

West Des Moines, IA

PROJECT: Anderson Ex Co.,CY25 On-Call Support,IA
27225172.00

DATE: 2/9/2026

SUBJECT: Anderson Excavating C&D Landfill - 78-SDP-04-89 -
Leachate Collection System
Evaluation

TRANSMITTAL ID: 00002

PURPOSE: For your approval

VIA: Info Exchange

FROM

NAME	COMPANY	EMAIL	PHONE
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TO

NAME	COMPANY	EMAIL	PHONE
brian.rath@dnr.iowa.gov		brian.rath@dnr.iowa.gov	

REMARKS: Brian -

Please find for download the Anderson Excavating C&D Landfill Leachate Collection System Evaluation. Please let us know if you have any questions or comments.

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DESCRIPTION OF CONTENTS

QTY	DATED	TITLE	NOTES
1	2/9/2026	Anderson Excavating C&D Landfill - 78-SDP-04-89 - Leachate Collection System Evaluation 02.09.2026.pdf	

COPIES:

Becky Jolly
Virginia Anderson
Tim Buelow

(Anderson Excavating Company)
(SCS Engineers)

Transmittal

DATE: 2/9/2026
TRANSMITTAL ID: 00002

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February 9, 2026
File No. 27225172.00

Mr. Brian Rath, P.E.
Iowa Department of Natural Resources
Land Quality Bureau
6200 Park Avenue
Des Moines, Iowa 50321

Re: Leachate Collection System Evaluation
Anderson Excavating C&D Landfill
Permit No. 78-SDP-04-89

Dear Mr. Rath:

SCS Engineers, on behalf of Anderson Excavating, has completed an evaluation of the leachate collection system for Anderson Excavating C&D Landfill. Services were performed in response to the Notice of Violation issued on March 8, 2023 (Doc #106031). Please find attached a copy of the Anderson Excavating C&D Landfill Leachate Collection System Evaluation.

Should you have any questions or need clarification, please contact Tim Buelow at (515) 415-9216.

Sincerely,



Sean Marczewski
Senior Project Professional
SCS Engineers

BAH/SAM/TCB



Timothy C. Buelow, P.E.
VP, Senior Project Advisor
SCS Engineers

Enclosure

copy: Ms. Virginia Anderson, Anderson Excavating
Mr. Jim Brick, Brick Gentry P.C.





Leachate Collection System Evaluation

Anderson Excavating C&D Landfill
Permit No. 78-SDP-04-89
Council Bluffs, Iowa

Prepared for:

Anderson Excavating

SCS ENGINEERS

27225172.00 | February 2026

1690 All-State Ct, Ste 100
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1.0 INTRODUCTION

Anderson Excavating Company, formerly Anderson Excavating & Wrecking Company, operated the Anderson Excavating C&D Landfill from 1995 until 2016. A closure permit was issued on April 11, 2016 (Doc #85941), with an expiration date of April 11, 2046. The DNR issued a Notice of Violation (NOV) on March 8, 2023 (Doc #106031) stating that there was an apparent failure of the Landfill's engineered leachate collection system, whose purpose is to protect groundwater at the site. Specifically, the NOV stated that chemical oxygen demand and total organic halogens concentrations were measured in the downgradient well MW-12 above the background control limits. Subsequent field investigations, control system repairs, and HELP modeling were performed to evaluate the functionality of the leachate collection system and are summarized and discussed herein.

1.1 BACKGROUND

Site Location

The Council Bluffs C&D Landfill (Landfill) property is depicted on **Figure 1**. The Landfill is located at 2520 Kaneshville Boulevard, approximately 1.7 miles west of Interstate 80 in Pottawattamie County, Iowa. The legal description is Part of Lot 5, Auditors Subdivision, NE $\frac{1}{4}$, SW $\frac{1}{4}$, and parts of NE $\frac{1}{4}$, NW $\frac{1}{4}$, and SE $\frac{1}{4}$, NW $\frac{1}{4}$, and Parts of Lots 1 and 2 Prosperity Acres SW $\frac{1}{4}$, NW $\frac{1}{4}$, all located in Section 20, T75N, R43W, Pottawattamie County, Iowa.

Facility

The Landfill is located within a mining pit that was abandoned in the 1950s after a failed attempt to obtain sand and gravel. The new Landfill permit was issued on August 31, 1995 (Doc #35410). The Landfill property covers approximately 80 acres, of which approximately 1.9 acres were used for C&D waste disposal. The Phase 1 cell construction was completed as documented in the Phase 1 Construction Observation Report dated November 27, 1996, included as Attachment 3 of Appendix 5 in the 2006 Permit Renewal dated October 20, 2006 (Doc #18722). A variance was verbally approved to use recycled concrete and brick with a maximum diameter of three inches and 10% by dry weight passing a 200-mesh sieve as the drainage layer aggregate in the Phase 1 cell. The Phase 2 cell construction was completed as documented in the Phase 2 Construction Observation Report dated May 4, 2000, included as Attachment 4 of Appendix 5 in the 2006 Permit Renewal dated October 20, 2006 (Doc #18722). Whole glazed brick and crushed concrete were used as the drainage layer aggregate in accordance with Permit Amendment #2 dated May 3, 2000 (Doc #35451).

Geology and Hydrogeology

The 1995 Hydrogeological Investigation Report for Anderson Excavating and Wrecking Company Construction and Demolition Landfill, prepared by Howard R. Green Company Consulting Engineers (Doc #35471), provided the following geological description:

The landfill is located in the "Western Loess Hills," which is characterized by thick wind deposited soil (loess) overlying glacial deposits. The unconsolidated sediments at the site consist of up to 200 feet of Pleistocene sediments, primarily clayey silt to silty clay (loess), showing increasing sand and clay content with depth. The thick

loess section has been removed over the central portion of the site during a past failed attempt to locate gravel deposits. The Pennsylvanian bedrock beneath the site consists primarily of limestone and shale with thin coal seams. The elevation of the bedrock ranges from 994.2 to 1002.59 feet, amsl.

According to the above-referenced 1995 Hydrogeological Investigation Report:

The uppermost aquifer beneath the site is the water table, which is located within the loess section. The water table elevation ranges from 1086.48 feet on the north side of the site to 1071.32 feet in the southeast corner of the site. Based on in-situ permeability tests, K-values of this loess unit range from 7.2×10^{-6} to 3.1×10^{-7} cm/sec, while transmissivity values range from 0.106 to 0.398 square feet per day.

The water table flow direction is primarily toward the southeast and Mosquito Creek. The primary flow direction of the lower screened interval is toward the southwest.

Horizontal flow gradients were found to vary from 0.010 to 0.053 in the water table aquifer and from 0.019 to 0.065 in the lower screened interval. The vertical flow gradients between the water table and the basal sand unit are downward (recharge condition) and varied from 0.027 to 0.251.

The horizontal flow velocity at the water table varied from 8.0×10^{-3} to 9.4×10^{-4} ft/day. The horizontal flow velocity in the basal sand unit varied from 9.6×10^{-1} to 8.6×10^{-6} ft/day. The recharge flux rate between the water table and the basal sand unit varied from 0.0004 ft³/day per sq. ft. to 0.0024 ft³/day per sq. ft.

1.2 LEACHATE COLLECTION SYSTEM DESCRIPTION

The leachate control system is shown in **Figure 1**. The leachate collection system for the Phase 1 area consists of two perforated collection pipes that drain into a main header through manhole MH-1, which empties into a storage tank. The leachate collection system for Phase 2 consists of three perforated collection pipes that connect to a main header line. The main header line for the Phase 2 area is located along the east toe of the Phase 1 area from the southeast corner of the Phase 2 area to the storage tank. In addition, a perforated pipe was added with the main header line to provide an extra collection pipe along the east toe of the Phase 1 area.

1.3 LEACHATE COLLECTION SYSTEM PERFORMANCE OBSERVATION SUMMARY

Seven leachate piezometers, LPZ-1, LPZ-2, LPZ-3, LPZ-4, LPZ-5, LPZ-6, and LPZ-7, are located throughout the site in both Phase 1 and Phase 2 areas. Leachate piezometer LPZ-1 was presumably constructed in 1996 in conjunction with the construction of the Phase 1 cell. Leachate piezometer LPZ-2 was constructed on August 20, 2008. LPZ-3 through LPZ-7 were installed on May 14, 2025, as documented in Leachate Piezometer Installation dated August 8, 2025 (Doc #113632). Since 2008, the leachate level thickness in LPZ-1 and LPZ-2 have predominantly been measured as dry or having thicknesses of less than 1 foot. Infrequent readings exceeding 6 feet in LPZ-1 and 15 feet in LPZ-2 have been measured; however, these measurements appear erroneous, as generally the measurements preceding and following these measurements were often reported as dry. Accurate depth to liquid readings in leachate piezometers is sometimes complicated by condensate on the

interior sides of the riser pipe, resulting in false readings of perceived elevated liquid. The fluid level in the tank decreased as the measured depth to fluid changed from approximately 12.4 feet to 16.5 feet after being pumped out in August 2024 (Doc #111411 and Doc #115314). No substantial increase in the fluid level in the tank has been observed during the monthly level measurement events following pumping the tank.

2.0 LEACHATE COLLECTION SYSTEM EVALUATION

The leachate collection system evaluation consisted of two components: 1) an investigation into the functionality of the leachate collection system and 2) the USEPA Hydrologic Evaluation of Landfill Performance (HELP) modeling to evaluate potential performance expectations of the leachate collection system for comparison to actual observations.

2.1 SUMMARY OF ACTIVITIES

Since 2019, a series of inspections and corrective actions have been conducted to address concerns with the Landfill's leachate collection system after the DNR identified anomalous leachate levels and potential system deficiencies. Over the following years, detailed camera inspections, excavation work, and extensive repairs addressed multiple issues. Through coordinated efforts by SCS Engineers, contractors, and regulatory staff, the site undertook repairs, system upgrades, and expanded monitoring in an attempt to establish proper leachate conveyance and evaluate subsurface conditions. In 2025, these efforts culminated in a more comprehensive understanding of the collection system's functionality, supported by new piezometer level measurement data and confirmation of flow to the storage tank from cleanouts. The leachate control system is shown in **Figure 1**. Below is a chronological summary of activities.

February 14, 2019: In their review of the 2018 Leachate Control System Performance Evaluation Report (LCSPER), the DNR commented that although the elevated leachate levels recorded after the 2017 line cleaning were considered anomalous, they still suggested two likely explanations: either the liner is leaking at a rate that exceeds the collection system's collection rate, or the storage tank is leaking. The DNR directed the development of a plan to explain the issue and evaluate potential remedies.

Details documented in correspondence dated February 14, 2019 (Doc #94405).

April 24, 2019: Backlund Plumbing televised the leachate lines. The findings are summarized below.

- Cleanout 1: Refusal at 137 feet, but the line appeared to be open.
- Cleanout 2: Pinched and plugged with debris/sediment at 70 feet.
- Cleanout 3: Underwater at 60 feet and appeared pinched at 110 feet.
- Cleanout 4: Underwater at 40 feet and appeared pinched at 100 feet.
- Cleanout 5: Appeared pinched at 18 feet.
- Cleanout 6: Blockage at 30 feet.
- Cleanout 7: Underwater for the length of the video, and had artesian flow when the cap was removed.

Details documented in correspondence dated November 30, 2020 (Doc #99014).

2019: Barker Lemar Engineering Consultants (Barker Lemar) excavated around the leachate storage tank, and it appeared to be constructed out of fiberglass and was in good condition. This is contrary to the steel construction tank specifications detailed in the 1995 Site Development and Operations Plan (Doc #35507). During the inspection, the incoming leachate line was observed to be loose and was repaired.

Details documented in correspondence dated November 25, 2019 (Doc #96486) and August 29, 1995 (Doc #35507).

March 8, 2023: The DNR determined that the site was in violation of the leachate collection system maintenance requirements of Special Provision #6b of the closure permit, subparagraph 114.26(11)"a"(8) and paragraph 114.26(14)"e" of the Iowa Administrative Code, and the April 13, 2016 amendment to Administrative Order 2013-SW-03.

Details documented in correspondence dated March 8, 2023 (Doc #106031).

November – December 2023: SCS Engineers (SCS) assessed and repaired the downstream portion of the leachate collection system. This included repairing damaged pipes, installing new cleanouts, and installing a valve immediately upstream of the storage tank. Details are summarized below.

- A hose-clamp type fastener was observed on the leachate conveyance line between MH-1 and the storage tank between two sections of pipe. The fastener was removed, and the two sections of pipe were fusion-welded together.
- After the repair, a flow test was performed between the outfall of MH-1 and the storage tank. Water was poured into MH-1 and was observed flowing into the storage tank.
- New cleanout sweeps (Cleanout 8 and Cleanout 9) were installed to allow both upstream and downstream inspection and cleaning of the leachate conveyance line between MH-1 and the storage tank.
- The blockage in Cleanout 6 was removed. During removal, a pinch-point was observed in the pipe, which was removed and repaired, and a new cleanout sweep was installed. The pipe, which was previously not connected, was connected to the storage tank. The Amendment to the 1995 Site Development and Operations Plan dated August 4, 1999 (Doc #35480) stated that the leachate storage tank would be removed and replaced with a leachate lagoon and was approved in the 1999 Permit Renewal dated September 14, 1999 (Doc #35435). The 2006 Permit Renewal dated October 20, 2006 (Doc #18722), which included an updated Development and Operations Plan, stated that the lagoon was not constructed since the storage tank was able to provide storage for approximately seven months of leachate generation and that the leachate laterals in Phase 2 were temporarily connected to the existing leachate storage tank. However, a temporary connection was not observed during these repairs, and it appears that the line was attached to the tank for the first time during this work.
- Cleanout 7 was observed propped up on a hillside of the ravine where the storage tank is located. This was an additional collection pipe that was installed along the east toe of the Phase 2 Cell. The pipe was installed above the trench of the new header line and flows north to the sump area in Phase 2 Cell. Since the south cleanout of the pipe was artesian during the 2019 camera inspection, it was decided to connect the pipe to the storage tank, and a new cleanout was installed to allow inspection and cleaning.

- A butterfly valve was installed directly upstream of the storage tank to allow isolation of the upstream collection system.
- The pinch-point that was observed during the 2019 camera inspection in Cleanout 5 was repaired.

Details documented in correspondence dated August 4, 1999 (Doc #35480), October 20, 2006 (Doc #18722), and December 12, 2023 (Doc #108441).

June 25, 2024: SCS performed a camera inspection of targeted sections of the upstream collection system. Details are summarized below.

- SCS personnel conducted a 50-foot-deep confined space entry into MH-1 to televise and document the condition of the two inlet pipes originating from Cleanout 3 and Cleanout 4. No blockages or pinches were observed in either pipe throughout the 150-foot camera run.
- Cleanout 2 was televised, and the pinch-point that was noted during the 2019 camera inspection at approximately 70' into the pipe was observed and confirmed.

Details documented in correspondence dated July 31, 2024 (Doc #110589).

July – September 2024: The internal service road was repaired, and the leachate storage tank was pumped out. A total of approximately 18,000 gallons was hauled to the City of Council Bluffs POTW. The measured depth to fluid in the tank before being pumped was approximately 12.4 feet, which decreased to approximately 16.5 feet after pumping. No substantial increase in the fluid level in the tank has been observed during the monthly level measurement events following pumping the tank.

Details documented in correspondence dated August 27, 2024 (Doc #110768) and November 27, 2024 (Doc #111411).

March – May 2025: As a result of a meeting between SCS Engineers, Jim Brick (attorney with Brick Gentry, P.C.), and DNR representatives on January 10, 2025, five new leachate piezometer locations were surveyed, staked, drilled, and piezometers installed. Initial leachate level measurements taken immediately after piezometer installation indicated that no leachate was present. Monthly leachate measurements commenced in June 2025, and the piezometers have remained dry since installation on May 15, 2025.

Details documented in correspondence dated May 20, 2025 (Doc #113095) and August 8, 2025 (Doc #113623).

October 7, 2025: SCS Engineers flushed the leachate collection pipes to determine if the pipes conveyed leachate to the storage tank. The volume of the leachate pipes and the trench aggregate void space was calculated to confirm that a sufficient volume of water was introduced into the collection system to fill the pipes and saturate the trenches. Flow was observed into the leachate storage tank from Cleanouts 1, 4, and 5. Cleanout 2 is pinched at approximately 70 feet, and Cleanout 3 is damaged and could not be located. It should be noted that flow into the storage tank was observed before the calculated pipe and trench volumes had been introduced into the pipes.

2.2 HELP MODEL EVALUATION

To provide insight into the recorded volumes of leachate collected at the site, the Hydrologic Evaluation of Landfill Performance (HELP) Model was used to estimate leachate collection potential at the Landfill using site conditions and parameter values from the June 1995 Construction and

Development Plan (Doc #35406) and construction certification reports for Phase 1 and Phase 2 included in Attachments 3 and 4 of Appendix 5 in the October 2006 Site Development and Operations Plan (Doc# 18722), and the final cover Closure Documentation and Remaining Requirements Letter (Doc #88916).

HELP Model Inputs

The weather data used in the HELP Model was simulated using the HELP Model's built-in WGEN simulator. The simulation time for the model and weather simulation was set to 30 years to account for weather variation. Wind speed and relative humidity data were imported from the NSRDB database provided in the HELP Model manual.

A Summary of the layers used in the HELP Model simulation is summarized below:

- Layer 1, a 24-inch uncompacted soil layer using the standard HELP layer Clay Loam properties.
- Layer 2, a 24-inch thick compacted vertical percolation layer using the maximum allowed 1×10^{-7} cm/sec hydraulic conductivity.
- Layer 3, a waste layer using the waste thickness used in the 1990 HELP model evaluation and the standard HELP layer MSW properties.
- Layer 4, a 1-foot-thick drainage layer using total porosity and field capacity from the standard HELP layer Loamy Fine Sand, and the as-built brick drainage layer permeability listed in the 1996 Construction Observation Report included in the October 20, 2006 Permit Renewal (Doc #18722).
- Layer 5, a 4-foot compacted liner using the HELP Model's standard soil barrier liner layer, which was then modified to use the lowest hydraulic conductivity from the liner construction certification reports to be conservative. The information for the liner permeability used was from the June 1995 Closure/Post-Closure Plan (Doc #35464).

The full list of input parameters is included in **Attachment A**.

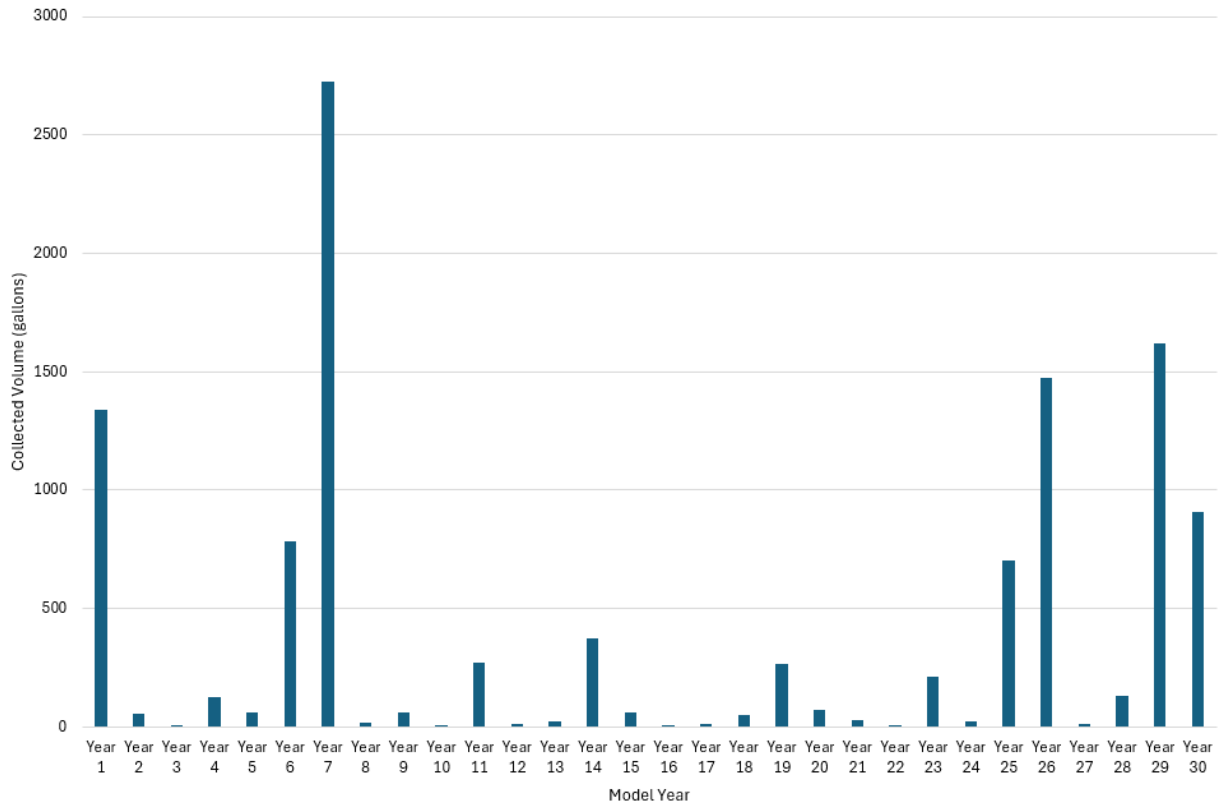
HELP Model Output

The HELP Model evaluation indicated that the expected average annual amount of leachate collected was 382 gallons over the 30-year model period. The annual amount collected per year ranged from 3 gallons to 2,727 gallons (see graph and Table 1 on the following pages), indicating that it would not be uncommon for the system to collect minimal amounts of leachate at times, but it will also collect larger amounts under higher precipitation periods. This could explain the occasional presence of leachate in the collection tank and the need for periodic disposal, but also periods of essentially no accumulation of leachate in the collection tank. The historical leachate management record indicates that for some years, more than 3,000 gallons of leachate were removed from the tank, while in other years, no leachate was removed. The HELP Model summary output is included in **Attachment A**.

Table 1
HELP Model Volume Summary of Collected Leachate

Model Year	Collected Volume (ft ³)	Collected Volume (gal)
Year 1	179.3	1341
Year 2	7.3	55
Year 3	0.68	5
Year 4	16.8	126
Year 5	8.2	61
Year 6	105	785
Year 7	364.5	2727
Year 8	2.13	16
Year 9	8.5	64
Year 10	0.7572	6
Year 11	36.2	271
Year 12	1.78	13
Year 13	2.99	22
Year 14	50.3	376
Year 15	7.99	60
Year 16	0.68	5
Year 17	1.38	10
Year 18	6.76	51
Year 19	35.3	264
Year 20	9.65	72
Year 21	4.0200	30
Year 22	0.356	3
Year 23	28.3	212
Year 24	2.97	22
Year 25	94.3	705
Year 26	197.1	1474
Year 27	1.78	13
Year 28	17.8	133
Year 29	216.2	1617
Year 30	121.6	910

Anderson Excavation C&D Landfill - Council Bluffs
HELP Model Summary of Collected Leachate



3.0 SUMMARY AND RECOMMENDATIONS

In March 2023, the DNR determined that the site was in violation of the leachate collection system maintenance requirements of Special Provision #6b of the closure permit, subparagraph 114.26(11)"a"(8) and paragraph 114.26(14)"e" of the Iowa Administrative Code, and the April 13, 2016 amendment to Administrative Order 2013-SW-03.

Since then, extensive investigations and repairs to the leachate collection system have been completed in order to determine the functionality of the leachate collection system. SCS Engineers completed significant corrective work to the downstream portion of the collection system, including repairing pipes, removing blockages in pipes, installing new cleanouts, and connecting pipes to the storage tank. Conveyance to the storage tank was verified, and since the tank was pumped out in 2024, the leachate level in the tank has not changed any appreciable level. Leachate has generally not been measurable within the waste, including in the five newly installed piezometers, indicating that leachate is generally not accumulating above the liner. The collected volume observations are also within the performance expectations indicated by the HELP Model. Based on the repairs and observations made, it appears that if leachate is generated and is collected by the leachate collection system, it is conveyed to the storage tank.

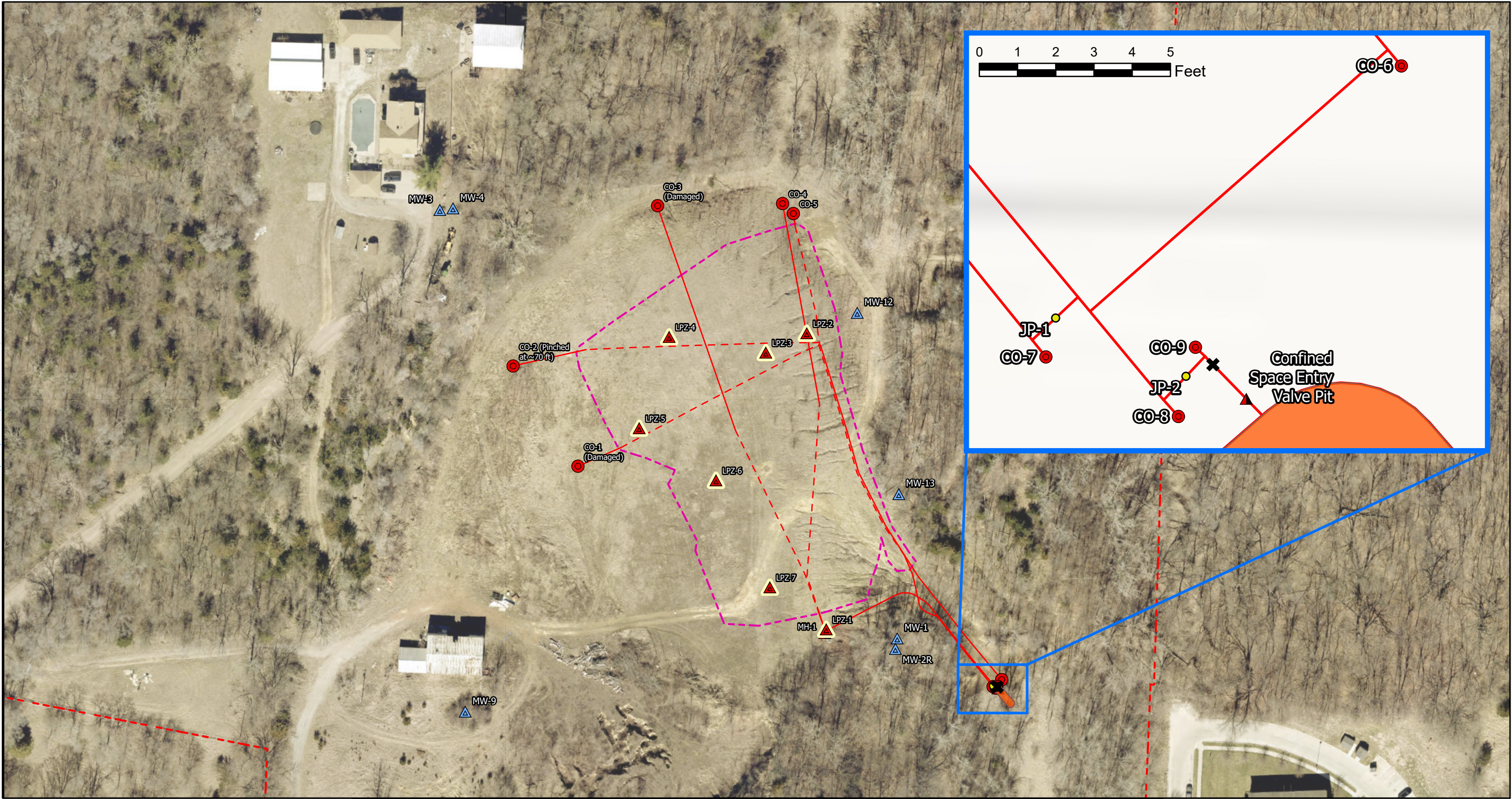
The Notice of Violation issued in March 2023 also stated that the final cover maintenance requirements of Special Provisions #9, #10, and #11 of the closure permit, and paragraphs 114.26(14)"a" through "c" of the IAC were not being met. It is recommended that the final cover be repaired to meet the requirements of IAC 567-114.26(13)"b". A final cover repair plan, including a plan for soil amendment, as necessary, to meet the final cover permeability requirement of no greater than 1×10^{-7} cm/sec will be submitted under separate cover if the DNR is in agreement with repairing the final cover to the specifications cited.



Figures

Leachate Control System

C:\Users\hmadson\OneDrive - SCS Engineers\Desktop\GIS\Maped\Leachate\Site Map\Leachate CB 2023 AMVOR.aprx
Path: C:\Users\hmadson\OneDrive - SCS Engineers\Desktop\GIS\Maped\Leachate\Site Map\Leachate CB 2023 AMVOR.aprx
User: hmadson
Date Saved: 11/05/2025 2:27 PM



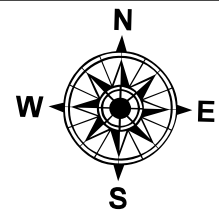
Leachate Control System

Legend

- | | | |
|---------------------------|---|---|
| Leachate Monitoring Point | Junction Point | Leachate Collection Piping (Perforated) |
| Manhole | Above Ground Shutoff Valve | Leachate Collection Piping (Solid) |
| Leachate Cleanout | Approximate Location of Leachate Storage Tank | Approximate Waste Boundary |
| Monitoring Well | | Approximate Property Boundary |

*All map feature locations are approximate

Anderson Excavating Council
Bluffs Landfill
Council Bluffs, Iowa
Project No: 27225172.01
Drawing Date: November
2025



0 75 150 300
Feet

Figure 1

Attachment A

HELP Model Inputs and Outputs

Input Table

Input	Value	Reasoning
General		
Landfill Area	2.57 Acres	Based on approximate waste boundary on sheet 3, Doc #77621
Years of Simulation	30 Years	Allows for weather variability
% Subject to Runoff	100%	Based on average slope of the landfill being >5%, and the minimum being >3% Doc #90384
Initial Moisture	Not Specified	Not specifying initial moisture assumes steady state conditions within layers, as the soil water content is at or near field capacity
Weather data	Simulated	
Windspeed/ Rel Humidity		Imported from NSRDB Database
Growing season	4/14 - 10/16	https://weatherspark.com/m/9471/8/Average-Weather-in-August-in-Council-Bluffs-Iowa-United-States
Leaf Area Index	4.5	Hydrologic Evaluation of Landfill Performance:HELP 4.0 User Manual Page 42
Evaporative Zone Depth	24 Inches	Average from -Hydrologic Evaluation of Landfill Performance:HELP 4.0 User Manual Page 43
Runoff Curve Number	87.4	Used HELP- computed curve number (3) based on following inputs
Slope	3%	1995 Model Input
Slope Length	144 Feet	Maximum drainage length from Closure Documentation Doc #88916
Vegetative Cover	Fair Grass	Spring SAER doc#109956
Layers		
Layer 1		
Type	Clay Loam	Conductivity Aligns with layer 1 in 1995 model Doc 35406
Thickness	24 Inches	Page 34 Doc #35406
Properties	Standard	Properties provided in standard layer
Layer 2		
Type	Vertical Percolation Layer	Page 34 Doc #35406
Thickness	24 Inches	Page 34 Doc #35406
Properties	Standard for Liner soils	Properties provided in standard layer
Layer 3		
Type	MSW	Waste Layer
Thickness	216 Inches	Waste thickness Aligns with layer 1 in 1995 model Doc #35406
Properties	Standard	Properties provided in standard layer
Layer 4		
Type	Crushed Brick	Page 31 Doc #35406
Thickness	12 Inches	Page 31 Doc #35406
Slope	4%	Page 2 Doc #113623
Drainage Length	50 Feet	Average from drainage length calculation
Properties	Standard	Used Total porosity, wilting point, and field capacity from the standard HELP layer Loamy Fine Sand
Hydraulic conductivity	1.1×10^{-3}	Doc #18722 Construction Observation Report
Layer 5		
Type	Liner Soil	Page 15 Doc #35406
Thickness	48 Inches	Page 15 Doc #35406
Properties	Standard	Properties provided in standard layer
Hydraulic Conductivity	9.1×10^{-6} cm/s	Lowest liner soil permeability in Doc #35464

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 4.0 BETA (2018)
DEVELOPED BY USEPA NATIONAL RISK MANAGEMENT RESEARCH LABORATORY

Title: Anderson Excavating **Simulated On:** 2/4/2026 10:02

Layer 1

Type 1 - Vertical Percolation Layer (Cover Soil)

CL - Clay Loam

Material Texture Number 11

Thickness	=	24 inches
Porosity	=	0.464 vol/vol
Field Capacity	=	0.31 vol/vol
Wilting Point	=	0.187 vol/vol
Initial Soil Water Content	=	0.2953 vol/vol
Effective Sat. Hyd. Conductivity	=	6.40E-05 cm/sec

Layer 2

Type 1 - Vertical Percolation Layer

Vertical Percolation Layer

Material Texture Number 43

Thickness	=	24 inches
Porosity	=	0.427 vol/vol
Field Capacity	=	0.418 vol/vol
Wilting Point	=	0.367 vol/vol
Initial Soil Water Content	=	0.418 vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-07 cm/sec

Layer 3

Type 1 - Vertical Percolation Layer (Waste)

Municipal Solid Waste (MSW) (900 pcy)

Material Texture Number 18

Thickness	=	216 inches
Porosity	=	0.671 vol/vol
Field Capacity	=	0.292 vol/vol
Wilting Point	=	0.077 vol/vol
Initial Soil Water Content	=	0.292 vol/vol
Effective Sat. Hyd. Conductivity	=	1.00E-03 cm/sec

Layer 4

Type 2 - Lateral Drainage Layer

Crushed Brick

Material Texture Number 45

Thickness	=	12 inches
Porosity	=	0.457 vol/vol
Field Capacity	=	0.131 vol/vol
Wilting Point	=	0.058 vol/vol
Initial Soil Water Content	=	0.131 vol/vol
Effective Sat. Hyd. Conductivity	=	1.10E-03 cm/sec
Slope	=	4 %
Drainage Length	=	50 ft

Layer 5

Type 3 - Barrier Soil Liner

Barrier Soil Liner

Material Texture Number 44

Thickness	=	48 inches
Porosity	=	0.427 vol/vol
Field Capacity	=	0.418 vol/vol
Wilting Point	=	0.367 vol/vol
Initial Soil Water Content	=	0.427 vol/vol
Effective Sat. Hyd. Conductivity	=	9.10E-08 cm/sec

Note: Initial moisture content of the layers and snow water were
computed as nearly steady-state values by HELP.

General Design and Evaporative Zone Data

SCS Runoff Curve Number	=	87.4
Fraction of Area Allowing Runoff	=	100 %
Area projected on a horizontal plane	=	2.57 acres
Evaporative Zone Depth	=	24 inches
Initial Water in Evaporative Zone	=	7.086 inches
Upper Limit of Evaporative Storage	=	11.136 inches
Lower Limit of Evaporative Storage	=	4.488 inches
Initial Snow Water	=	0 inches
Initial Water in Layer Materials	=	102.259 inches
Total Initial Water	=	102.259 inches
Total Subsurface Inflow	=	0 inches/year

Note: SCS Runoff Curve Number was calculated by HELP.

Evapotranspiration and Weather Data

Station Latitude	=	41.22 Degrees
Maximum Leaf Area Index	=	4.5
Start of Growing Season (Julian Date)	=	104 days
End of Growing Season (Julian Date)	=	289 days
Average Wind Speed	=	8 mph
Average 1st Quarter Relative Humidity	=	71 %
Average 2nd Quarter Relative Humidity	=	73 %
Average 3rd Quarter Relative Humidity	=	78 %
Average 4th Quarter Relative Humidity	=	70 %

Note: Evapotranspiration data was obtained for Council Bluffs, Iowa

Normal Mean Monthly Precipitation (inches)

<u>Jan/Jul</u>	<u>Feb/Aug</u>	<u>Mar/Sep</u>	<u>Apr/Oct</u>	<u>May/Nov</u>	<u>Jun/Dec</u>
0.670149	1.030657	1.807893	3.126882	4.509741	5.027056
4.02387	3.792371	3.103839	2.633905	1.831989	1.04441

Note: Precipitation was simulated based on HELP V4 weather simulation for:
Lat/Long: 41.22/-95.78

Normal Mean Monthly Temperature (Degrees Fahrenheit)

<u>Jan/Jul</u>	<u>Feb/Aug</u>	<u>Mar/Sep</u>	<u>Apr/Oct</u>	<u>May/Nov</u>	<u>Jun/Dec</u>
33	34.8	43.4	55.1	67.2	80.6
86.8	81.3	73.9	59.7	45.8	35.8

Note: Temperature was simulated based on HELP V4 weather simulation for:
Lat/Long: 41.22/-95.78
Solar radiation was simulated based on HELP V4 weather simulation for:
Lat/Long: 41.22/-95.78

353		0.00	0.000	0.073	0.2727	0.0004	0.0000	6.72E-04
354		0.00	0.000	0.108	0.2682	0.0004	0.0000	6.33E-04
355		0.14	0.000	0.133	0.2682	0.0004	0.0000	5.55E-04
356		0.13	0.000	0.161	0.2668	0.0001	0.0000	3.70E-04
357		0.26	0.000	0.107	0.2731	0.0002	0.0000	5.46E-04
358		0.44	0.000	0.067	0.2889	0.0004	0.0000	6.24E-04
359		0.00	0.000	0.041	0.2871	0.0003	0.0000	8.52E-04
360	*	0.00	0.000	0.000	0.2871	0.0003	0.0000	4.40E-04
361	*	0.01	0.000	0.007	0.2871	0.0003	0.0000	4.36E-04
362		0.05	0.000	0.048	0.2873	0.0002	0.0000	2.47E-04
363		0.00	0.000	0.036	0.2858	0.0004	0.0000	6.62E-04
364	*	0.00	0.000	0.000	0.2858	0.0004	0.0000	6.35E-04
365	*	0.00	0.000	0.023	0.2849	0.0004	0.0000	7.04E-04

* = Frozen (air or soil)

Annual Totals for Year 1			
	inches	cubic feet	percent
Precipitation	31.73	296,011.6	100.00
Runoff	0.190	1,769.7	0.60
Evapotranspiration	31.242	291,462.9	98.46
Drainage Collected from Layer 4	0.0192	179.3	0.06
Percolation/Leakage through Layer 5	0.631947	5,895.5	1.99
Average Head on Top of Layer 5	0.0106	---	---
Change in Water Storage	-0.3533	-3,295.8	-1.11
Soil Water at Start of Year	102.2585	953,979.9	322.28
Soil Water at End of Year	101.9052	950,684.2	321.16
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353	*	0.00	0.000	0.013	0.2495	0.0002	0.0000	6.25E-04
354	*	0.00	0.000	0.015	0.2504	0.0004	0.0000	7.63E-04
355		0.00	0.000	0.000	0.2704	0.0003	0.0000	7.38E-04
356		0.00	0.000	0.043	0.2771	0.0001	0.0000	7.01E-04
357	*	0.00	0.000	0.030	0.2759	0.0001	0.0000	6.67E-04
358		0.00	0.000	0.055	0.2736	0.0004	0.0000	7.56E-04
359		0.00	0.000	0.086	0.2700	0.0001	0.0000	6.93E-04
360		0.00	0.000	0.034	0.2686	0.0001	0.0000	6.65E-04
361		0.00	0.000	0.040	0.2669	0.0004	0.0000	6.61E-04
362		0.00	0.000	0.031	0.2657	0.0004	0.0000	7.17E-04
363	*	0.00	0.000	0.000	0.2657	0.0004	0.0000	7.42E-04
364	*	0.01	0.000	0.008	0.2658	0.0001	0.0000	6.84E-04
365	*	0.00	0.000	0.027	0.2647	0.0001	0.0000	6.75E-04

* = Frozen (air or soil)

Annual Totals for Year 2			
	inches	cubic feet	percent
Precipitation	34.37	320,633.2	100.00
Runoff	1.544	14,400.7	4.49
Evapotranspiration	32.990	307,770.5	95.99
Drainage Collected from Layer 4	0.0008	7.3017	0.00
Percolation/Leakage through Layer 5	0.312231	2,912.8	0.91
Average Head on Top of Layer 5	0.0005	---	---
Change in Water Storage	-0.4779	-4,458.1	-1.39
Soil Water at Start of Year	101.9052	950,684.2	296.50
Soil Water at End of Year	101.4274	946,226.0	295.11
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353	*	*	0.00	0.000	0.014	0.2603	0.0000	0.0000	0.00E+00
354	*	*	0.00	0.000	0.018	0.2603	0.0000	0.0000	0.00E+00
355	*	*	0.00	0.000	0.022	0.2603	0.0000	0.0000	0.00E+00
356	*	*	0.08	0.000	0.020	0.2603	0.0000	0.0000	0.00E+00
357	*	*	0.02	0.000	0.000	0.2603	0.0000	0.0000	0.00E+00
358	*	*	0.07	0.000	0.000	0.2603	0.0000	0.0000	0.00E+00
359	*	*	0.07	0.000	0.010	0.2603	0.0000	0.0000	0.00E+00
360		*	0.00	0.000	0.000	0.2603	0.0000	0.0000	0.00E+00
361	*	*	0.00	0.000	0.021	0.2603	0.0000	0.0000	0.00E+00
362		*	0.00	0.282	0.000	0.2702	0.0000	0.0000	0.00E+00
363		*	0.09	0.005	0.026	0.2725	0.0000	0.0000	0.00E+00
364	*	*	0.04	0.000	0.014	0.2725	0.0000	0.0000	0.00E+00
365	*	*	0.00	0.000	0.013	0.2725	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 3			
	inches	cubic feet	percent
Precipitation	33.34	311,025.5	100.00
Runoff	0.836	7,799.4	2.51
Evapotranspiration	32.304	301,362.7	96.89
Drainage Collected from Layer 4	0.0001	0.6762	0.00
Percolation/Leakage through Layer 5	0.113262	1,056.6	0.34
Average Head on Top of Layer 5	0.0001	---	---
Change in Water Storage	0.0864	806.0	0.26
Soil Water at Start of Year	101.4274	946,226.0	304.23
Soil Water at End of Year	101.5051	946,950.9	304.46
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0087	81.2	0.03

353		*	0.00	0.000	0.000	0.3191	0.0004	0.0000	7.45E-04
354	*	*	0.00	0.000	0.000	0.3191	0.0005	0.0000	7.76E-04
355		*	0.00	0.000	0.000	0.3191	0.0004	0.0000	9.03E-04
356		*	0.00	0.000	0.000	0.3191	0.0002	0.0000	8.43E-04
357	*	*	0.00	0.000	0.000	0.3191	0.0002	0.0000	6.86E-04
358	*	*	0.00	0.000	0.000	0.3191	0.0005	0.0000	8.37E-04
359		*	0.00	0.000	0.000	0.3191	0.0003	0.0000	8.29E-04
360		*	0.00	0.000	0.000	0.3191	0.0002	0.0000	7.16E-04
361	*	*	0.00	0.000	0.000	0.3191	0.0004	0.0000	6.94E-04
362		*	0.00	0.000	0.000	0.3191	0.0004	0.0000	8.34E-04
363		*	0.01	0.000	0.005	0.3193	0.0004	0.0000	8.38E-04
364	*	*	0.10	0.000	0.016	0.3193	0.0002	0.0000	7.70E-04
365		*	0.01	0.008	0.025	0.3219	0.0002	0.0000	7.08E-04

* = Frozen (air or soil)

Annual Totals for Year 4			
	inches	cubic feet	percent
Precipitation	27.61	257,539.8	100.00
Runoff	3.140	29,290.5	11.37
Evapotranspiration	22.894	213,584.4	82.93
Drainage Collected from Layer 4	0.0018	16.8	0.01
Percolation/Leakage through Layer 5	0.266624	2,487.4	0.97
Average Head on Top of Layer 5	0.0010	---	---
Change in Water Storage	1.3035	12,160.7	4.72
Soil Water at Start of Year	101.5051	946,950.9	367.69
Soil Water at End of Year	102.8173	959,192.7	372.44
Snow Water at Start of Year	0.0087	81.2	0.03
Snow Water at End of Year	0.0000	0.0000	0.00

353		0.00	0.000	0.039	0.3214	0.0000	0.0000	0.00E+00
354	*	0.00	0.000	0.000	0.3213	0.0000	0.0000	8.34E-05
355	*	0.00	0.000	0.000	0.3211	0.0001	0.0000	2.23E-04
356	*	0.00	0.000	0.000	0.3210	0.0001	0.0000	3.61E-04
357	*	0.03	0.000	0.003	0.3216	0.0002	0.0000	4.98E-04
358	*	0.34	0.000	0.009	0.3223	0.0002	0.0000	6.33E-04
359		0.08	0.000	0.000	0.3315	0.0003	0.0000	7.66E-04
360	*	0.08	0.000	0.014	0.3322	0.0003	0.0000	8.96E-04
361		0.07	0.000	0.005	0.3439	0.0004	0.0000	1.02E-03
362	*	0.00	0.000	0.001	0.3437	0.0004	0.0000	1.15E-03
363	*	0.00	0.000	0.000	0.3436	0.0005	0.0000	1.27E-03
364	*	0.00	0.000	0.000	0.3434	0.0005	0.0000	1.39E-03
365	*	0.00	0.000	0.000	0.3433	0.0006	0.0000	1.50E-03

* = Frozen (air or soil)

Annual Totals for Year 5			
	inches	cubic feet	percent
Precipitation	28.18	262,886.0	100.00
Runoff	1.255	11,711.0	4.45
Evapotranspiration	25.816	240,836.5	91.61
Drainage Collected from Layer 4	0.0009	8.2032	0.00
Percolation/Leakage through Layer 5	0.324235	3,024.8	1.15
Average Head on Top of Layer 5	0.0006	---	---
Change in Water Storage	0.7831	7,305.5	2.78
Soil Water at Start of Year	102.8173	959,192.7	364.87
Soil Water at End of Year	103.6004	966,498.2	367.65
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353		0.00	0.000	0.107	0.3446	0.0158	0.0001	3.10E-03
354		0.00	0.000	0.092	0.3406	0.0117	0.0001	3.10E-03
355		0.00	0.000	0.036	0.3389	0.0070	0.0000	3.10E-03
356	*	0.00	0.000	0.029	0.3375	0.0018	0.0000	2.17E-03
357		0.05	0.000	0.057	0.3371	0.0004	0.0000	1.10E-03
358		0.00	0.000	0.071	0.3339	0.0004	0.0000	9.35E-04
359		0.01	0.000	0.036	0.3327	0.0003	0.0000	6.04E-04
360	*	0.12	0.000	0.028	0.3334	0.0000	0.0000	0.00E+00
361	*	0.00	0.000	0.011	0.3340	0.0000	0.0000	0.00E+00
362		0.00	0.000	0.032	0.3341	0.0000	0.0000	1.86E-05
363		0.06	0.000	0.040	0.3349	0.0000	0.0000	1.42E-04
364		0.11	0.000	0.043	0.3376	0.0001	0.0000	2.80E-04
365		0.00	0.000	0.040	0.3358	0.0002	0.0000	4.18E-04

* = Frozen (air or soil)

Annual Totals for Year 6			
	inches	cubic feet	percent
Precipitation	38.72	361,227.2	100.00
Runoff	2.365	22,067.7	6.11
Evapotranspiration	35.734	333,367.5	92.29
Drainage Collected from Layer 4	0.0113	105.0	0.03
Percolation/Leakage through Layer 5	0.808823	7,545.6	2.09
Average Head on Top of Layer 5	0.0062	---	---
Change in Water Storage	-0.1992	-1,858.7	-0.51
Soil Water at Start of Year	103.6004	966,498.2	267.56
Soil Water at End of Year	103.4011	964,639.5	267.05
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353		0.00	0.000	0.055	0.2754	0.0002	0.0000	7.90E-04
354		0.00	0.000	0.086	0.2718	0.0002	0.0000	7.67E-04
355		0.00	0.000	0.069	0.2689	0.0002	0.0000	7.80E-04
356		0.00	0.000	0.065	0.2662	0.0002	0.0000	7.93E-04
357		0.00	0.000	0.066	0.2635	0.0002	0.0000	5.84E-04
358		0.00	0.000	0.024	0.2625	0.0003	0.0000	8.83E-04
359	*	0.00	0.000	0.019	0.2617	0.0003	0.0000	7.80E-04
360	*	0.00	0.000	0.000	0.2617	0.0001	0.0000	7.29E-04
361		0.00	0.000	0.028	0.2605	0.0003	0.0000	6.77E-04
362		0.00	0.000	0.047	0.2585	0.0004	0.0000	7.11E-04
363		0.00	0.000	0.031	0.2573	0.0003	0.0000	8.64E-04
364		0.00	0.000	0.050	0.2552	0.0003	0.0000	7.78E-04
365		0.01	0.000	0.035	0.2542	0.0002	0.0000	7.55E-04

* = Frozen (air or soil)

Annual Totals for Year 7			
	inches	cubic feet	percent
Precipitation	28.07	261,906.9	100.00
Runoff	0.822	7,670.7	2.93
Evapotranspiration	28.538	266,232.4	101.65
Drainage Collected from Layer 4	0.0391	364.5	0.14
Percolation/Leakage through Layer 5	0.887376	8,278.4	3.16
Average Head on Top of Layer 5	0.0215	---	---
Change in Water Storage	-2.2123	-20,639.1	-7.88
Soil Water at Start of Year	103.4011	964,639.5	368.31
Soil Water at End of Year	101.1888	944,000.4	360.43
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353	*	0.11	0.000	0.028	0.2522	0.0000	0.0000	0.00E+00
354		0.00	0.000	0.063	0.2520	0.0000	0.0000	0.00E+00
355	*	0.00	0.000	0.000	0.2520	0.0000	0.0000	0.00E+00
356	*	0.03	0.000	0.033	0.2518	0.0000	0.0000	0.00E+00
357	*	0.00	0.000	0.000	0.2518	0.0000	0.0000	0.00E+00
358		0.00	0.000	0.023	0.2508	0.0000	0.0000	0.00E+00
359		0.01	0.000	0.027	0.2500	0.0000	0.0000	0.00E+00
360		0.19	0.000	0.032	0.2567	0.0000	0.0000	0.00E+00
361		0.00	0.000	0.021	0.2558	0.0000	0.0000	0.00E+00
362		0.00	0.000	0.021	0.2549	0.0000	0.0000	0.00E+00
363	*	0.00	0.000	0.020	0.2541	0.0000	0.0000	0.00E+00
364		0.01	0.000	0.025	0.2534	0.0000	0.0000	0.00E+00
365	*	0.61	0.000	0.022	0.2542	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 8			
	inches	cubic feet	percent
Precipitation	36.26	338,290.1	100.00
Runoff	1.586	14,796.3	4.37
Evapotranspiration	33.782	315,155.9	93.16
Drainage Collected from Layer 4	0.0002	2.1301	0.00
Percolation/Leakage through Layer 5	0.226550	2,113.5	0.62
Average Head on Top of Layer 5	0.0002	---	---
Change in Water Storage	0.6670	6,222.2	1.84
Soil Water at Start of Year	101.1888	944,000.4	279.05
Soil Water at End of Year	101.3230	945,252.3	279.42
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.5328	4,970.4	1.47

353	*	*	0.02	0.000	0.015	0.2333	0.0001	0.0000	6.92E-04
354	*	*	0.00	0.000	0.000	0.2333	0.0004	0.0000	7.67E-04
355		*	0.00	0.000	0.000	0.2333	0.0001	0.0000	6.99E-04
356	*	*	0.00	0.000	0.000	0.2333	0.0004	0.0000	6.73E-04
357		*	0.00	0.000	0.000	0.2333	0.0004	0.0000	7.07E-04
358		*	0.00	0.000	0.000	0.2333	0.0004	0.0000	6.88E-04
359		*	0.00	0.000	0.000	0.2333	0.0003	0.0000	8.47E-04
360		*	0.27	0.049	0.009	0.2420	0.0001	0.0000	7.11E-04
361		*	0.00	0.000	0.000	0.2420	0.0001	0.0000	7.08E-04
362		*	0.00	0.000	0.000	0.2420	0.0001	0.0000	7.09E-04
363		*	0.00	0.000	0.000	0.2420	0.0001	0.0000	7.19E-04
364		*	0.02	0.000	0.007	0.2425	0.0002	0.0000	5.74E-04
365		*	0.10	0.001	0.008	0.2464	0.0004	0.0000	6.55E-04

* = Frozen (air or soil)

Annual Totals for Year 9			
	inches	cubic feet	percent
Precipitation	31.91	297,685.6	100.00
Runoff	0.776	7,235.1	2.43
Evapotranspiration	31.610	294,893.8	99.06
Drainage Collected from Layer 4	0.0009	8.5057	0.00
Percolation/Leakage through Layer 5	0.387047	3,610.8	1.21
Average Head on Top of Layer 5	0.0006	---	---
Change in Water Storage	-0.8642	-8,062.6	-2.71
Soil Water at Start of Year	101.3230	945,252.3	317.53
Soil Water at End of Year	100.9915	942,160.0	316.50
Snow Water at Start of Year	0.5328	4,970.4	1.67
Snow Water at End of Year	0.0000	0.0000	0.00

353		0.00	0.000	0.067	0.2946	0.0000	0.0000	0.00E+00
354		0.00	0.000	0.095	0.2905	0.0000	0.0000	0.00E+00
355		0.00	0.000	0.047	0.2883	0.0000	0.0000	0.00E+00
356		0.00	0.000	0.043	0.2864	0.0000	0.0000	0.00E+00
357		0.00	0.000	0.051	0.2841	0.0000	0.0000	0.00E+00
358	*	0.03	0.000	0.027	0.2838	0.0000	0.0000	0.00E+00
359	*	0.02	0.000	0.032	0.2833	0.0000	0.0000	0.00E+00
360		0.00	0.000	0.030	0.2819	0.0000	0.0000	0.00E+00
361		0.00	0.000	0.034	0.2803	0.0000	0.0000	0.00E+00
362		0.00	0.000	0.039	0.2785	0.0000	0.0000	0.00E+00
363	*	0.00	0.000	0.000	0.2783	0.0000	0.0000	0.00E+00
364	*	0.20	0.000	0.011	0.2789	0.0000	0.0000	0.00E+00
365	*	0.22	0.000	0.017	0.2796	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 10			
	inches	cubic feet	percent
Precipitation	32.65	304,590.6	100.00
Runoff	2.899	27,047.3	8.88
Evapotranspiration	28.511	265,979.6	87.32
Drainage Collected from Layer 4	0.0001	0.7572	0.00
Percolation/Leakage through Layer 5	0.127192	1,186.6	0.39
Average Head on Top of Layer 5	0.0001	---	---
Change in Water Storage	1.1122	10,376.3	3.41
Soil Water at Start of Year	100.9915	942,160.0	309.32
Soil Water at End of Year	101.7534	949,267.7	311.65
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.3504	3,268.6	1.07

353		0.00	0.000	0.018	0.2613	0.0002	0.0000	7.59E-04
354	*	0.00	0.000	0.018	0.2606	0.0001	0.0000	7.67E-04
355	*	0.78	0.000	0.012	0.2614	0.0004	0.0000	6.73E-04
356	*	0.00	0.000	0.006	0.2622	0.0003	0.0000	9.09E-04
357	*	0.00	0.000	0.003	0.2630	0.0002	0.0000	8.23E-04
358	*	0.00	0.000	0.010	0.2638	0.0002	0.0000	7.06E-04
359	*	0.00	0.000	0.004	0.2647	0.0004	0.0000	7.37E-04
360	*	0.00	0.000	0.012	0.2655	0.0004	0.0000	8.07E-04
361		0.00	0.000	0.000	0.2884	0.0004	0.0000	6.59E-04
362		0.00	0.000	0.080	0.2876	0.0003	0.0000	8.95E-04
363		0.00	0.000	0.045	0.2858	0.0001	0.0000	7.27E-04
364		0.00	0.000	0.023	0.2848	0.0004	0.0000	6.37E-04
365		0.00	0.000	0.019	0.2840	0.0002	0.0000	8.49E-04

* = Frozen (air or soil)

Annual Totals for Year 11			
	inches	cubic feet	percent
Precipitation	33.23	310,046.5	100.00
Runoff	1.994	18,606.6	6.00
Evapotranspiration	31.023	289,414.0	93.35
Drainage Collected from Layer 4	0.0039	36.2	0.01
Percolation/Leakage through Layer 5	0.410946	3,833.8	1.24
Average Head on Top of Layer 5	0.0022	---	---
Change in Water Storage	-0.1977	-1,844.0	-0.59
Soil Water at Start of Year	101.7534	949,267.7	306.17
Soil Water at End of Year	101.9061	950,692.4	306.63
Snow Water at Start of Year	0.3504	3,268.6	1.05
Snow Water at End of Year	0.0000	0.0000	0.00

353	0.05	0.000	0.074	0.2874	0.0002	0.0000	2.79E-04
354	0.31	0.000	0.089	0.2964	0.0000	0.0000	0.00E+00
355	0.00	0.000	0.043	0.2947	0.0000	0.0000	0.00E+00
356	0.00	0.000	0.068	0.2919	0.0000	0.0000	0.00E+00
357	0.00	0.000	0.098	0.2878	0.0000	0.0000	0.00E+00
358	0.00	0.000	0.131	0.2823	0.0000	0.0000	0.00E+00
359	0.00	0.000	0.171	0.2752	0.0000	0.0000	0.00E+00
360	0.00	0.000	0.193	0.2671	0.0000	0.0000	0.00E+00
361	0.00	0.000	0.076	0.2640	0.0000	0.0000	0.00E+00
362	0.00	0.000	0.054	0.2617	0.0000	0.0000	0.00E+00
363	0.00	0.000	0.051	0.2596	0.0000	0.0000	0.00E+00
364	0.02	0.000	0.054	0.2582	0.0000	0.0000	0.00E+00
365	0.00	0.000	0.034	0.2568	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 12			
	inches	cubic feet	percent
Precipitation	32.07	299,205.3	100.00
Runoff	1.452	13,541.7	4.53
Evapotranspiration	31.019	289,378.1	96.72
Drainage Collected from Layer 4	0.0002	1.7866	0.00
Percolation/Leakage through Layer 5	0.207132	1,932.4	0.65
Average Head on Top of Layer 5	0.0002	---	---
Change in Water Storage	-0.6055	-5,648.7	-1.89
Soil Water at Start of Year	101.9061	950,692.4	317.74
Soil Water at End of Year	101.3006	945,043.7	315.85
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353		0.02	0.000	0.034	0.3098	0.0003	0.0000	8.20E-04
354		0.06	0.000	0.055	0.3096	0.0003	0.0000	8.12E-04
355	*	0.00	0.000	0.000	0.3095	0.0003	0.0000	8.04E-04
356	*	0.00	0.000	0.000	0.3093	0.0003	0.0000	7.96E-04
357		0.00	0.000	0.037	0.3076	0.0003	0.0000	6.77E-04
358	*	0.00	0.000	0.000	0.3074	0.0002	0.0000	4.54E-04
359	*	0.00	0.000	0.000	0.3072	0.0001	0.0000	2.35E-04
360	*	0.00	0.000	0.000	0.3070	0.0000	0.0000	3.76E-05
361	*	0.00	0.000	0.000	0.3068	0.0000	0.0000	0.00E+00
362	*	0.06	0.000	0.010	0.3075	0.0000	0.0000	0.00E+00
363		0.00	0.000	0.036	0.3072	0.0000	0.0000	0.00E+00
364	*	0.02	0.000	0.016	0.3071	0.0000	0.0000	0.00E+00
365		0.45	0.000	0.042	0.3237	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 13			
	inches	cubic feet	percent
Precipitation	38.46	358,809.5	100.00
Runoff	1.628	15,190.4	4.23
Evapotranspiration	34.877	325,372.3	90.68
Drainage Collected from Layer 4	0.0003	2.9899	0.00
Percolation/Leakage through Layer 5	0.275348	2,568.8	0.72
Average Head on Top of Layer 5	0.0003	---	---
Change in Water Storage	1.6802	15,675.1	4.37
Soil Water at Start of Year	101.3006	945,043.7	263.38
Soil Water at End of Year	102.9809	960,718.8	267.75
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353	*		0.00	0.000	0.020	0.2334	0.0003	0.0000	6.84E-04
354	*	*	0.00	0.000	0.000	0.2334	0.0004	0.0000	5.94E-04
355	*	*	0.00	0.000	0.000	0.2334	0.0002	0.0000	8.07E-04
356		*	0.00	0.000	0.000	0.2334	0.0001	0.0000	6.47E-04
357		*	0.00	0.000	0.000	0.2334	0.0004	0.0000	7.02E-04
358		*	0.00	0.000	0.000	0.2334	0.0003	0.0000	6.75E-04
359		*	0.00	0.000	0.000	0.2334	0.0003	0.0000	6.31E-04
360	*	*	0.06	0.000	0.028	0.2334	0.0004	0.0000	7.00E-04
361	*	*	0.00	0.000	0.026	0.2334	0.0004	0.0000	6.73E-04
362	*	*	0.00	0.000	0.001	0.2334	0.0004	0.0000	6.37E-04
363		*	0.00	0.000	0.000	0.2334	0.0004	0.0000	6.95E-04
364	*	*	0.00	0.000	0.000	0.2334	0.0003	0.0000	6.19E-04
365	*	*	0.04	0.000	0.013	0.2334	0.0004	0.0000	6.57E-04

* = Frozen (air or soil)

Annual Totals for Year 14			
	inches	cubic feet	percent
Precipitation	34.21	319,189.0	100.00
Runoff	6.082	56,741.5	17.78
Evapotranspiration	29.849	278,460.2	87.24
Drainage Collected from Layer 4	0.0054	50.3	0.02
Percolation/Leakage through Layer 5	0.563732	5,259.1	1.65
Average Head on Top of Layer 5	0.0030	---	---
Change in Water Storage	-2.2855	-21,322.1	-6.68
Soil Water at Start of Year	102.9809	960,718.8	300.99
Soil Water at End of Year	100.6699	939,159.6	294.23
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0254	237.1	0.07

353	*		0.20	0.000	0.008	0.2432	0.0004	0.0000	6.97E-04
354	*	*	0.05	0.000	0.015	0.2432	0.0003	0.0000	8.70E-04
355	*	*	0.08	0.000	0.007	0.2432	0.0002	0.0000	7.21E-04
356	*	*	0.00	0.000	0.017	0.2432	0.0002	0.0000	7.33E-04
357	*	*	0.00	0.000	0.000	0.2432	0.0002	0.0000	6.09E-04
358	*	*	0.00	0.000	0.023	0.2432	0.0004	0.0000	7.24E-04
359	*	*	0.00	0.000	0.007	0.2432	0.0004	0.0000	7.54E-04
360	*	*	0.06	0.000	0.009	0.2432	0.0003	0.0000	7.06E-04
361	*	*	0.00	0.000	0.009	0.2432	0.0003	0.0000	6.86E-04
362	*	*	0.00	0.000	0.000	0.2432	0.0004	0.0000	6.98E-04
363	*	*	0.00	0.000	0.019	0.2432	0.0004	0.0000	7.20E-04
364	*	*	0.00	0.000	0.025	0.2432	0.0003	0.0000	7.00E-04
365		*	0.14	0.216	0.000	0.2561	0.0002	0.0000	7.27E-04

* = Frozen (air or soil)

Annual Totals for Year 15			
	inches	cubic feet	percent
Precipitation	33.70	314,408.6	100.00
Runoff	0.924	8,623.1	2.74
Evapotranspiration	31.925	297,830.7	94.73
Drainage Collected from Layer 4	0.0009	7.9960	0.00
Percolation/Leakage through Layer 5	0.322874	3,012.1	0.96
Average Head on Top of Layer 5	0.0006	---	---
Change in Water Storage	0.5290	4,934.7	1.57
Soil Water at Start of Year	100.6699	939,159.6	298.71
Soil Water at End of Year	101.2243	944,331.4	300.35
Snow Water at Start of Year	0.0254	237.1	0.08
Snow Water at End of Year	0.0000	0.0000	0.00

353	*	0.04	0.000	0.033	0.2662	0.0000	0.0000	0.00E+00
354		0.00	0.000	0.009	0.2658	0.0000	0.0000	0.00E+00
355		0.00	0.000	0.009	0.2654	0.0000	0.0000	0.00E+00
356		0.00	0.000	0.018	0.2647	0.0000	0.0000	0.00E+00
357		0.00	0.000	0.011	0.2642	0.0000	0.0000	0.00E+00
358	*	0.00	0.000	0.000	0.2642	0.0000	0.0000	0.00E+00
359	*	0.00	0.000	0.000	0.2642	0.0000	0.0000	0.00E+00
360	*	0.00	0.000	0.000	0.2642	0.0000	0.0000	0.00E+00
361	*	0.00	0.000	0.011	0.2639	0.0000	0.0000	0.00E+00
362		0.00	0.000	0.017	0.2633	0.0000	0.0000	0.00E+00
363		0.00	0.000	0.009	0.2630	0.0000	0.0000	2.14E-05
364		0.01	0.000	0.016	0.2626	0.0000	0.0000	0.00E+00
365	*	0.00	0.000	0.000	0.2626	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 16			
	inches	cubic feet	percent
Precipitation	27.73	258,652.6	100.00
Runoff	0.458	4,270.1	1.65
Evapotranspiration	27.108	252,889.6	97.77
Drainage Collected from Layer 4	0.0001	0.6842	0.00
Percolation/Leakage through Layer 5	0.116193	1,084.0	0.42
Average Head on Top of Layer 5	0.0001	---	---
Change in Water Storage	0.0438	408.3	0.16
Soil Water at Start of Year	101.2243	944,331.4	365.10
Soil Water at End of Year	101.2680	944,739.7	365.25
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353		*	0.20	0.050	0.039	0.2935	0.0003	0.0000	5.35E-04
354	*	*	0.21	0.000	0.024	0.2935	0.0003	0.0000	5.65E-04
355		*	0.00	0.000	0.000	0.2935	0.0002	0.0000	6.90E-04
356		*	0.00	0.050	0.037	0.2978	0.0001	0.0000	5.65E-04
357		*	0.15	0.033	0.038	0.3012	0.0003	0.0000	5.46E-04
358	*	*	0.00	0.000	0.001	0.3012	0.0003	0.0000	5.77E-04
359	*	*	0.00	0.000	0.000	0.3012	0.0003	0.0000	5.55E-04
360	*	*	0.00	0.000	0.000	0.3012	0.0002	0.0000	6.90E-04
361	*	*	0.00	0.000	0.000	0.3012	0.0001	0.0000	5.83E-04
362	*	*	0.00	0.000	0.000	0.3012	0.0001	0.0000	5.77E-04
363		*	0.00	0.000	0.000	0.3012	0.0001	0.0000	5.61E-04
364	*	*	0.00	0.000	0.000	0.3012	0.0001	0.0000	5.64E-04
365		*	0.00	0.000	0.000	0.3012	0.0001	0.0000	5.38E-04

* = Frozen (air or soil)

Annual Totals for Year 17			
	inches	cubic feet	percent
Precipitation	32.92	307,088.2	100.00
Runoff	3.212	29,967.3	9.76
Evapotranspiration	28.574	266,570.0	86.81
Drainage Collected from Layer 4	0.0001	1.3829	0.00
Percolation/Leakage through Layer 5	0.124989	1,166.0	0.38
Average Head on Top of Layer 5	0.0001	---	---
Change in Water Storage	1.0058	9,383.5	3.06
Soil Water at Start of Year	101.2680	944,739.7	307.64
Soil Water at End of Year	102.2739	954,123.2	310.70
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353		*	0.00	0.000	0.000	0.3876	0.0002	0.0000	7.04E-04
354		*	0.02	0.000	0.012	0.3881	0.0004	0.0000	1.02E-03
355		*	0.00	0.000	0.000	0.3881	0.0001	0.0000	8.44E-04
356		*	0.00	0.000	0.000	0.3881	0.0004	0.0000	7.39E-04
357		*	0.00	0.000	0.003	0.3881	0.0003	0.0000	9.87E-04
358	*	*	0.00	0.000	0.000	0.3881	0.0005	0.0000	8.66E-04
359	*	*	0.13	0.000	0.021	0.3881	0.0005	0.0000	8.33E-04
360	*	*	0.04	0.000	0.000	0.3881	0.0005	0.0000	9.29E-04
361	*	*	0.05	0.000	0.026	0.3881	0.0001	0.0000	8.31E-04
362	*	*	0.00	0.000	0.012	0.3881	0.0002	0.0000	8.68E-04
363	*	*	0.00	0.000	0.006	0.3881	0.0002	0.0000	8.32E-04
364	*	*	0.00	0.000	0.003	0.3881	0.0001	0.0000	8.00E-04
365	*	*	0.04	0.000	0.000	0.3881	0.0004	0.0000	7.61E-04

* = Frozen (air or soil)

Annual Totals for Year 18			
	inches	cubic feet	percent
Precipitation	33.46	312,169.0	100.00
Runoff	3.212	29,967.9	9.60
Evapotranspiration	27.602	257,504.7	82.49
Drainage Collected from Layer 4	0.0007	6.7604	0.00
Percolation/Leakage through Layer 5	0.309715	2,889.4	0.93
Average Head on Top of Layer 5	0.0005	---	---
Change in Water Storage	2.3368	21,800.2	6.98
Soil Water at Start of Year	102.2739	954,123.2	305.64
Soil Water at End of Year	104.4204	974,148.6	312.06
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.1902	1,774.8	0.57

353	*		0.01	0.000	0.000	0.2115	0.0004	0.0000	6.45E-04
354	*		0.00	0.000	0.023	0.2123	0.0004	0.0000	6.13E-04
355	*		0.00	0.000	0.020	0.2131	0.0002	0.0000	7.37E-04
356	*		0.00	0.000	0.017	0.2139	0.0004	0.0000	6.67E-04
357	*		0.03	0.000	0.007	0.2147	0.0003	0.0000	6.36E-04
358	*		0.00	0.000	0.000	0.2156	0.0003	0.0000	5.61E-04
359	*		0.00	0.000	0.021	0.2164	0.0003	0.0000	7.72E-04
360	*		0.00	0.000	0.018	0.2172	0.0002	0.0000	5.72E-04
361	*		0.21	0.000	0.016	0.2180	0.0004	0.0000	6.80E-04
362	*		0.02	0.000	0.013	0.2188	0.0001	0.0000	6.21E-04
363	*		0.00	0.000	0.022	0.2197	0.0001	0.0000	6.06E-04
364	*		0.00	0.000	0.008	0.2205	0.0003	0.0000	5.86E-04
365	*	*	0.00	0.000	0.016	0.2205	0.0004	0.0000	6.19E-04

* = Frozen (air or soil)

Annual Totals for Year 19			
	inches	cubic feet	percent
Precipitation	26.70	249,048.3	100.00
Runoff	2.616	24,402.4	9.80
Evapotranspiration	27.562	257,125.8	103.24
Drainage Collected from Layer 4	0.0038	35.3	0.01
Percolation/Leakage through Layer 5	0.434569	4,054.1	1.63
Average Head on Top of Layer 5	0.0022	---	---
Change in Water Storage	-3.9199	-36,569.3	-14.68
Soil Water at Start of Year	104.4204	974,148.6	391.15
Soil Water at End of Year	100.3518	936,191.8	375.91
Snow Water at Start of Year	0.1902	1,774.8	0.71
Snow Water at End of Year	0.3390	3,162.2	1.27

353		0.00	0.000	0.030	0.2976	0.0002	0.0000	7.01E-04
354		0.00	0.000	0.021	0.2968	0.0001	0.0000	6.64E-04
355	*	0.00	0.000	0.003	0.2968	0.0002	0.0000	7.15E-04
356	*	0.06	0.000	0.006	0.2976	0.0001	0.0000	6.89E-04
357	*	0.08	0.000	0.000	0.2984	0.0001	0.0000	5.99E-04
358		0.00	0.000	0.026	0.3012	0.0004	0.0000	5.95E-04
359	*	0.00	0.000	0.017	0.3004	0.0004	0.0000	8.25E-04
360		0.00	0.000	0.021	0.2996	0.0001	0.0000	3.31E-04
361	*	0.00	0.000	0.000	0.2996	0.0003	0.0000	5.94E-04
362		0.00	0.000	0.027	0.2985	0.0003	0.0000	8.00E-04
363		0.00	0.000	0.028	0.2973	0.0004	0.0000	7.02E-04
364	*	0.00	0.000	0.000	0.2973	0.0003	0.0000	5.94E-04
365		0.00	0.000	0.031	0.2960	0.0002	0.0000	4.94E-04

* = Frozen (air or soil)

Annual Totals for Year 20			
	inches	cubic feet	percent
Precipitation	37.16	346,682.4	100.00
Runoff	2.723	25,405.0	7.33
Evapotranspiration	32.617	304,284.4	87.77
Drainage Collected from Layer 4	0.0010	9.6563	0.00
Percolation/Leakage through Layer 5	0.339095	3,163.4	0.91
Average Head on Top of Layer 5	0.0007	---	---
Change in Water Storage	1.4814	13,819.9	3.99
Soil Water at Start of Year	100.3518	936,191.8	270.04
Soil Water at End of Year	102.1721	953,173.9	274.94
Snow Water at Start of Year	0.3390	3,162.2	0.91
Snow Water at End of Year	0.0000	0.0000	0.00

353		*	0.00	0.000	0.000	0.2493	0.0001	0.0000	4.88E-04
354		*	0.00	0.000	0.000	0.2493	0.0003	0.0000	5.32E-04
355		*	0.00	0.000	0.000	0.2493	0.0003	0.0000	5.69E-04
356		*	0.00	0.000	0.000	0.2493	0.0001	0.0000	5.14E-04
357	*	*	0.00	0.000	0.000	0.2493	0.0002	0.0000	4.89E-04
358	*	*	0.00	0.000	0.000	0.2493	0.0003	0.0000	5.29E-04
359	*	*	0.00	0.000	0.000	0.2493	0.0003	0.0000	5.27E-04
360	*	*	0.02	0.000	0.010	0.2493	0.0003	0.0000	5.22E-04
361	*	*	0.00	0.000	0.012	0.2493	0.0003	0.0000	5.09E-04
362	*	*	0.00	0.000	0.000	0.2493	0.0003	0.0000	5.68E-04
363	*	*	0.00	0.000	0.000	0.2493	0.0003	0.0000	5.48E-04
364	*	*	0.00	0.000	0.000	0.2493	0.0001	0.0000	4.94E-04
365	*	*	0.01	0.000	0.011	0.2493	0.0003	0.0000	5.24E-04

* = Frozen (air or soil)

Annual Totals for Year 21			
	inches	cubic feet	percent
Precipitation	28.88	269,466.2	100.00
Runoff	1.766	16,473.0	6.11
Evapotranspiration	27.993	261,152.9	96.91
Drainage Collected from Layer 4	0.0004	4.0167	0.00
Percolation/Leakage through Layer 5	0.283282	2,642.8	0.98
Average Head on Top of Layer 5	0.0003	---	---
Change in Water Storage	-1.1584	-10,806.5	-4.01
Soil Water at Start of Year	102.1721	953,173.9	353.73
Soil Water at End of Year	101.0138	942,367.4	349.72
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353	*	0.00	0.000	0.000	0.2781	0.0000	0.0000	0.00E+00
354	*	0.00	0.000	0.000	0.2781	0.0000	0.0000	0.00E+00
355	*	0.03	0.000	0.020	0.2787	0.0000	0.0000	0.00E+00
356	*	0.07	0.000	0.026	0.2804	0.0000	0.0000	0.00E+00
357	*	0.00	0.000	0.000	0.2804	0.0000	0.0000	0.00E+00
358	*	0.00	0.000	0.000	0.2804	0.0000	0.0000	0.00E+00
359	*	0.00	0.000	0.000	0.2804	0.0000	0.0000	0.00E+00
360		0.00	0.000	0.045	0.2785	0.0000	0.0000	0.00E+00
361		0.00	0.000	0.033	0.2772	0.0001	0.0000	2.91E-04
362		0.00	0.000	0.019	0.2764	0.0000	0.0000	1.24E-07
363	*	0.00	0.000	0.000	0.2764	0.0000	0.0000	0.00E+00
364		0.00	0.000	0.018	0.2756	0.0000	0.0000	0.00E+00
365		0.00	0.000	0.020	0.2748	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 22			
	inches	cubic feet	percent
Precipitation	28.98	270,359.2	100.00
Runoff	0.992	9,255.8	3.42
Evapotranspiration	27.370	255,339.5	94.44
Drainage Collected from Layer 4	0.0000	0.3560	0.00
Percolation/Leakage through Layer 5	0.071939	671.1	0.25
Average Head on Top of Layer 5	0.0001	---	---
Change in Water Storage	0.5459	5,092.4	1.88
Soil Water at Start of Year	101.0138	942,367.4	348.56
Soil Water at End of Year	101.5596	947,459.9	350.44
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353		0.01	0.000	0.028	0.2330	0.0005	0.0000	8.66E-04
354		0.00	0.000	0.028	0.2319	0.0004	0.0000	7.85E-04
355		0.00	0.000	0.018	0.2311	0.0005	0.0000	8.70E-04
356		0.03	0.000	0.033	0.2309	0.0005	0.0000	8.38E-04
357		0.00	0.000	0.014	0.2303	0.0004	0.0000	7.70E-04
358	*	0.01	0.000	0.008	0.2303	0.0005	0.0000	8.08E-04
359	*	0.24	0.000	0.019	0.2311	0.0005	0.0000	7.89E-04
360	*	0.00	0.000	0.011	0.2319	0.0003	0.0000	9.73E-04
361	*	0.00	0.000	0.006	0.2327	0.0002	0.0000	8.31E-04
362	*	*	0.05	0.000	0.004	0.0002	0.0000	6.62E-04
363	*	*	0.00	0.000	0.021	0.0005	0.0000	7.56E-04
364	*	*	0.00	0.000	0.027	0.0002	0.0000	9.09E-04
365		*	0.00	0.008	0.020	0.0004	0.0000	7.86E-04

* = Frozen (air or soil)

Annual Totals for Year 23			
	inches	cubic feet	percent
Precipitation	35.04	326,912.5	100.00
Runoff	3.966	37,000.2	11.32
Evapotranspiration	31.549	294,325.5	90.03
Drainage Collected from Layer 4	0.0030	28.3	0.01
Percolation/Leakage through Layer 5	0.283867	2,648.2	0.81
Average Head on Top of Layer 5	0.0017	---	---
Change in Water Storage	-0.7600	-7,089.7	-2.17
Soil Water at Start of Year	101.5596	947,459.9	289.82
Soil Water at End of Year	100.7997	940,370.2	287.65
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353		0.00	0.000	0.053	0.3821	0.0004	0.0000	1.78E-03
354	*	0.17	0.000	0.024	0.3828	0.0004	0.0000	1.36E-03
355	*	0.00	0.000	0.023	0.3835	0.0009	0.0000	2.19E-03
356	*	0.00	0.000	0.019	0.3841	0.0007	0.0000	2.21E-03
357	*	0.00	0.000	0.016	0.3848	0.0006	0.0000	2.10E-03
358	*	0.00	0.000	0.010	0.3847	0.0007	0.0000	2.18E-03
359	*	0.00	0.000	0.000	0.3845	0.0008	0.0000	2.26E-03
360	*	0.00	0.000	0.000	0.3844	0.0009	0.0000	2.32E-03
361		0.01	0.000	0.047	0.3828	0.0008	0.0000	2.16E-03
362		0.00	0.000	0.044	0.3808	0.0008	0.0000	2.27E-03
363		0.00	0.000	0.070	0.3778	0.0008	0.0000	3.01E-03
364		0.00	0.000	0.048	0.3756	0.0012	0.0000	2.32E-03
365		0.00	0.000	0.068	0.3727	0.0004	0.0000	2.26E-03

* = Frozen (air or soil)

Annual Totals for Year 24			
	inches	cubic feet	percent
Precipitation	31.57	294,551.2	100.00
Runoff	2.118	19,761.3	6.71
Evapotranspiration	25.678	239,555.5	81.33
Drainage Collected from Layer 4	0.0003	2.9796	0.00
Percolation/Leakage through Layer 5	0.256511	2,393.0	0.81
Average Head on Top of Layer 5	0.0003	---	---
Change in Water Storage	3.5200	32,838.5	11.15
Soil Water at Start of Year	100.7997	940,370.2	319.26
Soil Water at End of Year	104.3197	973,208.7	330.40
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353		*	0.00	0.065	0.000	0.3525	0.0000	0.0000	0.00E+00
354		*	0.18	0.327	0.000	0.3628	0.0000	0.0000	0.00E+00
355		*	0.17	0.043	0.005	0.3680	0.0000	0.0000	0.00E+00
356		*	0.17	0.050	0.005	0.3728	0.0000	0.0000	0.00E+00
357		*	0.00	0.000	0.000	0.3728	0.0000	0.0000	0.00E+00
358		*	0.00	0.000	0.000	0.3728	0.0000	0.0000	0.00E+00
359		*	0.00	0.000	0.000	0.3728	0.0000	0.0000	0.00E+00
360	*	*	0.00	0.000	0.000	0.3728	0.0000	0.0000	0.00E+00
361	*	*	0.00	0.000	0.000	0.3728	0.0000	0.0000	0.00E+00
362	*	*	0.00	0.000	0.000	0.3728	0.0000	0.0000	0.00E+00
363	*	*	0.04	0.000	0.006	0.3728	0.0000	0.0000	0.00E+00
364	*	*	0.00	0.000	0.014	0.3728	0.0000	0.0000	0.00E+00
365	*	*	0.00	0.000	0.016	0.3728	0.0000	0.0000	0.00E+00

* = Frozen (air or soil)

Annual Totals for Year 25			
	inches	cubic feet	percent
Precipitation	29.39	274,159.2	100.00
Runoff	2.700	25,191.2	9.19
Evapotranspiration	26.152	243,972.1	88.99
Drainage Collected from Layer 4	0.0101	94.3	0.03
Percolation/Leakage through Layer 5	0.664187	6,196.3	2.26
Average Head on Top of Layer 5	0.0056	---	---
Change in Water Storage	-0.1388	-1,294.7	-0.47
Soil Water at Start of Year	104.3197	973,208.7	354.98
Soil Water at End of Year	104.1727	971,837.8	354.48
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0082	76.1	0.03

353		0.00	0.000	0.016	0.1957	0.0001	0.0000	7.10E-04
354		0.00	0.000	0.015	0.1951	0.0003	0.0000	6.60E-04
355	*	0.07	0.000	0.017	0.1959	0.0004	0.0000	7.02E-04
356	*	0.00	0.000	0.009	0.1967	0.0004	0.0000	7.47E-04
357	*	0.01	0.000	0.031	0.1961	0.0004	0.0000	7.36E-04
358		0.00	0.000	0.016	0.1954	0.0004	0.0000	7.88E-04
359		0.00	0.000	0.016	0.1947	0.0002	0.0000	6.09E-04
360		0.00	0.000	0.016	0.1940	0.0004	0.0000	7.38E-04
361		0.11	0.000	0.038	0.1972	0.0004	0.0000	6.42E-04
362	*	0.00	0.000	0.000	0.1972	0.0004	0.0000	6.60E-04
363	*	0.00	0.000	0.015	0.1966	0.0002	0.0000	8.06E-04
364	*	0.25	0.000	0.012	0.1974	0.0002	0.0000	7.44E-04
365	*	0.11	0.000	0.006	0.1982	0.0002	0.0000	5.28E-04

* = Frozen (air or soil)

Annual Totals for Year 26			
	inches	cubic feet	percent
Precipitation	31.12	290,297.1	100.00
Runoff	0.929	8,669.1	2.99
Evapotranspiration	33.506	312,584.5	107.68
Drainage Collected from Layer 4	0.0211	197.1	0.07
Percolation/Leakage through Layer 5	0.699683	6,527.4	2.25
Average Head on Top of Layer 5	0.0117	---	---
Change in Water Storage	-4.0391	-37,681.1	-12.98
Soil Water at Start of Year	104.1727	971,837.8	334.77
Soil Water at End of Year	99.8335	931,356.3	320.83
Snow Water at Start of Year	0.0082	76.1	0.03
Snow Water at End of Year	0.3083	2,876.6	0.99

353	*	0.18	0.000	0.016	0.2159	0.0003	0.0000	5.99E-04
354	*	0.00	0.000	0.023	0.2167	0.0001	0.0000	5.73E-04
355		0.00	0.000	0.023	0.2199	0.0001	0.0000	5.49E-04
356	*	0.00	0.000	0.000	0.2199	0.0001	0.0000	5.27E-04
357		0.00	0.000	0.003	0.2198	0.0003	0.0000	5.30E-04
358		0.00	0.000	0.005	0.2196	0.0003	0.0000	5.83E-04
359		0.00	0.000	0.003	0.2195	0.0002	0.0000	5.16E-04
360		0.00	0.000	0.009	0.2191	0.0003	0.0000	5.81E-04
361		0.07	0.000	0.044	0.2202	0.0002	0.0000	5.47E-04
362		0.00	0.000	0.024	0.2193	0.0002	0.0000	5.85E-04
363		0.00	0.000	0.016	0.2186	0.0002	0.0000	4.07E-04
364		0.00	0.000	0.003	0.2185	0.0002	0.0000	6.09E-04
365		0.00	0.000	0.003	0.2184	0.0003	0.0000	5.80E-04

* = Frozen (air or soil)

Annual Totals for Year 27			
	inches	cubic feet	percent
Precipitation	28.66	267,414.9	100.00
Runoff	0.576	5,370.1	2.01
Evapotranspiration	27.736	258,756.2	96.76
Drainage Collected from Layer 4	0.0002	1.7851	0.00
Percolation/Leakage through Layer 5	0.217327	2,027.5	0.76
Average Head on Top of Layer 5	0.0002	---	---
Change in Water Storage	0.1350	1,259.3	0.47
Soil Water at Start of Year	99.8335	931,356.3	348.28
Soil Water at End of Year	100.2768	935,492.2	349.83
Snow Water at Start of Year	0.3083	2,876.6	1.08
Snow Water at End of Year	0.0000	0.0000	0.00

353	*	*	0.00	0.000	0.000	0.3556	0.0001	0.0000	7.31E-04
354	*	*	0.00	0.000	0.006	0.3556	0.0004	0.0000	8.68E-04
355	*	*	0.00	0.000	0.000	0.3556	0.0002	0.0000	6.11E-04
356	*	*	0.07	0.000	0.007	0.3556	0.0003	0.0000	9.01E-04
357	*	*	0.12	0.000	0.000	0.3556	0.0001	0.0000	7.67E-04
358		*	0.02	0.634	0.000	0.3655	0.0002	0.0000	7.72E-04
359		*	0.02	0.000	0.013	0.3657	0.0002	0.0000	7.15E-04
360	*	*	0.02	0.000	0.023	0.3657	0.0002	0.0000	8.07E-04
361		*	0.07	0.006	0.024	0.3675	0.0002	0.0000	6.05E-04
362		*	0.00	0.000	0.000	0.3675	0.0004	0.0000	7.88E-04
363		*	0.00	0.000	0.002	0.3675	0.0004	0.0000	7.91E-04
364	*	*	0.00	0.000	0.000	0.3675	0.0003	0.0000	7.66E-04
365		*	0.00	0.000	0.000	0.3675	0.0001	0.0000	7.28E-04

* = Frozen (air or soil)

Annual Totals for Year 28			
	inches	cubic feet	percent
Precipitation	33.27	310,340.3	100.00
Runoff	2.571	23,981.6	7.73
Evapotranspiration	26.723	249,297.5	80.33
Drainage Collected from Layer 4	0.0019	17.8	0.01
Percolation/Leakage through Layer 5	0.342082	3,191.3	1.03
Average Head on Top of Layer 5	0.0011	---	---
Change in Water Storage	3.6287	33,852.1	10.91
Soil Water at Start of Year	100.2768	935,492.2	301.44
Soil Water at End of Year	103.9054	969,344.3	312.35
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.0000	0.0000	0.00

353	*	*	0.01	0.000	0.007	0.4463	0.0004	0.0000	1.09E-03
354	*	*	0.00	0.000	0.000	0.4463	0.0005	0.0000	1.21E-03
355	*	*	0.14	0.000	0.013	0.4463	0.0005	0.0000	1.36E-03
356	*	*	0.00	0.000	0.013	0.4463	0.0006	0.0000	2.01E-03
357		*	0.00	0.052	0.021	0.4482	0.0004	0.0000	1.36E-03
358	*	*	0.00	0.000	0.000	0.4482	0.0009	0.0000	2.24E-03
359		*	0.00	0.000	0.000	0.4482	0.0006	0.0000	2.10E-03
360		*	0.04	0.006	0.008	0.4493	0.0008	0.0000	2.24E-03
361		*	0.05	0.013	0.008	0.4507	0.0005	0.0000	2.20E-03
362		*	0.00	0.000	0.000	0.4507	0.0012	0.0000	3.10E-03
363	*	*	0.00	0.000	0.000	0.4507	0.0009	0.0000	2.23E-03
364	*	*	0.09	0.000	0.021	0.4507	0.0007	0.0000	3.07E-03
365	*	*	0.05	0.000	0.000	0.4507	0.0013	0.0000	2.32E-03

* = Frozen (air or soil)

Annual Totals for Year 29			
	inches	cubic feet	percent
Precipitation	44.63	416,334.4	100.00
Runoff	5.512	51,422.2	12.35
Evapotranspiration	36.136	337,113.6	80.97
Drainage Collected from Layer 4	0.0232	216.2	0.05
Percolation/Leakage through Layer 5	0.646280	6,029.2	1.45
Average Head on Top of Layer 5	0.0128	---	---
Change in Water Storage	2.3103	21,553.3	5.18
Soil Water at Start of Year	103.9054	969,344.3	232.83
Soil Water at End of Year	106.0913	989,735.9	237.73
Snow Water at Start of Year	0.0000	0.0000	0.00
Snow Water at End of Year	0.1245	1,161.7	0.28

353	*	0.13	0.181	0.000	0.3629	0.0000	0.0000	0.00E+00
354	*	0.00	0.000	0.000	0.3629	0.0000	0.0000	0.00E+00
355	*	0.14	0.022	0.013	0.3673	0.0000	0.0000	0.00E+00
356	*	0.00	0.000	0.000	0.3673	0.0000	0.0000	0.00E+00
357	*	0.00	0.000	0.000	0.3673	0.0000	0.0000	0.00E+00
358	*	0.00	0.000	0.000	0.3673	0.0000	0.0000	0.00E+00
359	*	0.00	0.000	0.000	0.3673	0.0000	0.0000	0.00E+00
360	*	0.05	0.000	0.011	0.3688	0.0000	0.0000	0.00E+00
361	*	0.00	0.000	0.004	0.3689	0.0000	0.0000	0.00E+00
362		0.00	0.000	0.093	0.3648	0.0005	0.0000	1.35E-03
363		0.00	0.000	0.122	0.3596	0.0005	0.0000	1.33E-03
364		0.00	0.000	0.060	0.3569	0.0005	0.0000	1.31E-03
365	*	0.00	0.000	0.025	0.3556	0.0005	0.0000	1.29E-03

* = Frozen (air or soil)

Annual Totals for Year 30			
	inches	cubic feet	percent
Precipitation	34.05	317,701.9	100.00
Runoff	3.309	30,873.6	9.72
Evapotranspiration	32.515	303,339.3	95.48
Drainage Collected from Layer 4	0.0130	121.6	0.04
Percolation/Leakage through Layer 5	0.720378	6,720.5	2.12
Average Head on Top of Layer 5	0.0072	---	---
Change in Water Storage	-2.5032	-23,353.0	-7.35
Soil Water at Start of Year	106.0913	989,735.9	311.53
Soil Water at End of Year	103.7125	967,544.6	304.54
Snow Water at Start of Year	0.1245	1,161.7	0.37
Snow Water at End of Year	0.0000	0.0000	0.00

Average Annual Totals Summary

Title: Anderson Excavating

Simulated on: 2/4/2026 10:04

	Average Annual Totals for Years 1 - 30*			
	(inches)	[std dev]	(cubic feet)	(percent)
Precipitation	32.60	[3.93]	304,154.4	100.00
Runoff	2.138	[1.409]	19,950.1	6.56
Evapotranspiration	30.031	[3.298]	280,163.8	92.11
Subprofile1				
Lateral drainage collected from Layer 4	0.0055	[0.0092]	51.0	0.02
Percolation/leakage through Layer 5	0.379181	[0.222322]	3,537.4	1.16
Average Head on Top of Layer 5	0.0031	[0.005]	---	---
Water storage				
Change in water storage	0.0485	[1.8426]	452.2	0.15

* Note: Average inches are converted to volume based on the user-specified area.

Peak Values Summary

Title: Anderson Excavating

Simulated on: 2/4/2026 10:04

	Peak Values for Years 1 - 30*	
	(inches)	(cubic feet)
Precipitation	3.29	30,694.7
Runoff	1.581	14,751.2
Subprofile1		
Drainage collected from Layer 4	0.0003	2.6285
Percolation/leakage through Layer 5	0.003099	28.9
Average head on Layer 5	0.0566	---
Maximum head on Layer 5	0.1108	---
Location of maximum head in Layer 4	0.95	(feet from drain)
Other Parameters		
Snow water	2.6786	24,988.8
Maximum vegetation soil water	0.4640	(vol/vol)
Minimum vegetation soil water	0.1870	(vol/vol)

Final Water Storage in Landfill Profile at End of Simulation Period

Title: Anderson Excavating

Simulated on: 2/4/2026 10:05

Simulation period: 30 years

Layer	Final Water Storage	
	(inches)	(vol/vol)
1	8.5352	0.3556
2	10.0373	0.4182
3	63.0720	0.2920
4	1.5720	0.1310
5	20.4960	0.4270
Snow water	0.0000	---