FORM I
SOIL EROSION AND SEDIMENTATION CONTROLS

Prepared 6/2003; Revised 9/10, 8/13, 11/17, 05/18, 10/25, 07/2026

This Form I presents the Erosion and Sedimentation Control Designs for new proposed entrance for the facility.

Form I - Table of Contents

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
06/03; Rev 09/10, 08/13, 11/17, 05/18, 10/25, 07/26
DEP USE ONLY
Date Received

FORM I
SOIL EROSION AND SEDIMENTATION CONTROLS

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form I, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: 273.151, 275.205, 277.151, 279.232, 281.132, 283.106, 288.151, 289.252, 291.205, 293.232, 295.132, 297.106

SECTION A. SITE IDENTIFIER

Applicant/permittee: *Westmoreland Sanitary Landfill, LLC.*

Site Name: *Sanitary Landfill*

Facility ID (as issued by DEP): *100277*

SECTION B. EROSION AND SEDIMENT CONTROL

Provide a plan for the control of erosion and sedimentation on land within the permit area, all borrow areas and adjacent areas to be disturbed by construction activities. Include a narrative describing the implementation of the plan, its relationship to the overall staging of earth moving activities, and detailed design and construction plans and specifications for each structure or facility used in the plan. The plan must be site specific for each phase of construction. Include design assumptions, runoff calculations, channel profiles, cross sections, channel linings, and applicable details on attached Data Sheet for all collection and interceptor ditches. Provide documentation on the capacity of existing drainage system and the effect that storage or disposal activities will have on the drainage. Show discharge points to natural drainageways and all culverts that carry drainage away from the site. Plans and maps shall contain all details necessary for construction of the structures. *Attachment I-6 includes channel and pond design for proposed entrance area.*

SECTION C. DIVERSION CONTROLS

Provide a plan for the collection and conveyance to a natural drainageway of the runoff from up slope undisturbed areas. Include design calculations, profiles, cross sections, and applicable details for each structure, ditch, or channel used for diverting runoff. The diversion control and erosion and sedimentation control plan shall be based on the requirements of Chapter 102 (Erosion and Sedimentation Control) of the Department's regulations. Calculations indicating water quantities shall be based on a 24-hour precipitation event with a frequency of once in 25 years. More stringent criteria may be required by the Department based on the most recent edition of the USDA-SCS, *Engineering Field Manual for conservation Practices,* or as otherwise determined necessary by the Department. *Attachment I-6 includes channel and pond design for proposed entrance area.*

SECTION D. ACCESS ROADS (Residual Waste Facilities Must Submit Form 23R)

Access roads shall have drainage system that is compatible with the natural contours, structurally stable, and capable of passing safely the peak flow from a 25-year, 24-hour precipitation event.

Provide the following information for each haul road to be used in the operation.

a) Show the location on the application's topographic maps;

b) Description and typical cross sections showing the construction of each access road including existing and proposed contours, grades, slopes, culvert locations, outlet protection, and other drainage control;

c) Measures to control and prevent erosion and sedimentation; include proposed spacing of sediment traps, turnouts, cross drains, culverts, check dams, stabilized ditches, erosion resistant surfacing, etc.;

d) Plan for reclamation after the operation is completed;

Attachment I-6 includes channel and pond design for proposed entrance area. Entrance road shown on permit drawings included with the 07/2026 Permit Modification.

FORM I
DIVERSION/COLLECTION DITCH DATA SHEET

Title: *Entrance Area*	Site: *Sanitary Landfill*		
Prepared by: *Civil Design Solutions*	Telephone Number: *412-299-2700*	Date: *07/2026*	Sheet *1* of *1*

Estimated Peak Storm Intensity: *3.93* **(in./hr.)** ***Design Calculations:*** *Channel E1*

Station		Drainage Area (acres)	Design Storm (yrs.)	Average Watershed Slope %)	Peak Discharge Q (cfs)	Channel Bed Slope (%)	Freeboard (ft.)	Channel Lining	Manning's Coefficient (n)	Channel Bottom Width (ft.)	Channel Side Slopes (%)	Flow Area (sq. ft.)	Flow Depth (ft.)	Top Flow Width (ft.)	Flow Velocity (ft./sec.)	Q Available (cfs)	With Freeboard		
Start End	Elevation																Channel Depth (ft.)	Top Channel Width (ft.)	Q Available (cfs)
0+00	1108.0																		
11+40	1002.0	1.0	25	33	4.98	9.30	1.57	Matting	0.030	1.0	2H:1V	0.80	0.43	2.7	6.38	6.38	2.0	9.0	152.01

Refer to attached Channel Profile

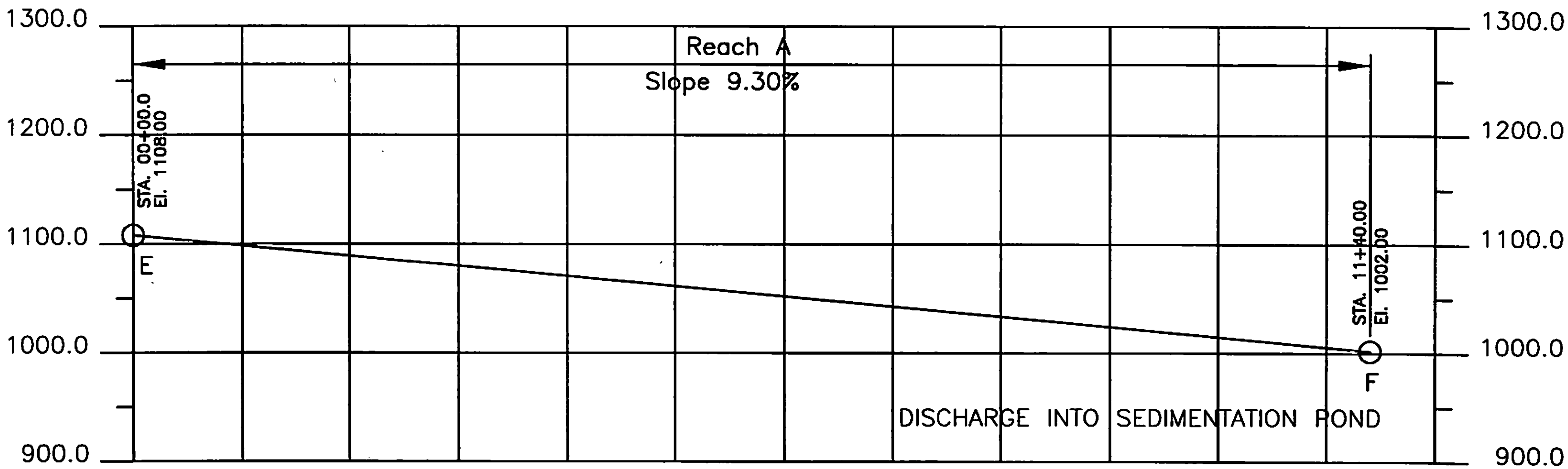
Elevation

Stations

PROFILE

Vertical Scale 1" = ____________

Horizontal Scale 1" = ____________



CHANNEL E1 Profile

Scale 1"=100ft

FORM I
DIVERSION/COLLECTION DITCH DATA SHEET

Title: *Entrance Area*	Site: *Sanitary Landfill*		
Prepared by: *Civil Design Solutions*	Telephone Number: *412-299-2700*	Date: *12/2024*	Sheet *1* of *1*

Estimated Peak Storm Intensity: *3.93* **(in./hr.)** ***Design Calculations:*** *Channel E2*

Station																	With Freeboard		
Start End	Elevation	Drainage Area (acres)	Design Storm (yrs.)	Average Watershed Slope %)	Peak Discharge Q (cfs)	Channel Bed Slope (%)	Freeboard (ft.)	Channel Lining	Manning's Coefficient (n)	Channel Bottom Width (ft.)	Channel Side Slopes (%)	Flow Area (sq. ft.)	Flow Depth (ft.)	Top Flow Width (ft.)	Flow Velocity (ft./sec.)	Q Available (cfs)	Channel Depth (ft.)	Top Channel Width (ft.)	Q Available (cfs)
0+00	1108.0																		
11+70	1002.0	6.1	25	33.0	19.27	9.06	1.33	Matting	0.030	2.0	2H:1V	2.24	0.67	4.7	8.75	19.27	2.0	10.0	190.75

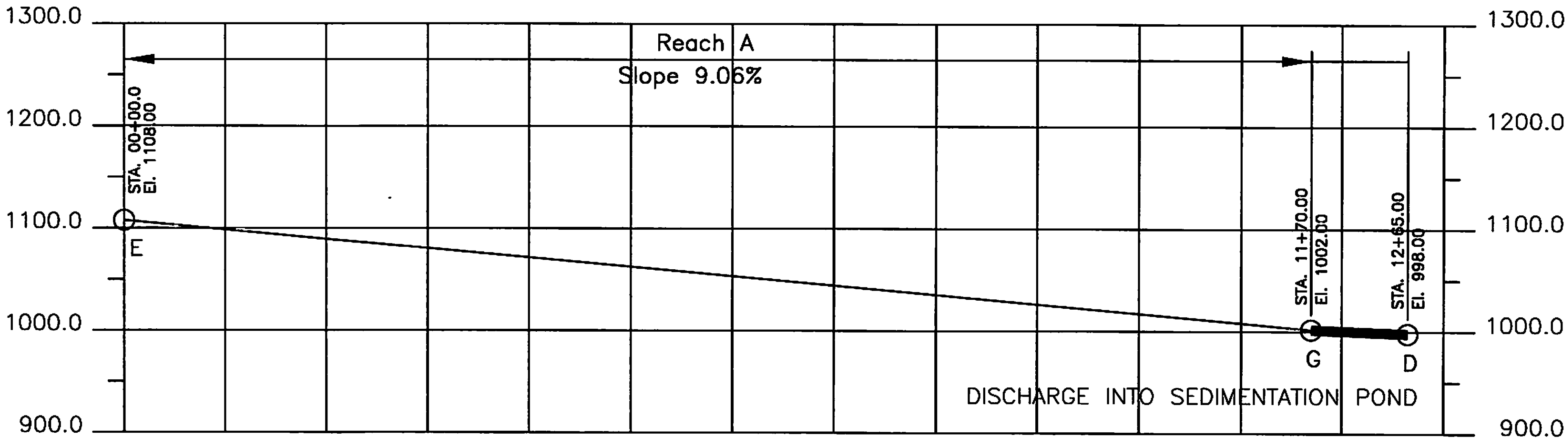
Refer to attached Channel Profile

Elevation

Stations

PROFILE

Vertical Scale 1" = ____________
Horizontal Scale 1" = ____________



CHANNEL E2 Profile

Scale 1"=100ft

S:\2026-083\Permit\Form I\Channels\PROFILES.dwg, 6/30/2026 11:09:59 AM

FORM I
DIVERSION/COLLECTION DITCH DATA SHEET

Title: *Entrance Area*	Site: *Sanitary Landfill*		
Prepared by: *Civil Design Solutions*	Telephone Number: *412-299-2700*	Date: *07/2026*	Sheet *1* of *1*

Estimated Peak Storm Intensity: *3.93* **(in./hr.)** ***Design Calculations:*** *Channel E-3*

Station																	With Freeboard		
Start End	Elevation	Drainage Area (acres)	Design Storm (yrs.)	Average Watershed Slope %)	Peak Discharge Q (cfs)	Channel Bed Slope (%)	Freeboard (ft.)	Channel Lining	Manning's Coefficient (n)	Channel Bottom Width (ft.)	Channel Side Slopes (%)	Flow Area (sq. ft.)	Flow Depth (ft.)	Top Flow Width (ft.)	Flow Velocity (ft./sec.)	Q Available (cfs)	Channel Depth (ft.)	Top Channel Width (ft.)	Q Available (cfs)
0+00	1037.0																		
8+75	1013.0	2.8	25	33.0	5.20	2.74	0.83	Matting	0.030	4.0	2H:1V	7.42	1.17	8.7	0.71	5.20	2.0	12.0	15.16
9+40	998.0	2.9	25	33.0	5.39	22.08	1.74	Matting	0.030	2.0	2.0	0.66	0.26	3.0	8.35	5.39	2.0	10.0	304.44

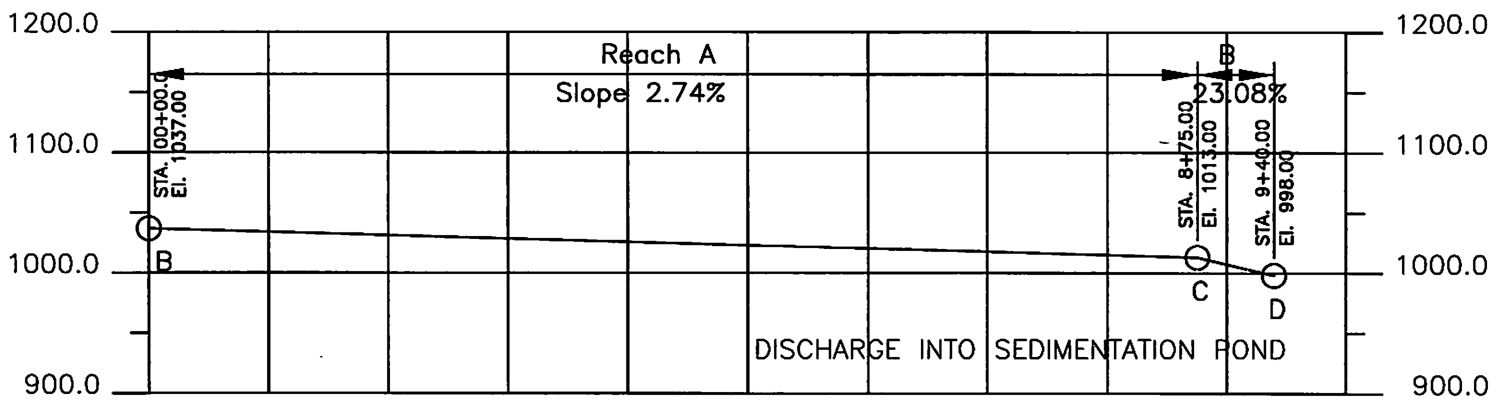
Refer to attached Channel Profile

Elevation

Stations

PROFILE

Vertical Scale 1" = ____________
Horizontal Scale 1" = ____________



CHANNEL E3 Profile

Scale 1"=100ft

SECTION E. SEDIMENTATION PONDS

Sedimentation ponds and other impoundments must be constructed in accordance with the requirements of Chapter 102 and this permit before any earthmoving activities start in the drainage area. Each impoundment must be inspected during construction by or under the supervision of a registered professional engineer, licensed in Pennsylvania, and certified by the Department upon completion of construction.

Any enlargement, reduction in size, reconstruction, or other modification that may affect the stability or operation must be approved by the Department. Ponds must be certified and approved by the Department prior to the start of storage or disposal activities.

Identification *Sedimentation Pond E1 (Entrance Area)*

U.S.G.S. Quadrangle *Denora, PA* Location: Latitude *40° 08' 58"*; Longitude *79° 51' 35"*

Or Location from Bottom Right corner of U.S.G.S. Quadrangle; inches North: ______ inches West: ______

HYDROLOGY: Drainage area *12.71-ac* acres; Design Storm *25-yr, 24-hr* Average Watershed Slope *25%*

Land Use *Landfill* Soil Type *C* Curve Number *82 to 98* Peak Discharge *See Calculations*

Embankment	Top Width (Minimum)	*12-ft*
	Outside Slope (Maximum)	*2H:1V*
	Inside Slope (Maximum)	*2.5H:1V*
	Top Elevation	*El. 1000*
	Upstream Toe Elevation	*El. 1000*
	Liner Material (earthen, synthetic, etc.)	*Earthen*
Impoundment Dimensions and Capacities	Length at Bottom	*85-ft (Average)*
	Width at Bottom	*16-ft (Average)*
	Length at Crest of Principal Spillway	*220-ft (average)*
	Width at Crest of Principal Spillway	*70-ft (Average)*
	Depth from Crest of Principal Spillway	*11.5-ft*
	Length at Crest of Emergency Spillway	*240-ft (Average)*
	Width at Crest of Emergency Spillway	*110-ft (Average)*
	Volume at Crest of Principle Spillway	*77,184-cf*
Principal Spillway	Time of Detention	*2.5-days*
	Maximum Sediment Storage Volume	*13,328-cf*
	Shape (Circular, semi-circular, trapezoid, etc.)	*Circular*
	Dimensions (W x H x L)	*2.5-ft diameter CPE*
	Inlet Elevation	*Crest 996.5*
	Slope and Length	*9% slope, 100-ft length*
	Discharge Elevation	*987*
	Spillway Capacity	*26.95-cfs @ El. 998.0*
	Construction Material	*CMP*
Dewatering Device	Type/Size	*Perforated Riser Pipe*
	Inlet Elevation	*989.5 (bottom row)*
	Discharge Controls (i.e. self draining or valved)	*Self Draining*
	Discharge Capacity (maximum)	*0.612-cfs @ El. 996.5*
	Time to Dewater Full Pond	*5.4-days*
Emergency Spillway	Shape	*Trapezoidal*
	Dimensions (W x H x L)	*8-ft bottom width*
	Slope	*1.0%*
	Discharge Elevation	*997.8*
	Type of Lining/Protection	*Matting*
	Spillway Capacity (provide design calculations)	*See Routings*

FORM I – SOIL EROSION AND SEDIMENTATION CONTROLS

ATTACHMENT I-6

ENTRANCE AREA EROSION AND SEDIMENTATION CONTROLS

CHANNEL DESIGNS

Civil Design Solutions, Inc.

PROJECT	WESTMORELAND SANITARY LANDFILL			PROJECT NO.	2026-083		
ENTRANCE AREA – EROSION AND SEDIMENTATION				PAGE		OF	
MADE BY	DWM	DATE	06/2026	CHECKED BY	KAF	DATE	06/2026

INTRODUCTION

This calculation involves the estimation of peak flows and design of the surface water channels for the proposed Sanitary Landfill entrance area. Peak flows utilized for channel sizing have been estimated by use of the SCS TR-55 (Soil Conservation Services Technical Release - 55) graphical peak method. All channels have been designed for the 25-year 24-hour storm event, as the requirements of the 25 Pa. Code § 273.

HYDROLOGY

The peak flow to the channel have been estimated using the SCS TR-55 Method to calculate the time of concentration of the channel reach, the composite runoff curve number describing the reach's watershed. estimate the flow.

T he following runoff coefficients will be utilized.

CN DATA	
Description	**CN**
Impervious	98
Newly Graded	91
Meadow, non-grazed	78
Landfill (1)	79

(1) Landfill surface areas will be assumed to be 25% Newly graded (no vegetation) and 75% grass cover, yielding a composite CN of 0.25*91 + 0.75*74 = 79.

As per the TR-55 methods, times of concentration will be estimated as the sum of sheet flow, shallow flow and channel flow. Similar to the calculation of a composite CN above. Maximum sheet flow length will be 200-ft consistent with TR-55. Sheet flow time will be estimated by use of the SCS Kinematic Wave Equation, identified below. Channels where the calculation of a Sheet Flow time of concentration was not performed, a time of 0.1-hrs was assigned.

Civil Design Solutions, Inc.

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$$\text{Sheet Flow } T_C = \left[\frac{0.007\,(nL)^{0.8}}{\sqrt{P_2}\,(S^{0.4})}\right]$$

Where:

Sheet Flow T_C = Travel Time, hr

L = Length of flow path, ft

n = Roughness Coefficient

S = Surface Slope, ft/ft

P_2 = Rainfall Depth 2 – yr, 24 – hr storm, inch

Shallow flow times of concentration will be estimated depending on paved/unpaved condition of the flow path, identified below.

$$\text{Shallow Flow } T_C = \left[\frac{1}{\text{Factor}\left(\sqrt{S}\right)3600}\right]$$

Where:

Shallow Flow T_C = Unit Travel Time, hr/ft

Factor = 16.1345 for Unpaved, 20.3282 for Paved

S = Surface Slope, ft/ft

Channel flow times of concentration will be estimated as part of the channel cross section design, utilizing actual flow depth and velocity information.

All channels have been designed utilizing the 25-year 24-hour storm event. Flows in the channels have been estimated for other storm frequencies also. The rainfall values for this site listed below, have been taken from the NOAA Atlas 14 on-line database (report included here). This site is located within areas applicable to SCS rainfall distribution II.

RAINFALL DATA		
Frequency	**Duration**	**Depth (in)**
2 yr	24 hr	2.37
10 yr	24 hr	3.32
25 yr	24 hr	3.93
50 yr	24 hr	4.43
100 yr	24 hr	4.95

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CHANNELS

With the peak discharge for each channel, the channel cross section is sized and a channel lining material is selected (from the channel lining design options, included below). Flow properties within the channels are estimates from Manning's Equation:

$$V = \frac{Q}{A} = 1.49\frac{R^{2/3}\sqrt{S_f}}{n} = 1.49\frac{\left[\frac{A}{WP}\right]^{2/3}\sqrt{S_f}}{n}$$

Where:

V = Velocity, fps

Q = Flowrate, cfs

A = Cross – Sectional area of flow, sf

R = Hydraulic Radius, ft

WP = Wetted Perimeter, ft

S_f = Slope of channel, ft / ft

n = Manning's roughness coefficient

All channels have been designed trapezoidal in cross sectional shape. Sizing of channels have been selected for constructability and maintenance. In addition to the selection of a size for each channel, the lining material has been selected from the following information. Maximum velocity checks for the channels are performed as part of the computer design, an additional check is done to verify Shear Stress applied to the lining.

The check of Shear Stress is presented in a spreadsheet summary included with the channel designs. Shear Stress is checked using the following equation

$$\tau_D = 62.4(d)S$$

Where:

τ_D = Shear Stress, lb/sf

S = Channel Slope, ft/ft

d = Flow Depth, ft

Civil Design Solutions, Inc.

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CHANNEL LININGS			
Material	n	Vmax (fps)	τ_s max (lb/sf)
Grass	0.035 (6)	4.0 (7)	1.00 (3)
Matting (1)	0.030 (5)	12.0	6.00 (2)
Gabion	0.027 (4)	22.0 (4)	8.35 (4)
Grouted RipRap	0.030 (8)	20.0 (8)	13.0 (8)
Chute	0.030 (9)	20.0 (9)	13.0 (9)
HDPE (10)	0.013 (10)	22.0 (10)	10.00 (10)
Grout	0.027	20.0	13.0

1. The term Matting is used to reference synthetic (non-degradable) matting which reinforces the base of vegetation within the channel.
2. Taken as average of manufacturer reported maximum shear stress of 3 lb/sf for long term unvegetated and 10 lb/sf for short term vegetated.
3. Vegetative Liners Class C. Taken from Table 6, Page 21, Reference 5.
4. Taken from Table 13, Page 31, Reference 5.
5. See Reference 5 for maximum velocities and allowable shear stress based on riprap size.
6. Taken from Table 12, Page 26, Reference 5.
7. Taken from Table 7a, Page 23, Reference 5.
8. The Manning's n has been taken to be 0.030 which is reported as a typical value for grouted riprap as shown in Table 2.1 of the Federal Highway Administration Hydraulic Engineering Circular 15. This channel lining has been taken to have a maximum shear stress of 13.0-lb/sf and a maximum allowable velocity of 20-fps matching that shown for Grout in this same table.
9. Chute lining shall include Grouted Rirap to be used as part of all downchute channel construction. The design Manning's n, maximum velocity and maximum shear stress have been specified to match the Grouted Riprap specifications also presented on this table.
10. HDPE lining shall consist of geomembrane channels lined with a HDPE piping. While this material is expected to have superior resistance to maximum velocities and shear stresses, values have been provided here for calculation purposes.

Following the selection of the channel cross section and lining, the freeboard is also checked. The procedure for checking freeboard is clearly presented on the spreadsheet titled "Surface Water Channel Design Freeboard Verifications"

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REFERENCES

1. Soil Conservation Service, URBAN HYDROLOGY FOR SMALL WATERSHEDS, Technical Release 55, June 1986.

2. Soil Conservation Service, ENGINEERING FIELD MANUAL FOR CONSERVATION PRACTICES, November 1986.

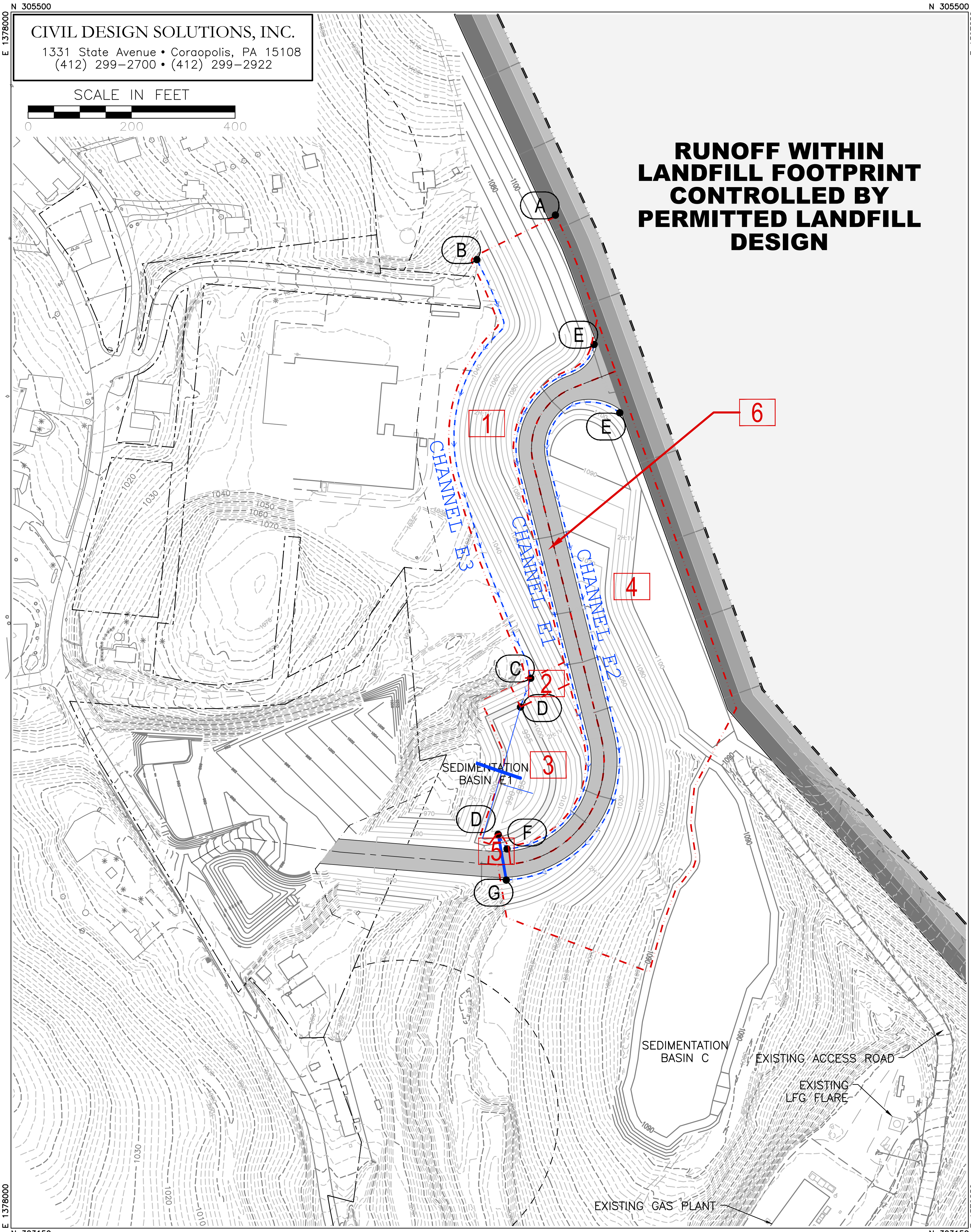
3. Ven Te Chow, OPEN CHANNEL HYDRAULICS, Mc-Graw Hill Book Company, 1959.

4. Goldman, Jackson and Bursztynsky, EROSION AND SEDIMENT CONTROL HANDBOOK, Mc-Graw Hill Book Company, 1986.

5. Commonwealth of Pennsylvania, Department of Environmental Protection, Bureau of Water Quality Protection, EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL, March 2000.

6. Pennsylvania State University, COMPUTATIONAL METHODS IN STORMWATER MANAGEMENT, short course reference document.

7. Hydrometerlogical Design Studies Center, DOC/NOAA/National Weather Service, Point Precipitation Frequency Estimates from NOAA Atlas 14.



CHANNEL/CULVERT LEGEND

PROPOSED CHANNEL

PROPOSED CULVERT

EA DESIGN POINT ID

40 WATERSHED AREA ID

NOTES

1. NOVEMBER 14, 2025 DRONE MAPPING BY NOBLE ENVIRONMENTAL.

DES	DWM	06/2026	SANITARY LANDFILL
CHECK	DJM	06/2026	SHEET TITLE: ENTRANCE AREA E&S CALCULATIONS
APPROVED	DWM	06/2026	
SCALE	1" = 200'		
ISSUED	06/2026		

WESTMORELAND SANITARY LANDFILL

FIGURE: 1

Civil Design Solutions, Inc.

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ELEVATIONS

Point	Elevation
A	1114.50
B	1037.00
C	1013.00
D	998.00
E	1108.00
F	1002.00
G	1002.00

LENGTHS

From	To	Length
A	B	175.00
B	C	875.00
C	D	65.00
E	F	1140.00
F	D	40.00
E	G	1170.00
G	D	95.00

NOAA Atlas 14, Volume 2, Version 3
Location name: Rostraver Township, Pennsylvania, USA*
Latitude: 40.1443°, Longitude: -79.8579°
Elevation: 918 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.310 (0.281-0.342)	0.370 (0.336-0.408)	0.448 (0.406-0.494)	0.507 (0.459-0.558)	0.584 (0.526-0.641)	0.642 (0.576-0.704)	0.697 (0.623-0.763)	0.754 (0.670-0.824)	0.829 (0.735-0.904)	0.885 (0.780-0.964)
10-min	0.482 (0.437-0.531)	0.577 (0.525-0.637)	0.697 (0.630-0.768)	0.783 (0.708-0.861)	0.893 (0.804-0.981)	0.973 (0.874-1.07)	1.05 (0.938-1.15)	1.12 (1.00-1.23)	1.22 (1.08-1.33)	1.29 (1.14-1.40)
15-min	0.591 (0.535-0.651)	0.706 (0.642-0.780)	0.856 (0.774-0.943)	0.964 (0.872-1.06)	1.10 (0.993-1.21)	1.20 (1.08-1.32)	1.30 (1.16-1.43)	1.40 (1.24-1.53)	1.52 (1.35-1.66)	1.61 (1.42-1.75)
30-min	0.782 (0.708-0.861)	0.945 (0.859-1.04)	1.17 (1.06-1.29)	1.34 (1.21-1.47)	1.56 (1.40-1.71)	1.72 (1.55-1.89)	1.88 (1.68-2.06)	2.04 (1.82-2.23)	2.25 (2.00-2.46)	2.41 (2.13-2.63)
60-min	0.955 (0.865-1.05)	1.16 (1.05-1.28)	1.47 (1.33-1.62)	1.70 (1.54-1.87)	2.02 (1.82-2.22)	2.27 (2.04-2.49)	2.52 (2.25-2.75)	2.77 (2.46-3.03)	3.12 (2.76-3.40)	3.39 (2.99-3.69)
2-hr	1.10 (1.01-1.20)	1.34 (1.23-1.46)	1.69 (1.54-1.84)	1.96 (1.78-2.13)	2.33 (2.12-2.52)	2.63 (2.38-2.84)	2.93 (2.64-3.16)	3.24 (2.91-3.49)	3.67 (3.26-3.94)	4.00 (3.54-4.29)
3-hr	1.17 (1.08-1.28)	1.42 (1.30-1.54)	1.78 (1.64-1.94)	2.07 (1.90-2.25)	2.46 (2.25-2.67)	2.78 (2.53-3.02)	3.12 (2.82-3.36)	3.46 (3.11-3.72)	3.94 (3.51-4.22)	4.31 (3.81-4.62)
6-hr	1.40 (1.29-1.53)	1.68 (1.55-1.84)	2.10 (1.93-2.29)	2.43 (2.23-2.65)	2.90 (2.65-3.15)	3.29 (2.99-3.55)	3.69 (3.34-3.98)	4.11 (3.70-4.42)	4.70 (4.19-5.04)	5.17 (4.58-5.53)
12-hr	1.66 (1.53-1.82)	1.98 (1.82-2.17)	2.44 (2.24-2.67)	2.82 (2.58-3.07)	3.37 (3.06-3.66)	3.82 (3.46-4.13)	4.29 (3.86-4.62)	4.79 (4.28-5.15)	5.50 (4.87-5.89)	6.07 (5.34-6.48)
24-hr	1.99 (1.86-2.13)	2.37 (2.22-2.55)	2.90 (2.70-3.11)	3.32 (3.10-3.57)	3.93 (3.65-4.21)	4.43 (4.10-4.73)	4.95 (4.57-5.27)	5.49 (5.05-5.84)	6.26 (5.72-6.64)	6.87 (6.24-7.28)
2-day	2.32 (2.18-2.49)	2.76 (2.60-2.96)	3.34 (3.14-3.58)	3.81 (3.57-4.08)	4.47 (4.18-4.77)	5.00 (4.66-5.33)	5.55 (5.15-5.90)	6.11 (5.66-6.49)	6.88 (6.34-7.31)	7.50 (6.87-7.96)
3-day	2.50 (2.34-2.67)	2.96 (2.78-3.17)	3.56 (3.34-3.81)	4.04 (3.79-4.32)	4.72 (4.41-5.03)	5.26 (4.90-5.60)	5.82 (5.41-6.19)	6.38 (5.92-6.78)	7.17 (6.61-7.61)	7.78 (7.14-8.26)
4-day	2.67 (2.51-2.85)	3.16 (2.96-3.38)	3.78 (3.54-4.03)	4.28 (4.00-4.56)	4.97 (4.64-5.29)	5.52 (5.15-5.87)	6.09 (5.66-6.47)	6.66 (6.18-7.08)	7.45 (6.88-7.91)	8.07 (7.41-8.56)
7-day	3.19 (3.01-3.38)	3.76 (3.55-3.99)	4.44 (4.18-4.71)	4.98 (4.69-5.27)	5.71 (5.37-6.04)	6.28 (5.89-6.64)	6.86 (6.42-7.24)	7.44 (6.94-7.85)	8.21 (7.62-8.66)	8.80 (8.14-9.28)
10-day	3.67 (3.48-3.88)	4.32 (4.10-4.57)	5.04 (4.79-5.33)	5.62 (5.33-5.94)	6.40 (6.05-6.75)	7.00 (6.60-7.38)	7.59 (7.15-8.00)	8.19 (7.69-8.63)	8.96 (8.39-9.44)	9.54 (8.91-10.1)
20-day	5.14 (4.91-5.40)	6.02 (5.75-6.33)	6.94 (6.62-7.30)	7.67 (7.31-8.05)	8.62 (8.20-9.05)	9.35 (8.88-9.80)	10.1 (9.53-10.5)	10.7 (10.2-11.3)	11.6 (11.0-12.2)	12.3 (11.5-12.9)
30-day	6.46 (6.16-6.77)	7.54 (7.19-7.92)	8.62 (8.21-9.04)	9.46 (9.01-9.92)	10.6 (10.0-11.1)	11.4 (10.8-11.9)	12.2 (11.5-12.8)	12.9 (12.3-13.6)	13.9 (13.2-14.6)	14.6 (13.8-15.4)
45-day	8.26 (7.91-8.61)	9.62 (9.22-10.0)	10.9 (10.4-11.3)	11.8 (11.3-12.3)	13.0 (12.5-13.6)	13.9 (13.3-14.5)	14.8 (14.1-15.4)	15.5 (14.8-16.2)	16.5 (15.7-17.3)	17.2 (16.3-18.0)
60-day	9.94 (9.55-10.4)	11.5 (11.1-12.1)	12.9 (12.4-13.5)	14.0 (13.4-14.6)	15.3 (14.7-16.0)	16.3 (15.6-17.0)	17.2 (16.4-17.9)	18.0 (17.2-18.7)	19.0 (18.1-19.8)	19.6 (18.8-20.5)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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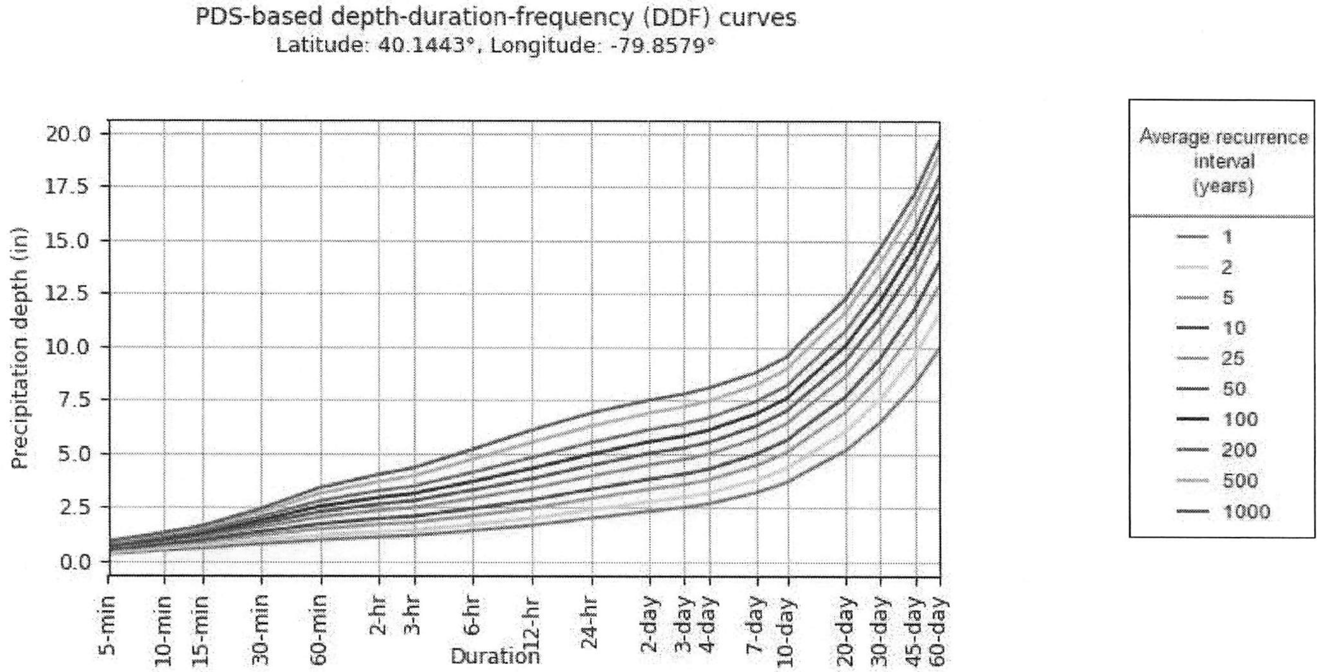
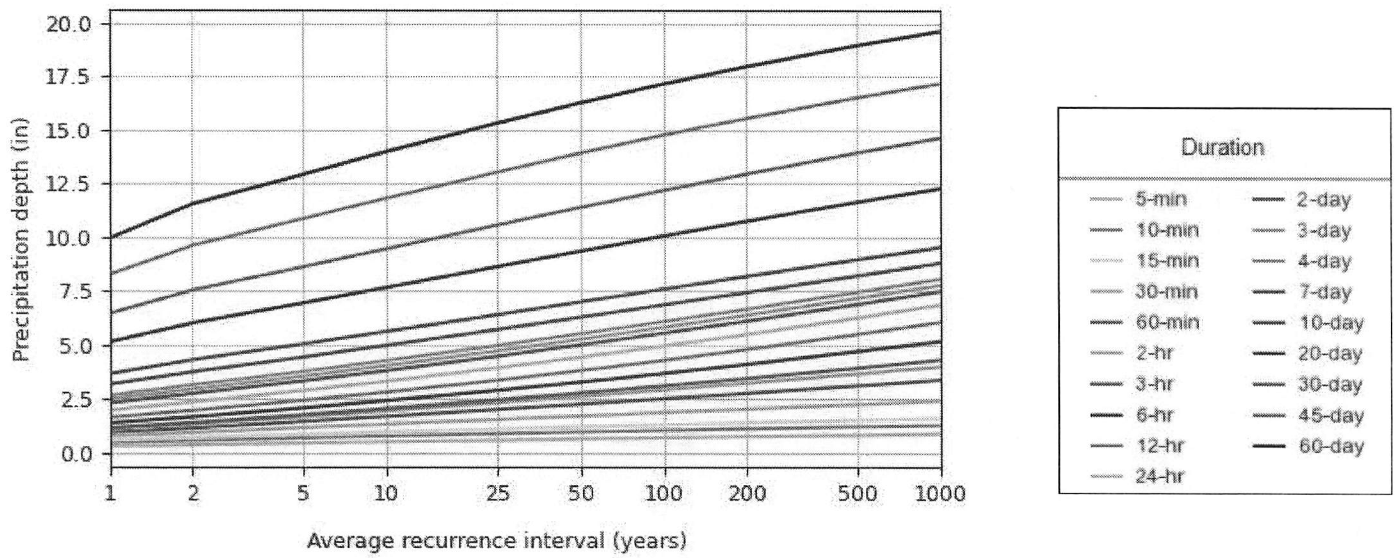
PF graphical





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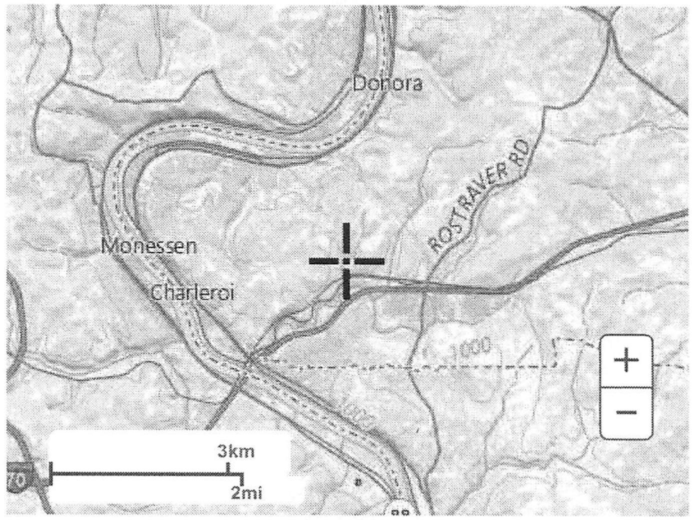
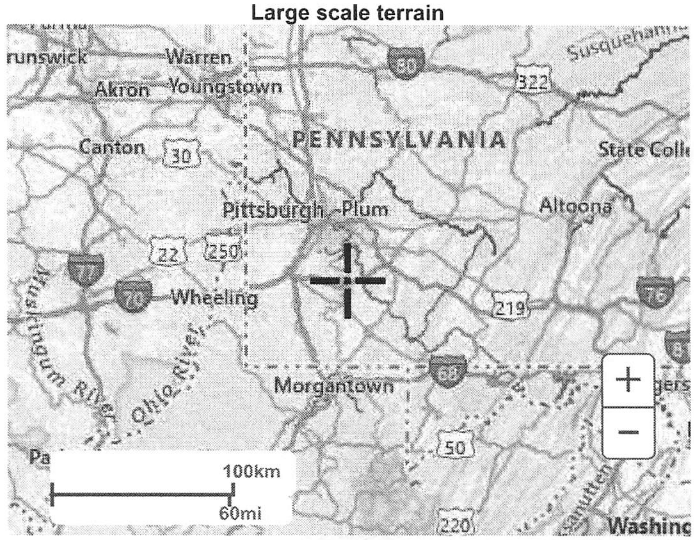
Maps & aerials

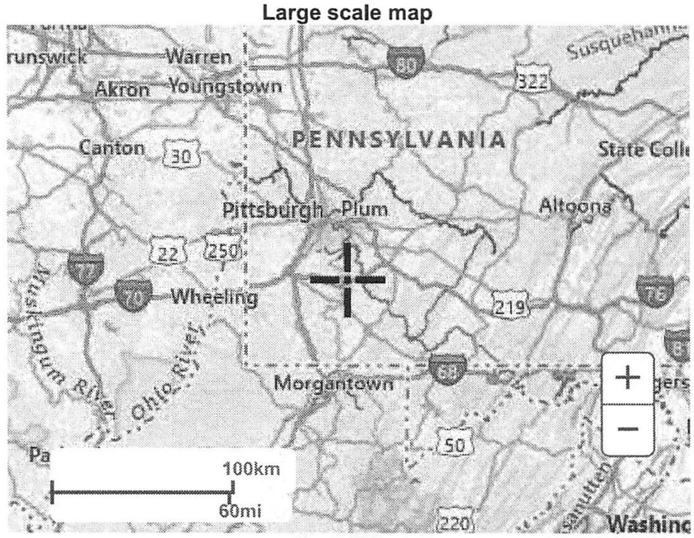
Small scale terrain



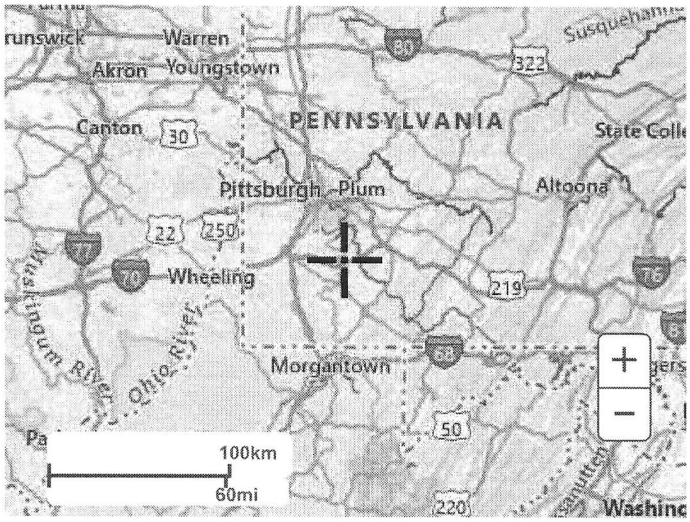
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

SANITARY LANDFILL - ENTRANCE AREA

Stormwater and Erosion & Sediment Controls - Watershed Areas

Watershed ID	Watershed Area (AC)	Watershed Area (AC)	Landfill CN=82 (%)	Impervious CN=98 (%)	Grass CN=79 (%)	Landfill CN=82 (AC)	Impervious CN=98 (AC)	Grass CN=79 (AC)
1	2.78	120,919	100%	0%	0%	2.78	0.00	0.00
2	0.11	4,603	100%	0%	0%	0.11	0.00	0.00
3	1.04	45,127	80%	20%	0%	0.83	0.21	0.00
4	6.07	264,366	95%	5%	0%	5.77	0.30	0.00
5	0.05	1,969	40%	60%	0%	0.02	0.03	0.00
6	0.97	42,077	0%	100%	0%	0.00	0.97	0.00

SANITARY LANDFILL - ENTRANCE AREA

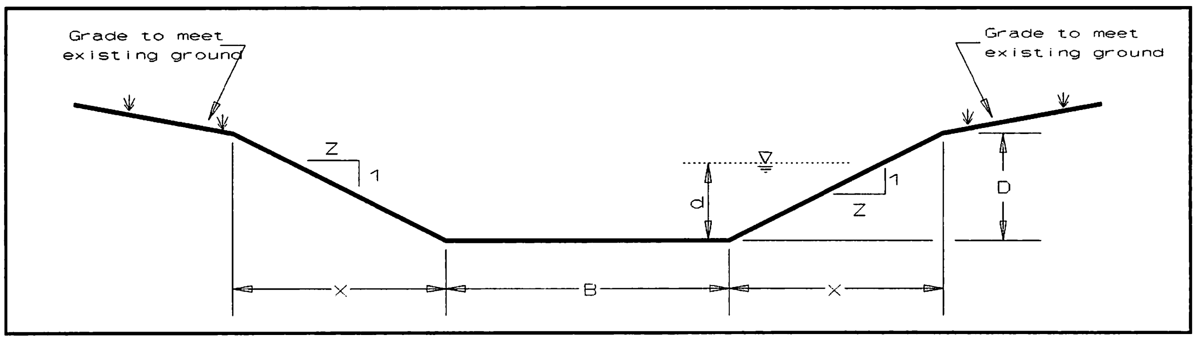
Erosion & Sediment Controls - Watershed Areas

Channel ID	Contributing Watersheds	Landfill CN=82 (AC)	Imp CN=98 (AC)	Grass CN=79 (AC)
E1 - A	6	0.00	0.97	0.00
E2 - A	4	5.77	0.30	0.00
E3 - A	1	2.78	0.00	0.00
E3 - B	1 , 2	2.89	0.00	0.00

Project : Sanitary Landfill - Entrance
Location :
Project #: 000-000-000

By : DWM
Date : 06-29-26
Status: Developed

The following lined section was chosen
for channel : C1-A



Where:

Z : 2.00
D : 2.00
X : 4.00
B : 1.00
d : 0.43

And

Manning's n	() :	0.030
Velocity	(fps) :	6.38
Flow Rate	(cfs) :	4.98
Flow Area	(sf) :	0.80
Wetted Perimeter	(ft) :	2.92
Hydraulic Radius	(ft) :	0.27
Lining material	:	Matting

Worksheet 2: Runoff Curve Number and Runoff

Project Sanitary Landfill - Entrance By DWM Date 06-29-26

Location 1-A , Checked ______ Date ______

Circle one: Developed 000-000-000

1. Runoff Curve Number (CN)

Soil name and hydrologic group (appendix a)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Table 2-2	Area (acres)	Product of CN x Area
Impervious		98	0.97	95.06
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
		Totals =	0.97	95.06

1/ Use only one CN source per line.

CN (weighted) = Total product / total area = 95.06 / 0.97 = 98.00 ; Use CN = 98

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr	25	10	50
Rainfall, P (24-hour)	in	3.93	4.43	4.43
Runoff, Q .... (use P and CN with Table 2-1, Figure 2-1, or eqs. 2-3 and 2-4.)	in	3.70	4.20	4.19

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project Sanitary Landfill - Entrance   By DWM   Date 06-29-26

Location C1-A ,   Checked ______   Date ______

Circle one: Developed
Circle one: T_c T_t through subarea   000-000-000

Notes: Space for as many as two segments per flow type can be used for each worksheet.
Include a map, schematic, or description of flow segments.

<u>Sheet Flow</u> (Applicable to Tc only)	Unit	Segment 1		Segment 2		Total
Segment ID						
1. Surface description (Table 3-1)						
2. Manning's roughness coeff., n (Table 3-1)						
3. Flow length, L (total L < 300 ft)	ft					
4. Two-yr 24-hr rainfall, P2	in					
5. Land slope, s	ft/ft					
6. $Tt = \frac{0.007\ (nL)^{0.8}}{(P2^{0.5})(s^{0.4})}$ Compute Tt	hr	0.10	+	0.00	=	0.10

<u>Shallow Concentrated Flow</u>	Unit	Segment 1		Segment 2		Total
Segment ID						
7. Surface description (paved or unpaved)						
8. Flow Length, L	ft					
9. Watercourse slope, s	ft/ft					
10. Average velocity, V (Figure 3-1)	ft/s					
11. $Tt = L/(3600V)$ Compute Tt	hr	0.00	+	0.00	=	0.00

<u>Channel Flow</u>	Unit	Segment 1		Segment 2		Total
Segment ID				E-F		
12. Cross sectional flow area, a	sf			0.80		
13. Wetted perimeter, Pw	ft			2.92		
14. Hydraulic radius, $r = a/Pw$ Compute r	ft			0.27		
15. Channel slope, s	ft/ft			0.093		
16. Manning's roughness coeff., n				0.030		
17. $V = (1.49/n)r^{(2/3)}s^{(1/2)}$ Compute V	ft/s			6.38		
18. Flow length, L	ft			1140.0		
19. $Tt = L/(3600V)$ Compute Tt	hr		+	0.05	=	0.05

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19) .... hr 0.15

Worksheet 4: Graphical Peak Discharge Method

Project Sanitary Landfill - Entrance By DWM Date 06-29-26

Location E1-A , Checked ________ Date ________

Circle one: Developed 000-000-000

1. Data

Drainage area .... A_m = 0.97/640 mi^2 (acres/640)

Runoff curve number .... CN = 98 (From Worksheet 2)

Time of Concentration .... T_c = 0.15 hr (From Worksheet 3)

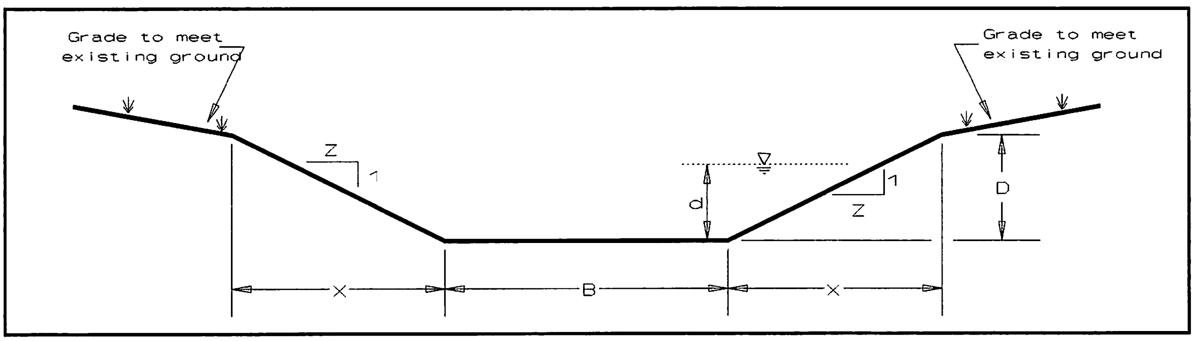
Rainfall distribution type .... = II (I, IA, II, III)

Pond and swamp areas spread throughout watershed .... = 0% Percent of A_m (0 acres or mi^2 covered)

		Storm #1	Storm #2	Storm #3
2. Frequency	yr	25	10	50
3. Rainfall, P (24-hour)	in	3.93	4.43	4.43
4. Initial abstraction, Ia .... (use CN with Table 4-1.)	in	0.041	0.041	0.041
5. Compute Ia/P	.	0.01	0.01	0.01
6. Unit peak discharge, qu .... (use Tc and Ia/P with exhibit 4-II)	csm/in	889.0	893.0	893.0
7. Runoff, Q .... (From Worksheet 2).	in	3.70	4.20	4.19
8. Pond and swamp adjustment factor, Fp (use percent pond and swamp area with Table 4-2. Factor is 1.0 for zero percent pond and swamp area.)		1	1	1
9. Peak discharge, qp (where qp = qu Am Q Fp)............	cfs	5.0	5.7	5.7

Project :	Sanitary Landfill - Entrance	By :	DWM
Location :		Date :	06-29-26
Project #:	000-000-000	Status:	Developed

The following lined section was chosen
for channel: E2-A



<u>Where:</u>

Z : 2.00
D : 2.00
X : 4.00
B : 2.00
d : 0.67

<u>And</u>

Manning's n	() :	0.030
Velocity	(fps) :	8.75
Flow Rate	(cfs) :	19.27
Flow Area	(sf) :	2.24
Wetted Perimeter	(ft) :	5.00
Hydraulic Radius	(ft) :	0.45
Lining material	:	Matting

Worksheet 2: Runoff Curve Number and Runoff

Project Sanitary Landfill - Entrance By DWM Date 06-29-26

Location E2-A , Checked ________ Date ________

Circle one: Developed 000-000-000

1. Runoff Curve Number (CN)

Soil name and hydrologic group (appendix a)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Table 2-2	Area (acres)	Product of CN x Area
Impervious		98	0.30	29.40
Landfill		82	5.77	473.14
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
		Totals =	6.07	502.54

1/ Use only one CN source per line.

$$\text{CN (weighted)} = \frac{\text{Total product}}{\text{total area}} = \frac{502.54}{6.07} = 82.79$$; Use CN = $\boxed{83}$

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr	25	10	50
Rainfall, P (24-hour)	in	3.93	4.43	4.43
Runoff, Q .... (use P and CN with Table 2-1, Figure 2-1, or eqs. 2-3 and 2-4.)	in	2.23	2.67	2.66

Similar to (210-VI-TR-55. Second Ed., June 1986)

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project Sanitary Landfill - Entrance By DWM Date 06-29-26

Location 2-A , Checked ______ Date ______

Circle one: Developed

Circle one: T_c T_t through subarea 000-000-000

Notes: Space for as many as two segments per flow type can be used for each worksheet.
Include a map, schematic, or description of flow segments.

Sheet Flow (Applicable to Tc only)

Segment ID				
1. Surface description (Table 3-1)...........				
2. Manning's roughness coeff., n (Table 3-1)..				
3. Flow length, L (total L < 300 ft)..........	ft			
4. Two-yr 24-hr rainfall, P2	in			
5. Land slope, s............................	ft/ft			
6. Tt = 0.007 (nL)^0.8 / (P2^0.5)(s^0.4) Compute Tt	hr	0.10	+ 0.00	= 0.10

Shallow Concentrated Flow

Segment ID				
7. Surface description (paved or unpaved).....				
8. Flow Length, L...........................	ft			
9. Watercourse slope, s.....................	ft/ft			
10. Average velocity, V (Figure 3-1)...........	ft/s			
11. Tt = L/(3600V) Compute Tt	hr	0.00	+ 0.00	= 0.00

Channel Flow

Segment ID			E-G	
12. Cross sectional flow area, a	sf		2.24	
13. Wetted perimeter, Pw	ft		5.00	
14. Hydraulic radius, r = a/Pw Compute r......	ft		0.45	
15. Channel slope, s	ft/ft		0.091	
16. Manning's roughness coeff., n			0.030	
17. V = (1.49/n)r^(2/3)s^(1/2) Compute V	ft/s		8.75	
18. Flow length, L	ft		1170.0	
19. Tt = L/(3600V) Compute Tt	hr		+ 0.04	= 0.04

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19) .... hr 0.14

Worksheet 4: Graphical Peak Discharge Method

Project Sanitary Landfill - Entrance By DWM Date 06-29-26

Location 2-A , Checked ______ Date ______

Circle one: Developed 000-000-000

1. Data

Drainage area .... A_m = 6.07/640 mi^2 (acres/640)

Runoff curve number .... CN = 83 (From Worksheet 2)

Time of Concentration .... T_c = 0.14 hr (From Worksheet 3)

Rainfall distribution type .... = II (I, IA, II, III)

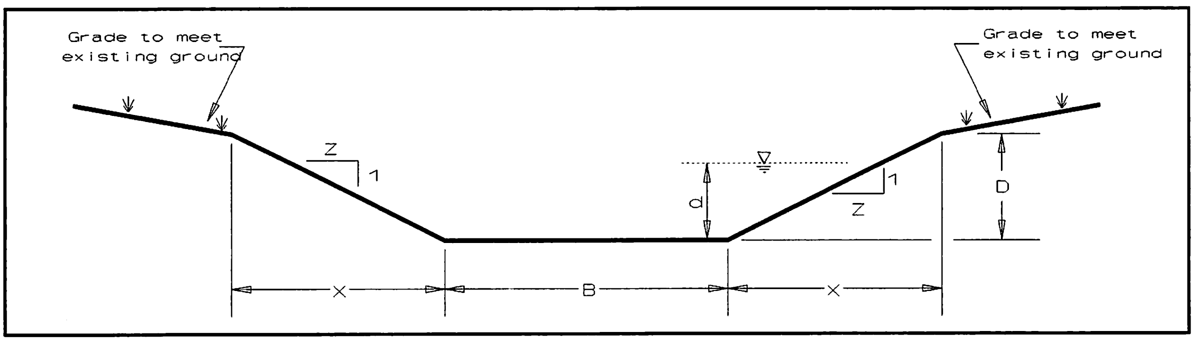
Pond and swamp areas spread throughout watershed .... = 0% Percent of A_m (0 acres or mi^2 covered)

		Storm #1	Storm #2	Storm #3
2. Frequency	yr	25	10	50
3. Rainfall, P (24-hour)	in	3.93	4.43	4.43
4. Initial abstraction, Ia .... (use CN with Table 4-1.)	in	0.410	0.410	0.410
5. Compute Ia/P		0.10	0.09	0.09
6. Unit peak discharge, qu .... (use Tc and Ia/P with exhibit 4-II)	csm/in	913.0	920.0	920.0
7. Runoff, Q .... (From Worksheet 2).	in	2.23	2.67	2.66
8. Pond and swamp adjustment factor, Fp (use percent pond and swamp area with Table 4-2. Factor is 1.0 for zero percent pond and swamp area.)		1	1	1
9. Peak discharge, qp (where qp = qu Am Q Fp)............	cfs	19.3	23.3	23.2

Similar to (210-VI-TR-55. Second Ed., June 1986)

Project :	Sanitary Landfill - Entrance	By :	DWM
Location :		Date :	06-29-26
Project #:	000-000-000	Status:	Developed

The following lined section was chosen
for channel: E3-A



Where:

Z : 2.00
D : 2.00
X : 4.00
B : 4.00
d : 1.17

And

Manning's n	() :	0.300
Velocity	(fps) :	0.71
Flow Rate	(cfs) :	5.20
Flow Area	(sf) :	7.42
Wetted Perimeter	(ft) :	9.23
Hydraulic Radius	(ft) :	0.80
Lining material	:	Matting

Worksheet 2: Runoff Curve Number and Runoff

Project Sanitary Landfill - Entrance By DWM Date 06-29-26

Location 3-A , Checked Date

Circle one: Developed 000-000-000

1. Runoff Curve Number (CN)

Soil name and hydrologic group (appendix a)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Table 2-2	Area (acres)	Product of CN x Area
Landfill		82	2.78	227.96
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
1/ Use only one CN source per line.		Totals =	2.78	227.96

CN (weighted) = Total product / total area = 227.96 / 2.78 = 82.00 ; Use CN = 82

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr	25	10	50
Rainfall, P (24-hour)	in	3.93	4.43	4.43
Runoff, Q .... (use P and CN with Table 2-1, Figure 2-1, or eqs. 2-3 and 2-4.)	in	2.14	2.58	2.57

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project Sanitary Landfill - Entrance By DWM Date 06-29-26

Location E-A , Checked ______ Date ______

Circle one: Developed

Circle one: $\boxed{T_c}$ T_t through subarea 000-000-000

Notes: Space for as many as two segments per flow type can be used for each worksheet.
Include a map, schematic, or description of flow segments.

	Unit				
Sheet Flow (Applicable to Tc only) Segment ID					
1. Surface description (Table 3-1)					
2. Manning's roughness coeff., n (Table 3-1)					
3. Flow length, L (total L < 300 ft)	ft				
4. Two-yr 24-hr rainfall, P2	in				
5. Land slope, s	ft/ft				
6. Tt = 0.007 (nL)^0.8 / (P2^0.5)(s^0.4) Compute Tt	hr	0.00	+ 0.00	=	0.00
Shallow Concentrated Flow Segment ID					
7. Surface description (paved or unpaved)					
8. Flow Length, L	ft				
9. Watercourse slope, s	ft/ft				
10. Average velocity, V (Figure 3-1)	ft/s				
11. Tt = L/(3600V) Compute Tt	hr	0.00	+ 0.00	=	0.00
Channel Flow Segment ID			B-C		
12. Cross sectional flow area, a	sf		7.42		
13. Wetted perimeter, Pw	ft		9.23		
14. Hydraulic radius, r = a/Pw Compute r	ft		0.80		
15. Channel slope, s	ft/ft		0.027		
16. Manning's roughness coeff., n			0.300		
17. V = (1.49/n)r^(2/3)s^(1/2) Compute V	ft/s		0.71		
18. Flow length, L	ft		875.0		
19. Tt = L/(3600V) Compute Tt	hr	0.10	+ 0.34	=	0.44

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)	hr	0.44

Similar to (210-VI-TR-55, Second Ed., June 1986)

Worksheet 4: Graphical Peak Discharge Method

Project Sanitary Landfill - Entrance By DWM Date 06-29-26

Location E3-A , Checked ______ Date ______

Circle one: Developed 000-000-000

1. Data

Drainage area .... A_m = 2.78/640 mi^2 (acres/640)

Runoff curve number .... CN = 82 (From Worksheet 2)

Time of Concentration .... T_c = 0.44 hr (From Worksheet 3)

Rainfall distribution type .... = II (I, IA, II, III)

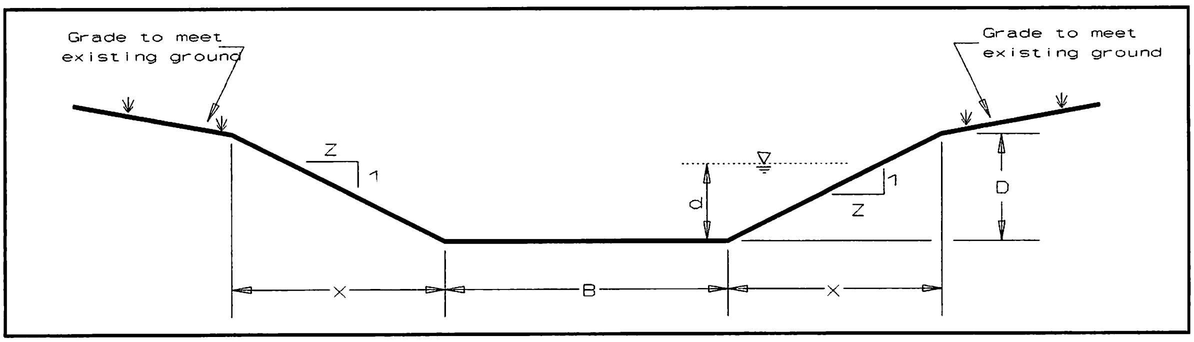
Pond and swamp areas spread throughout watershed .... = 0% Percent of A_m (0 acres or mi^2 covered)

		Storm #1	Storm #2	Storm #3
2. Frequency	yr	25	10	50
3. Rainfall, P (24-hour)	in	3.93	4.43	4.43
4. Initial abstraction, Ia .... (use CN with Table 4-1.)	in	0.439	0.439	0.439
5. Compute Ia/P		0.11	0.10	0.10
6. Unit peak discharge, qu .... (use Tc and Ia/P with exhibit 4-II)	csm/in	559.0	574.0	574.0
7. Runoff, Q .... (From Worksheet 2).	in	2.14	2.58	2.57
8. Pond and swamp adjustment factor, Fp (use percent pond and swamp area with Table 4-2. Factor is 1.0 for zero percent pond and swamp area.)		1	1	1
9. Peak discharge, qp (where qp = qu Am Q Fp)............	cfs	5.2	6.4	6.4

Similar to (210-VI-TR-55. Second Ed., June 1986)

Project :	Sanitary Landfill - Entrance	By :	DWM
Location :		Date :	06-29-26
Project #:	000-000-000	Status:	Developed

The following lined section was chosen
for channel E3-B



Where:

Z : 2.00
D : 2.00
X : 4.00
B : 2.00
d : 0.26

And

Manning's n	() :	0.030
Velocity	(fps) :	8.35
Flow Rate	(cfs) :	5.39
Flow Area	(sf) :	0.66
Wetted Perimeter	(ft) :	3.16
Hydraulic Radius	(ft) :	0.21
Lining material	:	Matting

Worksheet 2: Runoff Curve Number and Runoff

Project Sanitary Landfill - Entrance By DWM Date 06-29-26

Location 3-B , Checked Date

Circle one: Developed 000-000-000

1. Runoff Curve Number (CN)

Soil name and hydrologic group (appendix a)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Table 2-2	Area (acres)	Product of CN x Area
Landfill		82	2.89	236.98
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
		0	0.00	0.00
1/ Use only one CN source per line.		Totals =	2.89	236.98

CN (weighted) = Total product / total area = 236.98 / 2.89 = 82.00 ; Use CN = 82

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr	25	10	50
Rainfall, P (24-hour)	in	3.93	4.43	4.43
Runoff, Q .... (use P and CN with Table 2-1, Figure 2-1, or eqs. 2-3 and 2-4.)	in	2.14	2.58	2.57

Worksheet 3: Time of Concentration (T_c) or Travel Time (T_t)

Project Sanitary Landfill - Entrance By DWM Date 06-29-26

Location 3-B , Checked ______ Date ____________

Circle one: Developed
Circle one: T_c T_t through subarea 000-000-000

Notes: Space for as many as two segments per flow type can be used for each worksheet.
Include a map, schematic, or description of flow segments.

Sheet Flow (Applicable to Tc only)					
Segment ID		3-A			
1. Surface description (Table 3-1)...........					
2. Manning's roughness coeff., n (Table 3-1)..					
3. Flow length, L (total L < 300 ft)..........	ft				
4. Two-yr 24-hr rainfall, P2	in				
5. Land slope, s.............................	ft/ft				
6. Tt = 0.007 (nL)^0.8 / (P2^0.5)(s^0.4) Compute Tt	hr	0.00	+ 0.00	=	0.00

Shallow Concentrated Flow					
Segment ID		3-A			
7. Surface description (paved or unpaved).....					
8. Flow Length, L............................	ft				
9. Watercourse slope, s......................	ft/ft				
10. Average velocity, V (Figure 3-1)...........	ft/s				
11. Tt = L/(3600V) Compute Tt	hr	0.00	+ 0.00	=	0.00

Channel Flow					
Segment ID		3-A	C-D		
12. Cross sectional flow area, a	sf		0.66		
13. Wetted perimeter, Pw	ft		3.16		
14. Hydraulic radius, r = a/Pw Compute r......	ft		0.21		
15. Channel slope, s	ft/ft		0.231		
16. Manning's roughness coeff., n			0.030		
17. V = (1.49/n)r^(2/3)s^(1/2) Compute V	ft/s		8.35		
18. Flow length, L	ft		65.0		
19. Tt = L/(3600V) Compute Tt	hr	0.44	+ 0.00	=	0.44

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19) .... hr 0.44

Worksheet 4: Graphical Peak Discharge Method

Project Sanitary Landfill - Entrance By DWM Date 06-29-26

Location E3-B , Checked ________ Date ________

Circle one: Developed 000-000-000

1. Data

Drainage area .... A_m = 2.89/640 mi^2 (acres/640)

Runoff curve number .... CN = 82 (From Worksheet 2)

Time of Concentration .... T_c = 0.44 hr (From Worksheet 3)

Rainfall distribution type .... = II (I, IA, II, III)

Pond and swamp areas spread throughout watershed .... = 0% Percent of A_m (0 acres or mi^2 covered)

		Storm #1	Storm #2	Storm #3
2. Frequency	yr	25	10	50
3. Rainfall, P (24-hour)	in	3.93	4.43	4.43
4. Initial abstraction, Ia .... (use CN with Table 4-1.)	in	0.439	0.439	0.439
5. Compute Ia/P		0.11	0.10	0.10
6. Unit peak discharge, qu .... (use Tc and Ia/P with exhibit 4-II)	csm/in	557.0	564.0	564.0
7. Runoff, Q .... (From Worksheet 2).	in	2.14	2.58	2.57
8. Pond and swamp adjustment factor, Fp (use percent pond and swamp area with Table 4-2. Factor is 1.0 for zero percent pond and swamp area.)		1	1	1
9. Peak discharge, qp (where qp = qu Am Q Fp)............	cfs	5.4	6.6	6.6

Sanitary Landfill - Surface Water Channel Design Freeboard Verifications

Channel	Channel Slope (So) (ft/ft)	Flow Depth (Dm) (ft)	Channel Depth (ft)	Channel Sideslope (_H:1V)	Channel Width (ft)	Selected Lining	Manning's n	Hydraulic Radius (R) (ft)	Flow Velocity (V) (fps)	Critical Slope (Sc) (ft/ft)	Flow Regime	Unstable Freeboard (ft)	Stable Freeboard (ft)	Actual Freeboard (ft)	Design Check
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
E1-A	0.093	0.43	1.5	2.0	1.0	Matting	0.030	0.27	6.38	0.022	Stable	-	0.50	1.07	OK
E2-A	0.091	0.67	1.5	2.0	2.0	Matting	0.030	0.45	8.75	0.018	Stable	-	0.50	0.83	OK
E3-A	0.027	1.17	2.0	2.0	4.0	Grass	0.030	0.80	0.71	0.015	Stable	-	0.50	0.83	OK
E3-B	0.231	0.26	1.5	2.0	2.0	Matting	0.030	0.21	8.35	0.023	Stable	-	0.50	1.24	OK

(1)-(9) Information taken from channel designs included with Permit Application.

(10) Calculated using equation below.

$$S_c = \frac{14.56(n^2)(\text{Area}/\text{Top Width})}{(\text{Hydraulic Radius})^{2/3}}$$

(11) Flow is Unstable if 0.7(Sc) < So < 1.3(Sc)

(12) Unstable F = 0.075(V)(Dm)

(13) Stable F = MIN(0.5-ft or 0.25(Dm))

(14) Actual Freeboard (12) = (3) - (2)

(15) Design check is "OK" if Actual Freeboard is larger than the required Freeboard

Sanitary Landfill
Surface Water Channel Lining Shear Stress Verifications

Channel	Channel Slope (So) (ft/ft)	Flow Depth (Dm) (ft)	Channel Bottom (ft)	Selected Lining
	(1)	(2)		(3)
E1-A	0.093	0.43	1.00	Matting
E2-A	0.091	0.67	2.00	Matting
E3-A	0.027	1.17	4.00	Matting
E3-B	0.231	0.26	2.00	Matting

Estimated Shear (lb/sf)	Allowable Shear (lb/sf)	Lining Acceptable
(4)	(5)	
2.50	6.00	OK
3.80	6.00	OK
1.97	6.00	OK
3.75	6.00	OK

Bottom Width to d Ratio	B to d Acceptable
(6)	(7)
2.33	OK
2.99	OK
3.42	OK
7.69	OK

(1)-(3) Information taken from channel designs included with Permit Application.
(4) Calculated using shear stress equation below.

$$\tau = 62.4 * FlowDepth * ChannelSlope$$

(5) Taken from Channel Design Narrative for different materials.
(6) Calculated as [Channel Bottom Width] / [Flow Depth]
(7) Ratio is taken to be acceptable if it is less than 12.

CULVERT DESIGNS

Civil Design Solutions, Inc.

PROJECT	WESTMORELAND SANITARY LANDFILL	PROJECT NO.	2026-083
ENTRANCE AREA – EROSION AND SEDIMENTATION		PAGE	1 OF 1

MADE BY	KAF	DATE	06/2026	CHECKED BY	DWM	DATE	06/2026

INTRO

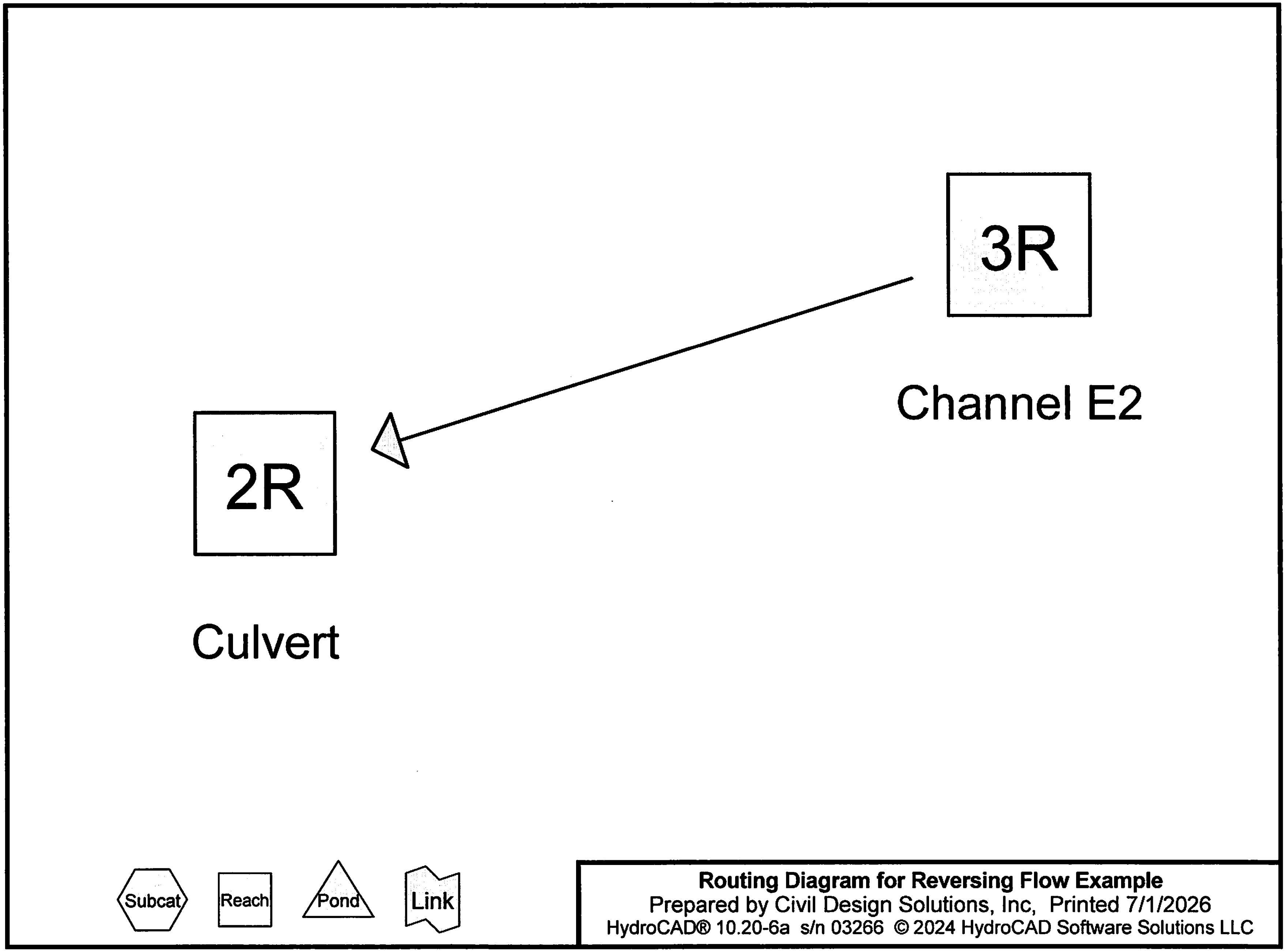
This calculation involves the design of a culvert that conveys runoff from Channel E-2A under the entrance road to the proposed Sedimentation Pond E1.

METHOD

This culvert has been designed for the peak flow as taken from the channel design calculations provided with this permit modification. The flows taken from the design calculations have been estimated for the 25-year, 24-hour storm event, as per the requirements of 25 Pa. Code §273.242(a) of the Municipal Waste Regulations.

CONCLUSION

The selected, analyzed culvert has been selected to pass the required 25-year, 24-hour flow with acceptable headwater conditions as to not exceed the maximum upstream channel flow depth or overtop the design roadway elevation as summarized for each culvert design.


3R
Channel E2
2R
Culvert
Subcat
Reach
Pond
Link
Routing Diagram for Reversing Flow Example
Prepared by Civil Design Solutions, Inc, Printed 7/1/2026
HydroCAD® 10.20-6a s/n 03266 © 2024 HydroCAD Software Solutions LLC

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	2R	1,000.00	998.00	95.0	0.0211	0.030	0.0	30.0	0.0	

Summary for Reach 2R: Culvert

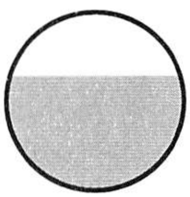
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow = 19.27 cfs @ 5.98 hrs, Volume= 55.637 af
Outflow = 19.27 cfs @ 5.98 hrs, Volume= 55.622 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1P

Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.02 hrs
Max. Velocity= 5.76 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 5.76 fps, Avg. Travel Time= 0.3 min

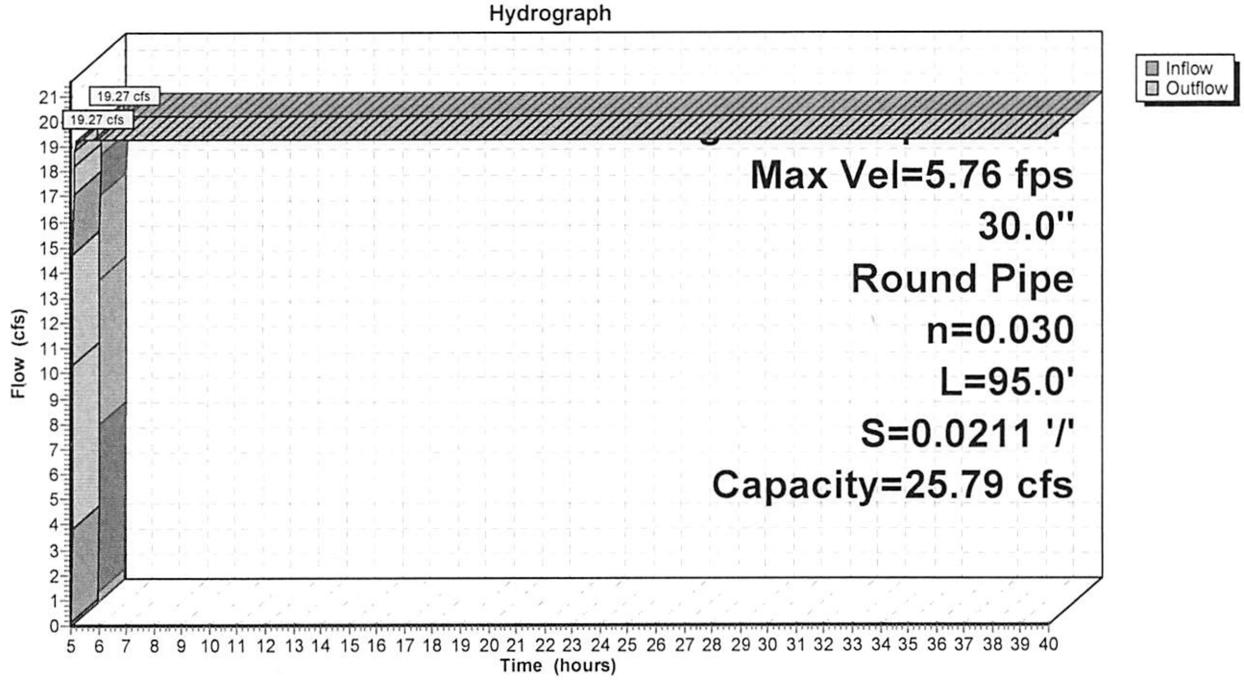
Peak Storage= 318 cf @ 5.98 hrs
Average Depth at Peak Storage= 1.61' , Surface Width= 2.39'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 25.79 cfs

30.0" Round Pipe
n= 0.030
Length= 95.0' Slope= 0.0211 '/'
Inlet Invert= 1,000.00', Outlet Invert= 998.00'



Reach 2R: Culvert

Hydrograph



SEDIMENTATION POND DESIGN

Civil Design Solutions, Inc.

PROJECT	Westmoreland Sanitary LF	PROJECT NO.	2026-083
Sedimentation Basin Design – Pond E1		PAGE	OF

MADE BY	DWM	DATE	06/2026	CHECKED BY	KAF	DATE	06/2026

1.0 INTRODUCTION

The proposed sedimentation basin, which provides stormwater management and erosion & sedimentation control for the site development, must satisfy regulations set forth by the Commonwealth of Pennsylvania 25 PA Code Chapter 102 which are presented as part of the Erosion and Sediment Pollution Control Program Manual, last revised March 2012, Technical Guidance #363-2134-008 (PADEP E&S Manual). Pages 159 through 162 of the manual outline the requirements for the design of sediment basins, as paraphrased below:

1. A sediment storage zone of 1,000-cubic feet per disturbed acre within the watershed of the basin shall be provided. The sediment storage zone should be at least 1-foot in depth.

2. A dewatering zone of 5,000-cubic feet for each acre tributary to the basin is to be provided. Reductions in the dewatering zone are allowed unless the basin is in a HQ or EV watershed, however the minimum required dewatering zone is at least 3,600-cubic feet per acre. The minimum depth of the dewatering zone is 3-feet.

3. Sediment basins must have a flow length to width ratio of at least 2L:1W.

4. Sediment basins must dewater in a period ranging from 2 to 7 days.

5. Every sediment basin should be provided with an emergency spillway with a minimum bottom width of 8-feet.

6. The elevation of the emergency spillway crest must be at least 6-inches above that of the principal spillway (top of dewatering zone).

7. Sediment basin spillways must be able to discharge 2-cfs/ac from the entire contributing watershed or route the anticipated peak flow from the 25-year, 24-hour storm event, assuming all dewatering perforations are clogged. Discharge capacity may be provided by the principal spillway, or a combination of the principal and emergency spillways. At a minimum, the principal spillway should be designed to convey the calculated peak flow from a 10-year, 24-hour storm event.

8. A minimum of 24-inches of freeboard is required above the elevation of the 2-cfs/acre discharge or the routed peak flow from the 25-year, 24-hour storm. If the emergency spillway is being used to provide part of the 2-cfs/acre discharge, the freeboard must be provided above the design flow elevation in the emergency spillway. An acceptable alternative is to provide a discharge capacity equal to the 100-year, 24-hour storm event with 12-inches of freeboard.

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Sedimentation Basin Design – Pond E1				PAGE		OF	
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9. When a perforated riser is selected as the means to dewater the basin, the diameter of the riser should be at least 1.25 times that of the outlet barrel. The minimum riser diameter is 15-inches. The minimum barrel diameter is 12-inches.

The analysis of this proposed sedimentation basin is based on accepted design practices, methodologies and assumptions. Where possible, references have been made to applicable design references.

2.0 DESIGN PARAMETERS

1. The proposed sedimentation basin is being analyzed based on a maximum upstream contributory drainage area of 12.71-acres which includes inflow from Entrance Channels E1, E2 and E3 along with direct flow into the pond.

2. All routings for this design have been performed with a storage-elevation routing methodology. All inflow hydrographs have been developed using the SCS TR-55 tabular hydrograph method.

3. The inflow hydrographs for this pond have been taken to be the surface flow from the upstream contributory drainage area. Times of concentration (Tc) were taken from each channel discharging into the pond.

3.0 VOLUME SIZING

As per the PADEP E&S Manual, the proposed sedimentation basin shall have a minimum capacity of 5,000-cf/acre tributary to the basin for the dewatering zone. The sediment storage portion of the required volume shall be 1,000-cf/acre of disturbed area tributary to the basin. Reductions in the dewatering zone volume have not been taken for this design.

The total disturbed upstream contributory watershed area = 12.71-ac, use 13-ac for design purposes.

Minimum sediment storage = 13-ac * 1,000-cf/ac = 13,000-cf

The sediment storage zone for Sedimentation Basin E1 provides a volume of 13,327-cf at elevation 989.5 (Min 1-ft) which exceeds the required storage.

The additional 5,000-cf of storage per acre for the dewatering zone results in a dewatering volume of:

Dewatering Volume = 13-acres * 5,000-cf/ac = 65,000-cf

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Sedimentation Basin Design – Pond E1		PAGE	OF

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Reductions are allowed in the dewatering volume for top dewatering, permanent pools, 4:1 or greater flow length, and 4 to 7 day dewatering times. For this basin, we will take reductions for 4-7 day dewatering time.

4-7 Day dewatering time = 350 x watershed area (ac) = 350 x 13 = 4,550-cf reduction

Top dewatering time = 700 x watershed area (ac) = 700 x 13 = 9,100-cf reduction

Required Dewatering Volume = 65,000-cf – 4,550-cf – 9,100-cf = 51,350-cf

Total Storage Required = Sediment Storage Provided + Dewatering Volume Required
= 13,327-cf + 51,350-cf = 64,677-cf

The crest of the principal spillway is set at elevation 996.5 which provides a total volume of 77,184-cf

Dewatering Volume = Total Volume – Sediment Storage Volume
= 77,184-cf – 13,327-cf = 63,857-cf which exceeds that required of 51,350-cf

An Elevation-Storage Table and Stage Storage Curve are included with this design report showing the design surface areas and volumes for a series of elevations in the sedimentation basin and is found in Attachment 1.1.

4.0 PRINCIPAL SPILLWAY DESIGN

The principal spillway shall be designed such that the combination of storage and principal spillway discharge will accommodate the runoff from the 24-hour 25-year storm event or a minimum of 2-cfs per tributary acre. The principal spillway shall be designed such that no flow enters the emergency spillway.

The principal spillway shall consist of a riser, barrel and anti-vortex trash rack. The riser will be embedded into a reinforced concrete base.

Riser Design

One 2.5-foot diameter riser pipe will be selected with its crest being set at elevation of 996.5 which provides a 1.3-foot vertical separation to the invert of the emergency spillway (997.8), which is larger than the 6-inch separation specified by the PADEP E&S Manual. The flow entering the riser at any elevation can be found as the minimum of the riser calculated in a weir and orifice condition, as specified below:

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$$Q_{Riser} = Min\left[Q_{Weir}, Q_{Orifice}\right]$$

$$Q_{Weir} = C[L]H^{3/2} = C[\pi D]H^{3/2}$$

Where:

C = Weir Coefficient (3.1 for CMP)

L = Length of weir (perimeter of Riser)

H = Head over Weir

$$Q_{Orifice} = C[A_o]\sqrt{2gH} = C\left[\pi \frac{D_o^2}{4}\right]\sqrt{2gH}$$

Where:

C = Orifice Coefficient (0.6 for sharp)

A_o = Area of Orifice

g = Gravity

H = Head over Orifice Invert

D_o = Diameter of Orifice

The proposed principal spillway has been checked by routing storm events through the sedimentation basin. As shown here, the basin is capable of handling the peak runoff generated from the contributory drainage area with the combination of storage and discharge from the principal spillway.

Item	Design Value
Riser Type	Circular CPE
Riser Quantity	1
Riser Dimension	2.5-ft Diameter
Riser Crest Elevation	El. 996.50
Emergency Spillway Invert Elevation	El. 997.80

Barrel Pipe Design

The outlet barrel must be capable of handling, at minimum, the flow through the riser pipe. This check was automatically performed during the routing. The sizing of the barrel pipe was automatically checked by having the routing program take the total flow through the principal spillway as the minimum flow through either the barrel or riser pipe.

$$Q_{Principal} = MIN\left[Q_{Riser}, Q_{Barrel}\right]$$

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Sedimentation Basin Design – Pond E1		PAGE	OF

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$$Q_{Barrel} = A\sqrt{2g\frac{H}{K_i + K_o + L(K_f)}}$$

Where

A = Area of barrel pipe, sf

g = Gravity

H = Head on Barrel Pipe (to center of outlet)

K_i = Inlet Losses (1.0)

K_o = Outlet Losses (1.0)

K_f = Frictional Losses (seebelow)

L = Length of Barrel Pipe

$$K_f = \frac{5087[n^2]}{d_i^{4/3}}$$

Where:

n = Manning's Roughness Coefficient

d_i = Barrel Pipe diameter, inches

The selected barrel, as summarized here has been checked by routing storm events through the sedimentation pond.

For this pond design, the principal spillway has been designed for the 25-year 24-hour storm event. For this routing, the minimum freeboard is greater than 24-inches. The peak pool elevation from the routing of the 24-hour 25-year storm event is below the emergency spillway invert, as shown above and provides a freeboard greater than 2.305-ft to the pond embankment.

Item	Value
Barrel Type	Circular CPE
Design Manning's n	0.015
Barrel Quantity	1
Barrel Dimension	2-ft Diameter
Barrel In Invert	987-ft
Barrel Out Invert	978-ft
Barrel Length	100-ft
Pond Embankment	1000-ft
Maximum Pool Elevation 25-yr, 24-hr	El. 996.664 (1.136-ft freeboard to emergency spillway & 3.336-ft to embankment)
Discharge at 25-yr, 24-hr	1.616-cfs

Design Flow Check (2-cfs/ac)

As per the PADEP E&S Manual, the principal spillway shall be able to pass 2-cfs per acre. To verify this capacity for the principal spillway, the flow will be calculated with the water surface in the pond set at the invert of the emergency spillway.

- **Riser – Weir**. Using the equations identified above, the flow into the riser using the weir equation can be estimated as Q = C(π D) $H^{(3/2)}$ = 3.1 (π 2.5-ft) $(997.8\text{-}996.5)^{(3/2)}$ = 36.09-cfs.

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Sedimentation Basin Design – Pond E1		PAGE	OF

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- **Riser – Orifice**. Using the equations identified above, the flow into the riser using the orifice equation can be estimated as $Q = C (\pi/4) (D^2) (2\ g\ H)^{(1/2)} = 0.6 (\pi/4) (2.5\text{-ft})^2 [(2)\ 32.2\ (997.8\text{-}996.5)]^{(1/2)} = 26.95$-cfs.

- **Barrel Pipe**. Using the equations identified above, the flow into the barrel pipe can be estimated as $Q = A [(2)\ g\ (H / (K_i + K_o + L(K_f)))]^{(1/2)} = \pi (2^2/4) [(2)\ 32.2\ ((997.8\text{-}978.0\text{-}0.5(2)) / (1 + 1 + 100(0.052)))]^{(1/2)} = 56.83$-cfs.

The invert of the emergency spillway is at elevation 997.8-ft, while maintaining a 2-ft freeboard to the pond embankment, results in an allowable 0.2-ft flow depth in the emergency spillway. The design check for the emergency spillway, the emergency spillway has been modeled as a broad-crested weir with a weir coefficient of 2.6 utilizing the standard weir equation of $Q = C\ L\ H^{3/2}$.

- **Emergency Spillway**. Using the equation identified above, the flow through the emergency spillway can be estimated as $Q = C\ L\ H^{3/2}$ = 2.6 (8-ft) (998.0-997.8)^((3/2) = 1.8-cfs.

Therefore, the total estimated flow through the spillways at a water surface elevation of 997.8-ft to maintain more than a 2-ft freeboard to the embankment elevation of 1,000-ft is 26.95-cfs (principal spillway). The emergency spillway flow is not included here although it could since it would contribute 1.8-cfs of flow with a 2-ft freeboard to the embankment. This is acceptable since it is larger than the required flow of 13-ac (rounded up for design) * 2-cfs/ac = 26-cfs.

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5.0 RISER PIPE ANTI-FLOTATION FOUNDATION DESIGN

A reinforced concrete base shall be designed to resist the uplift effect of the riser pipe. For conservativism, the weight of the soil over the toes of the concrete footer and the weight of the anti-vortex trash rack will be neglected. The boyant effect of the riser will be counteracted by the weight of the concrete footer, alone.

$$V_{MIN} = 1.10 * \left[(0.62 * H * D^2) - \left(\frac{H * W_R}{87.6} \right) \right]$$

Where

V_{MIN} = Minimum Footer Concrete Volume, cf

1.10 = Minimum factor of Safety, recommended by SCS

H = Height of Riser, ft

D = Diameter of Riser, ft

W_R = Weight of Riser, lb / ft

$$V_{MIN} = 1.10 * \left[(0.62 * [996.5 - 989.5] * [2.5]^2) - \left(\frac{[996.5 - 989.5] * 10}{87.6} \right) \right]$$

$$V_{MIN} = 39.3 - cf$$

W_R Taken from Reference 3, Table 1 – 12, Page 47

The selected riser foundation shall be 8-feet x 8-feet x 2.5-feet thick. This provides a concrete volume of 50-cf, which exceeds that required.

Item	Value
Footer Length	8-ft
Footer Width	8-ft
Footer Thickness	2.5-ft
Actual Concrete Volume	50-cf

The concrete footer shall be reinforced with steel reinforcing rods to counter-act the effects of temperature expansion/contraction. The footer shall be reinforced with #6 rebar, 12-in c-c, both ways, two layers with minimum 4-inch clearance to all sides of the footer.

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Sedimentation Basin Design – Pond E1		PAGE	OF

MADE BY DWM DATE 06/2026 CHECKED BY KAF DATE 06/2026

6.0 EMERGENCY SPILLWAY DESIGN

The proposed sedimentation basin is designed so that the principal spillway can safely discharge the 50-year, 24-hour storm event without the emergency spillway functioning. This design has been verified by routing the storm through the basin which results in no flow from the emergency spillway.

The emergency spillway shall be a trapezoidal channel with a minimum 8-ft wide bottom and 3H:1V sideslopes. The invert of the emergency spillway shall be at elevation 997.8. The crest of the embankment is at 1000.0, which provides 3.209-ft of freeboard from the routed 50-yr water surface elevation.

For computational purposes, the emergency spillway has been modeled as a broad-crested weir with a weir coefficient of 2.6 utilizing the standard weir equation of $Q = C\ L\ H^{3/2}$.

The spillway shall be protected (assuming a 4-hour flow time) using North American Green P300 Turf Reinforcement Mat (TRM).

Item	Value
Spillway Bottom Width	8-ft
Spillway Invert Elevation	997.8-ft
Spillway Channel Sideslope	3H:1V (or flatter)
Spillway depth	2.2-ft
Pond Embankment El.	1000-ft
Maximum Pool Elevation 25-yr, 24-hr	996.664
Flow at 25-yr, 24-hr	1.616-cfs
Maximum Pool Elevation 50-yr, 24-hr	996.791
Flow at 50-yr, 24-hr	3.85-cfs

Civil Design Solutions, Inc.

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7.0 ANTI-SEEP COLLAR DESIGN

The number and size of anti-seep collars shall be selected such that increase in seepage length Ls increases by a minimum 15% within the normal saturation zone. The normal saturation zone is determined by the phreatic line drawn at a 4H:1V slope.

$$L_s = Y(Z+4)\left[1+\frac{Pipe\ Slope}{0.25-Pipe\ Slope}\right]$$

Where:

Y = Distance from up stream invert of barrel to riser crest

Z = Slope of the up stream embankment

PipeSlope = Barrel Slope, ft/ft

$$L_s = 9.5(2+4)\left[1+\frac{0.09}{0.25-0.09}\right] = 89.06\ ft$$

The increase due to 2 collars with 3.5-feet projection is (2 collars * 2 sides * 5.5-feet = 14-feet). Using two collars, the resulting increase is, [(14-ft)/89.06-ft]=15.7%.

The minimum spacing is 5 x the projection = 5 x 3.5-ft = 17.5-ft. A spacing of 18-ft will be used, with the initial collar a minimum 10-ft downstream of the riser. The collar should not be placed any closer to the upstream face to maintain sufficient distance.

Item	Design Value
Anti-seep Collar Quantity	2
Anti-seep Collar Projection	3.5-ft
Anti-seep Collar Length and Width	9-ft x 9-ft
Minimum Collar Spacing	18-ft

Civil Design Solutions, Inc.

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8.0 POND DEWATERING

To facilitate dewatering of the pond to the top of the sediment storage elevation, dewatering perforations shall be provided in the riser pipe. As per the PADEP E&S Manual, the pond shall dewater in no less that 2 days and no more than 7 days. A total of 12 perforations are proposed for this riser pipe, as shown below. The dewatering time for this configuration has been checked by estimating the dewatering time for the pond with the initial elevation set at the crest elevation for the principal spillway. It is estimated that the pond will be dewatered in 5.4-days.

Orifice Invert	Perforation Quantity	Perforation Diameter
989.5	2	1-inch
991.5	2	1-inch
992.5	4	1-inch
994.5	4	1-inch

9.0 FLOW LENGTH

The minimum flow length to width ratio is 2:1. The following formula may be used to determine if this criteria is met:

$L_{(min)} = 1.41(SA_3)^{0.5}$

Where: $L_{(min)}$ = Minimum Flow Length

SA_3 = Surface Area at the crest of the principal spillway

$L_{(min)} = 1.41(13{,}200\text{-sf})^{0.5} = 132\text{-ft}$

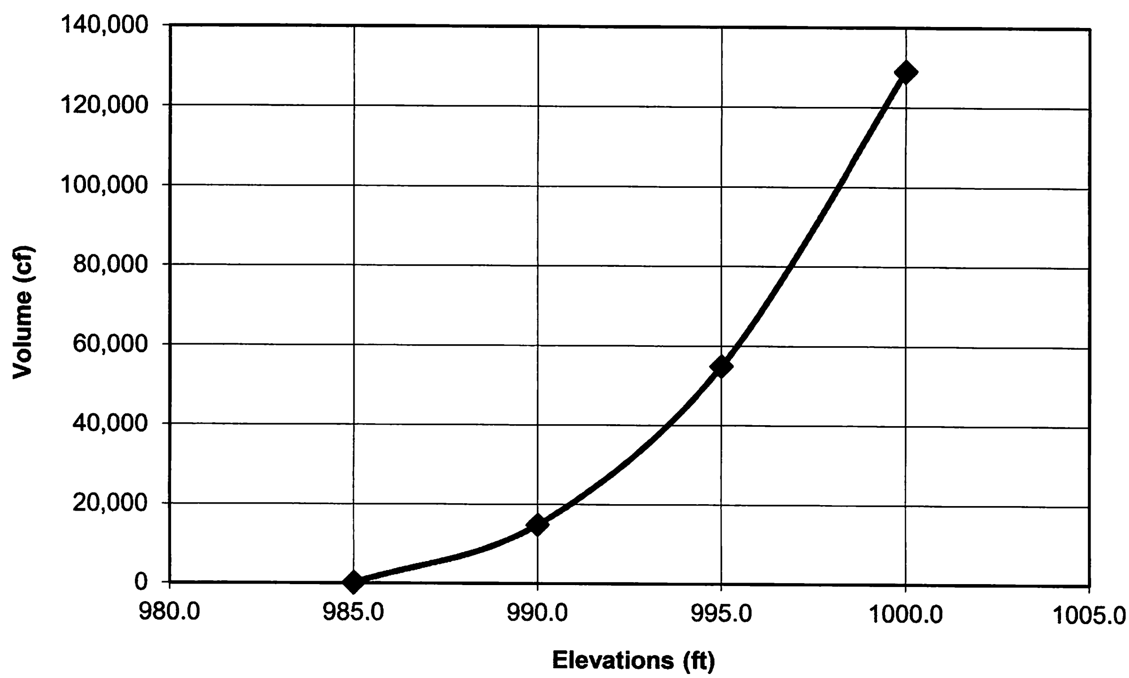
The measured flow length at the crest of the principal spillway elevation of 996.5-ft is 13,200-sf. Two baffles are required as shown on the design for the pond.

10.0 OUTLET APRON DESIGN

From the storm routings for this pond, it is estimated that the 50-year 24-hour storm, the peak flow will be 3.82-cfs. This flow will be used to size the outlet apron. From the design nomograph, the outlet apron shall be 25-ft long and constructed of R-4 riprap.

SANIARY LANDFILL
ENTRANCE SEDIMENTATION POND E1

Elevation	Pond Area (sf)	Incremental Volume (cf)	Cumulative Volume (cf)	Cumulative Volume (ac-ft)	Cumulative Volume (gal)
985.00	966		0		
990.00	4,957	14,808	14,808	0.34	110,764
995.00	11,099	40,140	54,948	1.26	411,011
1000.00	18,549	74,120	129,068	2.96	965,429



SANIARY LANDFILL
ENTRANCE SEDIMENTATION POND E1
DEWATERING ORIFICE SUMMARY

Orifice Row	1	2	3	4	5	6	7
Orifice Invert (ft)	989.50	991.50	992.50	994.50			
Orifice Quantity	2	2	4	4			
Orifice Diameter (in)	1.00	1.00	1.00	1.00			
Orifice Coefficient	0.6	0.6	0.6	0.6			

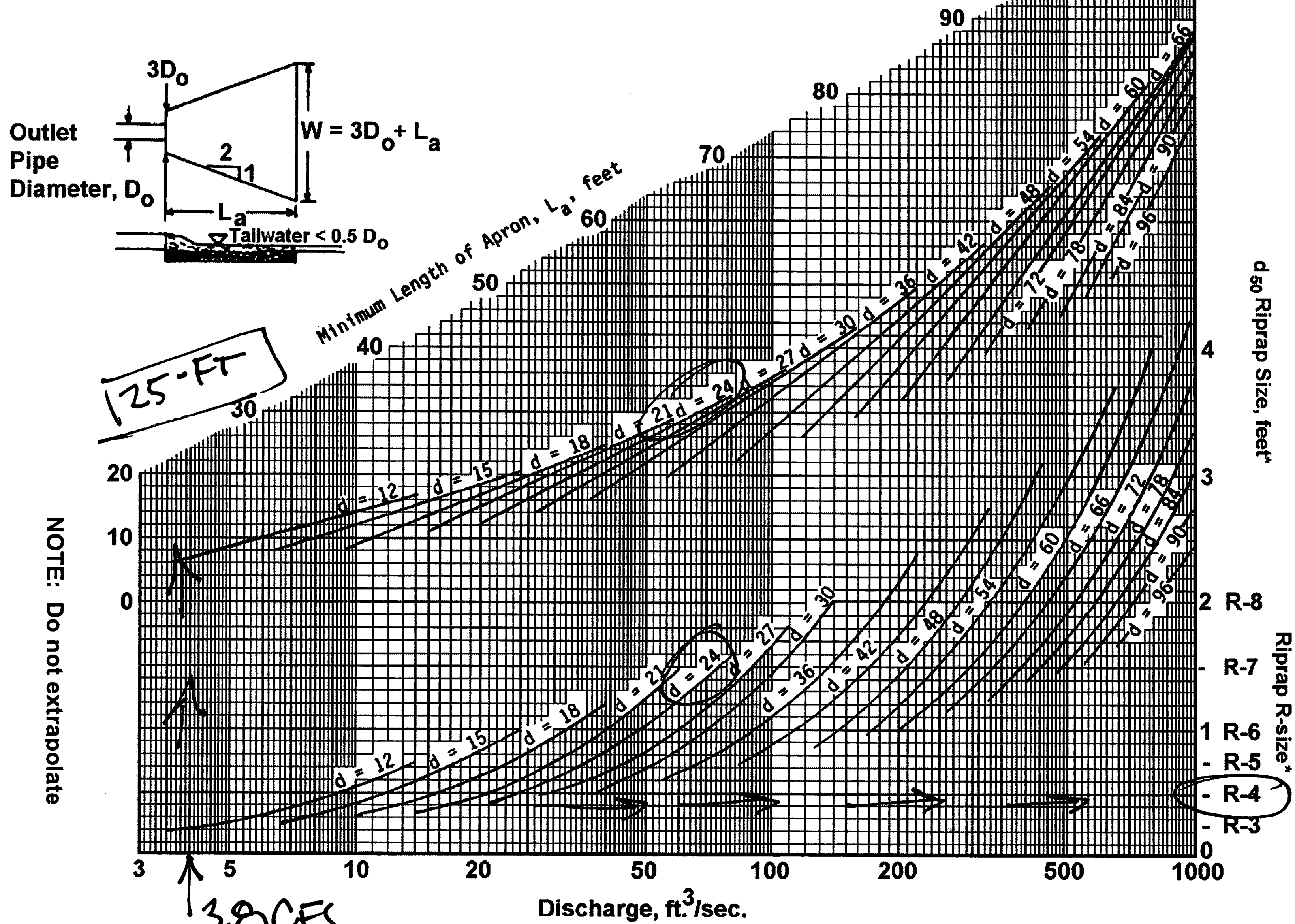
Elevation (ft)	Row Flow (cfs)	Row Flow (cfs)	Row Flow (cfs)	Row Flow (cfs)	Row Flow (cfs)	Row Flow (cfs)	Row Flow (cfs)	Total Flow (cfs)
996.50	0.139	0.117	0.209	0.147	-	-	-	0.612
996.00	0.134	0.111	0.196	0.127	-	-	-	0.567
995.00	0.123	0.098	0.165	0.071	-	-	-	0.457
994.00	0.111	0.082	0.127	-	-	-	-	0.321
993.00	0.098	0.064	0.071	-	-	-	-	0.233
992.00	0.082	0.036	-	-	-	-	-	0.118
991.00	0.064	-	-	-	-	-	-	0.064
990.00	0.036	-	-	-	-	-	-	0.036
989.50	-	-	-	-	-	-	-	0.000
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-

Water Surface Elevation (ft)	Cummulative Storage (cf)	Incremental Storage (cf)	Orifice Flow (cfs)	Average Flow (cfs)	Incremental Time (hr)	Cumulative Time (hr)	Cumulative Time (days)	Comment
996.50	77,184.0		0.612			0.00	0.0	Top Riser
996.00	69,772.0	7,412.0	0.567	0.590	3.49	3.49	0.1	
995.00	54,948.0	14,824.0	0.457	0.512	8.04	11.53	0.5	
994.00	46,920.0	8,028.0	0.321	0.389	5.73	17.26	0.7	
993.00	38,892.0	8,028.0	0.233	0.277	8.05	25.31	1.1	
992.00	30,864.0	8,028.0	0.118	0.175	12.74	38.05	1.6	
991.00	22,836.0	8,028.0	0.064	0.091	24.51	62.56	2.6	
990.00	14,808.0	8,028.0	0.036	0.050	44.60	107.16	4.5	
989.50	13,327.0	1,481.0	0.000	0.018	22.85	130.01	5.4	Sed Elevation
-								
-								
-								
-								
-								

DESIGN OF RIPRAP APRON OUTLET PROTECTION FROM A ROUND PIPE FLOWING FULL
MINIMUM TAILWATER CONDITION (T_W < 0.5 DIAMETER)

Adapted from USDA - NRCS

FIGURE 9.3
Riprap Apron Design, Minimum Tailwater Condition



* For discharge velocities exceeding Maximum Allowable for Riprap indicated, increase d_{50} stone size and/or provide velocity reduction device.

NOTE: Do not extrapolate

Not to be used for Box Culverts

10-Year 24-Hour

Storm Routing

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         Sedimentation Pond E1 - 10 Year                          Date 06/30/26

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==============================================================================
PROCESSING NETWORK

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Node FLOW will generate a composite SCS TR-55 Hydrograph

INPUT SUMMARY

24 Hour Rainfall : 3.32 (inches)
Rainfall Distribution Type : II

SUB	DESCRIPTION
1	Channel E1
2	Channel E2
3	Channel E3
4	Direct Pond Inflow

SUB	ENTERED		ROUNDED		AREA	CN
	Tc (hr)	Tt (hr)	Tc (hr)	Tt (hr)	(acre)	
1	0.150	0.000	0.2	0	0.970	98
2	0.140	0.000	0.1	0	6.070	83
3	0.440	0.000	0.4	0	2.780	82
4	0.100	0.000	0.1	0	1.090	98

SUB	Area (sq-mi)	Q (in)	Am Q (sq-mi-in)	Ia (in)	Ia/P	ROUNDED Ia/P
1	0.002	3.087	0.005	0.041	0.012	0.100
2	0.009	1.708	0.016	0.410	0.123	0.123
3	0.004	1.635	0.007	0.439	0.132	0.132
4	0.002	3.087	0.005	0.041	0.012	0.100

SCS TR-55 Unit Discharge tables used for interpolation

SUB	LOWER UNIT DISCHARGE TABLE			UPPER UNIT DISCHARGE TABLE		
	Tc (hr)	Tt (hr)	Ia/P	Tc (hr)	Tt (hr)	Ia/P
1	0.2	0	0.1	0.2	0	0.3
2	0.1	0	0.1	0.1	0	0.3
3	0.4	0	0.1	0.4	0	0.3
4	0.1	0	0.1	0.1	0	0.3

Time (hr)	Sub-Area 1	Sub-Area 2	Sub-Area 3	Sub-Area 4	Total (cfs)
11.00	0.11	0.34	0.11	0.13	0.68
11.30	0.15	0.49	0.15	0.18	0.96
11.60	0.22	0.76	0.21	0.28	1.47
11.90	0.98	5.07	0.46	1.76	8.27
12.00	1.89	10.33	0.87	3.40	16.49
12.10	3.46	16.22	1.74	5.31	26.73
12.20	3.74	9.98	3.13	3.30	20.15
12.30	2.25	3.52	4.08	1.14	10.98
12.40	1.17	2.43	3.99	0.77	8.36
12.50	0.78	2.04	3.04	0.65	6.51
12.60	0.60	1.73	2.13	0.55	5.00
12.70	0.48	1.43	1.55	0.45	3.92
12.80	0.40	1.27	1.18	0.40	3.26
13.00	0.33	1.11	0.76	0.35	2.55
13.20	0.29	0.96	0.57	0.30	2.12
13.40	0.25	0.86	0.47	0.27	1.85
13.60	0.23	0.78	0.41	0.24	1.66
13.80	0.21	0.71	0.37	0.22	1.51
14.00	0.19	0.64	0.33	0.20	1.36
14.30	0.16	0.58	0.29	0.18	1.21
14.60	0.15	0.55	0.26	0.17	1.13
15.00	0.14	0.49	0.24	0.15	1.02
15.50	0.13	0.44	0.21	0.14	0.92
16.00	0.11	0.39	0.19	0.12	0.82
16.50	0.10	0.36	0.17	0.11	0.74
17.00	0.09	0.34	0.16	0.11	0.70
17.50	0.09	0.32	0.15	0.10	0.67
18.00	0.08	0.31	0.14	0.09	0.63
19.00	0.07	0.26	0.12	0.08	0.54
20.00	0.06	0.22	0.11	0.07	0.46
22.00	0.06	0.21	0.09	0.06	0.42
26.00	0.00	0.00	0.00	0.00	0.00

Node POND is a pond which will route a single hydrograph

INPUT SUMMARY

SUMMARY OF ELEVATION-OUTFLOW TABLE CALCULATION PARAMETERS
Minimum Elevation for Calculations : 0 feet
Maximum Elevation for Calculations : 0 feet
Elevation Increment for Calculations : 0 feet

SUMMARY OF ROUTING PARAMETERS
Initial Pool Elevation : 989.5 feet
Outlet Summary Equation : MIN({A},MIN({B},{C}))+{1}
Criteria for determination of Routing end : DURATION OF INFLOW

SUMMARY OF OUTLET DEVICES

ID	DESCRIPTION	SUBSTITUTED EQUATION
A	Riser Orifice	0.6*(3.1514*SQR(2.5)/4)*SQRT(2*32.2*({ELEV}-996.5))
B	Riser Weir	3.1*7.85*({ELEV}-996.5)^(3/2)
C	Barrel Pipe	((3.1514/4)*SQR(2))*SQRT((2*32.2)*({ELEV}-978-0.5*2)/(1.0+1.0+100*((5087*0.015^2)/((2*12)^(4/3)))))
1	E Spillway	2.6*8*({ELEV}-997.8)^(3/2)

ID	QTY	ELEVATION		TIME	
		Emin (ft)	Emax (ft)	Tmin (hr)	Tmax (hr)
A	1	996.50	99999.00	-1.00	99999.00
B	1	996.50	99999.00	-1.00	99999.00
C	1	996.50	99999.00	-1.00	99999.00
1	1	997.80	99999.00	-1.00	99999.00

Elevation-Storage

Elevation	Storage
985.00	0.00
990.00	14808.00
995.00	54948.00
1000.00	129068.00

If required, storage data for elevations above those specified in

the table will be estimated by the power-law regression equation:
STORAGE (cf) = 1858.8239 * [Elevation (ft) - 985.00]^1.4681

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TIME (hr)	INFLOW (cfs)	ELEV (ft)	STORAGE (ac-ft)	OUTFLOW (cfs)
11.00	0.684	989.500	0.3060	0.000
11.30	0.959	989.799	0.3263	0.000
11.60	1.471	990.089	0.3563	0.000
11.90	8.266	990.745	0.4772	0.000
12.00	16.489	991.300	0.5795	0.000
12.10	26.734	992.270	0.7583	0.000
12.20	20.148	993.321	0.9520	0.000
12.30	10.984	994.020	1.0808	0.000
12.40	8.358	994.453	1.1606	0.000
12.50	6.506	994.786	1.2220	0.000
12.60	4.998	995.024	1.2696	0.000
12.70	3.917	995.132	1.3064	0.000
12.80	3.257	995.220	1.3363	0.000
13.00	2.547	995.359	1.3836	0.000
13.20	2.118	995.472	1.4221	0.000
13.40	1.853	995.570	1.4554	0.000
13.60	1.661	995.657	1.4850	0.000
13.80	1.506	995.733	1.5109	0.000
14.00	1.363	995.802	1.5344	0.000
14.30	1.208	995.896	1.5664	0.000
14.60	1.126	995.982	1.5956	0.000
15.00	1.024	996.085	1.6307	0.000
15.50	0.921	996.202	1.6705	0.000
16.00	0.818	996.308	1.7066	0.000
16.50	0.737	996.403	1.7389	0.000
17.00	0.702	996.491	1.7688	0.000
17.50	0.666	996.555	1.7906	0.314
18.00	0.627	996.580	1.7991	0.551
19.00	0.538	996.584	1.8005	0.592
20.00	0.461	996.574	1.7971	0.490
22.00	0.420	996.566	1.7944	0.413
26.00	0.000	996.525	1.7804	0.096

TIME (hr)	ELEV (ft)	DEVICE A (cfs)	DEVICE B (cfs)	DEVICE C (cfs)	DEVICE 1 (cfs)	TOTAL (cfs)
11.000	989.500	0.000	0.000	0.000	0.000	0.000
11.300	989.799	0.000	0.000	0.000	0.000	0.000
11.600	990.089	0.000	0.000	0.000	0.000	0.000
11.900	990.745	0.000	0.000	0.000	0.000	0.000
12.000	991.300	0.000	0.000	0.000	0.000	0.000
12.100	992.270	0.000	0.000	0.000	0.000	0.000
12.200	993.321	0.000	0.000	0.000	0.000	0.000
12.300	994.020	0.000	0.000	0.000	0.000	0.000
12.400	994.453	0.000	0.000	0.000	0.000	0.000
12.500	994.786	0.000	0.000	0.000	0.000	0.000
12.600	995.024	0.000	0.000	0.000	0.000	0.000
12.700	995.132	0.000	0.000	0.000	0.000	0.000
12.800	995.220	0.000	0.000	0.000	0.000	0.000
13.000	995.359	0.000	0.000	0.000	0.000	0.000
13.200	995.472	0.000	0.000	0.000	0.000	0.000
13.400	995.570	0.000	0.000	0.000	0.000	0.000
13.600	995.657	0.000	0.000	0.000	0.000	0.000
13.800	995.733	0.000	0.000	0.000	0.000	0.000
14.000	995.802	0.000	0.000	0.000	0.000	0.000
14.300	995.896	0.000	0.000	0.000	0.000	0.000
14.600	995.982	0.000	0.000	0.000	0.000	0.000
15.000	996.085	0.000	0.000	0.000	0.000	0.000
15.500	996.202	0.000	0.000	0.000	0.000	0.000
16.000	996.308	0.000	0.000	0.000	0.000	0.000
16.500	996.403	0.000	0.000	0.000	0.000	0.000
17.000	996.491	0.000	0.000	0.000	0.000	0.000
17.500	996.555	5.560	0.314	55.437	0.000	0.314
18.000	996.580	6.706	0.551	55.477	0.000	0.551
19.000	996.584	6.872	0.592	55.483	0.000	0.592
20.000	996.574	6.450	0.490	55.467	0.000	0.490
22.000	996.566	6.091	0.413	55.455	0.000	0.413
26.000	996.525	3.749	0.096	55.390	0.000	0.096

25-Year 24-Hour

Storm Routing

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         Sedimentation Pond E1 - 25 Year                                 Date 06/30/26

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PROCESSING NETWORK

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Node FLOW will generate a composite SCS TR-55 Hydrograph

INPUT SUMMARY

24 Hour Rainfall : 3.93 (inches)
Rainfall Distribution Type : II

SUB	DESCRIPTION
1	Channel E1
2	Channel E2
3	Channel E3
4	Direct Pond Inflow

SUB	ENTERED		ROUNDED		AREA	CN
	Tc (hr)	Tt (hr)	Tc (hr)	Tt (hr)	(acre)	
1	0.150	0.000	0.2	0	0.970	98
2	0.140	0.000	0.1	0	6.070	83
3	0.440	0.000	0.4	0	2.780	82
4	0.100	0.000	0.1	0	1.090	98

SUB	Area (sq-mi)	Q (in)	Am Q (sq-mi-in)	Ia (in)	Ia/P	ROUNDED Ia/P
1	0.002	3.695	0.006	0.041	0.010	0.100
2	0.009	2.226	0.021	0.410	0.104	0.104
3	0.004	2.143	0.009	0.439	0.112	0.112
4	0.002	3.695	0.006	0.041	0.010	0.100

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Sedimentation Pond E1

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SCS TR-55 Unit Discharge tables used for interpolation

SUB	LOWER UNIT DISCHARGE TABLE			UPPER UNIT DISCHARGE TABLE		
	Tc (hr)	Tt (hr)	Ia/P	Tc (hr)	Tt (hr)	Ia/P
1	0.2	0	0.1	0.2	0	0.3
2	0.1	0	0.1	0.1	0	0.3
3	0.4	0	0.1	0.4	0	0.3
4	0.1	0	0.1	0.1	0	0.3

Time (hr)	Sub-Area 1	Sub-Area 2	Sub-Area 3	Sub-Area 4	Total (cfs)
11.00	0.13	0.50	0.16	0.15	0.93
11.30	0.17	0.70	0.22	0.21	1.31
11.60	0.26	1.09	0.32	0.33	2.01
11.90	1.17	6.97	0.68	2.10	10.92
12.00	2.26	13.62	1.25	4.07	21.20
12.10	4.14	21.28	2.44	6.36	34.22
12.20	4.48	13.21	4.26	3.95	25.90
12.30	2.69	4.58	5.45	1.37	14.09
12.40	1.40	3.11	5.30	0.93	10.74
12.50	0.93	2.61	4.00	0.77	8.31
12.60	0.72	2.21	2.78	0.65	6.36
12.70	0.57	1.82	2.02	0.54	4.96
12.80	0.48	1.61	1.53	0.48	4.10
13.00	0.39	1.40	0.98	0.42	3.19
13.20	0.34	1.21	0.73	0.36	2.64
13.40	0.30	1.08	0.60	0.32	2.31
13.60	0.27	0.98	0.52	0.29	2.07
13.80	0.25	0.89	0.47	0.26	1.87
14.00	0.22	0.81	0.42	0.24	1.69
14.30	0.20	0.72	0.36	0.21	1.50
14.60	0.18	0.68	0.32	0.20	1.39
15.00	0.17	0.62	0.30	0.18	1.26
15.50	0.15	0.55	0.27	0.16	1.14
16.00	0.13	0.49	0.24	0.14	1.01
16.50	0.12	0.45	0.21	0.13	0.91
17.00	0.11	0.43	0.20	0.13	0.87
17.50	0.11	0.41	0.19	0.12	0.82
18.00	0.10	0.38	0.17	0.11	0.77
19.00	0.09	0.32	0.15	0.09	0.66
20.00	0.07	0.28	0.13	0.08	0.57
22.00	0.07	0.26	0.12	0.08	0.51
26.00	0.00	0.00	0.00	0.00	0.00

Node POND is a pond which will route a single hydrograph

INPUT SUMMARY

SUMMARY OF ELEVATION-OUTFLOW TABLE CALCULATION PARAMETERS
Minimum Elevation for Calculations : 0 feet
Maximum Elevation for Calculations : 0 feet
Elevation Increment for Calculations : 0 feet

SUMMARY OF ROUTING PARAMETERS
Initial Pool Elevation : 989.5 feet
Outlet Summary Equation : MIN({A},MIN({B},{C}))+{1}
Criteria for determination of Routing end : DURATION OF INFLOW

SUMMARY OF OUTLET DEVICES

ID	DESCRIPTION	SUBSTITUTED EQUATION
A	Riser Orifice	0.6*(3.1514*SQR(2.5)/4)*SQRT(2*32.2*({ELEV}-996.5))
B	Riser Weir	3.1*7.85*({ELEV}-996.5)^(3/2)
C	Barrel Pipe	((3.1514/4)*SQR(2))*SQRT((2*32.2)*({ELEV}-978-0.5*2)/(1.0+1.0+100*((5087*0.015^2)/((2*12)^(4/3)))))
1	E Spillway	2.6*8*({ELEV}-997.8)^(3/2)

ID	QTY	ELEVATION Emin (ft)	ELEVATION Emax (ft)	TIME Tmin (hr)	TIME Tmax (hr)
A	1	996.50	99999.00	-1.00	99999.00
B	1	996.50	99999.00	-1.00	99999.00
C	1	996.50	99999.00	-1.00	99999.00
1	1	997.80	99999.00	-1.00	99999.00

Elevation-Storage

Elevation	Storage
985.00	0.00
990.00	14808.00
995.00	54948.00
1000.00	129068.00

If required, storage data for elevations above those specified in

```
the table will be estimated by the power-law regression equation:
 STORAGE (cf) = 1858.8239 * [Elevation (ft) - 985.00]^1.4681
```

Project: Sanitary Landfill - Entrance Area
Sedimentation Pond E1

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Project Number 2026-083 By DWM Chk KAF Rev

TIME (hr)	INFLOW (cfs)	ELEV (ft)	STORAGE (ac-ft)	OUTFLOW (cfs)
11.00	0.933	989.500	0.3060	0.000
11.30	1.309	989.909	0.3338	0.000
11.60	2.007	990.189	0.3748	0.000
11.90	10.917	991.058	0.5349	0.000
12.00	21.200	991.779	0.6678	0.000
12.10	34.217	993.022	0.8969	0.000
12.20	25.904	994.369	1.1451	0.000
12.30	14.090	995.143	1.3101	0.000
12.40	10.740	995.444	1.4125	0.000
12.50	8.315	995.677	1.4918	0.000
12.60	6.355	995.856	1.5527	0.000
12.70	4.958	995.994	1.5997	0.000
12.80	4.104	996.105	1.6375	0.000
13.00	3.190	996.283	1.6981	0.000
13.20	2.642	996.424	1.7460	0.000
13.40	2.306	996.541	1.7859	0.202
13.60	2.065	996.618	1.8121	0.986
13.80	1.871	996.654	1.8243	1.471
14.00	1.691	996.664	1.8277	1.616
14.30	1.497	996.663	1.8274	1.601
14.60	1.393	996.655	1.8246	1.485
15.00	1.265	996.645	1.8212	1.344
15.50	1.137	996.635	1.8178	1.207
16.00	1.009	996.625	1.8144	1.075
16.50	0.908	996.617	1.8117	0.974
17.00	0.866	996.611	1.8097	0.900
17.50	0.822	996.607	1.8083	0.852
18.00	0.771	996.603	1.8070	0.804
19.00	0.659	996.593	1.8035	0.690
20.00	0.566	996.585	1.8008	0.603
22.00	0.515	996.577	1.7981	0.520
26.00	0.000	996.525	1.7804	0.096

Project: Sanitary Landfill - Entrance Area
Sedimentation Pond E1

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TIME (hr)	ELEV (ft)	DEVICE A (cfs)	DEVICE B (cfs)	DEVICE C (cfs)	DEVICE 1 (cfs)	TOTAL (cfs)
11.000	989.500	0.000	0.000	0.000	0.000	0.000
11.300	989.909	0.000	0.000	0.000	0.000	0.000
11.600	990.189	0.000	0.000	0.000	0.000	0.000
11.900	991.058	0.000	0.000	0.000	0.000	0.000
12.000	991.779	0.000	0.000	0.000	0.000	0.000
12.100	993.022	0.000	0.000	0.000	0.000	0.000
12.200	994.369	0.000	0.000	0.000	0.000	0.000
12.300	995.143	0.000	0.000	0.000	0.000	0.000
12.400	995.444	0.000	0.000	0.000	0.000	0.000
12.500	995.677	0.000	0.000	0.000	0.000	0.000
12.600	995.856	0.000	0.000	0.000	0.000	0.000
12.700	995.994	0.000	0.000	0.000	0.000	0.000
12.800	996.105	0.000	0.000	0.000	0.000	0.000
13.000	996.283	0.000	0.000	0.000	0.000	0.000
13.200	996.424	0.000	0.000	0.000	0.000	0.000
13.400	996.541	4.801	0.202	55.415	0.000	0.202
13.600	996.618	8.144	0.986	55.537	0.000	0.986
13.800	996.654	9.304	1.471	55.593	0.000	1.471
14.000	996.664	9.602	1.616	55.609	0.000	1.616
14.300	996.663	9.572	1.601	55.608	0.000	1.601
14.600	996.655	9.334	1.485	55.595	0.000	1.485
15.000	996.645	9.028	1.344	55.579	0.000	1.344
15.500	996.635	8.711	1.207	55.563	0.000	1.207
16.000	996.625	8.382	1.075	55.548	0.000	1.075
16.500	996.617	8.110	0.974	55.535	0.000	0.974
17.000	996.611	7.899	0.900	55.526	0.000	0.900
17.500	996.607	7.755	0.852	55.519	0.000	0.852
18.000	996.603	7.609	0.804	55.513	0.000	0.804
19.000	996.593	7.230	0.690	55.497	0.000	0.690
20.000	996.585	6.912	0.603	55.485	0.000	0.603
22.000	996.577	6.579	0.520	55.472	0.000	0.520
26.000	996.525	3.749	0.096	55.390	0.000	0.096

50-Year 24-Hour

Storm Routing

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         Sedimentation Pond E1 - 50 year                           Date 06/30/26

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PROCESSING NETWORK

           Project SANENT
Project Dos Path C:\WIMP\
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                   Tue Jun 30, 2026 1:32 pm                    WIMP Ver 1.2.c
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Node FLOW will generate a composite SCS TR-55 Hydrograph

INPUT SUMMARY

24 Hour Rainfall : 4.43 (inches)
Rainfall Distribution Type : II

SUB	DESCRIPTION
1	Channel E1
2	Channel E2
3	Channel E3
4	Direct Pond Inflow

SUB	ENTERED		ROUNDED		AREA	CN
	Tc (hr)	Tt (hr)	Tc (hr)	Tt (hr)	(acre)	
1	0.150	0.000	0.2	0	0.970	98
2	0.140	0.000	0.1	0	6.070	83
3	0.440	0.000	0.4	0	2.780	82
4	0.100	0.000	0.1	0	1.090	98

SUB	Area (sq-mi)	Q (in)	Am Q (sq-mi-in)	Ia (in)	Ia/P	ROUNDED Ia/P
1	0.002	4.194	0.006	0.041	0.009	0.100
2	0.009	2.663	0.025	0.410	0.093	0.100
3	0.004	2.575	0.011	0.439	0.099	0.100
4	0.002	4.194	0.007	0.041	0.009	0.100

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Sedimentation Pond E1

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SCS TR-55 Unit Discharge tables used for interpolation

SUB	LOWER UNIT DISCHARGE TABLE			UPPER UNIT DISCHARGE TABLE		
	Tc (hr)	Tt (hr)	Ia/P	Tc (hr)	Tt (hr)	Ia/P
1	0.2	0	0.1	0.2	0	0.3
2	0.1	0	0.1	0.1	0	0.3
3	0.4	0	0.1	0.4	0	0.3
4	0.1	0	0.1	0.1	0	0.3

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Sedimentation Pond E1

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Time (hr)	Sub-Area 1	Sub-Area 2	Sub-Area 3	Sub-Area 4	Total (cfs)
11.00	0.15	0.61	0.20	0.17	1.13
11.30	0.20	0.86	0.28	0.24	1.58
11.60	0.30	1.34	0.40	0.38	2.42
11.90	1.33	8.44	0.86	2.39	13.01
12.00	2.56	16.34	1.58	4.62	25.10
12.10	4.70	25.51	3.03	7.21	40.46
12.20	5.09	15.86	5.23	4.49	30.67
12.30	3.06	5.48	6.62	1.55	16.71
12.40	1.59	3.71	6.42	1.05	12.77
12.50	1.06	3.11	4.82	0.88	9.86
12.60	0.81	2.63	3.33	0.74	7.52
12.70	0.65	2.17	2.42	0.61	5.85
12.80	0.55	1.92	1.82	0.54	4.83
13.00	0.44	1.67	1.16	0.47	3.75
13.20	0.39	1.44	0.86	0.41	3.10
13.40	0.34	1.29	0.70	0.36	2.70
13.60	0.31	1.16	0.62	0.33	2.42
13.80	0.28	1.06	0.55	0.30	2.19
14.00	0.25	0.96	0.49	0.27	1.98
14.30	0.22	0.86	0.43	0.24	1.75
14.60	0.21	0.81	0.38	0.23	1.63
15.00	0.19	0.73	0.35	0.21	1.48
15.50	0.17	0.66	0.31	0.19	1.33
16.00	0.15	0.58	0.28	0.16	1.18
16.50	0.13	0.53	0.25	0.15	1.06
17.00	0.13	0.51	0.23	0.14	1.01
17.50	0.12	0.48	0.22	0.14	0.96
18.00	0.11	0.45	0.20	0.13	0.90
19.00	0.10	0.38	0.18	0.11	0.77
20.00	0.08	0.33	0.16	0.09	0.66
22.00	0.08	0.30	0.13	0.09	0.60
26.00	0.00	0.00	0.00	0.00	0.00

Node POND is a pond which will route a single hydrograph

INPUT SUMMARY

SUMMARY OF ELEVATION-OUTFLOW TABLE CALCULATION PARAMETERS

Minimum Elevation for Calculations : 0 feet
Maximum Elevation for Calculations : 0 feet
Elevation Increment for Calculations : 0 feet

SUMMARY OF ROUTING PARAMETERS

Initial Pool Elevation : 989.5 feet
Outlet Summary Equation : MIN({A},MIN({B},{C}))+{1}
Criteria for determination of Routing end : DURATION OF INFLOW

SUMMARY OF OUTLET DEVICES

ID	DESCRIPTION	SUBSTITUTED EQUATION
A	Riser Orifice	0.6*(3.1514*SQR(2.5)/4)*SQRT(2*32.2*({ELEV}-996.5))
B	Riser Weir	3.1*7.85*({ELEV}-996.5)^(3/2)
C	Barrel Pipe	((3.1514/4)*SQR(2))*SQRT((2*32.2)*({ELEV}-978-0.5*2)/(1.0+1.0+100*((5087*0.015^2)/((2*12)^(4/3)))))
1	E Spillway	2.6*8*({ELEV}-997.8)^(3/2)

ID	QTY	ELEVATION		TIME	
		Emin (ft)	Emax (ft)	Tmin (hr)	Tmax (hr)
A	1	996.50	99999.00	-1.00	99999.00
B	1	996.50	99999.00	-1.00	99999.00
C	1	996.50	99999.00	-1.00	99999.00
1	1	997.80	99999.00	-1.00	99999.00

Elevation-Storage

Elevation	Storage
985.00	0.00
990.00	14808.00
995.00	54948.00
1000.00	129068.00

If required, storage data for elevations above those specified in

the table will be estimated by the power-law regression equation:

STORAGE (cf) = 1858.8239 * [Elevation (ft) - 985.00]^1.4681

Project: Sanitary Landfill - Entrance Area
Sedimentation Pond E1

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TIME (hr)	INFLOW (cfs)	ELEV (ft)	STORAGE (ac-ft)	OUTFLOW (cfs)
11.00	1.125	989.500	0.3060	0.000
11.30	1.578	989.993	0.3395	0.000
11.60	2.419	990.266	0.3890	0.000
11.90	13.013	991.304	0.5803	0.000
12.00	25.104	992.158	0.7377	0.000
12.10	40.457	993.627	1.0084	0.000
12.20	30.670	995.120	1.3023	0.000
12.30	16.710	995.694	1.4976	0.000
12.40	12.772	996.053	1.6198	0.000
12.50	9.861	996.328	1.7134	0.000
12.60	7.517	996.536	1.7842	0.166
12.70	5.851	996.675	1.8315	1.782
12.80	4.832	996.747	1.8560	2.987
13.00	3.747	996.791	1.8709	3.820
13.20	3.096	996.778	1.8665	3.567
13.40	2.700	996.756	1.8590	3.152
13.60	2.417	996.735	1.8519	2.772
13.80	2.189	996.720	1.8468	2.511
14.00	1.978	996.705	1.8417	2.259
14.30	1.749	996.686	1.8352	1.952
14.60	1.627	996.674	1.8311	1.766
15.00	1.477	996.662	1.8270	1.587
15.50	1.327	996.650	1.8229	1.414
16.00	1.177	996.640	1.8195	1.275
16.50	1.060	996.630	1.8161	1.141
17.00	1.010	996.622	1.8134	1.037
17.50	0.960	996.618	1.8121	0.986
18.00	0.899	996.614	1.8107	0.937
19.00	0.767	996.604	1.8073	0.816
20.00	0.660	996.594	1.8039	0.701
22.00	0.599	996.584	1.8005	0.592
26.00	0.000	996.528	1.7814	0.114

Project: Sanitary Landfill - Entrance Area
Sedimentation Pond E1

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Project Number 2026-083 By DWM Chk KAF Rev

TIME (hr)	ELEV (ft)	DEVICE A (cfs)	DEVICE B (cfs)	DEVICE C (cfs)	DEVICE 1 (cfs)	TOTAL (cfs)
11.000	989.500	0.000	0.000	0.000	0.000	0.000
11.300	989.993	0.000	0.000	0.000	0.000	0.000
11.600	990.266	0.000	0.000	0.000	0.000	0.000
11.900	991.304	0.000	0.000	0.000	0.000	0.000
12.000	992.158	0.000	0.000	0.000	0.000	0.000
12.100	993.627	0.000	0.000	0.000	0.000	0.000
12.200	995.120	0.000	0.000	0.000	0.000	0.000
12.300	995.694	0.000	0.000	0.000	0.000	0.000
12.400	996.053	0.000	0.000	0.000	0.000	0.000
12.500	996.328	0.000	0.000	0.000	0.000	0.000
12.600	996.536	4.499	0.166	55.407	0.000	0.166
12.700	996.675	9.918	1.782	55.626	0.000	1.782
12.800	996.747	11.783	2.987	55.740	0.000	2.987
13.000	996.791	12.790	3.820	55.809	0.000	3.820
13.200	996.778	12.501	3.567	55.788	0.000	3.567
13.400	996.756	11.996	3.152	55.754	0.000	3.152
13.600	996.735	11.493	2.772	55.721	0.000	2.772
13.800	996.720	11.121	2.511	55.697	0.000	2.511
14.000	996.705	10.735	2.259	55.674	0.000	2.259
14.300	996.686	10.225	1.952	55.644	0.000	1.952
14.600	996.674	9.890	1.766	55.625	0.000	1.766
15.000	996.662	9.543	1.587	55.606	0.000	1.587
15.500	996.650	9.183	1.414	55.587	0.000	1.414
16.000	996.640	8.871	1.275	55.571	0.000	1.275
16.500	996.630	8.548	1.141	55.556	0.000	1.141
17.000	996.622	8.281	1.037	55.543	0.000	1.037
17.500	996.618	8.144	0.986	55.537	0.000	0.986
18.000	996.614	8.005	0.937	55.530	0.000	0.937
19.000	996.604	7.646	0.816	55.515	0.000	0.816
20.000	996.594	7.269	0.701	55.499	0.000	0.701
22.000	996.584	6.872	0.592	55.483	0.000	0.592
26.000	996.528	3.967	0.114	55.395	0.000	0.114