower building and flare information.

The blower building and flare system have been upgraded since initial installation in 1997. The current layout of this area is shown on Drawing A-14 in **Appendix E-19.**

The gas collection system is designed to collect gas and transport it to a central point for destruction via flaring. It is designed to function for at least the remainder of the 30-year post closure period for Site 1A.

E.5.2 Landfill Gas Monitoring Plan

A Gas Monitoring Plan is provided as **Appendix E-20.** This plan summarizes how Site 1 Phase A will measure the composition of landfill gas and monitor methane in the subsurface and in ambient air. This plan includes the following major elements:

- Narrative describing most likely gas migration paths;
- A figure showing the monitoring devices;
- Documentation that the below ground monitoring devices satisfy applicable requirements;
- Ambient air monitoring procedures;
- Monitoring inside buildings associated with Site 1A; and
- Parameters to be tested.

Consistent with Permit Condition III.E.1, gas monitoring will be performed on an annual basis.

Gas monitoring equipment must have infrared sensor technology for CH₄ and CO₂ measurements, galvanic fuel cell/chemical sensor for O₂ measurement, temperature probe to measure the temperature of the gas stream, internal pressure sensors to measure static, available, and differential pressures, the ability to be calibrated in the field, the ability to measure data and user defined comments electronically, and the ability to download stored data into a .csv or excel file.

Raw gas monitoring data will be retained by both the environmental manager and the third party contractor as an electronic file. In addition, a written log book will be kept by the individuals responsible for the operation and maintenance of the gas system.

E.5.3 Landfill Gas Disposal/Processing System

Landfill gas collected from the extraction wells is burned in an on-site flare south and west of 1A. The location of the flare is shown on **Figure E-1**.

E.5.4 Summary of Landfill Gas Collection/Monitoring/Processing Systems

The gas collection, monitoring and processing systems are described thoroughly in Sections E.5.1 through E.5.3.

E.6 Post-Closure Inspection Plan

The procedures to be followed to inspect the functionality of the various components of the post-closure care at the Zion Site 1A Landfill were previously presented above in Section D.3.

E.6.1 Inspection Log

The inspection logs are discussed above in Section D.3.1.

E.6.1.1 Items Inspected

The items inspected are discussed above in Section D.3.1.1.

E.6.1.2 Types of Problems

The types of problems the inspector must look for during an inspection are discussed above in Section D.3.1.2.

E.6.1.3 Inspection Frequency

The inspection frequency for each item to be inspected is presented above in Section D.3.1.3.

E.6.2 Repair Log

A repair log, to be utilized if inspections identify items needing repair, is presented above in Section D.3.2.

E.6.3 24 Hour Reporting

If an inspection identifies an issue that may endanger human health or the environment, the 24 hour reporting procedures are presented above in Section D.3.3.

E.7 Post-Closure Monitoring Plan

The monitoring to be performed during the post-closure care period is discussed throughout this permit application.

E.7.1 Facility Controls

E.7.2 Surveys and Corrective Action

The permittee shall protect and maintain the surveyed benchmarks present at or near the closed Site 1 Phase A facility, in accordance with Permit Condition III.C.8. No revisions to the General Post-Closure Care Requirements contained in Permit Condition III.C are being sought as part of this Permit Renewal Application. The Site 1 Phase A survey benchmarks used to identify the location of the disposal unit will be re-surveyed once every five years, beginning with the date the Agency issues the permit renewal, unless the permit is appealed.

The closed Site 1 Phase A Landfill is subject to post-closure requirements in accordance with 35 IAC 724.210(b). A surveyed plat prepared and certified by a professional land surveyor indicating the type, location, and quantity of wastes disposed at the facility was previously provided to the

local zoning authority following closure. A copy of this information was previously also transmitted to Illinois EPA. A copy of this documentation is presented in **Appendix E-1**.

No solid waste management units (SWMUs) with cover systems and/or engineered barriers or units/areas subject to an Environmental Land Use Control (ELUC) or Uniform Environmental Covenants Act (UECA). Therefore, no ongoing survey requirements are applicable.

E.7.3 Leachate Collection System

Monitoring of the leachate collection system is proposed to continue in accordance with the monitoring program implemented in accordance with the effective Permit.

E.7.3.1 Leachate Quality

A representative sample of the leachate will be collected and analyzed by a laboratory in accordance with Section E.3.1 above.

E.7.3.2 Leachate Quantity

The quantity of leachate that accumulates in the leachate tank will be quantified as discussed above in Section E.3.4. In addition, each tanker load of leachate hauled from the facility is documented on a manifest that includes the total quantity of leachate hauled. The quantities of leachate removed from the facility are regularly tabulated and presented within the Annual Facility Reports, due by March 1 each year.

E.7.3.3 Leachate Reporting

The quality and quantity of leachate generated at the closed Site 1 Phase A landfill will be regularly reported to Illinois EPA with the Annual Report due by March 1 each year.

E.7.4 Leak Detection System (LDS)

As a leak detection system is not required at the facility due to the age of the facility, this section is not applicable.

E.7.5 Groundwater Monitoring System

The groundwater monitoring program to be performed during the post-closure period is presented above in Section C.

E.7.6 Gas Collection System

E.7.6.1 Gas Quality

The quality of gas collected from the closed Site 1 Phase A facility will be monitored in accordance with the Gas Monitoring Plan included in this Permit Renewal Application as **Appendix E-20**.

The results of the annual gas probe monitoring are presented in the Annual Reports, due each year by March 1. The results from the perimeter gas monitoring program over the last several years has not identified instances of landfill gas in a probe over 50 percent of the lower explosive limit (LEL).

E.7.6.2 Gas Quantity

As of 2020, the gas extraction system contains 28 gas extraction wells that are tuned monthly to optimize gas extraction and maintain compliance with New Source Performance Standards regulations. Monthly gas extraction well monitoring data is maintained within the facility's record files. Information gathered from 2018-20 related to the gas collection and control system is presented in **Appendix E-22**.

E.7.6.3 Summary of Results from the Gas Collection/Monitoring System

The information obtained from the gas collection, monitoring, and processing systems will be maintained in the facility's operating records and submitted each year with the Annual Report, due by March 1 of the following year.

There have been no major upgrades of the gas system in the last three years. However, a minor upgrade was completed in 2024 when several small-diameter out-of-waste gas wells were installed on the west side of the Zion Landfill Site 1 Phase A. These were installed in response to an exceedance of methane in gas monitoring probe GMP-2R, as described in Section E.5.

E.8 Post-Closure Maintenance Plan

E.8.1 Procedures, Equipment & Materials

The preventative and corrective maintenance procedures, equipment, and materials required to properly maintain adequate post-closure care of the closed landfill are presented above in Section D. The following items are included in the maintenance plan, as applicable:

- Security control devices;
- Erosion damage repair;

- Settlement, subsidence, and displacement;
- Mowing, fertilization, and other vegetative cover maintenance;
- Run-on and run-off control features;
- Leachate removal system;
- Gas monitoring/extraction system; and
- Replacement of groundwater monitoring wells, as needed.

Additionally, the final cover elevation reference points (i.e., survey control points) consisting of surveyed monuments will be regularly inspected for structural integrity. These reference points may be surveyed periodically during post-closure to assess the degree of subsidence and/or differential settlement that may occur during post-closure (if visual evidence of subsidence and/or differential settlement is observed).

Leachate and Gas Collection System Maintenance. Visual inspections will be performed during the gas monitoring events to verify the condition of the wellheads and the cap. The visual inspection of the wellheads will ensure there are no cracks, bad o-rings, or blockages that could be caused by liquid, ice, or other substances. The well casings above grade will be visually inspected along with the surrounding area for signs of damage, deterioration, or potential problems. There must be a tight seal between the boot and the well casing.

The isolation valve on the collection header will be exercised as necessary to ensure performance. If monitoring of the operating parameters indicates surging or a pipe break, the following procedure will be implemented:

- Close the inline valve on the problem length of pipe to isolate it from the entire system and prevent having to shut down the entire system. Close all wellhead valves on the isolated portion of the header.
- Repair the damaged pipe.

Additional details pertaining to the maintenance of the gas monitoring and maintenance system are provided in the Operations and Maintenance Manual, Landfill Gas Extraction System, dated August 1998, which is provided in **Appendix E-21**. This document contains the following information:

- Purpose of the landfill gas extraction system;
- Site and system description;

- The physical components of the system, including: extraction wells, gas collection header and lateral piping network, condensate pump stations, condensate/leachate collection tank, knockout pot, extraction system blowers, blower building, air compressor, and flare system;
- Maintenance of each of the above physical components;
- Testing procedures;
- Contingency measures; and
- Safety procedures.

Over the last 10 years, the landfill gas collection system has functioned as designed. The results from regular inspection and maintenance work performed on the gas monitoring system are included in the Annual Reports submitted to the Illinois EPA by March 1.

E.8.2 Rationale

The above maintenance program was devised to remedy identified deterioration or malfunction of equipment or structures revealed by the inspection on a schedule which ensures the problem does not lead to an unacceptable environmental or human health hazard. Where a hazard is imminent or has already occurred, remedial action will be taken.

E.8.3 Frequency

The frequency for maintaining the items mentioned above is presented in Section D.3 of this Permit Renewal Application, Inspection Requirements.

E.9 Survey Plat

A survey plat for the Zion Site 1A facility is presented in **Appendix E-1**. This survey plat was prepared by a professional land surveyor and identifies the Zion Site 1A Landfill property with respect to permanently surveyed benchmarks and the legal boundary of the facility. The plat contains a note, prominently displayed stating that the land has been used to manage hazardous wastes and the owner/operator obligations to restrict disturbance of the units containing hazardous waste in accordance with the applicable Subpart G regulations. The survey plat was previously filed with the local zoning authority over local land use and a copy provided to Illinois EPA.

E.10 Notice in Deed and Certification

A notice has been previously filed on the deed to the property notifying any potential purchaser that:

- The land has been used to manage hazardous waste;
- Use of these areas is restricted;
- A survey plat of the type/location/quantity of material in the disposal units or areas has been filed with the Illinois EPA, and the County Recorder; and
- For hazardous waste disposed prior to January 12, 1981, identify the type, location, and quantity of the hazardous waste to the best of the owner or operator's knowledge and in accordance with any records the owner or operator has kept.

A copy of the above notice is contained in **Appendix E-1**.

E.11 Post Closure Cost Estimate

A table estimating the costs for performing the required post-closure care activities is presented as **Table E-3**. This table includes a summary of the costs, including calculations and supporting information used in developing the estimate. The cost estimate is based on third party costs and includes the number of years post-closure care must still be provided. The post-closure cost estimate identifies the various tasks needed to carry out the required post-closure care activities, the cost associated with each task, and the amount of time/materials/efforts needed to perform each task, along with their unit costs.

Table E-3 of the 2021 application has been updated in June 2025 to reflect 2025 costs in response to notice of deficiency (NOD) comments from the Agency. In some cases, current 2025 costs are provided, while in others the 2021 costs have been updated using Agency-provided inflation factors. Documentation of current costs is provided in **Appendix E-25**.

E.12 Financial Assurance Mechanism for Post-Closure Care

The permittee is utilizing post-closure insurance as the mechanism to satisfy the financial assurance requirements for post-closure care of the facility. A copy of the latest insurance policy #CPC-IL96-010 is presented in **Appendix E-23**. This documentation was previously provided to Illinois EPA in a separate letter from the permittee dated December 18, 2020. Once Illinois EPA approves the Post-Closure Cost Estimate included in this Permit Renewal Application, future

updates to the financial assurance mechanism will be consistent with the latest approved post-closure cost estimate.

E.13 State Mechanisms

The state of Illinois has not assumed legal responsibility for compliance with post-closure requirements or assured that state funds are available to cover post-closure requirements. Therefore, this section is not applicable.

F. CORRECTIVE ACTION

In accordance with Section 3004(u) of RCRA and 35 Ill. Adm. Code 724.201, the Permittee shall institute such corrective action as necessary to protect human health and the environment from all releases of hazardous wastes or hazardous constituents, listed in 35 Ill. Adm. Code 721, Appendix H from any solid waste management unit (SWMU) at the Zion facility. Illinois EPA and USEPA issued a joint RCRA permit to this facility in 1988. The USEPA portion of that permit contained requirements for addressing two SWMUs at the facility. According to Permit Condition V.A.2 in the Effective Permit, the Permittee has adequately addressed corrective action at these two SWMUs.

No additional SWMUs have since been identified at the facility. Therefore, Sections F.1 through F.7 are not applicable. However, the Permittee must provide corrective action, as appropriate, for any future releases from SWMUs.

F.1 Identification of SWMUs

Not applicable.

F.2 Characterization of SWMUs

Not applicable.

F.3 Characterization of Releases from SWMUs

Not applicable.

F.4 Information Required for Renewal Applications

Not applicable.

F.5 Proposed Interim Measures to be Conducted

Not applicable.

F.6 Cost Estimate for Required Corrective Action

Not applicable.

F.7 Financial Assurance for Corrective Action

Not applicable.

F.7 Financial Assurance for Corrective Action

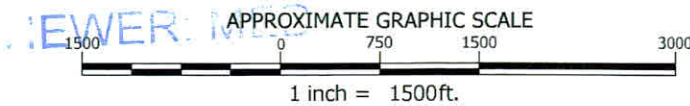
Not applicable.

Figures

DRAWN BY: RMD
REVIEWED BY: MM
DATE: 2/15/2021
FILE: 0120-037-10
CAD: SITE 1.dwg
FIGURE B-1



SOURCE: BASE IMAGE ADAPTED FROM USGS QUAD MAPS, DATED 2018.
(4) MAPS USED TO GENERATE THIS MAP FROM WADSWORTH, IL; ZION, IL; KENOSHA, WI;
& PLEASANT PRAIRIE, WI.
GROUND CONTOURS FROM ABOVE MAPS OF NATIONAL ELEVATIONS DATASET, DATED
2000-2003. AERIAL IMAGERY FROM AUGUST 2015 - NOVEMBER 2015.
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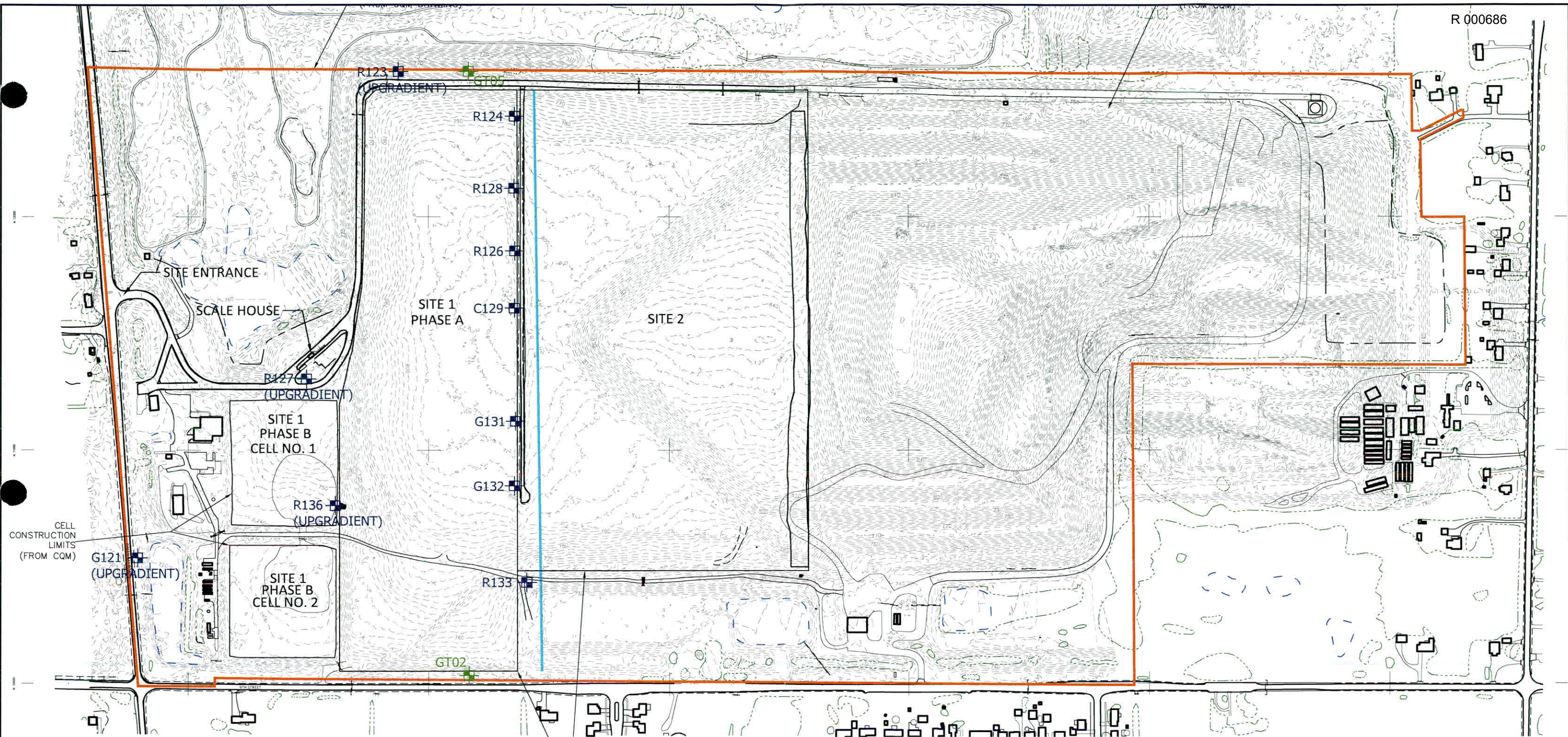
PREPARED FOR:
ZION LANDFILL

SITE LOCATION / SURROUNDING LAND USE MAP
SITE 1A - ZION LANDFILL
POST-CLOSURE PERMIT APPLICATION
LAKE COUNTY, ZION, IL

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FIGURE B-2



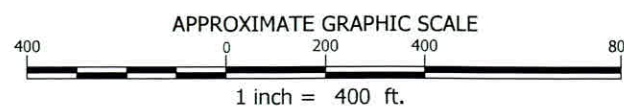
LEGEND

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE SITE 1A WASTE MANAGEMENT BOUNDARY
- APPROXIMATE WATER EDGE
- APPROXIMATE VEGETATIVE EDGE
- POINT OF COMPLIANCE
- MONITORING WELL LOCATION (SHALLOW DRIFT AQUIFER)
- MONITORING WELL LOCATION (SHALLOW ZONE)

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JUN 27 2025

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PREPARED FOR:
ZION LANDFILL

TOPOGRAPHIC MAP

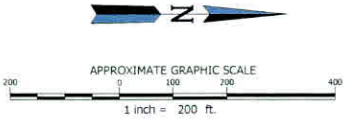
SITE 1 - PHASE A
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LAKE COUNTY, ZION, IL

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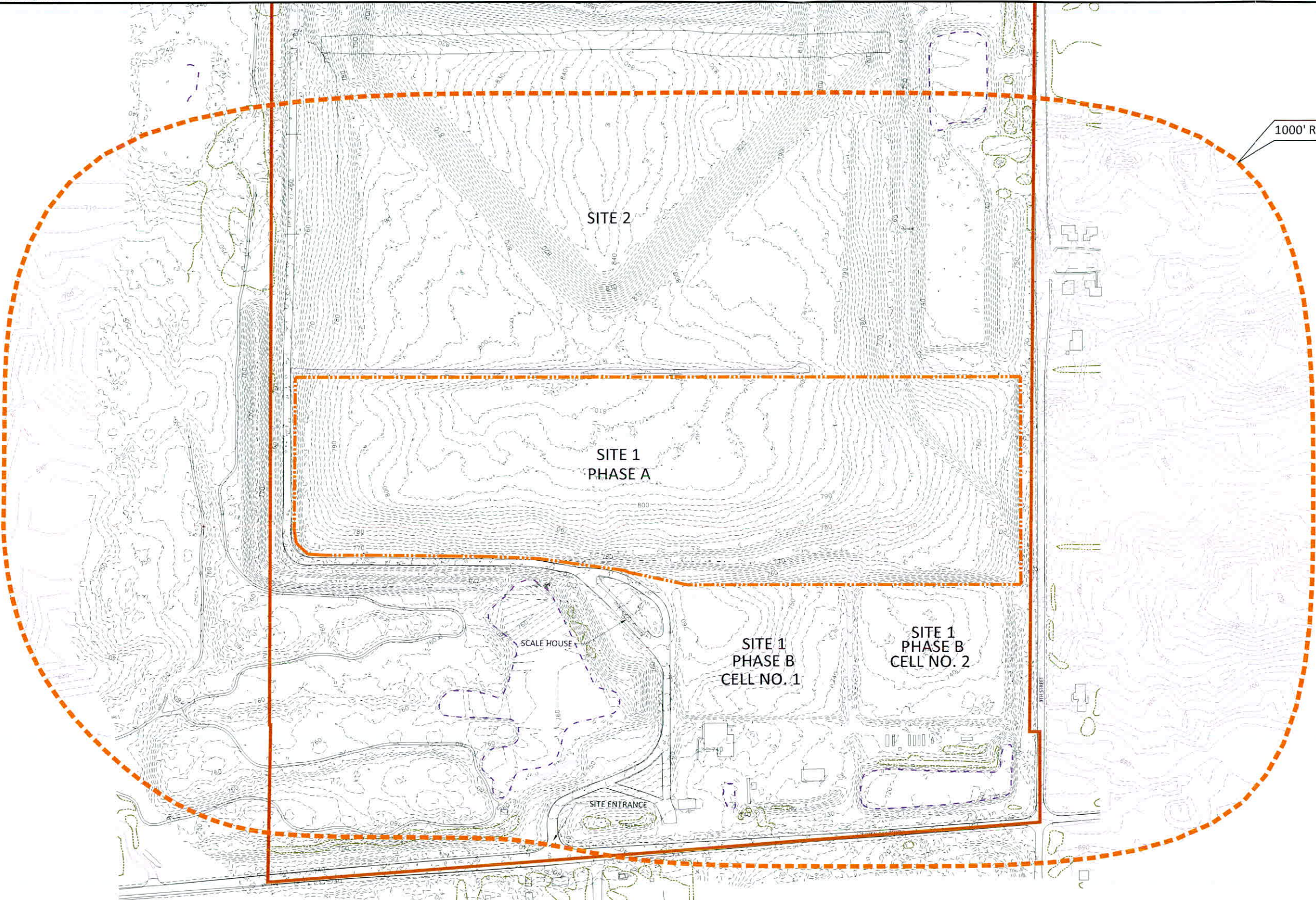
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DATE: 2/22/2021
FILE: 0120-037-10
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FIGURE B-3

- LEGEND
- APPROXIMATE SITE BOUNDARY
 - APPROXIMATE SITE 1A WASTE MANAGEMENT BOUNDARY
 - APPROXIMATE WATER EDGE
 - APPROXIMATE VEGETATIVE EDGE



1000' RADIUS



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SOURCE: LAND CONTOURS WITHIN SITE BOUNDARY BASED UPON AERIAL SURVEY PERFORMED APRIL 2020, BY TETRA TECH.
TOPOGRAPHY NORTH AND SOUTH OF PROPERTY LIMITS ADAPTED FROM GOOGLE EARTH LAND DATA BY WEAVER CONSULTANTS GROUP.

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TOPOGRAPHIC MAP - 1000' RADIUS
SITE 1 - PHASE A
POST-CLOSURE PERMIT APPLICATION
LAKE COUNTY, ZION, IL

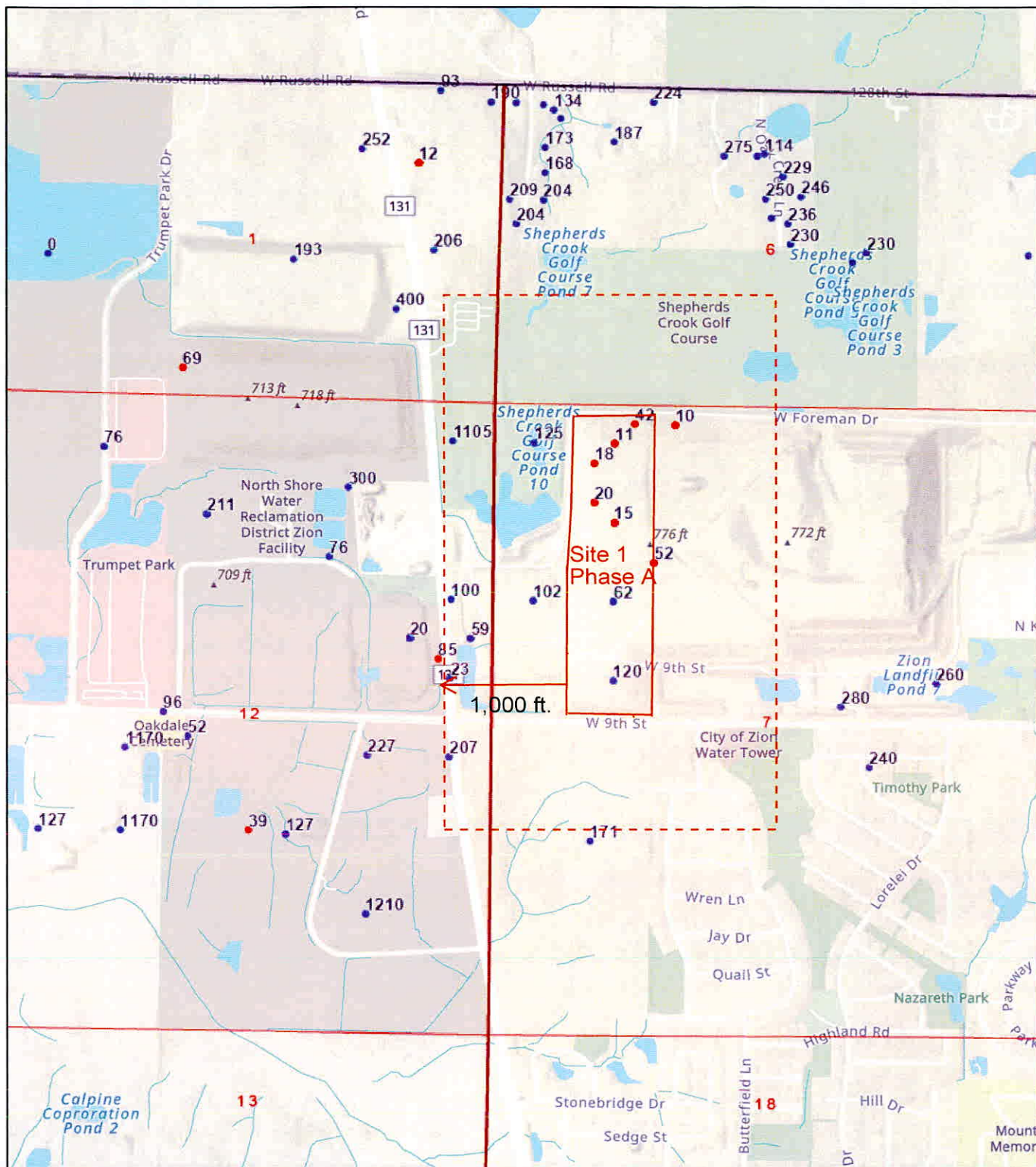
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FIGURE B-3A

R000688



5/21/2025, 12:59:52 PM

Sections

☐ Townships

 Counties

Water and Related Wells

- Water

- Engineering

Labels - Total Depth

Aquifer Present

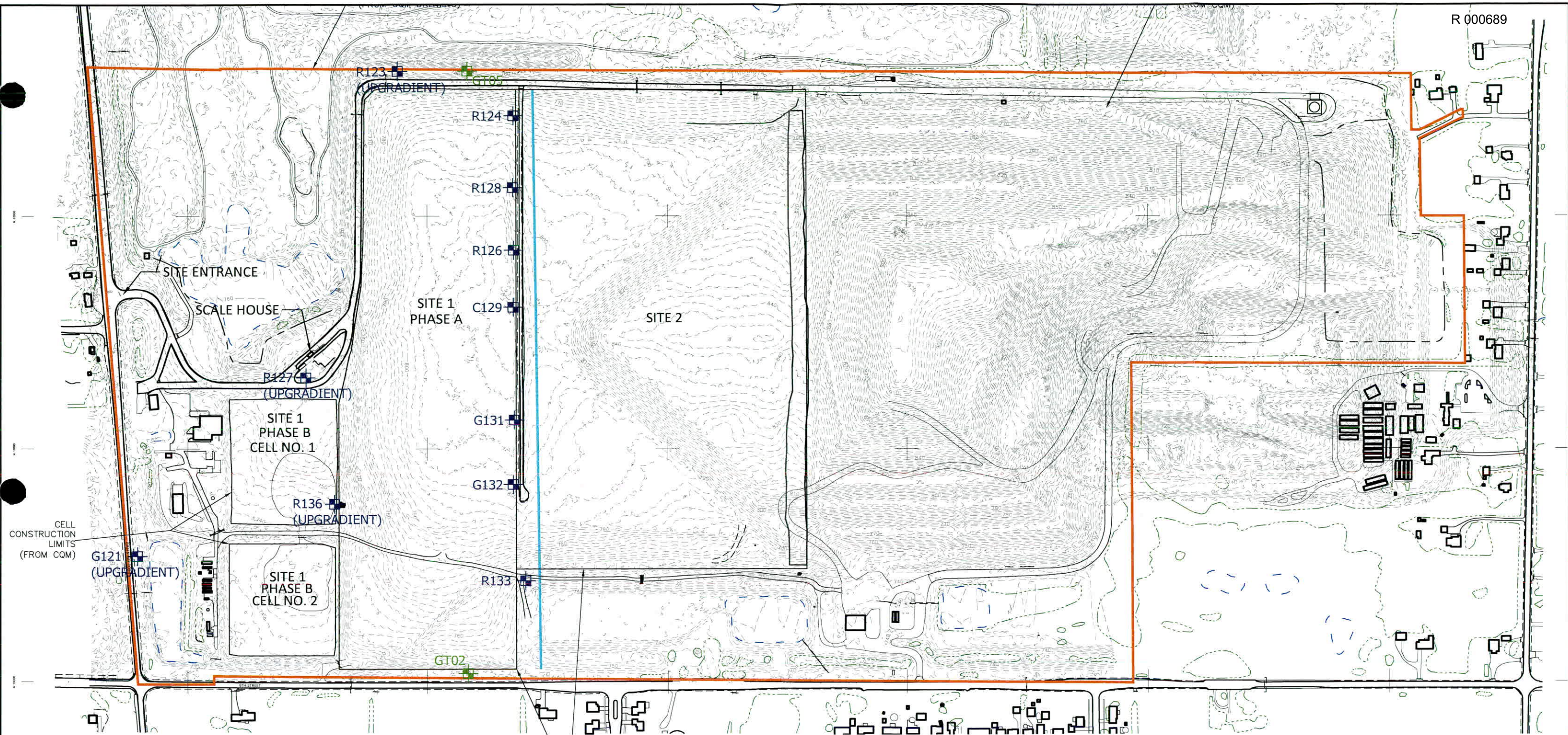
1:18,056

0 500 1,000 2,000 ft

0 187.5 375 750 m

Esri, NASA, NGA, USGS, FEMA, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Illinois State Geological Survey

Illinois State Geological Survey
Illinois State Geological Survey



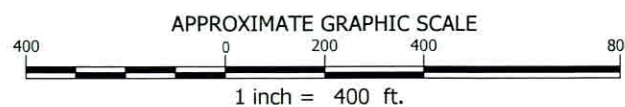
LEGEND

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE SITE 1A WASTE MANAGEMENT BOUNDARY
- APPROXIMATE WATER EDGE
- APPROXIMATE VEGETATIVE EDGE
- POINT OF COMPLIANCE
- MONITORING WELL LOCATION (SHALLOW DRIFT AQUIFER)
- MONITORING WELL LOCATION (SHALLOW ZONE)

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RELEASE

JUN 27 2025

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PREPARED FOR:
ZION LANDFILL

GROUNDWATER MONITORING NETWORK
SITE 1 - PHASE A
POST-CLOSURE PERMIT APPLICATION
LAKE COUNTY, ZION, IL

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CAD: SITE 1.dwg
FIGURE C-1

Figure C-2

Groundwater Sampling Form - Zion Landfill**Well ID:** _____**Field Sampler:****Method of Purge (from Lists):** Pump – Submersible (i.e., centrifugal submersible, gear drive and helical rotor (progressing cavity pumps).**Pre-Purge Water Depth from TOIC (ft):****Date of Purge:**

Casing Diameter (in): 2

Three Casing Volume (gal):

Sample Date:

Method of Sample: Pump – Submersible (i.e., centrifugal submersible, gear drive and helical rotor (progressing cavity pumps).

If unable to sample, provide reason from Lists: N/A**Purge Data (Purge not to Exceed 1 GPM)**

| Time | Cumulative Volume (gal) | pH (SU) | Temperature (Degrees F) | Conductivity (umhos/cm) | Turbidity (NTUs) |
|------|----------------------------|------------|----------------------------|----------------------------|---------------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Sampling Data

| Time | VOC Discharge Rate (ml/min) | Non-VOC Discharge Rate (ml/min) | pH (SU) | Temperature (Degrees F) | Conductivity (umhos/cm) | Turbidity (NTUs) |
|------|--------------------------------|------------------------------------|------------|----------------------------|----------------------------|---------------------|
| | | | | | | |

Sample Appearance

| Color | Odor |
|-------|------|
| Clear | None |



Page Pgs

| | | | |
|-----------------|--|------------------------------------|--------------------------------------|
| Company Name: | | | |
| Street Address: | | | |
| City: | | State: | Zip: |
| Phone: | | e-Mail: | |
| Send Report To: | | Hardcopy: <input type="checkbox"/> | PDF e-Mail: <input type="checkbox"/> |
| Sampled By: | | | |

[illegible]

Cooler Temperature: 0.1-6°C Yes ☐ No ☐ _____ °C
Received within 6 hrs of collection: _____
Ice Present: Yes ☐ No ☐ _____

Sample Refrigerated: Yes _____ No _____
Refrigerator Temperature: _____ °C

*Matrix Code Key: **DW**-drinking water **GW**-groundwater **WW**- wastewater
S-soil **SL**-sludge **WIPE**-wipe **O**-other

| | | | |
|---------------------------------|------------|--------------|------------|
| Notes and Special Instructions: | | | |
| | | | |
| Relinquished By: | Date/Time: | Received By: | Date/Time: |
| Relinquished By: | Date/Time: | Received By: | Date/Time: |



LEGEND

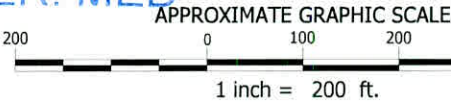
- APPROXIMATE SITE BOUNDARY
- APPROXIMATE SITE 1A WASTE MANAGEMENT BOUNDARY
- LEACHATE DISCHARGE PIPING
- AIR SUPPLY PIPING
- GAS HEADER PIPING
- CONDENSATE DISCHARGE PIPING
- APPROXIMATE WATER EDGE
- APPROXIMATE VEGETATIVE EDGE

- EW-43 EXTRACTION WELL
- REW-2 REMOTE EXTRACTION WELLHEADS
- NORTH TRENCH SUMP
- CONDENSATE SUMP
- VALVE BOX

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JUN 27 2025

REVIEWER: MED



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PREPARED FOR:

ZION LANDFILL

PHASE A LEACHATE & GAS COLLECTION SYSTEM

SITE 1 - PHASE A
POST-CLOSURE PERMIT APPLICATION
LAKE COUNTY, ZION, IL

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DATE: 2/22/2021
FILE: 0120-037-10
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FIGURE E-1

R 000692

Tables

Table C-1
Hazardous Waste Codes Corresponding to Indicator Parameters

| Waste Code | Description (Basis for Listing) | Indicator Parameters |
|------------|---|-------------------------|
| D002 | Corrosivity | Metals |
| D005 | Barium | Metals |
| D006 | Cadmium | Metals |
| D007 | Chromium | Metals |
| D008 | Lead | Metals |
| D009 | Mercury | Metals |
| F001 | Halogenated organic solvents (tetrachloroethylene, methylene chloride, TCE, 1,1,1-trichloroethane, carbon tetrachloride, chlorinated fluorocarbons) | VOCs |
| F002 | Halogenated organic solvents (tetrachloroethylene, methylene chloride, TCE, 1,1,1-trichloroethane, 1,1,2-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane) | VOCs |
| F003 | Ignitable non-halogenated organic solvents (Ignitability) | VOCs |
| F005 | Non-halogenated organic solvents (Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, 2-ethoxyethanol benzene, 2-nitropropane, ignitability) | VOCs |
| F006 | Wastewater treatment sludges from electroplating operations (Cd, Cr +6, Ni, CN) | Metals |
| F008 | Plating bath residues from electroplating operations where cyanides are used (Cyanide) | Metals |
| F009 | Stripping & cleaning bath solutions from electroplating operations where cyanides are used (Cyanide) | Cyanide |
| F019 | Wastewater treatment sludges from chemical conversion coating of aluminum (Cr +6, Cyanide) | Metals and cyanide |
| K052 | Leaded tank bottoms from petroleum refining industry (lead) | Metals |
| K061 | Emission control dust/sludge from steel production (Cr +6, lead, corrosivity) | Metals |
| K062 | Spent pickle liquor from steel finishing operations (Cr +6, lead, corrosivity) | Metals |
| U019 | Benzene | VOCs |
| U036 | Chlorodane | VOCs |
| U044 | Chloroform | VOCs |
| U061 | DDT | VOCs |
| U083 | Propane, 1,1,-dichloro | VOCs |
| U210 | Tetrachloroethylene | VOCs |
| U220 | Toluene | VOCs |
| U228 | Trichloroethylene | VOCs |
| U239 | Xylene | VOCs |
| U226 | Methylchloroform | VOCs |
| P004 | Aldrin | VOCs |
| P029 | Copper cyanide | Cyanide |

**Table C-2
Summary of Indicator Parameters**

| Parameter | Storet Number |
|---|----------------------|
| <u>Volatile Organic Compounds (VOCs) – List G1</u> | |
| Acetone | 81552 |
| Acrolein | 34210 |
| Acrylonitrile | 34215 |
| Benzene | 34030 |
| Bromodichloromethane | 32101 |
| Bromoform | 32104 |
| Bromomethane | 34413 |
| Carbon Tetrachloride | 32102 |
| Chlorobenzene | 34301 |
| Chloroethane | 34311 |
| 2-Chloroethyl Vinyl Ether | 34576 |
| Chloroform | 32106 |
| Chloromethane | 34418 |
| 1,1-Dichloroethane | 34496 |
| 1,2-Dichloroethane | 34531 |
| 1,1-Dichloroethene | 34501 |
| trans-1,2-Dichloroethene | 34546 |
| 1,2-Dichloropropane | 34541 |
| cis-1,3-Dichloropropene | 34704 |
| trans-1,3-Dichloropropene | 34699 |
| 1,4-Dioxane | 81582 |
| Ethyl Benzene | 78113 |
| Isobutyl Alcohol | 77033 |
| Methylene Chloride | 34423 |
| Pyridine | 77045 |
| 1,1,2,2-Tetrachloroethane | 34516 |
| Toluene | 34010 |
| 1,1,1-Trichloroethane | 34506 |
| 1,1,2-Trichloroethane | 34511 |
| Trichloroethene | 39180 |
| Vinyl Chloride | 39175 |
| 1,2-Dichlorobenzene | 34536 |
| 1,3-Dichlorobenzene | 34566 |
| 1,4-Dichlorobenzene | 34571 |
| Hexachlorobutadiene | 39702 |
| Hexachloroethane | 34396 |
| Naphthalene | 34696 |
| Nitrobenzene | 34447 |

Table C-2
Summary of Indicator Parameters

| Parameter | Storet Number |
|--------------------------|----------------------|
| 1,2,4-Trichlorobenzene | 34551 |
| Metals – List G2: | |
| Barium, dissolved | 01005 |
| Barium, total | 01007 |
| Cadmium, dissolved | 01025 |
| Cadmium, total | 01027 |
| Chromium, dissolved | 01030 |
| Chromium, total | 01034 |
| Cyanide, dissolved | 00723 |
| Cyanide, total | 00720 |
| Lead, dissolved | 01049 |
| Lead, total | 01051 |
| Mercury, dissolved | 71890 |
| Mercury, total | 71900 |
| Nickel, dissolved | 01065 |
| Nickel, total | 01067 |

Table C-3
Groundwater Monitoring System Summary

| Well | Feet (msl) | | | | | | Stickup (ft above grnd surf) | Feet (Below Grnd Surf) | | | | | | | |
|-------|------------|---------|---------------------------|--------------------|-----------------|-------------------|------------------------------------|------------------------|---|-------|-------------------|--------------------------------|---------------------------------|------------------------------------|-------------------|
| | Northing | Easting | 2024 Ground Surface | 2024 Top Casing | Screen Interval | Bottom of Well | | Screen Interval | | | Bottom of Well | Internal Casing Material | Internal Casing Dia. (in) | Geologic Formation Monitored | Date Installed |
| G121* | 10,535 | 7,808 | 726.80 | 729.16 | 627.0 - 632.0 | 627.0 | 5.0 | 96.0 | - | 91.0 | 96.0 | SS | 2.0 | SDA | 09/85 |
| R127* | 11,302 | 8,513 | 761.00 | 763.35 | 651.4 - 656.1 | 650.9 | 2.6 | 109.4 | - | 104.7 | 109.9 | PVC | 2.0 | SDA | 09/05 |
| R136* | 10,761 | 8,632 | 745.60 | 748.14 | 634.7 - 644.5 | 634.2 | 2.4 | 111.0 | - | 101.2 | 111.5 | PVC | 2.0 | SDA | 09/05 |
| R123* | 12,616 | 8,896 | 760.70 | 763.07 | 640.9 - 645.6 | 640.4 | 2.4 | 119.9 | - | 115.2 | 120.4 | PVC | 2.0 | SDA | 09/05 |
| R124 | 12,427 | 9,375 | 786.00 | 788.39 | 634.8 - 644.8 | 634.8 | 2.4 | 151.4 | - | 141.4 | 151.4 | SS | 2.0 | SDA | 10/93 |
| R128 | 12,119 | 9,373 | 798.30 | 803.31 | 649.0 - 653.8 | 648.6 | 4.6 | 149.4 | - | 144.6 | 149.8 | SS | 2.0 | SDA | 10/93 |
| R126 | 11,851 | 9,377 | 805.80 | 807.99 | 648.4 - 658.4 | 648.4 | 2.2 | 157.6 | - | 147.6 | 157.6 | SS | 2.0 | SDA | 10/93 |
| C129 | 11,607 | 9,375 | 809.10 | 812.62 | 644.9 - 649.6 | 644.4 | 2.6 | 165.2 | - | 160.5 | 165.7 | PVC | 2.0 | SDA | 09/05 |
| G131 | 11,121 | 9,380 | 805.00 | 809.55 | 649.8 - 654.8 | 649.8 | 4.2 | 157.1 | - | 152.1 | 157.1 | SS | 2.0 | SDA | 07/93 |
| G132 | 10,844 | 9,374 | 799.50 | 805.09 | 637.3 - 647.3 | 637.3 | 2.4 | 162.4 | - | 152.4 | 162.4 | PVC/SS | 2.0 | SDA | 07/93 |
| R133 | 10,430 | 9,424 | 757.20 | 758.90 | 639.0 - 649.0 | 639.0 | 2.0 | 118.4 | - | 108.4 | 118.4 | PVC/SS | 2.0 | SDA | 02/89 |
| GT02 | 10,033 | 9,185 | 742.30 | 745.8 | 712.3 - 717.3 | 710.55 | 2.4 | 30.0 | - | 25.0 | 30.0 | SS | 2.0 | SZ | 10/84 |
| GT05 | 12,617 | 9,184 | 760.00 | 762.12 | 706.6 - 711.4 | 706.4 | 2.2 | 53.2 | - | 48.4 | 53.4 | SS | 2.0 | SZ | 09/84 |

Notes:

* = Upgradient Well


SDA = Shallow Drift Aquifer

SZ = Shallow Zone

TABLE E-1
GAS/LEACHATE EXTRACTION WELL INFORMATION
Zion Landfill - Site 1A
Zion, Illinois

Measured
Depth minus
1 ft. (pump 3.167 ft)

| Well No. | Northing (feet) | Easting (feet) | Total Feet at Drilling | Solid (feet) | Perfs. (feet) | Sounded Total Depth (feet) | Total Feet at Drilling | Well Base (Elevation) | Aprox. Bottom of Excavation Limits | Reported Depth (feet) | Measured Depth (feet) | Stickup (feet) | Depth to Pump Bottom (feet) | Depth to Bubbler Tube (feet) | Depth to Pump Top (feet) |
|----------|-----------------|----------------|------------------------|--------------|---------------|----------------------------|------------------------|-----------------------|------------------------------------|-----------------------|-----------------------|----------------|-----------------------------|------------------------------|--------------------------|
| EW-1 | 12415.8 | 9311.3 | 43.12 | 19.22 | 23.90 | 11.00 | 43.12 | 750.4 | 750 | 43.5 | 43.3 | 5.0 | 42.3 | 41.3 | 39.1 |
| EW-2 | 12029.9 | 9350.4 | 57.26 | 24.46 | 32.80 | 58.40 | 57.26 | 748.4 | 747 | 57.7 | 59.8 | 4.1 | 58.8 | 57.8 | 55.6 |
| EW-3 | 12136.1 | 9119.7 | 62.27 | 29.57 | 32.70 | 57.00 | 62.27 | 747.6 | 748 | 64.2 | 63.7 | 5.0 | 62.7 | 61.7 | 59.5 |
| EW-4 | 12425.6 | 9096.8 | 41.34 | 18.54 | 22.70 | 43.90 | 41.34 | 750.9 | 750 | 42.0 | NM | NM | NM | NM | NM |
| EW-5 | 12419.8 | 8889.8 | 41.24 | 18.34 | 22.90 | 42.50 | 41.24 | 750.3 | 750 | 42.3 | NM | NM | NM | NM | NM |
| EW-6 | 12244.1 | 8894.3 | 51.56 | 19.66 | 31.90 | 52.70 | 51.56 | 749.3 | 748 | 52.4 | NM | NM | NM | NM | NM |
| EW-7 | 12077.7 | 8892.1 | 55.93 | 22.93 | 33.00 | 57.90 | 55.93 | 747.5 | 747 | 56.6 | NM | NM | NM | NM | NM |
| EW-8 | 11912.0 | 8884.5 | 54.36 | 17.36 | 37.00 | 54.60 | 54.36 | 744.8 | 745 | 55.1 | 54.7 | 5.3 | 53.7 | 52.7 | 50.5 |
| EW-9 | 11719.3 | 8871.0 | 51.73 | 17.73 | 34.00 | 52.80 | 51.73 | 746.8 | 741 | 53.2 | 52.0 | 5.3 | 51.0 | 50.0 | 47.8 |
| EW-10 | 11725.7 | 9245.2 | 68.20 | 27.20 | 41.00 | 69.00 | 68.20 | 747.2 | 741 | 70.3 | 70.4 | 5.3 | 69.4 | 68.4 | 66.2 |
| EW-11 | 11576.0 | 8869.2 | 56.47 | 22.27 | 34.20 | 56.30 | 56.47 | 746.3 | 740 | 57.4 | 55.5 | 5.1 | 54.5 | 53.5 | 51.3 |
| EW-12 | 11428.9 | 8851.5 | 53.59 | 16.49 | 37.10 | 56.20 | 53.59 | 746.5 | 739 | 55.4 | 56.5 | 5.2 | 55.5 | 54.5 | 52.3 |
| EW-12A | 11335.2 | 8782.9 | 37.52 | 12.22 | 25.30 | 35.90 | 37.52 | 751.2 | 735 | NM | NM | NA | 34.9 +/- | NA | 38 +/- |
| EW-13 | 11426.8 | 9169.1 | 70.32 | 26.32 | 44.00 | 70.40 | 70.32 | 744.7 | 739 | 71.9 | 71.6 | 5.8 | 70.6 | 69.6 | 67.4 |
| EW-14 | 11224.3 | 8836.8 | 53.68 | 18.48 | 35.20 | 52.90 | 53.68 | 744.8 | 738 | 54.7 | 53.7 | 5.0 | 52.7 | 51.7 | 49.5 |
| EW-15 | 11053.4 | 8813.8 | 52.25 | 18.25 | 34.00 | 52.70 | 52.25 | 743.1 | 738 | 53.0 | 53.2 | 5.1 | 52.2 | 51.2 | 49.0 |
| EW-16 | 11170.1 | 9074.9 | 67.26 | 24.76 | 42.50 | 67.80 | 67.26 | 745.0 | 738 | 68.6 | 68.7 | 5.0 | 67.7 | 66.7 | 64.5 |
| EW-17 | 10864.2 | 8800.8 | 43.41 | 18.91 | 24.50 | 44.10 | 43.41 | 742.7 | 735 | 44.0 | 43.7 | 4.8 | 42.7 | 41.7 | 39.5 |
| EW-18 | 10824.6 | 9077.1 | 63.67 | 25.67 | 38.00 | 65.00 | 63.67 | 741.8 | 735 | 64.4 | 65.7 | 5.4 | 64.7 | 63.7 | 61.5 |
| EW-19 | 10661.4 | 8812.9 | 39.89 | 20.09 | 18.80 | 40.10 | 39.89 | 740.6 | 733 | 40.4 | 40.0 | 4.8 | 39.0 | 38.0 | 35.8 |
| EW-20 | 10465.7 | 8823.4 | 35.66 | 21.66 | 14.00 | 36.20 | 35.66 | 739.9 | 733 | 36.2 | 36.1 | 5.0 | 35.1 | 34.1 | 31.9 |
| EW-21 | 10292.2 | 8794.5 | 27.04 | 17.74 | 9.30 | 27.50 | 27.04 | 740.0 | 731 | 27.7 | 27.9 | 4.6 | 26.9 | 25.9 | 23.7 |
| EW-22 | 10280.3 | 8992.4 | 32.07 | 20.97 | 11.10 | 31.80 | 32.07 | 739.3 | 731 | 32.6 | 31.7 | 4.5 | 30.7 | 29.7 | 27.5 |
| EW-23 | 10252.2 | 9175.6 | 29.35 | 19.35 | 10.00 | 30.60 | 29.35 | 740.5 | 731 | 29.8 | NM | NM | NM | NM | NM |
| EW-24 | 10445.8 | 9176.4 | 42.11 | 20.11 | 22.00 | 43.70 | 42.11 | 740.0 | 733 | 42.6 | 43.0 | 4.9 | 42.0 | 41.0 | 38.8 |
| EW-25 | 10555.3 | 9010.9 | 47.97 | 19.17 | 28.80 | 49.00 | 47.97 | 741.2 | 733 | 48.9 | 48.5 | 4.5 | 47.5 | 46.5 | 44.3 |
| EW-26 | 10579.8 | 9312.6 | 48.67 | 20.00 | 28.67 | 49.20 | 48.67 | 739.4 | 733 | 49.2 | 49.5 | 5.1 | 48.5 | 47.5 | 45.3 |
| EW-27 | 10932.2 | 9293.5 | 65.71 | 23.71 | 42.00 | 59.20 | 65.71 | 741.8 | 735 | 66.8 | 65.7 | 4.1 | 64.7 | 63.7 | 61.5 |
| EW-28 | 11225.5 | 9357.1 | 68.81 | 24.31 | 44.50 | 64.20 | 68.81 | 744.5 | 738 | 69.3 | 65.5 | 4.2 | 64.5 | 63.5 | 61.3 |

- Notes:
- Used 3.5-inch diameter slug on all wells.
 - Wells EW-4, EW-5, EW-6, EW-7, and EW-23 are currently not scheduled to receive pumps.
 - Information in columns with hatch marks  was provided by Energy Developments Leachate Monitoring Report, dated March 20, 2007.
 - Well base elevation from Table 1 in Construction Acceptance Report, Landfill Gas Extraction System, by RMT, Inc., dated February 1998.
 - Approximate bottom of landfill excavation elevations obtained from Cross Sections contained in Appendix E-2 to May 2021 Permit Renewal Application.
 - Information in other columns without hatch marks provided by WCG based on field data.
 - Information regarding EW-12A provided by facility personnel.

R 000698

Table E-2
Log for Documenting
90 Day Storage Requirement
Leachate Accumulation Tank
Zion Landfill - Site 1 - Phase A

[illegible]

Tank Volume = 8,000 gallons.

At least 8,000 gal of throughput (i.e., OUT of tank) on average every 90 days during year? Yes_____ No _____

*Negative volume INTO Tank means a greater volume was pumped from the tank than entered tank.

Table E-3
Cost Estimate for Post-Closure Care - June 2025
Zion Landfill, Site 1 Phase A

| | Item | Units | Quantity | 2025 Updated Quantity | 2021 Unit Cost | 2022 Unit Cost | 2023 Unit Cost | 2024 Unit Cost | 2025 Unit Cost | 2025 Extended Cost | Post-Closure Care Period began February 10, 1998. As of February 10, 2025, 27 years have been completed and 3 years of the minimum 30 year post-closure period have yet to be completed. |
|----|---|--------------|----------|-----------------------|----------------|-------------------------------|----------------|----------------|----------------|--------------------|--|
| | Inflation Factors from Illinois EPA: | | | | 1.0143 | 1.070 | 1.036 | 1.024 | | | Annual inflation factors from post-closure care cost estimates from other waste disposal facilities utilized for inflation adjustments. |
| 1 | Landfill Inspections | Monthly | 12 | 12 | \$750 | \$761 | \$814 | \$843 | \$864 | \$10,362 | Frequency and scope of inspections presented in Section D.3 of May 2021 Permit Renewal Application. Costs updated to reflect annual inflation since 2021. |
| 1a | Inspect Vacuum Curtain System | Monthly | -- | 12 | -- | -- | -- | -- | \$115 | \$1,380 | Vacuum curtain system installed to address a landfill gas exceedance reported at well GMP-2 (Permit Mod. Log No. B-23R-M-8). New line item added in June 2025. |
| 2 | 90-Day Leachate Accumulation Tank Inspections | Weekly | 52 | 52 | \$100 | \$101 | \$109 | \$112 | \$115 | \$5,987 | Weekly inspection is only required on 90-Day Leachate Accumulation Tank (see Section D.3 in May 2021 Permit Renewal Application). Costs updated to reflect annual inflation since 2021. |
| 3 | Mowing (minimum of once per year) | Acres | 49 | 49 | \$60 | \$61 | \$65 | \$67 | \$69 | \$3,385 | Annual mowing required pursuant to Section D.3 of May 2021 Permit Renewal Application. Costs updated to reflect annual inflation since 2021. |
| 4 | Vegetation Repair (1/2 ft. topsoil layer) - Fertilizer, Mulch & Seed | Acre | 0.25 | 0.25 | \$7,800 | \$7,912 | \$8,465 | \$8,770 | \$8,981 | \$2,245 | Expect no more than 0.25 acre of vegetative cover replacement per year. Costs updated to reflect annual inflation since 2021. |
| 5 | Fence Repair and Maintenance | Annual | 1 | 1 | \$675 | \$685 | \$733 | \$759 | \$777 | \$777 | Fence repair only expected once per year during remaining post-closure care period. Costs updated to reflect annual inflation since 2021. |
| | Subtotal Costs - Post-Closure Inspection: \$24,137 | | | | | | | | | | |
| 6 | Groundwater Sample Collections (13 wells sampled semi-annually x 2nd & 4th qtrs.) | Wells | 26 | 26 | \$100 | Current (2025) Costs Utilized | | | \$203 | \$5,278 | 11 wells listed in Section IV of Permit and 2 in Section IV-A (13 total). Cost based on Proposal from EIL dated 1/14/2025. |
| 7a | Laboratory Analysis - Annual Event-2nd Qtr. (List G1/G2) 13 wells/year x 1 sample/well for List G1 and G2 | Wells | 13 | 13 | \$303 | Current (2025) Costs Utilized | | | \$457 | \$5,941 | In accordance with Section IV and IV-A of Permit: List G1 constituents analyzed 2x per year, List G1 1x. Analytical costs based on estimate from First Environmental Laboratories, dated 1/16/2025. |
| 7b | Laboratory Analysis - 4th Qtr. Event (List G1 only) (13 wells/year x 1 sample/well for List G1) | Wells | 13 | 13 | \$195 | Current (2025) Costs Utilized | | | \$377 | \$4,901 | In accordance with Section IV and IV-A of Permit: 4th Qtr. Event only for List G1. Analytical costs based on estimate from First Environmental Laboratories, dated 1/16/2025. |
| 8 | Groundwater Reporting - Semi-annual basis | Events | 2 | 2 | \$1,500 | Current (2025) Costs Utilized | | | \$4,500 | \$9,000 | Two groundwater reports required per year, in accordance with Section IV and IV-A of the Permit. Cost based on Proposal from EIL dated 1/14/2025. |
| 9 | Gas Monitoring - 5 perimeter probes and ambient | Year | 1 | 1 | \$500 | \$507 | \$543 | \$562 | \$576 | \$576 | Scope is in accordance with Gas Monitoring Plan included with May 2021 Permit Renewal Application. Costs updated to reflect annual inflation since 2021. |
| | Subtotal Costs - Groundwater/Gas Monitoring: \$25,696 | | | | | | | | | | |
| 10 | Leachate Removal, Transportation & Disposal | gallons/year | 215,000 | 167,000 | \$0.56 | \$0.57 | \$0.61 | \$0.63 | \$0.64 | \$107,675 | The quantity of leachate removal is based on the average amount of hazardous waste leachate manifested and transported from the site in 2022-24 (108,400 gal, 130,090 gal, and 262,459 gal). Although leachate production is expected to decrease with time, to be conservative, this quantity is assumed to be produced during the rest of the 30 year post-closure period. Unit cost updated to reflect annual inflation since 2021. |
| 11 | Leachate Analysis | year | 1 | 1 | \$844 | Current (2025) Costs Utilized | | | \$1,236 | \$1,236 | One sample of leachate analyzed per year for 35 IAC 811 Appendix C constituents, pursuant to Permit Condition III.G.7. Leachate analysis is based on analytical costs from First Environmental Laboratories, dated 1/16/2025. |
| 12 | Maintenance of Leachate Collection/Extraction System (includes pump maintenance/replacement, line cleaning, and quarterly leachate head level measurements) | Lump Sum | 1 | 1 | \$45,000 | \$45,644 | \$48,839 | \$50,597 | \$51,811 | \$51,811 | Lump sum estimate is based on 2021 costs listed in operation and maintenance agreement. Costs updated to reflect annual inflation since 2021. |
| | Subtotal Costs - Leachate: \$160,722 | | | | | | | | | | |
| | Total Annual Cost in 2025 Dollars \$210,554 | | | | | | | | | | |
| | 10% Contingency (on annual costs) \$21,055 | | | | | | | | | | |
| | Total Annual Cost (w/ Contingency) \$231,610 | | | | | | | | | | |
| | Remaining Post-Closure Care Period (years) 3.0 | | | | | | | | | | The post-closure period ends as soon as February 10, 2028. As of February 10, 2025, 27 years have been completed and a minimum of 3 years remain. |
| | Total Current Annual Costs (annual cost with contingency x years of post-closure remaining): \$631,663 | | | | | | | | | | |
| | Lump Sum (One Time) Cost Items to be Incurred Prior to End of Post-Closure Care Period | | | | | | | | | | |
| | Certification of Post-Closure Care | Lump Sum | 1 | 1 | \$500 | \$507 | \$543 | \$562 | \$576 | \$576 | Costs updated to reflect annual inflation since 2021. |
| | Monitoring Well Decommissioning/Abandonment | Well | 13 | 13 | \$1,000 | \$1,014 | \$1,085 | \$1,124 | \$1,151 | \$14,968 | 13 wells to be abandoned by drilling subcontractor, in accordance with 77 IAC 920. Costs updated to reflect annual inflation since 2021. |
| | Abandonment of Gas Probes | Probe | 5 | 5 | \$540 | \$548 | \$586 | \$607 | \$622 | \$3,109 | 5 gas probes included in Gas Monitoring Plan. Costs updated to reflect annual inflation since 2021. |
| | Total Lump Sum (One-Time) Costs: \$18,652 | | | | | | | | | | |
| | 10% Contingency (on one-time costs) \$1,865 | | | | | | | | | | |
| | TOTAL POST-CLOSURE CARE COSTS \$652,180 | | | | | | | | | | |

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Appendix A-1

Part A Permit Application and Supporting Materials/LPC-PA23 Form

OMB# 2050-0024; Expires 05/31/2020

United States Environmental Protection Agency
RCRA SUBTITLE C SITE IDENTIFICATION FORM

1. Reason for Submittal (Select only one.)

| | |
|-------------------------------------|--|
| <input type="checkbox"/> | Obtaining or updating an EPA ID number for an on-going regulated activity that will continue for a period of time. (Includes HSM activity) |
| <input type="checkbox"/> | Submitting as a component of the Hazardous Waste Report for _____ (Reporting Year) |
| <input type="checkbox"/> | Site was a TSD facility and/or generator of $\geq 1,000$ kg of non-acute hazardous waste, > 1 kg of acute hazardous waste, or > 100 kg of acute hazardous waste spill cleanup in one or more months of the reporting year (or State equivalent LQG regulations) |
| <input type="checkbox"/> | Notifying that regulated activity is no longer occurring at this Site |
| <input type="checkbox"/> | Obtaining or updating an EPA ID number for conducting Electronic Manifest Broker activities |
| <input checked="" type="checkbox"/> | Submitting a new or revised Part A Form |

2. Site EPA ID Number

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| I | L | D | 9 | 8 | 0 | 7 | 0 | 0 | 7 | 2 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|

3. Site Name

Zion Landfill Site 1 Phase A

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4. Site Location Address

| | | |
|----------------------------------|-----------------------|----------------|
| Street Address 701 Green Bay Rd. | | |
| City, Town, or Village Zion | | County Lake |
| State IL | Country United States | Zip Code 60099 |

5. Site Mailing Address

☒ Same as Location Address

| | | |
|------------------------|---------|----------|
| Street Address | | |
| City, Town, or Village | | |
| State | Country | Zip Code |

6. Site Land Type

| | | | | | | | |
|---|---------------------------------|-----------------------------------|----------------------------------|---------------------------------|------------------------------------|--------------------------------|--------------------------------|
| <input checked="" type="checkbox"/> Private | <input type="checkbox"/> County | <input type="checkbox"/> District | <input type="checkbox"/> Federal | <input type="checkbox"/> Tribal | <input type="checkbox"/> Municipal | <input type="checkbox"/> State | <input type="checkbox"/> Other |
|---|---------------------------------|-----------------------------------|----------------------------------|---------------------------------|------------------------------------|--------------------------------|--------------------------------|

7. North American Industry Classification System (NAICS) Code(s) for the Site (at least 5-digit codes)

| | |
|---------------------|---|
| A. (Primary) 562212 | C. |
| B. 562211 | D. EPA - DIVISION OF RECORDS MANAGEMENT RELEASABLE |

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EPA ID Number

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| I | L | D | 9 | 8 | 0 | 7 | 0 | 0 | 7 | 2 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|

OMB# 2050-0024; Expires 05/31/2020

8. Site Contact Information

☐ Same as Location Address

| | | | | | |
|------------------------|--|---------|----------------------|-----------|-----------------------|
| First Name | James | MI | W | Last Name | Hitzeroth |
| Title | Environmental Manager | | | | |
| Street Address | 26 W. 580 Schick Rd. | | | | |
| City, Town, or Village | Hanover Park | | | | |
| State | IL | Country | United States | | Zip Code 60133 |
| Email | JHitzeroth@republicservices.com | | | | |
| Phone | 224-970-1129 | Ext | -- | | Fax |

9. Legal Owner and Operator of the Site

A. Name of Site's Legal Owner

☐ Same as Location Address

| | | | | | | | |
|------------------------|---|---------|----------------------|--|----------|--------------------------------|-----------------|
| Full Name | Zion Landfill, Inc. | | | | | Date Became Owner (mm/dd/yyyy) | 1/7/2021 |
| Owner Type | <input checked="" type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other | | | | | | |
| Street Address | 701 Green Bay Road | | | | | | |
| City, Town, or Village | Zion | | | | | | |
| State | IL | Country | United States | | Zip Code | 60099-9564 | |
| Email | bstenzel@gflenv.com | | | | | | |
| Phone | 847-732-2048 | Ext | | | Fax | | |
| Comments | | | | | | | |

B. Name of Site's Legal Operator

☐ Same as Location Address

| | | | | | | | |
|------------------------|---|---------|----------------------|--|----------|-----------------------------------|-------------------|
| Full Name | BFI Waste Systems of North America, LLC | | | | | Date Became Operator (mm/dd/yyyy) | 10/15/1976 |
| Operator Type | <input checked="" type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other | | | | | | |
| Street Address | 26 W. Schick Rd | | | | | | |
| City, Town, or Village | Hanover Park | | | | | | |
| State | IL | Country | United States | | Zip Code | 60133 | |
| Email | JHitzeroth@republicservices.com | | | | | | |
| Phone | 224-970-1129 | Ext | | | Fax | | |
| Comments | | | | | | | |

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10. Type of Regulated Waste Activity (at your site)

Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities

| | | |
|--|---|---|
| <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | 1. Generator of Hazardous Waste—If "Yes", mark only one of the following—a, b, c | |
| <input checked="" type="checkbox"/> | a. LQG | -Generates, in any calendar month (includes quantities imported by importer site) 1,000 kg/mo (2,200 lb/mo) or more of non-acute hazardous waste; or - Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lb/mo) of acute hazardous waste; or - Generates, in any calendar month or accumulates at any time, more than 100 kg/mo (220 lb/mo) of acute hazardous spill cleanup material. |
| <input type="checkbox"/> | b. SQG | 100 to 1,000 kg/mo (220-2,200 lb/mo) of non-acute hazardous waste and no more than 1 kg (2.2 lb) of acute hazardous waste and no more than 100 kg (220 lb) of any acute hazardous spill cleanup material. |
| <input type="checkbox"/> | c. VSQG | Less than or equal to 100 kg/mo (220 lb/mo) of non-acute hazardous waste. |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 2. Short-Term Generator (generates from a short-term or one-time event and not from on-going processes). If "Yes", provide an explanation in the Comments section. <i>Note: If "Yes", you MUST indicate that you are a Generator of Hazardous Waste in Item 10.A.1 above.</i> | |
| <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | 3. Treater, Storer or Disposer of Hazardous Waste—Note: Part B of a hazardous waste permit is required for these activities. | |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 4. Receives Hazardous Waste from Off-site | |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 5 Recycler of Hazardous Waste | |
| <input type="checkbox"/> | a. Recycler who stores prior to recycling | |
| <input type="checkbox"/> | b. Recycler who does not store prior to recycling | |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 6. Exempt Boiler and/or Industrial Furnace—If "Yes", mark all that apply. | |
| <input type="checkbox"/> | a. Small Quantity On-site Burner Exemption | |
| <input type="checkbox"/> | b. Smelting, Melting, and Refining Furnace Exemption | |

B. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g. D001, D003, F007, U112). Use an additional page if more spaces are needed.

| | | | | | | |
|------|--|--|--|--|--|--|
| F039 | | | | | | |
| | | | | | | |
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C. Waste Codes for State Regulated (non-Federal) Hazardous Wastes. Please list the waste codes of the State hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.

| | | | | | | |
|--|--|--|--|--|--|--|
| | | | | | | |
| | | | | | | |

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1. Additional Regulated Waste Activities (NOTE: Refer to your State regulations to determine if a separate permit is required.)**A. Other Waste Activities**

| | |
|--|---|
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 1. Transporter of Hazardous Waste—If “Yes”, mark all that apply. |
| <input type="checkbox"/> | a. Transporter |
| <input type="checkbox"/> | b. Transfer Facility (at your site) |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 2. Underground Injection Control |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 3. United States Importer of Hazardous Waste |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 4. Recognized Trader—If “Yes”, mark all that apply. |
| <input type="checkbox"/> | a. Importer |
| <input type="checkbox"/> | b. Exporter |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 5. Importer/Exporter of Spent Lead-Acid Batteries (SLABs) under 40 CFR 266 Subpart G—If “Yes”, mark all that apply. |
| <input type="checkbox"/> | a. Importer |
| <input type="checkbox"/> | b. Exporter |

B. Universal Waste Activities

| | |
|--|--|
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 1. Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more) - If “Yes” mark all that apply. Note: Refer to your State regulations to determine what is regulated. |
| <input type="checkbox"/> | a. Batteries |
| <input type="checkbox"/> | b. Pesticides |
| <input type="checkbox"/> | c. Mercury containing equipment |
| <input type="checkbox"/> | d. Lamps |
| <input type="checkbox"/> | e. Other (specify) _____ |
| <input type="checkbox"/> | f. Other (specify) _____ |
| <input type="checkbox"/> | g. Other (specify) _____ |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 2. Destination Facility for Universal Waste Note: A hazardous waste permit may be required for this activity. |

C. Used Oil Activities

| | |
|--|---|
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 1. Used Oil Transporter—If “Yes”, mark all that apply. |
| <input type="checkbox"/> | a. Transporter |
| <input type="checkbox"/> | b. Transfer Facility (at your site) |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 2. Used Oil Processor and/or Re-refiner—If “Yes”, mark all that apply. |
| <input type="checkbox"/> | a. Processor |
| <input type="checkbox"/> | b. Re-refiner |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 3. Off-Specification Used Oil Burner |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 4. Used Oil Fuel Marketer—If “Yes”, mark all that apply. |
| <input type="checkbox"/> | a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner |
| <input type="checkbox"/> | b. Marketer Who First Claims the Used Oil Meets the Specifications |

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D. Pharmaceutical Activities

| | |
|--|--|
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 1. Operating under 40 CFR 266 Subpart P for the management of hazardous waste pharmaceuticals—if “Yes”, mark only one. Note: See the item-by-item instructions for definitions of healthcare facility and reverse distributor. |
| <input type="checkbox"/> | a. Healthcare Facility |
| <input type="checkbox"/> | b. Reverse Distributor |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | 2. Withdrawing from operating under 40 CFR 266 Subpart P for the management of hazardous waste pharmaceuticals. Note: You may only withdraw if you are a healthcare facility that is no longer an LQG or SQG. |

12. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR 262 Subpart K.

| | |
|--|---|
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | A. Opting into or currently operating under 40 CFR 262 Subpart K for the management of hazardous wastes in laboratories— If “Yes”, mark all that apply. Note: See the item-by-item instructions for definitions of types of eligible academic entities. |
| <input type="checkbox"/> | 1. College or University |
| <input type="checkbox"/> | 2. Teaching Hospital that is owned by or has a formal written affiliation with a college or university |
| <input type="checkbox"/> | 3. Non-profit Institute that is owned by or has a formal written affiliation with a college or university |
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | B. Withdrawing from 40 CFR 262 Subpart K for the management of hazardous wastes in laboratories. |

13. Episodic Generation

| | |
|--|---|
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | Are you an SQG or VSQG generating hazardous waste from a planned or unplanned episodic event, lasting no more than 60 days, that moves you to a higher generator category. If “Yes”, you must fill out the Addendum for Episodic Generator? |
|--|---|

14. LQG Consolidation of VSQG Hazardous Waste

| | |
|--|--|
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | Are you an LQG notifying of consolidating VSQG Hazardous Waste Under the Control of the Same Person pursuant to 40 CFR 262.17(f)? If “Yes”, you must fill out the Addendum for LQG Consolidation of VSQGs hazardous waste. |
|--|--|

15. Notification of LQG Site Closure for a Central Accumulation Area (CAA) (optional) OR Entire Facility (required)

| | |
|---|---|
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | LQG Site Closure of a Central Accumulation Area (CAA) or Entire Facility. |
| A. <input type="checkbox"/> Central Accumulation Area (CAA) or <input type="checkbox"/> Entire Facility | |
| B. Expected closure date: _____ mm/dd/yyyy | |
| C. Requesting new closure date: _____ mm/dd/yyyy | |
| D. Date closed : _____ mm/dd/yyyy | |
| <input type="checkbox"/> | 1. In compliance with the closure performance standards 40 CFR 262.17(a)(8) |
| <input type="checkbox"/> | 2. Not in compliance with the closure performance standards 40 CFR 262.17(a)(8) |

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OMB# 2050-0024; Expires 05/31/2020

16. Notification of Hazardous Secondary Material (HSM) Activity

| | |
|--|---|
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | Are you notifying under 40 CFR 260.42 that you will begin managing, are managing, or will stop managing hazardous secondary material under 40 CFR 260.30, 40 CFR 261.4(a)(23), (24), (25), or (27)? If "Yes", you must fill out the Addendum to the Site Identification Form for Managing Hazardous Secondary Material. |
|--|---|

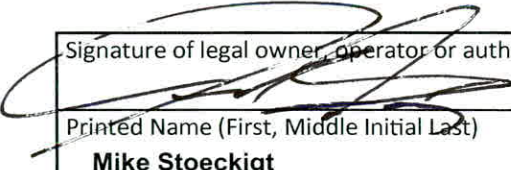
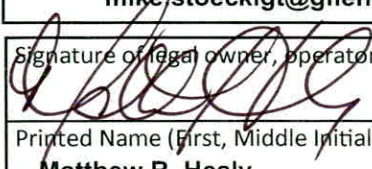
17. Electronic Manifest Broker

| | |
|--|--|
| <input type="checkbox"/> Y <input checked="" type="checkbox"/> N | Are you notifying as a person, as defined in 40 CFR 260.10, electing to use the EPA electronic manifest system to obtain, complete, and transmit an electronic manifest under a contractual relationship with a hazardous waste generator? |
|--|--|

18. Comments (include item number for each comment)

| |
|--|
| |
|--|

19. Certification I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. **Note: For the RCRA Hazardous Waste Part A permit Application, all owners and operators must sign (see 40 CFR 270.10(b) and 270.11).**

| | |
|---|-----------------------|
| Signature of legal owner, operator or authorized representative | Date (mm/dd/yyyy) |
|  | 6-10-25 |
| Printed Name (First, Middle Initial Last) | Title |
| Mike Stoeckigt | Region Vice President |
| Email | |
| mike.stoeckigt@gflenv.com | |
| Signature of legal owner, operator or authorized representative | Date (mm/dd/yyyy) |
|  | 06/03/2025 |
| Printed Name (First, Middle Initial Last) | Title |
| Matthew R. Healy | Vice President |
| Email | |
| mhealy@republicservices.com | |

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ADDENDUM TO THE SITE IDENTIFICATION FORM: NOTIFICATION OF HAZARDOUS SECONDARY MATERIAL ACTIVITY

**ONLY fill out this form if:**

- You are located in a State that allows you to manage excluded hazardous secondary material (HSM) under 40 CFR 260.30, 261.4(a)(23), (24), (25), or (27) (or state equivalent; See <https://www.epa.gov/epawaste/hazard/dsw/statespf.htm> for a list of eligible states; AND
- You are or will be managing excluded HSM in compliance with 40 CFR 260.30, 261.4(a)(23), (24), (25), or (27) (or state equivalent) or have stopped managing excluded HSM in compliance with the exclusion(s) and do not expect to manage any amount of excluded HSM under the exclusion(s) for at least one year. Do not include any information regarding your hazardous waste activities in this section. Note: If your facility was granted a solid waste variance under 40 CFR 260.30 prior to July 13, 2015, your management of HSM under 40 CFR 260.30 is grandfathered under the previous regulations and you are not required to notify for the HSM management activity excluded under 40 CFR 260.30.

1. Reason for Notification (Include dates where requested)

- ☐ Facility will begin managing excluded HSM as of _____ (mm/dd/yyyy).
- ☐ Facility is still managing excluded HSM/re-notifying as required by March 1 of each even-numbered year.
- ☐ Facility has stopped managing excluded HSM as of _____ (mm/dd/yyyy) and is notifying as required.

2. Description of Excluded HSM Activity. Please list the appropriate codes (see Code List section of the instructions) and quantities, in short tons, to describe your excluded HSM activity ONLY (do not include any information regarding your hazardous wastes). Use additional pages if more space is needed.

| A. Facility Code | B. Waste Code(s) for HSM | C. Estimate Short Tons of excluded HSM to be managed annually | D. Actual Short Tons of excluded HSM that was managed during the most recent odd-numbered year | E. Land-based Unit Code |
|------------------|--------------------------|---|--|-------------------------|
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ADDENDUM TO THE SITE IDENTIFICATION FORM: EPISODIC GENERATOR

**ONLY fill out this form if:**

- You are an SQG or VSQG generating hazardous waste from a planned or unplanned episodic event, lasting no more than 60 days, that moves the generator to a higher generator category pursuant to 40 CFR 262 Subpart L. Note: Only one planned and one unplanned episodic event are allowed within one year; otherwise, you must follow the requirements of the higher generator category. Use additional pages if more space is needed.

| | |
|---|--|
| Episodic Event | |
| 1. Planned <input type="checkbox"/> Excess chemical inventory removal <input type="checkbox"/> Tank cleanouts <input type="checkbox"/> Short-term construction or demolition <input type="checkbox"/> Equipment maintenance during plant shutdowns <input type="checkbox"/> Other _____ | 2. Unplanned <input type="checkbox"/> Accidental spills <input type="checkbox"/> Production process upsets <input type="checkbox"/> Product recalls <input type="checkbox"/> "Acts of nature" (Tornado, hurricane, flood, etc.) <input type="checkbox"/> Other _____ |
| 3. Emergency Contact Phone | 4. Emergency Contact Name |
| 5. Beginning Date _____ (mm/dd/yyyy) | 6. End Date _____ (mm/dd/yyyy) |

Waste 1

| | |
|--|--|
| 7. Waste Description | 8. Estimated Quantity (in pounds) |
| 9. Federal and/or State Hazardous Waste Codes | |
| | |
| | |

Waste 2

| | |
|--|--|
| 7. Waste Description | 8. Estimated Quantity (in pounds) |
| 9. Federal and/or State Hazardous Waste Codes | |
| | |
| | |

Waste 3

| | |
|--|--|
| 7. Waste Description | 8. Estimated Quantity (in pounds) |
| 9. Federal and/or State Hazardous Waste Codes | |
| | |
| | |

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United States Environmental Protection Agency
HAZARDOUS WASTE PERMIT PART A FORM



1. Facility Permit Contact

| | | | | |
|------------|--|-----|-----------|------------------|
| First Name | James | MI | Last Name | Hitzeroth |
| Title | Environmental Manager | | | |
| Email | JHitzeroth@republicservices.com | | | |
| Phone | 224-970-1129 | Ext | Fax | |

2. Facility Permit Contact Mailing Address

| | | | |
|------------------------|--------------------------|---------|----------------------|
| Street Address | 26W580 Schick Rd. | | |
| City, Town, or Village | Hanover Park | | |
| State | IL | Country | United States |
| Zip Code | 60133 | | |

3. Facility Existence Date (mm/dd/yyyy)

10/15/1976

Other Environmental Permits

| A. Permit Type | B. Permit Number | | | | | | | | | | C. Description |
|----------------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|--|--|
| N | 0 | 0 | 6 | 7 | 7 | 2 | 5 | | | | Stormwater Discharge Permit |
| E | 1 | 9 | 9 | 5 | | | 3 | 4 | 3 | | IL Solid Waste Disposal Permit |
| E | 1 | 9 | 9 | 2 | | | 3 | 2 | 8 | | IL Solid Waste Disposal Permit |
| E | 9 | 7 | 0 | 3 | 0 | 0 | 6 | 4 | | | Clean Air Act Permit Program Permit |
| E | 1 | 2 | 0 | 7 | 0 | 0 | 6 | 2 | | | Air Construc permit - 2014-25 LF Expan |
| E | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 1 | | | Air Construc Permit - Enclosed Flare |
| E | 1 | 1 | 0 | 3 | 0 | 0 | 0 | 9 | | | Air Construc Permit - Vert Landfill Expan |
| E | 24120010 | | | | | | | | | | Air Construc Permit - Sulfur Removal System |

5. Nature of Business

Closed RCRA Subtitle C Landfill

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6. Process Codes and Design Capacities

| Line Number | | A. Process Code | | | B. Process Design Capacity | | C. Process Total Number of Units | D. Unit Name |
|-------------|---|-----------------|---|---|----------------------------|---------------------|----------------------------------|------------------------|
| | | | | | (1) Amount | (2) Unit of Measure | | |
| 0 | 1 | D | 8 | 0 | 5,160,000 | Y | 1 | Zion LF Site 1 Phase A |
| 0 | 2 | S | 0 | 2 | 8,000 | G | 1 | Leachate Tank |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

7. Description of Hazardous Wastes (Enter codes for Items 7.A, 7.C and 7.D(1))

| Line No. | | A. EPA Hazardous Waste No. | | | B. Estimated Annual Qty of Waste | C. Unit of Measure | D. Processes | | | | | | | | | | | |
|----------|---|----------------------------|---|---|----------------------------------|--------------------|-------------------|---|---|---|--|--|--|--|--|--|--|--|
| | | | | | | | (1) Process Codes | | | | | | (2) Process Description (if code is not entered in 7.D1)) | | | | | |
| 0 | 1 | F | 0 | 3 | 9 | 200,000 | gallons | S | 0 | 2 | | | | | | | | |
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8. Map

Attach to this application a topographical map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all spring, rivers, and other surface water bodies in this map area. See instructions for precise requirements.

9. Facility Drawing

All existing facilities must include a scale drawing of the facility. See instructions for more detail.

10. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, and disposal areas; and sites of future storage, treatment, or disposal areas. See instructions for more detail.

11. Comments

A map satisfying Item 8 above is provided in the Part B Post-Closure Permit Renewal Application as Figure B-2. A drawing satisfying Item 9 above is provided in the Part B Post-Closure Permit Renewal Application as Figure B-3. Photographs satisfying Item 10 showing existing structures and storage areas are presented in the Part B Post-Closure Permit Renewal Application in Appendix A-1, immediately following this Part A Application Form.

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Photograph #1

View from top of
closed Site 1, Phase
A Landfill, from the
southeast.



Photograph #2

View of west slope
of closed landfill
from the south.



Photograph #3

View of double walled
leachate accumula-
tion tank and con-
crete containment.



Photograph #4

View of Flare-Blower
Building, from the east.
Leachate tank also visi-
ble along left frame of
photo.



Photograph #5

View of Flare-Blower
Building from the north.



Illinois Environmental Protection Agency

2520 West Iles Avenue • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

RCRA Permit Application Form (LPC-PA23)

This form must be used for any permit application for a hazardous waste management facility regulated in accordance with RCRA, Subtitle C, including all requests to modify an existing permit. One original and three (3) copies, of all permit applications must be submitted. Attach the original and appropriate number of copies of a cover letter, any necessary plans, specifications, reports, forms, (e.g., corrective action certification form), and any other certifications etc. to fully support and describe the activities or modifications being proposed. Attach sufficient information to demonstrate compliance with all applicable regulatory requirements. Applications without this form will be deemed incomplete. Please refer to the RCRA checklist and decision guide documents for further guidance. For RCRA corrective action, this form should only be used if requesting an actual modification to a RCRA permit. A RCRA Corrective Action Certification form should be used in all other instances.

Note: Permit applications which are hand-delivered to the Bureau of Land, Permit Section must be delivered to 1021 North Grand Avenue East between the hours of 8:30 a.m. to 5:00 p.m., Monday through Friday (excluding State holidays).

Please type or print all information legibly.

I. Site Identification

Site # (Illinois EPA): 0978020001

USEPA ID Number: ILD980700728

Site Name: Zion Landfill Site 1 Phase A

Physical Site Location (street, road, etc.): 701 Green Bay Road

City: Zion

Zip Code: 60099

County: Lake

Existing RCRA Permit (if applicable): B-23R

II. Owner/Operator Identification

Owner Information

Name: Zion Landfill, Inc.

Mailing Address:

701 Green Bay Rd.
Zion, IL 60099

Contact Name: Brad Stenzel

Phone #: 847-732-2048

Email: bstenzel@gflenv.com

Operator Information

Name: BFI Waste Systems of North America, LLC

Mailing Address:

25 W. 580 Schick Rd.
Hanover Park, IL 60103

Contact Name: James Hitzeroth

Phone #: 224-970-1129

Email: JHitzeroth@republicservices.com

A 39(i) certification must be submitted with information concerning the following persons or entities:

- the owner of the business entity applying for the permit;
- the operator of the business entity applying for the permit;
- each employee or officer of the owner or operator who signed the permit application or has managerial authority at the site; and
- any additional owner, operator, or officer or employee of the owner or operator from whom a certification is requested by the Illinois EPA, including any officer or employee who will be responsible for overseeing or implementing regulated activities governed by the permit.

JUN 27 2025

REVIEWER: MED

JUN 23 2025

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III. Permit Application Identification

Application Type

- | | | |
|---|--|---|
| <input type="checkbox"/> New Part B Permit | <input type="checkbox"/> Class 1 Modification | <input type="checkbox"/> Remedial Action Plan Permit (RAPP) |
| <input checked="" type="checkbox"/> Part B Permit Renewal | <input type="checkbox"/> Class 1* (prior approval required) Modification | <input type="checkbox"/> Sig RAPP Modification |
| | <input type="checkbox"/> Class 2 Modification | <input type="checkbox"/> Non Sig RAPP Modification |
| | <input type="checkbox"/> Class 3 Modification | <input type="checkbox"/> Major UIC Modification |
| | <input type="checkbox"/> Additional information to supplement UIC Class I application Log Number | <input type="checkbox"/> Minor UIC Modification |

This Application Involves

- | | | | |
|--------------------------------------|--|--|---------------------------------------|
| <input type="checkbox"/> Storage | <input type="checkbox"/> Treatment | <input checked="" type="checkbox"/> Disposal | <input type="checkbox"/> Incineration |
| <input type="checkbox"/> Groundwater | <input type="checkbox"/> Corrective Action | <input type="checkbox"/> UIC Class I | <input type="checkbox"/> UIC Class V |

Description of This Permit Request: (Include a brief narrative description here.)

Permit Renewal Application, due every 10 years.

IV. SIGNATURES

Original signatures required. Signature stamps or applications transmitted electronically or by facsimile are not acceptable. All applications shall be signed by the person in accordance with 35 IAC 702.126(a).

Please check the box of the appropriate certification.

Owner

- ☒ I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons that manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Alternative owner certification. For remedial action plans (RAPs) permit under Subpart H of 35 IAC 703, the owner may choose to make the following certification instead of the certification above.

- ☐ Based on my knowledge of the conditions of the property described in the RAP and my inquiry of the person or persons that manage the system referenced in the operator's certification, or those persons directly responsible for gathering the information, the information submitted is, upon information and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner Name (Printed or Typed): Mike Stoeckigt

Owner Signature: 

Date:

6-10-25

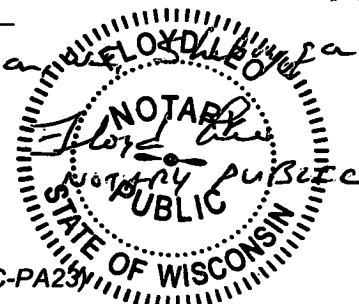
Title: Region Vice President

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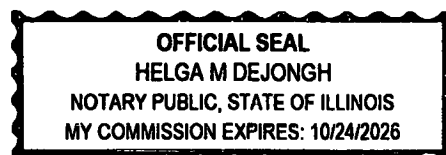
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*Subscribed & Sworn before me in Sheboygan County
on 6-10-2025*



Operator

I certify under penalty of law that this document and all attachment were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons that manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information.

Operator Name (Printed or Typed): Matthew HealyOperator Signature: Date: 6-13-2025Title: Vice President**Notary** (Required for both owner and operator signatures)Subscribed and Sworn before me this 13th day of June 2025.Notary Signature: My commission expires on: 24 October 2026

Notary Seal

Engineer

I certify under penalty of law that this document and all attachment were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons that manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information.

Engineer Name (Print or Type): Ed Doyle, P.E.Engineer Signature: Illinois License No.: 062-048126Expiration Date of License: 11/30/2025Engineer Phone No. 630-254-9388Email: edoyle@EILLLC.com

Engineer Address:

1323 Butterfield Rd.

Suite 104

Downers Grove, IL 60515-5620



Engineer Seal

Environmental Information
Logistics, LLC
IL Design Firm
Registration #
184004752-0002
Renewal Date: 4/30/2026

All information submitted as part of the Application is available to the public except when specifically designated by the Applicant to be treated confidentially as a trade secret or secret process in accordance with Section 7(a) of the Environmental Protection Act, applicable Rules and Regulations of the Illinois Pollution Control Board and applicable Illinois EPA rules and guidelines.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

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Instructions for RCRA Permit Application Form LPC-PA23

The following instructions are designed to aid in the completion of the RCRA Permit Application Form LPCPA23. If you have additional questions regarding the form, or the informational requirements, please contact the Illinois EPA Bureau of Land (BOL) Permit Section at 217-524-3300.

This form must be used for any permit application for a hazardous waste management facility regulated in accordance with RCRA, Subtitle C, including all requests to modify an existing permit. If an application has already been submitted to the Agency, a completed RCRA Permit Application Form must accompany all additional information that is submitted to the agency for that application. An example of "additional information" would be a response to verbal or written comments from the Agency. For RCRA corrective action, this form should only be used if requesting an actual modification to a RCRA permit. A RCRA Corrective Action Certification form should be used in all other instances.

I. Site Identification

Enter all of the required information in the space provided. If you do not have an Illinois or USEPA identification number, call the Illinois EPA BOL Waste Reduction and Compliance Section at 217-785-8604 to obtain these numbers prior to completing the form.

II. Owner/Operator Identification

The terms "owner" and "operator" are defined at 35 IAC 720.110 and 702.110. If the facility has the same owner and operator, you may type in "same" under operator information. Also, if the contact person for an application is different from the owner or operator (i.e. the consultant), please indicate this in the cover letter for the application.

III. Permit Application Identification

Indicate both the type of application and the kind of waste management involved. For instance, if the application involves more than one type of waste management, check all applicable options.

IV. Signatures

The signatory requirements for permit applicants are identified at 35 IAC 702.126 and 702.151. If the facility has the same owner and operator, you may type in "same" under operator information.

Notary Public: A notary public's signature and stamp are required for both the owner and operator signatures on the form.

Engineer Certification: A professional engineer that is licensed in the State of Illinois must certify all technical information provided in a permit application. 35 IAC 703.182 describes the types of information that must be certified by a professional engineer.

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RCRA Permit Application Form (LPC-PA23)

This form must be used for any permit application for a hazardous waste management facility regulated in accordance with RCRA, Subtitle C, including all requests to modify an existing permit. One original and three (3) copies, of all permit applications must be submitted. Attach the original and appropriate number of copies of a cover letter, any necessary plans, specifications, reports, forms, (e.g., corrective action certification form), and any other certifications etc. to fully support and describe the activities or modifications being proposed. Attach sufficient information to demonstrate compliance with all applicable regulatory requirements. Applications without this form will be deemed incomplete. Please refer to the RCRA checklist and decision guide documents for further guidance. For RCRA corrective action, this form should only be used if requesting an actual modification to a RCRA permit. A RCRA Corrective Action Certification form should be used in all other instances.

Note: Permit applications which are hand-delivered to the Bureau of Land, Permit Section must be delivered to 1021 North Grand Avenue East between the hours of 8:30 a.m. to 5:00 p.m., Monday through Friday (excluding State holidays).

Please type or print all information legibly.

I. Site Identification

Site # (Illinois EPA): 0978020001

USEPA ID Number: ILD980700728

Site Name: Zion Site 1 Landfill

Physical Site Location (street, road, etc.): 701 Green Bay Road

City: Zion

Zip Code: 60099

County: Lake

Existing RCRA Permit (if applicable): B-23R

II. Owner/Operator Identification

Owner Information

Name: Zion Landfill, Inc.

Mailing Address:

701 Green Bay Rd.
Zion, IL 60099

Contact Name: Jim Lewis

Phone #: 847-599-5910

Email: james.lewis@advanceddisposal.com

Operator Information

Name: BFI Waste Systems of North America, LLC

Mailing Address:

26 W. 580 Schick Rd.
Hanover Park, IL 60103

Contact Name: James Hitzeroth

Phone #: 224-970-1129

Email: JHitzeroth@republicservices.com

A 39(i) certification must be submitted with information concerning the following persons or entities:

- the owner of the business entity applying for the permit;
- the operator of the business entity applying for the permit;
- each employee or officer of the owner or operator who signed the permit application or has managerial authority at the site; and
- any additional owner, operator, or officer or employee of the owner or operator from whom a certification is requested by the Illinois EPA, including any officer or employee who will be responsible for overseeing or implementing regulated activities governed by the permit.

III. Permit Application Identification

Application Type

- | | | |
|---|--|---|
| <input type="checkbox"/> New Part B Permit | <input type="checkbox"/> Class 1 Modification | <input type="checkbox"/> Remedial Action Plan Permit (RAPP) |
| <input checked="" type="checkbox"/> Part B Permit Renewal | <input type="checkbox"/> Class 1* (prior approval required) Modification | <input type="checkbox"/> Sig RAPP Modification |
| | <input type="checkbox"/> Class 2 Modification | <input type="checkbox"/> Non Sig RAPP Modification |
| | <input type="checkbox"/> Class 3 Modification | <input type="checkbox"/> Major UIC Modification |
| | <input type="checkbox"/> Additional information to supplement UIC Class I application Log Number | <input type="checkbox"/> Minor UIC Modification |

This Application Involves

- | | | | |
|--------------------------------------|--|--|---------------------------------------|
| <input type="checkbox"/> Storage | <input type="checkbox"/> Treatment | <input checked="" type="checkbox"/> Disposal | <input type="checkbox"/> Incineration |
| <input type="checkbox"/> Groundwater | <input type="checkbox"/> Corrective Action | <input type="checkbox"/> UIC Class I | <input type="checkbox"/> UIC Class V |

Description of This Permit Request: (Include a brief narrative description here.)

Permit Renewal Application, due every 10 years.

IV. SIGNATURES

Original signatures required. Signature stamps or applications transmitted electronically or by facsimile are not acceptable. All applications shall be signed by the person in accordance with 35 IAC 702.126(a).

Please check the box of the appropriate certification.

Owner

- ☒ I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons that manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Alternative owner certification. For remedial action plans (RAPs) permit under Subpart H of 35 IAC 703, the owner may choose to make the following certification instead of the certification above.

- ☐ Based on my knowledge of the conditions of the property described in the RAP and my inquiry of the person or persons that manage the system referenced in the operator's certification, or those persons directly responsible for gathering the information, the information submitted is, upon information and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

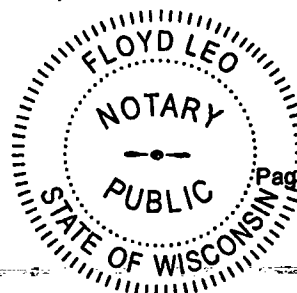
Owner Name (Printed or Typed): Mike Stoeckigt

Owner Signature: 

Date: 4-26-21

Title: Region Vice President

*Subscribed & Sworn before me in Sheboygan, WI, Sheboygan County, WI
on 04-26-2021, Floyd Leo Notary Public
My Commission expires on 02-23-2025*



Operator

I certify under penalty of law that this document and all attachment were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons that manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information.

Operator Name (Printed or Typed): Matthew HealyOperator Signature: Date: 05/04/2021Title: Vice President**Notary** (Required for both owner and operator signatures)Subscribed and Sworn before me this 4th day of May 2021.Notary Signature: My commission expires on: 24 October 2022

Notary Seal

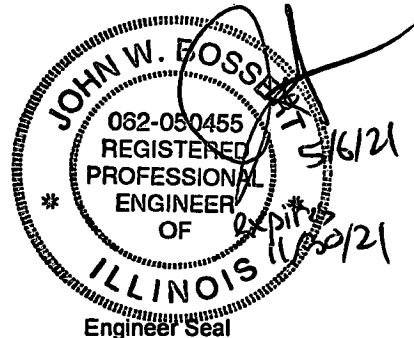
Engineer

I certify under penalty of law that this document and all attachment were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons that manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information.

Engineer Name (Print or Type): John BossertEngineer Signature: Illinois License No.: 062-050455Expiration Date of License: Nov 30, 2021Engineer Phone No. 217-787-0290Email: jbossert@wcgrp.com

Engineer Address:

3516 Ogden Rd.
Springfield, IL 62711



All information submitted as part of the Application is available to the public except when specifically designated by the Applicant to be treated confidentially as a trade secret or secret process in accordance with Section 7(a) of the Environmental Protection Act, applicable Rules and Regulations of the Illinois Pollution Control Board and applicable Illinois EPA rules and guidelines.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Instructions for RCRA Permit Application Form LPC-PA23

The following instructions are designed to aid in the completion of the RCRA Permit Application Form LPCPA23. If you have additional questions regarding the form, or the informational requirements, please contact the Illinois EPA Bureau of Land (BOL) Permit Section at 217-524-3300.

This form must be used for any permit application for a hazardous waste management facility regulated in accordance with RCRA, Subtitle C, including all requests to modify an existing permit. If an application has already been submitted to the Agency, a completed RCRA Permit Application Form must accompany all additional information that is submitted to the agency for that application. An example of "additional information" would be a response to verbal or written comments from the Agency. For RCRA corrective action, this form should only be used if requesting an actual modification to a RCRA permit. A RCRA Corrective Action Certification form should be used in all other instances.

I. Site Identification

Enter all of the required information in the space provided. If you do not have an Illinois or USEPA identification number, call the Illinois EPA BOL Waste Reduction and Compliance Section at 217-785-8604 to obtain these numbers prior to completing the form.

II. Owner/Operator Identification

The terms "owner" and "operator" are defined at 35 IAC 720.110 and 702.110. If the facility has the same owner and operator, you may type in "same" under operator information. Also, if the contact person for an application is different from the owner or operator (i.e. the consultant), please indicate this in the cover letter for the application.

III. Permit Application Identification

Indicate both the type of application and the kind of waste management involved. For instance, if the application involves more than one type of waste management, check all applicable options.

Signatures

The signatory requirements for permit applicants are identified at 35 IAC 702.126 and 702.151. If the facility has the same owner and operator, you may type in "same" under operator information.

Notary Public: A notary public's signature and stamp are required for both the owner and operator signatures on the form.

Engineer Certification: A professional engineer that is licensed in the State of Illinois must certify all technical information provided in a permit application. 35 IAC 703.182 describes the types of information that must be certified by a professional engineer.

Appendix A-2
39i Certification



Illinois Environmental Protection Agency

2520 West Iles Avenue • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

39(i) Certification for Operating a Waste Management Facility

Pursuant to 415 ILCS 5/39(i), prior to issuing any RCRA permit, or any permit for a waste storage site, sanitary landfill, waste disposal site, waste transfer station, waste treatment facility, waste incinerator, clean construction or demolition debris fill operation, or used tire storage site, the Illinois EPA must conduct an evaluation of the prospective owner's or operator's prior experience in waste management operations, clean construction or demolition debris fill operations, and tire storage site management. As part of that evaluation please complete and submit this form with your permit application.

This form may be completed online and saved locally before printing, signing and submitting it to the Illinois EPA at the address below. If the form is completed manually, please type or print clearly.

Illinois Environmental Protection Agency
Division of Land Pollution Control - #33
39(i) Certification
2520 West Iles Avenue
P.O. Box 19276
Springfield, IL 62794-9276

I. Applicant Information

Site Name Zion Landfill Site 1 Phase A

IEPA BOL No.: 0978020001

Site Address 701 Green Bay Road

City: Zion

State: IL

Zip Code: 60099

Permit Numbers (if applicable): B-23R

Owner

Owner Name: Zion Landfill, Inc.

Street Address: 701 Green Bay Road

City: Zion

State: IL

Zip: 60099

Operator

Operator Name: BFI Waste Systems of North America, LLC

Street Address: 26 W. 580 Schick Rd.

City: Hanover Par

State: IL

Zip: 60099

Is this 39(i) certification for the owner or the operator?

☐ Owner

☒ Operator

☐ Owner and operator are the same entity

II. Officers and Employees with Site Responsibility

Unless the owner and operator are the same entity, a separate 39(i) form must be submitted for both the owner and operator. Persons operating under the authority of the owner should be listed on the owner's 39(i) form and persons operating under authority of the operator should be listed on the operator's 39(i) form.

A. Officers: List the name and title of all officers of the owner or operator that will have personal involvement or active participation in the operation or management of the site or facility for which the application is submitted.

| Name | Title |
|---------------|----------------|
| Matthew Healy | Vice President |

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JUN 23 2025

IEPA-BOL
PERMIT SECTION

B. Employees: List the name and title of each employee of the owner or operator that will have personal involvement or active participation in the overall operation or management of the site or facility for which the application is submitted (e.g. site managers, site engineers, and other persons who direct or control the overall day-to-day management of the operation, but not persons whose duties are exclusively limited to equipment operation, labor, or similar non-managerial functions).

| Name | Title |
|-----------------|-----------------------|
| James Hitzeroth | Environmental Manager |

III. Owner, Operator, Officer, and Employee Information

A. Prior Conduct Identification

The applicant must answer each of the following questions for every owner or operator, and for any officer or employee identified under Section II. If the answer to any of the following questions is affirmative, the applicant must complete an Attachment A for each person for whom the answer is affirmative and include a copy of each final administrative or judicial determination that required an affirmative response. If the information for each owner, operator, officer, and employee has not changed since the applicant's last submission of a 39(i) certification, the applicant can skip to Section III(C), below.

- 1) Has there been a finding that any person named in Section II violated federal, State, or local laws, regulations, standards, or ordinances in the operation of one or more waste management facilities or sites, clean construction or demolition debris fill operation facilities or sites, or tire storage sites? ☐ Yes
☒ No
- 2) Has any person named in Section II ever been convicted in this or another State of any crime which is a felony under the laws of this State, or convicted of a felony in a federal court; or convicted in this or another state or federal court of any of the following crimes: forgery, official misconduct, bribery, perjury, or knowingly submitting false information under any environmental law, regulation, or permit term or condition? ☐ Yes
☒ No
- 3) Has there been a finding against any person named in Section II of gross carelessness or incompetence in handling, storing, processing, transporting or disposing of waste, clean construction or demolition debris, or used or waste tires, or a finding of gross carelessness or incompetence in using clean construction or demolition debris as fill? ☐ Yes
☒ No

B. Pending Proceedings

The applicant must answer each of the following questions for every owner or operator, and for any officer or employee identified in Section II. If the answer to any of the following questions is affirmative, the applicant must complete an Attachment A for each person for whom the answer is affirmative and provide information identified in Attachment A regarding the pending proceeding.

1. Is there any proceeding currently pending against any person named in Section II that could result in a conviction or finding described in subsection A, above? ☐ Yes
☒ No
2. Is there any proceeding currently pending against any person named in Section II that could result in the reversal of a conviction or finding described in subsection A, above? ☐ Yes
☒ No

C. Prior Application Information

If (i) the applicant has previously submitted the Attachments required pursuant to subsections A and B above and (ii) the Attachments previously submitted are still complete, true, and correct, then the applicant does not need to include Attachments with this submission if the following box is checked:

☐ By checking this box, I affirm that the Attachments previously submitted are still complete, true, and correct and wish to incorporate them into this Certification.

If the above box is checked, identify the application that contains the previously submitted Attachments that are complete, true, and correct.

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JUN 23 2025

IEPA-BOL
PERMIT SECTION

Authorization for Release of Information

This Certification must be signed by an officer of the applicant.

The undersigned authorizes any representative of the Illinois Environmental Protection Agency bearing this release to obtain any information from the Illinois State Police pertaining to the criminal records of the applicant and hereby directs the Illinois State Police to release such information upon request of the bearer. The undersigned authorizes a review of and full disclosure of all records, or any part thereof, concerning the applicant's criminal records by and to a duly authorized agent of the Illinois Environmental Protection Agency, whether the records are of public, private, or confidential nature. The intent of this authorization is to give consent for full and complete disclosure of the applicant's criminal records.

The undersigned fully understands that any information which is developed directly or indirectly, in whole or in part, as a result of this authorization will be considered in determining whether a permit shall be issued by the Illinois Environmental Protection Agency under the Environmental Protection Act [415 ILCS 5]. The undersigned further agrees to release the Illinois State Police and the Illinois Environmental Protection Agency, its agents and designees under this release, from any and all liability which may be incurred as a result of compliance with this authorization for release of information.

Certification Statements

I certify under penalty of law that the information submitted, including information on any Attachments submitted as part of or incorporated into this Certification, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))



Signature of Applicant Officer

6.13.2025

Date



Printed Name

Vice President

Title

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JUN 23 2025

IEPA-BOL
PERMIT SECTION



Illinois Environmental Protection Agency

2520 West Iles Avenue • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

39(i) Certification for Operating a Waste Management Facility

Pursuant to 415 ILCS 5/39(i), prior to issuing any RCRA permit, or any permit for a waste storage site, sanitary landfill, waste disposal site, waste transfer station, waste treatment facility, waste incinerator, clean construction or demolition debris fill operation, or used tire storage site, the Illinois EPA must conduct an evaluation of the prospective owner's or operator's prior experience in waste management operations, clean construction or demolition debris fill operations, and tire storage site management. As part of that evaluation please complete and submit this form with your permit application.

This form may be completed online and saved locally before printing, signing and submitting it to the Illinois EPA at the address below. If the form is completed manually, please type or print clearly.

Illinois Environmental Protection Agency
Division of Land Pollution Control - #33
39(i) Certification
2520 West Iles Avenue
P.O. Box 19276
Springfield, IL 62794-9276

I. Applicant Information

Site Name Zion Landfill Site 1 Phase A

IEPA BOL No.: 0978020001

Site Address 701 Green Bay Road

City: Zion

State: IL

Zip Code: 60099

Permit Numbers (if applicable): B-23R

Owner

Owner Name: Zion Landfill, Inc.

Street Address: 701 Green Bay Road

City: Zion

State: IL

Zip: 60099

Operator

Operator Name: BFI Waste Systems of North America, LLC

Street Address: 26 W. 580 Schick Rd.

City: Hanover Par

State: IL

Zip: 60099

Is this 39(i) certification for the owner or the operator?

☒ Owner

☐ Operator

☐ Owner and operator are the same entity

II. Officers and Employees with Site Responsibility

Unless the owner and operator are the same entity, a separate 39(i) form must be submitted for both the owner and operator. Persons operating under the authority of the owner should be listed on the owner's 39(i) form and persons operating under authority of the operator should be listed on the operator's 39(i) form.

A. Officers: List the name and title of all officers of the owner or operator that will have personal involvement or active participation in the operation or management of the site or facility for which the application is submitted.

| Name | Title |
|----------------|-----------------------|
| Mike Stoeckigt | Region Vice President |

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JUN 23 2025
IEPA-BOL
PERMIT SECTION

- B. Employees: List the name and title of each employee of the owner or operator that will have personal involvement or active participation in the overall operation or management of the site or facility for which the application is submitted (e.g. site managers, site engineers, and other persons who direct or control the overall day-to-day management of the operation, but not persons whose duties are exclusively limited to equipment operation, labor, or similar non-managerial functions).

| Name | Title |
|--------------|-----------------------------|
| Brad Stenzel | Landfill General Manager II |

III. Owner, Operator, Officer, and Employee Information

A. Prior Conduct Identification

The applicant must answer each of the following questions for every owner or operator, and for any officer or employee identified under Section II. If the answer to any of the following questions is affirmative, the applicant must complete an Attachment A for each person for whom the answer is affirmative and include a copy of each final administrative or judicial determination that required an affirmative response. If the information for each owner, operator, officer, and employee has not changed since the applicant's last submission of a 39(i) certification, the applicant can skip to Section III(C), below.

- 1) Has there been a finding that any person named in Section II violated federal, State, or local laws, regulations, standards, or ordinances in the operation of one or more waste management facilities or sites, clean construction or demolition debris fill operation facilities or sites, or tire storage sites? ☐ Yes
☒ No
- 2) Has any person named in Section II ever been convicted in this or another State of any crime which is a felony under the laws of this State, or convicted of a felony in a federal court; or convicted in this or another state or federal court of any of the following crimes: forgery, official misconduct, bribery, perjury, or knowingly submitting false information under any environmental law, regulation, or permit term or condition? ☐ Yes
☒ No
- 3) Has there been a finding against any person named in Section II of gross carelessness or incompetence in handling, storing, processing, transporting or disposing of waste, clean construction or demolition debris, or used or waste tires, or a finding of gross carelessness or incompetence in using clean construction or demolition debris as fill? ☐ Yes
☒ No

B. Pending Proceedings

The applicant must answer each of the following questions for every owner or operator, and for any officer or employee identified in Section II. If the answer to any of the following questions is affirmative, the applicant must complete an Attachment A for each person for whom the answer is affirmative and provide information identified in Attachment A regarding the pending proceeding.

1. Is there any proceeding currently pending against any person named in Section II that could result in a conviction or finding described in subsection A, above? ☐ Yes
☒ No
2. Is there any proceeding currently pending against any person named in Section II that could result in the reversal of a conviction or finding described in subsection A, above? ☐ Yes
☒ No

C. Prior Application Information

If (i) the applicant has previously submitted the Attachments required pursuant to subsections A and B above and (ii) the Attachments previously submitted are still complete, true, and correct, then the applicant does not need to include Attachments with this submission if the following box is checked:

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If the above box is checked, identify the application that contains the previously submitted Attachments that are complete, true, and correct.

RECEIVED
JUN 23 2025
IEPA-BOL
PERMIT SECTION

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The undersigned fully understands that any information which is developed directly or indirectly, in whole or in part, as a result of this authorization will be considered in determining whether a permit shall be issued by the Illinois Environmental Protection Agency under the Environmental Protection Act [415 ILCS 5]. The undersigned further agrees to release the Illinois State Police and the Illinois Environmental Protection Agency, its agents and designees under this release, from any and all liability which may be incurred as a result of compliance with this authorization for release of information.

Certification Statements

I certify under penalty of law that the information submitted, including information on any Attachments submitted as part of or incorporated into this Certification, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Signature of Applicant Officer

Date

MIKE STORCIC167
Printed Name

6-10-25
VICE PRESIDENT - MIDWEST
Title

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JUN 23 2025

IEPA-BOL
PERMIT SECTION

Appendix A-3

Facility Mailing List and Public Notice Information

| Agency | Name | Address | City | State | Zip | Phone (If Avail.) | Email (If Avail.) |
|---|--|---|--------------|-------|------------|-------------------|--|
| Chicago Tribune | Richard Wronski, Staff Reporter | 1717 N Penny Lane, Suite 200 | Schaumburg | IL | 60173 | 847-755-8942 | |
| | Earl Null | 3114 16th Street | Rockford | IL | 61109 | | |
| Local TV or radio station(s) | WGN Radio | 303 East Wacker Drive, Suite 1800 | Chicago | IL | 60601-5213 | 312-222-4700 | desk@wgnv.com |
| United States Senator | The Honorable Richard Durbin | 230 S. Dearborn Street, Suite 3892 | Chicago | IL | 60604 | 312-886-3506 | |
| United States Senator | The Honorable Tammy Duckworth | 230 S. Dearborn Street, Suite 3900 | Chicago | IL | 60604 | | |
| U.S. Representative, District 10 | Brad Schneider | 111 Barclay Ave., Suite 200 | Lincolnshire | IL | 60069 | | |
| Illinois State Senator, District 31 | Melinda Bush | 10 North Lake Street, Suite 112 | Grayslake | IL | 60030 | | |
| Illinois State Representative, District 61 | Joyce Mason | 36100 Brookside Dr., Suites LL 60 | Gurnee | IL | 60031 | | |
| USEPA - Region V, Land, Chemicals & Redevelopment Division | USEPA - Region V, Land, Chemicals & Redevelopment Division D. Scott Ireland, Chief | 77 West Jackson Blvd., MC: LR-17J | Chicago | IL | 60604 | | |
| USEPA - Region V, Land, Chemicals & Redevelopment Division | USEPA - Region V, Land, Chemicals & Redevelopment Division Mary Setnicar, Associate Chief | 77 West Jackson Blvd., MC: LL-17J | Chicago | IL | 60604 | | |
| USEPA - Region V, Land, Chemicals & Redevelopment Division, RCRA C&D Section | USEPA - Region V, Land, Chemicals & Redevelopment Division, RCRA C&D Section Susan Mooney, Chief | 77 West Jackson Blvd., MC: LL-17J | Chicago | IL | 60604 | | |
| USEPA - Region V, Land, Chemicals & Redevelopment Division | USEPA - Region V, Land, Chemicals & Redevelopment Division Rafael P. Gonzalez, Public Affairs Specialist | 77 West Jackson Blvd., MC: RE-19K | Chicago | IL | 60016 | | |
| Illinois EPA- Reg. Off. Manager, Bureau of Land (In Regional Office with Inspection Jurisdiction) | Paul Einsenbrant | 9511 Harrison Street | Des Plaines | IL | 62794-9276 | | |
| Illinois EPA- BOL Permit Reviewer, #33 | Kevin Lesko | 1021 North Grand Avenue, East, PO Box 19276 | Springfield | IL | 62794-9276 | | |
| Illinois EPA- Office of Community Relations, #5 | Cassandra Metz | 1021 North Grand Avenue, East, PO Box 19276 | Springfield | IL | 60604 | | |
| U.S. Army Corps of Engineers | U.S. Army Corps of Engineers | 231 S. LaSalle Street, 15th Floor | Chicago | IL | 60602 | 800-964-3013 | |
| Office of Illinois Attorney General | Office of Illinois Attorney General, Environmental Bureau North | 69 West Washington Street, Suite 1800 | Chicago | IL | 60602 | 217-785-4836 | |
| Illinois Historic Preservation Agency | Illinois Historic Preservation Agency, Preservation Services/ Archeology Sect. | 1 Old State Capitol Plaza | Springfield | IL | 62702-1271 | 217-782-6302 | DNR.DWRM@illinois.gov |
| Illinois Department of Natural Resources | Illinois Department of Natural Resources, Resource Management | One Natural Resources Way | Springfield | IL | 62702-9276 | | |
| Illinois Department of Natural Resources | Illinois Department of Natural Resources, Office of Water Resource Management | One Natural Resources Way | Springfield | IL | 62702-9276 | | |
| Illinois Department of Natural Resources | Illinois Department of Natural Resources, Div. of Natural Resource Review & Coord., Office of Realty/Env. Planning | One Natural Resources Way | Springfield | IL | 62764 | 217-782-7820 | |
| Illinois Department of Transportation, Bureau of Design & Environment | Illinois Department of Transportation, Bureau of Design & Environment, Geological Waste and Assessment Unit | 2300 S. Dirksen Parkway | Springfield | IL | 62794 | 217-782-2172 | |
| Illinois Department of Agriculture, Division of Natural Resources | Illinois Department of Agriculture, Division of Natural Resources | State Fairgrounds, PO Box 19281 | Springfield | IL | 62701 | | |
| Illinois Department of Commerce and Economic Opportunity | Erin Guthrie, Acting Director | 500 East Monroe Street | Springfield | IL | 62701 | 217-522-5512 | |
| Illinois State Chamber of Commerce | Illinois State Chamber of Commerce | 215 East Adams Street | Springfield | IL | 62761 | | |
| Illinois Department of Public Health | Illinois Department of Public Health | 525-535 West Jefferson Street | Springfield | IL | 61820 | 217-333-8940 | |
| Waste Management Research Center | Waste Management Research Center | 1 East Hazelwood Drive | Champaign | IL | 61820 | 217-333-6880 | |
| Illinois State Natural History Survey | Eric Schaubert | 1816 South Oak Street, MC: 652 | Champaign | IL | 61820 | 217-333-4747 | info@isgs.illinois.gov |
| Illinois State Geological Survey | Richard Berg, Director | 615 East Peabody | Champaign | IL | 61820 | 217-333-2210 | |
| Illinois State Water Survey | Illinois State Water Survey Director | 2204 Griffith Drive | Champaign | IL | 61820 | | |
| Local ESDA Coordinator/ Emergency Services/ Fire Department | Fire & Rescue Department | 2828 Sheridan Road | Zion | IL | 60099 | | |
| County State's Attorney | Eric F. Rinehart | 18 North County Street | Waukegan | IL | 60085 | | |
| County Board Energy & Environment Committee Chair | Terry Wilke | 18 North County Street | Waukegan | IL | 60085 | | |
| County Board Clerk | Robin M. O'Connor | 18 North County Street | Waukegan | IL | 60085 | | |
| Township Supervisor | Cheri Neal | 1015 27th Street | Zion | IL | 60099 | | |

| Agency | Name | Address | City | State | Zip | Phone (If Avail.) | Email (If Avail.) |
|--|--|---|------------------|-------|------------|------------------------------|---------------------------|
| Township Clerk | Sheryl Spooner | 1015 27th Street | Zion | IL | 60099 | | |
| Zion Mayor | Bill McKinney | 2828 Sheridan Road | Zion | IL | 60099 | | |
| City Clerk | Sheryl Spooner | 2828 Sheridan Road | Zion | IL | 60099 | | |
| Public Works Director | Ray Roberts | 3220 W. 27th Street | Zion | IL | 60099 | | |
| Lake County Health Department and Community Health Center | Mark Pfister | 3010 Grand Avenue | Waukegan | IL | 60085 | | |
| Facility Headquarters (Owner) | GFL Environmental, Attn: Mark Bingham | 701 Green Bay Road | Zion | IL | 60099 | (847) 623-3870 | |
| Facility Headquarters (Operator) | BFI Waste Systems of North America, LLC, Attn: James Hltzeroth | 26WS80 Schick Road | Hanover Park | IL | 60103 | | emh@bfi-waste.com |
| Zion-Benton Public Library | Reference Desk | 2400 Gabriel Ave. | Zion | IL | 60099 | | |
| IL League of Women Voters | IL League of Women Voters | 332 South Michigan Avenue, Suite 634, #1050 | Chicago | IL | 60426 | 708-596-7040 | |
| Envirte Corporation | Envirte Corporation, Operations Manager | 16435 South Center Avenue | Harvey | IL | 62706 | | |
| Statehouse Press Room | Statehouse Press Room Kurt Erickson | 401 S. 2nd Street, Statehouse W. Mezzanine | Springfield | IL | 60601-7447 | 312-251-1680 | |
| Sierra Club | Sierra Club, Jack Darin | 70 E. Lake Street, Suite 1500 | Chicago | IL | 46312 | 219-391-7020 | |
| Pollution Control Industries | Pollution Control Industries, Tita LaGrimas, Director of Regional Affairs | 4343 Kennedy Ave. | East Chicago | IN | 60419 | 708-225-8500 | |
| Safety-Kleen Dolton Recycle Center | Safety-Kleen Dolton Recycle Center Operations Manager | 633 E. 138th Street | Dolton | IL | 62711 | 217-787-5864 | info@lung.org |
| American Lung Association of Illinois | American Lung Association of Illinois, Angela Tin, Director of Environmental Programs | 3000 Kelly Lane | Springfield | IL | 62711 | 217-585-9517 | |
| American Environmental Corporation - Emergency Services & Public Involvement | American Environmental Corporation, Emergency Services & Public Involvement, Greg Michaud, Manager | 3700 W. Grand Ave., Suite A | Springfield | IL | 60044 | 847-578-5000 | |
| Deigan & Associates, LLC - Environmental Consultants | Deigan & Associates, LLC - Environmental Consultants, Gary J. Deigan | 28835 N. Herky Drive, Unit 120 | Lake Bluff | IL | 60044 | 618-271-7820 | |
| Environmental Organizations in Area | | | | | | | |
| Will Co. Environmental Network | | | | | | | |
| | Ellen Rendulick, CARE | | | | | | |
| | Nancy Jasiek, SOLVE | | | | | | |
| R.A.P.E. | | PO Box 207 | Ormaiz | IL | 61350 | | |
| Illinois Citizen Action | Earl Johnson | PO Box 4 | Libertyville, IL | IL | 60048 | | |
| CLEAR | Paul & Chris Geiselhart | | | | | | |
| DELEGATED | | | | | | | |
| LAKE COUNTY | | | | | | | |
| Mark A. Pfister, Director | Population Health Services | 3010 Grand Avenue | Waukegan | IL | 60085 | 847-377-8028 | mpfister@lakecountyil.gov |
| Greg Giroux, Environmental Protection Specialist | Population Health Services | 3010 Grand Avenue | Waukegan | IL | 60085 | 847-377-8013 | GGiroux@lakecountyil.gov |
| Michael Adam, Solid Waste Unit Coordinator | Lake County Health Department and Community Health Center, Solid Waste Unit | 500 W. Winchester Road, Suite 102 | Libertyville | IL | 60048 | 847-377-8016 or 847-377-8030 | madam@lakecountyil.gov |

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUN 27 2025

REVIEWER: MED

Public Notice of Submittal of RCRA Part B Post-Closure Permit Renewal Application

Zion Site 1 Landfill

Facility address: 701 Green Bay Road
Zion, IL 60099

Hazardous Waste Management Operations: Closed Landfill

The above referenced permit application materials have been prepared and are available for community members to review and copy at the following repositories:

Zion-Benton Public Library
2400 Gabriel Ave.
Zion, IL 60099

The current library hours (with limited lobby service) are:

| | |
|---------------|--------------|
| Mon, Wed, Th: | 10 AM – 6 PM |
| Tue: | 10 AM – 7 PM |
| Sat: | 10 AM – 5 PM |

Office of County Board Chair
Lake Co. Board Office
18 North County Street
Waukegan, IL 60085

Normal business hours are: 8:30 AM – 4:30 PM (M-F).

The applicant will update the repository materials periodically during the Illinois EPA's review of the permit application.

Name, Address, Telephone # of Permittee's Contact:

Mr. Jim Hitzeroth
BFI Waste Systems of North America, LLC
26 West 580 Schick Road
Hanover Park, Illinois 60103
Ph: (224) 970-1129

For general information on the hazardous waste management permit program in Illinois, please contact: the Illinois EPA RCRA Community Involvement Coordinator.

Appendix B-1

Effective Hazardous Waste Management RCRA Post-Closure Permit



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY ^{R 000735}

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, DIRECTOR

217/524-3300

March 12, 2018

CERTIFIED MAIL

7014 2120 0002 3286 4738

7014 2120 0002 3286 4745

Republic Services Co.
Attn: Kevin Bremer
3832 South Kostner Ave.
Crestwood, Illinois 60445

Advanced Disposal Services
Attn: Daniel DeWaard
1798 Hagemann Drive
Batavia, Illinois 60510

Re: 0978020001 -- Lake County
Zion Site 1 Landfill
ILD980700728
Log No. B-23R-M-7
RCRA Permit
Permit Approval

Dear Mr. Bremer and Mr. DeWaard:

This letter is regarding a document entitled; "Construction Acceptance Report" dated February 21, 2018 and submitted by Civil & Environmental Consultants, Inc. (CEC) on behalf of BFI Waste Systems of North America, LLC (BFI), operator, and Advanced Disposal Services Zion Landfill, Inc. as the owner of the above-referenced facility.

The document provided a report summarizing the Construction Quality Assurance documentation prepared during installation of approximately 320 feet of replacement leachate forcemain, the abandonment of the old forcemain piping, and repairs to a leachate forcemain junction at the above referenced RCRA permitted site. The new section of forcemain replaced an existing section that had a blockage and was not conveying leachate from Site 1 Phase A of the Zion Landfill to the dedicated hazardous waste storage tank. The new forcemain junction replaced a pinched 2-inch line and was reconfigured to allow for better flow of leachate. This document was reviewed by the Illinois EPA as a Class I permit modification in accordance with 35 Ill. Adm. Code 703.281 and 703, Appendix A, A.1.

The Illinois EPA has reviewed the information contained in your submittal and hereby approves your Construction Acceptance Report. This determination was based on our review of (1) the RCRA Post-Closure Permit issued for the above referenced facility; (2) the regulations [35 IAC Subtitle G]; and (3) the information contained in your submittal. Operations at the above referenced facility must be conducted in accordance with the RCRA Post-Closure Permit and all subsequent approved modifications.

No changes to your RCRA Post-Closure Permit are required at this time; however, a revised cover page for your permit is attached which incorporates the subject report by reference. Please

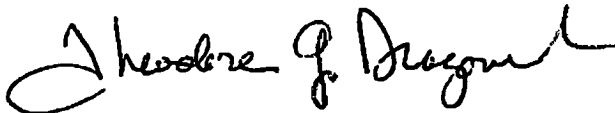
Mr. Bremer and Mr. DeWaard
Log No. B-23R-M-7
Page 2

attach this cover page to the front of your RCRA permit. Pursuant to 35 Ill. Adm. Code 703.281(a)(2), the permittee must send a notice of this modification to all persons on the facility mailing list, maintained by the Illinois EPA in accordance with 35 Ill. Adm. Code 705.163(a)(4), and the appropriate units of state and local government as specified in 35 Ill. Adm. Code 705.163(a)(5). For a Class I modification the notice must be made within 90 calendar days after the change is put into effect.

Work required by this permit, your application or the regulations may also be subject to other laws governing professional services, such as the Illinois Professional Land Surveyor Act of 1989, the Professional Engineering Practice Act of 1989, the Professional Geologist Licensing Act, and the Structural Engineering Licensing Act of 1989. This permit does not relieve anyone from compliance with these laws and the regulations adopted pursuant to these laws. All work that falls within the scope and definitions of these laws must be performed in compliance with them. The Illinois EPA may refer any discovered violation of these laws to the appropriate regulating authority.

If you have any questions concerning the groundwater related aspects of this permit, please contact Will Sparks or my staff at 217/782-3440. If you have questions regarding other aspects of this permit, please contact Kelly Huser at 217/524-3867.

Sincerely,



Theodore J. Dragovich, P.E., Manager
Permit Section
Division of Land Pollution Control
Bureau of Land

TJD:KDH:0978020001-RCRA-B23RM7-Approval.docx

KDH-JEM

Attachments: Cover Page for RCRA Post-Closure Permit

cc: Gary Victorine, USEPA Region V
Jim Hitzereth, BFI Waste Systems of North America
James Lewis, Advanced Disposal Services
Chastity Montalvo, CEC
Kenneth Kruszynski, P.E., CEC



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY ^{B.000737}

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397

BRUCE RAUNER, GOVERNOR

ALEC MESSINA, DIRECTOR

HAZARDOUS WASTE MANAGEMENT RCRA POST-CLOSURE PERMIT

0978020001 – Lake County
Zion Site 1 Landfill
ILD980700728
Log No. B-23R-M-7
RCRA Permits

Issue Date: September 30, 2011
Effective Date: November 4, 2011
Expiration Date: November 4, 2021
Modification Date: March 12, 2018

OPERATOR:

BFI Waste Systems of North America, LLC
Attn: James Hitzeroth
26 W 580 Schick Road
Hanover Park, Illinois 60103

OWNER:

Advanced Disposal Services
Attn: James Lewis
701 Green Bay Road
Zion, Illinois 60099

A modified RCRA post-closure permit is hereby granted pursuant to the Resource Conservation and Recovery Act, the Illinois Environmental Protection Act, and Title 35 Illinois Administrative Code (IAC) 702, 703, 705, and 720 through 729 to BFI Waste Systems of North America, LLC to provide post-closure care for a closed landfill at the Zion Site 1 Landfill facility located at 701 Green Bay Road, Zion Illinois. This landfill, referred to as the Phase A landfill, is approximately 40 acres in size and operated between 1976 and 1993. Illinois EPA initially issued a permit for this landfill in 1976 and then issued it a RCRA permit in 1988. The landfill received mainly non-hazardous waste but did also receive some hazardous waste; it was certified closed on February 10, 1998 (and thus the thirty-year post-closure care period for the landfill began on that date).

This modified permit consists of the conditions contained in the eight sections and two attachments previously issued on July 28, 2015 and the applicable regulations contained in the Illinois Environmental Protection Act and 35 IAC 702, 703, 705 and 720 through 729 in effect on the effective date of this permit. The Environmental Protection Act (Ill. Rev. Stat., Chapter 111 1/2, Section 1039) grants the Illinois EPA the authority to impose conditions on permits which are issued.

This modified permit is issued based on the information contained in the approved permit application as described in Section II of the permit previously issued on July 28, 2015 and the information submitted February 21, 2018 and assigned Log No. B-23R-M-7 by Illinois EPA. Any inaccuracies found in this information may be grounds for the termination or modification of this permit (see 35 IAC 702.186 and 702.187) and potential enforcement action.

If you have any questions regarding the groundwater-related aspects of this permit, please contact Will Sparks at 217/782-3440. Please contact Kelly Huser at 217/524-3867 regarding the other aspects of this permit.

Sincerely,

Theodore J. Dragovich, P.E., Manager
Permit Section
Bureau of Land
Division of Land Pollution Control

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KDH JKM

4302 N. Main St., Rockford, IL 61103 (815)937-7760
595 S. State, Elgin, IL 60123 (847)608-3131
2125 S. First St., Champaign, IL 61820 (217)278-5800
2009 Mall St., Collinsville, IL 62234 (618)346-5120

9511 Harrison St., Des Plaines, IL 60016 (847)294-4000
412 SW Washington St., Suite D, Peoria, IL 61602 (309)671-3022
2309 W. Main St., Suite 116, Marion, IL 62959 (618)993-7200
100 W. Randolph, Suite 4-500, Chicago, IL 60601



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829

BRUCE RAUNER, GOVERNOR

LISA BONNETT, DIRECTOR

217/524-3300

July 28, 2015

CERTIFIED MAIL

7012 0470 0001 2976 7760

7012 0470 0001 2976 7777

Republic Services Co.
Attn: Eric Schuck
9813 Flying Cloud Drive
Eden Prairie, MN 55347

Advanced Disposal Services
Attn: Daniel DeWaard
1798 Hagemann Drive
Batavia, Illinois 60510

Re: 0978020001 -- Lake County
Zion Site 1 Landfill
ILD980700728
Log No. B-23R-M-5
Class 2 Permit Modification
RCRA Permits
Permit Approval

Dear Mr. Schuck and Mr. DeWaard:

This letter is in response to the Class 2 permit modification request, dated May 15, 2015 and received by the Illinois EPA on May 15, 2015. This document was submitted by Civil & Environmental Consultants, Inc. (CEC) on behalf of BFI Waste Systems of North America, LLC (BFI), operator, and Advanced Disposal Services Zion Landfill, Inc. as the owner. This modification request proposed (1) reduced monitoring frequency at the landfill gas monitoring probes; (2) revisions on reporting total leachate removed; and (3) miscellaneous administrative changes, for the above referenced facility.

The Illinois EPA has reviewed the information contained in your submittal and hereby approves the request for modification. This determination was based on our review of (1) the RCRA Post-Closure Permit issued for the above referenced facility; (2) the regulations [35 IAC Subtitle G]; and (3) the information contained in your submittal. Operations at the above referenced facility must be conducted in accordance with the RCRA Post-Closure Permit and all subsequent approved modifications.

A revised RCRA Post-Closure Permit is attached. The following sections of the permit have been revised: General Facility Description, Condition III.B, Condition III.D, Condition III.E, Condition III.G.4, Condition III.J.3 and Section VIII. In addition, a description of this permit modification request (Log No. B-23R-M-5) has been added to Section II of the permit. Section II identifies the documents/applications that comprise the approved permit application for this permit.

Work required by this permit, your application or the regulations may also be subject to other laws governing professional services, such as the Illinois Professional Land Surveyor Act of 1989, the Professional Engineering Practice Act of 1989, the Professional Geologist Licensing Act, and the Structural Engineering Licensing Act of 1989. This permit does not relieve anyone from compliance with these laws and the regulations adopted pursuant to these laws. All work that falls within the scope and definitions of these laws must be performed in compliance with them. The Illinois EPA may refer any discovered violation of these laws to the appropriate regulating authority.

If you have any questions concerning the groundwater related aspects of this permit, please contact Dana Austin of my staff at 217/524-8964. If you have questions regarding other aspects of this permit, please contact Kevin Lesko at 217/524-3271.

Sincerely,



Stephen F. Nightingale, P.E.
Manager, Permit Section
Bureau of Land

SFN:KDH:0978020001-RCRA-B23RM5-Approval.docx

SFN KDH

Attachments: Revised Hazardous Waste Management RCRA Post-Closure Permit

cc: Gary Victorine, USEPA Region V
Jim Hitzeroth, BFI Waste Systems of North America
James Lewis, Advanced Disposal Services
Catherine Case, Civil & Environmental Consultants, Inc.
Beau Harp, Civil & Environmental Consultants, Inc.



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

R 000740

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829

BRUCE RAUNER, GOVERNOR

LISA BONNETT, DIRECTOR

HAZARDOUS WASTE MANAGEMENT RCRA POST-CLOSURE PERMIT

0978020001 – Lake County
Zion Site 1 Landfill
ILD980700728
Log No. B-23R-M-5
RCRA Permits

Issue Date: September 30, 2011
Effective Date: November 4, 2011
Expiration Date: November 4, 2021
Modification Date: July 28, 2015

OPERATOR:

BFI Waste Systems of North America, LLC
Attn: James Hitzeroth
26 W 580 Schick Road
Hanover Park, Illinois 60103

OWNER:

Advanced Disposal Services
Attn: James Lewis
701 Green Bay Road
Zion, Illinois 60099

A RCRA post-closure permit is hereby granted pursuant to the Resource Conservation and Recovery Act, the Illinois Environmental Protection Act, and Title 35 Illinois Administrative Code (IAC) 702, 703, 705, and 720 through 729 to BFI Waste Systems of North America, LLC to provide post-closure care for a closed landfill at the Zion Site 1 Landfill facility located at 701 Green Bay Road, Zion Illinois. This landfill, referred to as the Phase A landfill, is approximately 40 acres in size and operated between 1976 and 1993. Illinois EPA initially issued a permit for this landfill in 1976 and then issued it a RCRA permit in 1988. The landfill received mainly non-hazardous waste but did also receive some hazardous waste; it was certified closed on February 10, 1998 (and thus the thirty-year post-closure care period for the landfill began on that date).

This permit consists of the conditions contained in the eight sections and two attachments which follow and the applicable regulations contained in the Illinois Environmental Protection Act and 35 IAC 702, 703, 705 and 720 through 729 in effect on the effective date of this permit. The Environmental Protection Act (Ill. Rev. Stat., Chapter 111 1/2, Section 1039) grants the Illinois EPA the authority to impose conditions on permits which are issued.

This permit is issued based on the information contained in the approved permit application as described in Section II of this permit. Any inaccuracies found in this information may be grounds for the termination or modification of this permit (see 35 IAC 702.186 and 702.187) and potential enforcement action.

If you have any questions regarding the groundwater-related aspects of this permit, please contact Dana Austin at 217/524-8964. Please contact Kevin Lesko at 217/524-3271 regarding the other aspects of this permit.

Sincerely,

Stephen F. Nightingale, P.E.
Manager, Permit Section, Bureau of Land

SFN:KDH:0978020001-RCRA-B23RM5-Approval.docx

KDK

**HAZARDOUS WASTE MANAGEMENT
RCRA POST-CLOSURE PERMIT**

Log No. B-23R-M-5

Zion Site, I Landfill

LPC No. 0978020001

USEPA ID No. ILD980700728

0978020001
Zion Site I Landfill
Log No. B-23R-M-5
Page 1 of 1

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Attachments: A - Site Layout Map (1 page)
B - Groundwater Monitoring Attachments (6 pages)

0978020001
Zion Site 1 Landfill
Log No. B-23R-M-5
Page I-1 of I-2

SECTION I: GENERAL FACILITY DESCRIPTION

On October 30, 1976, Illinois issued Browning-Ferris Industries (BFI) to operate a 59-acre solid waste disposal site at the location now known as Zion Site 1 Landfill (Permit No. 1976-53-OP); this facility is located at 701 Green Bay Road, Zion, Illinois. BFI disposed of waste in an approximately 40-acre portion of the overall permitted facility under the terms and conditions of this permit until November 1980, at which time the regulations governing the management of hazardous wastes came into effect. After November 1980 and until April 1988, BFI operated this landfill in accordance with this state permit and associated supplemental permits) and the hazardous waste interim status regulations. On April 5, 1988 Illinois EPA issued this facility a RCRA permit which set forth detailed requirements for the management of hazardous wastes at this facility.

During the time that BFI operated the approximately 40-acre landfill, mainly non-hazardous waste was disposed in it, but some hazardous waste was also disposed there. BFI ceased disposing of hazardous waste in this unit in 1990; it did however continue to dispose of non-hazardous waste there until 1993. Closure activities of this landfill were completed in 1997 and on February 10, 1998, BFI certified completion of closure of this unit. This landfill is typically referred to as Phase A of the Zion Site 1 Landfill.

Ten acres of the initially permitted site were re-permitted by Illinois EPA for the disposal of only non-hazardous waste on June 24, 1994 (Permit No. 1992-328-LFM). The actual portions of this 10 acre parcel used for landfilling purposes were Cell 1 which consists of 4.9 acres and Cell 2 which consists of 4.7 acres. Non-hazardous waste was disposed in these units from 1994 until 1996. Closure activities for both cells were completed in 1998 and Illinois EPA approved the certification of closure of these units on August 28, 1998. The post-closure care period of these units, to be carried out in accordance with the facility's permit, began on April 25, 1998. Closed Cells 1 and 2 are typically referred to as Phase B of Zion Site 1 Landfill.

The remaining ten acres of the originally permit facility house ancillary equipment and structures associated with the Phase A and B landfills. Leachate and landfill gas management systems have been installed in the Phase A and Phase B and the following equipment/structures associated with these systems are present in this area:

1. The tanks and associated loading areas used to accumulate the collected leachate before it is sent off-site for treatment;
2. The blowers, flare and gas to energy station associated with the gas management system at the facility.

0978020001
Zion Site 1 Landfill
Log No. B-23R-M-5
Page I-2 of I-2

In addition to the units mentioned above, BFI permitted a 74.38 acre solid waste disposal site on the land just east of Phase I mentioned above. Illinois EPA issued the operating permit for this site on December 31, 1981 (Permit No. 1980-24-OP); this permit only allowed for the disposal of non-hazardous waste at this site. On March 21, 1997, Illinois EPA issued a permit (1995-343-LFM) which allowed for an expansion of this landfill to the east and also allowed for a vertical expansion over a portion of the initially permitted disposal area. This second disposal site, now with approximately 130 acres to be used for landfilling purposes, was once referred to as BFI #2, but is now referred to as Veolia ES Zion Landfill.

Browning-Ferris Industries was purchased by Allied Waste Systems in May 1999, and thus became a part of Allied Waste Systems. In May 2000, the three landfills discussed above (Zion Site 1 Landfill, Phase A; Zion Site 1 Landfill, Phase B; and BFI #2) were sold to Onyx. As part of this transaction, BFI retained the post-closure care responsibilities for the Phase A and Phase B landfills associated with Zion Site 1 Landfill while Onyx took over operation of the BFI #2 landfill.

Since 2000, Onyx became a part of Veolia and Veolia sold its North American sites to Advanced Disposal Services. Allied Waste Systems has become a part of Republic Services, Inc. BFI Waste Systems of North America, LLC, a subsidiary of Republic Services, Inc., is the operator of the Zion Site 1 Phase A landfill covered by this permit and is responsible for providing post-closure care of this landfill. Advanced Disposal Services Zion Landfill, Inc. is the owner of the Site 1 Phase A and Phase B landfills and also continues to own and operate the former BFI #2 landfill which is now known as the Advanced Disposal Services Zion Landfill. The facility boundary is approximately 318 acres. A map showing the layout of the three landfill areas within the parcel is provided in Attachment A to this permit.

0978020001
Zion Site 1 Landfill
Log No. B-23R-M-5
Page II-1 of II-3

SECTION II: APPROVED PERMIT APPLICATION

The following documents comprise the approved Permit Renewal Application for the renewed RCRA Permit being issued to the Zion Site 1 Landfill facility in Zion, Illinois (the Illinois EPA log number for this renewed permit is B-23R; the Illinois EPA identification number for this facility is 0978020001; the USEPA Identification number for this facility ILD980700728):

1. A document entitled, "Post-Closure Permit Application, Zion Landfill Site 1, Phase A," dated December 2009 and prepared by Weaver Boos Consultants. This document was submitted January 8, 2010 by Michael B. Maxwell, LPG and Elizabeth A. Steinhour, Weaver Boos Consultants; it was received by Illinois EPA on January 11, 2010.
2. Information submitted January 12, 2010 by Michael B. Maxwell, LPG and Elizabeth A. Steinhour, Weaver Boos Consultants. This submittal contained additional information regarding Appendix A-5 of the application identified in Item 1 above and was received by Illinois EPA on January 14, 2010.
3. Information submitted July 15, 2010 by Michael B. Maxwell, LPG and Elizabeth A. Steinhour, Weaver Boos Consultants; it was received by Illinois EPA on July 19, 2010. This submittal included:
 - a. A complete revised version of the text of the application identified in Item 1 above (Sections A thru I). These pages have the phrase "Revised July 2010" in their header.
 - b. A revised Figure E-1 of the document identified in Item 1 above;
 - c. A revised Table E-2 of the document identified in Item 1 above;
 - d. Boring Logs and Well Construction Forms (for wells to be abandoned), this information was incorporated into the end of Appendix E-2 of the document identified in Item 1 above.
4. A document entitled, "Leachate & Gas Control System Documentation, Zion Landfill Site 1, Phase A," dated February 2011 and prepared by Weaver Boos Consultants. This document was submitted February 22, 2011 by Michael B. Maxwell, LPG and Elizabeth A. Steinhour, Weaver Boos Consultants; it was received by Illinois EPA on February 23, 2011.

0978020001
Zion Site 1 Landfill
Log No. B-23R-M-5
Page II-2 of II-3

5. Information submitted via e-mail on April 7, 2011 by Michael B. Maxwell, LPG, Weaver Boos Consultants. This submittal included a table entitled "Gas/Leachate Extraction Well Information"; this table was inserted into the front of Appendix D5 of the document identified in Item 4 above.
6. Information submitted April 8, 2011 by Michael B. Maxwell, LPG, Weaver Boos Consultants; it was received by Illinois EPA on April 22, 2011. This submittal included a revised Appendix E5 (Wind Rose) to be inserted into the document identified in Item 1 above.
7. Information submitted April 21, 2011 Elizabeth A Steinhour and John Bossert, P.E., Weaver Boos Consultants; it was received by Illinois EPA on April 22, 2011. This submittal included:
 - a. General additional information;
 - b. A complete revised version of the text of the document identified in Item 4 above (Pages 1 thru 26). The date 4 8 11 is printed on the lower right-hand corner of each revised page.
 - c. Revised Sheets 1 thru 4 of the document identified in Item 4 above;
 - d. A new Sheet 5 for the document identified in Item 4 above
 - e. A drawing entitled "Site 1-Phase A, Forcemain Profile and Details," Drawing 2 of 2, prepared by Weaver Boos Consultants and dated February 5, 2003.
 - f. Copies of annual reports submitted for the facility for the years 2003 thru 2010.
8. Permit modification, Log # B-23R-M-1, dated January 20, 2012 and received on January 23, 2012. This document was submitted by Joseph Miller, P.G. of Environmental Information Logistics, LLC (EIL) on behalf of BFI Waste Systems of North America, LLC (BFI), operator, and Veolia ES Zion Landfill, Inc. (Veolia), owner. This document proposed background values for the detection and shallow zone observation monitoring program wells. The parameters are identified in List G1 – Semi-Annual Groundwater Sampling in Section IV, Condition E(1) and Section IV-A, Condition D(1)) of the permit.

0978020001
Zion Site 1 Landfill
Log No. B-23R-M-5
Page II-3 of II-3

9. Permit modification, Log # B-23R-M-2, dated April 18, 2012 and received on April 19, 2012. This document was submitted by Weaver Boos Consultants on behalf of BFI Waste Systems of North America, LLC (BFI), operator and Veolia ES Zion Landfill, Inc. (Veolia), owner. This document presented the results of replacement of a portion of the force main piping which carries leachate from leachate extraction wells in the closed hazardous waste landfill at this facility to a leachate accumulation tank.
10. Permit modification, Log # B-23R-M-3, dated November 15, 2013 and received on November 18, 2013. This document was submitted by Joseph Miller, P.G. of Environmental Information Logistics, LLC (EIL) on behalf of BFI Waste Systems of North America, LLC (BFI), operator, and Advanced Disposal Services Zion Landfill, Inc. as the owner. This modification approved proposes background values which are contained in List G2 -Annual Groundwater Sampling, found in Section IV, Condition E(1) and Section IV-A, Condition D(1) of the permit.

In addition, a typo in the notation at the end of List G1- Semi-Annual Groundwater Sampling (Section IV, Condition E(1)) referenced well G123 rather than the correct well designation of R126. This notation now reads "*** BGQs Specific Conductance in Well R126 (2495 micromhos/cm)."

11. Permit modification, Log # B-23R-M-5, dated May 15, 2015 and received on May 15, 2015. This document was submitted by Civil & Environmental Consultants, Inc. (CEC) on behalf of BFI Waste Systems of North America, LLC (BFI), operator, and Advanced Disposal Services Zion Landfill, Inc. as owner. This modification approves (1) annual monitoring for the landfill gas migration monitoring probes; (2) reporting total leachate removed by reporting amount removed from the tank each quarter; (3) revised quarterly landfill inspection form; and (4) corrected minor typographical errors.

0978020001
Zion Site I Landfill
Log No. B-23R-M-5
Page III-1 of III-17

SECTION III: POST-CLOSURE

A. SUMMARY

Phase A of the Zion Site I Landfill, the hazardous waste management unit which is the subject of this permit, is 40 acres in size. It received mainly non-hazardous waste, but also some hazardous waste from 1976 to 1990; from 1990 and 1993 it only received non-hazardous waste. Waste ceased being disposed in this landfill in 1993. Closure activities for the landfill were completed in 1997 and it was formally certified closed on February 10, 1998. The Permittee has been providing post-closure care of the Phase A Landfill since that time.

The Permittee must continue to provide post-closure care for the Phase A landfill until at least February 9, 2028. This section contains the requirements which the Permittee must carry out while they continue to provide post-closure care of the Phase A landfill. The required post-closure care activities include:

1. Inspecting and maintaining the final cover, berms and drainage structures associated with the closed Phase A landfill;
2. Operating and maintaining the leachate and gas management systems installed in the closed Phase A landfill.
3. Complying with the terms and conditions of Section IV and IV-A (Groundwater) of this permit.
4. Providing financial assurance for the post-closure activities described herein, including any associated operation and maintenance costs, as required by 35 Ill. Adm. Code 724, Subpart H.

B. UNIT IDENTIFICATION

Illinois EPA initially issued a permit to dispose of waste in the Phase A landfill on October 30, 1976 (Permit No. 1975-53-OP). The Phase A landfill is trapezoidal in nature; it is approximately 2450' long from north to south; its northern boundary is approximately 630' wide while its southern boundary is approximately 740' wide. In total, the Phase A landfill covers approximately 40 acres.

0978020001
Zion Site I Landfill
Log No. B-23R-M-5
Page III-2 of III-17

While both hazardous and non-hazardous wastes were disposed in the Phase A landfill after it began operation in 1976, the vast majority of the waste disposed in the landfill is non-hazardous waste. Hazardous waste ceased to be disposed of in this landfill in 1990 and in 1993 the landfill ceased receiving non-hazardous waste. From 1982 to 1990 (the time period when accurate data was maintained), approximately 232,000 tons of hazardous waste were disposed in this landfill.

A minimum of ten feet of in-situ or recompacted clay was to be present along the sidewalls and beneath the bottom of the landfill. The bottom of the landfill slopes north to south from an elevation approximately 750' MSL to an elevation of approximately 730' MSL. In general, the bottom of the landfill is between 10' and 20' below the initial grade of the area where the landfill is located.

A bentonite-soil slurry wall was constructed around the southern portions of the Phase A landfill in the late 1980s and keyed into low permeable soils located beneath the subsurface. This slurry wall is present, in part, along the southern boundary of the landfill and extends approximately 330' from the southeast corner of the landfill north along the landfill's eastern property boundary (the average depth of this portion of the slurry wall is 25'). The other portion of the slurry wall extends approximately 1400' north of the southwest corner of the landfill along the landfill's western boundary (the average depth of this portion of the slurry wall is 35').

A separate permitted solid waste landfill is located directly east of the Phase A landfill (this second landfill is the Veolia ES landfill). A minimum of ten feet of clay soil separates this second landfill from the Phase A landfill, both below grade and above grade. The final grades of these two landfills coincide along their intersection.

Closure activities for the Phase A landfill were completed in 1997 and on February 10, 1998, BFI formally certified completion of closure of the landfill. The final cover placed over the landfill includes from bottom to top:

1. A minimum of two feet of compacted clay;
2. A 40 mil LLDPE (linear low density polyethylene) geomembrane over the top of the landfill where the elevation ranges from approximately 790 ft. MSL to 810 ft. MSL (this area is approximately 450' (east/west) by 1770' (north/south) in size—approximately 18.3 acres; it begins approximately 100' south of the northern boundary of the landfill and is adjacent to eastern boundary of the Phase A landfill);

0978020001
Zion Site 1 Landfill
Log No. B-23R-M-5
Page III-3 of III-17

3. A geocomposite drainage layer. On the top of the landfill, this layer consisted of a polypropylene drainage grid and a non-woven geotextile (the drainage grid was placed on top of the geomembrane). On the sideslopes of the landfill, this layer consisted of a polypropylene drainage grid sandwiched between two non-woven geotextiles;
4. A minimum of three feet of protective soil layer (the upper six inches of this layer is topsoil);
5. A vegetative layer.

A leachate management system and a landfill gas management system have been installed in the closed landfill. Both of these systems use the same 29 wells to extract either leachate or landfill gas. The collected leachate flows to an 8,000 gal above-ground tank where it is accumulated until it is shipped off by truck for treatment. The collected landfill gas typically flows to an on-site gas to energy facility which burns the gas to create electricity; if this station cannot accept the landfill gas for some reason, the gas is burned in an on-site flare.

C. GENERAL POST-CLOSURE CARE REQUIREMENTS

1. The post-closure care period for the closed Phase A landfill began February 10, 1998. Post-closure care of this landfill must continue until at least February 9, 2028.
2. Any time during the post-closure care period for these units, the Illinois Pollution Control Board may, in accordance with the permit modification procedures of 35 Ill. Adm. Code 702, 703, and 705, do either of the following:
 - a. Shorten the post-closure care period applicable to the Phase A Landfill if the Board has found by an adjusted standard issued pursuant to Section 28.1 of the Illinois Environmental Protection Act (Act) and 35 Ill. Adm. Code 101 and 104 that the reduced period is sufficient to protect human health and the environment (e.g., leachate or groundwater monitoring results, characteristics of the waste, application of advanced technology or alternative disposal, treatment, or re-use techniques indicate that the hazardous waste management unit or facility is secure); or
 - b. Extend the post-closure care period applicable to the Phase A Landfill if the Board has found by an adjusted standard issue pursuant to Section 28.1

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of the Act and 35 Ill. Adm. Code 101 and 104 that the extended period is necessary to protect human health and the environment (e.g., leachate or groundwater monitoring results indicate a potential for migration of hazardous wastes at levels that may be harmful to human health and the environment).

3. The Agency may restrict the future use of the Phase A landfill if it is necessary to protect human health and the environment. This includes permanent prohibition of the use of the site for purposes which create an unreasonable risk to human health or the environment. The Agency shall file such restrictions of record in the Office of the Lake County Recorder.
4. Post-closure use of the Phase A landfill must never be allowed to disturb the integrity of the final cover, berms or any other components associated with the closed landfill or the function of the facility's monitoring system, unless the Agency determines, by way of a permit modification, that the disturbance:
 - a. Is necessary for the proposed use of the property and will not increase the potential hazard to human health or the environment, or
 - b. Is necessary to reduce a threat to human health or the environment.
5. The Permittee must submit a request for permit modification to change any aspect of the approved post-closure care plan, as modified by the conditions of this permit. This request must be in accordance with the applicable requirements of 35 Ill. Adm. Code 702, 703, 705 and 724 and must include a copy of the amended post-closure plan. The request must be submitted at least 180 days prior to the date that the change is needed. Post-closure care of the landfill must be in accordance with the conditions of this permit until such time as the proposed modification is properly incorporated into the facility's RCRA permit.
6. The Permittee shall inspect the final cover, berms and drainage structures of the closed Phase A landfill on a quarterly basis in accordance with the provisions of Section I of the permit application as modified by this permit. The results of each inspection must be documented in the facility's operating record.
7. The Permittee shall maintain the integrity and effectiveness of the final cover, berms and drainage structures of the Phase A landfill. This includes making repairs as necessary to correct the effects of settling, subsidence, erosion, etc.

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Corrective action shall be taken if any problem listed below is encountered when inspecting the final cover, berms and drainage structures of the landfill:

- a. Cracks greater than one inch wide in the final cover or berms, rills, gullies and crevices greater than six inches deep.
- b. Depressions (ponds) and holes in the final cover;
- c. Eroded or scoured drainage channels;
- d. Little or no vegetation is present in an area in excess of 100 square feet in size;
- e. Gas and/or odor problems;
- f. Growth of vegetation with taproots;
- g. Vectors;
- h. Leachate popouts or seeps.

Appropriate follow-up inspections must be conducted to verify the corrective action taken adequately addresses the observed problem. In addition, the corrective action taken and results of all follow-up inspections must be documented in the facility's operating record.

- 8. The Permittee shall protect and maintain the surveyed benchmarks present at or near the closed Phase A landfill.
- 9. The Permittee shall place additional warning signs (DANGER - UNAUTHORIZED PERSONNEL KEEP OUT) around the closed Phase A landfill as necessary such that one is clearly legible at any point near the perimeter of the landfill.

D. OPERATION OF THE LEACHATE AND GAS MANAGEMENT SYSTEMS

- 1. Two of the most important aspects of post-closure care of a landfill which received mainly non-hazardous waste are the proper management of leachate and landfill gas generated within the closed landfill. Failure to properly manage this

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leachate and landfill gas may allow contaminants to migrate away from the landfill and impact the surrounding area.

2. A landfill gas extraction/management system was installed within the closed Phase A landfill in 1997. This system currently consists of a blower, 28 vertical extraction located throughout the landfill, piping required to carry the extracted gas to a treatment unit and equipment to treat/burn the extracted landfill gas.
3. In 1998, modifications were made to the gas extraction wells mentioned above so that they could also be used to remove leachate from the landfill (i.e., submersible pumps and associated piping were placed in each of the wells). Additional piping, etc. was installed during this effort so that the extracted leachate could be routed to an above-ground tank where it is accumulated before being sent off-site for treatment.
4. Several minor modification has been made to the leachate and landfill gas management since they were first installed. Drawings showing the current layout of these systems is provided in the document entitled "Leachate and Gas Control Documentation" which is a part of the approved permit application.
5. One of the keys aspects of the leachate and landfill gas management systems for the Phase A landfill is the interval over which each extraction well is screened. A tabular summary of this information is as follows (* = no leachate extraction pump present in well; well is only for removal of landfill gas):

| Extraction Well No. | Surface Elevation (ft. MSL) | Approximate Screened Interval (ft. MSL) |
|----------------------------|------------------------------------|--|
| EW-1 | 789.3 | 750.4-774.3 |
| EW-2 | 802.5 | 748.4-781.2 |
| EW-3 | 807.3 | 747.6-780.3 |
| EW-4* | 789.0 | 750.9-773.7 |
| EW-6* | 797.3 | 749.3-781.2 |
| EW-7* | 799.1 | 747.5-780.5 |
| EW-8 | 798.0 | 747.8-784.8 |
| EW-9 | 795.2 | 746.8-780.8 |

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| Extraction Well No. | Surface Elevation (ft. MSL) | Approximate Screened Interval (ft. MSL) |
|----------------------------|------------------------------------|--|
| EW-10 | 812.4 | 747.2-788.2 |
| EW-11 | 799.0 | 746.3-780.5 |
| EW-12 | 797.1 | 746.5-783.6 |
| EW-12A | 787.1 | 751.2-776.5 |
| EW-13 | 811.4 | 744.7-788.7 |
| EW-14 | 795.0 | 744.8-780.0 |
| EW-15 | 791.7 | 743.1-777.1 |
| EW-16 | 809.0 | 745.0-787.5 |
| EW-17 | 782.5 | 742.7-767.2 |
| EW-18 | 801.2 | 741.8-779.8 |
| EW-19 | 776.7 | 740.6-760.4 |
| EW-20 | 771.6 | 739.9-753.9 |
| EW-21 | 763.5 | 740.0-749.3 |
| EW-22 | 767.8 | 739.3-750.4 |
| EW-23* | 766.4 | 740.5-750.5 |
| EW-24 | 777.7 | 740.0-762.0 |
| EW-25 | 785.9 | 741.2-770.0 |
| EW-26 | 783.2 | 739.4-768.2 |
| EW-27 | 804.6 | 741.8-783.8 |
| EW-28 | 809.7 | 744.5-789.0 |

6. The leachate and gas management systems at the Phase A landfill must be operated, monitored, maintained and inspected in accordance with the provisions of this permit and the document entitled "Leachate and Gas Collection Control Documentation." Additional requirements associated with these systems are set forth in Subsection E, F and G below.

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E. LANDFILL GAS MONITORING

The Landfill Gas Monitoring Program to be implemented for the closed Phase A landfill is set forth in Appendix E of "Leachate and Gas Collection Control Documentation" and is hereby approved subject to the following conditions and modifications:

1. The six perimeter gas monitoring probes and four ambient air locations (three down-wind and one up-wind) must be sampled on an annual basis and the samples analyzed for the following parameters:
 - a. Pressure (determined before collecting any samples)
 - b. Methane
 - c. Oxygen
 - d. Carbon Dioxide
2. All ambient air samples must be collected: (1) no more than one inch above the ground surface; and (2) within 100' of the leachate (or at the property boundary if it is closer).
3. During the annual monitoring required above, the presence of any malodors near the sample points and beyond the property boundary must be noted in the field notes for the sampling effort. At a minimum, these notes must document that the presence of malodors was evaluated at each sampling location.
4. The steps described in Condition III.E.5 below must be carried out if any of the following occur during the required annual landfill gas monitoring program:
 - a. A methane concentration greater than 50% of the lower explosive limit in air is detected in any of the below ground monitoring devices outside the waste boundary;
 - b. A methane concentration greater than 50% of the lower explosive limit in air is detected during ambient air monitoring;
 - c. A methane concentration greater than 25% of the lower explosive limit in air is detected in any building on or near the facility;

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- d. Malodors attributed to the unit are detected beyond the property boundary
5. If any of the items identified in Condition III.E.4 occur, the Permittee shall:
- a. Take immediate action, as appropriate, to protect human health from the adverse conditions
 - b. Within two business days of the occurrence, notify the Illinois EPA in writing of the occurrence, including its location and a description of its nature (quantitatively if possible).
 - c. Monitor the gas probes and ambient air on a daily basis for the parameters set forth in Condition III.E.1; appropriate action will have been taken when the results of the monitoring program are below all the criteria identified in Condition III.E.4 for five consecutive days.
 - d. Submit weekly reports documenting the action taken to correct the problem and summarizing all monitoring efforts carried out during the response period.
 - e. If, after thirty days, problems are still occurring, the Permittee must submit a Class 1* permit modification request which describes the changes which must be made at the landfill to remedy the problem. Until such time as the modification request is approved, the Permittee must still comply with the requirements of Conditions III.E.5.a through d above.
6. At the end of the post-closure care period, the gas monitoring probes shall be decommissioned. The probes outside the waste boundary shall be decommissioned using Illinois EPA's groundwater monitoring well plugging procedures. In decommissioning probes within the waste boundary, the pipe must be cut off at least two feet below the compacted clay layer and plugged. The final cover in this area must then be reconstructed, as appropriate.

F. GAS MANAGEMENT SYSTEM

- 1. Except as modified in this permit, the landfill gas extraction system associated with the closed Phase A landfill must be operated, maintained and inspected in

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accordance with Appendix H of the document entitled "Leachate & Gas Control System Documentation, Zion Site 1 Landfill."

2. The Permittee must operate the landfill gas collection system installed in the closed Phase A landfill in such a manner that:
 - a. The criteria set forth in III.E.4 above are not exceeded:
 - b. It is capable of removing landfill gas from the entire landfill
3. The landfill gas collected from this facility is typically directed to a gas-to-energy facility where it is burned in internal combustion engines which in turn drive generators to produce electricity. When the gas-to-energy facility cannot receive landfill gas, the gas is directed to a flare where it is burned. The Permittee must maintain a log of all the times that the landfill gas is diverted to the flare.
4. The following measurements shall be made quarterly on the landfill gas flowing into the flare or the gas-to-energy facility: flow rate, heat value, percent oxygen and percent carbon dioxide.
5. At a minimum, all equipment and appurtenances associated with the gas management system must be inspected and maintained, as necessary on a quarterly basis.
6. The Permittee must comply with the terms and conditions of Permit No. 097200AAU issued by Illinois EPA's Bureau of Air in regards to emissions from the landfill and from the flare used on occasion to burn collected landfill gas. It is understood that operation of the on-site landfill gas-to-energy plant is operated by Bio-Energy, Inc. under Permit No. 097200ABC issued by Illinois EPA's Bureau of Air.
7. Condensate from the landfill gas extraction system must be managed as a listed hazardous waste (F039). Currently, this condensate is collected and discharged into the on-site leachate collection tank.

G. LEACHATE MANAGEMENT

1. The leachate pumps in the extraction wells identified in Condition III.D.5 are located approximately one foot above the bottom of the well. These pumps

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automatically turn on when the leachate level is approximately 3.5' above the bottom of the pump.

2. A manhole/sump is present just outside the southwest corner of the landfill which receives leachate from the original leachate collection trenches installed along the perimeter of the landfills base. The bottom of this sump is at an elevation of approximately 726 MSL. A pump similar to that described above is present in the sump and its intake is located approximately one foot above the bottom of the sump/manhole.
3. The level of leachate in each extraction well and the manhole/sump (relative to mean sea level) must be monitored on a quarterly basis.
4. The total amount of leachate removed from the site shall be determined on a quarterly basis. This determination shall be made using the reported leachate loads removed from the tank each quarter. The counter devices associated with each extraction pump will be read on a quarterly basis to determine if the pumps are working.
5. A record of the date each load of leachate is sent off-site for treatment must be maintained, as well as the volume shipped. In maintaining this record, adjustments must be made for the amount of gas condensate generated and transferred to the leachate accumulation tank.
6. Prior to shipping a load of leachate off-site for treatment, a sample must be collected and analyzed for:
 - a. Five day biological oxygen demand (BOD₅);
 - b. Chemical Oxygen demand;
 - c. Total solids;
 - d. Total suspended solids;
 - e. Dissolved solids;
 - f. Total iron;
 - g. pH;

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- h. The groundwater monitoring constituents set forth in Lists G1 and G2 of Condition IV.E.1 of this permit;
- i. Any other parameters deemed necessary by the facility receiving the leachate for treatment.

The results of this sampling/analysis effort must be documented in the facility's operating record.

7. A sample of leachate must be collected from an extraction well within the landfill annually and analyzed for the constituents set forth in 35 Ill. Admin. Code 811, Appendix C.

- a. The following four extraction wells shall constitute the locations where these samples are to be collected: EW-2; EW-6; EW-20; EW-24
- b. A sample must be collected from EW-2 within one year of the effective date of this permit;
- c. A sample must be collected from EW-20 within two years of the effective date of this permit;
- d. A sample must be collected from EW-6 within three years of the effective date of this permit;
- e. A sample must be collected from EW-24 within four years of the effective date of this permit;
- f. The order in which a leachate sample is collected/analyzed after the permit has been in effect for four years shall follow that set forth in Conditions III.G.7.b through e above.

The results of this sampling/analysis effort must be document in the facility's operating record.

8. The Permittee shall continue to operate the leachate collection and removal system throughout the post-closure care period until pumpable quantities of leachate are no longer present.

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H. RECORDKEEPING AND REPORTING

1. A detailed record of all activities, observations, and corrective action associated with providing post-closure of the closed Phase A landfill must be created and maintained at this facility.
2. By March 1 of each year, the Permittee shall submit a report to Illinois EPA which summarizes the post-closure care activities completed during the previous calendar year. This report should contain:
 1. Background information about the facility and a general discussion of the post-closure care activities carried out during the year;
 2. Dates quarterly inspections were conducted and copies of completed inspection checklists (these inspection include those required by Conditions III.C.6 above);
 3. A general discussion of the observations from the quarterly inspections mentioned above. Problems observed during the quarterly inspections must also be discussed and documentation must be provided regarding actions taken to correct the problem;
 4. A discussion of all maintenance activities carried out during the year, including mowing the vegetative cover over the landfill.
 5. The results of the landfill gas monitoring required by Condition III.E.2 above and the action taken if any exceedences identified in Condition III.E.5 occur;
 6. Information regarding the landfill gas being sent to the gas-to-energy plant or flare as required by Condition III.F.3 above;
 7. Identification of any time periods when either the leachate or gas management systems were not operating or not operating properly; including identification of any time periods when the landfill gas was directed to the flare rather than the gas to energy system.
 8. Information regarding the leachate management program being carried out:

- a. The information required by Condition III.G.5 above as it relates to the amount of leachate sent off-site throughout the year;
 - b. The amount of leachate removed from each leachate extraction well during the year as required by Condition III.G.4 above;
 - c. The level of leachate observed each quarter in each leachate extraction well as required by Condition III.G.3 above
 - d. The results of the analyses conducted on leachate as required by Conditions IV.G.6 and 7 above.
9. An evaluation of the data collected for the leachate and gas management programs at the facility to determine if they are operating effectively.
 10. Recommended changes which should be made to the leachate or gas management units to increase their effectiveness in removing leachate or landfill gas from the landfill.

This information will form the foundation to support the certification of completion of post-closure care eventually submitted to Illinois EPA in accordance with 35 Ill. Admin. Code 724.220 and Condition III.K.3 of this permit.

I. FINANCIAL ASSURANCE FOR POST-CLOSURE CARE

1. The estimated annual cost of providing post-closure of the Phase A Landfill is \$194,354.60 (in 2009 dollars); this includes a contingency factor for unexpected expenses of 15%. As the post-closure care period for this unit began on February 10, 1998, seventeen years of post-closure care must still be provided. Thus, the total post-closure care estimate for the closed Phase A landfill is \$3,304,028 (in 2009 dollars).
2. Financial assurance meeting the requirements of 35 Ill. Adm. Code 724, Subpart H must be maintained for post-closure care of the closed Phase A landfill.

J. CONTACT INFORMATION/REQUIREMENTS

1. This permit sets forth requirements which the Permittee must carry out at the facility whose address is:

Zion Landfill Site 1
701 North Green Bay Road
Zion, Illinois 60098.

2. The contact person for the operator, BFI Waste Systems of North America, LLC is:

James W. Hitzeroth
26 W. Schick Road
Hanover Park, Illinois 60103
Telephone No.: 630/894-5001
e-mail address: JHitzeroth@republicservices.com

3. The contact person for the owner, Advanced Disposal Services Zion Landfill, Inc. is:

James Lewis
Advanced Disposal Services
701 North Green Bay Road
Zion, Illinois 60099
Telephone No.: 847/599-5910

4. A copy of this permit and associated approved permit application must be maintained: (1) at this facility; and (2) by Mr. Hitzeroth.
5. Requests to change the contact persons identified above shall be submitted as Class 1 permit modification requests.

K. NOTICES AND CERTIFICATION

1. Within sixty days of the effective date of this permit, the Permittee shall:
 - a. Submit to the local zoning authority or the authority with jurisdiction over local land use, and to the Agency a survey plat and a record of the type, location, and quantity of wastes disposed of within each cell or other

disposal unit of the facility. For hazardous wastes disposed before January 12, 1981, the Permittee shall identify the type, location, and quantity of the wastes to the best of his knowledge and in accordance with any records he has kept. This plat must be prepared and certified by an independent registered land surveyor.

- b. Record, in accordance with Illinois law, a notation on the deed to the facility property – or on some other instrument that is normally examined during title search – that will in perpetuity notify any potential purchaser of the property that:
 - (i) The land has been used to manage hazardous wastes;
 - (ii) Its use is restricted under 35 IAC 724.217(c);
 - (iii) The survey plat and record of the type, location, and quantity of hazardous wastes disposed within each cell or other hazardous waste disposal unit of the facility have been filed with the Agency, the County Recorder, and any local zoning authority.
 - c. Submit a certification to the Agency's Division of Land Pollution Control, signed by the Permittee, that the documents have been appropriately distributed/recorded including copies of the documents distributed/recorded.
2. If the Permittee or any subsequent owner or operator of the land upon which a hazardous waste disposal unit is located wishes to remove hazardous wastes and hazardous waste residues, the liner, if any, or contaminated soils, he must request first a modification to this post closure permit in accordance with the applicable requirements in 35 Ill. Adm. Code Parts 703, 705 and 724. This request must be submitted to Illinois EPA at least 180 days prior to the date that wish to remove the materials. The owner or operator must, at a minimum, demonstrate that the removal of hazardous wastes will satisfy the criteria of 35 Ill. Adm. Code 724.217(c).
3. No later than sixty (60) days after completion of the established post closure care period for the closed Phase A landfill, the Permittee shall submit to the Agency, by registered mail, a certification that the post-closure care for the closed Phase A landfill was performed in accordance with the specifications in the approved post-closure plan.

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- a. The certification must be signed by the owner or operator and a qualified registered professional engineer.
- b. Documentation regarding the efforts carried out during the post-closure care period must accompany this certification.

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SECTION IV: GROUNDWATER DETECTION MONITORING PROGRAM

A. SUMMARY

Groundwater parameters monitored in the uppermost aquifer below the facility indicate that, at the present time, no groundwater impacts have occurred. Therefore, a Groundwater Detection Monitoring Program meeting the requirements of 35 Ill. Adm. Code 724.198 shall be implemented at the facility. Phase A of the Zion Site 1 Landfill has eleven (11) existing monitoring wells which monitor the interglacial sand unit at a depth of approximately 100 feet below ground surface.

B. DEFINITION

As used herein, the words or phrases set forth below shall have the following definitions:

1. "Site" or "Facility" refers to the location at 701 Green Bay Road, Zion, County of Lake State of Illinois.
2. "Permittee" refers to the Facility.
3. "Illinois EPA" refers to the Illinois Environmental Protection Agency.
4. "RCRA" shall mean the Resource Conservation and Recovery Act as defined by Section 3.425 of the Environmental Protection Act, 415 ILCS 5/1 (2006).
5. "Permit" refers to the renewed RCRA Permit.
6. "Point of Compliance" refers to the vertical surface located at the hydraulically downgradient limits of the waste management area extending down into the uppermost aquifer underlying the regulated unit.
7. "Ft-bgs" refers to the number of feet below the ground surface.
8. "Ft-MSL" refers to the number of feet below the ground surface referenced to mean sea level.
9. "Detected" shall mean a concentration equal to or above the PQL listed in the latest version of USEPA's "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) for the applicable analytical methods

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specified in the approved Sampling and Analysis Procedures, which are incorporated by reference in Condition IV.H of the permit.

10. "Uppermost Aquifer" refers to the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically connected with this aquifer in the vicinity of the facility. The uppermost aquifer in the vicinity of the Phase A of the Zion Site 1 landfill has been identified as the interglacial sand deposits.
11. "Stick-up" refers to the height of the referenced survey datum. This point is determined within ± 0.01 foot in relation to mean sea level, which in turn is established by referenced to an established National Geodetic Vertical Datum.

C. IMPLEMENTATION

1. The Permittee shall implement the Groundwater Detection Monitoring Program upon the effective date of this permit. On that date, the groundwater monitoring requirements set forth in this permit shall supersede those previously established.
2. The Permittee shall carry out the detection monitoring specified in this permit on the groundwater beneath Phase A of the Zion Site 1 Landfill facility in Zion, Illinois. The uppermost aquifer in the vicinity of the facility has been identified as interglacial sand deposits. For the purpose of this permit and in accordance with the 35 Ill. Adm. Code Part 620 regulations, the uppermost aquifer has been designated Class I: Potable Resource Groundwater.
3. The Point of Compliance, defined as the vertical surface located at the hydraulically downgradient limit of the waste management area that extends down into the uppermost aquifer underlying the regulated unit, is delineated by the wells identified as the point of compliance wells in Condition IV.D.1 and illustrated in Figure E-1 of the approved Permit Renewal Application.

D. WELL LOCATION AND CONSTRUCTION

1. The Permittee shall install and maintain groundwater monitoring wells identified in the table below to allow for the collection of groundwater samples and elevations from the shallow zone and uppermost aquifer. The location of these wells are specified in Figure E-1 of the approved Permit Renewal Application:

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| <u>Well No.</u> | <u>Well Depth from top of Inner Casing (ft)</u> | <u>Well Bottom Elevation (ft-MSL)</u> | <u>Well Screen Interval (ft-MSL)</u> |
|-----------------|---|---|--|
|-----------------|---|---|--|

Background Wells

| | | | |
|------|-------|-------|-------------|
| G121 | 102.0 | 627.0 | 632.0-627.0 |
| R123 | 122.6 | 640.4 | 645.6-640.4 |
| R136 | 113.8 | 634.2 | 644.5-634.7 |
| R127 | 112.2 | 650.9 | 656.1-651.4 |

Point of Compliance Wells

| | | | |
|------|-------|-------|-------------|
| R124 | 153.4 | 634.8 | 644.8-634.8 |
| R126 | 159.4 | 648.4 | 658.4-648.4 |
| R128 | 155.2 | 647.7 | 652.7-647.7 |
| C129 | 168.1 | 644.4 | 649.6-644.9 |
| G131 | 161.3 | 649.8 | 654.8-649.8 |
| G132 | 167.9 | 637.3 | 647.3-637.3 |
| R133 | 119.7 | 639.0 | 649.0-639.0 |

2. Construction of each new monitoring well/piezometer must be in accordance with the diagram contained in Attachment B to this permit unless otherwise approved in writing by the Illinois EPA. Any new monitor wells/piezometers to be installed must be continuously sampled and logged on Illinois EPA boring logs which can be found at <http://www.epa.state.il.us/land/regulatory/programs/permits-and-management/form/index.html#groundwater-permits>.
3. The Permittee shall notify the Illinois EPA within thirty (30) days in writing if any of the wells identified in Condition IV.D.1 are damaged or the structural integrity has been compromised. A proposal for the replacement of the subject well shall accompany this notification. The well shall not be plugged until the new well is on-line and monitoring data has been obtained and verified, unless the well is extremely damaged and would create a potential route for groundwater contamination. Prior to replacing the subject well, the Permittee shall obtain written approval from the Illinois EPA regarding the proposed installation procedures and construction.
4. Should any well become consistently dry or unserviceable, a replacement well shall be provided within ten (10) feet of the existing well. This well shall monitor the same zone as the existing well and be constructed in accordance with the

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current Illinois EPA groundwater monitoring well construction standards at the time the wells are replaced. A replacement well which is more than ten (10) feet from the existing well or does not monitor the same geologic zone must be approved by the Illinois EPA and designated as a new well.

5. The Permittee shall submit boring logs, construction diagrams and data sheets from installation and development of a new or replacement well to the Illinois EPA at the address below within thirty (30) days of the date that installation of the well is completed. In addition, the Permittee shall submit certification that plugging and abandonment of a well was carried out in accordance with the approved procedures to the Illinois EPA at the address below within thirty (30) days of the date that the well is plugged and abandoned. All information should be submitted to the appropriate State Agencies.

Illinois Environmental Protection Agency
Bureau of Land - #33
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

6. All wells/piezometers shall be equipped with protective caps and locks. Monitoring wells or piezometers located in high traffic areas must be protected with bumper guards or other alternate barriers.
7. All wells/piezometers not utilized in the approved groundwater monitoring system, but retained by the facility, must be constructed and maintained in accordance with 77 Ill. Adm. Code 920 regulations. Monitoring wells that are improperly constructed must be abandoned in accordance with Condition IV.D.3.

E. MONITORING PARAMETERS

1. The Permittee shall determine groundwater quality at each groundwater monitoring well identified in Condition IV.D.1, at both background and point of compliance locations, semi-annually during the active life (including closure and post-closure care period) of the landfill. Samples collected during the semi-annual and annual sampling events of each year shall be analyzed for the constituents below:

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List G1 – Semi-Annual Groundwater Sampling

| <u>Field Parameters</u> | <u>Storet Number</u> | <u>Reporting Units</u> |
|--|---------------------------------|-----------------------------------|
| pH * | 00400 | |
| Specific Conductance ** | 00094 | micromhos/cm |
| Temperature of Water Sample | 00011 | (°F) |
| Turbidity | 45626 | Ntus |
| Depth to Water (below land surface) | 72019 | Feet |
| Depth to Water (below measuring point) | 72109 | Feet |
| Elevation of Bottom of Well# | 72020 | Ft-MSL |
| Elevation of Groundwater Surface | 71993 | Ft-MSL |
| Elevation of Measuring Point (top of casing)## | 72110 | Ft-MSL |

Shall be determined once every five (5) years during the annual sampling event in accordance with Condition IV.G.3.

Shall be surveyed once every five (5) years, or at the request of the Illinois EPA, or whenever the elevation changes as required by Condition IV.G.2.

* Background Groundwater Quality values (BGQs) for pH in well G131 (8.45-10.23) and well G132(8.03-9.64).

** BGQs for specific Conductance in Well R126 (2495 micromhos/cm).

| <u>Parameters</u> | <u>Storet Number</u> | <u>BGQs (ug/L)</u> |
|---------------------------|---------------------------------|---------------------------|
| Acetone | 81552 | 100 |
| Acrolein | 34210 | 25 |
| Acrylonitrile | 34215 | 10 |
| Benzene | 34030 | 5 |
| Bromodichloromethane | 32101 | 5 |
| Bromoform | 32104 | 5 |
| Bromomethane | 34413 | 5 |
| Carbon Tetrachloride | 32102 | 5 |
| Chlorobenzene | 34301 | 5 |
| Chloroethane | 34311 | 10 |
| 2-Chloroethyl Vinyl Ether | 34576 | 10 |
| Chloroform | 32106 | 5 |
| Chloromethane | 34418 | 10 |
| 1,1-Dichloroethane | 34496 | 5 |
| 1,2-Dichloroethane | 34531 | 5 |

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| <u>Parameters</u> | <u>Storet Number</u> | <u>BGOs (ug/L)</u> |
|---------------------------|--------------------------|--------------------|
| 1,1-Dichloroethene | 34501 | 5 |
| trans-1,2-Dichloroethene | 34546 | 5 |
| 1,2-Dichloropropane | 31541 | 5 |
| cis-1,3-Dichloropropene | 34704 | 5 |
| trans-1,3-Dichloropropene | 34699 | 5 |
| 1,4-Dioxane | 81582 | 120 |
| Ethyl Benzene | 78113 | 5 |
| Isobutyl Alcohol | 77033 | 100 |
| Methylene Chloride | 34423 | 5 |
| Pyridine | 77045 | 5 |
| 1,1,2,2-Tetrachloroethane | 34516 | 5 |
| Toluene | 34010 | 5 |
| 1,1,1-Trichloroethane | 34506 | 5 |
| 1,1,2-Trichloroethane | 34511 | 5 |
| Trichloroethene | 39180 | 5 |
| Vinyl Chloride | 39175 | 2 |
| 1,2-Dichlorobenzene | 34536 | 10 |
| 1,3-Dichlorobenzene | 34566 | 10 |
| 1,4-Dichlorobenzene | 34571 | 10 |
| Hexachlorobutadiene | 39702 | 10 |
| Hexachloroethane | 34396 | 10 |
| Naphthalene | 34696 | 10 |
| Nitrobenzene | 34447 | 10 |
| 1,2,4-Trichlorobenzene | 34551 | 10 |

List G2 – Annual Groundwater Sampling

| <u>Parameters</u> | <u>Storet Number</u> | <u>BGOs (ug/L)</u> |
|----------------------|--------------------------|--------------------|
| Barium (dissolved) | 01005 | 1000 |
| Barium (total) | 01007 | 1000 |
| Cadmium (dissolved) | 01025 | 2 |
| Cadmium (total) | 01027 | 3 |
| Chromium (dissolved) | 01030 | 10 |
| Chromium (total) | 01034 | 10 |

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| <u>Parameters</u> | <u>Storet Number</u> | <u>BGOs (ug/L)</u> |
|---------------------|--------------------------|--------------------|
| Cyanide (dissolved) | 00723 | 0.005 |
| Cyanide (total) | 00720 | 0.005 |
| Lead (dissolved) | 01049 | 5 |
| Lead (total) | 01051 | 5 |
| Mercury (dissolved) | 71890 | 0.2 |
| Mercury (total) | 71900 | 0.2 |
| Nickel (dissolved) | 01065 | 100 |
| Nickel (total) | 01067 | 100 |

Note: All constituents with "dissolved" labeled to the right shall be determined using groundwater samples which have been filtered through a 0.45 micron filter and used for statistical purposes.

2. Alternate concentration limits may be established in accordance with 35 Ill. Adm. Code 724.194(b) where the Permittee can determine a constituent will not pose a substantial hazard to human health or the environment. The alternate concentration limits proposed by the facility must be approved by the Illinois EPA.
3. The Permittee shall establish background values in accordance with the procedures specified in Section E of the approved Permit Renewal Application as well as the following procedures:
 - a. Background groundwater quality for a monitoring parameter or constituent shall be based on data from four (4) consecutive sampling events of the upgradient groundwater monitoring wells for two (2) years.
 - b. For those monitoring parameters or constituents not detected above the practical quantitation limit (PQL) during background gathering, the PQL shall be the established background value.

F. DETECTION MONITORING PROGRAM

1. The Permittee shall determine groundwater quality at each monitoring well identified in Condition IV.D.1 semi-annually and annually during the active life of the regulated unit (including the closure and post-closure care periods). The

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Permittee shall express the groundwater quality at each monitoring well in a form necessary for the determination of statistically significant changes (i.e. means, variances, etc.).

2. The Permittee shall determine the groundwater flow rate and direction in the uppermost aquifer semi-annually, and report to the Illinois EPA at least annually from monitoring wells identified in Condition IV.D.1
3. The Permittee shall determine whether there is a statistically significant increase, (or decrease in the case of pH) over the background values established for each parameter identified in Condition IV.E.1 or the 35 Ill. Adm. Code 620, Class I Groundwater Quality Standards, whichever is greater, each time groundwater quality is determined at the point of compliance. In determining whether such a change has occurred, the Permittee must compare groundwater quality at each monitoring well identified in Condition IV.D.1 to the background value derived in accordance with the statistical procedures specified in Section E of the approved Permit Renewal Application.

G. GROUNDWATER ELEVATION

1. The Permittee shall determine the groundwater surface elevation referenced to mean sea level (MSL) at each well each time groundwater is sampled in accordance with Condition IV.J.3.
2. The Permittee shall determine the surveyed elevation of "stick-up" referenced to MSL when the well is installed (with as-built diagrams) and every five (5) years; or at the request of the Illinois EPA; or whenever the elevation changes in accordance with Condition IV.J.5.
3. Elevation, as referenced to MSL, of the bottom of each monitoring well (STORET 72020), is to be reported once every five (5) years, or whenever the pumps are removed from the well for maintenance; or at the request of the Illinois EPA; or whenever the elevation changes in accordance with Condition IV.J.6. The mandatory measurement shall be taken during the annual sampling events.

H. SAMPLING AND ANALYTICAL PROCEDURES

1. The Permittee shall use the techniques and procedures described in Section E of the approved Permit Renewal Application except as modified below, when

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obtaining and analyzing samples from the groundwater monitoring wells described in Condition IV.D.1:

- a. Samples shall be collected by the techniques described in Section E in the approved Permit Renewal Application.
- b. Samples shall be preserved and shipped (when shipped off-site for analysis) in accordance with the procedures specified in Section E of the approved Permit Renewal Application.
- c. Samples shall be analyzed in accordance with the procedures specified in Section E approved Permit Renewal Application.
- d. Samples shall be tracked and controlled using the chain-of-custody procedures specified in Section E approved Permit Renewal Application.

I. STATISTICAL PROCEDURES

When evaluating the monitoring results in accordance with Condition IV.F, the Permittee shall use the following procedure:

1. The statistical methods to be used shall be as specified in Section E of the approved Permit Renewal Application.
2. Analytical data shall be compared to the parameter background values established in accordance with Section E of the approved Permit Renewal Application.
3. For Constituents which have not been detected in the groundwater, a value of two times the practical quantitation limit (PQL) shall be used as the background concentration.

J. REPORTING AND RECORDKEEPING

1. The Permittee shall enter all monitoring, testing, and analytical data obtained in accordance with Conditions IV.E, IV.F, IV.G, IV.H, and IV.I in the operating record. The data must include all computations, calculated means, variances, t-statistic values, and t-statistic results or results of statistical tests that the Illinois EPA has determined to be equivalent.

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2. Samples collected to meet the requirements of the groundwater monitoring program described in Conditions IV.E, IV.F, IV.G and IV.I shall be collected and reported, as identified in the table below. All additional information required by the groundwater monitoring program (as Specified in Conditions IV.E, IV.F, IV.G, IV.I) shall also be submitted to the Illinois EPA at the address listed in Condition IV.D.5 in accordance with this schedule.

| <u>Samples to be Collected During The Months of</u> | <u>Results Submitted to the Illinois EPA by the Following</u> | <u>Parameters</u> |
|---|---|-------------------|
| April – May | July 15 | List G1 and G2 |
| October – November | January 15 | List G1 |

3. Groundwater surface elevation data, measured pursuant to Condition IV.G.1 shall be collected semi-annually and submitted to the Illinois EPA according to the schedule in Condition IV.J.2.
4. The Permittee shall report the groundwater flow rate and direction in the uppermost aquifer as required by Condition IV.F.2 during the annual sampling event of the year.
5. The Permittee shall report the surveyed elevation, as required by Condition IV.G.2, of the top of the well casing "stick-up", referenced to MSL in accordance with the following schedule:
- For wells identified in Condition IV.D.1, every five (5) years (during the annual sampling event); or at the request of the Illinois EPA; or whenever the elevation changes.
 - For any new wells, at the time of installation and reported in the as-built diagrams, subsequent measurements shall be made every five (5) years (during the annual sampling event), or at the request of the Illinois EPA, or whenever the elevation changes.
6. Elevation of the bottom of each monitoring well identified in Condition IV.D.1, as referenced to MSL, is to be reported every five (5) years. This measurement shall be taken during the annual sampling event (Storet 72020) in accordance with Condition IV.G.3.

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7. Information required by Conditions IV.J.2, IV.J.3, IV.J.5 and IV.J.6 must be submitted in an electronic format. The information is to be submitted, as fixed-width text files formatted as found in Attachment B, in accordance with the schedule found in Condition IV.J.2 above. Additional guidance regarding the submittal of the information in an electronic format can be found at <http://www.epa.state.il.us/land/regulatory-programs/electronic-intro.html>.
8. The Permittee shall submit a completed "RCRA Facility Groundwater, Leachate and Gas Reporting Form" (LPC-592) as a cover sheet for any notices or reports required by the permit for identification purposes. Only one copy of the LPC-592 must accompany your submittal. However, the Permittee must submit one (1) original and (excluding the groundwater and leachate monitoring results submitted in an electronic format) a minimum of two (2) copies of each notice or report you submit to the Illinois EPA. The form is not to be used for permit modification requests.
9. The Permittee shall report all information to the Illinois EPA in a form which can be easily reviewed. All submittals contain tables of data drawings and text (as necessary) to accurately describe the information contained in the submittal.
10. If the Permittee determines, pursuant to Condition IV.F.3 of this Section, that there is a statistically significant change for any of the parameters specified in Condition IV.E.1 at any monitoring well at the compliance point, the Permittee shall:
 - a. Notify the Illinois EPA in writing within seven days indicating which parameters and wells have shown statistically significant increases and provide all statistical calculations. This notification shall be submitted to the Illinois EPA within seven (7) days of the date that the increases are discovered.
 - b. Sample the groundwater in all wells listed in Condition IV.D.1 and determine the concentration of all constituents identified in Appendix I of 35 Ill. Adm. Code, Part 724 such that the results will accompany the permit modification required by Condition IV.J.10.d below.
 - c. For any Appendix I compounds found in the analysis pursuant to this condition, the Permittee may resample within one month and repeat the analysis for those compounds detected. If results of the second analysis confirm the initial results, then these constituents will form the basis for compliance monitoring. If the Permittee does not resample for the

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compounds pursuant to this condition, the hazardous constituents found during the initial Appendix I analysis will form the basis for compliance monitoring.

- d. Submit to the Illinois EPA an application for a permit modification to establish a compliance monitoring program meeting the requirements of 35 Ill. Adm. Code 724.199. The application shall be submitted to the Illinois EPA within ninety (90) days of the date that the increase is discovered. Furthermore, the application must include the following information:
- i. An identification of the concentration of any 35 Ill. Adm. Code 724, Appendix I constituents found in the groundwater at each monitoring well at the point of compliance;
 - ii. Any proposed changes to the groundwater monitoring system at the facility necessary to meet the requirements 35 Ill. Adm. Code 724.199;
 - iii. Any proposed changes to the monitoring frequency, sampling and analysis procedures, or methods or statistical procedures used at the facility necessary to meet the requirements of 35 Ill. Adm. Code 724.199; and
 - iv. For each hazardous constituent found at the compliance point, a proposed concentration limit under 35 Ill. Adm. Code 724.194(a)(1) or 724.194(a)(2), or a notice of intent to seek an alternate concentration limit for a hazardous constituent under 35 Ill. Adm. Code 724.194(b).
- e. Submit to the Illinois EPA a corrective action feasibility plan to meet the requirements of 35 Ill. Adm. Code 724.200 unless the concentrations of all hazardous constituents identified under Condition IV.J.10.b above are listed in 35 Ill. Adm. Code 620.410 and their concentrations do not exceed the respective Groundwater Quality Standards or the Permittee has sought an alternate concentration limits under Condition IV.J.10.d.iv above for every hazardous constituent identified under Condition IV.J.10.b above. This plan must be submitted to the Illinois EPA within 180 days of the date the increases is discovered.

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- f. Submit to the Illinois EPA all data necessary to justify any alternate concentration limit for a hazardous constituent sought under Condition IV.J.10.d.iv above. This plan must be submitted to the Illinois EPA within 180 days of the date the increases is discovered.
- 11. If the Permittee determines, pursuant to Condition IV.F.3, that there is a statistically significant increase above the background values for the parameters specified in Condition IV.E.1, the Permittee may demonstrate that a source other than a regulated unit caused the increase or that the increase resulted from error in sampling, analysis, or evaluation. The Permittee shall submit a permit modification application in accordance with Condition IV.J.10.d unless the demonstration successfully shows that a source other than the regulated unit caused the increase or that the increase resulted from errors in sampling, analysis or evaluation and the Illinois EPA concurs.

To make this demonstration, the Permittee shall:

- a. Notify the Illinois EPA in writing that they intend to make this demonstration. This notification must be submitted to the Illinois EPA within seven (7) days of the date that the increase is discovered.
- b. Submit a report to the Illinois EPA which demonstrates that a source other than a regulated unit caused the increase, or that the increase resulted from error in sampling, analysis, or evaluation. This report must be submitted within ninety (90) days of the date that the increase is discovered.
- c. Submit to the Illinois EPA an application to make any appropriate changes to the Groundwater Detection Monitoring Program. This application must be submitted within ninety (90) days of the date that the increase is discovered.
- d. Continue to monitor in accordance with the detection monitoring program at the facility.

K. REQUEST FOR PERMIT MODIFICATION

- 1. If the Permittee or the Illinois EPA determines that the Detection Monitoring Program no longer satisfies the requirements of 35 Ill. Adm. Code 724.198, the Permittee must, within ninety (90) days, submit an application for a permit

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modification to the Illinois EPA to make any appropriate changes to the program which will satisfy the regulations.

2. Conditions in this section of the Permit may be modified in accordance with 35 Ill. Adm. Code 705.128 if there is cause for such modification, as defined in 35 Ill. Adm. Code 702.184. Causes for modification identified in this section include, but are not limited to, alterations to the permitted facility, additional information which would have justified the application of different permit conditions at the time of issuance, and new regulations.

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SECTION IV-A: SHALLOW ZONE OBSERVATION MONITORING PROGRAM

A. SUMMARY

In addition to the Groundwater Detection Monitoring Program utilized to monitor the uppermost aquifer at the facility, Phase A of Zion Site 1 Landfill has two existing wells to monitor groundwater in the shallow groundwater zone at the facility. These groundwater monitoring wells are intended to detect any releases from the landfill to the shallow groundwater zone that could potentially impact the uppermost aquifer at the facility.

B. IMPLEMENTATION

1. The Permittee shall implement the Shallow Zone Observation Monitoring Program upon the effective date of this permit. On that date, the shallow zone observation monitoring requirements set forth in this permit shall previously established requirements.
2. The Permittee shall carry out the shallow zone observation monitoring specified in this permit on the groundwater beneath the Phase A of Zion Site 1 Landfill. For the purpose of this permit the shallow zone consists of discontinuous sand and silt lenses.

C. WELL LOCATION AND CONSTRUCTION

1. The Permittee shall install and maintain groundwater monitoring wells at the locations specified on the map presented in the approved Permit Renewal Application and in conformance with the following list:

| <u>Well No.</u> | <u>Well Depth top of Inner Casing (ft.)</u> | <u>Well Bottom Elevation (ft.-MSL)</u> | <u>Well Screen Interval (ft.-MSL)</u> |
|-----------------|---|--|---------------------------------------|
| GT02 | 33.4 | 712.3 | 717.3-712.3 |
| GT05 | 54.4 | 707.9 | 712.9-707.9 |

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2. Construction of each new monitoring well/piezometer must be in accordance with the diagram contained in Attachment B to this permit unless otherwise approved in writing by the Illinois EPA. Any new monitor wells/piezometers to be installed must be continuously sampled and logged on Illinois EPA boring logs which can be found at <http://www.epa.state.il.us/land/regulatory/programs/permits-and-management/form/index.html#groundwater-permits>.
3. The Permittee shall notify the Illinois EPA within thirty (30) days in writing if any of the wells identified in Condition IV-A.C.1 are damaged or the structural integrity has been compromised. A proposal for the replacement of the subject well shall accompany this notification. The well shall not be plugged until the new well is on-line and monitoring data has been obtained and verified, unless the well is extremely damaged and would create a potential route for groundwater contamination. Prior to replacing the subject well, the Permittee shall obtain written approval from the Illinois EPA regarding the proposed installation procedures and construction.
4. Should any well become consistently dry or unserviceable, a replacement well shall be provided within ten (10) feet of the existing well. This well shall monitor the same zone as the existing well and be constructed in accordance with the current Illinois EPA groundwater monitoring well construction standards at the time the wells are replaced. A replacement well which is more than ten (10) feet from the existing well or does not monitor the same geologic zone must be approved by the Illinois EPA and designated as a new well.
5. The Permittee shall submit boring logs, construction diagrams and data sheets from installation and development of a new or replacement well to the Illinois EPA at the address below within thirty (30) days of the date that installation of the well is completed. In addition, the Permittee shall submit certification that plugging and abandonment of a well was carried out in accordance with the approved procedures to the Illinois EPA at the address below within thirty (30) days of the date that the well is plugged and abandoned. All information should be submitted to the appropriate State Agencies.

Illinois Environmental Protection Agency
Bureau of Land - #33
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

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6. All wells/piezometers shall be equipped with protective caps and locks. Monitoring wells or piezometers located in high traffic areas must be protected with bumper guards or other alternate barriers.
7. All wells/piezometers not utilized in the approved groundwater monitoring system, but retained by the facility, must be constructed and maintained in accordance with 77 Ill. Adm. Code 920 regulations. Monitoring wells that are improperly constructed must be abandoned in accordance with Condition IV-A.C.3.

D. MONITORING PARAMETERS

1. The Permittee shall determine groundwater quality at the monitoring wells identified in IV-A.C.1, semi-annually and annually during the active life (including closure and post-closure care period) of the landfill. Samples collected during the semi-annual and annual sampling events of each year shall be analyzed for the field parameters and hazardous waste constituents below.

List G1 – Semi-Annual Groundwater Sampling

| <u>Field Parameters</u> | <u>Storet Number</u> | <u>Reporting Units</u> |
|--|-----------------------------|-------------------------------|
| pH * | 00400 | |
| Specific Conductance ** | 00094 | micromhos/cm |
| Temperature of Water Sample | 00011 | (°F) |
| Turbidity | 45626 | Ntus |
| Depth to Water (below land surface) | 72019 | Feet |
| Depth to Water (below measuring point) | 72109 | Feet |
| Elevation of Bottom of Well# | 72020 | Ft-MSL |
| Elevation of Groundwater Surface | 71993 | Ft-MSL |
| Elevation of Measuring Point (top of casing)## | 72110 | Ft-MSL |

Shall be determined once every five (5) years during the annual sampling event in accordance with Condition IV-A.F.3.

Shall be surveyed once every five (5) years, or at the request of the Illinois EPA, or whenever the elevation changes as required by Condition IV-A.F.2.

* BGQs for pH in well GT02 (6.80-7.52) and well GT05 (6.67-7.65).

** BGQs for Specific Conductance in Well GT02 (2098 micromhos/cm) and well GT05 (4142 micromhos/cm).

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| <u>Parameters</u> | <u>Storet Number</u> | <u>BGOs (ug/L)</u> |
|---------------------------|--------------------------|--------------------|
| Acetone | 81552 | 100 |
| Acrolein | 34210 | 25 |
| Acrylonitrile | 34215 | 10 |
| Benzene | 34030 | 5 |
| Bromodichloromethane | 32101 | 5 |
| Bromoform | 32104 | 5 |
| Bromomethane | 34413 | 5 |
| Carbon Tetrachloride | 32102 | 5 |
| Chlorobenzene | 34301 | 5 |
| Chloroethane | 34311 | 10 |
| 2-Chloroethyl Vinyl Ether | 34576 | 10 |
| Chloroform | 32106 | 5 |
| Chloromethane | 34418 | 10 |
| 1,1-Dichloroethane | 34496 | 5 |
| 1,2-Dichloroethane | 34531 | 5 |
| 1,1-Dichloroethene | 34501 | 5 |
| trans-1,2-Dichloroethene | 34546 | 5 |
| 1,2-Dichloropropane | 31541 | 5 |
| cis-1,3-Dichloropropene | 34704 | 5 |
| trans-1,3-Dichloropropene | 34699 | 5 |
| 1,4-Dioxane | 81582 | 120 |
| Ethyl Benzene | 78113 | 5 |
| Isobutyl Alcohol | 77033 | 100 |
| Methylene Chloride | 34423 | 5 |
| Pyridine | 77045 | 5 |
| 1,1,2,2-Tetrachloroethane | 34516 | 5 |
| Toluene | 34010 | 5 |
| 1,1,1-Trichloroethane | 34506 | 5 |
| 1,1,2-Trichloroethane | 34511 | 5 |
| Trichloroethene | 39180 | 5 |
| Vinyl Chloride | 39175 | 2 |
| 1,2-Dichlorobenzene | 34536 | 10 |
| 1,3-Dichlorobenzene | 34566 | 10 |

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| <u>Parameters</u> | <u>Storet Number</u> | <u>BGOs (ug/L)</u> |
|------------------------|--------------------------|--------------------|
| 1,4-Dichlorobenzene | 34571 | 10 |
| Hexachlorobutadiene | 39702 | 10 |
| Hexachloroethane | 34396 | 10 |
| Naphthalene | 34696 | 10 |
| Nitrobenzene | 34447 | 10 |
| 1,2,4-Trichlorobenzene | 34551 | 10 |

List G2 – Annual Groundwater Sampling

| <u>Parameters</u> | <u>Storet Number</u> | <u>Well GT02 BGOs (ug/L)</u> | <u>Well GT05 BGOs (ug/L)</u> |
|----------------------|--------------------------|----------------------------------|----------------------------------|
| Barium (dissolved) | 01005 | 1000 | 1000 |
| Barium (total) | 01007 | 1000 | 1000 |
| Cadmium (dissolved) | 01025 | 2 | 6 |
| Cadmium (total) | 01027 | 1 | 2 |
| Chromium (dissolved) | 01030 | 10 | 20 |
| Chromium (total) | 01034 | 56 | 10 |
| Cyanide (dissolved) | 00723 | 0.005 | 0.005 |
| Cyanide (total) | 00720 | 0.005 | 0.005 |
| Lead (dissolved) | 01049 | 7 | 5 |
| Lead (total) | 01051 | 6 | 5 |
| Mercury (dissolved) | 71890 | 0.2 | 0.2 |
| Mercury (total) | 71900 | 0.2 | 0.2 |
| Nickel (dissolved) | 01065 | 100 | 299 |
| Nickel (total) | 01067 | 125 | 338 |

Note: All constituents with "dissolved" labeled to the right shall be determined using groundwater samples which have been filtered through a 0.45 micron filter and used for statistical purposes along with TOC.

2. Alternate concentration limits may be established in accordance with 35 Ill. Adm. Code 724.194(b) where the Permittee can determine a constituent will not pose a substantial hazard to human health or the environment. The alternate

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concentration limits proposed by the facility must be approved by the Illinois EPA.

3. The Permittee shall establish the intrawell background values in accordance with the procedures specified in Section E of the approved Permit Renewal Application.

E. SHALLOW ZONE OBSERVATION MONITORING PROGRAM

1. The Permittee shall determine groundwater quality at each monitoring well identified in Condition IV-A.C.1 semi-annually and annually during the active life of the regulated unit (including the closure and post-closure care periods). The Permittee shall express the groundwater quality at each monitoring well in a form necessary for the determination of statistically significant changes (i.e. means, variances, etc.).
2. The Permittee shall determine the groundwater elevations in the shallow groundwater zone semi-annually, and report to the Illinois EPA at least annually from monitoring wells identified in Condition IV-A.C.1.
3. The Permittee shall determine whether there is a statistically significant increase, (or decrease in the case of pH) over the background values established for each parameter identified in Condition IV-A.D.1 or the 35 Ill. Adm. Code 620, Class I Groundwater Quality Standards, whichever is greater, each time groundwater quality is determined.

F. GROUNDWATER ELEVATION

1. The Permittee shall determine the groundwater surface elevation referenced to mean sea level (MSL) at each well each time groundwater is sampled in accordance with Condition IV-A.I.3.
2. The Permittee shall report the surveyed elevation of stick-up referenced to MSL when the well is installed (with as-built diagrams) and every five years; or at the request of the Illinois EPA; or whenever the elevation changes in accordance with Condition IV-A.I.4.

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3. Elevation, as referenced to MSL, of the bottom of each monitoring well (STORET 72039), is to be reported once every five (5) years, or whenever the pumps are removed from the well for maintenance; or at the request of the Illinois EPA; or whenever the elevation changes in accordance with IV-A.1.5. The mandatory measurement shall be taken during the annual sampling events.

G. SAMPLING AND ANALYTICAL PROCEDURES

1. The Permittee shall use the following techniques and procedures described in Section E of the approved Permit Renewal Application except as modified below, when obtaining and analyzing samples from the groundwater monitoring wells described in Condition IV-A.C.1 above.
 - a. Samples shall be collected using the techniques described in Section E of the approved Permit Renewal Application.
 - b. Samples shall be preserved and shipped (when shipped off-site for analysis) in accordance with the procedures specified in Section E of the approved Permit Renewal Application.
 - c. Samples shall be analyzed in accordance with the procedures specified in Section E of the approved Permit Renewal Application.
 - d. Samples shall be tracked and controlled using the chain-of-custody procedures specified in Section E of the approved Permit Renewal Application.

H. STATISTICAL PROCEDURES

When evaluating the monitoring results in accordance with Condition IV-A.E, the Permittee shall use the following procedures:

1. The statistical methods to be used shall be as specified in Section E of the approved Permit Renewal Application.
2. Analytical data shall be compared to the parameter background values established in accordance with Section E of the approved Permit Renewal Application.

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3. For Constituents which have not been detected in the groundwater, a value of two times the practical quantitation limit (PQL) shall be used as the background concentration.

I. REPORTING AND RECORDKEEPING

1. The Permittee shall enter all monitoring, testing, and analytical data obtained in accordance with Condition IV-A.D, IV-A.E, IV-A.F, IV-A.G and IV-A.H in the operating record. The data must include all computations, calculated means, variances, t-statistic values, and t-statistic results or results of statistical test that the Illinois EPA has determined to be equivalent.
2. Samples collected to meet the requirements of the groundwater monitoring program described in Conditions IV-A.D, IV-A.E, IV-A.F and IV-A.H shall be collected and reported, as identified in the table below. All additional information required by the groundwater monitoring program (as Specified in Conditions IV-A.D, IV-A.E, IV-A.F and IV-A.H) shall also be submitted to the Illinois EPA at the address listed in Condition IV-A.C.5 in accordance with this schedule.

| <u>Samples to be Collected During The Months of</u> | <u>Results Submitted to the Illinois EPA by the Following</u> | <u>Parameters</u> |
|--|--|--------------------------|
| April – June | July 15 | List G1 and G2 |
| October – December | January 15 | List G1 |

3. Groundwater surface elevation data, measured pursuant to Condition IV-A.F.1 shall be collected semi-annually and submitted to the Illinois EPA as identified in the table above.
4. The Permittee shall report the surveyed elevation, as required by Condition IV-A.F.2, of the top of the well casing "stick-up", referenced to MSL in accordance with the following schedule:
 - a. For wells identified in Condition IV-A.C.1, every five (5) years (during the annual sampling event); or at the request of the Illinois EPA; or whenever the elevation changes.

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- b. For any new wells, at the time of installation and reported in the as-built diagrams, subsequent measurements shall be made every five (5) years (during the annual sampling event), or at the request of the Illinois EPA, or whenever the elevation changes.
5. Elevation of the bottom of each monitoring well identified in Condition IV-A.C.1, as referenced to MSL, is to be reported every five (5) years. This measurement shall be taken during the annual sampling event (Storet 72020) in accordance with Condition IV-A.F.3.
6. Information required by Conditions IV-A.I.2, IV-A.I.3, IV-A.I.4 and IV-A.I.5 must be submitted in an electronic format. The information is to be submitted, as fixed-width text files formatted as found in Attachment B, in accordance with the schedule found in Condition IV-A.I.2 above. Additional guidance regarding the submittal of the information in an electronic format can be found at <http://www.epa.state.il.us/land/regulatory-programs/electronic-intro.html>.
7. The Permittee shall submit a completed "RCRA Facility Groundwater, Leachate and Gas Reporting Form" (LPC-592) as a cover sheet for any notices or reports required by the permit for identification purposes. Only one copy of the LPC-592 must accompany your submittal. However, the Permittee must submit one (1) original and (excluding the groundwater and leachate monitoring results submitted in an electronic format) a minimum of two (2) copies of each notice or report you submit to the Illinois EPA. The form is not to be used for permit modification requests.
8. The Permittee shall report all information to the Illinois EPA in a form which can be easily reviewed. All submittals contain tables of data drawings and text (as necessary) to accurately describe the information contained in the submittal.
9. If the Permittee determines, pursuant to Condition IV-A.E.3, that there is a statistically significant increase for any of the parameters specified in Condition VI-A.D.1 at any monitoring well in Condition VI-A.C.1 the Permittee shall:
 - a. Notify the Illinois EPA in writing within seven days indicating which parameters and wells have shown statistical changes and provide the statistical calculations. This notification shall be submitted to the Illinois EPA within seven (7) days of the date that the increase is discovered.

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- b. Sample the groundwater in the affected well(s) listed in Condition IV-A.C.1 and determine the concentration of all the hazardous wastes and the hazardous waste constituents identified in Appendix I of 35 Ill. Adm. Code 724 such that the results will accompany their permit modification required by Condition IV-A.1.9.d.
- c. For any Appendix I compounds found in the analysis pursuant to this Condition, the Permittee may resample within one month and repeat analysis for those compounds detected. If results of the second analysis confirm the initial results, then these constituents will form the basis for compliance monitoring. If the Permittee does not resample for the compounds pursuant to this Condition, the hazardous constituents found during the initial Appendix I analysis will form the basis for compliance monitoring.
- d. Submit to the Illinois EPA an application for a permit modification to establish a compliance monitoring program meeting the requirements of 35 Ill. Adm. Code 724.199. The application shall be submitted to the Illinois EPA within ninety (90) days of the date that the exceedence is discovered. Furthermore, the application must include the following information:
 - i. An identification of the concentration of any 35 Ill. Adm. Code 724, Appendix I constituent(s) found in the groundwater at each monitoring well;
 - ii. Any proposed changes to the groundwater monitoring system at the facility necessary to meet the requirements of 35 Ill. Adm. Code 724.199; and
 - iii. Any proposed changes to the monitoring frequency, sampling and analysis procedure or methods or statistical procedures used at the facility necessary to meet the requirements of 35 Ill. Adm. Code 724.199.
 - iv. For each hazardous constituent found, a proposed concentration limit under 35 Ill. Adm. Code 724.194(a)(1) or 724.194(a)(2), or a notice

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of intent to seek an alternate concentration limit for a hazardous constituent under 35 Ill. Adm. Code 724.194(b).

- e. Submit to the Illinois EPA a corrective action feasibility plan to meet the requirements of 35 Ill. Adm. Code 724.200 unless the concentrations of all hazardous constituents identified under Condition IV-A.I.9.b above are listed in 35 Ill. Adm. Code 620.410 and their concentrations do not exceed the respective Groundwater Quality Standards or the Permittee has sought an alternate concentration limits under Condition IV-A.I.9.d.iv above for every hazardous constituent identified under Condition IV-A.I.b above. This plan must be submitted to the Illinois EPA within 180 days of the date the increases is discovered.
 - f. Submit to the Illinois EPA all data necessary to justify and alternate concentration limit for a hazardous constituent sought under Condition IV-A.I.9.d.iv above. This plan must be submitted to the Illinois EPA within 180 days of the date the increases is discovered.
10. If the Permittee determines, pursuant to Condition IV-A.E.3, that there is a statistically significant change above or for pH below the background values for the parameters specified in Condition IV-A.D.1, the Permittee may demonstrate that a source other than a regulated unit caused the increase or that the increase resulted from error in sampling, analysis, or evaluation. The Permittee shall submit a permit modification application in accordance with Condition IV-A.I.9.d above unless the demonstration successfully shows that a source other than the regulated unit caused the increase or that the increase resulted from errors in sampling, analysis or evaluation and the Illinois EPA concurs.

To make this demonstration, the Permittee shall:

- a. Notify the Illinois EPA in writing that they intend to make this demonstration. This notification must be submitted to the Illinois EPA within seven (7) days of the date that they intend to make this demonstration.
- b. Submit a report to the Illinois EPA which demonstrates that a source other than the regulated unit caused the increase, or that the increase resulted from error in sampling, analysis, or evaluation. This report must be

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submitted within ninety (90) days of the date that the increase is discovered.

- c. Submit to the Illinois EPA an application to make any appropriate changes to the Shallow Zone Observation Monitoring Program. This report must be submitted within ninety (90) days of the date that the increase is discovered.
- d. Continue to monitor in accordance with the Shallow Zone Observation Monitoring Program at the facility.

J. REQUEST FOR PERMIT MODIFICATION

- 1. If the Permittee or the Illinois EPA determines that the Detection Monitoring Program no longer satisfies the requirements of 35 Ill. Adm. Code 724.198, the Permittee must, within ninety (90) days, submit an application for a permit modification to the Illinois EPA to make any appropriate changes to the program which will satisfy the regulations.
- 2. Conditions in this section of the Permit may be modified in accordance with 35 Ill. Adm. Code 705.128 if there is cause for such modification, as defined in 35 Ill. Adm. Code 702.184. Causes for modification identified in this section include, but are not limited to, alterations to the permitted facility, additional information which would have justified the application of different permit conditions at the time of issuance, and new regulations.

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SECTION V: CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

A. INTRODUCTION

1. In accordance with Section 3004(u) of RCRA and 35 Ill. Adm. Code 724.201, the Permittee shall institute such corrective action as necessary to protect human health and the environment from all releases of hazardous wastes or hazardous constituents, listed in 35 Ill. Adm. Code 721, Appendix H from any solid waste management unit (SWMU) at its facility in Zion, Illinois.
2. Illinois EPA and USEPA issued a joint RCRA permit to this facility in 1988. The USEPA portion of that permit contained requirements for addressing two solid waste management units at the facility. The Permittee has adequately addressed corrective action at these two SWMUs.
3. The requirements of 35 Ill. Admin. Code 620 and 742 must be met in determining remediation objectives for all corrective action activities. However, the Permittee must provide corrective action, as appropriate, for any future releases from SWMUs present at the facility.
4. All Illinois EPA final actions on corrective action submittals are subject to the appeal provisions of Sections 39 and 40 of the Illinois Environmental Protection Act.
5. Unless there is a desire to modify specific requirements set forth in this Section, information submitted to Illinois EPA regarding the corrective action requirements set forth in this Section is not a request to modify this permit nor subject to the requirements of 35 Ill. Adm. Code 703, Subpart G.
 - a. A completed Illinois EPA RCRA Corrective Action Certification form (available on Illinois EPA's internet site (www.epa.state.il.us)) must accompany all corrective action related information submitted to Illinois EPA.
 - b. To allow for proper review of all corrective action related information submitted to Illinois EPA, the original and two copies of the information must be submitted.

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B. REQUIREMENTS FOR ADDRESSING NEWLY-IDENTIFIED SOLID WASTE MANAGEMENT UNIT(S)

- 1. The Permittee shall notify the Illinois EPA in writing of any newly-identified SWMU(s) discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means, no later than sixty (60) calendar days after discovery. The notification shall provide the following information, as available:**

 - a. The location of the newly-identified SWMU in relation to other SWMUs on a scaled map or drawing;**
 - b. The type and past and present function of the unit;**
 - c. The general dimensions, capacities, and structural description of the unit (available drawings and specifications provided);**
 - d. The period during which the unit was operated;**
 - e. The specifics on all materials, including but not limited to, wastes and hazardous constituents, that have been or are being managed at the SWMU, to the extent available; and**
 - f. The results of any relevant available sampling and analysis which may aid in determining whether releases of hazardous wastes or hazardous constituents have occurred or are occurring from the unit.**
- 2. If the submitted information demonstrates a potential for a release of hazardous waste or hazardous waste constituents from the newly identified SWMU, the Illinois EPA may request in writing, that the Permittee prepare a Solid Waste Management Unit (SWMU) Assessment Plan and a proposed schedule of implementation and completion of the Plan for any additional SWMU(s) discovered subsequent to the issuance of this permit. Guidance for the development of a SWMU assessment plan will be provided in Illinois EPA's written request for such a plan.**

This SWMU Assessment plan must propose investigations, including field investigations if necessary, to determine the release potential to specific environmental media for the newly-identified SWMU. The SWMU Assessment

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Plan must demonstrate that the sampling and analysis program, if applicable, is capable of yielding representative samples and must include parameters sufficient to identify migration of hazardous waste and hazardous constituents from the newly-discovered SWMU(s) to the environment.

3. The Illinois EPA shall either approve, approve with conditions, or disapprove the Plan in writing. If the plan is approved, the Permittee shall begin to implement the Plan within forty-five (45) calendar days of receiving such written notification. If the Plan is disapproved, the Illinois EPA shall notify the Permittee in writing of the Plan's deficiencies and specify a due date for submittal of a revised plan.
4. The Permittee shall submit a report documenting the results of the approved SWMU Assessment Plan to the Illinois EPA in accordance with the schedule in the approved SWMU Assessment Plan. The SWMU Assessment Report shall describe all results obtained from the implementation of the approved SWMU Assessment Plan.
5. Additional investigation, and corrective measures as necessary, shall be carried out to ensure the requirements of 35 Ill. Adm. Code 724.201 are met. Further guidance regarding compliance with these requirements will be provided as necessary. The requirements of 35 Ill. Adm. Code 742 must also be met.

C. FUTURE RELEASES FROM SWMUs

There exists a potential that a release may occur in the future from SWMUs identified in the RFA or RFI which did not require any corrective action at the time that the RFA or RFI was completed. If the Permittee discovers that a release has occurred from such a SWMU in the future, then the Illinois EPA must be notified of this release within sixty (60) days after its discovery. This notice must contain the information identified in Condition V.B.1 above. Upon the Illinois EPA's written request, the Permittee shall determine the nature and extent of the contamination by following the procedures set forth in Subsection B above.

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D. INTERIM MEASURES

At any time during the course of this permit, the Permittee may initiate interim measures for the purpose of preventing continuing releases and/or mitigating the results of releases and/or mitigating the migration of hazardous wastes or hazardous constituents. It shall not be necessary to conduct all phases of an investigation prior to implementing an interim measure if the Illinois EPA and the Permittee agree that a problem can be corrected, or a release cleaned up, without additional study and/or without a formal corrective measures study (CMS).

1. Prior to implementing any interim measures, the Permittee must submit detailed information regarding the proposed interim measure to the Illinois EPA for approval. This information shall include, at a minimum:
 - a. Objectives of the interim measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long-term solution at the facility;
 - b. Design, construction, and maintenance requirements;
 - c. Schedules for design and construction; and
 - d. Schedules for progress reports.
2. If the Illinois EPA determines that a release cannot be addressed without additional study and/or a formal CMS, then the Illinois EPA will notify the Permittee that these must be performed. Any proposal made under this provision or any other activity resulting from such proposal shall not affect the schedule for implementation of any other portion of the permit.
3. If the Illinois EPA determines that interim measures are necessary to protect human health or the environment, the Permittee will be notified by way of a permit modification.

E. FINANCIAL ASSURANCE

35 Ill. Adm. Code 724.201 requires that financial assurance be established for completing required corrective action at solid waste management units. As all corrective action

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efforts at this facility have been completed, the current cost estimate for corrective action at this facility is \$0.

1. The Permittee shall demonstrate compliance with the financial assurance requirements of 35 Ill. Adm. Code 724.201 by providing documentation of financial assurance using a mechanism specified in 35 Ill. Adm. Code 724.243, in at least the amount of the approved corrective action cost estimate. The words "completion of corrective action" shall be substituted for "closure and/or post-closure," as appropriate in the financial instrument specified in 35 Ill. Adm. Code 724.251. The Illinois EPA may accept financial assurance for completion of corrective action in combination with another financial mechanism that is acceptable under 35 Ill. Adm. Code 724.246 at its discretion.
2. The financial assurance requirements of 35 Ill. Adm. Code 724.201 must also be met for any investigative or corrective action efforts carried out in accordance with Subsections B or C above. Detailed cost estimates must be developed for any activities carried out under this Section and must accompany any workplan/report submitted to Illinois EPA for review and approval. Appropriate documentation of financial assurance in at least the amount of the approved cost estimate must be submitted to Illinois EPA within 60 days after the cost estimates are approved.
3. Financial assurance for corrective action must be updated, as necessary, to reflect the current status of the RCRA corrective action program at this facility. In addition, this financial assurance must be adjusted annually for inflation.

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SECTION VI: STANDARD CONDITIONS

A. INTRODUCTION

This section contains standard conditions applicable to Phase A of the Zion Site 1 Landfill. These standard conditions pertain to: (1) general requirements; and (2) post-closure care of the closed Phase A Landfill.

B. GENERAL REQUIREMENTS

1. **EFFECT OF PERMIT (35 IAC 702.181)** The existence of a RCRA permit shall not constitute a defense to a violation of the Environmental Protection Act or Subtitle G, except for development, modification or operation without a permit. Issuance of this permit does not convey property rights or any exclusive privilege. Issuance of this permit does not authorize any injury to persons or property or invasion of other private rights, or infringement of state or local law or regulations.
2. **PERMIT ACTIONS (35 IAC 702.146)** This permit may be modified, reissued or revoked for cause as specified in 35 IAC 703.270 through 703.273 and Section 702.186. The filing of a request by the Permittee for a permit modification or revocation, or a notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay the applicability or enforceability of any permit condition.
3. **SEVERABILITY (35 IAC 700.107)** The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.
4. **PERMIT CONDITION CONFLICT (35 IAC 702.160)** In case of conflict between a special permit condition and a standard condition, the special condition will prevail.
5. **DUTY TO COMPLY (35 IAC 702.141 and 703.242)** The Permittee shall comply with all conditions of this permit except for the extent and for the duration such noncompliance is authorized by an emergency permit. Any permit noncompliance constitutes a violation of the Environmental Protection Act and is

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grounds for enforcement action; permit revocation or modification; or for denial of a permit renewal application.

6. **DUTY TO REAPPLY (35 IAC 702.142 and 703.125)** If the Permittee wishes to continue an activity allowed by this permit after the expiration date of this permit, the Permittee must apply for a new permit at least 180 days before this permit expires, unless permission for a later date has been granted by the Agency.
7. **PERMIT EXPIRATION** This permit and all conditions herein will remain in effect beyond the permit's expiration date if the Permittee has submitted a timely, complete application (see 35 IAC 703.181-703.209) and, through no fault of the Permittee, the Agency has not issued a new permit as set forth in 35 IAC 702.125.
8. **NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE (35 IAC 702.143)** It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
9. **DUTY TO MITIGATE (35 IAC 702.144)** In the event of noncompliance with the permit, the Permittee shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.
10. **PROPER OPERATION AND MAINTENANCE (35 IAC 702.145)** The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory, and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.
11. **DUTY TO PROVIDE INFORMATION (35 IAC 702.148)** The Permittee shall furnish to the Agency, within a reasonable time, any relevant information which the Agency may request to determine whether cause exists for modifying, revoking and reissuing or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Agency, upon request, copies of records required to be kept by this permit.

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12. INSPECTION AND ENTRY (35 IAC 702.149) The Permittee shall allow an authorized representative of the Agency, upon the presentation of credentials and other documents as may be required by law, to:

- a. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- d. Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the appropriate Act, any substances or parameters at any location.

13. MONITORING AND RECORDS. (35 IAC 702.150)

- a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the waste must be the appropriate method from Appendix A of 35 IAC 721. Laboratory methods must be those specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, latest versions; Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, latest versions; or an equivalent method as specified in the approved Waste Analysis Plan.
- b. The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports and records required by this permit, and records of all data used to complete the application for this permit for a period of at least 3 years from the date of the sample, measurement, report or application. These periods may be extended by request of the Agency at any time. The Permittee shall maintain records from all groundwater monitoring wells and associated groundwater surface elevations, for the active life of the facility, and for disposal facilities for the post-closure care period as well.

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- c. **Records of monitoring information shall include:**
 - i. The date(s), exact place, and time of sampling or measurements;
 - ii. The individual(s) who performed the sampling or measurements;
 - iii. The date(s) analyses were performed;
 - iv. The individual(s) who performed the analyses;
 - v. The analytical technique(s) or method(s) used; and
 - vi. The result(s) of such analyses.
- 14. **REPORTING PLANNED CHANGES (35 IAC 703.244 and 702.152(a))** The Permittee shall give notice to the Agency as soon as possible of any planned physical alterations or additions to the permitted facility. For a new HWM facility, the permittee may not commence treatment, storage or disposal of hazardous waste; and for a facility being modified the permittee may not treat, store or dispose of hazardous waste in the modified portion of the facility, until:
 - a. The Permittee has submitted to the Agency by certified mail or hand delivery a letter signed by the Permittee and a registered professional engineer stating that the facility has been constructed or modified in compliance with the permit; and
 - b. The Agency has inspected the modified or newly constructed facility and finds it is in compliance with the condition of the permit; or if, within 15 days of the date of submission of the letter in paragraph (a), the Permittee has not received notice from the Agency of its intent to inspect, prior inspection is waived and the Permittee may commence treatment, storage or disposal of hazardous waste.
- 15. **ANTICIPATED NONCOMPLIANCE (35 IAC 702.152(b) and 703.247)** The Permittee shall give advance notice to the Agency of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. For a new facility, the Permittee shall not treat, store or dispose of hazardous waste; and for a facility being modified, the Permittee shall not treat, store or dispose of hazardous waste in the modified portion of the facility, except as provided in Section 703.280, until:

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- a. The Permittee has submitted to the Agency by certified mail or hand delivery a letter signed by the Permittee and a registered professional engineer stating that the facility has been constructed or modified in compliance with the permit; and
- b. Either:
 - (1) The Agency has inspected the modified or newly constructed facility and finds it is in compliance with the conditions of the permit; or
 - (2) Within 15 days after the date of submission of the letter in paragraph i. above, the Permittee has not received notice from the Agency of its intent to inspect, the Permittee may commence treatment, storage or disposal of hazardous waste.
- 16. **TRANSFER OF PERMITS (35 IAC 702.152(c))** This permit is not transferable to any person except after notice to the Agency. The Agency may require modification of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the appropriate Act. (See Sections 703.260 and 703.270, in some cases modification is mandatory.)
- 17. **MONITORING REPORTS (35 IAC 702.152(d))** Monitoring results shall be reported at the intervals specified in the permit.
- 18. **COMPLIANCE SCHEDULES (35 IAC 702.152(e))** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than specified in 35 IAC 702.162.
- 19. **TWENTY-FOUR HOUR REPORTING (35 IAC 702.152(f) and 703.245(b))**
 - a. The Permittee shall report to the Agency any noncompliance with the permit which may endanger health or the environment. Any such information shall be reported orally within 24 hours from the time the Permittee becomes aware of the following circumstances. This report shall include the following:
 - (1) Information concerning the release of any hazardous waste that may cause an endangerment to public drinking water supplies.

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- (2) Information concerning the release or discharge of any hazardous waste or of a fire or explosion at the HWM facility, which could threaten the environment or human health outside the facility.
 - b. The description of the occurrence and its cause shall include:
 - (1) Name, address, and telephone number of the owner or operator;
 - (2) Name, address, and telephone number of the facility;
 - (3) Date, time, and type of incident;
 - (4) Name and quantity of material(s) involved;
 - (5) The extent of injuries, if any;
 - (6) An assessment of actual or potential hazards to the environment and human health outside the facility, where applicable; and
 - (7) Estimated quantity and disposition of recovered material that resulted from the incident.
 - c. A written submission shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance including exact dates and times and if the noncompliance has not been corrected; the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The Agency may waive the five day written notice requirement in favor of a written report within fifteen days.
20. **OTHER NONCOMPLIANCE (35 IAC 702.152(g))** The Permittee shall report all instances of noncompliance not otherwise required to be reported under Standard Conditions 17, 18, and 19, at the time monitoring reports, as required by this permit, are submitted. The reports shall contain the information listed in Standard Condition 19.
21. **OTHER INFORMATION (35 IAC 702.152(h))** Where the Permittee becomes aware that it failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Agency, the Permittee shall promptly submit such facts or information.

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22. **REPORTING REQUIREMENTS (35 IAC 724.175)** The report required by 35 Ill. Adm. Code 724.175 shall be submitted in addition to those required by 35 Ill. Adm. Code 702.152 (reporting requirements).

23. **SUBMITTAL OF REPORTS OR OTHER INFORMATION** All written reports or other written information required to be submitted by the terms of this permit shall be sent to:

Illinois Environmental Protection Agency
Division of Land Pollution Control #24
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

24. **SIGNATORY REQUIREMENT (35 IAC 702.151)** All permit applications, reports or information submitted to the Agency shall be signed and certified as required by 35 IAC 702.126.

25. **CONFIDENTIAL INFORMATION** Any claim of confidentiality must be asserted in accordance with 35 IAC 702.103 and 35 IAC 161.

26. **DOCUMENTS TO BE MAINTAINED AT FACILITY SITE** The Permittee shall maintain at the facility, the following documents and amendments, revisions and modifications to these documents:

- a. The post-closure care plan as required by 35 IAC 724.212(a) and this permit.
- b. Cost estimate for facility post-closure care as required by 35 IAC 724.242(d) and this permit.
- c. Operating record as required by 35 IAC 724.173 and this permit.
- d. Inspection schedules as required by 35 IAC 724.115(b) and this permit.

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C. POST-CLOSURE

1. **CARE AND USE OF PROPERTY** The Permittee shall provide post-closure care for the facility as required by 35 IAC 724.217 and in accordance with the approved post-closure plan.
2. **AMENDMENT TO POST-CLOSURE PLAN** The Permittee must amend the post-closure plan whenever a change in the facility operation plans or facility design affects the post-closure plan or when an unexpected event has occurred which has affected the post-closure plan pursuant to 35 IAC 724.218(d).
3. **COST ESTIMATE FOR FACILITY POST-CLOSURE** The Permittee's original post-closure cost estimate, prepared in accordance with 35 IAC 724.244, must be:
 - a. Adjusted for inflation either 60 days prior to each anniversary of the date on which the first closure cost estimate was prepared or if using the financial test or corporate guarantee, within 30 days after close of the firm's fiscal year.
 - b. Revised whenever there is a change in the facility's post-closure plan increasing the cost of closure.
 - c. Kept on record at the facility and updated.
4. **FINANCIAL ASSURANCE FOR POST-CLOSURE CARE** The Permittee shall demonstrate compliance with 35 IAC 724.245 by providing documentation of financial assurance, as required by 35 IAC 724.251, in at least the amount of the cost estimates required by the previous permit condition. Changes in financial assurance mechanisms must be approved by the Agency pursuant to 35 IAC 724.245.
5. **LIABILITY REQUIREMENTS** The Permittee shall demonstrate continuous compliance with the requirements of 35 IAC 724.247 and the documentation requirements of 35 IAC 724.251.
6. **INCAPACITY OF OWNERS OR OPERATORS, GUARANTORS, OR FINANCIAL INSTITUTIONS** The Permittee shall comply with 35 IAC 724.248 whenever necessary.

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SECTION VII: SPECIAL CONDITIONS

A. HAZARDOUS WASTE MANAGEMENT ACTIVITIES

1. In addition to the terms and conditions of this permit, the requirements of 35 Ill. Admin. Code 722 must be met in regards to the management of hazardous waste generated in carrying out the requirements of this permit. The main hazardous waste generated at this facility is leachate extracted from the closed Phase A landfill.
2. Documentation of compliance with the requirements of 35 Ill. Admin. Code 722 must be maintained by the Permittee.

B. PUBLIC NOTIFICATION AND PARTICIPATION

1. A repository of all information submitted to Illinois EPA as part of the requirements of this permit must be established and maintained at the Zion-Benton Public Library. This repository must be well organized and kept up to date. A comprehensive list of all documents in the repository must be provided, as well as a brief description of each document in the repository. The Permittee must visit the repository on a regular basis to ensure its organization and integrity is maintained.
2. The public participation and public notification requirements of 35 Ill. Admin. Code 703 and 705 must be met any time requests to modify this facility are submitted to Illinois EPA for review and approval.
3. An appropriate facility mailing list as required by 35 Ill. Admin. Code 705 must be maintained and updated on a regular basis.

C. REQUIRED FORMS

1. The Permittee shall provide a completed Illinois EPA permit application form LPC-PA23 with all additional information, permit modifications, and permit applications that are submitted to the Illinois EPA Bureau of Land. A copy of this form is available on Illinois EPA's internet site.

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2. To ensure the requirements of Section 39, Paragraph (i) of the Illinois Environmental Protection are met, the Permittee is required to complete and provide the following 39i Certification forms to the Illinois EPA Bureau of Land:
 - a. A 39i certification form for legal entities must be filled out for the legal entity (i.e. company) identified as the applicant in the approved Permit Renewal Application, and
 - b. A 39i form for individuals must be filled out for the individual that signs the 39i certification form for legal entities mentioned above, and
 - c. A 39i form for individuals must be filled out for each individual who signs the permit application.
3. Copies of the 39i certification forms identified in Condition VII.C.2 above are available on Illinois EPA's internet site.
4. If the applicant desires additional staff to be able to sign future modifications, certifications, etc., then 39i certification forms for individuals must be submitted for each such individual.
5. The 39i certification forms will be treated as confidential by the Illinois EPA. The applicant may also request the information on the 39i certification form be maintained confidential in accordance with 2 Ill. Adm. Code 1828.
6. The Permittee shall submit the necessary 39i certification form(s) and supporting documentation within 30 days of any of the following events:
 - a. The owner or operator, or officer of the owner or operator, or any employee who has control over operating decisions regarding the facility has violated federal, State, or local laws, regulations, standards, or ordinances in the operation of waste management facilities or sites; or
 - b. The owner or operator, or officer of the owner or operator, or any employee who has control over operating decisions regarding the facility has been convicted in this or another State of any crime which is a felony under the laws of this State, or conviction of a felony in a federal court; or
 - c. The owner or operator, or officer of the owner or operator, or any employee who has control over operating decisions regarding the facility has

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committed an act of gross carelessness or incompetence in handling, storing, processing, transporting, or disposing of waste.

- d. A new person is associated with the owner or operator who can sign the permit application or who has control over operating decisions regarding the facility, such as a corporate officer or a delegated employee.

The 39i certification submitted in accordance with a, b, or c above must describe the violation(s), convictions, carelessness, or incompetence which necessitated the need for submitting an updated certification form. The 39i certification submitted in accordance with d above must include the date that the new person above began employment with the applicant.

- 7. The 39i certification forms and supporting documentation shall be submitted to the address specified below:

Illinois Environmental Protection Agency
Bureau of Land #33 – 39i Certification
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

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SECTION VIII: REPORTING AND NOTIFICATION REQUIREMENTS

SECTION III: POST-CLOSURE

| <u>Condition</u> | <u>Submittal</u> | <u>Due Date</u> |
|------------------|---|--|
| C.5 | Permit modification request to change any aspect of the approved post-closure care plan. | 180 days prior to date change is needed |
| E.5.b. | Notification of exceedances of specified levels detected during the required landfill gas monitoring program | Within two business days |
| E.5.d | Reports documenting action being taken to address land gas monitoring exceedences. | Weekly |
| E.5.e | Class 1* permit modification request proposing changes to the approved landfill gas management plan. | 30 days after landfill gas monitoring program exceedances observed, unless able to correct these exceedances prior to this due date. |
| H.2 | Annual Report regarding post-closure care efforts carried out each year. | March 1 of following year |
| J.5 | Submit notification that post-closure contact person has changed. | Within 5 days after change is made. |
| K.1 | Submit documentation that survey plat and restrictive notice have been properly distributed/recorded. | Within 60 days of the effective date of this permit. |
| K.2 | Submit application for permit modification, if the Permittee wishes to remove any materials from the closed landfill. | At least 180 days prior to the date that wish to remove the materials. |

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| <u>Condition</u> | <u>Submittal</u> | <u>Due Date</u> |
|------------------|---|--|
| K.3 | Submit certification for completion of post-closure care. | Within 60 days after post-closure care has been completed. |

SECTION IV: GROUNDWATER DETECTION MONITORING PROGRAM

| <u>Condition</u> | <u>Submittal</u> | <u>Due Date</u> | | | | | | | | | | |
|-------------------|--|--|-------------------|---------|------------------|--------|----------------|---------------|------------|---------|------------------|------------|
| J.2 | Groundwater monitoring data and statistical calculations required semi-annually. | <table><tr><th>Samples Collected</th><th>Results</th></tr><tr><td>During Preceding</td><td>Due to</td></tr><tr><td><u>Mos. of</u></td><td><u>EPA by</u></td></tr><tr><td>April-June</td><td>July 15</td></tr><tr><td>October-December</td><td>January 15</td></tr></table> | Samples Collected | Results | During Preceding | Due to | <u>Mos. of</u> | <u>EPA by</u> | April-June | July 15 | October-December | January 15 |
| Samples Collected | Results | | | | | | | | | | | |
| During Preceding | Due to | | | | | | | | | | | |
| <u>Mos. of</u> | <u>EPA by</u> | | | | | | | | | | | |
| April-June | July 15 | | | | | | | | | | | |
| October-December | January 15 | | | | | | | | | | | |
| J.3 | Groundwater Surface Elevation. | Semi-annually | | | | | | | | | | |
| J.4 | Groundwater flow rate and direction. | Annually with the groundwater data due July 15 | | | | | | | | | | |
| J.5 | Surveyed Elevation. | Every 5 years <u>or</u> at the request of Illinois EPA <u>or</u> whenever the elevation changes. In addition, for new wells, at the time of installation. | | | | | | | | | | |
| J.6 | Elevation of the bottom of each well. | Every 5 years due July 15. | | | | | | | | | | |
| J.10.a | Notify the Illinois EPA in writing of statistically significant increase. | Within 7 days the increase was discovered. | | | | | | | | | | |
| J.10.b | Sample groundwater in all wells for Appendix I constituents. | Immediately after increase is discovered. | | | | | | | | | | |
| J.10.d | Apply for permit modification establishing compliance monitoring program. | Within 90 days the increase was discovered. | | | | | | | | | | |

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| <u>Condition</u> | <u>Submittal</u> | <u>Due Date</u> |
|------------------|---|--|
| J.10.e | Provide the Illinois EPA with corrective action feasibility plan. | Within 180 days the increase was discovered. |
| J.11.a | Notify the Illinois EPA in writing of intent to make demonstration. | Within 7 days the increase was discovered. |
| J.11.b | Submit a report to the Illinois EPA which demonstrates that a source other than a regulated unit caused the increase, or resulted from error. | Within 90 days the increase was discovered. |
| J.11.c | Submit to the Illinois EPA application to change detection monitoring program. | Within 90 days the increase was discovered. |

SECTION IV-A: SHALLOW ZONE OBSERVATION MONITORING PROGRAM

| <u>Condition</u> | <u>Submittal</u> | <u>Due Date</u> | | | | | | |
|--|--|---|--|-----------------------|-----------|---------|------------------|------------|
| I.2 | Groundwater monitoring data and statistical calculations required semi-annually. | <table><tr><th>Samples Collected During Preceding Mos. of</th><th>Results Due to EPA by</th></tr><tr><td>April-May</td><td>July 15</td></tr><tr><td>October-December</td><td>January 15</td></tr></table> | Samples Collected During Preceding Mos. of | Results Due to EPA by | April-May | July 15 | October-December | January 15 |
| Samples Collected During Preceding Mos. of | Results Due to EPA by | | | | | | | |
| April-May | July 15 | | | | | | | |
| October-December | January 15 | | | | | | | |
| I.3 | Groundwater Surface Elevation. | Semi-annually | | | | | | |
| I.4 | Surveyed Elevation. | Every 5 years <u>or</u> at the request of Illinois EPA <u>or</u> whenever the elevation changes. In addition, for new wells, at the time of installation. | | | | | | |
| I.5 | Elevation of the bottom of each well. | Every 5 years due July 15. | | | | | | |
| I.9.a | Notify the Illinois EPA in writing of significant increase. | Within 7 days the increase was discovered. | | | | | | |

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| <u>Condition</u> | <u>Submittal</u> | <u>Due Date</u> |
|------------------|---|--|
| I.9.b | Sample Groundwater in all wells for Appendix I. | Immediately after increase discovered. |
| I.9.d | Apply for a permit modification establishing a compliance monitoring program. | Within 90 days the increase was discovered. |
| I.9.e | Provide the Illinois EPA with a corrective action feasibility plan. | Within 180 days the increase was discovered. |
| I.10.a | Notify the Illinois EPA in writing of intent to make demonstration. | Within 7 days the increase was discovered. |
| I.10.b | Submit a report to the Illinois EPA which demonstrates that a source other than a regulated unit caused the increase, or resulted from error. | Within 90 days the increase was discovered. |
| I.10.c | Submit to the Illinois EPA application to change shallow zone observation monitoring program. | Within 90 days the increase was discovered. |

SECTION V: CORRECTIVE ACTION

| <u>Condition</u> | <u>Submittal</u> | <u>Due Date</u> |
|------------------|---|------------------------------|
| B.1 | Notification of Newly Identified SWMUs. | Within 30 days of discovery. |
| C | Notification of release from existing SWMU. | Within 60 days of discovery |
| E.3 | Updating financial assurance for corrective action. | As necessary. |

SECTION VI: STANDARD CONDITIONS

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| <u>Condition</u> | <u>Submittal</u> | <u>Due Date</u> |
|------------------|--|---|
| B.6 | Complete application for new permit. | At least 180 days prior to permit expiration. |
| B.11 | Information requested by Agency and copies of records required to be kept by the Agency. | Submittal date to be determined by this permit. |
| B.14 | Notify Agency of planned physical alterations or additions. | At least 15 days prior to planned change. |
| B.15 | Notify Agency of changes which may result in permit noncompliance. | Within 15 days of change. |
| B.16 | Application for permit modification indicating permit is to be transferred. | At least 90 days prior to transfer date. |
| B.18 | Submission of any information required in a compliance schedule. | Within 14 days after each schedule date. |
| B.19. | Report to Agency any non-compliance which may endanger health or environment. | |
| | by telephone | Within 24 hours after discovery, and |
| | in writing | 5 days after discovery. |
| B.20 | Report of all other instances of non-compliance. | March 1 of each year along with Annual Report. |
| B.22 | Annual Report | March 1 of each year (for previous calendar year) |
| C.2 | Application for permit modification | Within 90 days of |

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| <u>Condition</u> | <u>Submittal</u> | <u>Due Date</u> |
|------------------|---|---|
| | amending post closure plan. | discovery of need for modification. |
| C.3.a. | Adjust post closure cost estimate for inflation. | Within 30 days after anniversary date. |
| C.3.b | Revision of post closure cost estimate. | As needed, within 90 days of discovery of revision. |
| C.4 | Change in financial assurance mechanism for post closure care. | As needed. |
| C.5 | Change in coverage for sudden and non-sudden accidental occurrences. | As needed. |
| C.6 | Notify Agency of commencement of voluntary or involuntary bankruptcy proceedings. | Within 10 days after commencement of proceeding. |

SECTION VII: SPECIAL CONDITIONS

| <u>Condition</u> | <u>Submittal</u> | <u>Due Date</u> |
|------------------|--|--|
| C.6 | Submittal of updated 39(i) Certification Forms | Within thirty days after an event occurs which impacts the 39(i) certifications for the facility on file with Illinois EPA |

**HAZARDOUS WASTE MANAGEMENT
RCRA POST-CLOSURE PERMIT**

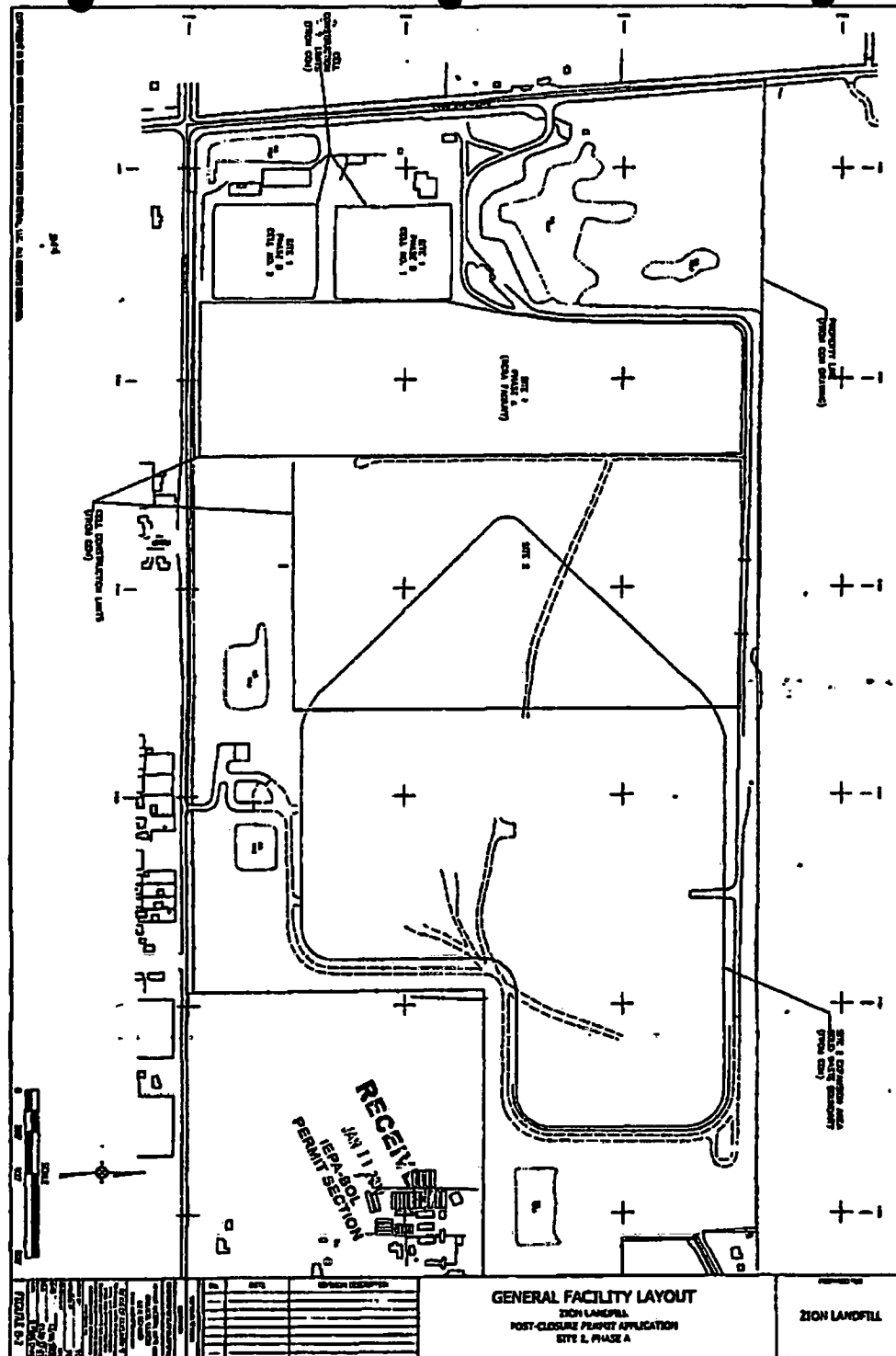
Log No. B-23R-M-5

Zion Site 1 Landfill

LPC No. 0978020001

USEPA ID No. ILD980700728

Attachment A: Site Layout Map



**HAZARDOUS WASTE MANAGEMENT
RCRA POST-CLOSURE PERMIT**

Log No. B-23R-M-5

Zion Site 1 Landfill

LPC No. 0978020001

USEPA ID No. ILD980700728

Attachment B: Groundwater Monitoring Attachments

Monitoring Well Diagram (1 page)

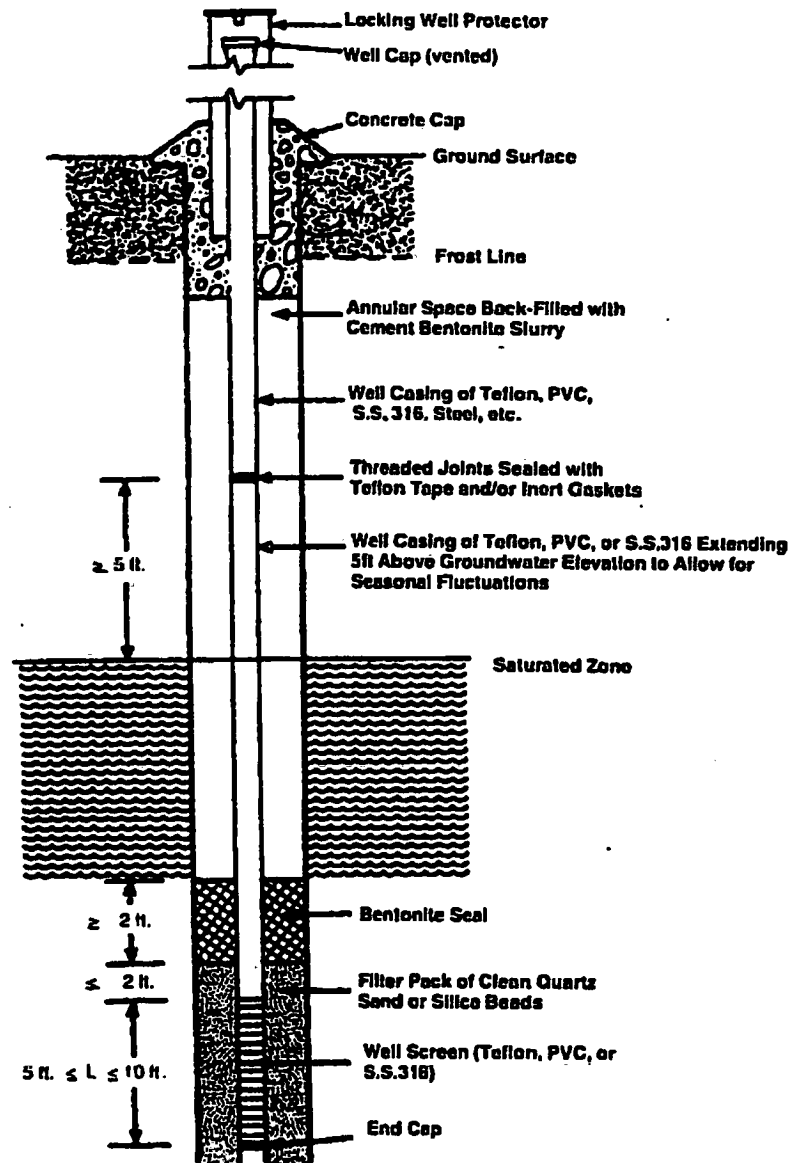
Field Boring Log (1 page)

RCRA Facility Groundwater, Leachate and Gas Reporting Form (1 page)

Formatting Requirements for Electronically Submitted Groundwater and Leachate Data (3 pages)

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Attachment B
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Monitoring Well Diagram





County _____

During No. _____ Monitoring Well No. _____

Surface Elevation: _____ **Completion Depth:** _____

Auger Depth: _____ Rotary Depth: _____

Date: Start: _____ Finish: _____

Drilling Equipment

Field Doring Log (revised 02/02/04)

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Illinois
 Environmental
 Protection Agency

Bureau of Land
 1021 North Grand Avenue East
 Box 19276
 Springfield, IL 62794-9276

RCRA FACILITY GROUNDWATER, LEACHATE AND GAS REPORTING FORM

This form must be used as a cover sheet for the notices and reports, identified below as required by: (1) a facility's RCRA interim status closure plan; (2) the RCRA interim status regulations; or (3) a facility's RCRA permit. All reports must be submitted to the Illinois EPA's Bureau of Land Permit Section. This form is for use by Hazardous Waste facilities only. Reporting for Solid Waste facilities should be submitted on a separate form. All reports submitted to the Illinois EPA's Bureau of Land Permit Section must contain an original, plus a minimum of two copies.

Note: This form is not to be used with permit or closure plan modification requests. The facility's approved permit or closure plan will state whether the document you are submitting is required as a report or a modification request.

Facility Name: _____ Site ID #: _____
 Facility Address: _____ Fed ID #: _____

Check the appropriate heading. Only one heading may be checked for each corresponding submittal. Check the appropriate sub-heading, where applicable. Attach the original and all copies behind this form.

- ☐ **LPC-160 Forms**
- | | |
|---|--|
| <input type="checkbox"/> Groundwater <input type="checkbox"/> Quarterly – Indicate one: 1 2 3 4 <input type="checkbox"/> Semi-Annual <input type="checkbox"/> Annual <input type="checkbox"/> Biennial | <input type="checkbox"/> Leachate <input type="checkbox"/> Quarterly – Indicate one: 1 2 3 4 <input type="checkbox"/> Semi-Annual <input type="checkbox"/> Annual <input type="checkbox"/> Biennial |
|---|--|
- ☐ **Groundwater Data (without LPC-160 Forms)**
☐ Quarterly – Indicate one: 1 2 3 4
☐ Annual ☐ Semi-Annual ☐ Biennial
- ☐ **Well Construction Information**
☐ Well Construction Forms, Boring Logs and/or Abandonment Forms
☐ Well Survey Data (e.g., Stick-up Elevation Data)
- ☐ **Notice of Statistically Significant Evidence of Groundwater Contamination**
 (35 Ill. Adm. Code 724.198)
- ☐ **Notice of Exceedence of Groundwater Concentration Limit** (35 Ill. Adm. Code 724.199(h))
- ☐ **Notice of Alternate Source or Error in Sampling Analysis or Evaluation of Groundwater**
 (35 Ill. Adm. Code 724.199(l))
- ☐ **Gas Monitoring Reports**
- ☐ **Other (identify)** _____

**Formatting Requirements for the 01 Record of the Electronically Submitted
 Groundwater and Leachate Data (the 01 Record portion of the LPC-160 is included
 for example purposes)**

**ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
 DIVISION OF LAND POLLUTION CONTROL
 CHEMICAL ANALYSIS FORM**

Page 1 of _____

| | | | | | | | | |
|--------------------------------|---|---|---|---|---|---|---------------|--|
| RECORD CODE | | | | | | | TRANS CODE | |
| L | P | C | S | M | 0 | 1 | A | |
| | | | | | | | | |
| REPORT DUE DATE ____/____/____ | | | | | | | | |
| 36 M D Y 41 | | | | | | | | |

FEDERAL ID NUMBER _____

SITE INVENTORY NUMBER _____
9 18MONITOR POINT NUMBER _____
(see Instructions) 19 22

REGION _____ CO. _____

DATE COLLECTED ____/____/____
23 M D Y 28

FACILITY NAME _____

FOR IEPA USE ONLYLAB _____
29DATE RECEIVED ____/____/____
41 M D Y 47BACKGROUND SAMPLE (X) _____ TIME COLLECTED ____:____:____
54 (24 Hr. Clock) 55 11 M 58UNABLE TO COLLECT SAMPLE _____
(see Instructions) 59MONITOR POINT SAMPLED BY _____
(see Instructions) 60 OTHER (SPECIFY) _____SAMPLE FIELD FILTERED — INORGANICS (X) _____ ORGANICS (X) _____
61 62**SAMPLE APPEARANCE**_____
63 102**COLLECTOR COMMENTS**_____
103 142**LAB COMMENTS**_____
150 199

IL 532 1213
 LPC 160 01/90

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 ½, Section 1004 and 1021. Disclosure of this information is required. Failure to do so may result in a civil penalty up to \$25,000 for each day the failure continues a fine up to \$1,000.00 and imprisonment up to one year. This form has been approved by the Forms Management Center.

All analytical procedures must be performed in accordance with the methods contained in "Test Methods for Evaluating Solid Wastes. Physical/Chemical Methods." SW-846, 3rd Edition, September 1986 or equivalent methods approved by the Agency. Proper sample chain of custody control and quality assurance/quality control procedures must be maintained in accordance with the facility sampling and analysis plan.

*Only Keypunch with Data in Column 35 or Columns 38-47

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KEY:

| | <u>Description</u> | <u>Format</u> |
|----------------|-----------------------------|---------------|
| Spaces 1-7 | Record Code | LPCSM01 |
| Space 8 | Trans Code | A |
| Spaces 9-18 | Site ID | 0000000000 |
| Spaces 19-22 | Mon Pt ID | G000 |
| Spaces 23-28 | Date Collected | 000000 |
| Space 29 | Lab | |
| Spaces 30-35 | Filler | |
| Spaces 36-41 | Report Due Date | 000000 |
| Spaces 42-47 | Date Received | 000000 |
| Spaces 48-53 | Filler 2 | |
| Space 54 | Background Sample | |
| Spaces 55-58 | Time Collected | 0000 |
| Space 59 | Unable to Collect Sample | |
| Space 60 | Monitoring Point Sampled By | |
| Space 61 | Field Filtered – Inorganic | |
| Space 62 | Field Filtered – Organic | |
| Spaces 63-102 | Sample Appearance | |
| Spaces 103-142 | Collector Comments | |
| Spaces 143-149 | Filler 3 | |
| Spaces 150-199 | Lab Comments | |

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**Formatting Requirements for the 02 Record of the Electronically Submitted
 Groundwater and Leachate Data (the 02 Record portion of the LPC-160 is included
 for example purposes)**

| RECORD CODE | | | | | | | TRANS CODE | | (COLUMNS 9-29 FROM ABOVE) | |
|---------------------------|---|------------------|---------------------|-----------|--------|-------|------------|--|---------------------------|--|
| L P C B M O 2 | | | | | | | A | | | |
| | FIELD MEASUREMENTS CONSTITUENT DESCRIPTION AND REQUIRED UNIT OF MEASURE | STORET NUMBER | Remarks See last | Replicate | < or > | VALUE | | | | |
| Q | TEMP OF WATER (unfiltered °F) | 0 0 0 1 1 | | | | | | | | |
| Q | SPEC COND (unfiltered umhos) | 0 0 0 9 4 | | | | | | | | |
| Q | pH (unfiltered units) | 0 0 4 0 0 | | | | | | | | |
| Q | ELEV OF GW SURF (ft ref MSL) | 7 1 9 9 3 | | | | | | | | |
| Q | DEPTH OF WATER (ft below LS) | 7 2 0 1 9 | | | | | | | | |
| A | BTM WELL ELEV (ft ref MSL) | 7 2 0 2 0 | | | | | | | | |
| Q | DEPTH TO WATER FR MEA PT (ft) | 7 2 1 0 9 | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

IL 532 1213
 LPC 160 01.90

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 ½, Section 1004 and 1021. Disclosure of this information is required. Failure to do so may result in a civil penalty up to \$25,000 for each day the failure continues a fine up to \$1,000.00 and imprisonment up to one year. This form has been approved by the Forms Management Center.

All analytical procedures must be performed in accordance with the methods contained in "Test Methods for Evaluating Solid Wastes. Physical/Chemical Methods," SW-846, 3rd Edition, September 1986 or equivalent methods approved by the Agency. Proper sample chain of custody control and quality assurance/quality control procedures must be maintained in accordance with the facility sampling and analysis plan.

*Only Key punch with Data in Column 35 or Columns 36-47

KEY:

Spaces Numbered

Spaces 1-7
 Space 8
 Spaces 9-18
 Spaces 19-22
 Spaces 23-28
 Space 29
 Spaces 30-34
 Space 35
 Space 36
 Space 37
 Space 38-47

Description

Record Code
 Trans Code
 Site ID
 Mon Pt ID
 Date Collected
 Lab
 STORET Number
 Remarks
 Replicate
 < or >
 Value

Format

LPCSM02
 A
 0000000000

Appendix B-2

Legal Description/Plat of Survey

RO

GREEN

BAY

LEACHATE STORAGE TANK AREA

SITE ONE - PHASE B

15.307 Ac.

SITE ONE - PHASE A

43.699 Ac.

NINTH

STREET

EXCEPTIL

Exception

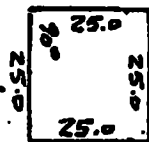
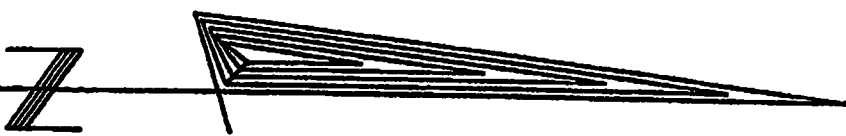
REVIEWER: MED

JUN 27 2025

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

R 000823

1" = 200'



See Detail

949.48

East Line of Section 12

949.48

1286.61

518.0

518.0

1287.89

132

N. 83° 30' 14" W. 748.73

N. 0° 09' 13" W.

2609.82

N. R.O.W. Line

S. line of N.W. 1/4 1305.23

1310.45

77

SITE ONE - PHASE A

The Northwest Quarter of Section 7, Township 46 North, Range 12 East of the Third Principal Meridian, except that part thereof lying East of a line drawn from a point on the North line of said Section 7, said point being 1300.5 feet West from the Northeast corner of said Northwest Quarter to a point in the South line of said Section 7, said point being 1310.45 feet West of the Southeast corner of the West half of Section 7, and also except the North 1320 feet of the West 528 feet thereof, and also except the West 518 feet of that part of said Northwest Quarter lying South of the North 1320 feet thereof, all in Lake County, Illinois.

SITE ONE - PHASE B

The West 518.0 feet (except the North 1320 feet thereof) of the Northwest Quarter of Section 7, Township 46 North, Range 12 East of the Third Principal Meridian, in Lake County, Illinois.

LEACHATE STORAGE TANK AREA

That part of the Northeast Quarter of Section 12, Township 46 North, Range 11 East of the Third Principal Meridian, described as follows: Beginning at the Southeast corner of said Northeast Quarter of Section 12; thence North along the East line of said Northeast Quarter of Section 12, 949.48 feet; thence West at right angles to the last described line, 17.87 feet, to the point of beginning of the parcel herein described; thence South parallel to the East line of of said Northeast Quarter of Section 12, 25.0 feet; thence West at right angles to the last described line, 25 feet; thence North parallel to aforesaid East line, 25.0 feet; thence East at right angles to the last described line, 25.0 feet to the point of beginning, all in Lake County, Illinois.

STATE OF ILLINOIS)

S.S.

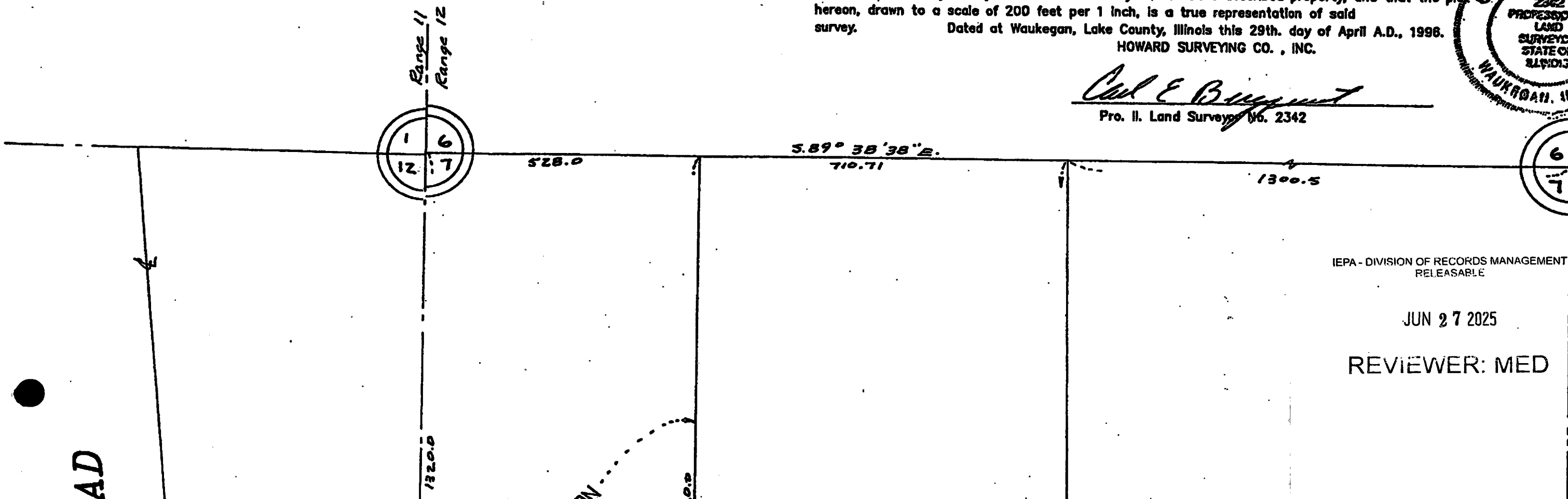
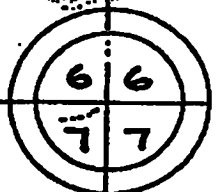
COUNTY OF LAKE)

In behalf of Howard Surveying Co., Inc., we as Professional Illinois Land Surveyors do hereby certify that we have surveyed the above described property, and that the plat hereon, drawn to a scale of 200 feet per 1 inch, is a true representation of said survey.

Dated at Waukegan, Lake County, Illinois this 29th. day of April A.D., 1996.

HOWARD SURVEYING CO., INC.

Carl E. Bergquist
Pro. Il. Land Surveyor No. 2342



IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUN 27 2025

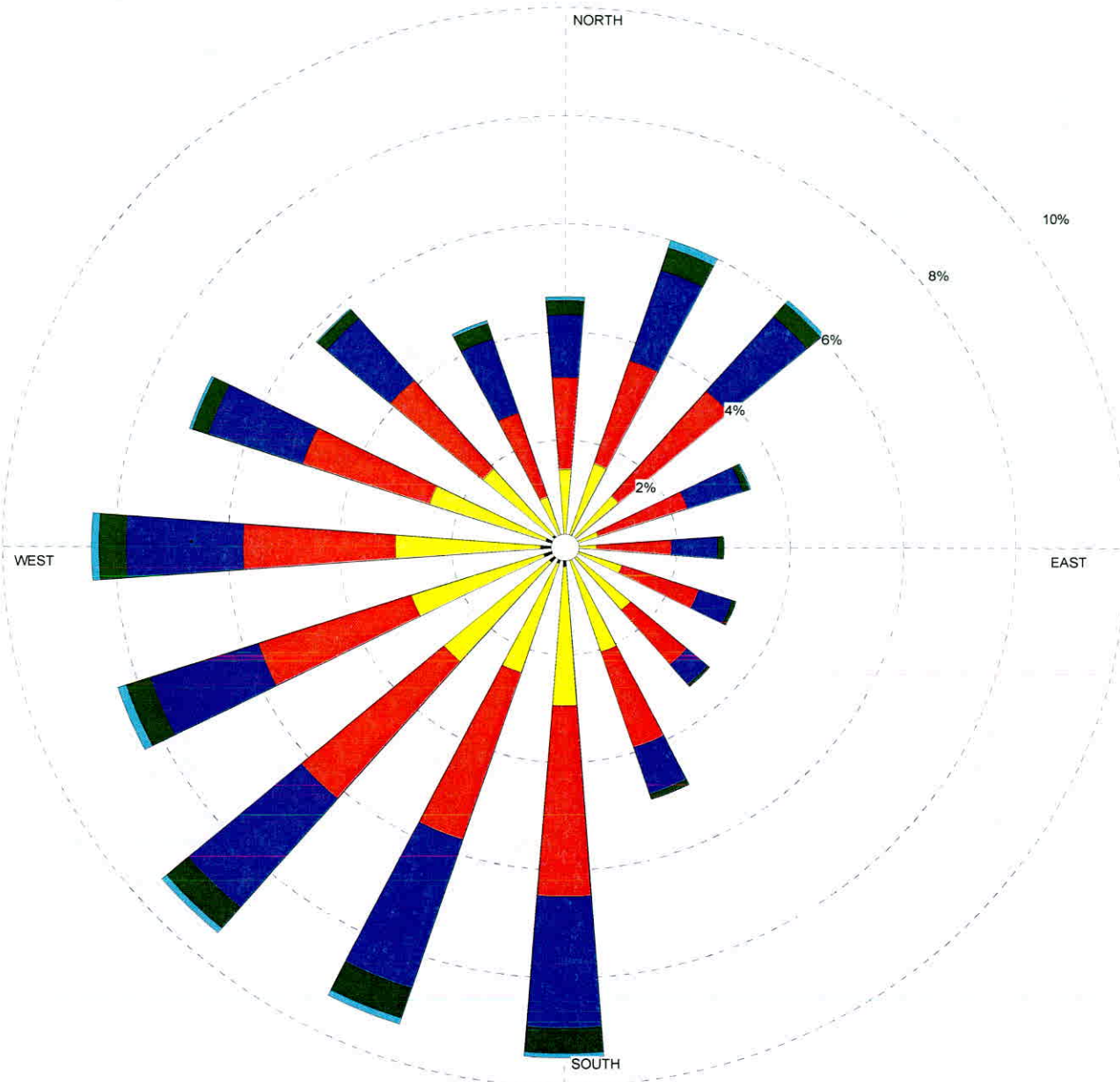
REVIEWER: MED

Appendix B-3

Wind Rose

WIND ROSE PLOT

Station #94846 - CHICAGO/O'HARE INT'L ARPT, IL



Wind Speed (Knots)



MODELER

DISPLAY

Wind Speed

AVG. WIND SPEED

9.25 Knots

ORIENTATION

**Direction
(blowing from)**

DATE

10/7/2004

UNIT

Knots

CALM WINDS

3.10%

PLOT YEAR-DATE-TIME

**Jan 1 - Dec 31
Midnight - 11 PM**

COMPANY NAME

Illinois State Climatologist Office

COMMENTS

1961-1990 Annual Average

PROJECT/PLOT NO.

Appendix B-4
Floodplain Documentation



Federal Emergency Management Agency

R 000828

Washington, D.C. 20472

APR 24 1996

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Chuck Paxton
Mayor of the City of Zion
2828 Sheridan Road
Zion, Illinois 60099

IN REPLY REFER TO:

Case Number: 95-05-331P

Community Name: City of Zion,
Lake County, Illinois

Community Number: 170399

Map Panel Number: 170357 0035

(Unincorporated Areas of
Lake County)

Effective Date of
this Revision:

APR 24 1996

102-D

Dear Mayor Paxton:

The Flood Insurance Rate Map (FIRM) for the unincorporated areas of Lake County has been revised by this Letter of Map Revision (LOMR) to reflect fill placement for the expansion of the Zion Sanitary Landfill affecting two unnamed Zone A flood hazard areas. The subject areas are located approximately 1,600 feet and 2,200 feet north of 9th Street. This revision was initiated by Mr. Robert F. Pfister of Browning Ferris Industries (BFI) in a letter dated August 30, 1995. The subject area is shown on the unincorporated areas of Lake County FIRM number 170357, panel 0035 B, dated November 3, 1982; however, the City of Zion has annexed this area.

We received the following technical data, prepared by BFI, in support of this request:

- a certified topographic map, dated November 1994, entitled Existing Site Topography, Figure 1, at a scale of 1"= 200', with a contour interval of 2 feet, delineating the two unnamed Zone A flood hazard areas;

- an undated, certified topographic work map entitled Figure 2, at a scale of 1"= 200', with a contour interval of 2 feet, delineating the proposed expansion of the Zion Sanitary Landfill;

- an attachment to Revision Requestor and Community Official Form (MT-2 Form 1) describing the content of the enclosed topographic maps, and stating that the proposed landfill expansion provides stormwater detention for the 100-yr flood, as required by City and County Ordinances; and

- completed application/certification forms, including community concurrence with the request.

We received all data necessary to process this request by February 20, 1996.

A4-1

Based on our review of the submitted data, we are issuing this LOMR to reflect the removal of two unnamed Zone A flood hazard areas, approximately 1,600 feet and 2,200 feet north of 9th Street, that have been filled for the expansion of the Zion Sanitary Landfill. This LOMR revises FIRM number 170357, panel 0035 B, dated November 3, 1982. The revision is shown on the enclosed annotated portions of FIRM panel 0035 B. The submitted information indicated that this area has been annexed by the City of Zion. We have not reflected these corporate limits changes in this LOMR.

This revision is effective as of the date of this letter. Any requests to review or alter this determination should be made within 30 days, and must be based on scientific or technical data.

Your community must approve all proposed floodplain development and ensure that permits required by Federal and/or State law have been obtained. State or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If the State of Illinois or the City of Zion has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum National Flood Insurance Program (NFIP) requirements.

We will not republish the FIRM for the unincorporated areas of Lake County to reflect this determination. We have issued a preliminary countywide format Flood Insurance Study (FIS) report and FIRM for Lake County and incorporated areas dated September 26, 1994. We are currently resolving the appeals and protests that were received regarding the preliminary FIRM. We will issue a revised preliminary FIRM for the panels affected by the appeals and protests in the near future. This LOMR, which affects preliminary FIRM number 17097C0057 F and 17097C0076 F, will be incorporated into the final publication.

Neither will we print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders. The community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR so that interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from it. For instance, prepare a news release for publication in your community's newspaper, describing the revision and how your community will provide the data and help interpret the NFIP maps.

This request has met our criteria for removing an area from a special flood hazard area, which is an area that would be inundated by a 1% annual chance flood, to reflect the placement of fill. However, we encourage you to require that the lowest adjacent grade and lowest floor (including basement) of any structure placed within the subject area be elevated to a level at or above the base (1% annual chance) flood elevation.

Use the map panel listed above and revised by this letter for all flood insurance policies and renewals issued in your community.

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65.

A4-2

3

Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS and FIRM, and modifications made by this LOMR, are the minimum requirements and do not supersede more stringent State or local requirements to which the regulations apply.

If you have any questions, please do not hesitate to contact the Director, Mitigation Division of the Federal Emergency Management Agency in Chicago, Illinois, at (312) 408-5548, or Philip Myers of our Headquarters staff in Washington, D.C., at (202) 646-2755, or by facsimile at (202) 646-4596.

Sincerely,



for Michael K. Buckley, P.E., Chief
Hazard Identification Branch
Mitigation Directorate

Enclosures

cc: Mr. Robert F. Pfister
State Coordinator

A4-3

PR0008361

708 894 9089

SFI-E&E HAULING

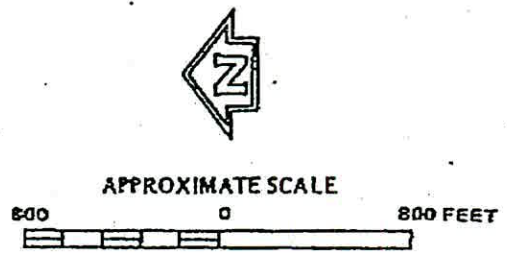
MAY. 02 '96 (THU) 09:11

A4-4

WISCONSIN
ILLINOIS

KENOSHA COUNTY
LAKE COUNTY

R 12 E
R 11 E



6

ZONE C

ZONE A

REVISED AREA

ZONE C

7

9TH STREET

City of Zion
AREA NOT INCLUDED

REVISED TO
REFLECT LOMR
DATED APR 24 1996

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

COUNTY OF
LAKE,
ILLINOIS
(UNINCORPORATED AREA)

PANEL 35 OF 155
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
171357 0835 B

EFFECTIVE DATE:
NOVEMBER 3, 1982



Federal Emergency Management Agency

LIST OF CURRENT FLOOD INSURANCE STUDY DATA

This list is provided to document all information currently effective for your community for insurance and floodplain management.

Date: April 24, 1996
Community: City of Zion, Lake County, Illinois
Community Number: 170399
Page Number: 1 of 1
CURRENT EFFECTIVE FLOOD INSURANCE STUDY DATE: January 16, 1981

FLOOD INSURANCE RATE MAP

Index Date: January 16, 1981

Panel Numbers
170399 0002 B, 0003 B, 0004 B, and
0005 B

Effective Date
January 16, 1981

FLOOD BOUNDARY AND FLOODWAY MAP

Index Date: January 16, 1981

Panel Numbers
170399 0002 B

Effective Date
January 16, 1981

LETTERS OF MAP REVISION

Panel Numbers
170357 0035 B

Effective Date
April 24, 1996

LETTERS OF MAP AMENDMENT AND MAP REVISION BASED ON FILL

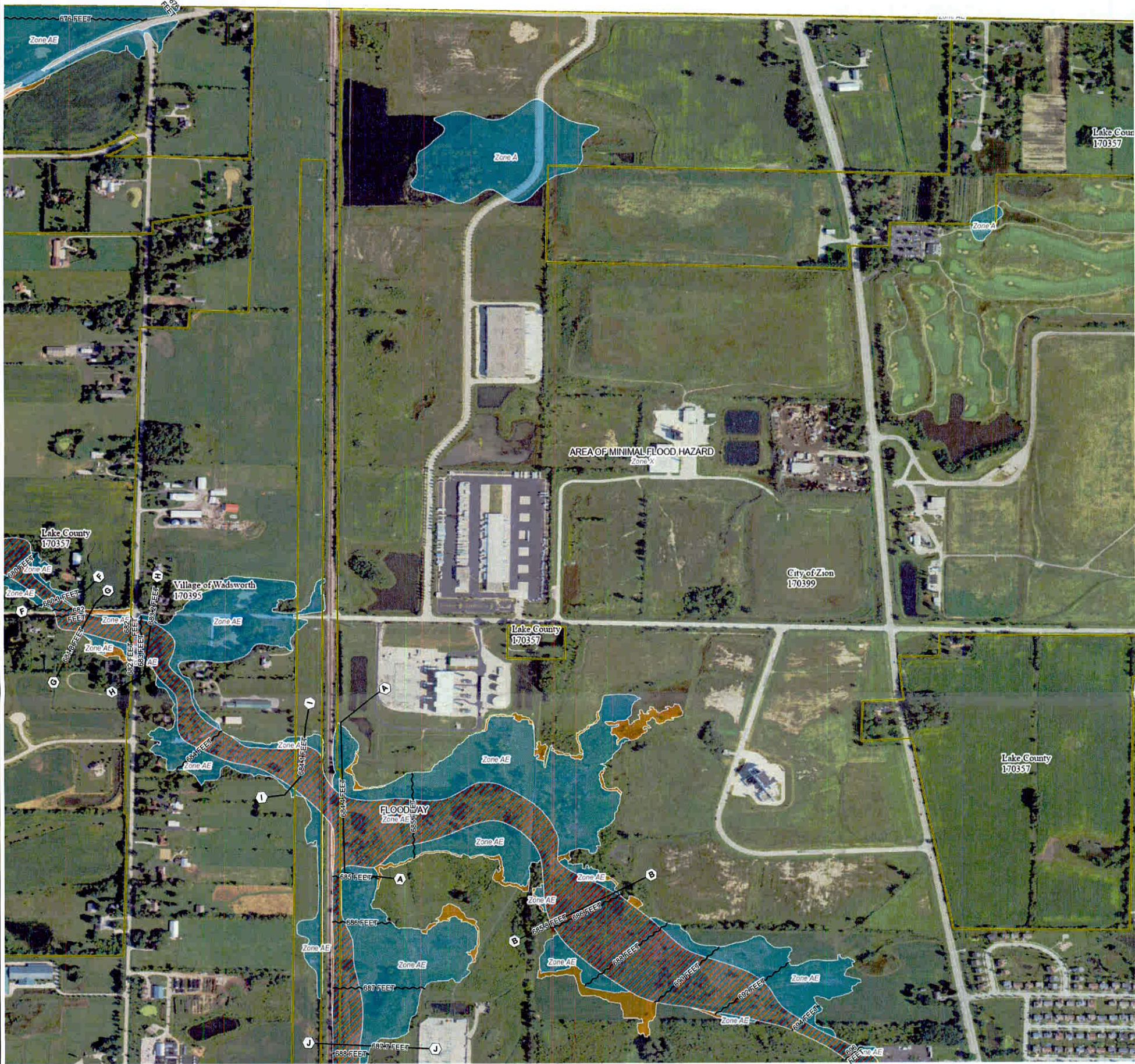
Panel Numbers
170399 0004 B

Effective Date
February 25, 1983

BEST AVAILABLE DATA LETTERS

None

A4-5



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP
FOR DRAFT FIRM PANEL LAYOUT



NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information Exchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

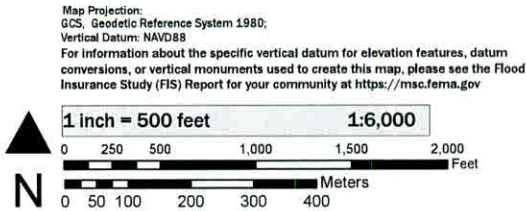
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 2/1/2021 6:00 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/118418>.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE



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JUN 27 2025

REVIEWER: MED

FEMA
National Flood Insurance Program

NATIONAL
FLOOD INSURANCE
LAKE COUNTY
AND INCORPORATED
PANEL 57

Panel Cont
COMMUNITY
VILLAGE OF WADSWORTH
LAKE COUNTY
VILLAGE OF WADSWORTH
LAKE COUNTY
VILLAGE OF WADSWORTH
LAKE COUNTY



87°50'37.08"W 42°27'49.33"N

ADDITIONAL INFORMATION
SYMBOLS AND INDEX MAP
SYMBOLS

Base Flood Elevation (BFE)
1A, V, AS9
BFE or Depth Zone AE, AO, AH, VE, AR
Atmospheric Floodway

Annual Chance Flood Hazard, Areas
annual chance flood with average
less than one foot or with drainage
of less than one square mile Zone X

Conditions 1% Annual
Flood Hazard Zone X
with Reduced Flood Risk due to Levee
Flood Hazard Zone X

with Flood Risk due to Levee Zone D

Minimal Flood Hazard Zone X

LOMRs

Undetermined Flood Hazard Zone D

Culvert, or Storm Sewer

Dike, or Floodwall

Locations with 1% Annual Chance
Surface Elevation

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information Exchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-438-6920.

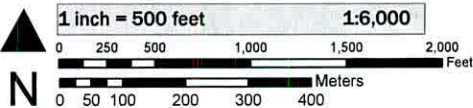
Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthorectified, Last refreshed October, 2020.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 2/1/2021 4:02 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/118416>

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

Map Projection:
NAD83, Geodetic Reference System 1980;
Vertical Datum: NAVD83
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at <https://msc.fema.gov>



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JUN 27 2025

REVIEWER: MED



NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

LAKE COUNTY, ILLINOIS
AND INCORPORATED AREAS
PANEL 76 OF 295

Panel Contains:

| COMMUNITY | NUMBER | PANEL |
|----------------------------|--------|-------|
| LAKE COUNTY | 170357 | 0076 |
| CITY OF ZION | 170399 | 0076 |
| VILLAGE OF WINTHROP HARBOR | 170398 | 0076 |

R 000834

Appendix C-1

Summary of Hydrogeologic Studies and Drilling History

District. Several small commercial properties are also situated northward along Green Bay Road. Although land use is varied, landfilling is predominant in the immediate vicinity of the proposed expansion property.

REGIONAL GEOLOGY

The landscape of northeastern Lake County is underlain by approximately 200 feet of Pleistocene glacial drift overlying Paleozoic bedrock. Surficial glacial tills in Lake County consist almost entirely of the Wadsworth Till Member of the Wisconsin Wedron Formation, which was the last and youngest till member to be deposited by Woodfordian Substage glaciers as they withdrew from Illinois. The Wadsworth Till Member was deposited by the Joliet Sublobe of the Lake Michigan Lobe (Willman and Frye, 1970).

Glacial till consists primarily of ground up rock debris which is eroded by, and incorporated into, the advancing glacier. As the glacier melts, an unsorted mixture of clay, silt, sand, gravel, and cobbles is deposited. Clay content depends upon the original material eroded and the distance the glacier has travelled. The Lake Michigan Lobe eroded and incorporated clay-rich shales from the Lake Michigan Basin. Clay content of the Wadsworth Till, generally as much as 40 to 50 percent, forms the groundmass, or matrix, for coarser particles. Compaction by the weight of the glacier makes the till a very tight material.

Glacial till is deposited in various modes near the active melting front of the glacier (Boulton, 1972). Material transported in the top of the glacier is deposited as supraglacial or ablation till. This often looser, sandier, and sometimes stratified deposit, if present, is generally found in the weathered zone of the glacial

till. Subglacial till melts out and is carried along at the base of the glacier. Such deposits are usually thin and sheared, and are often eroded shortly after deposition as the glacier advances; however, thicker deposits of similarly sheared or otherwise deformed glacial deposits have been recorded (Boulton, 1987). Englacial or melt-out till normally forms the bulk of the till deposit and is slowly deposited as the glacier melts. The glacier is always melting at its front in temperate zones, while being formed in arctic source zones. When rate of melting equals rate of glacial advance, the glacial front remains stationary and deposits considerable material in ridges called terminal or end moraines. When melting rate exceeds rate of advance, the glacier front retreats and the melt-out till forms a ground moraine behind the terminal moraine.

In Lake County, several pulses of the glacier, depositing Wadsworth Till, left in succession the Valparaiso, Tinley, Park Ridge, Deerfield, Blodgett, Highland Park, and Zion City Moraines, along with associated interglacial deposits.

Interglacial deposits typically consist of surficial deposits originating from a melting glacier. Complex depositional and erosional environments exist at the front of a glacier which may include braided streams and very small to very large glacial lakes. These active, fluctuating lacustrine and fluvial environments yield somewhat random deposits over a continually changing surface. Deposits within lacustrine environments are formed by seasonal fluctuations of fine sands and silts during times of high melt, and clays during times of low melt. In fluvial environments, braided streams deposit thin layers of sand in continually changing beds, in bar formations, and in lake deltas. Upon glacial readvance, these materials may be eroded, sheared, and covered by an additional layer of till. Where coarser sediments are thick and

continuous, such as might occur where a mature fluvial and/or lacustrine environment has had time to develop, they form productive drift aquifers. Where thin and discontinuous deposits are present, they may form random lenses and layers within the till throughout general zones. Portions of such deposits may be incorporated into the glacier, becoming isolated lenses surrounded by till. Such lenses may also form within the ice itself. The present day surface reflects remnants of a similar environment. Lake Michigan represents a late phase of a once much larger glacial lake. Figure 2 from Anderson (1989) illustrates a typical glacial front environment where lacustrine and fluvial sediments are formed.

The deposits expected to be present in the site vicinity include various moraines composed of Wadsworth Till and interglacial deposits of lacustrine and fluvial environments. Figure 3(A) shows the moraines left by the Woodfordian glaciers (Willman and Frye, 1970), and Figure 3(B) shows the surficial geology of Lake County (Lineback, 1979).

The Wadsworth Till Member consists of a clayey grey till, which is relatively high in expandable clay minerals and contains Mississippian-Devonian black shale pebbles. The Lake Border Drifts, which include the Zion City, Highland Park, Blodgett, Deerfield, and Park Ridge Drifts, are higher in expandable clay minerals and less pebbly than the Tinley and Valparaiso Drifts (Willman and Frye, 1970).

Other regional surficial deposits include: the Henry Formation which consists of sand and gravel outwash and ice contact deposits; the Grayslake Peat consisting of organic deposits developed in swampy depressions or deposited during the late stage of lake

filling; and the Equality Formation consisting primarily of lacustrine deposits.

Figure 4 shows selected geologic sections of Lake County from Larsen (1973), which give a regional overview of the landfill site environment. Drift thickness is approximately 200 feet in the site region and overlies Silurian Niagaran Dolomite bedrock. Figure 5(A) shows the bedrock surface (Horberg, 1957), and Figure 5(B) shows the drift thickness (Pisken and Bergstrom, 1967, Rev. 1975), in Lake County. The site is located at the head of a small tributary to an unnamed buried bedrock valley. The Silurian Dolomite is 150 to 200 feet thick in the site region (Larsen, 1973).

Figure 6 (Suter, et al., 1959) provides a description of the Paleozoic bedrock which overlies Precambrian crystalline basement rock. In Lake County, Silurian, Ordovician, and Cambrian sandstones, dolomites, and shales are present. Younger rocks have been eroded, some having been incorporated as the glacial till which forms the site environment.

REGIONAL HYDROGEOLOGY

The BFI Zion Sanitary Landfill and proposed east expansion site are located on a topographic high which is a recharge area for the region. Both surface and groundwater flow is multidirectional from the recharge area. Surface water flows overland to major discharge areas consisting of both rivers and lakes. Groundwater flows primarily vertically through large thicknesses of glacial till into shallow drift and bedrock aquifers, where it moves laterally into discharge zones some distance from the site. Flow through the glacial sediments is extremely slow, involving hundreds of years,

but nonetheless supplies appreciable quantities of water to underlying aquifers.

There are four major sources of water supplies for residents of northeastern Lake County. These include surface water bodies, aquifers located within the glacial drift, basal drift and shallow bedrock aquifers, and deep bedrock aquifers.

The following discussion of each of these systems is based on cited literature, conversations with community water suppliers, and a review of 117 water well logs obtained from the Illinois State Geological and Water Surveys and cross-correlated with records at the Lake County Department of Public Health. Logs for the water wells used in this study are located in Appendix A.

Surface Water

Surface water flow is multidirectional from the topographic high on which the site is situated. Drainage occurs by overland flow into small swales. Regionally, two tributaries drain eastward to Lake Michigan and two tributaries drain westward into the Des Plaines River (Figure 1). Small ponded areas are present north of the site. Wet areas are present along the southern portion of the east expansion property in early spring; however, these dry up during summer and appear to be a result of temporary ponding of natural drainage during the spring thaw. Rivers and ponds within the site region are not known to supply water to communities or private users.

Lake Michigan serves as the primary surficial source of community water supplies within the site region, as well as within much of Lake and Cook Counties. The City of Zion, located south of and including the landfill, began purchasing water from the Zion-Benton Treatment Plant (Lake County Public Water District) in 1957 (Woller

and Gibb, 1976). In 1958, Winthrop Harbor groundwater supply wells were supplemented with water from the Zion-Benton Treatment Plant which, since June 24, 1970, has obtained water from Lake Michigan. Winthrop Harbor has phased out use of groundwater wells and is currently reliant upon Lake Michigan water (Williams, 1986, 1988, and 1994).

Shallow Drift Aquifer

Shallow drift aquifers consist of locally or regionally consistent bodies of permeable sediments (usually sand and gravel) located within the glacial drift which are capable of producing water as to a well. The shallow drift aquifer in the site vicinity is composed of primarily fluvial, and some lacustrine, sediments consisting of sand and gravel layers, massive silts, and some thin-layered silt and clay deposits. The unit is regionally continuous, and lies approximately 100 feet below the land surface. The thickness of the shallow drift aquifer is reported by Larsen (1973) to be less than 15 feet. Figure 7(A) shows the occurrence and thickness of shallow drift aquifers in Lake County (Larsen, 1973).

No community water supply systems derive water from the shallow drift aquifer, and only a few private wells utilize this aquifer. A survey of 117 logs of local drinking water wells located within a mile of the BFI Sanitary Landfill and the proposed east expansion showed 37 wells screened in the shallow drift aquifer. The majority of these wells are located in Bartletts North Shore Acres subdivision over a quarter mile southeast of the site, and in Oakview Estates subdivision northeast of the site. Public water is now available to Bartletts North Shore Acres, North Prairie Estates, and Lorelei Acres, and many of the wells may no longer be in use (Williams, 1994). Well locations are shown on Figure 8, numbered in correspondence to well logs located in Appendix A. Question marks on Figure 8 indicate wells which were known to

exist, but for which no documentation was available. These wells are discussed in more detail in a later section.

Contours of static levels reported on the well logs are also shown on Figure 8. This represents a very rough approximation of a piezometric surface of the shallow drift aquifer. It cannot be considered totally accurate because the wells were installed on different dates with different, and often unknown, construction details. Additionally, well locations and elevations can only be roughly approximated from information provided on the well logs and U.S.G.S. topographic maps. Nonetheless, the data can yield a general overview of aquifer piezometric elevations. Static levels reported for the shallow drift aquifer range from 630 feet mean sea level (MSL) to 675 MSL in elevation. Piezometric levels for the existing site, as discussed in a later section of this report, ranged, with few exceptions, between 665 MSL in the southwestern portion of the property to 655 to the north, east, and southeast. Regional geology would suggest aquifer deposits are at higher elevations to the west, and lower to the east (see Figure 4). Water levels suggest that groundwater flow through the aquifer, while locally quite variable, is regionally to the east as well. Local variations are believed to reflect variations in recharge potential as well as configuration and transmissivity of the aquifer.

Basal Drift/Dolomite Aquifer

The third source of regional drinking water is the basal drift/shallow bedrock aquifer. This aquifer is composed primarily of Silurian Niagaran Dolomite bedrock, but includes overlying permeable sediments at the base of the glacial drift sequence. The Silurian Dolomite provides water from joints, fractures, and solution channels within the rock. Water is available where wells intercept waterbearing openings. Where dolomite rocks directly

underlie waterbearing sand and gravel, solution enhanced cracks and crevices maximize free exchange of water from glacial drift to bedrock, thereby furthering yield capability of the aquifer (Woller and Gibb, 1976). Many wells deriving water from these deposits screen both basal units and bedrock. Local well logs indicate basal sand and gravel at a depth approximately 200 feet below ground surface, with thicknesses ranging from nonexistent to approximately 40 feet. Larsen (1973) indicates the Silurian Dolomite aquifer to be 150 to 200 feet thick in the site vicinity (Figure 7(B)).

The City of Zion had one well that utilized the basal drift/dolomite aquifer until 1957, at which time the city began purchasing water from the Zion-Benton Treatment Plant. The well was abandoned and filled with concrete sometime during 1968 or 1969 (Woller and Gibb, 1976). Winthrop Harbor maintained five wells in the aquifer until 1958 when the water supply was supplemented with water from the Zion-Benton Treatment Plant. Three of these wells were abandoned and capped prior to 1958 and the others have been sealed and abandoned since that time (Williams, 1986, 1988, and 1994). Only a few private wells remain in Bartletts North Shore Acres and North Prairie Estates, subdivisions that now access Winthrop Harbor public water (Williams, 1994).

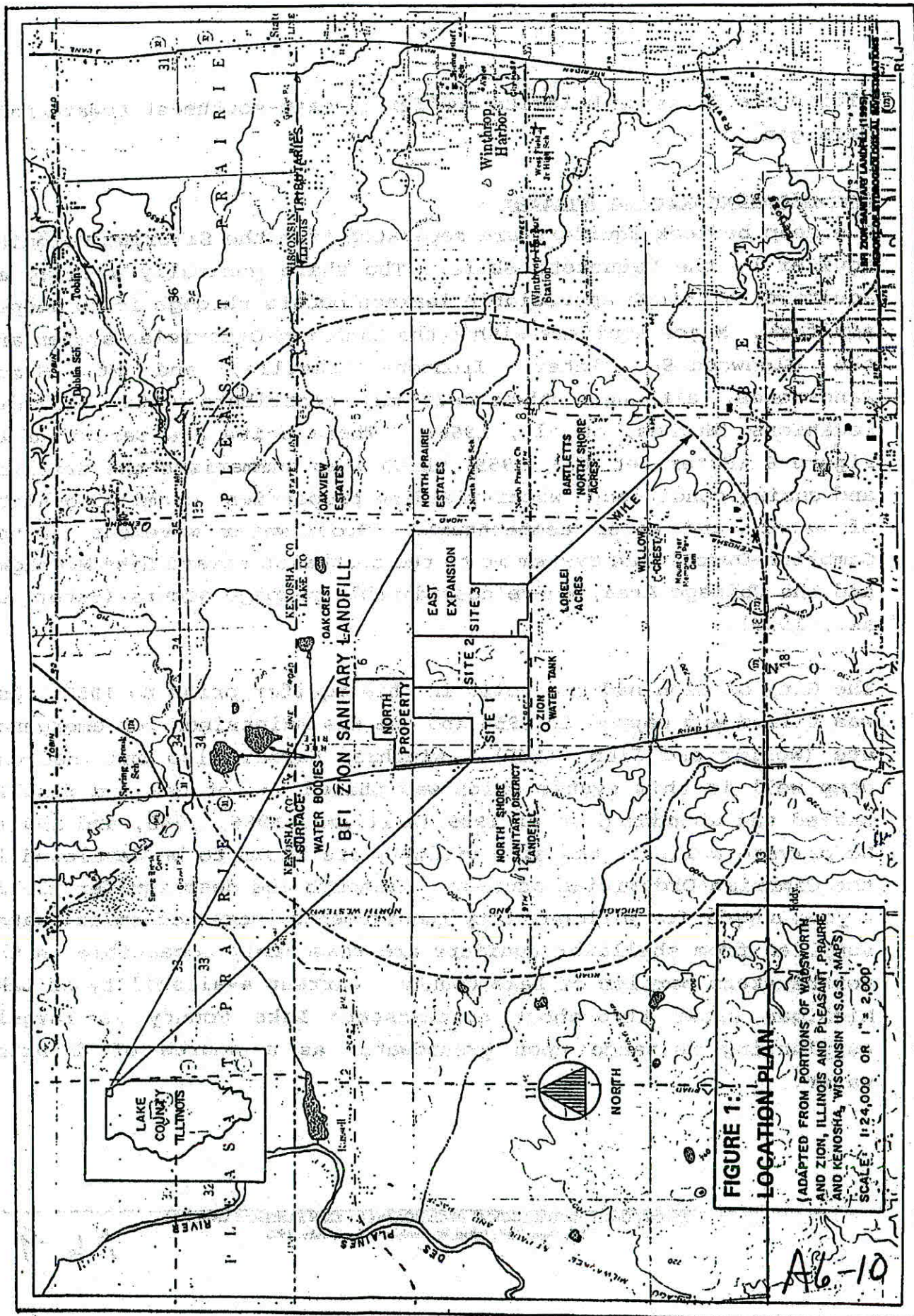
Figure 9 depicts locations of private water wells within a mile of the BFI Zion Sanitary Landfill finished in the basal drift/dolomite aquifer. Reported static levels were too variable to contour, ranging from elevation 525 MSL to 705 MSL, with all but three ranging from elevation 610 MSL to 675 MSL. Large differences in water levels, likely due to the large thickness of the aquifer and variations in well depth and casing intervals, prevented discernment of specific trends or flow directions. Regional flow

within the Silurian Dolomite aquifer is east-southeast toward Lake Michigan.

Cambrian-Ordovician Aquifer

The deep bedrock aquifers are separated from the Silurian Dolomite aquifer by the Maquoketa Shale. The shale generally acts as an aquitard, although appreciable leakage occurs through it to deeper aquifers. Major aquifers within the Cambrian-Ordovician system are the Glenwood-St. Peter, Iron-ton-Galesville, and Mt. Simon Sandstones, although other beds may contribute water in some locations (Hughes, et al., 1966). These units are described in Figure 6 (Suter, et al., 1959) which also summarizes the drilling and casing conditions, water-yielding properties, chemical quality of water, and water temperature. Groundwater movement in the Cambrian-Ordovician System is to the southeast toward Lake Michigan and the Chicago Area, where considerable pumpage occurs (Suter, et al., 1959).

The City of Zion had two wells in this aquifer prior to 1957. One was filled and capped in 1958 and one was maintained for emergency use (Woller and Gibb, 1976). Winthrop Harbor also once had one deep well in this system which was phased out of use and finally sealed and abandoned as of 1989 (Williams, 1986, 1988, and 1994). No private wells in the site vicinity are known to be developed in the Cambrian-Ordovician aquifer. Although the deep aquifer yields a good supply for high quantity requirements, more economical water supplies from shallower aquifers are reasonably accessible in the northeastern portion of Lake County. Current availability of Lake Michigan water throughout northeastern Lake County is largely supplanting reliance upon groundwater as a source of drinking water.



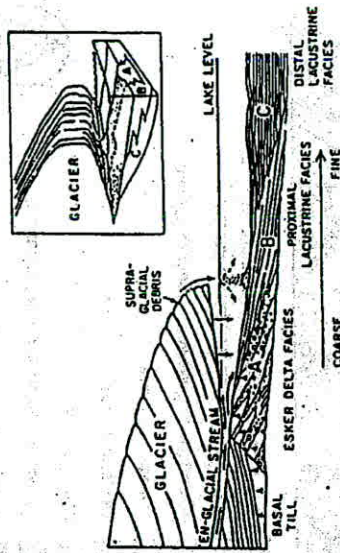


Figure 1. Transportation of till in the supraglacial, englacial, and basal environments and formation of an esker delta (adapted from Thomas, 1984).

REPRODUCED FROM ANDERSON (1989)

FIGURE 2: GLACIER FRONT ENVIRONMENT

NO SCALE

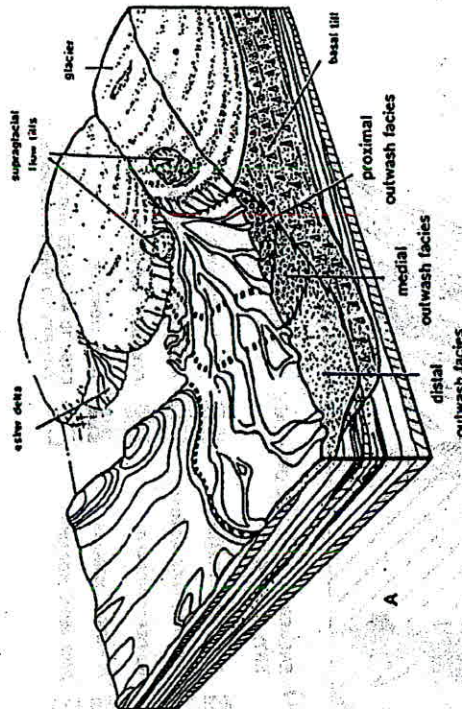
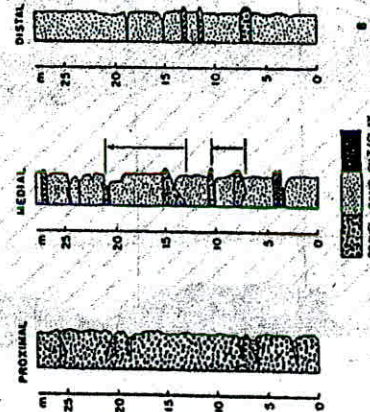
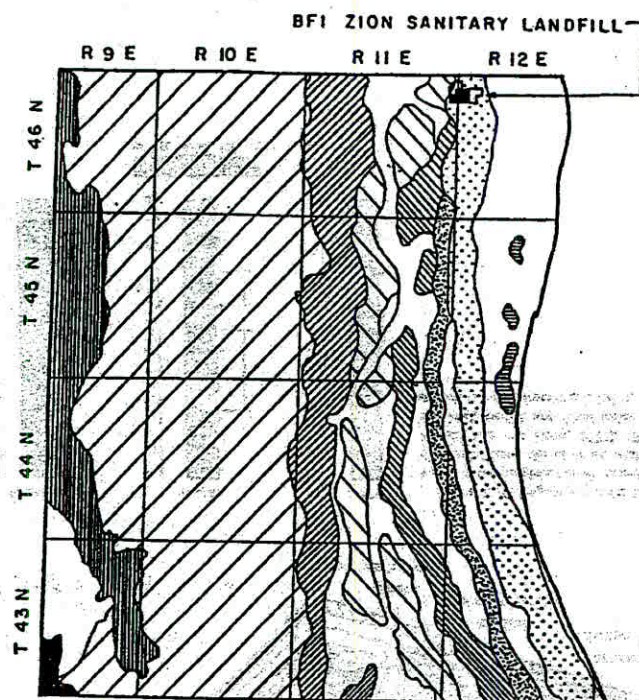


Figure 5. Hydrogeologic facies for outwash. (A) Conceptual model of the proglacial environment showing the proximal, medial, and distal facies of an outwash fan (adapted from Brodzinski and van Loon, 1987). (B) Vertical profiles for the proximal, medial, and distal facies assemblages of an outwash deposit (adapted from Miel, 1983).

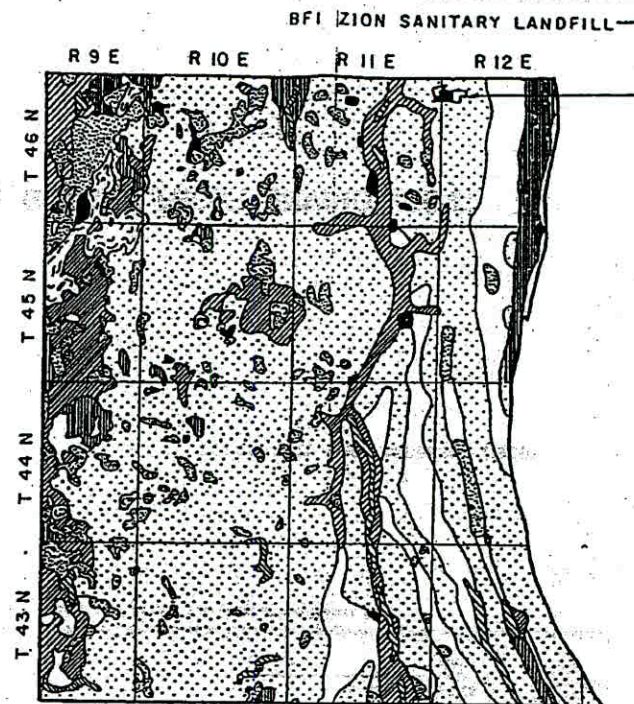


A6-11



(A) ENLARGED PORTION OF PLATE I, WILLMAN AND FRYE (1970).

- | | |
|-----------------------|--|
| ZION CITY MORaine | TINLEY MORaine |
| HIGHLAND PARK MORaine | VALPARAISO (UNDIFFERENTIATED) MORaine |
| BLODGETT MORaine | FOX LAKE MORaine |
| DEERFIELD MORaine | CARY MORaine |
| PARK RIDGE MORaine | GROUND MORAINES AND OTHER UNIDENTIFIED SURFICIAL SEDIMENTS |

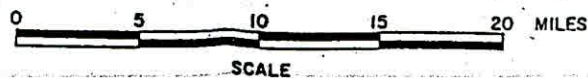


(B) ENLARGED PORTION OF LINEBACK (1979)

- | |
|---|
| WADSWORTH T.M., WEDRON FM. END MORaine |
| WADSWORTH T.M., WEDRON FM. GROUND MORaine |
| CAHOKIA ALLUVIUM |
| GRAYSLAKE PEAT |
| EQUALITY FM. |
| BATAVIA M. AND MACKINAW M., HENRY FM. |
| WASCO M., HENRY FM. |
| LAKES |



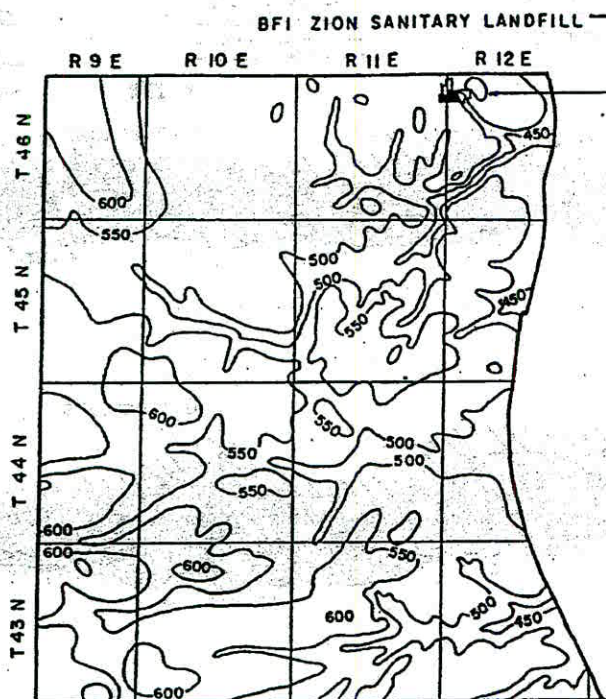
FIGURE 3: WOODFORDIAN MORAINES (A) AND SURFICIAL GEOLOGY (B) OF LAKE COUNTY



BFI ZION SANITARY LANDFILL (1995)
REPORT OF HYDROGEOLOGICAL INVESTIGATIONS

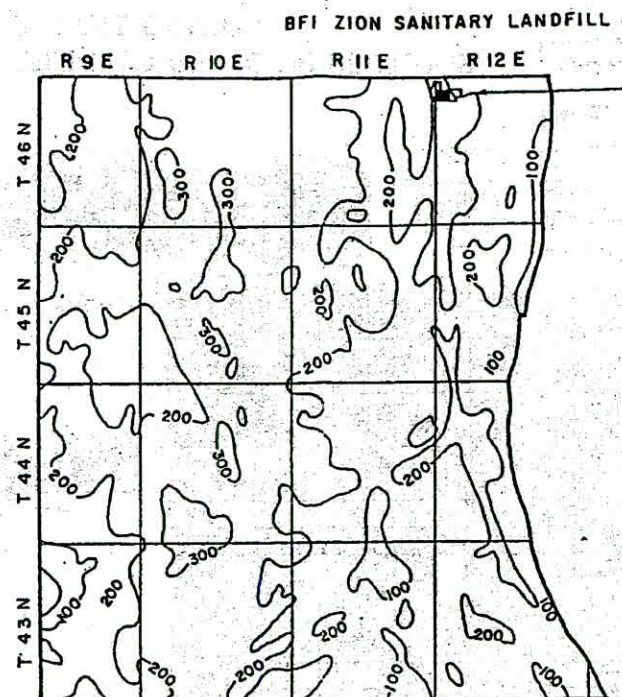
RLJ

R 000847



(A) ENLARGED PORTION OF PLATE 1, HORBERG (1957) - SECOND EDITION

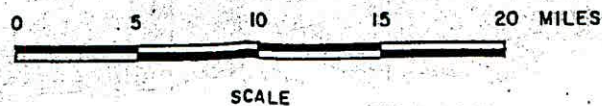
500' CONTOUR SHOWING ELEVATION IN FEET ABOVE MEAN SEA LEVEL, INTERVAL 50 FEET



(B) ENLARGED PORTION OF PLATE 1, PISKEN AND BERGSTROM (1967, REVISED 1975)

200' CONTOUR SHOWING THICKNESS IN FEET ABOVE MEAN SEA LEVEL, INTERVAL 100 FEET

FIGURE 5: BEDROCK SURFACE (A) AND DRIFT THICKNESS (B) OF LAKE COUNTY



BFI ZION SANITARY LANDFILL (1995)
REPORT OF HYDROGEOLOGICAL INVESTIGATIONS

RLJ

A6-14

| SYSTEM | SERIES | GROUP OR FORMATION | HYDROLOGIC UNITS | LOG | THICKNESS (FT.) | DESCRIPTION | DILLING AND CASING CONDITIONS | WATER-YIELDING PROPERTIES | CHEMICAL QUALITY OF WATER | WATER TEMPERATURE °F |
|------------|--------------|--------------------|------------------------|-----|-----------------|---|--|---|--|---------------------------|
| Cambrian | St. Croixian | Prairie du Chien | Glacial drift aquifers | | 0-350+ | Unconsolidated glacial deposits - pebbly clay (silt), silt, and gravel. Alluvial silt and sands along stream. | Soils, having sand locally, sand and gravel wells usually require screens and development casing required in wells into bedrock. | Sand and gravel, permeable. Some wells yield more than 1000 gpm. Specific capacities from 2.1 to 66 gpm/ft. av. 12 gpm/ft. Coefficient of trans. from 3400 to 100,000 gpd/ft. av. 25,000 gpd/ft. Pointed beds yield small supplies locally. | McHenry County, hardness from 100 to 450 ppm., av. 275. Other counties, see Silurian below and text. | 46° min. 52° av. 54° max. |
| | | Carboniferous | Trade-water | | 0-175 | Shale; sandstones, fine-grained; limestone; coal; clay. | Shale requires casing. | Not consistent; some wells yield more than 1000 gpm. Crevices and solution channels more abundant near surface. Specific capacities from 0.1 to 550 gpm/ft. Highest av. specific capacities (54.4 gpm/ft) in Du Page Co. wells, lowest (5 gpm/ft) in Lake Co. Coefficient of trans. averages 100,000 gpd/ft. in Du Page Co., 9000 gpd/ft. in Lake Co. | | |
| | | Kinderhook | | | 0-365 | Shale, green and brown, dolomitic; dolomite, silty. | | Emitted areas; not used as aquifer. | | |
| | | | | | 0-25 | Shale, calcareous; limestone beds, thin. | | | | |
| Ordovician | Niagaran | Port Byron | | | 0-465 | Dolomite, silty at base, locally cherty. | Upper part usually weathered and broken; extent of crevicing varies widely. | | | 54° |
| | | Waukesha | | | | | | | | |
| | Alexandrian | Kankakee | | | 0-250 | Shale, gray or brown, locally dolomitic and/or limestone, argillaceous. | Shale requires casing. | | | |
| | | Edgewood | | | | | | | | |
| | Clintonian | Maquoketa | | | 220-350+ | Dolomite and/or limestone, cherty. | Crevicing common only where formations underlie drift. Top of Galena usually selected for hole reduction and setting of casing. | | | |
| | | Galena | | | | | | | | |
| | Mohawkian | Decorah | | | 100-350 | Sandstone, fine- and coarse-grained; little dolomite; shale at top. | Lower cherty shale cave and are usually cased. Frangible sand may slough. | | | |
| | | Platteville | | | | | | | | |
| | Chazyan | Glenwood | | | | Sandstone, fine- to medium-grained; locally cherty red shale at base. | | | | |
| | | St. Peter | | | | | | | | |
| Cambrian | St. Croixian | Shakopee | | | 0-340 | Dolomite, sandy; cherty (oolitic); sandstone. | | | | |
| | | New Richmond | | | | Sandstone, interbedded with dolomite. | | | | |
| | | Chico | | | | Dolomite, white to pink, coarse-grained, cherty (oolitic); sandy at base. | Crevices encountered locally in the dolomite, especially in Trempealeau. Casing not required. | | | |
| | | Trempealeau | | | 0-225 | Dolomite, white, fine-grained, groed quartz; sandy at base. | | | | |
| | | Franconia | | | 45-175 | Dolomite, sandstone, and shale, glauconitic, green to red, micaceous. | | | | |
| | | Trenton | | | 105-270 | Sandstone, fine- to medium-grained, well sorted, upper part dolomitic. | Amount of cementation variable. Lower part more friable. Sometimes sloughs. | | | |
| | | Galena | | | 235-450 | Shale and siltstone, dolomitic, glauconitic; sandstone, dolomitic, glauconitic. | Casing not usually necessary. Locally weak shales may require casing. | | | |
| | | Eau Claire | | | | | | | | |
| | | St. Simon | | | 2000+ | Sandstone, coarse-grained, white, red in lower half; lenses of shale and siltstone, red, micaceous. | Casing not required. | | | |
| | | | | | | | | | | |

NOTE: PENNSYLVANIAN, MISSISSIPPIAN, AND DEVONIAN UNITS ARE ABSENT IN NORTHEAST ILLINOIS.

FIGURE 6:

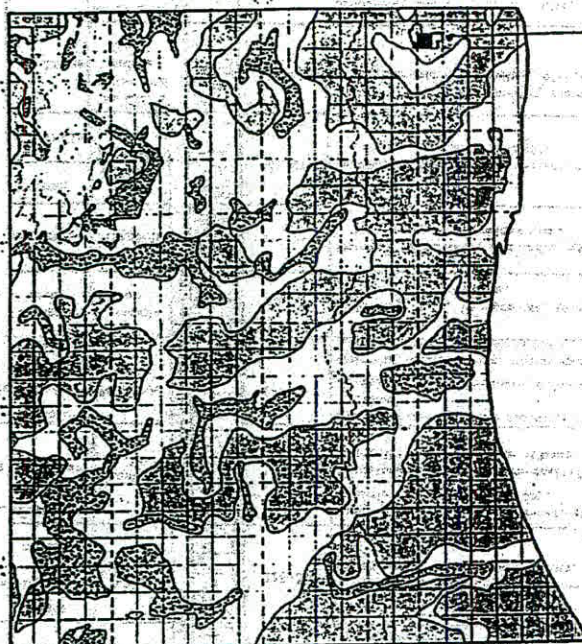
BEDROCK GEOLOGY

(REPRODUCED FROM FIGURE 17, SUTER, ET AL., 1959)

REPORT OF HYDROGEOLOGICAL INVESTIGATIONS
BET ZOOM SAMITARY LANDFILL (1959)
RLJ

A6-15

BFI ZION SANITARY LANDFILL



(A)

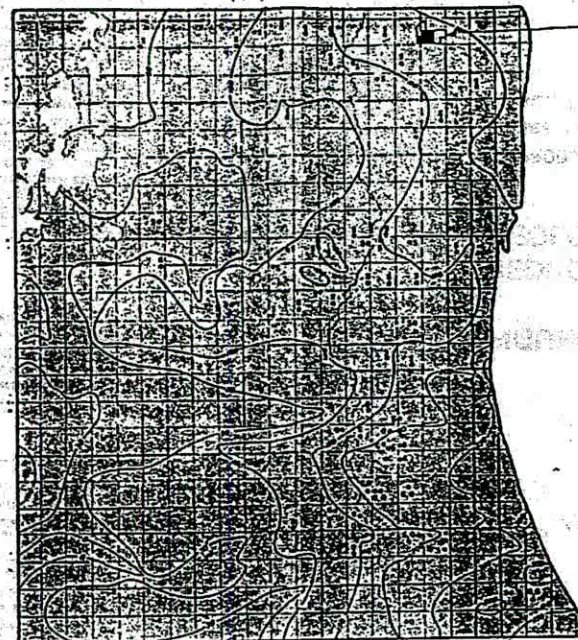
Sand aquifers are aquifers overlain by 10 feet or more of fine-grained deposits.

Less than 15 feet of sand and gravel reported.

15 to 50 feet of sand and gravel reported.

50 to more than 100 feet of sand and gravel reported.

BFI ZION SANITARY LANDFILL



(B)

50 - Thickness; interval 50 feet

Aquifer about 100 feet thick

Reported occurrence of objectionable substance that might impair water quality:

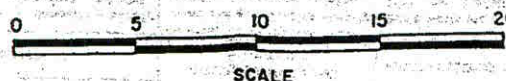
S - Hydrogen sulfide

C - Gas

O - Oil

FIGURE 7: BURIED SAND AND GRAVEL AQUIFERS (A) AND SHALLOW SILURIAN DOLOMITE AQUIFER (B) IN LAKE COUNTY

(REPRODUCED PORTIONS OF PLATE 2, LARSEN, 1973)



SCALE

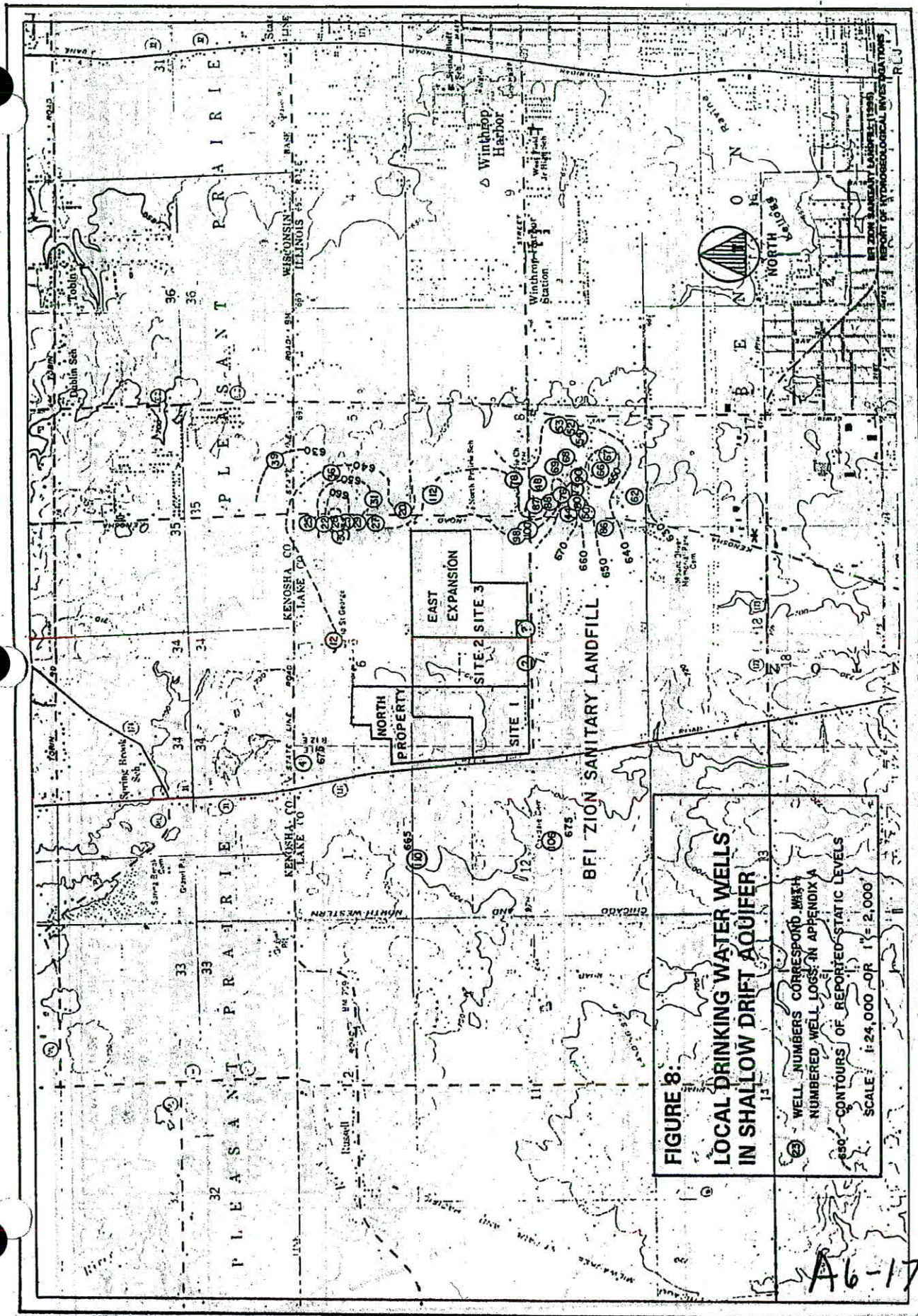


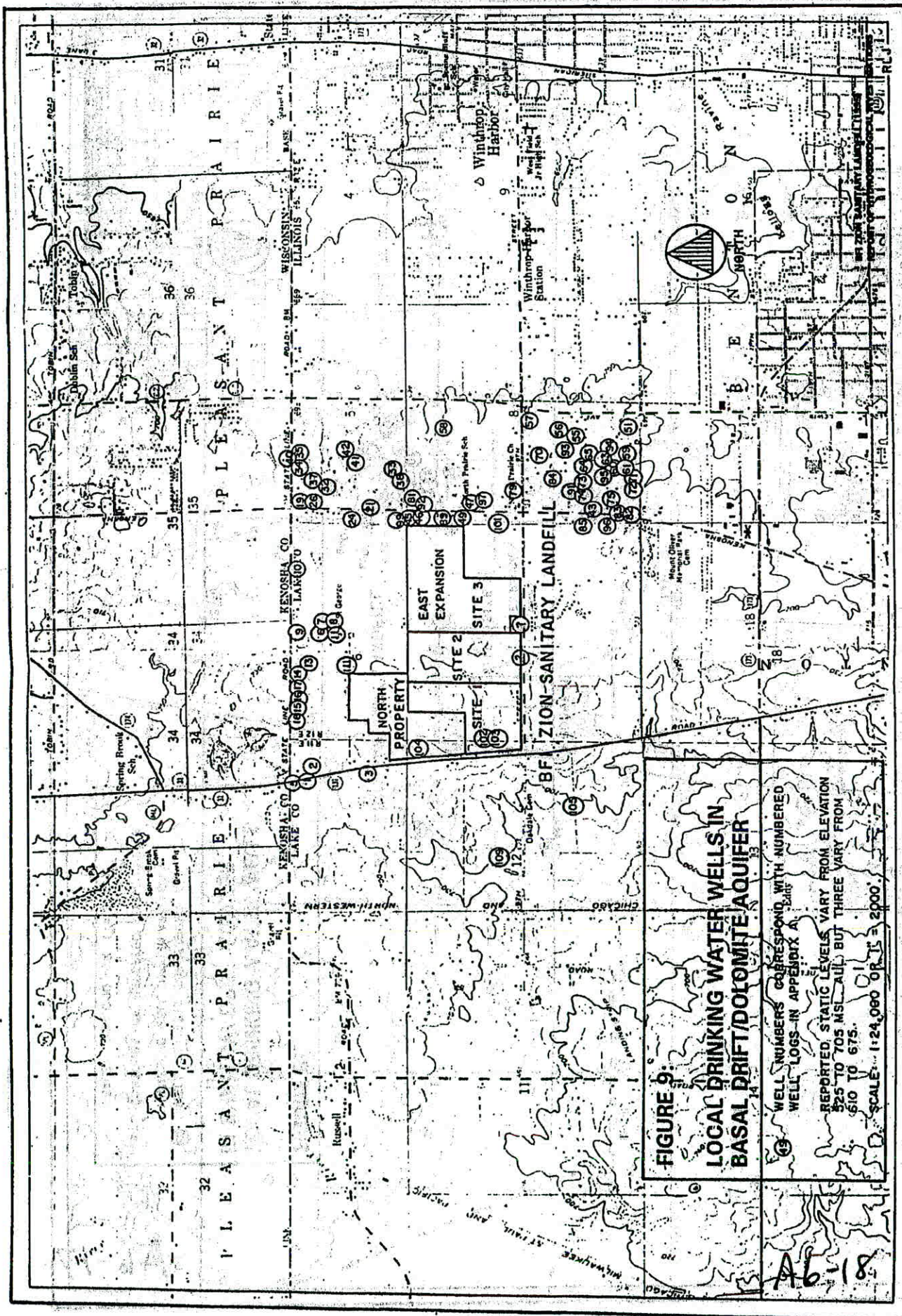
BFI ZION SANITARY LANDFILL (1995)
REPORT OF HYDROGEOLOGICAL INVESTIGATIONS

RLJ

AL-16

R 000851





BFI ZION DRILLING HISTORY

November, 1974: Geotechnical/Hydrogeological Site Investigation by Tom Handyside & Associates on Site 1. Ten soil borings ranging from 40 to 52 feet deep. Four piezometers installed.

July, 1976: Installation of Three Observation Wells by Soil Testing Services, Inc. W-1 (15 feet deep), W-2 (25 feet deep), and W-3 (20 feet deep). There is no information for these wells, but they are believed to be the original Site 1 monitoring wells G101, G102, and G103.

December, 1979: Geotechnical/Hydrogeological Investigation by Andrews Environmental Engineering, Inc. Ten soil borings on Site 2 ranging from 50.5 to 52 feet deep.

December, 1980: Installation of three new and one replacement well on Sites 1 and 2 by Andrews Environmental Engineering, Inc. G104 (56.5 feet deep), G105 (65 feet deep), G106 (47.5 feet deep), G107 (45 feet deep), G111 (15 feet deep). G111 is believed to have replaced the original G101.

July, 1982: Installation of five additional wells on Site 2 by Andrews Environmental Engineering, Inc. G108 (25 feet deep), G109 (60 feet deep), G110 (65 feet deep), G112 (60 feet deep), G113 (35 feet deep).

June, 1983: Eight test pits (TP-1 through TP-8) by Andrews Environmental Engineering and STS.

July/September, 1983: Hydrogeologic Investigation by Wehran Engineering. Eight piezometers, three borings, in July and six additional borings in September (B-83 series) on Site 1.

December, 1983 - February, 1984: Hydrogeological Site Characterization by Recra Research, Inc. Seven deep wells (MW-1 through MW-7, (G121-G127); five shallow wells (SW1 through SW5), eight piezometers (OW-1 through OW-4/couplets); and three deep borings TB-1 through TB-3) on Site 1.

October, 1984: Installation of three replacement wells (G123, G124, G126) and 14 new wells by Recra Research on Site 1. Nine deep wells (G128 through 134 and G136, G137); G135 shallow boring grouted at completion; six shallow wells GT01 through GT07 and GT09; one shallow boring (GT08) grouted at completion.

October, 1984: STS installs two piezometers (P1 and P2), location unknown.

June, 1985: Installation of five new monitoring wells by Peerless-Midwest on Site 1. G138 through G142.

A7-1

BFI ZION DRILLING HISTORY (CONTINUED)

September, 1985: Replacement of nine Site 1 monitoring wells by Peerless-Midwest. G121, G123, G124, G125, G127, G129, G131, G133, G134.

November, 1985: Installation of two piezometers on Site 1 by Exploration Technology, Inc. P1W and P2W.

March, 1986: Sixteen borings (EB-1 through EB-16), and installation of 10 piezometers (EP-2S, EP-2I, EP-2D; EP-6SS, EP-6S, EP-6I, EP-6D; EP-10S, EP-10I, EP-10D) on Site 3 by Jennings & Staurowsky and Testing Service Corporation.

June, 1986: Geotechnical evaluation by Soil Testing Services, Inc. on Site 1. Two standpipe piezometers, 15 pneumatic piezometers, 14 borings, and 1 test pit. Borings B-1 through B-3 and B101 through B112. Pneumatic piezometers labelled P-101A, B, and/or C, for example.

May, 1986: Installation of five piezometers (P3 through P7) by Testing Service Corporation on Site 1.

October, 1986 - January, 1987: On Site 3, EP-2S and EP-10S replaced, P-1 through P-6 shallow piezometers installed, and P-7 through P-9 deep piezometers installed by Jennings & Staurowsky and Testing Service Corporation.

December, 1987: Installation of two piezometers (P8 and P9) and one monitoring well (G143) on Site 1 by Patrick Engineering, Inc.

February, 1989: Patrick Engineering, Inc. replaces G132 and G133 on Site 1.

March/April, 1989: BB-1 through BB-9 borings and BP-1 through BP-5 piezometers installed on the North Property by Jennings & Staurowsky and Patrick Engineering, Inc.

June, 1988: Two borings and six monitoring wells installed on Site 1 by Patrick Engineering, Inc. G10A and G12A, grouted at completion; shallow wells GT10, GT11, GT12; and deep piezometers P11, P13, and P14.

November, 1988 and February/March, 1989: Installation of gas monitors on Sites 1 and 2 (GP-1 through GP-13) by Patrick Engineering, Inc.

September-October, 1989: Installation of nine monitoring wells by R. L. Jennings and Patrick Engineering, Inc. on Sites 2 and 3. GK1D, GK1S, GK6D, GK6S, GK7D, GK7S, GK9D, GK9S, and GK11D. Site 3 piezometers P-7 and P-9 renamed to GK2D and GK10D, respectively. Leachate well L101 installed on Site 2.

BFI ZION DRILLING HISTORY (CONTINUED)

April, 1990: Installation of five monitoring wells by R. L. Jennings and Testing Service Corporation on Site 2. GK3S, GK3D, GK4D, GK5S, and GK5D.

November, 1991: TSC installs Site 1 replacement wells R129 and R131.

December, 1991: Five deep soil borings (SB-1 through SB-5) drilled on Site 1 by WW Engineering and Science and Testing Service Corporation.

November/December, 1992: Three borings TB-1 (224 feet deep), TB-2 (60 feet) and TB-3 (60 feet) drilled on Site 3. Leachate wells L102 through L106 installed on Site 2.

January, 1993: Replacement of Site 2 GK1D with RK1D by Testing Service Corporation.

August, 1993: WW Engineering replaces Site 1 wells RT06, RT07, R124, R126, R128, A129, A131, and A132. Replacement well RK6D installed on Site 2.

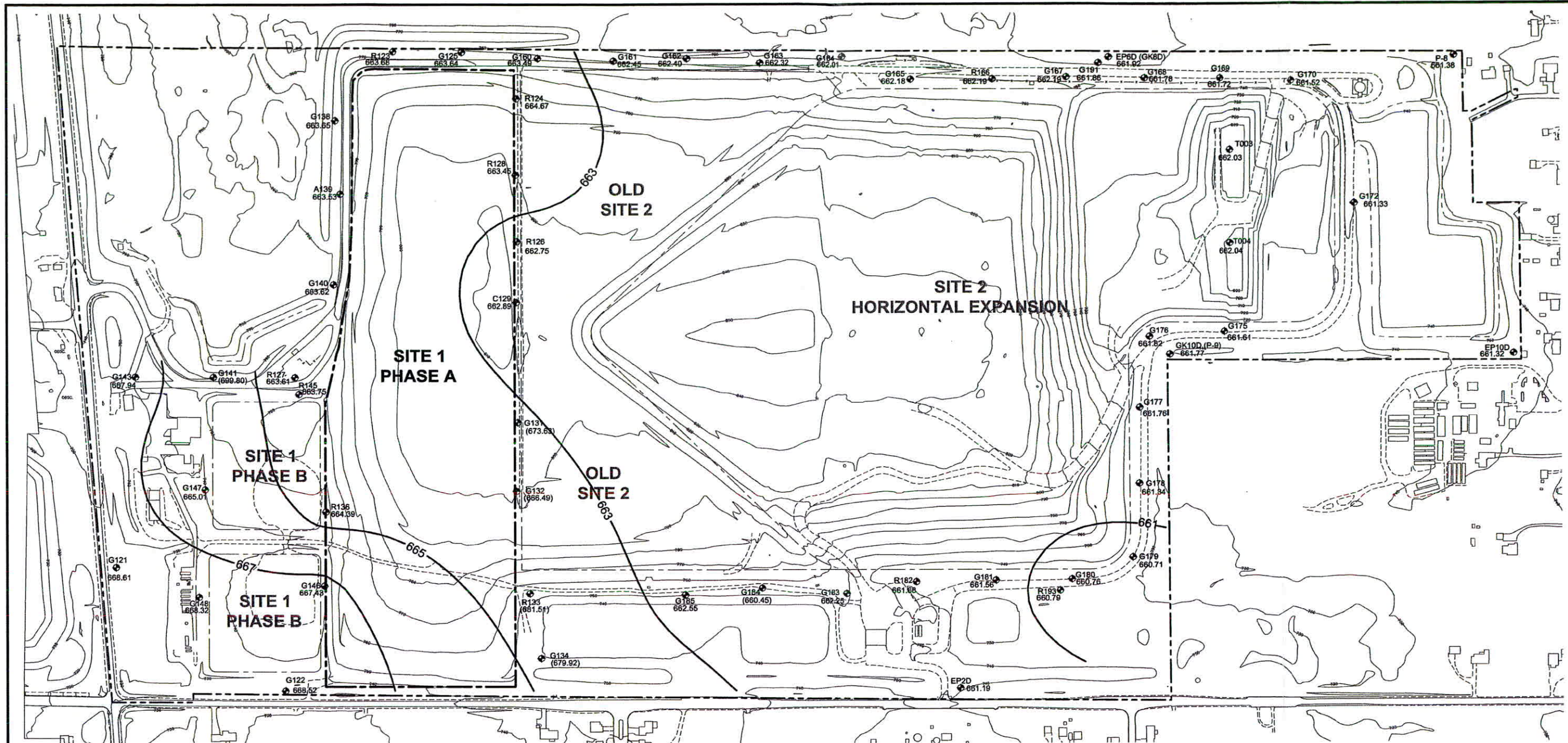
August - September, 1994: One boring and six monitoring wells installed on Site 1 by Testing Service Corporation. Boring GT13, backfilled at completion; three shallow wells GT14, GT16, GT17; and three deep wells G145, G147, G148.

September, 1995: Site 1 borings/wells GT15 and G146 installed by Testing Service Corporation.

June, 1977 - May, 1988: Ongoing trench probes to verify clay below the design base of Sites 1 and 2. Performed by various drilling firms and consultants. B-101 through B-283.

Appendix C-2

Potentiometric Contour Maps, Shallow Drift Aquifer



LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WASTE
- R136 (665.73) SHALLOW DRIFT AQUIFER MONITORING WELL AND GROUNDWATER ELEVATION USED TO DEVELOP POTENTIOMETRIC CONTOURS
- G141 (700.61) SHALLOW DRIFT AQUIFER MONITORING WELL AND GROUNDWATER ELEVATION NOT USED TO DEVELOP POTENTIOMETRIC CONTOURS

NOTES

1. TOPOGRAPHIC MAP PREPARED FROM AERIAL SURVEY PERFORMED IN MARCH 2009.
2. ELEVATION BASED ON MEAN SEA LEVEL.

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUN 27 2025

REVIEWER: MED



GRAPHIC SCALE
0 400
(IN FEET)
HORIZONTAL SCALE
1 INCH = 400 FEET



POTENTIOMETRIC CONTOUR MAP
SHALLOW DRIFT AQUIFER
January 27, 2009
ZION SITE 1 PHASE A LANDFILL

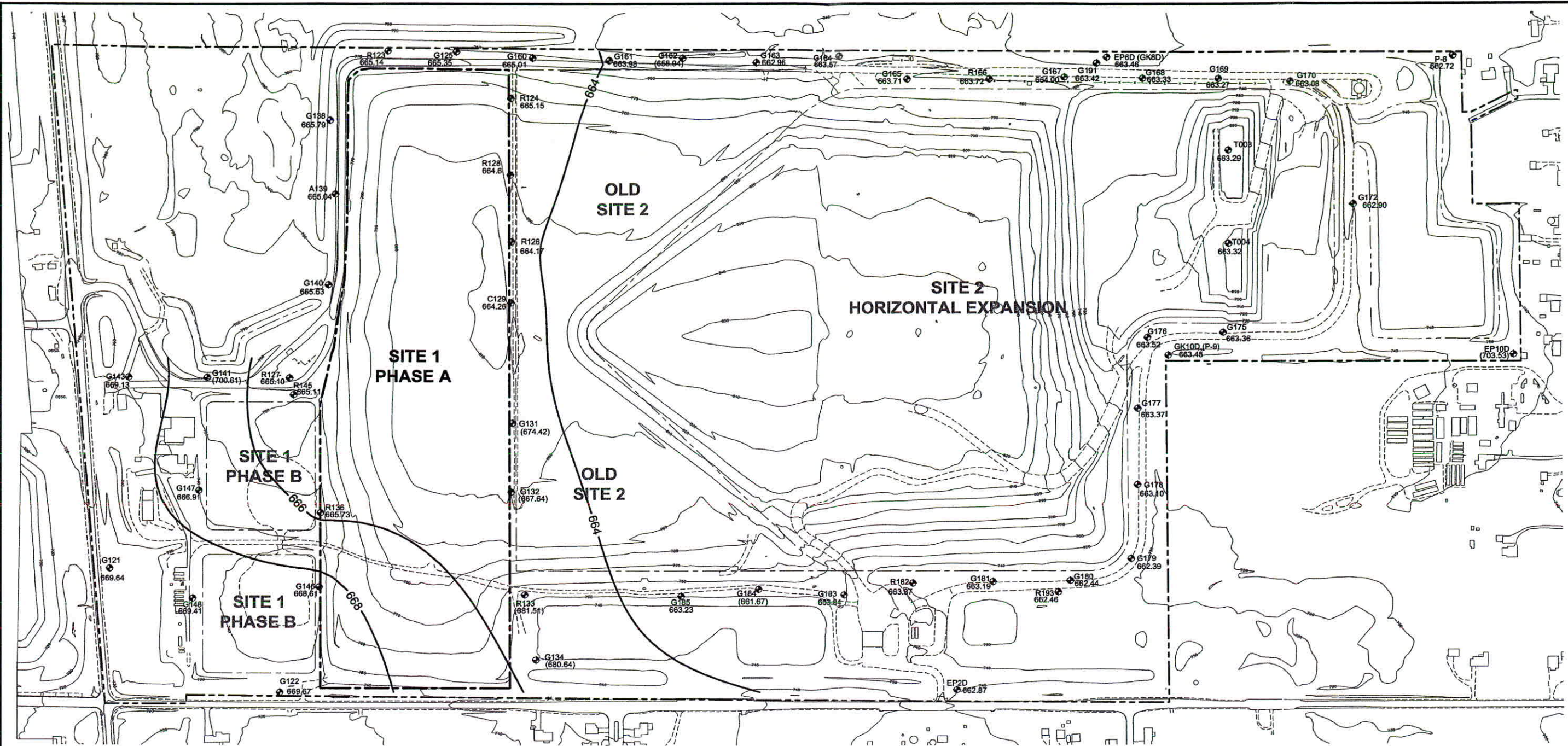


| | |
|------------|---------------|
| DATE | NOVEMBER 2009 |
| SCALE | AS SHOWN |
| DRAWN BY | 980404 |
| CHECKED BY | JDM |
| DATE | 01/04/10 |
| REVISION | 01/04/10 |



| | |
|----------|--|
| REVISION | |
| | |
| | |
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POTENTIOMETRIC CONTOUR MAP
SHALLOW DRIFT AQUIFER
April 1, 2009
ZION SITE 1 PHASE A LANDFILL



LEGEND

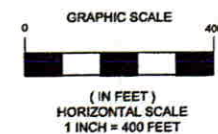
- PROPERTY BOUNDARY
- LIMIT OF WASTE
- R136
665.73 SHALLOW DRIFT AQUIFER MONITORING WELL AND GROUNDWATER ELEVATION USED TO DEVELOP POTENTIOMETRIC CONTOURS
- G141
(700.61) SHALLOW DRIFT AQUIFER MONITORING WELL AND GROUNDWATER ELEVATION NOT USED TO DEVELOP POTENTIOMETRIC CONTOURS

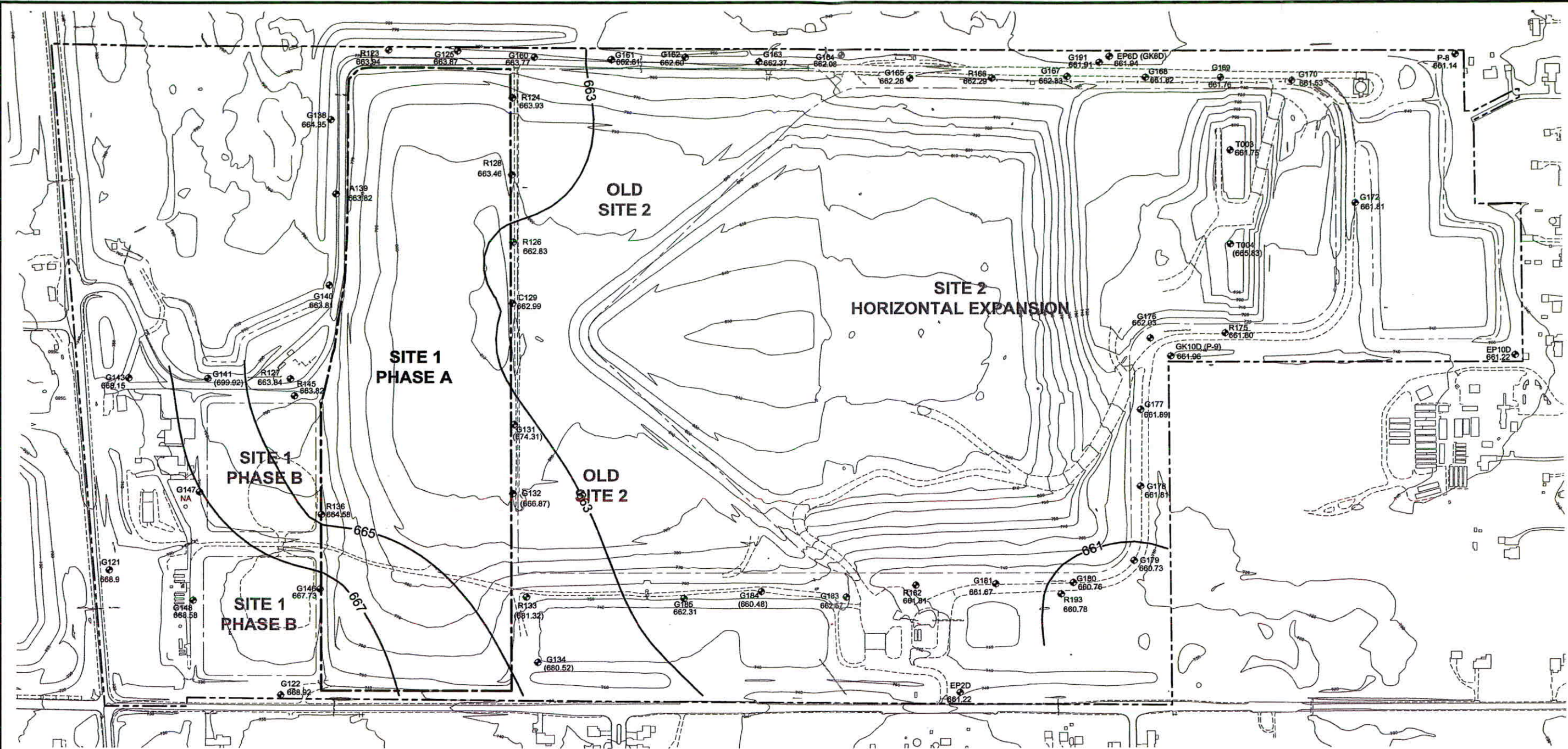
NOTES

- TOPOGRAPHIC MAP PREPARED FROM AERIAL SURVEY PERFORMED IN MARCH 2009.
 - ELEVATION BASED ON MEAN SEA LEVEL.
- IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUN 27 2025

REVIEWER: MED





LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WASTE
- R136 SHALLOW DRIFT AQUIFER MONITORING WELL AND GROUNDWATER ELEVATION USED TO DEVELOP POTENTIOMETRIC CONTOURS
- G141 SHALLOW DRIFT AQUIFER MONITORING WELL AND GROUNDWATER ELEVATION NOT USED TO DEVELOP POTENTIOMETRIC CONTOURS

NOTES

1. TOPOGRAPHIC MAP PREPARED FROM AERIAL SURVEY PERFORMED IN MARCH 2009.
2. ELEVATION BASED ON MEAN SEA LEVEL.

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUN 27 2025

REVIEWER: MED

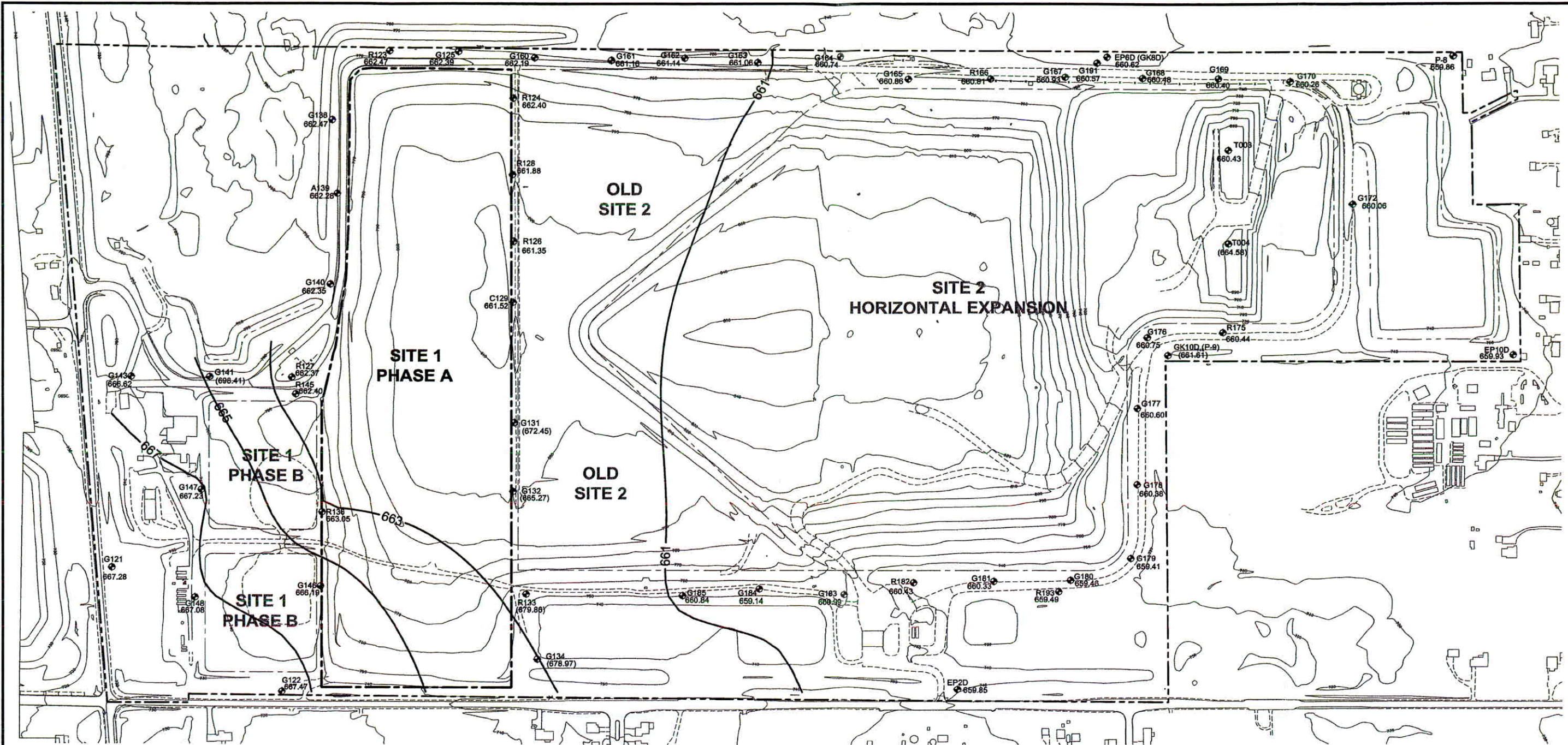


GRAPHIC SCALE
0 400
(IN FEET)
HORIZONTAL SCALE
1 INCH = 400 FEET



POTENTIOMETRIC CONTOUR MAP
SHALLOW DRIFT AQUIFER
July 27, 2009
ZION SITE 1 PHASE A LANDFILL





LEGEND

- PROPERTY BOUNDARY
- LIMIT OF WASTE
- R136 (665.73) SHALLOW DRIFT AQUIFER MONITORING WELL AND GROUNDWATER ELEVATION USED TO DEVELOP POTENTIOMETRIC CONTOURS
- G141 (700.61) SHALLOW DRIFT AQUIFER MONITORING WELL AND GROUNDWATER ELEVATION NOT USED TO DEVELOP POTENTIOMETRIC CONTOURS

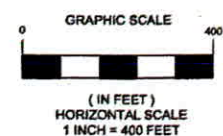
NOTES

1. TOPOGRAPHIC MAP PREPARED FROM AERIAL SURVEY PERFORMED IN MARCH 2009.
2. ELEVATION BASED ON MEAN SEA LEVEL.

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUN 27 2025

REVIEWER: MCD



POTENTIOMETRIC CONTOUR MAP
SHALLOW DRIFT AQUIFER
October 27, 2009
ZION SITE 1 PHASE A LANDFILL





Illinois
Environmental
Protection Agency

Bureau of Land
1021 North Grand Avenue East
Box 19276
Springfield, IL 62794-9276

June 28, 2019

RCRA FACILITY GROUNDWATER, LEACHATE AND GAS REPORTING FORM

This form must be used as a cover sheet for the notices and reports, identified below as required by: (1) a facility's RCRA interim status closure plan; (2) the RCRA interim status regulations; or (3) a facility's RCRA permit. All reports must be submitted to the Illinois EPA's Bureau of Land Permit Section. This form is for use by Hazardous Waste facilities only. Reporting for Solid Waste facilities should be submitted on a separate form. All reports submitted to the Illinois EPA's Bureau of Land Permit Section must contain an original, plus a minimum of two copies.

Note: This form is not to be used with permit or closure plan modification requests. The facility's approved permit or closure plan will state whether the document you are submitting is required as a report or a modification request.

Facility Name: Zion Site 1 Phase A Landfill

Site ID #: 0978020001

Facility Address: 701 Green Bay Road Zion, Illinois 60099

Fed ID #: ILD980700728

Check the appropriate heading. Only one heading may be checked for each corresponding submittal. Check the appropriate sub-heading, where applicable. Attach the original and all copies behind this form.

LPC-160 Forms

Groundwater

☐ Quarterly – Indicate one: 1 2 3 4
☐ Semi-Annual
☐ Annual
☐ Biennial

Leachate

☐ Quarterly – Indicate one: 1 2 3 4
☐ Semi-Annual
☐ Annual
☐ Biennial

☐ Groundwater Data (without LPC-160 Forms)

☐ Quarterly – Indicate one: 1 2 3 4
☐ Annual ☐ Semi-Annual ☐ Biennial

☐ Well Construction Information

☐ Well Construction Forms, Boring Logs and/or Abandonment Forms
☐ Well Survey Data (e.g., Stick-up Elevation Data)

☐ Notice of Statistically Significant Evidence of Groundwater Contamination (35 Ill. Adm. Code 724.198)

☐ Notice of Exceedence of Groundwater Concentration Limit (35 Ill. Adm. Code 724.199(h))

☐ Notice of Alternate Source or Error in Sampling Analysis or Evaluation of Groundwater (35 Ill. Adm. Code 724.199(i))

☐ Gas Monitoring Reports

☒ Other (identify) Annual groundwater flow report



BFI Waste Systems of North America, LLC.

26W580 Schick Road
Hanover Park, IL 60133

Fed Ex Tracking No. 7755 2244 8619

June 28, 2019

Mr. Kenneth E. Smith, P.E.
Permit Section, Bureau of Land - #33
Illinois Environmental Protection Agency
1021 N. Grand Avenue East
Springfield, Illinois 62702

Re: Annual Groundwater Flow Evaluation
0978020001 – Lake County
Zion Site 1 Phase A Landfill
ILD980700728

Dear Mr. Smith,

Enclosed, please find four copies of the above referenced report that is being submitted on behalf of BFI Waste Systems of North America, LLC.

If you have any questions concerning this submittal, feel free to contact me at (630) 894-5001 or JHitzeroth@republicservices.com.

Sincerely,
BFI Waste Systems of North America, LLC

James Hitzeroth



Fed Ex Tracking No. 7755 2244 8619

June 28, 2019

Mr. Kenneth E. Smith, P.E.
Illinois Environmental Protection Agency
Permit Section - Bureau of Land #33
1021 North Grand Avenue East
Springfield, Illinois 62794

Re: Annual Groundwater Flow Evaluation
0978020001 – Lake County
Zion Site 1 Phase A Landfill
ILD980700728

Dear Mr. Smith:

Groundwater elevations measured in the Shallow Drift Aquifer between the third quarter 2018 and second quarter 2019 are provided on Table 1. Groundwater flow within the Shallow Drift Aquifer was directed toward the northeast and east across the site during this period as shown on Drawing 1. The northeast and east groundwater flow direction was consistent with that historically observed at the site. The hydraulic gradient within the Shallow Drift Aquifer measured between wells G121 and C129 ranged between 0.0026 and 0.0029 as shown on Table 2. These data reflect consistency in the magnitude and direction of the horizontal gradient throughout the period and with that historically observed at the site. The existing monitoring network will continue to be capable of detecting a potential release from the landfill since no change in the direction of groundwater flow has occurred.

Please contact me at (630) 942-0652 should you have questions.

Sincerely,
Environmental Information Logistics

A handwritten signature in black ink, appearing to read "Joseph D. Miller". The signature is written in a cursive, flowing style.

Joseph D. Miller, P.G.
Hydrogeologist

cc: Mr. Eric Ballenger – BFI Waste Systems of North America, LLC
Mr. Jim Hitzeroth – BFI Waste Systems of North America, LLC

Attachments

Table 1
Summary of Shallow Drift Aquifer Groundwater Elevation Data

| Well Designation | Northing (ft) | Easting (ft) | 3rd Quarter 2018 (ft msl) | 4th Quarter 2018 (ft msl) | 1st Quarter 2019 (ft msl) | 2nd Quarter 2019 (ft msl) |
|---|---------------|--------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Permit Specified Wells | | | | | | |
| C129 | 11,606 | 9,375 | 664.28 | 665.89 | 666.57 | 667.33 |
| G121 | 10,535 | 7,808 | 669.70 | 671.03 | 671.71 | 672.20 |
| G131 | 11,121 | 9,380 | 674.09 | 673.70 | 675.49 | 675.97 * |
| G132 | 10,845 | 9,375 | 667.71 | 668.81 | 669.65 | 670.31 * |
| R123 | 12,616 | 8,896 | 665.14 | 666.63 | 667.37 | 668.07 |
| R124 | 12,427 | 9,375 | 664.97 | 666.49 | 667.25 | 667.91 |
| R126 | 11,851 | 9,378 | 664.02 | 665.62 | 666.32 | 667.05 |
| R127 | 11,303 | 8,513 | 665.12 | 666.58 | 667.30 | 668.04 |
| R128 | 12,120 | 9,373 | 664.16 | 666.10 | 666.81 | 667.55 |
| R133 | 10,430 | 9,425 | 681.33 | 681.59 | 682.31 | 682.72 * |
| R136 | 10,760 | 8,632 | 665.68 | 667.15 | 667.88 | 668.57 |
| Site 1 Phase B and Site 2 Wells | | | | | | |
| G122 | 10,037 | 8,474 | 669.68 | 670.98 | 671.72 | 672.20 |
| R145 | 11,236 | 8,529 | 665.17 | 666.69 | 667.43 | 668.13 |
| G146 | 10,462 | 8,627 | 668.62 | 669.97 | 670.63 | 671.21 |
| G147 | 10,849 | 8,158 | 666.85 | 668.33 | 669.02 | 669.66 |
| G148 | 10,415 | 8,136 | 669.50 | 670.82 | 671.43 | 671.98 |
| G160 | 12,590 | 9,459 | 664.99 | 666.51 | 667.25 | 667.92 |
| G161 | 12,579 | 9,757 | 663.99 | 665.55 | 666.29 | 667.00 |
| G162 | 12,586 | 10,045 | 664.05 | 665.60 | 666.31 | 667.05 |
| G163 | 12,570 | 10,335 | 663.90 | 665.44 | 666.19 | 666.89 |
| G164 | 12,596 | 10,663 | 663.81 | 665.38 | 666.10 | 666.83 |
| G165 | 12,504 | 10,929 | 663.82 | 665.41 | 666.14 | 666.85 |
| G167 | 12,511 | 11,541 | 663.01 | 666.02 | 666.37 | 666.15 |
| G168 | 12,507 | 11,844 | 663.49 | 665.05 | 665.77 | 666.47 |
| G169 | 12,506 | 12,141 | 663.36 | 664.96 | 665.58 | 666.25 |
| G170 | 12,494 | 12,422 | 663.09 | 664.66 | 665.37 | 666.03 |
| G178 | 10,872 | 11,817 | 663.59 | 664.15 | 664.72 | 666.32 |
| G179 | 10,575 | 11,790 | 662.42 | 664.03 | 664.72 | 665.33 |
| G180 | 10,487 | 11,555 | 662.54 | 664.09 | 664.79 | 665.44 |
| G181 | 10,483 | 11,256 | 663.20 | 664.52 | 665.39 | 666.12 |
| G183 | 10,430 | 10,673 | 663.97 | 665.37 | 665.80 | 666.90 |
| G184 | 10,452 | 10,337 | 662.50 | 665.39 | 666.47 | 666.87 |
| G185 | 10,425 | 10,033 | 664.30 | 665.31 | 666.30 | 666.86 |
| G191 | 12,568 | 11,666 | 663.42 | 665.02 | 665.73 | 666.42 |
| R166 | 12,504 | 11,250 | 663.72 | 665.33 | 666.00 | 666.72 |
| Site 1 Phase B and Site 2 Wells (Continued) | | | | | | |
| R182 | 10,471 | 10,945 | 663.47 | 665.01 | 665.70 | 666.46 |
| R193 | 10,441 | 11,509 | 662.46 | 664.06 | 664.73 | 665.39 |
| G201 | 12,425 | 12,722 | 663.02 | 664.57 | 665.28 | 665.94 |
| G202 | 12,366 | 13,021 | 663.08 | 664.64 | 665.35 | 665.97 |
| G203 | 12,167 | 13,073 | 663.06 | 664.58 | 665.34 | 665.94 |
| G204 | 11,968 | 13,075 | 662.96 | 664.51 | 665.23 | 665.89 |
| G205 | 11,768 | 13,075 | 663.03 | 664.65 | 665.29 | 665.98 |
| G206 | 11,565 | 13,074 | 662.79 | 664.37 | 665.25 | 665.72 |

Table 1
Summary of Shallow Drift Aquifer Groundwater Elevation Data

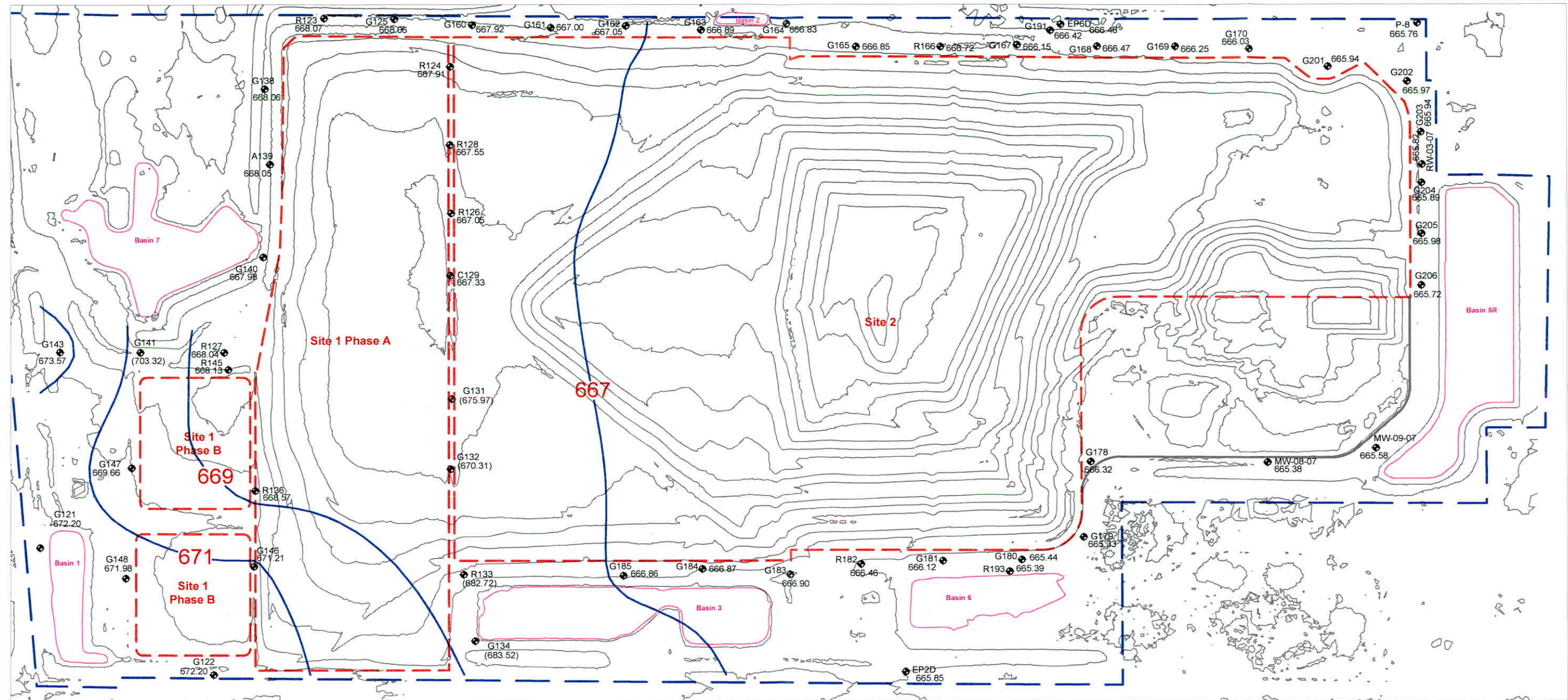
| Well Designation | Northing (ft) | Easting (ft) | 3rd Quarter 2018 (ft msl) | 4th Quarter 2018 (ft msl) | 1st Quarter 2019 (ft msl) | 2nd Quarter 2019 (ft msl) |
|------------------|---------------|--------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Piezometers | | | | | | |
| A139 | 12,042 | 8,689 | 665.09 | 666.62 | 667.37 | 668.05 |
| G125 | 12,613 | 9,163 | 665.41 | 666.65 | 667.38 | 668.06 |
| G134 | 10,169 | 9,468 | 681.81 | 682.43 | 683.15 | 683.52 * |
| G138 | 12,338 | 8,670 | 666.75 | 666.67 | 667.35 | 668.06 |
| G140 | 11,678 | 8,663 | 665.06 | 666.61 | 667.32 | 667.98 |
| G141 | 11,303 | 8,192 | 700.96 | 702.25 | 703.16 | 703.32 * |
| G143 | 11,304 | 7,884 | 670.84 | 669.63 | 673.03 | 673.57 |
| RW-03-07 | 12,040 | 13,077 | 662.92 | 664.44 | 665.19 | 665.82 |
| MW-08-07 | 10,869 | 12,490 | 662.64 | 664.18 | 664.70 | 665.38 |
| MW-09-07 | 10,925 | 12,901 | 661.68 | 664.27 | 664.89 | 665.58 |
| EP2D | 10,048 | 11,114 | 662.98 | 664.57 | 665.22 | 665.85 |
| EP6D | 12,592 | 11,706 | 663.44 | 665.05 | 665.74 | 666.48 |
| P-8 | 12,596 | 13,060 | 662.85 | 664.36 | 665.09 | 665.76 |

Notes:

* Indicates data not used during development of the potentiometric contour map since the wells do not reflect heads representative of the Uppermost Aquifer.

Table 2
Summary of Shallow Drift Aquifer Horizontal Hydraulic Gradient Data

| Well Designation | | | Northing | Easting |
|---|--|--|--|--|
| G121 | | | 10,535 | 7,808 |
| C129 | | | 11,606 | 9,375 |
| Horizontal Distance Between Wells (DI) = | | | | 1,898 |
| Well Designation | 3rd Quarter 2018 Groundwater Elevation | 4th Quarter 2018 Groundwater Elevation | 1st Quarter 2019 Groundwater Elevation | 2nd Quarter 2019 Groundwater Elevation |
| G121 | 669.70 | 671.03 | 671.71 | 672.20 |
| C129 | 664.28 | 665.89 | 666.57 | 667.33 |
| Horizontal Hydraulic Gradient Calculation | | | | |
| Change in Head (Dh) (ft) | 5.42 | 5.14 | 5.14 | 4.87 |
| Change in Length (DI) (ft) | 1,898 | 1,898 | 1,898 | 1,898 |
| Dh/DI (ft/ft) | 0.0029 | 0.0027 | 0.0027 | 0.0026 |



Legend:

G122
663.53 •

R133
(680.00) •

662

Shallow Drift Aquifer Monitoring Well and Groundwater Elevation Used to Develop the Potentiometric Contour Map

Shallow Drift Aquifer Monitoring Well and Groundwater Elevation Not Used to Develop the Potentiometric Contour Map

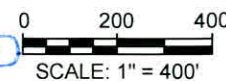
Potentiometric Contour (2-foot Interval)

Facility Boundary

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUN 27 2025

REVIEWER. MED



PREPARED BY



**ENVIRONMENTAL
INFORMATION
LOGISTICS, LLC**

PREPARED FOR

**BFI Waste Systems
of
North America, LLC**

Drawing 1

Shallow Drift Aquifer

Potentiometric Map - Second Quarter 2019

Zion Landfills
Zion, Illinois

990403

2019-06-12



June 28, 2019

Dear Customer:

The following is the proof-of-delivery for tracking number **775522448619**.

Delivery Information:

| | | | |
|--------------------------|--------------|---------------------------|--|
| Status: | Delivered | Delivery location: | 1021 E NORTH GRAND AVE Springfield, IL 62702 |
| Signed for by: | RD | Delivery date: | Jun 28, 2019 10:40 |
| Service type: | FedEx Ground | | |
| Special Handling: | | | |



Shipping Information:

| | | | |
|-------------------------|--------------|-------------------|----------------|
| Tracking number: | 775522448619 | Ship date: | Jun 27, 2019 |
| | | Weight: | 1.0 lbs/0.5 kg |

Recipient:
Kenn Smith
Illinois Environmental Protection A
1021 NORTH GRAND AVE E
SPRINGFIELD, IL 62702 US

Reference

Shipper:
Joseph D. Miller
EIL
534 Duane Street
Glen Ellyn, IL 60137 US
990404

Thank you for choosing FedEx.



Illinois
Environmental
Protection Agency

Bureau of Land
1021 North Grand Avenue East
Box 19276
Springfield, IL 62794-9276

June 26, 2020

RCRA FACILITY GROUNDWATER, LEACHATE AND GAS REPORTING FORM

This form must be used as a cover sheet for the notices and reports, identified below as required by: (1) a facility's RCRA interim status closure plan; (2) the RCRA interim status regulations; or (3) a facility's RCRA permit. All reports must be submitted to the Illinois EPA's Bureau of Land Permit Section. This form is for use by Hazardous Waste facilities only. Reporting for Solid Waste facilities should be submitted on a separate form. All reports submitted to the Illinois EPA's Bureau of Land Permit Section must contain an original, plus a minimum of two copies.

Note: This form is not to be used with permit or closure plan modification requests. The facility's approved permit or closure plan will state whether the document you are submitting is required as a report or a modification request.

Facility Name: Zion Site 1 Phase A Landfill

Site ID #: 0978020001

Facility Address: 701 Green Bay Road Zion, Illinois 60099

Fed ID #: ILD980700728

Check the appropriate heading. Only one heading may be checked for each corresponding submittal. Check the appropriate sub-heading, where applicable. Attach the original and all copies behind this form.

☐ LPC-160 Forms

☐ Groundwater

☐ Quarterly – Indicate one: 1 2 3 4

☐ Semi-Annual

☐ Annual

☐ Biennial

☐ Leachate

☐ Quarterly – Indicate one: 1 2 3 4

☐ Semi-Annual

☐ Annual

☐ Biennial

☐ Groundwater Data (without LPC-160 Forms)

☐ Quarterly – Indicate one: 1 2 3 4

☐ Annual

☐ Semi-Annual

☐ Biennial

☐ Well Construction Information

☐ Well Construction Forms, Boring Logs and/or Abandonment Forms

☐ Well Survey Data (e.g., Stick-up Elevation Data)

☐ Notice of Statistically Significant Evidence of Groundwater Contamination
(35 Ill. Adm. Code 724.198)

☐ Notice of Exceedence of Groundwater Concentration Limit (35 Ill. Adm. Code 724.199(h))

☐ Notice of Alternate Source or Error in Sampling Analysis or Evaluation of Groundwater
(35 Ill. Adm. Code 724.199(i))

☐ Gas Monitoring Reports

☒ Other (identify) Annual groundwater flow report



BFI Waste Systems of North America, LLC.
26W580 Schick Road
Hanover Park, IL 60133

June 26, 2020

Mr. Kenneth E. Smith, P.E.
Permit Section, Bureau of Land - #33
Illinois Environmental Protection Agency
1021 N. Grand Avenue East
Springfield, Illinois 62702

Re: Annual Groundwater Flow Evaluation
0978020001 – Lake County
Zion Site 1 Phase A Landfill
ILD980700728

Dear Mr. Smith,

Enclosed, please find four copies of the above referenced report that is being submitted on behalf of BFI Waste Systems of North America, LLC.

If you have any questions concerning this submittal, feel free to contact me at (224) 970-1129 or JHitzeroth@republicservices.com.

Sincerely,
BFI Waste Systems of North America, LLC

James Hitzeroth



Fed Ex Tracking No. 7707 4009 2926

June 26, 2020

Mr. Kenneth E. Smith, P.E.
Illinois Environmental Protection Agency
Permit Section - Bureau of Land #33
1021 North Grand Avenue East
Springfield, Illinois 62794

Re: Annual Groundwater Flow Evaluation
0978020001 – Lake County
Zion Site 1 Phase A Landfill
ILD980700728

Dear Mr. Smith:

Groundwater elevations measured in the Shallow Drift Aquifer between the third quarter 2019 and second quarter 2020 are provided on Table 1. Groundwater flow within the Shallow Drift Aquifer was directed toward the northeast and east across the site during this period as shown on Drawing 1. The northeast and east groundwater flow direction was consistent with that historically observed at the site. The hydraulic gradient within the Shallow Drift Aquifer measured between wells G121 and C129 ranged between 0.0026 and 0.0028 as shown on Table 2. These data reflect consistency in the magnitude and direction of the horizontal gradient throughout the period and with that historically observed at the site. The existing monitoring network will continue to be capable of detecting a potential release from the landfill since no change in the direction of groundwater flow has occurred.

Please contact me at (630) 750-6556 should you have questions.

Sincerely,
Environmental Information Logistics

A handwritten signature in black ink, appearing to read "Joseph D. Miller". The signature is written in a cursive, flowing style.

Joseph D. Miller, P.G.
Hydrogeologist

cc: Mr. Jim Hitzeroth – BFI Waste Systems of North America, LLC
Mr. Daniel Otzelberger – Advanced Disposal Services Zion Landfill, Inc.

Attachments

Table 1
Summary of Shallow Drift Aquifer Groundwater Elevation Data

| Well Designation | 3rd Quarter 2019 (ft msl) | 4th Quarter 2019 (ft msl) | 1st Quarter 2020 (ft msl) | 2nd Quarter 2020 (ft msl) |
|---------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Permit Specified Wells | | | | |
| C129 | 667.03 | 665.92 | 667.78 | 667.88 |
| G121 | 672.02 | 671.30 | 672.65 | 672.82 |
| G131 | 675.94 | 674.79 | 676.30 | 675.94 * |
| G132 | 669.97 | 668.95 | 670.64 | 670.74 * |
| R123 | 667.78 | 666.69 | 668.56 | 668.63 |
| R124 | 667.69 | 666.60 | 668.45 | 668.50 |
| R126 | 667.30 | 665.70 | 667.55 | 667.60 |
| R127 | 667.77 | 666.67 | 668.55 | 668.62 |
| R128 | 667.23 | 666.12 | 668.01 | 668.04 |
| R133 | 682.70 | 681.73 | 683.05 | 683.04 * |
| R136 | 668.28 | 667.19 | 669.04 | 669.10 |
| Site 1 Phase B and Site 2 Wells | | | | |
| G122 | 672.02 | 671.38 | 672.67 | 672.96 |
| R145 | 667.84 | 666.75 | 668.62 | 668.67 |
| G146 | 670.97 | 670.03 | 671.64 | 671.78 |
| G147 | 669.38 | 668.46 | 670.12 | 670.25 |
| G148 | 671.81 | 671.06 | 672.40 | 672.59 |
| G160 | 667.70 | 666.61 | 668.46 | 668.51 |
| G161 | 666.77 | 665.65 | 667.52 | 667.57 |
| G162 | 666.85 | 665.72 | 667.57 | 667.61 |
| G163 | 666.65 | 665.58 | 667.40 | 667.46 |
| G164 | 666.55 | 665.45 | 667.34 | 667.39 |
| G165 | 666.60 | 665.52 | 668.40 | 667.37 |
| G167 | 666.60 | 665.49 | 667.32 | 667.34 |
| G168 | 666.20 | 665.15 | 666.97 | 666.96 |
| G169 | 665.94 | 664.97 | 666.68 | 666.71 |
| G170 | 665.69 | 664.73 | 666.45 | 666.46 |
| G178 | 665.90 | 665.19 | 666.68 | 666.75 |
| G179 | 664.94 | 664.13 | 665.71 | 665.82 |
| G180 | 665.03 | 664.19 | 665.76 | 665.87 |
| G181 | 665.77 | 664.76 | 666.50 | 666.59 |
| G183 | 666.46 | 665.43 | 666.98 | 666.28 |
| G184 | 666.60 | 665.41 | 667.15 | 666.53 |
| G185 | 666.62 | 665.58 | 667.32 | 667.27 |
| G191 | 666.12 | 665.07 | 666.85 | 666.81 |
| R166 | 666.42 | 665.38 | 667.11 | 667.11 |
| R182 | 666.07 | 665.04 | 666.80 | 666.85 |
| R193 | 665.01 | 664.00 | 665.75 | 665.85 |
| G201 | 665.60 | 664.64 | 666.37 | 666.36 |
| G202 | 665.65 | 664.70 | 666.29 | 666.84 |
| G203 | 665.62 | 664.69 | 666.40 | 666.39 |
| G204 | 665.53 | 664.59 | 666.26 | 666.33 |
| G205 | 665.61 | 664.67 | 666.38 | 666.41 |
| G206 | 665.37 | 664.44 | 666.12 | 666.16 |
| G207 | --- | 664.55 | 666.19 | 666.27 |
| G208 | --- | 664.40 | 666.04 | 666.14 |
| G209 | --- | 664.39 | 666.03 | 666.08 |

Table 1
Summary of Shallow Drift Aquifer Groundwater Elevation Data

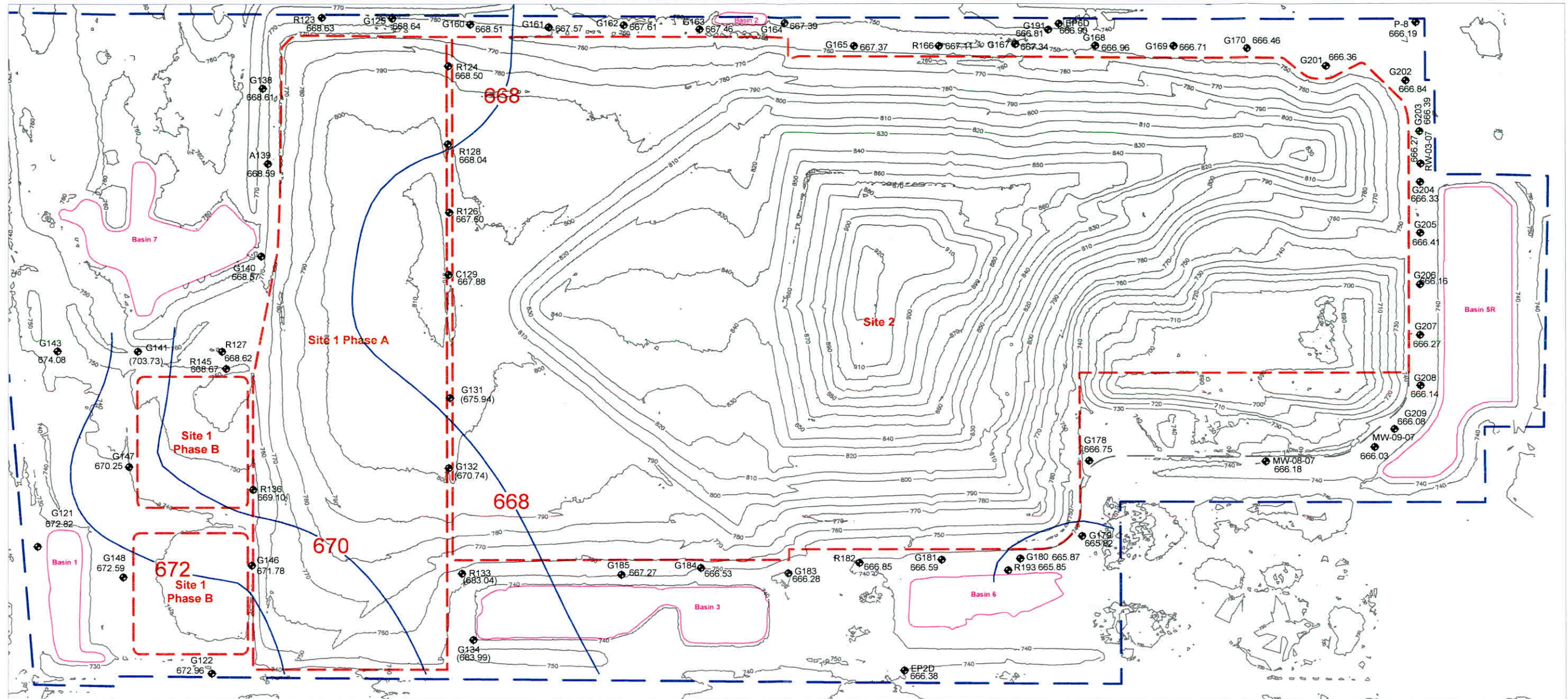
| Well Designation | 3rd Quarter 2019 (ft msl) | 4th Quarter 2019 (ft msl) | 1st Quarter 2020 (ft msl) | 2nd Quarter 2020 (ft msl) |
|---------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Piezometers | | | | |
| A139 | 667.73 | 666.71 | 668.52 | 668.59 |
| G125 | 667.84 | 666.72 | 668.59 | 668.64 |
| G134 | 683.51 | 682.56 | 683.81 | 683.99 * |
| G138 | 667.81 | 666.73 | 668.75 | 668.61 |
| G140 | 667.70 | 666.66 | 668.52 | 668.57 |
| G141 | 703.09 | 702.04 | 703.80 | 703.73 * |
| G143 | 673.23 | 672.40 | 674.02 | 674.08 |
| RW-03-07 | 665.50 | 664.65 | 666.25 | 666.27 |
| MW-08-07 | 665.35 | 664.40 | 666.07 | 666.18 |
| MW-09-07 | 665.20 | 664.32 | 665.94 | 666.03 |
| EP2D | 665.53 | 664.61 | 666.28 | 666.38 |
| EP6D | 666.12 | 665.07 | 666.90 | 666.90 |
| P8 | 665.42 | 664.48 | 666.18 | 666.19 |

Notes:

* Indicates data not used during development of the potentiometric contour map since the wells do not reflect heads representative of the Uppermost Aquifer.

Table 2
Summary of Shallow Drift Aquifer Horizontal Hydraulic Gradient Data

| Well Designation | | | Northing | Easting |
|---|--|--|--|--|
| G121 | | | 10,535 | 7,808 |
| C129 | | | 11,606 | 9,375 |
| Horizontal Distance Between Wells (DI) = | | | | 1,898 |
| Well Designation | 3rd Quarter 2019 Groundwater Elevation | 4th Quarter 2019 Groundwater Elevation | 1st Quarter 2020 Groundwater Elevation | 2nd Quarter 2020 Groundwater Elevation |
| G121 | 672.02 | 671.30 | 672.65 | 672.82 |
| C129 | 667.03 | 665.92 | 667.78 | 667.88 |
| Horizontal Hydraulic Gradient Calculation | | | | |
| Change in Head (Dh) (ft) | 4.99 | 5.38 | 4.87 | 4.94 |
| Change in Length (DI) (ft) | 1,898 | 1,898 | 1,898 | 1,898 |
| Dh/DI (ft/ft) | 0.0026 | 0.0028 | 0.0026 | 0.0026 |

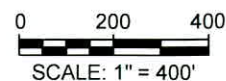


Legend:

- G122
663.53 • Shallow Drift Aquifer Monitoring Well and Groundwater Elevation Used to Develop the Potentiometric Contour Map
- R133
(680.00) • Shallow Drift Aquifer Monitoring Well and Groundwater Elevation Not Used to Develop the Potentiometric Contour Map
- 662 — Potentiometric Contour (2-foot Interval)
- Facility Boundary
- - - Waste Boundary

JUN 27 2025

REVIEWER: MLD



PREPARED BY
EIL
ENVIRONMENTAL
INFORMATION
LOGISTICS, LLC

PREPARED FOR
**BFI Waste Systems
of
North America, LLC**

Drawing 1
Shallow Drift Aquifer
Potentiometric Map - Second Quarter 2020
Zion Landfills
Zion, Illinois

990402

2020-06-09

Appendix C-3
Supporting Data For Statistical Calculations

Percentiles of Student's t-Distribution

(F = 1- α ; n = degrees of freedom)

| $\begin{matrix} \text{F} \\ \text{n} \end{matrix}$ | 0.6 | 0.75 | 0.9 | 0.95 | 0.975 | 0.99 | 0.995 | 0.9995 |
|--|-------|-------|-------|-------|--------|--------|--------|---------|
| 1 | 0.325 | 1.000 | 3.078 | 6.314 | 12.706 | 31.821 | 63.657 | 636.619 |
| 2 | 0.289 | 0.816 | 1.886 | 2.920 | 4.303 | 6.965 | 9.925 | 31.599 |
| 3 | 0.277 | 0.765 | 1.638 | 2.353 | 3.182 | 4.541 | 5.841 | 12.924 |
| 4 | 0.271 | 0.741 | 1.533 | 2.132 | 2.776 | 3.747 | 4.604 | 8.610 |
| 5 | 0.267 | 0.727 | 1.476 | 2.015 | 2.571 | 3.365 | 4.032 | 6.869 |
| 6 | 0.265 | 0.718 | 1.440 | 1.943 | 2.447 | 3.143 | 3.707 | 5.959 |
| 7 | 0.263 | 0.711 | 1.415 | 1.895 | 2.365 | 2.998 | 3.499 | 5.408 |
| 8 | 0.262 | 0.706 | 1.397 | 1.860 | 2.306 | 2.896 | 3.355 | 5.041 |
| 9 | 0.261 | 0.703 | 1.383 | 1.833 | 2.262 | 2.821 | 3.250 | 4.781 |
| 10 | 0.260 | 0.700 | 1.372 | 1.812 | 2.228 | 2.764 | 3.169 | 4.587 |
| 11 | 0.260 | 0.697 | 1.363 | 1.796 | 2.201 | 2.718 | 3.106 | 4.437 |
| 12 | 0.259 | 0.695 | 1.356 | 1.782 | 2.179 | 2.681 | 3.055 | 4.318 |
| 13 | 0.259 | 0.694 | 1.350 | 1.771 | 2.160 | 2.650 | 3.012 | 4.221 |
| 14 | 0.258 | 0.692 | 1.345 | 1.761 | 2.145 | 2.624 | 2.977 | 4.140 |
| 15 | 0.258 | 0.691 | 1.341 | 1.753 | 2.131 | 2.602 | 2.947 | 4.073 |
| 16 | 0.258 | 0.690 | 1.337 | 1.746 | 2.120 | 2.583 | 2.921 | 4.015 |
| 17 | 0.257 | 0.689 | 1.333 | 1.740 | 2.110 | 2.567 | 2.898 | 3.965 |
| 18 | 0.257 | 0.688 | 1.330 | 1.734 | 2.101 | 2.552 | 2.878 | 3.922 |
| 19 | 0.257 | 0.688 | 1.328 | 1.729 | 2.093 | 2.539 | 2.861 | 3.883 |
| 20 | 0.257 | 0.687 | 1.325 | 1.725 | 2.086 | 2.528 | 2.845 | 3.850 |
| 21 | 0.257 | 0.686 | 1.323 | 1.721 | 2.080 | 2.518 | 2.831 | 3.819 |
| 22 | 0.256 | 0.686 | 1.321 | 1.717 | 2.074 | 2.508 | 2.819 | 3.792 |
| 23 | 0.256 | 0.685 | 1.319 | 1.714 | 2.069 | 2.500 | 2.807 | 3.768 |
| 24 | 0.256 | 0.685 | 1.318 | 1.711 | 2.064 | 2.492 | 2.797 | 3.745 |
| 25 | 0.256 | 0.684 | 1.316 | 1.708 | 2.060 | 2.485 | 2.787 | 3.725 |
| 26 | 0.256 | 0.684 | 1.315 | 1.706 | 2.056 | 2.479 | 2.779 | 3.707 |
| 27 | 0.256 | 0.684 | 1.314 | 1.703 | 2.052 | 2.473 | 2.771 | 3.690 |
| 28 | 0.256 | 0.683 | 1.313 | 1.701 | 2.048 | 2.467 | 2.763 | 3.674 |
| 29 | 0.256 | 0.683 | 1.311 | 1.699 | 2.045 | 2.462 | 2.756 | 3.659 |
| 30 | 0.256 | 0.683 | 1.310 | 1.697 | 2.042 | 2.457 | 2.750 | 3.646 |
| 40 | 0.255 | 0.681 | 1.303 | 1.684 | 2.021 | 2.423 | 2.704 | 3.551 |
| 60 | 0.254 | 0.679 | 1.296 | 1.671 | 2.000 | 2.390 | 2.660 | 3.460 |
| 120 | 0.254 | 0.677 | 1.289 | 1.658 | 1.980 | 2.358 | 2.617 | 3.373 |
| ∞ | 0.253 | 0.674 | 1.282 | 1.645 | 1.96 | 2.326 | 2.576 | 3.291 |

Source: CRC Handbook of Tables for Probability and Statistics. 1966. W.H. Beyer, Editor. Published by the Chemical Rubber Company, Cleveland, Ohio.

Nonparametric Statistical Methods

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Table A.21. Upper tail probabilities for the null distribution of Kendall's K statistic: $n = 4(1)40$

For a given n , the entry in the table for the point x is $P_0\{K > x\}$. Under these conditions, if x is such that $P_0\{K > x\} = \alpha$, then $k(\alpha, n) = x$. For certain n , the entries are terminated at x_n , where x_n is the smallest possible value of x such that $P_0\{K > x\}$ is zero to three decimal places. [For $n = 4(1)40$ or $n = 5(1)37$ all even integers between $-n(n-1)/2$ and $n(n-1)/2$ have positive probability and for $n = 6(1)38$ or $n = 7(1)39$ all odd integers between $-n(n-1)/2$ and $n(n-1)/2$ have positive probability.]

| $(n) \rightarrow$ | | n | | | | | | | | | |
|-------------------|-----|------|------|------|------|------|------|------|------|------|--|
| $(5) \downarrow$ | x | 4 | 5 | 8 | 9 | 12 | 13 | 16 | 17 | 20 | |
| 0 | | .625 | .592 | .548 | .540 | .527 | .524 | .518 | .516 | .513 | |
| 2 | | .375 | .408 | .452 | .460 | .473 | .476 | .482 | .484 | .487 | |
| 4 | | .167 | .242 | .360 | .381 | .420 | .429 | .447 | .452 | .462 | |
| 6 | | .042 | .117 | .274 | .306 | .369 | .383 | .412 | .420 | .436 | |
| 8 | | | .042 | .199 | .238 | .319 | .338 | .378 | .388 | .411 | |
| 10 | | | .008 | .138 | .179 | .273 | .295 | .345 | .358 | .387 | |
| 12 | | | | .089 | .130 | .230 | .255 | .313 | .328 | .362 | |
| 14 | | | | .054 | .090 | .190 | .218 | .282 | .299 | .339 | |
| 16 | | | | .031 | .060 | .155 | .184 | .253 | .271 | .315 | |
| 18 | | | | .016 | .038 | .125 | .153 | .225 | .245 | .293 | |
| 20 | | | | .007 | .022 | .098 | .126 | .199 | .220 | .271 | |
| 22 | | | | .002 | .012 | .076 | .102 | .175 | .196 | .250 | |
| 24 | | | | .001 | .006 | .058 | .082 | .153 | .174 | .230 | |
| 26 | | | | .000 | .003 | .043 | .064 | .133 | .154 | .211 | |
| 28 | | | | | .001 | .031 | .050 | .114 | .135 | .193 | |
| 30 | | | | | .000 | .022 | .038 | .097 | .118 | .176 | |
| 32 | | | | | | .016 | .029 | .083 | .102 | .159 | |
| 34 | | | | | | .010 | .021 | .070 | .088 | .144 | |
| 36 | | | | | | .007 | .015 | .058 | .076 | .130 | |
| 38 | | | | | | .004 | .011 | .048 | .064 | .117 | |
| 40 | | | | | | .003 | .007 | .039 | .054 | .104 | |
| 42 | | | | | | .002 | .005 | .032 | .046 | .093 | |
| 44 | | | | | | .001 | .003 | .026 | .038 | .087 | |
| 46 | | | | | | .000 | .002 | .021 | .032 | .073 | |
| 48 | | | | | | | .001 | .016 | .026 | .064 | |
| 50 | | | | | | | .001 | .013 | .021 | .056 | |
| 52 | | | | | | | .000 | .010 | .017 | .049 | |
| 54 | | | | | | | | .008 | .014 | .043 | |
| 56 | | | | | | | | .006 | .011 | .037 | |
| 58 | | | | | | | | .004 | .009 | .032 | |
| 60 | | | | | | | | .003 | .007 | .027 | |
| 62 | | | | | | | | .002 | .005 | .023 | |
| 64 | | | | | | | | .002 | .004 | .020 | |
| 66 | | | | | | | | .001 | .003 | .017 | |
| 68 | | | | | | | | .001 | .002 | .014 | |
| 70 | | | | | | | | .001 | .002 | .012 | |

Table A.21 (continued)

| r | n | | | | | | | | |
|-----|---|---|---|---|----|----|------|------|------|
| | 4 | 5 | 8 | 9 | 12 | 13 | 16 | 17 | 20 |
| 72 | | | | | | | .000 | .001 | .010 |
| 74 | | | | | | | | .001 | .008 |
| 76 | | | | | | | | .001 | .007 |
| 78 | | | | | | | | .000 | .006 |
| 80 | | | | | | | | | .005 |
| 82 | | | | | | | | | .004 |
| 84 | | | | | | | | | .003 |
| 86 | | | | | | | | | .002 |
| 88 | | | | | | | | | .002 |
| 90 | | | | | | | | | .002 |
| 92 | | | | | | | | | .001 |
| 94 | | | | | | | | | .001 |
| 96 | | | | | | | | | .001 |
| 98 | | | | | | | | | .001 |
| 100 | | | | | | | | | .000 |

| r | n | | | | | | | | | |
|----|------|------|------|------|------|------|------|------|------|------|
| | 21 | 24 | 25 | 28 | 29 | 32 | 33 | 36 | 37 | 40 |
| 0 | .512 | .510 | .509 | .508 | .507 | .506 | .506 | .505 | .505 | .505 |
| 2 | .488 | .490 | .491 | .492 | .493 | .494 | .494 | .495 | .495 | .495 |
| 4 | .464 | .471 | .472 | .477 | .478 | .481 | .482 | .484 | .484 | .486 |
| 6 | .441 | .451 | .454 | .461 | .463 | .468 | .469 | .473 | .474 | .477 |
| 8 | .417 | .432 | .436 | .446 | .448 | .455 | .457 | .462 | .464 | .468 |
| 10 | .394 | .413 | .418 | .430 | .434 | .442 | .445 | .452 | .453 | .459 |
| 12 | .371 | .394 | .400 | .415 | .419 | .430 | .433 | .441 | .443 | .449 |
| 14 | .349 | .375 | .382 | .400 | .405 | .417 | .421 | .430 | .433 | .440 |
| 16 | .327 | .356 | .364 | .385 | .390 | .405 | .409 | .420 | .423 | .431 |
| 18 | .306 | .338 | .347 | .370 | .376 | .392 | .397 | .409 | .413 | .422 |
| 20 | .285 | .320 | .330 | .355 | .362 | .380 | .385 | .399 | .403 | .413 |
| 22 | .265 | .303 | .314 | .341 | .348 | .368 | .373 | .388 | .393 | .404 |
| 24 | .246 | .286 | .297 | .326 | .334 | .356 | .362 | .378 | .383 | .395 |
| 26 | .228 | .270 | .282 | .312 | .321 | .344 | .350 | .368 | .373 | .386 |
| 28 | .210 | .254 | .266 | .298 | .308 | .332 | .339 | .358 | .363 | .377 |
| 30 | .193 | .238 | .251 | .285 | .295 | .320 | .328 | .347 | .353 | .369 |
| 32 | .177 | .223 | .237 | .272 | .282 | .309 | .317 | .338 | .344 | .360 |
| 34 | .162 | .209 | .222 | .259 | .270 | .298 | .306 | .328 | .334 | .351 |
| 36 | .147 | .195 | .209 | .246 | .257 | .287 | .295 | .318 | .325 | .343 |
| 38 | .134 | .181 | .196 | .234 | .246 | .276 | .285 | .308 | .315 | .334 |
| 40 | .121 | .169 | .183 | .222 | .234 | .265 | .274 | .299 | .306 | .326 |
| 42 | .109 | .156 | .171 | .211 | .223 | .255 | .264 | .290 | .297 | .318 |
| 44 | .098 | .145 | .159 | .200 | .212 | .244 | .254 | .280 | .288 | .309 |

Table A.21 (continued)

| x | n | | | | | | | | | |
|-----|------|------|------|------|------|------|------|------|------|------|
| | 21 | 24 | 25 | 28 | 29 | 32 | 33 | 36 | 37 | 40 |
| 46 | .088 | .134 | .148 | .189 | .201 | .234 | .244 | .271 | .279 | .301 |
| 48 | .079 | .123 | .138 | .178 | .191 | .224 | .235 | .262 | .271 | .293 |
| 50 | .070 | .113 | .128 | .168 | .181 | .215 | .225 | .254 | .262 | .285 |
| 52 | .062 | .104 | .118 | .158 | .171 | .206 | .216 | .245 | .254 | .277 |
| 54 | .055 | .095 | .109 | .149 | .162 | .197 | .207 | .237 | .245 | .270 |
| 56 | .049 | .087 | .101 | .140 | .153 | .188 | .199 | .228 | .237 | .262 |
| 58 | .043 | .079 | .093 | .131 | .144 | .179 | .190 | .220 | .229 | .255 |
| 60 | .037 | .072 | .085 | .123 | .136 | .171 | .182 | .212 | .222 | .247 |
| 62 | .032 | .066 | .078 | .115 | .128 | .163 | .174 | .204 | .214 | .240 |
| 64 | .028 | .059 | .071 | .108 | .120 | .155 | .166 | .197 | .206 | .233 |
| 66 | .024 | .054 | .065 | .101 | .112 | .147 | .158 | .189 | .199 | .226 |
| 68 | .021 | .048 | .059 | .094 | .105 | .140 | .151 | .182 | .192 | .219 |
| 70 | .018 | .044 | .054 | .087 | .099 | .133 | .144 | .175 | .185 | .212 |
| 72 | .015 | .039 | .049 | .081 | .092 | .126 | .137 | .168 | .178 | .205 |
| 74 | .013 | .035 | .044 | .075 | .086 | .119 | .130 | .161 | .171 | .199 |
| 76 | .011 | .031 | .040 | .070 | .080 | .113 | .124 | .155 | .165 | .192 |
| 78 | .009 | .028 | .036 | .065 | .075 | .107 | .117 | .148 | .158 | .186 |
| 80 | .008 | .025 | .032 | .060 | .070 | .101 | .111 | .142 | .152 | .180 |
| 82 | .007 | .022 | .029 | .055 | .065 | .095 | .106 | .136 | .146 | .174 |
| 84 | .005 | .019 | .026 | .051 | .060 | .090 | .100 | .130 | .140 | .168 |
| 86 | .005 | .017 | .023 | .047 | .056 | .085 | .095 | .124 | .134 | .162 |
| 88 | .004 | .015 | .021 | .043 | .052 | .080 | .090 | .119 | .129 | .156 |
| 90 | .003 | .013 | .018 | .039 | .048 | .075 | .085 | .114 | .123 | .151 |
| 92 | .002 | .011 | .016 | .036 | .044 | .070 | .080 | .108 | .118 | .146 |
| 94 | .002 | .010 | .014 | .033 | .041 | .066 | .075 | .103 | .113 | .140 |
| 96 | .002 | .009 | .013 | .030 | .037 | .062 | .071 | .099 | .108 | .135 |
| 98 | .001 | .007 | .011 | .027 | .034 | .058 | .067 | .094 | .103 | .130 |
| 100 | .001 | .006 | .010 | .025 | .031 | .054 | .063 | .089 | .098 | .125 |
| 102 | .001 | .006 | .009 | .023 | .029 | .051 | .059 | .085 | .094 | .121 |
| 104 | .001 | .005 | .008 | .021 | .026 | .048 | .055 | .081 | .090 | .116 |
| 106 | .001 | .004 | .007 | .019 | .024 | .044 | .052 | .077 | .085 | .111 |
| 108 | .000 | .003 | .006 | .017 | .022 | .041 | .049 | .073 | .081 | .107 |
| 110 | | .003 | .005 | .015 | .020 | .039 | .046 | .069 | .077 | .103 |
| 112 | | .003 | .004 | .014 | .018 | .036 | .043 | .064 | .074 | .099 |
| 114 | | .002 | .004 | .012 | .017 | .033 | .040 | .062 | .070 | .095 |
| 116 | | .002 | .003 | .011 | .015 | .031 | .037 | .059 | .067 | .091 |
| 118 | | .001 | .003 | .010 | .014 | .029 | .035 | .056 | .063 | .087 |
| 120 | | .001 | .002 | .009 | .012 | .027 | .032 | .053 | .060 | .083 |
| 122 | | .001 | .002 | .008 | .011 | .025 | .030 | .050 | .057 | .080 |
| 124 | | .001 | .002 | .007 | .010 | .023 | .028 | .047 | .054 | .076 |
| 126 | | .001 | .001 | .006 | .009 | .021 | .026 | .044 | .051 | .073 |
| 128 | | .001 | .001 | .006 | .008 | .019 | .024 | .042 | .048 | .070 |
| 130 | | .000 | .001 | .005 | .007 | .018 | .023 | .039 | .046 | .067 |
| 132 | | | .001 | .004 | .007 | .016 | .021 | .037 | .043 | .064 |

Table A.21 (continued)

| x | n | | | | | | | | | |
|-----|----|----|------|------|------|------|------|------|------|------|
| | 21 | 24 | 25 | 28 | 29 | 32 | 33 | 36 | 37 | 40 |
| 134 | | | .001 | .004 | .006 | .015 | .019 | .035 | .041 | .061 |
| 136 | | | .001 | .003 | .005 | .014 | .018 | .033 | .039 | .058 |
| 138 | | | .000 | .003 | .005 | .013 | .017 | .031 | .037 | .055 |
| 140 | | | | .003 | .004 | .012 | .015 | .029 | .034 | .053 |
| 142 | | | | .002 | .004 | .011 | .014 | .027 | .032 | .050 |
| 144 | | | | .002 | .003 | .010 | .013 | .025 | .031 | .048 |
| 146 | | | | .002 | .003 | .009 | .012 | .024 | .029 | .046 |
| 148 | | | | .002 | .003 | .008 | .011 | .022 | .027 | .043 |
| 150 | | | | .001 | .002 | .007 | .010 | .021 | .025 | .041 |
| 152 | | | | .001 | .002 | .007 | .009 | .020 | .024 | .039 |
| 154 | | | | .001 | .002 | .006 | .008 | .018 | .022 | .037 |
| 156 | | | | .001 | .002 | .006 | .008 | .017 | .021 | .035 |
| 158 | | | | .001 | .001 | .005 | .007 | .016 | .020 | .034 |
| 160 | | | | .001 | .001 | .005 | .006 | .015 | .018 | .032 |
| 162 | | | | .001 | .001 | .004 | .006 | .014 | .017 | .030 |
| 164 | | | | .000 | .001 | .004 | .005 | .013 | .016 | .029 |
| 166 | | | | | .001 | .003 | .005 | .012 | .015 | .027 |
| 168 | | | | | .001 | .003 | .004 | .011 | .014 | .026 |
| 170 | | | | | .001 | .003 | .004 | .010 | .013 | .024 |
| 172 | | | | | .001 | .002 | .004 | .010 | .012 | .023 |
| 174 | | | | | .000 | .002 | .003 | .009 | .011 | .022 |
| 176 | | | | | | .002 | .003 | .008 | .011 | .020 |
| 178 | | | | | | .002 | .003 | .008 | .010 | .019 |
| 180 | | | | | | .002 | .002 | .007 | .009 | .018 |
| 182 | | | | | | .001 | .002 | .006 | .009 | .017 |
| 184 | | | | | | .001 | .002 | .006 | .008 | .016 |
| 186 | | | | | | .001 | .002 | .006 | .007 | .015 |
| 188 | | | | | | .001 | .002 | .005 | .007 | .014 |
| 190 | | | | | | .001 | .001 | .005 | .006 | .014 |
| 192 | | | | | | .001 | .001 | .004 | .006 | .013 |
| 194 | | | | | | .001 | .001 | .004 | .005 | .012 |
| 196 | | | | | | .001 | .001 | .004 | .005 | .011 |
| 198 | | | | | | .001 | .001 | .003 | .005 | .011 |
| 200 | | | | | | .000 | .001 | .003 | .004 | .010 |
| 202 | | | | | | | .001 | .003 | .004 | .009 |
| 204 | | | | | | | .001 | .003 | .004 | .009 |
| 206 | | | | | | | .001 | .002 | .003 | .008 |
| 208 | | | | | | | .001 | .002 | .003 | .008 |
| 210 | | | | | | | .000 | .002 | .003 | .007 |
| 212 | | | | | | | | .002 | .003 | .007 |
| 214 | | | | | | | | .002 | .002 | .006 |
| 216 | | | | | | | | .001 | .002 | .006 |
| 218 | | | | | | | | .001 | .002 | .005 |
| 220 | | | | | | | | .001 | .002 | .005 |

Table A.21 (continued)

| x | n | | | | | | | | | |
|-----|----|----|----|----|----|----|----|------|------|------|
| | 21 | 24 | 25 | 28 | 29 | 32 | 33 | 36 | 37 | 40 |
| 222 | | | | | | | | .001 | .002 | .005 |
| 224 | | | | | | | | .001 | .002 | .004 |
| 226 | | | | | | | | .001 | .001 | .004 |
| 228 | | | | | | | | .001 | .001 | .004 |
| 230 | | | | | | | | .001 | .001 | .004 |
| 232 | | | | | | | | .001 | .001 | .004 |
| 234 | | | | | | | | .001 | .001 | .003 |
| 236 | | | | | | | | .001 | .001 | .003 |
| 238 | | | | | | | | .001 | .001 | .003 |
| 240 | | | | | | | | .000 | .001 | .003 |
| 242 | | | | | | | | | .001 | .002 |
| 244 | | | | | | | | | .001 | .002 |
| 246 | | | | | | | | | .001 | .002 |
| 248 | | | | | | | | | .001 | .002 |
| 250 | | | | | | | | | .000 | .002 |
| 252 | | | | | | | | | | .002 |
| 254 | | | | | | | | | | .002 |
| 256 | | | | | | | | | | .001 |
| 258 | | | | | | | | | | .001 |
| 260 | | | | | | | | | | .001 |
| 262 | | | | | | | | | | .001 |
| 264 | | | | | | | | | | .001 |
| 266 | | | | | | | | | | .001 |
| 268 | | | | | | | | | | .001 |
| 270 | | | | | | | | | | .001 |
| 272 | | | | | | | | | | .001 |
| 274 | | | | | | | | | | .001 |
| 276 | | | | | | | | | | .001 |
| 278 | | | | | | | | | | .001 |
| 280 | | | | | | | | | | .000 |

Table A.21 (continued)

| x | n | | | | | | | | |
|----|------|------|------|------|------|------|------|------|------|
| | 6 | 7 | 10 | 11 | 14 | 15 | 18 | 19 | 22 |
| 1 | .500 | .500 | .500 | .500 | .500 | .500 | .500 | .500 | .500 |
| 3 | .360 | .386 | .431 | .440 | .457 | .461 | .470 | .473 | .478 |
| 5 | .235 | .281 | .364 | .381 | .415 | .423 | .441 | .445 | .456 |
| 7 | .136 | .191 | .300 | .324 | .374 | .385 | .411 | .418 | .434 |
| 9 | .068 | .119 | .242 | .271 | .334 | .349 | .383 | .391 | .412 |
| 11 | .028 | .068 | .190 | .223 | .295 | .313 | .354 | .365 | .390 |
| 13 | .008 | .035 | .146 | .179 | .259 | .279 | .327 | .339 | .369 |
| 15 | .001 | .015 | .108 | .141 | .225 | .248 | .300 | .314 | .348 |
| 17 | | .005 | .078 | .109 | .194 | .218 | .275 | .290 | .328 |
| 19 | | .001 | .054 | .082 | .165 | .190 | .250 | .267 | .308 |
| 21 | | .000 | .036 | .060 | .140 | .164 | .227 | .245 | .289 |
| 23 | | | .023 | .043 | .117 | .141 | .205 | .223 | .270 |
| 25 | | | .014 | .030 | .096 | .120 | .184 | .203 | .252 |
| 27 | | | .008 | .020 | .079 | .101 | .165 | .184 | .234 |
| 29 | | | .005 | .013 | .063 | .084 | .147 | .166 | .217 |
| 31 | | | .002 | .008 | .050 | .070 | .130 | .149 | .201 |
| 33 | | | .001 | .005 | .040 | .057 | .115 | .133 | .186 |
| 35 | | | .000 | .003 | .031 | .046 | .100 | .119 | .171 |
| 37 | | | | .002 | .024 | .037 | .088 | .105 | .157 |
| 39 | | | | .001 | .018 | .029 | .076 | .093 | .144 |
| 41 | | | | .000 | .013 | .023 | .066 | .082 | .131 |
| 43 | | | | | .010 | .018 | .056 | .072 | .120 |
| 45 | | | | | .007 | .014 | .048 | .062 | .109 |
| 47 | | | | | .005 | .010 | .041 | .054 | .099 |
| 49 | | | | | .003 | .008 | .034 | .047 | .089 |
| 51 | | | | | .002 | .006 | .029 | .040 | .080 |
| 53 | | | | | .002 | .004 | .024 | .034 | .072 |
| 55 | | | | | .001 | .003 | .020 | .029 | .064 |
| 57 | | | | | .001 | .002 | .016 | .025 | .058 |
| 59 | | | | | .000 | .001 | .013 | .021 | .051 |
| 61 | | | | | | .001 | .011 | .017 | .045 |
| 63 | | | | | | .001 | .009 | .014 | .040 |
| 65 | | | | | | .000 | .007 | .012 | .035 |
| 67 | | | | | | | .005 | .010 | .031 |
| 69 | | | | | | | .004 | .008 | .027 |
| 71 | | | | | | | .003 | .006 | .024 |
| 73 | | | | | | | .003 | .005 | .021 |
| 75 | | | | | | | .002 | .004 | .018 |
| 77 | | | | | | | .001 | .003 | .015 |
| 79 | | | | | | | .001 | .003 | .013 |
| 81 | | | | | | | .001 | .002 | .011 |
| 83 | | | | | | | .001 | .002 | .010 |
| 85 | | | | | | | .000 | .001 | .008 |
| 87 | | | | | | | | .001 | .007 |

Table A.21 (continued)

| x | n | | | | | | | | |
|-----|---|---|----|----|----|----|----|------|------|
| | 6 | 7 | 10 | 11 | 14 | 15 | 18 | 19 | 22 |
| 89 | | | | | | | | .001 | .006 |
| 91 | | | | | | | | .001 | .005 |
| 93 | | | | | | | | .000 | .004 |
| 95 | | | | | | | | | .003 |
| 97 | | | | | | | | | .003 |
| 99 | | | | | | | | | .002 |
| 101 | | | | | | | | | .002 |
| 103 | | | | | | | | | .002 |
| 105 | | | | | | | | | .001 |
| 107 | | | | | | | | | .001 |
| 109 | | | | | | | | | .001 |
| 111 | | | | | | | | | .001 |
| 113 | | | | | | | | | .001 |
| 115 | | | | | | | | | .000 |

| x | n | | | | | | | | |
|----|------|------|------|------|------|------|------|------|------|
| | 23 | 26 | 27 | 30 | 31 | 34 | 35 | 38 | 39 |
| 1 | .500 | .500 | .500 | .500 | .500 | .500 | .500 | .500 | .500 |
| 3 | .479 | .483 | .484 | .486 | .487 | .488 | .489 | .490 | .490 |
| 5 | .458 | .465 | .467 | .472 | .473 | .477 | .478 | .480 | .481 |
| 7 | .438 | .448 | .451 | .458 | .460 | .465 | .466 | .470 | .472 |
| 9 | .417 | .431 | .434 | .444 | .446 | .453 | .455 | .460 | .462 |
| 11 | .397 | .414 | .418 | .430 | .433 | .442 | .444 | .450 | .452 |
| 13 | .377 | .397 | .402 | .416 | .420 | .430 | .433 | .440 | .443 |
| 15 | .357 | .380 | .386 | .402 | .407 | .418 | .422 | .431 | .433 |
| 17 | .338 | .363 | .371 | .389 | .394 | .407 | .411 | .421 | .424 |
| 19 | .319 | .347 | .355 | .375 | .381 | .396 | .400 | .411 | .414 |
| 21 | .301 | .331 | .340 | .362 | .368 | .384 | .389 | .401 | .405 |
| 23 | .283 | .316 | .325 | .349 | .355 | .373 | .378 | .392 | .396 |
| 25 | .265 | .300 | .310 | .336 | .343 | .362 | .368 | .382 | .387 |
| 27 | .248 | .285 | .296 | .323 | .331 | .351 | .357 | .373 | .377 |
| 29 | .232 | .270 | .281 | .310 | .318 | .340 | .347 | .363 | .368 |
| 31 | .216 | .256 | .268 | .298 | .306 | .329 | .336 | .354 | .359 |
| 33 | .201 | .242 | .254 | .286 | .295 | .319 | .326 | .345 | .350 |
| 35 | .187 | .229 | .241 | .274 | .283 | .308 | .316 | .336 | .341 |
| 37 | .173 | .216 | .228 | .262 | .272 | .298 | .306 | .327 | .332 |
| 39 | .160 | .203 | .216 | .251 | .261 | .288 | .296 | .318 | .324 |
| 41 | .147 | .191 | .204 | .239 | .250 | .278 | .286 | .309 | .315 |
| 43 | .135 | .179 | .192 | .228 | .239 | .268 | .277 | .300 | .307 |
| 45 | .124 | .168 | .181 | .218 | .229 | .259 | .267 | .291 | .296 |
| 47 | .114 | .157 | .170 | .208 | .219 | .249 | .258 | .283 | .290 |

Table A.21 (continued)

| x | n | | | | | | | | |
|-----|------|------|------|------|------|------|------|------|------|
| | 23 | 26 | 27 | 30 | 31 | 34 | 35 | 38 | 39 |
| 49 | .104 | .147 | .160 | .198 | .209 | .240 | .249 | .274 | .282 |
| 51 | .094 | .137 | .150 | .188 | .199 | .231 | .240 | .266 | .274 |
| 53 | .086 | .127 | .141 | .178 | .190 | .222 | .232 | .258 | .266 |
| 55 | .078 | .118 | .132 | .169 | .181 | .213 | .223 | .250 | .258 |
| 57 | .070 | .110 | .123 | .160 | .172 | .205 | .215 | .242 | .250 |
| 59 | .063 | .102 | .115 | .152 | .164 | .196 | .206 | .234 | .243 |
| 61 | .057 | .094 | .107 | .144 | .155 | .183 | .198 | .227 | .235 |
| 63 | .051 | .087 | .099 | .136 | .147 | .180 | .191 | .219 | .228 |
| 65 | .046 | .080 | .092 | .128 | .140 | .173 | .183 | .212 | .221 |
| 67 | .041 | .073 | .085 | .121 | .132 | .165 | .176 | .205 | .214 |
| 69 | .036 | .067 | .079 | .114 | .125 | .158 | .168 | .198 | .207 |
| 71 | .032 | .062 | .073 | .107 | .118 | .151 | .161 | .191 | .200 |
| 73 | .028 | .057 | .067 | .100 | .112 | .144 | .154 | .184 | .193 |
| 75 | .025 | .052 | .062 | .094 | .105 | .137 | .148 | .177 | .187 |
| 77 | .022 | .047 | .057 | .088 | .099 | .131 | .141 | .171 | .180 |
| 79 | .019 | .043 | .052 | .083 | .093 | .125 | .135 | .165 | .174 |
| 81 | .017 | .039 | .048 | .077 | .088 | .119 | .129 | .158 | .168 |
| 83 | .015 | .035 | .044 | .072 | .082 | .113 | .123 | .152 | .162 |
| 85 | .013 | .032 | .040 | .067 | .077 | .107 | .117 | .147 | .156 |
| 87 | .011 | .029 | .036 | .063 | .072 | .102 | .112 | .141 | .150 |
| 89 | .009 | .026 | .033 | .059 | .068 | .097 | .107 | .135 | .145 |
| 91 | .008 | .023 | .030 | .054 | .063 | .092 | .101 | .130 | .139 |
| 93 | .007 | .021 | .027 | .051 | .059 | .087 | .096 | .125 | .134 |
| 95 | .006 | .019 | .025 | .047 | .055 | .082 | .092 | .120 | .129 |
| 97 | .005 | .017 | .022 | .043 | .052 | .078 | .087 | .115 | .124 |
| 99 | .004 | .015 | .020 | .040 | .048 | .074 | .083 | .110 | .119 |
| 101 | .004 | .013 | .018 | .037 | .045 | .070 | .078 | .105 | .114 |
| 103 | .003 | .012 | .016 | .034 | .041 | .066 | .074 | .101 | .109 |
| 105 | .003 | .010 | .015 | .032 | .038 | .062 | .070 | .096 | .105 |
| 107 | .002 | .009 | .013 | .029 | .036 | .058 | .066 | .092 | .101 |
| 109 | .002 | .008 | .012 | .027 | .033 | .055 | .063 | .088 | .096 |
| 111 | .001 | .007 | .010 | .025 | .031 | .052 | .059 | .084 | .092 |
| 113 | .001 | .006 | .009 | .023 | .028 | .049 | .056 | .080 | .088 |
| 115 | .001 | .005 | .008 | .021 | .026 | .046 | .053 | .076 | .084 |
| 117 | .001 | .005 | .007 | .019 | .024 | .043 | .050 | .073 | .081 |
| 119 | .001 | .004 | .006 | .017 | .022 | .040 | .047 | .069 | .077 |
| 121 | .000 | .004 | .006 | .016 | .020 | .038 | .044 | .066 | .074 |
| 123 | | .003 | .005 | .014 | .019 | .035 | .042 | .063 | .070 |
| 125 | | .003 | .004 | .013 | .017 | .033 | .039 | .060 | .067 |
| 127 | | .002 | .004 | .012 | .016 | .031 | .037 | .057 | .064 |
| 129 | | .002 | .003 | .011 | .014 | .029 | .034 | .054 | .061 |
| 131 | | .002 | .003 | .010 | .013 | .027 | .032 | .051 | .058 |
| 133 | | .001 | .003 | .009 | .012 | .025 | .030 | .049 | .055 |
| 135 | | .001 | .002 | .008 | .011 | .023 | .028 | .046 | .053 |

Table A.21 (continued)

| x | n | | | | | | | |
|-----|----|------|------|------|------|------|------|------|
| | 23 | 26 | 27 | 30 | 31 | 34 | 35 | 38 |
| 137 | | .001 | .002 | .007 | .010 | .022 | .026 | .044 |
| 139 | | .001 | .002 | .006 | .009 | .020 | .025 | .041 |
| 141 | | .001 | .001 | .006 | .008 | .019 | .023 | .039 |
| 143 | | .001 | .001 | .005 | .007 | .017 | .022 | .037 |
| 145 | | .001 | .001 | .005 | .007 | .016 | .020 | .035 |
| 147 | | .000 | .001 | .004 | .006 | .015 | .019 | .033 |
| 149 | | | .001 | .004 | .006 | .014 | .017 | .031 |
| 151 | | | .001 | .003 | .005 | .013 | .016 | .029 |
| 153 | | | .001 | .003 | .004 | .012 | .015 | .028 |
| 155 | | | .000 | .003 | .004 | .011 | .014 | .026 |
| 157 | | | | .002 | .004 | .010 | .013 | .025 |
| 159 | | | | .002 | .003 | .009 | .012 | .023 |
| 161 | | | | .002 | .003 | .008 | .011 | .022 |
| 163 | | | | .002 | .003 | .008 | .010 | .021 |
| 165 | | | | .001 | .002 | .007 | .010 | .019 |
| 167 | | | | .001 | .002 | .007 | .009 | .018 |
| 169 | | | | .001 | .002 | .006 | .008 | .017 |
| 171 | | | | .001 | .002 | .005 | .007 | .016 |
| 173 | | | | .001 | .001 | .005 | .007 | .015 |
| 175 | | | | .001 | .001 | .005 | .006 | .014 |
| 177 | | | | .001 | .001 | .004 | .006 | .013 |
| 179 | | | | .001 | .001 | .004 | .005 | .012 |
| 181 | | | | .000 | .001 | .003 | .005 | .011 |
| 183 | | | | | .001 | .003 | .005 | .011 |
| 185 | | | | | .001 | .003 | .004 | .010 |
| 187 | | | | | .001 | .003 | .004 | .009 |
| 189 | | | | | .001 | .002 | .003 | .009 |
| 191 | | | | | .000 | .002 | .003 | .008 |
| 193 | | | | | | .002 | .003 | .008 |
| 195 | | | | | | .002 | .003 | .007 |
| 197 | | | | | | .002 | .002 | .007 |
| 199 | | | | | | .001 | .002 | .006 |
| 201 | | | | | | .001 | .002 | .005 |
| 203 | | | | | | .001 | .002 | .005 |
| 205 | | | | | | .001 | .001 | .004 |
| 207 | | | | | | .001 | .001 | .004 |
| 209 | | | | | | .001 | .001 | .004 |
| 211 | | | | | | .001 | .001 | .004 |
| 213 | | | | | | .001 | .001 | .003 |
| 215 | | | | | | .001 | .001 | .003 |
| 217 | | | | | | .000 | .001 | .003 |
| 219 | | | | | | | .001 | .003 |
| 221 | | | | | | | .001 | .002 |
| 223 | | | | | | | | .002 |

Table A.21 (continued)

| | <i>n</i> | | | | | | | | |
|-----|----------|----|----|----|----|----|------|------|------|
| | 23 | 26 | 27 | 30 | 31 | 34 | 35 | 38 | 39 |
| 225 | | | | | | | .001 | .002 | .003 |
| 227 | | | | | | | .001 | .002 | .003 |
| 229 | | | | | | | .000 | .002 | .003 |
| 231 | | | | | | | | .002 | .002 |
| 233 | | | | | | | | .002 | .002 |
| 235 | | | | | | | | .001 | .002 |
| 237 | | | | | | | | .001 | .002 |
| 239 | | | | | | | | .001 | .002 |
| 241 | | | | | | | | .001 | .002 |
| 243 | | | | | | | | .001 | .001 |
| 245 | | | | | | | | .001 | .001 |
| 247 | | | | | | | | .001 | .001 |
| 249 | | | | | | | | .001 | .001 |
| 251 | | | | | | | | .001 | .001 |
| 253 | | | | | | | | .001 | .001 |
| 255 | | | | | | | | .001 | .001 |
| 257 | | | | | | | | .001 | .001 |
| 259 | | | | | | | | .000 | .001 |
| 261 | | | | | | | | | .001 |
| 263 | | | | | | | | | .001 |
| 265 | | | | | | | | | .001 |
| 267 | | | | | | | | | .001 |
| 269 | | | | | | | | | .000 |

Adapted from L. Kaarsmaker and A. van Wijngaarden, Tables for use in rank correlation, *Statist. Neerl.* 7, 41-54 (1953), with the permission of the authors, and the editors of *Statistica Neerlandica*.

Table A.22. Upper tail probabilities for the null distribution of the one-sided Kolmogorov-Smirnov J_1 statistic: $m = n = 1(1)30(2)40$

For given $m = n$, the table entry for the point x is $P_0\{J_1 > x\}$. Under these conditions, if x is such that $P_0\{J_1 > x\} = \alpha$, then $j_{\alpha}(a, n, n) = x$. For given $m = n$, the entries are terminated at x_n , where x_n is the smallest allowable value of x such that $P_0\{J_1 > x\}$ is zero to four decimal places.

| $m = n$ | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|
| x | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 0 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1 | .5000 | .6667 | .7500 | .8000 | .8333 | .8571 | .8750 |
| 2 | | .1667 | .3000 | .4000 | .4762 | .5357 | .5833 |
| 3 | | | .0500 | .1143 | .1786 | .2381 | .2917 |
| 4 | | | | .0143 | .0397 | .0714 | .1061 |
| 5 | | | | | .0040 | .0130 | .0265 |
| 6 | | | | | | .0011 | .0041 |
| 7 | | | | | | | .0003 |

| $m = n$ | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|
| x | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 0 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1 | .8889 | .9000 | .9091 | .9167 | .9231 | .9286 | .9333 |
| 2 | .6222 | .6545 | .6818 | .7051 | .7253 | .7429 | .7583 |
| 3 | .3394 | .3818 | .4196 | .4533 | .4835 | .5107 | .5353 |
| 4 | .1414 | .1762 | .2098 | .2418 | .2720 | .3004 | .3271 |
| 5 | .0435 | .0629 | .0839 | .1058 | .1280 | .1502 | .1722 |
| 6 | .0093 | .0168 | .0262 | .0373 | .0498 | .0632 | .0775 |
| 7 | .0012 | .0031 | .0062 | .0104 | .0157 | .0221 | .0295 |
| 8 | .0001 | .0004 | .0010 | .0022 | .0039 | .0063 | .0094 |
| 9 | | .0000 | .0001 | .0003 | .0007 | .0014 | .0025 |
| 10 | | | .0000 | .0000 | .0001 | .0003 | .0005 |
| 11 | | | | | .0000 | .0000 | .0001 |
| 12 | | | | | | | .0000 |

Table A.22 (continued)

 $m = n$

| | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|----|--------|--------|--------|--------|--------|--------|--------|
| 0 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1 | .9375 | .9412 | .9444 | .9474 | .9500 | .9524 | .9545 |
| 2 | .7721 | .7843 | .7953 | .8053 | .8143 | .8225 | .8300 |
| 3 | .5576 | .5779 | .5965 | .6135 | .6292 | .6437 | .6571 |
| 4 | .3522 | .3756 | .3977 | .4183 | .4377 | .4560 | .4731 |
| 5 | .1937 | .2147 | .2350 | .2546 | .2736 | .2918 | .3094 |
| 6 | .0922 | .1073 | .1226 | .1379 | .1532 | .1684 | .1833 |
| 7 | .0377 | .0467 | .0562 | .0662 | .0766 | .0873 | .0982 |
| 8 | .0131 | .0175 | .0225 | .0280 | .0340 | .0405 | .0474 |
| 9 | .0038 | .0056 | .0078 | .0104 | .0134 | .0168 | .0205 |
| 10 | .0009 | .0015 | .0023 | .0033 | .0046 | .0062 | .0080 |
| 11 | .0002 | .0003 | .0006 | .0009 | .0014 | .0020 | .0027 |
| 12 | .0000 | .0001 | .0001 | .0002 | .0004 | .0006 | .0008 |
| 13 | | .0000 | .0000 | .0000 | .0001 | .0001 | .0002 |
| 14 | | | | | .0000 | .0000 | .0001 |
| 15 | | | | | | | .0000 |

 $m = n$

| | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
|----|--------|--------|--------|--------|--------|--------|--------|
| 0 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1 | .9565 | .9583 | .9600 | .9615 | .9630 | .9643 | .9655 |
| 2 | .8370 | .8433 | .8492 | .8547 | .8598 | .8645 | .8690 |
| 3 | .6696 | .6812 | .6920 | .7021 | .7115 | .7204 | .7288 |
| 4 | .4893 | .5046 | .5190 | .5326 | .5455 | .5578 | .5694 |
| 5 | .3262 | .3424 | .3579 | .3728 | .3871 | .4009 | .4141 |
| 6 | .1981 | .2125 | .2267 | .2405 | .2541 | .2673 | .2801 |
| 7 | .1093 | .1204 | .1316 | .1428 | .1540 | .1651 | .1761 |
| 8 | .0546 | .0622 | .0699 | .0779 | .0860 | .0943 | .1027 |
| 9 | .0247 | .0291 | .0339 | .0390 | .0443 | .0498 | .0555 |
| 10 | .0100 | .0124 | .0150 | .0178 | .0209 | .0242 | .0278 |
| 11 | .0036 | .0047 | .0060 | .0074 | .0090 | .0108 | .0128 |
| 12 | .0012 | .0016 | .0022 | .0028 | .0036 | .0044 | .0054 |
| 13 | .0003 | .0005 | .0007 | .0010 | .0013 | .0017 | .0021 |
| 14 | .0001 | .0001 | .0002 | .0003 | .0004 | .0006 | .0008 |
| 15 | .0000 | .0000 | .0001 | .0001 | .0001 | .0002 | .0002 |
| 16 | | | .0000 | .0000 | .0000 | .0001 | .0001 |
| 17 | | | | | | .0000 | .0000 |

Appendix D-1
Sample Contractor Handout

Zion Landfill Site 1 Phase A Contractor Handout

SITE BACKGROUND

The Zion Landfill is located at 9th Street and Green Bay Road in Zion, Lake County, Illinois. Since its initial permit in 1975, the primary activity at the facility has been landfilling solid, non-hazardous, municipal waste. Figure 1, attached, shows the configuration of the facility.

In 1980, Federal regulations identified certain wastes as being hazardous and required specific management of these wastes. One requirement was that hazardous wastes could only be stored, treated or disposed in permitted facilities. The Zion Landfill applied for and received a permit to dispose of hazardous waste in one section of the facility commonly known as Site 1 Phase A (Site 1A). Hazardous wastes were accepted and landfilled in this area until 1991. Active hazardous waste management no longer occurs at the site and certification of closure for the site was submitted to the IEPA in February 1998. The landfill is regulated by the Illinois Environmental Protection Agency (IEPA) under a RCRA post-closure permit.

HAZARDOUS WASTE MANAGED

Site 1A accepted hazardous wastes from a variety of industries, including manufacturing, petrochemical, steel, and utilities. The hazardous characteristics of the wastes accepted included heavy metals and corrosivity. Some waste materials are automatically considered hazardous due to the process by which it is generated. The Zion Landfill accepted some of these "listed" wastes as well. Examples of listed wastes accepted include wastewater treatment sludges from electroplating operations; various solvents used in degreasing; pesticides; laboratory chemicals; and emission control dust from steel production. Much of the hazardous waste managed at the Zion Landfill's hazardous waste landfill (Site 1 Phase A) was from clean-up activities and generally consisted of soil contaminated with low concentrations of hazardous constituents.

Site 1A was a co-disposal landfill. Co-disposal, a common practice at that time, disposed of both hazardous waste and solid waste in the same landfill. The quantity of hazardous waste compared to the total quantity of solid, non-hazardous, municipal waste accepted in Site 1A was relatively small.

Zion Landfill Site 1 Phase A Contractor Handout

MONITORING SYSTEMS

There are several monitoring and management systems in place at the Zion Landfill to ensure against adverse affects to human health and the environment. Circling Site 1A is a system of groundwater monitoring wells. Samples of groundwater are obtained from each of these wells on a regular basis. The samples are analyzed for an extensive list of organic and inorganic parameters. The data is statistically evaluated and is provided to the IEPA for purposes of determining whether a statistically significant increase in concentrations of groundwater parameters is occurring. Further information concerning groundwater sampling and reporting can be obtained from the Landfill Manager.

Methane gas, a by-product of solid waste decomposition, is commonly produced at a landfill, even after the landfill cap is constructed. The Zion Landfill has received a permit from IEPA to install and operate a gas control system for the entire facility (solid and hazardous waste landfills). Vertical wells and horizontal piping are installed within the landfill to promote gas migration to specified areas where it is collected and flared. The practice controls the mechanism for gas escape and minimizes pressure build-up. In addition to the active gas control system, periodic gas monitoring is conducted around the site and continuously in the buildings.

Leachate is the liquid which forms in the bottom of a landfill as a result of waste decomposition and infiltration of precipitation. The gas control system described above is a dual extraction system that allows for the monitoring and removal of leachate. Leachate from Site 1A), which is hazardous by definition, is removed and routed to a storage tank prior to transporting off-site for proper treatment and disposal.

Mechanisms are in place to ensure security of the site, to respond to emergencies, and to perform regular inspection and maintenance activities.

TRAINING

Contractors hired by the facility to perform post-closure work that has the potential for exposure to hazardous waste or hazardous waste constituents must be trained in accordance with the requirements of 29 CFR 1910.120(p) prior to commencing work on Site 1A.

Zion Landfill Site 1 Phase A Contractor Handout

PRECAUTIONS

Workers are reminded to conduct safe and sound work consistent with normal industrial practices for the specific type of work. Site-specific precautions and observations are noted:

- In any emergency, notify Zion Landfill's manager or his designated representative immediately.
- Report unusual or abnormal smells to Zion Landfill's manager or his designated representative. A faint gas aroma is normal.
- Report seeps or breeches in the landfill cover to the Zion Landfill's manager or his designated representative.
- Report breeches in the security system to the Zion Landfill's manager or his designated representative. Always report when entering or leaving the site.
- Report unusual observations (e.g., flares not burning, monitoring wells disturbed, abnormal wildlife activities).

LOCATION OF FIRST AID SUPPLIES AND EMERGENCY EQUIPMENT

First aid kits, eye washes and showers are located in the maintenance shop. Fire extinguishers are located in the maintenance shop, the main office and on landfill vehicles.

EMERGENCY CONTACTS

| Title | Name | Phone |
|--|---------------|------------|
| General Manager | Brad Stenzel | [REDACTED] |
| Operations Manager | John Hagopian | [REDACTED] |
| BFI Environmental Manager | Jim Hitzeroth | [REDACTED] |
| Paramedics / Fire Department / Police Department | City of Zion | 911 |

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUN 27 2025

REVIEWER: MED

PROPERTY LINE
(FROM CQM DRAWING)

SITE 2 EXPANSION AREA
— SOLID WASTE BOUNDARY
(FROM CQM)

SITE ENTRANCE

SCALE HOUSE

SITE 1
PHASE A

SITE 2

Site Office with
First Aid Supplies

SITE 1
PHASE B
CELL NO. 1

SITE 1
PHASE B
CELL NO. 2

Maintenance Shop
with First Aid Supplies,
Eye Wash, Showers


IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUN 27 2025

REVIEWER. MED

CELL CONSTRUCTION LIMITS
(FROM CQM)

LEGEND

- APPROXIMATE SITE BOUNDARY
 APPROXIMATE SITE 1A WASTE MANAGEMENT BOUNDARY
 APPROXIMATE WATER EDGE

APPROXIMATE GRAPHIC SCALE

400 0 200 400 800

1 inch = 400 ft.

PREPARED FOR:
ZION LANDFILL

FACILITY LAYOUT

SITE 1 - PHASE A
POST-CLOSURE PERMIT APPLICATION
LAKE COUNTY, ZION, IL

REUSE OF DOCUMENTS
THIS DOCUMENT, AND THE DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, IS THE PROPERTY OF WEAVER CONSULTANTS GROUP, AND IS NOT TO BE USED IN WHOLE OR IN PART, WITHOUT THE WRITTEN AUTHORIZATION OF WEAVER CONSULTANTS GROUP.



| |
|-------------------|
| DRAWN BY: RMD |
| REVIEWED BY: MM |
| DATE: 4/14/2021 |
| FILE: 0120-037-10 |
| CAD: SITE 1.dwg |
| FIGURE 1 |

Appendix D-2
Post-Closure Inspection Forms

Weekly Inspection Form
90 Day Landfill Leachate Accumulation Tank
Zion Landfill - Site 1, Phase A

Date: _____ Time: _____

Full Name of Inspector (not just initials): _____

Signature of Inspector: _____

Weather Conditions at Time of Inspection
 (Temp, Precipitation): _____

Items to Be Inspected (if issues noted, provide detail in space below):

Tank labels/markings present and legible? (Check One)
 Yes _____ No _____

Aboveground portions of tank system (i.e., double-walled tank itself):
Corrosion or signs of waste release present? Yes _____ No _____

Construction materials and areas surrounding externally accessible
portion of the double-walled tank system: erosion or signs of waste
releases, such as cracks, wear, etc.? Yes _____ No _____

Overfill/Spill Control Equipment in good working order? (i.e., sump
pump and automatic float-controlled pump): Yes _____ No _____

Release detection equipment (between primary/secondary tank walls):
Leak Detection system operational? Yes _____ No _____

If applicable, describe follow up
 inspection and action(s) taken: _____

If any maintenance issues are
 warranted, provide additional
 detail (including date and nature of
 any repairs or other remedial
 actions initiated): _____

Note: Inspection records to be kept for minimum of 3 years from date of inspection.

**MONTHLY
POST-CLOSURE INSPECTION CHECKLIST FOR
ZION LANDFILL
SITE 1 PHASE A**

Date: _____ Time: _____ Name (Print): _____
Signature: _____

Weather Conditions: _____
(Temp., Wind, etc.) _____

S means Satisfactory
U means Unsatisfactory

S U

Leachate collection system

☐ ☐ Leachate wells – Physical condition of leachate collection system (i.e., integrity of well pumps and fixtures)

Gas collection system

☐ ☐ Gas wells – Remove weeds and debris from well heads; check for evidence of soil settlement around wells

☐ ☐ Gas wells – Inspect for exposed piping or leaking valves or fittings

☐ ☐ Gas wells - Monitor vacuum, methane concentration, temperature and flow rate to identify problems in piping system

☐ ☐ Condensate sumps and pump stations – Free water in sump, and if present, drain

☐ ☐ Condensate sumps and pump stations – Control panel and indicator light

☐ ☐ Gas extraction blowers – Leaks in piping or valve connections; condition of blower belts; or plugging of blowers due to silt

COMMENTS:

RESPONSE/CORRECTIVE ACTION AND SUGGESTED TIMEFRAMES:

**QUARTERLY
POST-CLOSURE INSPECTION CHECKLIST
ZION LANDFILL, SITE 1 PHASE A**

Date: _____

Time: _____

Name (Print): _____

Signature: _____

S indicates Satisfactory**U** indicates Unsatisfactory

| <u>S</u> | <u>U</u> | <u>Item</u> |
|-----------------|-----------------|--------------------|
|-----------------|-----------------|--------------------|

Site Security

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Evidence of unauthorized entry. |
| <input type="checkbox"/> | <input type="checkbox"/> | Integrity of security fencing and gates. |
| <input type="checkbox"/> | <input type="checkbox"/> | Integrity of entrance gate, lock, or signs. |

Vegetation, run-off, erosion

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Physical condition of run-off control structures (i.e., diversion ditches) |
| <input type="checkbox"/> | <input type="checkbox"/> | Evidence of elements affecting physical condition of final cover (i.e., ponding of rainwater, presence of burrowing animals, deep rooted vegetation leachate seeps, vegetative stress) |
| <input type="checkbox"/> | <input type="checkbox"/> | Physical condition of final cover (i.e., cracking, subsidence, erosion) |
| <input type="checkbox"/> | <input type="checkbox"/> | Physical condition of slopes, drainage ditches, (inflow/outflow) |
| <input type="checkbox"/> | <input type="checkbox"/> | Discharge from outflow ditch |
| <input type="checkbox"/> | <input type="checkbox"/> | Physical condition of roadways to permit access to the site for inspections, sampling, leachate removal, and periodic maintenance |
| <input type="checkbox"/> | <input type="checkbox"/> | Evidence of elements affecting physical condition of drainage ditches, undeveloped areas, (i.e. ponding of rainwater, vegetative stress, obstruction) |
| <input type="checkbox"/> | <input type="checkbox"/> | Physical condition of drainage ditches, undeveloped areas (i.e., cracking, pool-flow, erosion, subsidence roadways) |

Leachate Collection System

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Leachate headwell levels, total well depth, and pump recordings taken and documented |
| <input type="checkbox"/> | <input type="checkbox"/> | Leachate collection wells – Inspection for leaks in exposed piping, fittings and valves; vandalism; and settlement of well or surrounding area |
| <input type="checkbox"/> | <input type="checkbox"/> | Extraction pumps in leachate collection system working properly (poor yield, excess sediment accumulation, poorly operating pump). |

**QUARTERLY
POST-CLOSURE INSPECTION CHECKLIST
ZION LANDFILL, SITE 1 PHASE A**

Gas collection system

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Inspect isolation valve on the gas collection header |
| <input type="checkbox"/> | <input type="checkbox"/> | Inspect manual valve on condensate sumps and pump stations |
| <input type="checkbox"/> | <input type="checkbox"/> | Leakage on pipe fittings and valves to condensate sumps and pump stations |
| <input type="checkbox"/> | <input type="checkbox"/> | Enclosed flare – Clean flame scanner viewing window and vent port |
| <input type="checkbox"/> | <input type="checkbox"/> | Enclosed flare – Inspect solenoid valves |
| <input type="checkbox"/> | <input type="checkbox"/> | Enclosed flare – Lubricate purge blower fan and motor and louver doors on flare as needed and/or according to manufacturer specifications |
| <input type="checkbox"/> | <input type="checkbox"/> | Extraction blowers – Lubricate blower bearings and motor bearings as needed and/or according to manufacturer specifications |

Gas collection – Knockout Pot (if applicable)

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Perform maintenance as needed and/or according to manufacturer specifications to monitor for corrosion and grime build up. |
| <input type="checkbox"/> | <input type="checkbox"/> | Perform maintenance/cleaning of demister pad and inside of knockout pot according to manufacturer specifications |

Blower building

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Check compressor for maintenance activities (e.g., oil change) |
| <input type="checkbox"/> | <input type="checkbox"/> | Perform maintenance on building exhaust fans as needed and/or according to manufacturer specifications |
| <input type="checkbox"/> | <input type="checkbox"/> | Testing of explosive gas sensor performed, as recommended by the manufacturer |

COMMENTS:

RESPONSE:

GROUNDWATER WELL INSPECTIONS POST-CLOSURE INSPECTION CHECKLIST FOR ZION LANDFILL, PHASE 1 SITE A

Date: _____ Time: _____ Name (Print): _____

Signature: _____

Weather Conditions: _____

(Temp., Wind, etc.) _____

Satisfactory

Unsatisfactory

Item

Groundwater monitoring system *

Integrity and existence of locking caps

Physical condition of protective casing or surface grouting

Physical condition of groundwater wells and piezometers

Inspect groundwater pumps and well casing

COMMENTS:

RESPONSE:

Notes:

1. *Groundwater Inspections will be performed together with routine groundwater monitoring events. The current (as of 2021) frequency for groundwater monitoring is semi-annual.*

POST-CLOSURE REPAIR LOG

ZION LANDFILL – SITE 1, PHASE A

Inspection Date: _____ Time: _____ Inspector Name (Print): _____

Name (person who makes corrected repair): _____

Signature: _____

Date Repair Made: _____

Weather Conditions: _____

(Temp., Wind, etc.) _____

This form will be used to schedule and record repairs (deterioration, or malfunction of equipment or structures) revealed by an inspection of the items listed in the Inspection Log. The following items are included:

Item needing repair: _____

Problem identified during inspection that needs repair: _____

Other Comments (if applicable): _____

Appendix E-1

Plat of Survey and Post-Closure Notices

WEAVER
BOOS
CONSULTANTS

February 14, 2012
Project 0120-037-01

Illinois Environmental Protection Agency
Division of Land Pollution Control #24
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9296

Re: Zion Site 1A Landfill
ILD980700728
Log No. B-23R

To Whom It May Concern::

On behalf of BFI Waste Systems of North America, LLC (BFI), Weaver Boos Consultants North Central, LLC (Weaver Boos) hereby provides certification that documents referenced in Permit Condition III.K have been appropriately distributed/recorded. A certification statement signed by the Permittee is enclosed, along with copies of documents distributed/recorded.

If you have any questions, please do not hesitate to call either of the undersigned or Mr. Jim Hitzeroth of BFI at 630-894-5001.

Sincerely,

Weaver Boos Consultants North Central, LLC



Michael B. Maxwell, LPG
Senior Project Manager

Enclosures: Certification Statement
Notification of Use of Property to Manage Hazardous Waste
Correspondence to Zion Commissioner of Building and Public Works

Cc: Mr. Jim Hitzeroth, BFI (w/ encl.)

CERTIFICATION STATEMENT

The attached documents have been appropriately distributed/recorded in compliance with Permit Condition III.K to the Hazardous Waste Management RCRA Post-Closure Permit for the Zion Site 1 Landfill (ILD 980700728, Log No. B-23R) issued September 30, 2011 and Effective November 4, 2011.

Signature

Bryan Sommerman

Area President

Title

BFI Waste Systems of North America, LLC

Date

2-13-12



Image# 048289720006 Type: NOT
Recorded: 01/09/2012 at 10:35:23 AM
Receipt#: 2012-00001023
Page 1 of 6
Fees: \$41.00
IL Rental Housing Fund: \$10.00
Lake County IL Recorder
Mary Ellen Vanderventer Recorder
File **6807285**

**NOTIFICATION OF USE OF PROPERTY TO MANAGE HAZARDOUS WASTE AND
OF RESTRICTIONS ON FUTURE USE**

Submitted on behalf of:

Operator, BFI Waste Systems of North America, LLC and
Owner, Veolia ES Zion Landfill, Inc.

Document Prepared By:

Weaver Boos Consultants North Central, LLC
35 E. Wacker Dr., Suite 1250
Chicago, IL 60601

Return Copy of Recorded Document to:

Michael B. Maxwell
Weaver Boos Consultants North Central, LLC
35 E. Wacker Dr., Suite 1250
Chicago, IL 60601

FIVE

2012

DOCS
TS

RECEIVED

JAN 19 2012

WEAVER BOOS
CONSULTANTS

62

COPY

**NOTIFICATION OF USE OF PROPERTY TO MANAGE HAZARDOUS WASTE AND
OF RESTRICTIONS ON FUTURE USE**

Submitted on behalf of:

**Operator, BFI Waste Systems of North America, LLC and
Owner, Veolia ES Zion Landfill, Inc.**

Document Prepared By:

**Weaver Boos Consultants North Central, LLC
35 E. Wacker Dr., Suite 1250
Chicago, IL 60601**

Return Copy of Recorded Document to:

**Michael B. Maxwell
Weaver Boos Consultants North Central, LLC
35 E. Wacker Dr., Suite 1250
Chicago, IL 60601**

**NOTIFICATION OF USE OF PROPERTY TO MANAGE HAZARDOUS WASTE AND
OF RESTRICTIONS ON FUTURE USE**

This instrument, which constitutes a Notation to the Special Warrantee Deed to the property described and shown in Exhibit A attached hereto, which deed was recorded July 12, 2000 as Document No. 4551461 serves as a Notification of Use of Property to Manage Hazardous Waste and of Restrictions on Future Use. This instrument hereby notifies any prospective purchaser that a portion of the property, described in Exhibit B, has been used to manage hazardous wastes and is subject to the laws and regulations of the State of Illinois and the Illinois Pollution Control Board, specifically including 35 Illinois Administrative Code Part 724 and further, that pursuant to 35 Illinois Administrative Code (IAC) Part 724.217, use of the property described in Exhibit B is subject to certain restrictions. The area in which hazardous waste was disposed is described in Exhibit B, and the quantity and type of hazardous waste, as designated by Title 40 of the Code of Federal Regulations Part 261, is detailed in Exhibit C. This Notification is being recorded pursuant to 35 IAC 725.19 and 725.220 and copies have been placed in the landfill facility's operating record and submitted to the local zoning authority and the Illinois Environmental Protection Agency.

IN WITNESS WHEREOF, the undersigned has caused its name to be signed to these present by its General Manager this 28th day of December, 2011.

VEOLIA ES ZION LANDFILL, INC.

By (signature):

Print Name:

Print Title:

James A. Lewis
James A. Lewis
General Manager

STATE OF ILLINOIS)
)ss
 COUNTY OF COOK)

I, the undersigned, a Notary Public in and for said County in the State aforesaid, do hereby certify that James A. Lewis, personally known to me to be the General Manager of Veolia ES Zion Landfill, Inc., a _____ corporation, and personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me the 28th day of December 2011, in person, and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act, and as the free and voluntary act of such Corporation, for the uses and purposes therein set forth.



Patricia M. Shebesta
 Notary Public

My commission expires: 8/25/14

This instrument was prepared by:

Weaver Boos Consultants North Central, LLC
 35 E. Wacker Dr., Suite 1250
 Chicago, Illinois 60601

AFTER RECORDING, RETURN THIS INSTRUMENT TO:
 Weaver Boos Consultants North Central, LLC
 Michael B. Maxwell
 35 E. Wacker Dr., Suite 1250
 Chicago, Illinois 60601

FLAI OF SURVEY

SITE ONE - PHASE A

The Northwest Quarter of Section 7, Township 48 North, Range 12 East of the Third Principal Meridian, except that part thereof lying East of a line drawn from a point on the North line of said Section 7, said point being 1300.5 feet West from the Northeast corner of said Northwest Quarter to a point in the South line of said Section 7, said point being 1310.45 feet West of the Southeast corner of the West half of Section 7, and also except the North 1320 feet of the West 528 feet thereof, and also except the West 518 feet of that part of said Northwest Quarter lying South of the North 1320 feet thereof, all in Lake County, Illinois.

SITE ONE - PHASE B

The West 518.0 feet (except the North 1320 feet thereof) of the Northwest Quarter of Section 7, Township 46 North, Range 12 East of the Third Principal Meridian, in Lake County, Illinois.

LEACHATE STORAGE TANK AREA

That part of the Northeast Quarter of Section 12, Township 46 North, Range 11 East of the Third Principal Meridian, described as follows: Beginning at the Southeast corner of said Northeast Quarter of Section 12; thence North along the East line of said Northeast Quarter of Section 12, 948.48 feet; thence West at right angles to the last described line, 17.87 feet, to the point of beginning of the parcel herein described; thence South parallel to the East line of said Northeast Quarter of Section 12, 25.0 feet; thence West at right angles to the last described line, 25 feet; thence North parallel to aforesaid East line, 25.0 feet; thence East at right angles to the last described line, 25.0 feet to the point of beginning, all in Lake County, Illinois.

STATE OF ILLINOIS)
COUNTY OF LAKE) S.S.

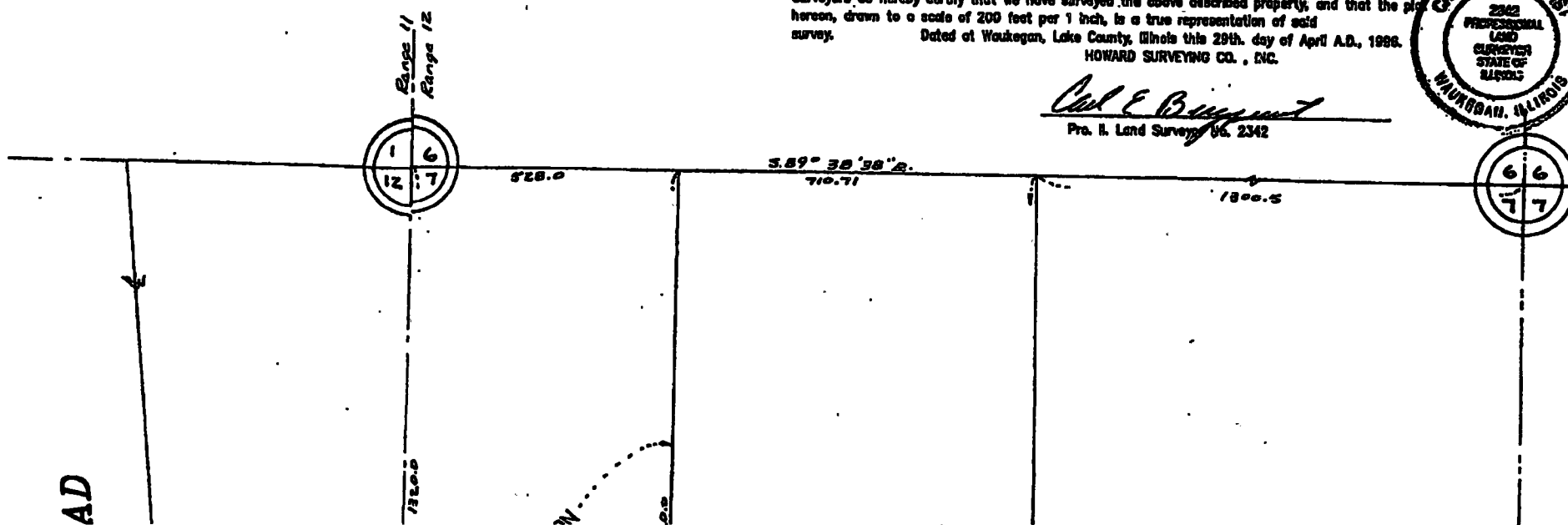
In behalf of Howard Surveying Co., Inc., we as Professional Illinois Land Surveyors do hereby certify that we have surveyed the above described property, and that the plan hereon, drawn to a scale of 200 feet per 1 inch, is a true representation of said survey.

Dated at Waukegan, Lake County, Illinois this 20th day of April A.D. 1999

Dated at Waukegan, Lake County, Illinois this 29th. day of April A.D., 1936.
HOWARD SURVEYING CO., INC.

HOWARD SURVEYING CO., INC.

Pro. II. Land Survey, Pg. 2342



AD

R 000912

EXHIBIT B

The Northwest Quarter of Section 7, Township 46 North, Range 12 East of the Third Principal Meridian, except that part thereof lying East of a line drawn from a point on the North line of said Section 7, said point being 1300.5 feet West from the Northeast corner of said Northwest Quarter to a point in the South line of said Section 7, said point being 1310.45 feet West of the Southeast corner of the West half of Section 7, and also except the North 1320 feet of the West 528 feet thereof, and also except the West 518 feet of that part of said Northwest Quarter lying South of the North 1320 feet thereof, all in Lake County, Illinois.

EXHIBIT C

| Waste Code | Description (Basis for Listing) |
|-------------------|---|
| D002 | Corrosivity |
| D005 | Barium |
| D006 | Cadmium |
| D007 | Chromium |
| D008 | Lead |
| D009 | Mercury |
| F001 | Halogenated organic solvents (tetrachloroethylene, methylene chloride, TCE, 1,1,1-trichloroethane, carbon tetrachloride, chlorinated fluorocarbons) |
| F002 | Halogenated organic solvents (tetrachloroethylene, methylene chloride, TCE, 1,1,1-trichloroethane, 1,1,2-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane) |
| F003 | Ignitable non-halogenated organic solvents (Ignitability) |
| F005 | Non-halogenated organic solvents (Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, 2-ethoxyethanol benzene, 2-nitropropane, ignitability) |
| F006 | Wastewater treatment sludges from electroplating operations (Cd, Cr +6, Ni, CN) |
| F008 | Plating bath residues from electroplating operations where cyanides are used (Cyanide) |
| F009 | Stripping & cleaning bath solutions from electroplating operations where cyanides are used (Cyanide) |
| F019 | Wastewater treatment sludges from chemical conversion coating of aluminum (Cr +6, Cyanide) |
| K052 | Leaded tank bottoms from petroleum refining industry (lead) |
| K061 | Emission control dust/sludge from steel production (Cr +6, lead, corrosivity) |
| K062 | Spent pickle liquor from steel finishing operations (Cr +6, lead, corrosivity) |
| U019 | Benzene |
| U036 | Chlorodane |
| U044 | Chloroform |
| U061 | DDT |
| U083 | Propane, 1,1,1-dichloro |
| U210 | Tetrachloroethylene |
| U220 | Toluene |
| U228 | Trichloroethylene |
| U239 | Xylene |
| U226 | Methylchloroform |
| P004 | Aldrin |
| P029 | Copper cyanide |

Note: Hazardous waste co-disposed with non-hazardous municipal solid waste. According to Permit Condition III.B, from 1982 to 1990 (the time period when accurate data was maintained), approximately 232,000 tons of hazardous waste were disposed in this landfill.

WEAVER
BOOS
CONSULTANTS

January 3, 2012
Project 0120-37-01

Mr. Frank Flammini
City of Zion
Commissioner of Building and Public Works
2828 Sheridan Road
Zion, IL 60099

Re: Survey Plat and Waste Disposal Information
Zion Site 1 – Phase A Landfill
ILD980700728
Zion, Illinois

Dear: Mr. Flammini:

On behalf of Operator, BFI Waste Systems of North America, LLC (BFI) and Owner, Veolia ES Zion Landfill, Inc., Weaver Boos Consultants North Central, LLC is herein submitting documentation in compliance with Permit Condition III.K to the Hazardous Waste Management RCRA Post-Closure Permit Log No. B-23R issued by the Illinois Environmental Protection Agency (EPA) on September 30, 2011.

Specifically, this Permit Condition indicates that the permittee shall:

Submit to the local zoning authority or the authority with jurisdiction over local land use, and to the Agency a survey plat and a record of the type, location, and quantity of wastes disposed of within each cell or other disposal unit of the facility. For hazardous wastes disposed before January 12, 1981, the Permittee shall identify the type, location, and quantity of the wastes to the best of his knowledge and in accordance with any records he has kept. This plat must be prepared and certified by an independent registered land surveyor.

Pursuant to the above permit condition, a plat of survey of the facility prepared and certified by an independent registered land surveyor is attached. Note that while other historical disposal units are shown on the attached plat of survey (such as Site 1 – Phase B), the subject of the above referenced permit is limited to Site 1 – Phase A.

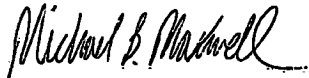
Mr. Frank Flammini
Page 2 of 2
January 3, 2012

Site 1 – Phase A was a co-disposal landfill. Co-disposal was a common practice during the active disposal period at this facility that occurred from the late 1970s through the early 1990s. This practice included the disposal of both hazardous waste and solid waste together in the same landfill. The quantity of hazardous waste, compared to the total quantity of non-hazardous municipal solid waste (MSW) accepted at Site 1 – Phase A was relatively small. According to Permit Condition III.B, from 1982 to 1990 (the time period when accurate data was maintained), approximately 232,000 tons of hazardous waste were disposed in this landfill. A summary of the types of hazardous waste received at Site 1 – Phase A is provided on the attached Table 1.

If you have any questions regarding this information, feel free to contact either of the undersigned or Mr. Jim Hitzeroth of BFI at (630) 894-5001.

Sincerely,

Weaver Boos Consultants North Central, LLC



Michael B. Maxwell, LPG
Senior Project Manager

Cc: Mr. Jim Hitzeroth (w/ encl.)

Enclosures: Plat of Survey
Summary of Hazardous Wastes Received at Zion Site 1A Landfill

RO.

GREEN

BAY

LEACHATE STORAGE TANK AREA

See Detail



949.48

East Line of Section 12

949.48

1286.61

SITE ONE - PHASE B

15.307 Ac.

1287.89

518.0
528.0

EXCEPTED

132

SITE ONE - PHASE A

43.699 Ac.

N. 0° 09' 13" W.

2609.82

IEPA - DIVISION OF RECORDS MANAGEMENT
DATE RECEIVED

JUN 7 2025

RECEIVED: MED

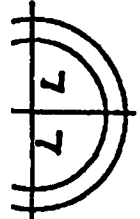
NINTH

STREET

N. E.O.W. Line
S. line of N.W. 1/4 1305:23

1310.45

1" = 200'



PLAN OF SURVEY

R 000918

SITE ONE - PHASE A

The Northwest Quarter of Section 7, Township 46 North, Range 12 East of the Third Principal Meridian, except that part thereof lying East of a line drawn from a point on the North line of said Section 7, said point being 1300.5 feet West from the Northeast corner of said Northwest Quarter to a point in the South line of said Section 7, said point being 1310.45 feet West of the Southeast corner of the West half of Section 7, and also except the North 1320 feet of the West 528 feet thereof, and also except the West 518 feet of that part of said Northwest Quarter lying South of the North 1320 feet thereof, all in Lake County, Illinois.

SITE ONE - PHASE B

The West 518.0 feet (except the North 1320 feet thereof) of the Northwest Quarter of Section 7, Township 46 North, Range 12 East of the Third Principal Meridian, in Lake County, Illinois.

LEACHATE STORAGE TANK AREA

That part of the Northeast Quarter of Section 12, Township 46 North, Range 11 East of the Third Principal Meridian, described as follows: Beginning at the Southeast corner of said Northeast Quarter of Section 12; thence North along the East line of said Northeast Quarter of Section 12, 949.48 feet; thence West at right angles to the last described line, 17.87 feet, to the point of beginning of the parcel herein described; thence South parallel to the East line of said Northeast Quarter of Section 12, 25.0 feet; thence West at right angles to the last described line, 25 feet; thence North parallel to aforesaid East line, 25.0 feet; thence East at right angles to the last described line, 25.0 feet to the point of beginning, all in Lake County, Illinois.

STATE OF ILLINOIS)

S.S.

COUNTY OF LAKE)

In behalf of Howard Surveying Co., Inc., we as Professional Illinois Land Surveyors do hereby certify that we have surveyed the above described property, and that the plan hereon, drawn to a scale of 200 feet per 1 inch, is a true representation of said survey.

Dated at Waukegan, Lake County, Illinois this 29th. day of April A.D., 1998.

HOWARD SURVEYING CO., INC.

Carl E. Bergquist
Pro. Il. Land Surveyor No. 2342

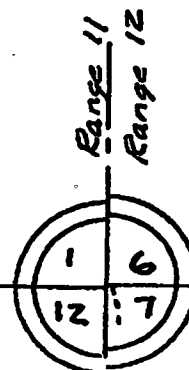


IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASE

JUN 27 2025

REVIEWER: MED

AD



528.0

5.89° 38' 38" E.
710.71

1300.5

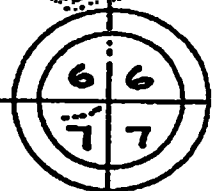


Table 1: Summary of Hazardous Wastes Received at Zion Site 1A Landfill

| Waste Code | Description (Basis for Listing) |
|-------------------|---|
| D002 | Corrosivity |
| D005 | Barium |
| D006 | Cadmium |
| D007 | Chromium |
| D008 | Lead |
| D009 | Mercury |
| F001 | Halogenated organic solvents (tetrachloroethylene, methylene chloride, TCE, 1,1,1-trichloroethane, carbon tetrachloride, chlorinated fluorocarbons) |
| F002 | Halogenated organic solvents (tetrachloroethylene, methylene chloride, TCE, 1,1,1-trichloroethane, 1,1,2-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane) |
| F003 | Ignitable non-halogenated organic solvents (Ignitability) |
| F005 | Non-halogenated organic solvents (Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, 2-ethoxyethanol benzene, 2-nitropropane, ignitability) |
| F006 | Wastewater treatment sludges from electroplating operations (Cd, Cr +6, Ni, CN) |
| F008 | Plating bath residues from electroplating operations where cyanides are used (Cyanide) |
| F009 | Stripping & cleaning bath solutions from electroplating operations where cyanides are used (Cyanide) |
| F019 | Wastewater treatment sludges from chemical conversion coating of aluminum (Cr +6, Cyanide) |
| K052 | Leaded tank bottoms from petroleum refining industry (lead) |
| K061 | Emission control dust/sludge from steel production (Cr +6, lead, corrosivity) |
| K062 | Spent pickle liquor from steel finishing operations (Cr +6, lead, corrosivity) |
| U019 | Benzene |
| U036 | Chlorodane |
| U044 | Chloroform |
| U061 | DDT |
| U083 | Propane, 1,1,-dichloro |
| U210 | Tetrachloroethylene |
| U220 | Toluene |
| U228 | Trichloroethylene |
| U239 | Xylene |
| U226 | Methylchloroform |
| P004 | Aldrin |
| P029 | Copper cyanide |

Note: Hazardous waste co-disposed with non-hazardous municipal solid waste. According to Permit Condition III.B, from 1982 to 1990 (the time period when accurate data was maintained), approximately 232,000 tons of hazardous waste were disposed in this landfill.

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-John Giampapa, REIT Management.

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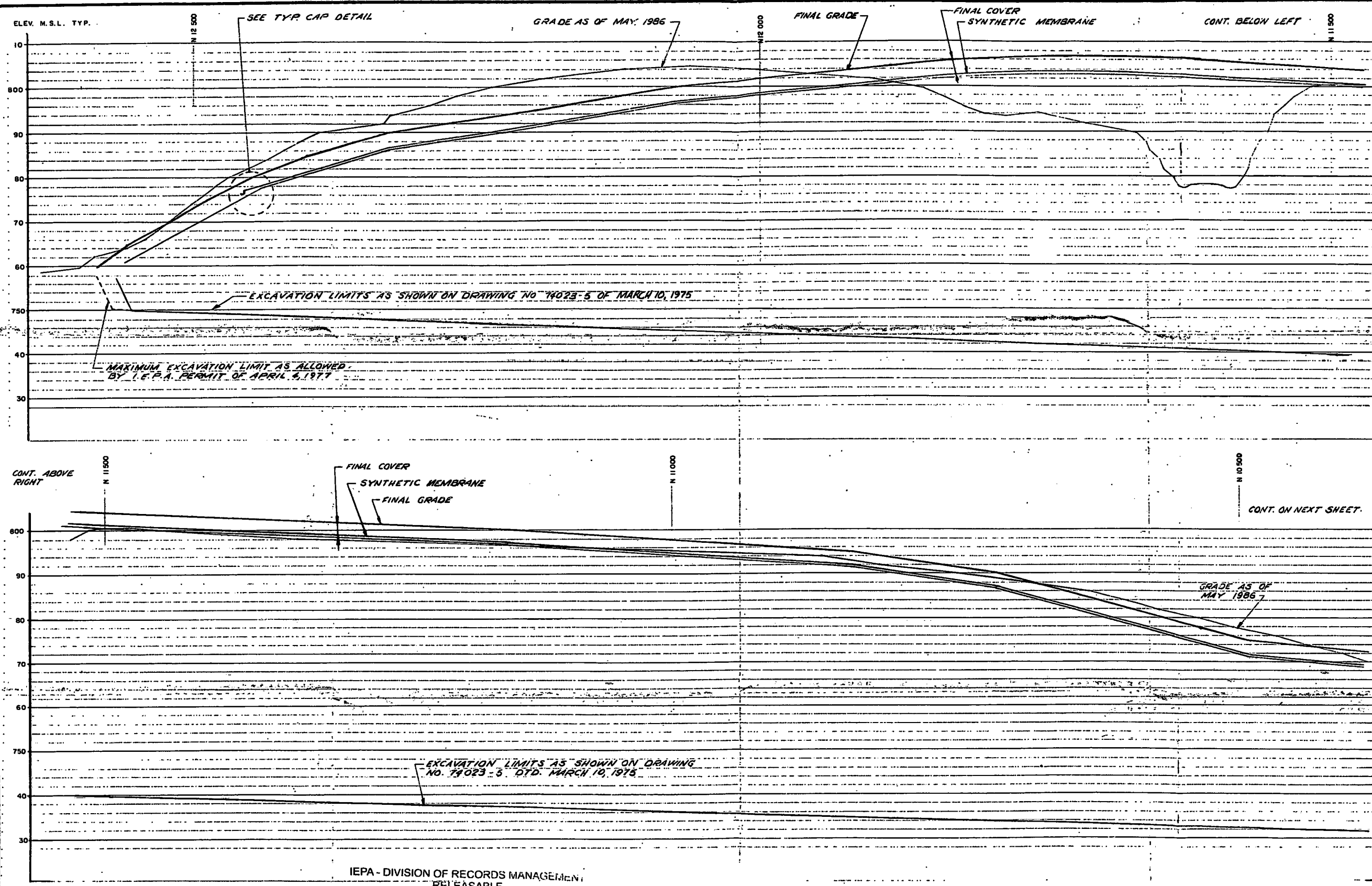
Package Status:

[Track](#)


Package Status

| | |
|-------------------|----------------------|
| Mercury Number | 82165120103164728 |
| Shipdate | 1/03/2012 |
| Recipient | Mr. Frank Flammini |
| Recipient Company | City Of Zion |
| City | ZION |
| Country | US |
| Reference | 0120-37-01 |
| Status | Delivered |
| Delivery Date | 1/5/2012 10:50:00 AM |
| Delivered To | GUZMAN |

Appendix E-2
Documentation of Landfill Excavation Limits



| REV | DESCRIPTION | DATE | BY |
|-----|-------------|------|----|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
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| | | | |
| | | | |
| | | | |

**BROWNING-FERRIS INDUSTRIES**
ENGINEERING SERVICES
14701 SAINT MARY'S STREET, P.O. BOX 3151, HOUSTON, TEXAS 77001 • (713) 870-8100

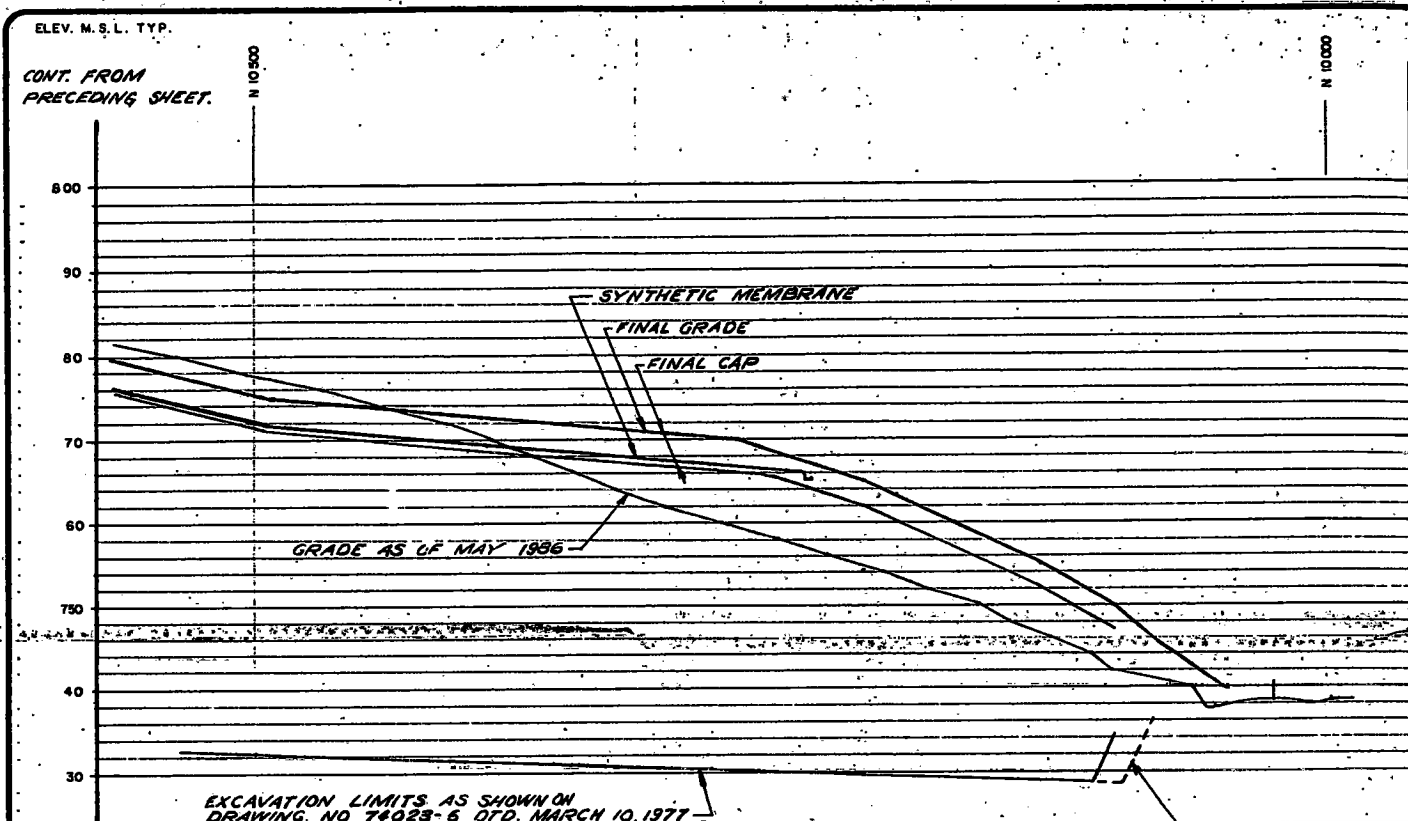
SECTION A-A
TITLE
DRAWING NUMBER
PROJECT NAME & LOCATION
WINTROP HARBOR EXISTING
WASTE MANAGEMENT UNIT
ATTACHMENT 13
EXHIBIT 1a

NOTED
DATE
JUN 8 1987
ENGINEER
D. SPARKS
DRAWN BY
R. THROOP
APPROVED BY
[Signature]
PROJECT NUMBER
334-830

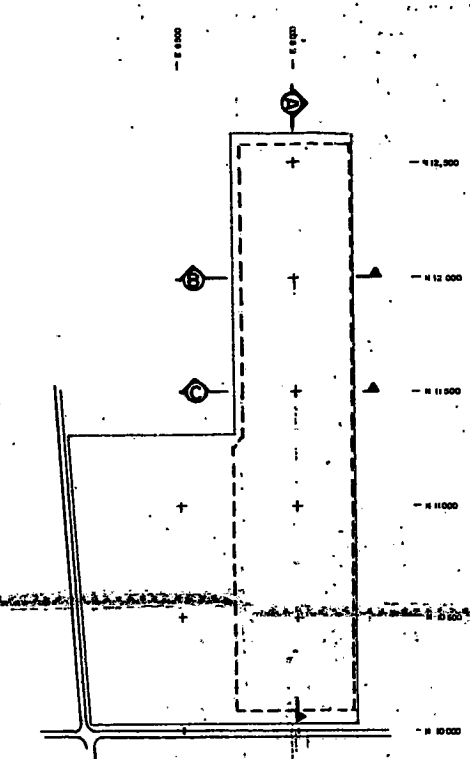
JUN 27 2025
REVIEWER: MED

SECTION A-A
(AT E 9,000 GRID LINE LOOKING EAST)
SCALE:
HORIZ: 1" = 40'
VERT: 1" = 10'

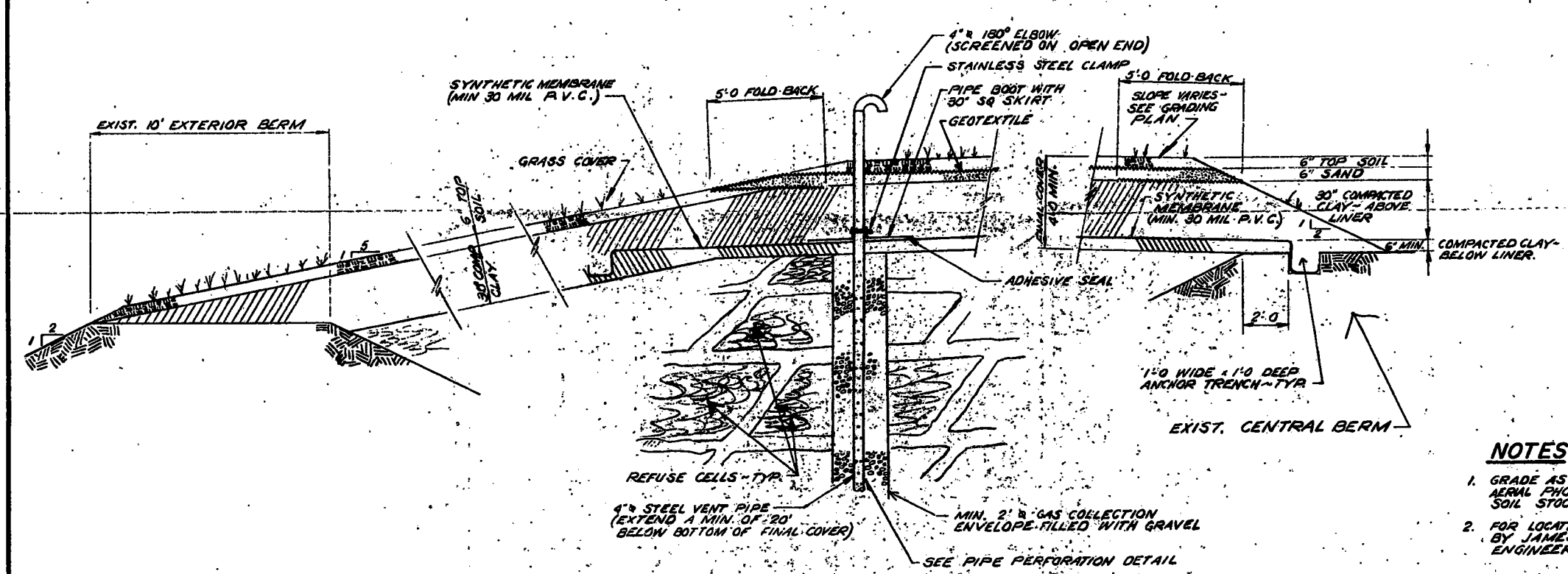
NOTE
GRADE AS OF MAY 1986 WAS DETERMINED BY AERIAL PHOTOGRAPHY. THE GRADE INCLUDES SOIL STOCKPILED ABOVE SOIL COVER & WASTE.
SEE DRAWING EXHIBIT 16 FOR KEY PLAN



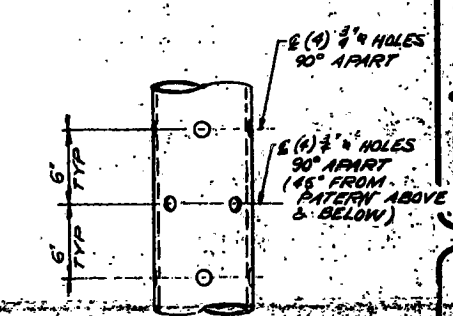
SECTION A-A
(AT E 9,000 GRID LINE, LOOKING EAST)
SCALE: HORIZ. 1" = 40'
VERT. 1" = 10'



KEY PLAN
N.T.S.



TYP. CAP & VENT PIPE DETAILS
N.T.S.



PIPE PERFORATION DETAIL

NOTES

1. GRADE AS OF MAY 1986 WAS DETERMINED BY AERIAL PHOTOGRAPHY. THE GRADE INCLUDES SOIL STOCKPILED ABOVE SOIL COVER & WASTE.
2. FOR LOCATION OF GAS VENTS, SEE DRAWING T6-102D-5 BY JAMES DOUGLAS ANDREWS, P.E., ENVIRONMENTAL ENGINEERING, INC.

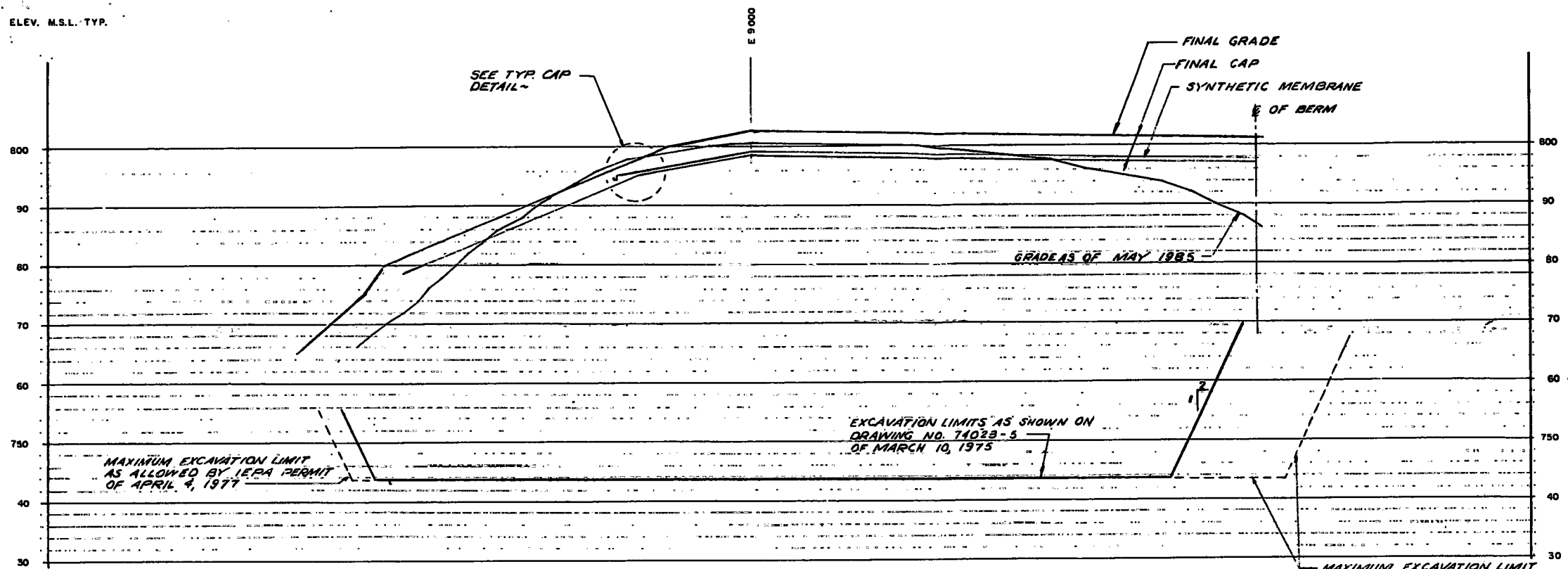
| REV. | DATE | BY | DESCRIPTION |
|------|--------|-----|-------------|
| 1 | 6-7-87 | WJL | REVISIONS |
| 2 | 7-7-87 | WJL | REVISIONS |
| 3 | 7-7-87 | WJL | REVISIONS |
| 4 | 7-7-87 | WJL | REVISIONS |
| 5 | 7-7-87 | WJL | REVISIONS |
| 6 | 7-7-87 | WJL | REVISIONS |
| 7 | 7-7-87 | WJL | REVISIONS |
| 8 | 7-7-87 | WJL | REVISIONS |
| 9 | 7-7-87 | WJL | REVISIONS |
| 10 | 7-7-87 | WJL | REVISIONS |

Browning-Ferris Industries
ENGINEERING SERVICES
1400 SAINT MARY'S STREET, P.O. BOX 3101, HOUSTON, TEXAS 77001-0310
713-670-8100

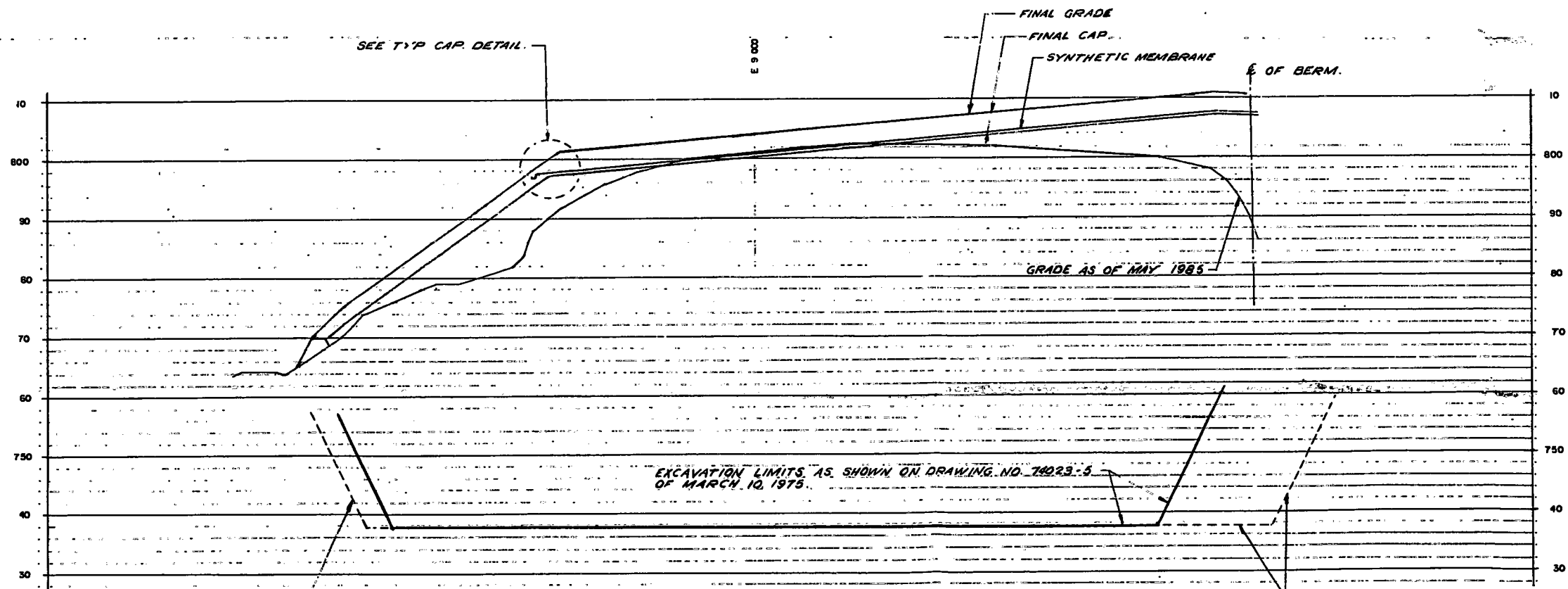
| | |
|-------------------------|--|
| TITLE | SECTION A-A & CAP DETAIL |
| DATE | JUN 1987 |
| DESIGNED BY | WJL |
| CHECKED BY | WJL |
| APPROVED BY | WJL |
| PROJECT NAME & LOCATION | WINTHROP HARBOR EXISTING WASTE MANAGEMENT UNIT |
| ATTACHMENT | 13 |
| EXHIBIT | 1b |

REVIEWER: MED

ELEV. M.S.L. TYP.



SECTION B-B
(AT N 12,000 GRID LINE, LOOKING NORTH)



SECTION C-C
(AT N 11,500 GRID LINE, LOOKING NORTH)

SCALE:
HORIZ. 1" = 40'
VERT. 1" = 10'

NOTE

GRADE AS OF MAY 1985 WAS DETERMINED BY AERIAL PHOTOGRAPHY. THE GRADE INCLUDES SOIL STOCKPILED ABOVE SOIL COVER & WASTE.

SEE DAWING EXHIBIT 16 FOR KEY PLAN

| REV. | DESCRIPTION | DATE | BY |
|------|--------------------------------|------|----|
| 1 | REVISION OF RECORDS MANAGEMENT | | |
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Bf
BROWNING-FERRIS INDUSTRIES
ENGINEERING SERVICES
14701 SAINT MARY'S STREET, P.O. BOX 3151, HOUSTON, TEXAS 77001 (713) 870-8100

| SCALE | NOTED | DATE | BY |
|-------------------------|-------------------------|-------------|----|
| 1" = 40' | 1" = 10' | MAY 7, 1987 | |
| ENGINEER | D. SAKKULA | | |
| DRAWN BY | R. THOMPSON | | |
| APPROVED BY | | | |
| PROJECT NUMBER | 334,630 | | |
| TITLE | SECTIONS B-B & C-C. | | |
| PROJECT NAME & LOCATION | WINTROP HARBOR EXISTING | | |
| | WASTE MANAGEMENT UNIT | | |
| DRAWING NUMBER | ATTACHMENT 13 | | |
| | EXHIBIT 2 | | |

REVIEWER: MED