Periodic Run-on and Run-off Control System Plan
Sibley Quarry Landfill

Trenton, Michigan

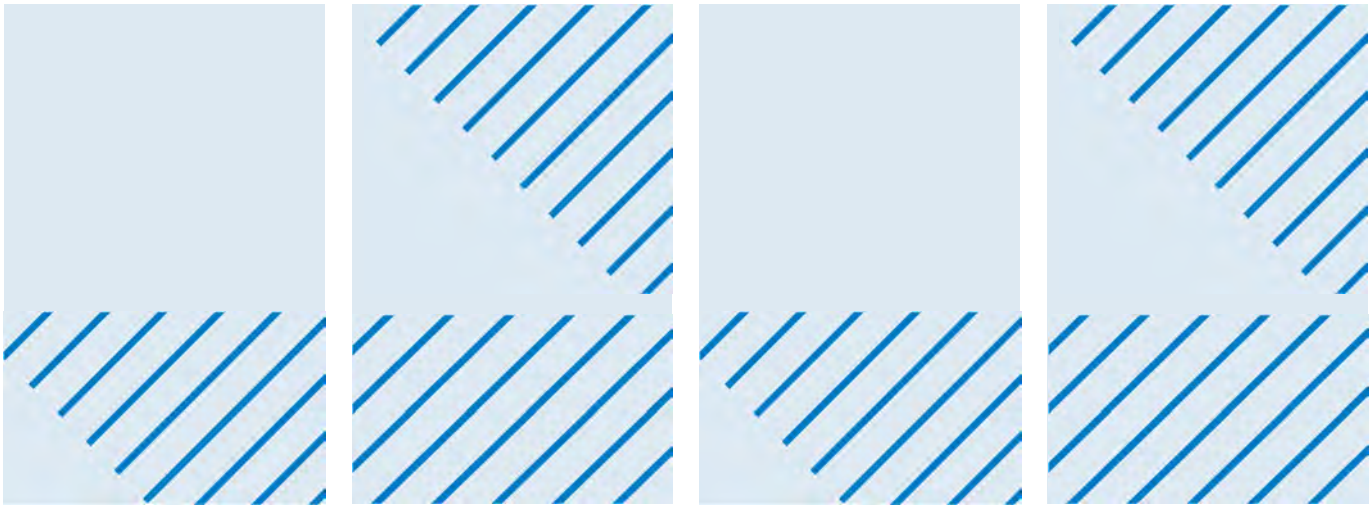
Prepared for
DTE Electric Company

Prepared by
Barr Engineering Michigan LLC

October 2026

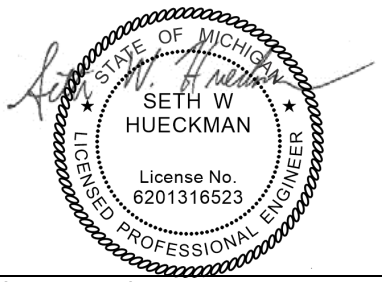
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Certification

I hereby certify that I have examined the facility and, being familiar with the provisions of 40 CFR 257 Subpart D, attest that this Coal Combustion Residuals landfill run-on and run-off control system plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and the requirements of 40 CFR § 257.81. I certify that the plan is adequate for this facility and that procedures for recordkeeping and reporting have been established.



Seth W. Hueckman
Michigan PE #: 6201316523

10/15/2026
Date

Revision	Date	Summary of Revisions
0	October 17, 2016	Initial Plan (Prepared by AECOM)
1	October 15, 2021	Periodic Update
2	October 15, 2026	Periodic Update

1 Introduction

DTE Electric Company (DTE Electric) owns and operates an existing coal combustion residuals (CCR) landfill located at the Sibley Quarry in Trenton, Michigan. The landfill is licensed under the Michigan Department of Environment, Great Lakes, and Energy (EGLE) Operating License Number 9602. The landfill receives a combination of CCR from nearby DTE Electric power plants and inert material. CCR management is subject to Federal Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments per 40 CFR 257 Subpart D. This CCR run-on and run-off control system plan has been developed to satisfy the requirements described in 40 CFR § 257.81, run-on and run-off controls for CCR landfills, as they apply to DTE's Sibley Quarry Landfill.

Sibley Quarry is a former limestone quarry with a base elevation of approximately 300 feet above mean sea level (amsl), and crest elevation along the quarry high wall of approximately 600 feet amsl, though elevation and delineation of the high wall crest is variable as one progresses around the perimeter of the quarry. The site consists of 207 acres located at 801 Fort Street in the City of Trenton, Wayne County, Michigan. The site was operated as a limestone quarry beginning in the mid 1800's and was acquired by DTE Electric in 1951. The site has been operated by DTE Electric as a landfill since acquisition and is currently licensed as a Coal Ash Landfill under the provisions of Michigan Part 115, Solid Waste Management, of the Natural Resource and Environmental Protection Act (NREPA), 1994 Public Act ("PA") 451.

The current operating license designates approximately 92 acres as areas authorized to receive waste. Approximately 90 acres, along the perimeter of landfill to the north, west, and south, are at final grade and have received final cover prior to September 2, 1999, and therefore are closed. Remaining portions of the site do not contain waste. In 2024, approximately 25.7 acres of the landfill were closed with a geosynthetic membrane and engineered turf cover system referred to as Closure Turf.

The quarry receives seepage inflows from the quarry high wall, direct precipitation on the quarry footprint, and some surface run-on from the closed quarry perimeter which generally slopes inward toward the quarry. The quarry is continually dewatered using submersible pumps in the chimney drain sump shown on Figure 1. The chimney drain dewatering system is designed to maintain quarry dewatering operations throughout future CCR filling operations within the quarry. The normal operating plan for the dewatering system is for water elevation within the chimney drain sump to move between a low elevation of 306 feet amsl and a high elevation of 309 feet amsl. Water discharge from the quarry is at a rate of approximately 1.5 million gallons per day. The water is treated and then discharged to the Detroit River in compliance with requirements of the National Pollutant Discharge Elimination System (NPDES) permit MI0001953.

2 Objectives

Per 40 CFR § 257.81, the owner of an existing CCR landfill is required to design, construct, operate, and maintain a run-on and run-off control system. To fulfill these objectives, the run-on and run-off control system plan must:

- provide documentation that the run-on control system adequately manages flow onto the active portion of the CCR unit during and following the peak discharge from a 25-year, 24-hour storm;
- provide documentation that the run-off control system adequately collects and controls at least the water volume from a 25-year, 24-hour storm;

- provide documentation that run-off from the active portion of the CCR landfill is handled in accordance with § 257.3-3;
- define recordkeeping requirements;
- define reporting requirements; and
- include a certification from a qualified professional engineer.

3 Run-on Control System

The purpose of a run-on control system is to prevent surface water from offsite areas flowing onto the active landfill area. The Sibley Quarry landfill is unique in that the active portion of the unit is self-contained below surrounding grade. The fill area is generally within the lower portions of the quarry, which are separated from perimeter land area by the quarry access ramps and quarry high wall. Run-on control from offsite areas is prevented by a ridge which surrounds the site, which has a minimum crest elevation of approximately 605 feet amsl and prevents surface water run-on for events up to and exceeding a 25-year, 24-hour storm. Figure 1 shows the perimeter ridge and the surrounding area, with arrows added to illustrate surface drainage outside of and away from the landfill.

4 Run-off Control System

The purpose of a run-off control system is to prevent water that has come into contact with CCR from draining offsite. Within the perimeter ridge that surrounds the active portions of the landfill, run-off flows towards the quarry chimney drain sump along varying slopes. Slope contours from a 2025 aerial survey are shown on Figure 1. These slopes include steep vertical drop-offs at the historic limits of the quarry mining development, channelized conveyances along access roads, and waste fill slopes that flow to the chimney drain sump.

Site hydrology and hydraulics were modeled using HydroCAD Version 10.20-9a and Soil Conservation Service (SCS) methods to estimate on-site effects of the design storm event. The design storm for the run-off control system is the 25-year, 24-hour storm event, which has a rainfall depth of 3.97 inches (reference: NOAA Atlas 14). Hydrology calculations are included in Appendix A.

The model shows that the peak flow from the design storm will be contained within the quarry below surrounding grade (approximately 605 feet amsl). Following the design storm event, the quarry sump dewatering system has capacity to return the system to the normal operating range by discharging accumulated run-off in accordance with the Sibley Quarry NPDES permit (MI0001953).

5 Recordkeeping and Reporting

According to 40 CFR § 257.81(c)(2), DTE Electric will amend the written run-on and run-off control system plan whenever there is a change in conditions that would substantially affect the written plan. Additionally, DTE Electric will prepare periodic updates to the plan every five years (minimum).

DTE Electric will maintain a copy of the most recent version of the run-on and run-off control system plan in the facility's operating record in accordance with 40 CFR § 257.105, Recordkeeping Requirements, and the plan will be made publicly available on the DTE Electric CCR web site in compliance with 40 CFR § 257.107, Publicly Accessible Internet Site Requirements. Notification will be sent to State Director in compliance with 40 CFR § 257.106, Notification Requirements.

6 Conclusion

This run-on and run-off control system plan meets the requirements of 40 CFR § 257.81 by:

- providing documentation that the run-on control system adequately manages flow onto the active portion of the CCR unit during and following the peak discharge from a 25-year, 24-hour storm;
- providing documentation that the run-off control system adequately collects and controls at least the water volume from a 25-year, 24-hour storm;
- providing documentation that run-off from the active portion of the CCR landfill is handled in accordance with § 257.3-3 via NPDES permit MI001953;
- defining recordkeeping and reporting requirements; and
- being certified by a qualified professional engineer.

This plan will continue to be maintained and implemented by DTE Electric per the requirements outlined and cited herein.

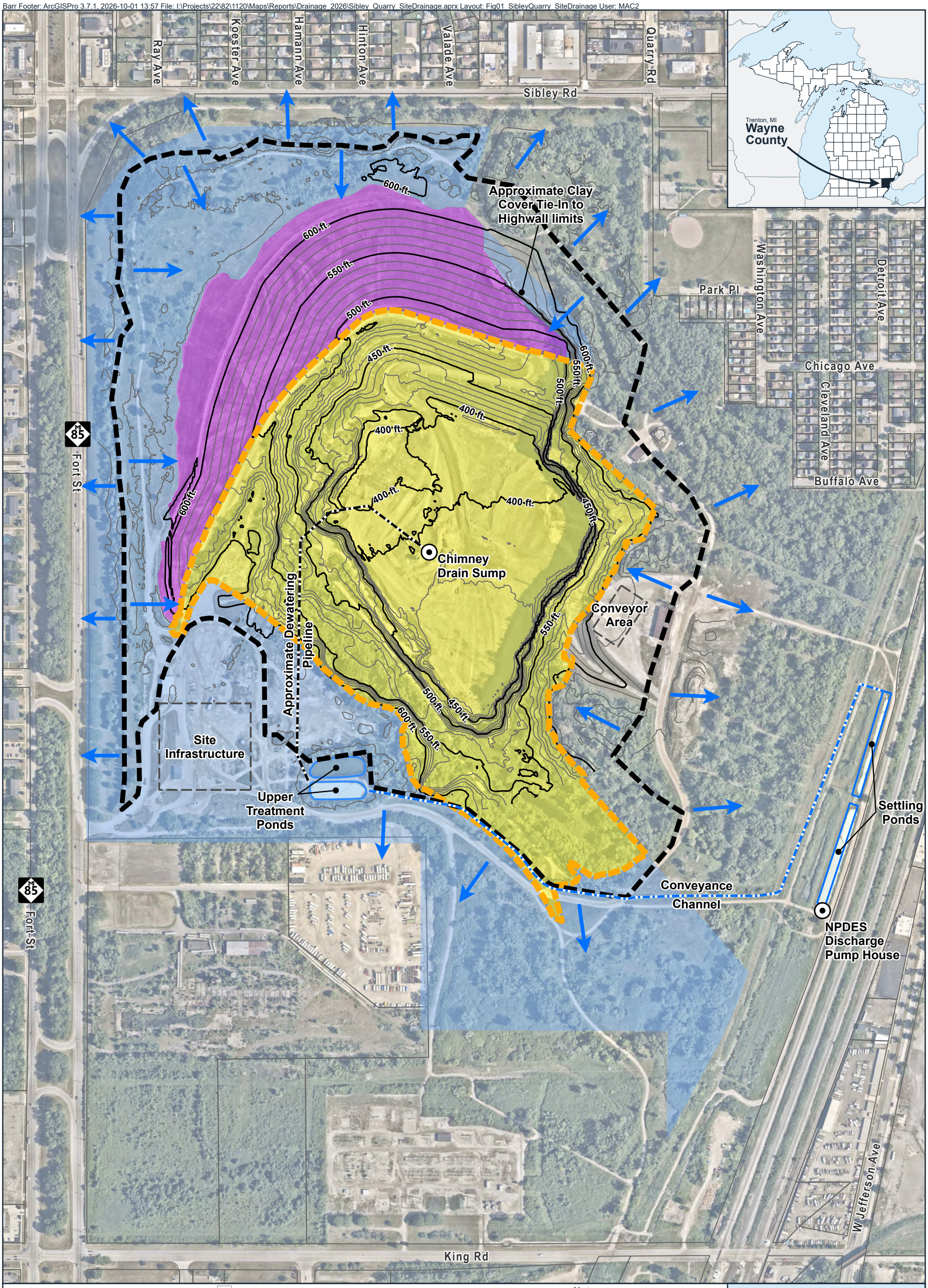
7 References

Barr, 2021. Coal Combustion Residuals Landfill Run-on and Run-off Control System Plan, Sibley Quarry Landfill, October 2021.

NOAA Atlas 14 Point Precipitation Frequency Estimates: Michigan. National Weather Service. https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=mi

Figures

Barr Footer: ArcGISPro 3.7.1, 2026-10-01 13:57 File: I:\Projects\22\82\1120\Maps\Reports\Drainage_2026\Sibley_Quarry_SiteDrainage.aprx Layout: Fig01_SibleyQuarry_SiteDrainage User: MAC2



- Approximate Drainage Divide
- Approximate Boundary of Permitted Active Landfilling Area
- Approximate Dewatering Pipeline
- Conveyance Channel
- Approximate Flow Arrow

Elevation Contours
- Index (50')
- Intermediate (10')

- Approximate Parcel Boundary
- Approximate Permitted Active Landfill Area
- Approximate Landfill Area That Received Clay Cover
- Approximate Landfill Area Covered with Closure Turf

Notes:
- Parcel data shown on this figure from 2026 and is provided by Wayne County for reference only.
- Topographic data shown on this figure from Sept 30, 2025 drone flight by PEA INC.

0 200 400 Feet

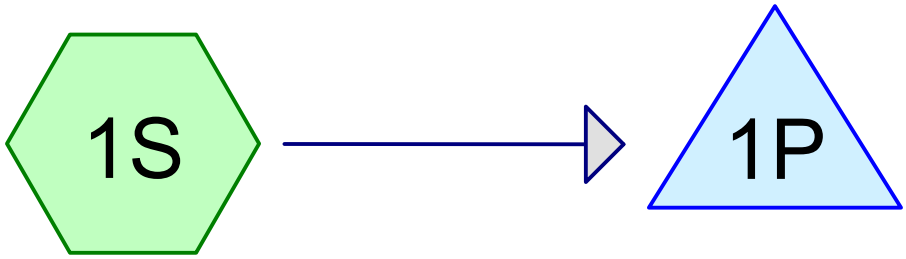
Aerial Image: Nearmap (7/29/2026)

Site Drainage
Sibley Quarry
DTE Energy
Trenton, Michigan

FIGURE 1

BARR

Appendix A – HydroCAD Model



Quarry Contributing Area

Quarry

Subcat Reach Pond Link

Routing Diagram for DTE Sibley RORO HH Model 9-21-26
Prepared by Barr Engineering, Printed 10/2/2026
HydroCAD® 10.20-9a s/n 00604 © 2026 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
65.700	82	CCR covered area (1S)
33.700	85	Clay Cover Outside of Quarry (1S)
25.700	100	Closure Turf Area - Completed 2023 (1S)
7.000	98	Impervious Area East of Quarry (1S)
20.000	71	Vegetated Area Outside of Quarry (1S)
152.100	**85**	**TOTAL AREA**

Summary for Subcatchment 1S: Quarry Contributing Area

Updated from 2020 model

Runoff by SCS TR-20 using MSE 24 hour rainfall.

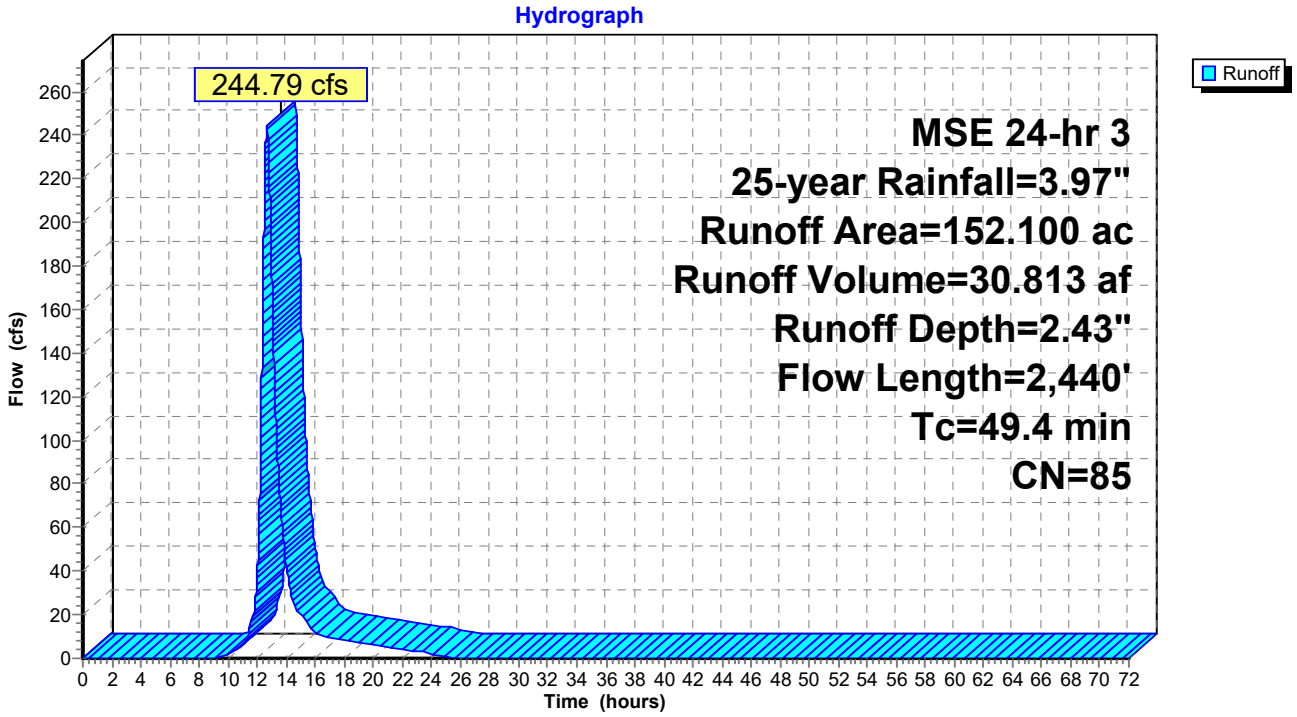
Runoff = 244.79 cfs @ 12.68 hrs, Volume= 30.813 af, Depth= 2.43"
Routed to Pond 1P : Quarry

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 25-year Rainfall=3.97"

	Area (ac)	CN	Description
*	65.700	82	CCR covered area
*	25.700	100	Closure Turf Area - Completed 2024
*	20.000	71	Vegetated Area Outside of Quarry
*	33.700	85	Clay Cover Outside of Quarry
*	7.000	98	Impervious Area East of Quarry
	152.100	85	Weighted Average
	119.400		78.50% Pervious Area
	32.700		21.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0200	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.34"
24.5	920	0.0080	0.63		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	80	0.0760	1.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.5	340	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	1,000	0.2800	8.52		**Shallow Concentrated Flow, rock ledges into sump area** Unpaved Kv= 16.1 fps
49.4	2,440	Total			

Subcatchment 1S: Quarry Contributing Area



Summary for Pond 1P: Quarry

Reflects 2026 chimney drain pumping system.

Inflow Area = 152.100 ac, 21.50% Impervious, Inflow Depth = 2.43" for 25-year event
Inflow = 244.79 cfs @ 12.68 hrs, Volume= 30.813 af
Outflow = 8.58 cfs @ 17.97 hrs, Volume= 14.102 af, Atten= 96%, Lag= 317.5 min
Primary = 8.58 cfs @ 17.97 hrs, Volume= 14.102 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 398.00' @ 17.97 hrs Surf.Area= 0.004 ac Storage= 24.670 af

Plug-Flow detention time= 763.8 min calculated for 14.102 af (46% of inflow)
Center-of-Mass det. time= 673.2 min (1,509.5 - 836.2)

Volume	Invert	Avail.Storage	Storage Description
#1	302.00'	0.300 af	**14.00'D x 85.00'H Vertical Cone/Cylinder**
#2	307.50'	18.400 af	**Chimney Drain - Drainage Layer Void Space** Listed below
#3	387.00'	266.543 af	**Custom Stage Data** Listed below
		285.243 af	Total Available Storage

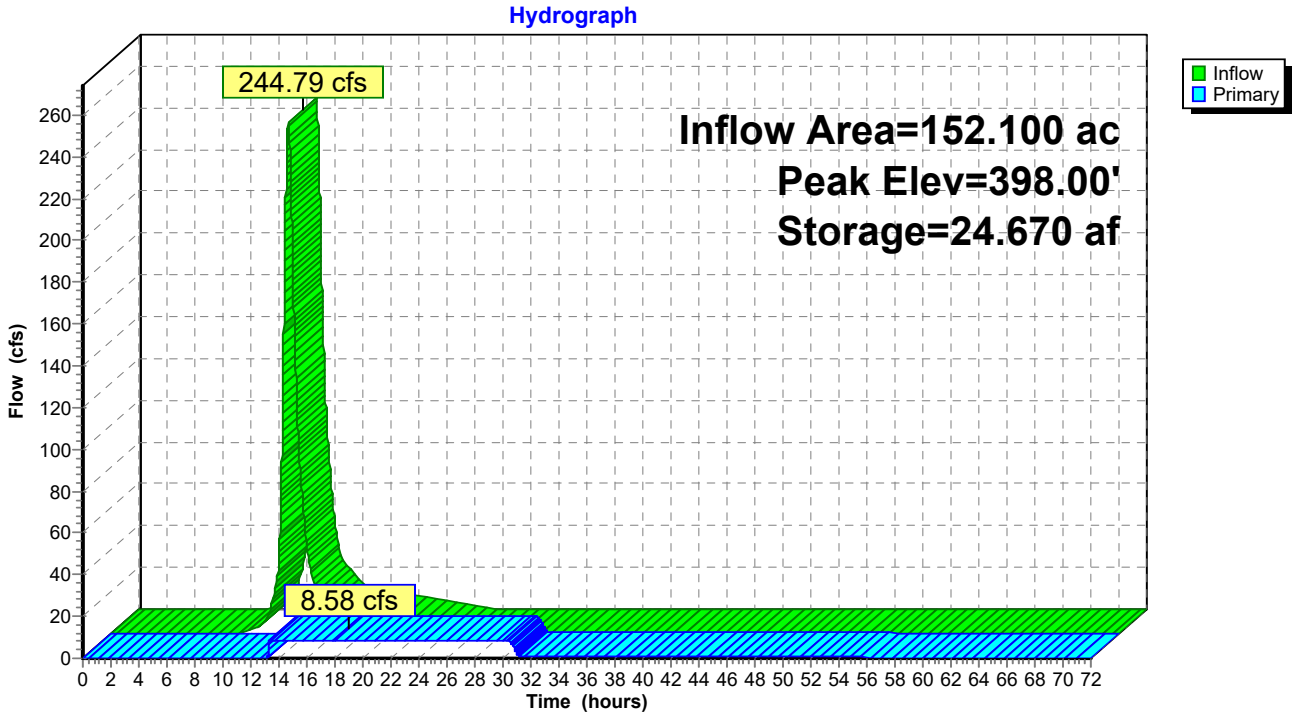
Elevation (feet)	Cum.Store (acre-feet)
307.50	0.000
315.00	18.400

Elevation (feet)	Cum.Store (acre-feet)
387.00	0.000
388.00	0.006
389.00	0.027
390.00	0.088
391.00	0.208
392.00	0.395
393.00	0.673
394.00	1.043
395.00	1.515
396.00	2.195
397.00	3.531
398.00	5.969
399.00	9.801
400.00	15.942
401.00	25.194
402.00	36.733
403.00	49.908
404.00	63.755
405.00	78.118
406.00	93.058
407.00	108.700
408.00	124.969
409.00	141.976
410.00	160.312
411.00	179.716
412.00	200.152
413.00	221.502
414.00	243.636
415.00	266.543

Device	Routing	Invert	Outlet Devices (Turned on 2 times)
#1	Primary	307.50'	**Chimney Drain Pump Curve Data** Discharges@614.00' Turns Off<306.17' Flow (gpm)= 0.0 400.0 800.0 1,200.0 1,400.0 1,600.0 1,700.0 1,800.0 1,900.0 1,975.0 Head (feet)= 300.00 298.00 288.00 273.00 260.00 245.00 235.00 225.00 218.00 212.00
#2	Primary	307.50'	**Chimney Drain Pump Curve Data** Discharges@614.00' Turns Off<306.17' Flow (gpm)= 0.0 400.0 800.0 1,200.0 1,400.0 1,600.0 1,700.0 1,800.0 1,900.0 1,975.0 Head (feet)= 300.00 298.00 288.00 273.00 260.00 245.00 235.00 225.00 218.00 212.00

Primary OutFlow Max=8.58 cfs @ 17.97 hrs HW=398.00' (Free Discharge)
└**1=Chimney Drain Pump Curve Data**(Pump Controls 4.29 cfs)
└**2=Chimney Drain Pump Curve Data**(Pump Controls 4.29 cfs)

Pond 1P: Quarry



Stage-Area-Storage for Pond 1P: Quarry

Elevation (feet)	Storage (acre-feet)
302.00	0.000
307.00	0.018
312.00	11.075
317.00	18.453
322.00	18.471
327.00	18.488
332.00	18.506
337.00	18.524
342.00	18.541
347.00	18.559
352.00	18.577
357.00	18.594
362.00	18.612
367.00	18.630
372.00	18.647
377.00	18.665
382.00	18.683
387.00	18.700
392.00	19.095
397.00	22.231
402.00	55.433
407.00	127.400
412.00	**218.852**
417.00	**285.243**
422.00	285.243
427.00	285.243
432.00	285.243
437.00	285.243
442.00	285.243
447.00	285.243
452.00	285.243
457.00	285.243
462.00	285.243
467.00	285.243
472.00	285.243
477.00	285.243
482.00	285.243
487.00	285.243
492.00	285.243
497.00	285.243
502.00	285.243
507.00	285.243
512.00	285.243
517.00	285.243
522.00	285.243
527.00	285.243
532.00	285.243
537.00	285.243
542.00	285.243
547.00	285.243
552.00	285.243
557.00	285.243
562.00	285.243
567.00	285.243
572.00	285.243
577.00	285.243
582.00	285.243
587.00	285.243
592.00	285.243
597.00	285.243
602.00	285.243
607.00	285.243
612.00	285.243