SANBORN HEAD
Building Trust. Engineering Success.

Mr. Allan G. Palmer
Eversource Energy
P.O. Box 330
Manchester, NH 03105-0330

November 22, 2016
File No. 2025.03

Sent via email

Re: Runon and Runoff Control System Plan
Merrimack Station Ash Landfill
Bow, New Hampshire

Dear Allan:

This letter serves as the initial Runon and Runoff Control System Plan (Plan) for the Merrimack Station Ash Landfill (landfill) in Bow, New Hampshire. Sanborn, Head & Associates, Inc. (Sanborn Head) prepared this Plan to comply with the requirements of the Standards for the Disposal of Coal Combustion Residuals (CCR) in Landfills and Surface Impoundments (40 CFR Part 257 Subpart D), which became effective on October 19, 2015.

REGULATORY REQUIREMENTS

The landfill must design, construct, operate, and maintain a runon and runoff control system to prevent flow onto the active portion of the landfill during peak discharge, and collect and control the water volume, resulting from a 24-hour, 25-year storm event [40 CFR Part 257.81(a)(1) and (2)]. Runoff from the active portion of the landfill must not cause non-point source pollution or discharges of pollutants into waters of the United States that violates applicable legal requirements.

As required by 40 CFR Part 257.81(c)(1), this Plan documents how the runon and runoff system was designed and constructed to meet the requirements described above. Periodic revisions to the plan should be made: (i) when there is a change in conditions that would substantially affect the Plan; and (ii) every five years.

SITE CHARACTERISTICS

As of August 2016, the approximately 5.4-acre lined landfill is comprised of 1.6 acres of final closed area, 0.6 acres of inactive area (i.e., no CCR in place), and 3.2 acres of active area (i.e., CCR is being placed). The site features, topography, and drainage patterns at and surrounding the landfill are depicted on Figure 1. The landfill is located in an area consisting of primarily sandy soils as documented by the U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Survey for the site (see enclosures).

Stormwater within the active portion of the landfill is managed as leachate and is collected in leachate collection system (LCS) piping and conveyed to underground leachate storage tanks prior to its removal for off-site treatment. This area is graded such that stormwater remains within this controlled area and does not runoff the active area. The inactive area

of the landfill is separated from the active area by a geomembrane-lined division berm. The berm keeps stormwater collected in the inactive area separate from the active area, and clean stormwater is discharged through a 6-inch diameter pipe to a swale to the south of the landfill. The stormwater discharges to the surrounding low areas south of the landfill and does not discharge to a water of the United States.

The final closed area of the landfill has a cover system that consists of 12 inches of sand bedding overlain by 36-mil thick Hypalon geomembrane, which is in turn is overlain by a 18-inch thick layer of sand cover and a 4-inch thick layer of topsoil. Stormwater in this area of the landfill discharges to the surrounding low areas north of the landfill and does not discharge to a water of the United States. There are no stormwater basins associated with the landfill.

Runon to the landfill from the west is obstructed by a gravel access road with drainage channels that direct stormwater around the perimeter of the landfill. A riprap lined swale along the eastern side of the landfill intercepts runon to the landfill and discharges the stormwater to the surrounding low areas south of the landfill (see Figure 1). A detail of the swale is provided on the attached Closure Plan, dated July 6, 1990 and prepared by others. The perimeter drainage features appeared to be in good condition during a December 17, 2015 site inspection.

STORMWATER CALCULATION

The stormwater features at the landfill were previously designed and installed by others and Sanborn Head observed the features during the annual inspection of the landfill on December 17, 2105. To verify the effectiveness of the runon and runoff control system to collect and control the water volume resulting from a 24-hour, 25-year storm event, Sanborn Head evaluated the landfill and storm event information using HydroCAD™ version 10.0, a stormwater modeling software developed by HydroCAD Software Solutions, LLC of Chocorua, New Hampshire.

Figure 1 depicts the landfill drainage features, subcatchment areas, and anticipated stormwater flow paths considered in the HydroCAD model and evaluation. Landfill drainage features and riprap lined swale dimensions are based on a drawing prepared by Public Service of New Hampshire titled, "Closure Plan, Ash Disposal Landfill, Merrimack Station, Bow, New Hampshire," dated July 6, 1990. The locations of existing stormwater and LCS pipes were taken from a drawing prepared by Public Service of New Hampshire titled, "Plan of Ash Disposal Landfill, Merrimack Station, Public Service Co. of New Hampshire, Bow, New Hampshire," dated July 13, 1990. Actual pipe locations and elevations may be different than modeled.

The rainfall volume for the 25-year, 24-hour stormwater event (i.e., 5.27 inches) was obtained from the Northeast Regional Climate Center extreme precipitation data.[1] The runoff curve numbers selected were based on surface and soil conditions, and are provided in the enclosed HydroCAD calculation output.

[1] http://precip.eas.cornell.edu/

CONCLUSIONS

As described above, runon from the surrounding areas is controlled by a gravel road access road with drainage channels to the west, a riprap lined perimeter swale to the east, and site grading to the north and south. As shown in the enclosed HydroCAD™ report, runoff resulting from the 24-hour, 25-year storm event discharges to a swale south of the landfill at a rate of approximately 0.76 cubic feet per second (cfs). Stormwater runoff from the closed portion of the landfill sheet flows into a wooded area at a rate of about 6.00 cfs. These flows are not expected to adversely impact existing stormwater management features and receiving areas.

This plan must be updated every 5 years, or by August 30, 2021, as required by 40 CFR Part 257.81(c)(4). This plan shall also be amended whenever there are conditions at the landfill that would substantially affect this plan.

Sincerely,
SANBORN, HEAD & ASSOCIATES, INC.

Lisa L. Damiano, P.E.
Project Manager

Eric S. Steinhauser, P.E., CPESC, CPSWQ
Senior Project Director

RLC/LLD/ESS:rlc/ess/lld

Enclosed: Figure 1 – Runon & Runoff Control System Plan
Custom Soil Resource Report for Merrimack and Belknap Counties, NH
Closure Plan
Plan of Ash Disposal Landfill
HydroCAD Report

P:\2000s\2025.03\Source Files\Runon & Runoff Report\20161122 Runon Runoff Report.docx

NOTES:

1. THE BASE MAP WAS PROVIDED IN ELECTRONIC FORMAT BY WSP-SELLS TRANSPORTATION & INFRASTRUCTURE OF NASHUA, NEW HAMPSHIRE IN A FILE TITLED "188714C-1.dwg" ON MAY 25, 2016.
2. THE HORIZONTAL DATUM IS BASED ON THE NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM NAD83 AND THE VERTICAL DATUM IS BASED ON NAVD88.
3. SITE BASELINE TRANSFORMED TO NH STATE PLANE COORDINATE SYSTEM FROM PLAN PROVIDED IN ELECTRONIC FORMAT BY DUBOIS AND KING INC. IN A FILE TITLED "98 Base Plan.dwg"
2. LOCATIONS OF EXISTING STORMWATER AND LEACHATE COLLECTION SYSTEM PIPES WERE DIGITIZED BASED ON A DRAWING PREPARED BY PUBLIC SERVICE OF NEW HAMPSHIRE TITLED "PLAN OF ASH DISPOSAL LANDFILL, MERRIMACK STATION, PUBLIC SERVICE CO. OF NEW HAMPSHIRE, BOW, NEW HAMPSHIRE" DATED JULY 13, 1990 AND ARE CONSIDERED APPROXIMATE.

LEGEND:

- 250 — EXISTING 10-FOOT CONTOUR LINES
- EXISTING 2-FOOT CONTOUR LINES
- 1995 LIMIT OF FINAL COVER SYSTEM
- CLOSED AREA
- LIMIT OF LINER
- FENCE LINE
- EXISTING RIPRAP
- 1S — SUBCATCHMENT AREA DESIGNATION
- 1P — POND DESIGNATION
- SUBCATCHMENT BOUNDARY
- FLOW PATH
- STORMWATER FLOW DIRECTION

NH STATE PLANE

GATE

GRAVEL ROAD (OBSTRUCTS RUNON TO SITE)

GATE

6"Ø SOLID LEACHATE COLLECTION PIPE

TO LEACHATE STORAGE TANKS (NOT SHOWN ON THIS DRAWING)

6"Ø PERFORATED STORMWATER COLLECTION PIPE

6"Ø SOLID DRAINAGE PIPE

GATE

EXISTING ONE-TWO ACRE LOW AREA FOR UNCONTAMINATED RUNOFF FROM NON-ACTIVE CELLS & FUTURE LANDFILL COVER

RIPRAP LINED SWALE

1P

2S

ACTIVE AREA STORMWATER MANAGED AS LEACHATE (NO DISCHARGE FROM SITE)

1S

INACTIVE AREA (TEMPORARY STORAGE OF STORMWATER)

4S

3S

CLOSED AREA (SHEET FLOWS TO NORTH)

1995 LIMIT OF FINAL COVER SYSTEM

GATE

GATE

SANBORN HEAD

GRAPHICAL SCALE
30' 15' 0' 30' 60'

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R. CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: E. STEINHAUSER
PROJECT MGR: L. DAMIANO
PIC: E. STEINHAUSER
DATE: NOVEMBER 2016

MERRIMACK STATION COAL ASH LANDFILL
PUBLIC SERVICE OF NEW HAMPSHIRE
BOW, NEW HAMPSHIRE

RUNON AND RUNOFF CONTROL SYSTEM PLAN

PROJECT NUMBER: 2025.03

FIGURE NUMBER: 1

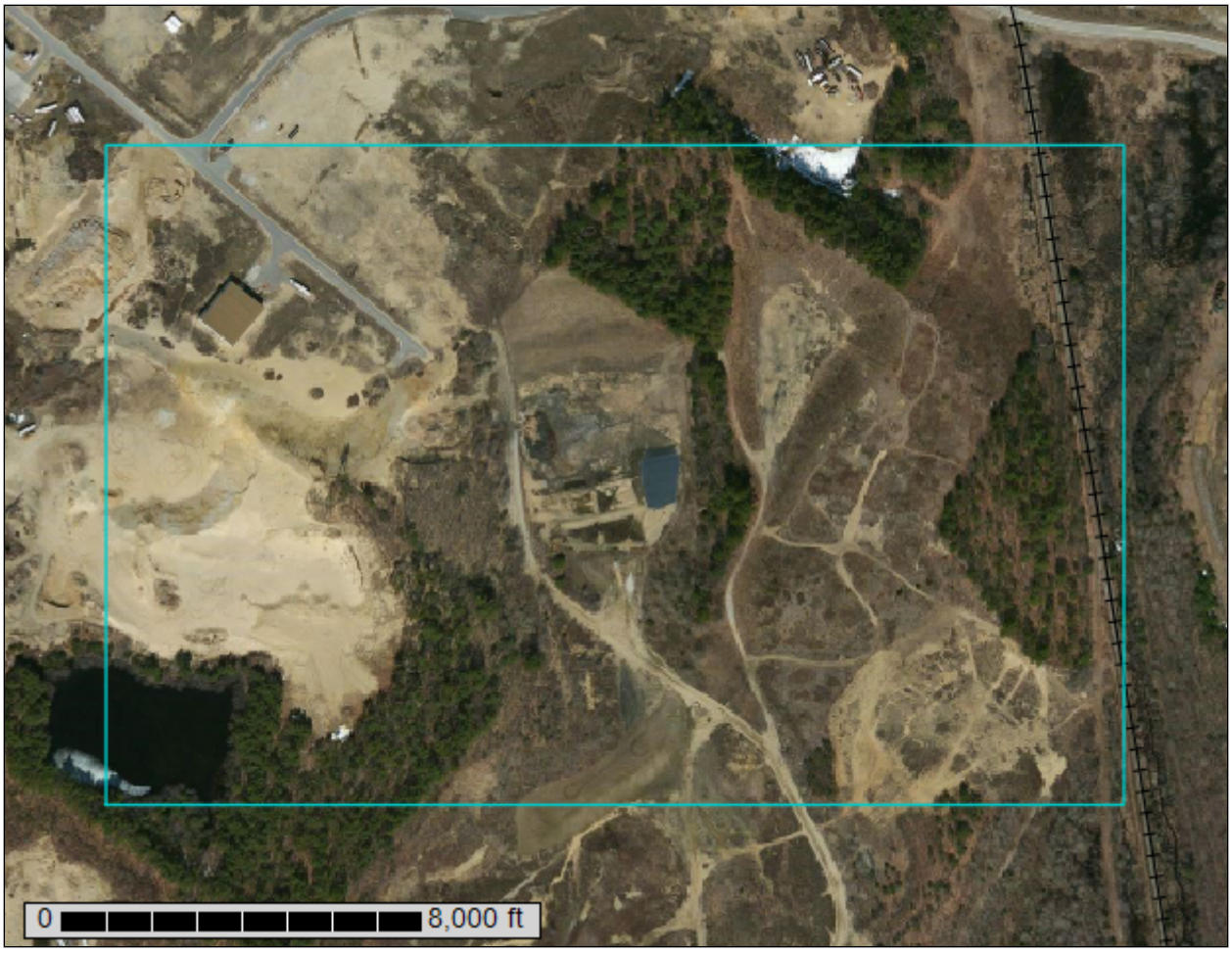
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Merrimack and Belknap Counties, New Hampshire



April 13, 2016

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:4,360 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Merrimack and Belknap Counties, New Hampshire
Survey Area Data: Version 20, Sep 22, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 8, 2011—Apr 9, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Merrimack and Belknap Counties, New Hampshire (NH609)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
6A	Saco mucky silt loam, 0 to 2 percent slopes, frequently flooded	4.2	4.2%
26A	Windsor loamy sand, 0 to 3 percent slopes	0.6	0.6%
26B	Windsor loamy sand, 3 to 8 percent slopes	7.9	7.8%
26E	Windsor loamy sand, 15 to 60 percent slopes	35.0	34.7%
196A	Meadowsedge peat, 0 to 1 percent slopes, ponded	3.2	3.1%
300B	Udipsamments, 0 to 6 percent slopes	50.0	49.5%
Totals for Area of Interest		**100.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been

observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Merrimack and Belknap Counties, New Hampshire

6A—Saco mucky silt loam, 0 to 2 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 9dm3
Elevation: 200 to 790 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 37 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Saco, frequently flooded, and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saco, Frequently Flooded

Setting

Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy and/or coarse-loamy alluvium derived from granite, gneiss or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
H1 - 2 to 8 inches: mucky silt loam
H2 - 8 to 35 inches: silt loam
H3 - 35 to 65 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: B/D

Minor Components

Rippowam

Percent of map unit: 10 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Convex

Timakwa

Percent of map unit: 10 percent
Landform: Bogs
Down-slope shape: Concave
Across-slope shape: Concave

Pootatuck

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

26A—Windsor loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkg
Elevation: 0 to 990 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting

Landform: Deltas, dunes, outwash plains, outwash terraces
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A

Minor Components

Deerfield, loamy sand
Percent of map unit: 10 percent
Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear

Hinckley, loamy sand
Percent of map unit: 5 percent
Landform: Deltas, eskers, outwash plains, kames
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear

26B—Windsor loamy sand, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 2svkf
Elevation: 0 to 1,210 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition
Windsor, loamy sand, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor, Loamy Sand

Setting
Landform: Deltas, dunes, outwash plains, outwash terraces

Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

O - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A

Minor Components

Hinckley, loamy sand

Percent of map unit: 10 percent
Landform: Deltas, eskers, outwash plains, kames
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear

Deerfield, loamy sand

Percent of map unit: 5 percent
Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear

26E—Windsor loamy sand, 15 to 60 percent slopes

Map Unit Setting

National map unit symbol: 2w2ws
Elevation: 0 to 760 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Windsor and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor

Setting

Landform: Deltas, dunes, outwash plains, outwash terraces
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 15 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A

Minor Components

Hinckley

Percent of map unit: 10 percent
Landform: Deltas, eskers, outwash plains, kames
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear

Deerfield

Percent of map unit: 5 percent
Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear

196A—Meadowsedge peat, 0 to 1 percent slopes, ponded

Map Unit Setting

National map unit symbol: 21xtp
Elevation: 250 to 2,940 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 90 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Meadowsedge, ponded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meadowsedge, Ponded

Setting

Landform: Bogs
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Organics

Typical profile

Oi - 0 to 4 inches: mucky peat
Oe - 4 to 65 inches: moderately decomposed plant material

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained

Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very high (about 20.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D

Minor Components

Chocorua
Percent of map unit: 5 percent
Landform: Bogs
Down-slope shape: Concave
Across-slope shape: Concave

Searsport
Percent of map unit: 3 percent
Landform: Outwash terraces
Down-slope shape: Concave
Across-slope shape: Concave

Chocorua
Percent of map unit: 3 percent
Landform: Bogs
Down-slope shape: Concave
Across-slope shape: Concave

Medomak
Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave

Peacham
Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave

300B—Udipsamments, 0 to 6 percent slopes

Map Unit Setting
National map unit symbol: 23g13
Elevation: 200 to 2,940 feet
Mean annual precipitation: 40 to 50 inches

Mean annual air temperature: 37 to 55 degrees F
Frost-free period: 90 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Udipsamments and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udipsamments

Setting

Landform: Terraces
Parent material: Outwash

Typical profile

H1 - 0 to 1 inches: loamy sand
H2 - 1 to 65 inches: gravelly sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydrologic Soil Group: A

Minor Components

Adams

Percent of map unit: 3 percent
Landform: Outwash terraces
Down-slope shape: Linear
Across-slope shape: Linear

Windsor

Percent of map unit: 2 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear

Champlain

Percent of map unit: 2 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear

Colton

Percent of map unit: 1 percent
Landform: Terraces

Down-slope shape: Linear
Across-slope shape: Linear

Hinckley

Percent of map unit: 1 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear

Boscawen

Percent of map unit: 1 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear

Soil Information for All Uses

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Soil Erosion

This folder contains a collection of tabular reports that present soil erosion factors and groupings. The reports (tables) include all selected map units and components for each map unit. Soil erosion factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

RUSLE2 Related Attributes

This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. The report includes the map unit symbol, the component name, and the percent of the component in the map unit. Soil property data for each map unit component include the hydrologic soil group, erosion factors Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the mineral surface horizon. Missing surface data may indicate the presence of an organic surface layer. .

Report—RUSLE2 Related Attributes

Soil properties and interpretations for erosion runoff calculations. The surface mineral horizon properties are displayed. Organic surface horizons are not displayed.

RUSLE2 Related Attributes–Merrimack and Belknap Counties, New Hampshire								
Map symbol and soil name	Pct. of map unit	Slope length (ft)	Hydrologic group	Kf	T factor	Representative value		
						% Sand	% Silt	% Clay
6A—Saco mucky silt loam, 0 to 2 percent slopes, frequently flooded								
Saco, frequently flooded	75	197	B/D	.43	3	21.2	69.3	9.5
26A—Windsor loamy sand, 0 to 3 percent slopes								
Windsor, loamy sand	85	200	A	.15	5	85.0	14.0	1.0
26B—Windsor loamy sand, 3 to 8 percent slopes								
Windsor, loamy sand	85	197	A	.15	5	85.0	14.0	1.0
26E—Windsor loamy sand, 15 to 60 percent slopes								
Windsor	85	197	A	.15	5	85.0	14.0	1.0
196A—Meadowsedge peat, 0 to 1 percent slopes, ponded								
Meadowsedge, ponded	85	197	A/D	—	2	70.0	25.0	5.0
300B—Udipsamments, 0 to 6 percent slopes								
Udipsamments	90	197	A	.05	5	96.0	2.0	2.0

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

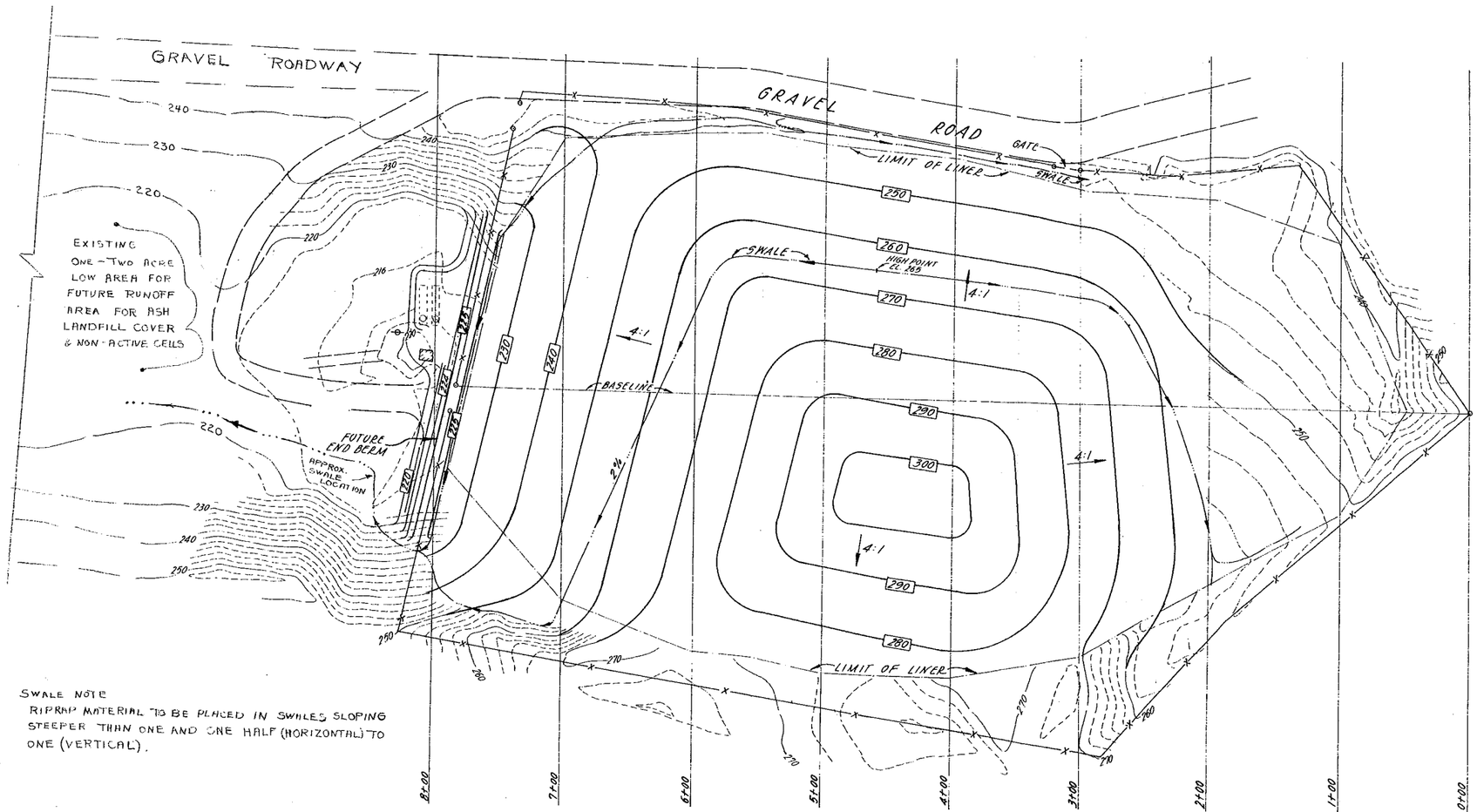
United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

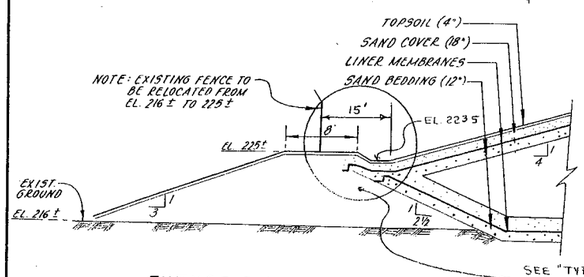
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

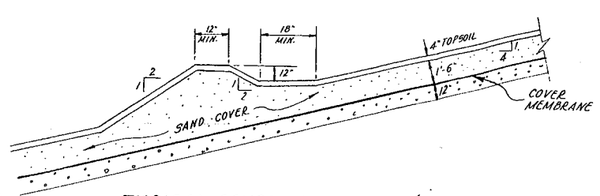


SWALE NOTE
RIPRAP MATERIAL TO BE PLACED IN SWALES SLOPING STEEPER THAN ONE AND ONE HALF (HORIZONTAL) TO ONE (VERTICAL).

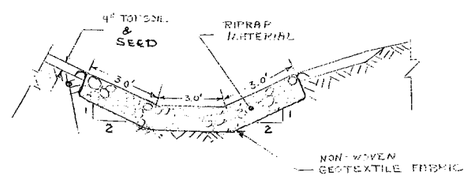


FUTURE END BERM DETAIL
(N.T.S.)

SEE "TYPICAL MEMBRANE LINER SYSTEM & ANCHORAGE AT LOW SIDE" FOR DETAILS (MK-S-10) 4



TYPICAL COVER MEMBRANE/SWALE DETAIL
(N.T.S.)



LINED RIPRAP SWALE
NTS

Notes:

1) BOTTOM MEMBRANE NOTE: FROM STATION 5+68 +/- TO THE END BERM, 60 MIL HYPALON MEMBRANE WILL BE INSTALLED IN PLACE OF THE 36 MIL HYPALON MEMBRANE NOTED ON PLANS.

2) CAP (COVER) MEMBRANE NOTE: FROM STATION 2+82 +/- TO THE END BERM, 45 MIL HYPALON MEMBRANE WILL BE INSTALLED IN PLACE OF THE 36 MIL HYPALON MEMBRANE NOTED ON PLANS.

THE STATE OF NEW HAMPSHIRE JAMES F. MAYO No. 6126 Licensed PROFESSIONAL ENGINEER

2001 REVISIONS
9/7/01

THE STATE OF NEW HAMPSHIRE ROBERT P. BRECKNOCK No. 4457 REG. PROFESSIONAL ENGINEER

Bob Breckenock

NO.	REVISION	DATE	DRWN	CHKD	APPR
1	ADDED "LINED RIPRAP SWALE DETAIL" NOTE	5/20	PSL		
2	REVISED RUNOFF BASIN NOTE & ADDED GROUND CONTOURS THIS AREA	1/1990	PSL		
3	REV. TYP. MEMBRANE DETAIL	10/92	MT		
4	ADDED NOTE TO FUTURE END BERM	5/01	PSL	JFM	JFM
5	ADDED 60 MIL AND 45 MIL NOTE	9/01	PSL	JFM	JFM

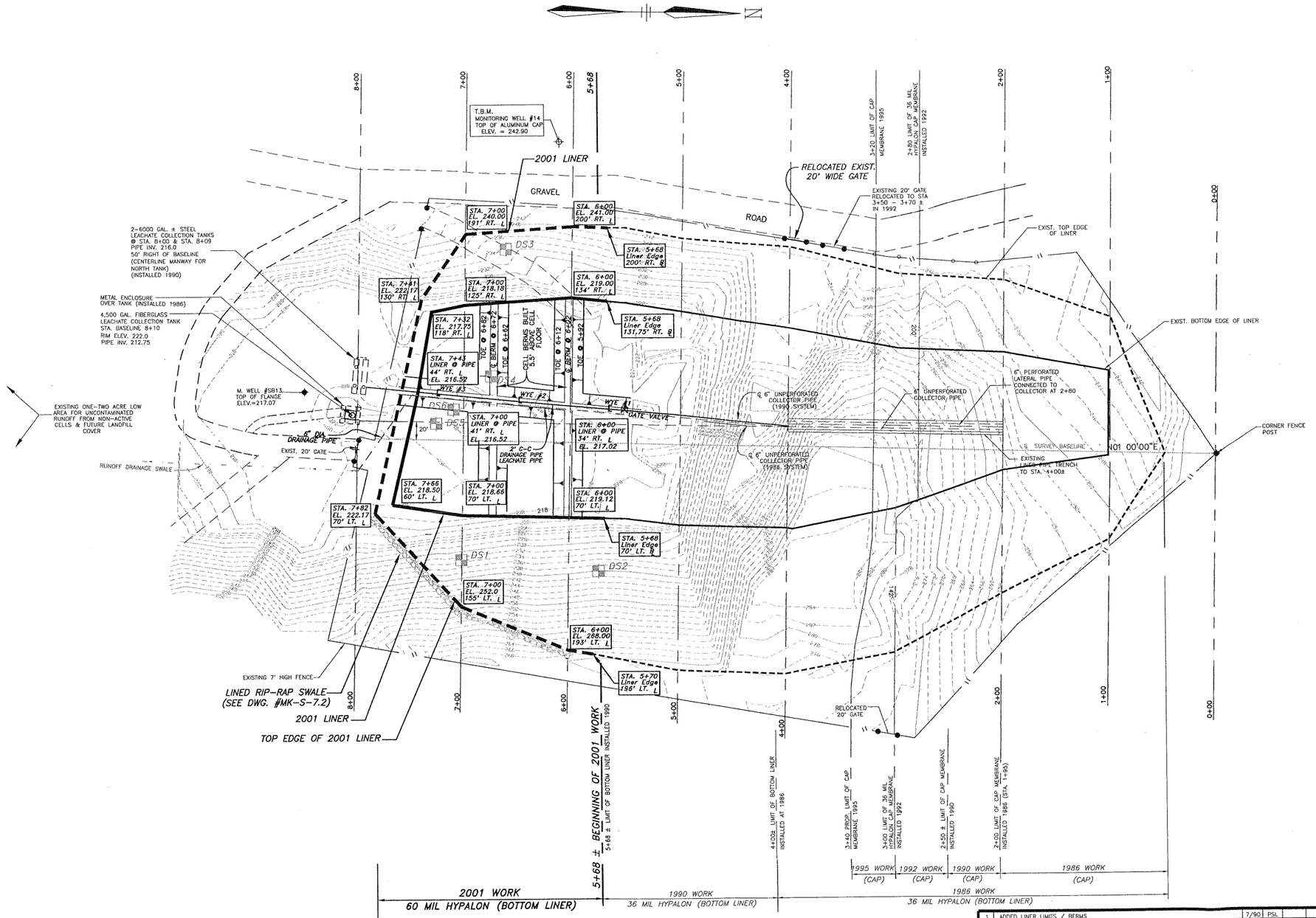
DRAWN: W. N. T.
DESIGNED: P. S. L.
CHECKED:
APPROVED:

PSNH PUBLIC SERVICE Company of New Hampshire — ENGINEERING DIVISION

CLOSURE PLAN
ASH DISPOSAL LANDFILL
MERRIMACK STATION
BOW, N. H.

SCALE	DATE	SHEET	DRAWING NO.
1" = 50'	7/6/90	___OF___	MK-S- 7.2

BRUNING 44-231 70385



REFERENCE PLAN :

DUBOIS AND KING INC. DWG. # C-164 PROJ. # 38001
1"=50' 10-31-83

SURVEY NOTES:

- SITE SURVEYED IN 1985
- SITE SURVEYED JULY 1988
- PARTIAL SURVEY JULY 1990
- SITE SURVEY OCTOBER 1991
- PARTIAL SURVEY OCTOBER 1993
- PARTIAL SURVEY MARCH 1995
- PARTIAL SURVEY 1997 (VOLUME)
- PARTIAL SURVEY APRIL 2001
- PARTIAL SURVEY NOVEMBER 2001

LEGEND:

- DENOTES EXISTING CONTOURS
- DENOTES EXISTING FENCE
- DENOTES DESTRUCTIVE SAMPLING SEAM SAMPLE
- WYE #1 DENOTES APPROXIMATE WYE LOCATION

NOTES:

1. SEE SECTION DRAWINGS FOR PROPOSED FINAL GRADES.
2. SEE DRAWINGS MK-S-11, 12, 13 FOR CELL SEPARATION BERM DETAILS.
3. RUNOFF FROM NON-ACTIVE CELLS TO FLOW THROUGH PIPES AND RUNOFF DRAINAGE SWALE THAT DIRECT UNCONTAMINATED RUNOFF TO EXISTING ONE-TWO ACRE LOW AREA SOUTH OF LANDFILL.
4. TOTAL AREA WITHIN FENCE IS 6.7 ± ACRES.
5. TOTAL AREA WITHIN LINER IS 5.4 ± ACRES.
6. BOTTOM MEMBRANE NOTE: FROM STATION 5+68 +/- TO THE END BERM, 60 MIL HYPALON MEMBRANE WILL BE INSTALLED IN PLACE OF THE 36 MIL HYPALON MEMBRANE NOTED ON PLANS.
7. CAP (COVER) MEMBRANE NOTE: FROM STATION 2+82 +/- TO THE END BE 45 MIL HYPALON MEMBRANE WILL BE INSTALLED IN PLACE OF THE 36 MIL HYPALON MEMBRANE NOTED ON PLANS.

AS-BUILT NOTE:

NOVEMBER 11, 2001 AS-BUILT SURVEY OF THE HORIZONTAL AND VERTICAL LOCATION OF THE LINER IS CONCURRENT WITH THE PROPOSED DESIGN.

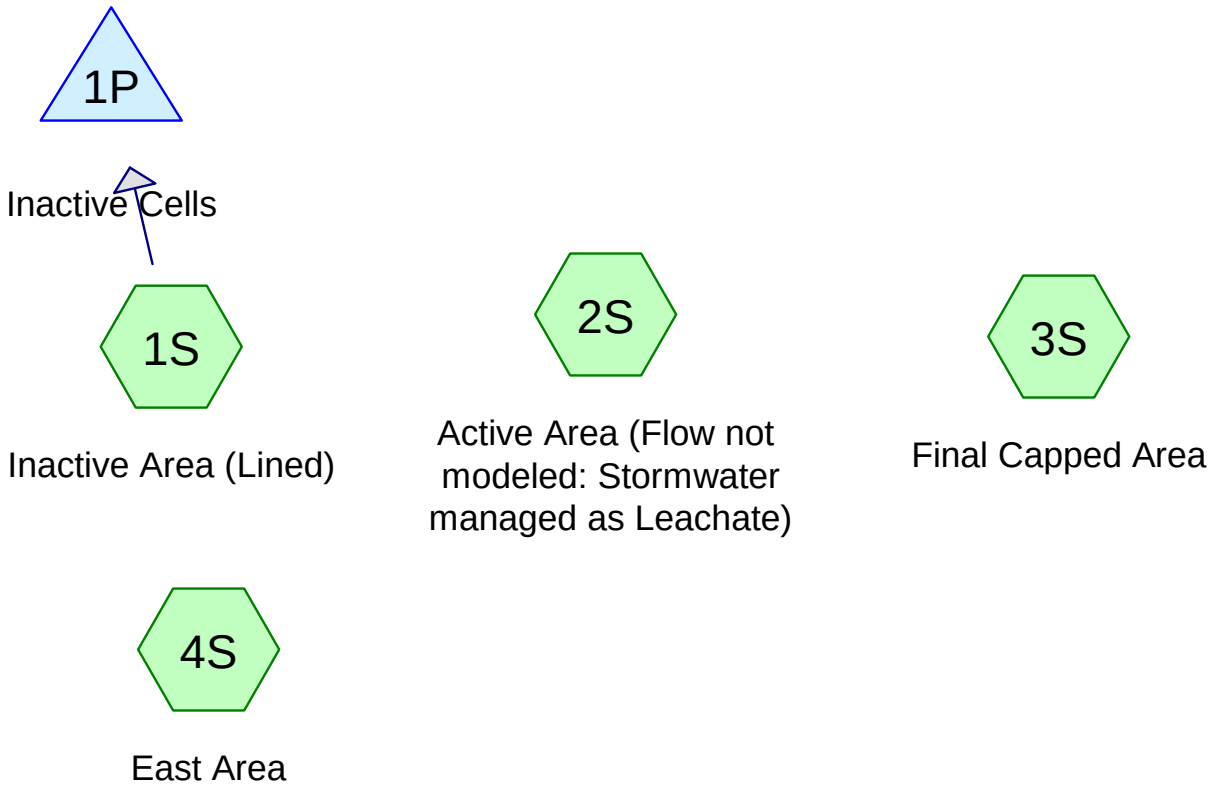
NO.	REVISION	DATE	DRWN	CHKD	APPR
1	ADDED LINER LIMITS / BERMS	7/90	PSL		
2	ADDED UNCONTAMINATED STORMWATER PIPE	8/90	PSL		
3	1990 "AS-BUILTS"	1/91	WNT		
4	UPDATED CONTOURS FROM OCT. 1991 SURVEY INFO.	11/91	GBS		
5	EXTENDED CAP MEMBRANE BETWEEN STA 2+50 & 3+00 AS SHOWN	6/92	NMV		
6	REVISED LIMIT OF CAP MEMBRANE BETWEEN STA. 2+80 & 3+00	10/92	WNT		
7	UPDATED CONTOURS FROM OCT. 1993 SURVEY	2/94	WNT		
8	UPDATED CONTOURS FROM MARCH 1995 SURVEY	4/95	WNT	PSL	PSL
9	UPDATED CONTOURS FROM APRIL 2001 SURVEY	6/01	WNT	PSL	PSL
10	ADDED 2001 LINER WORK ITEMS	6/01	WNT	PSL	PSL
11	ADDED 60 MIL & 45 MIL NOTES	9/01	JRM	PSL	PSL
12	2001 AS-BUILT	05/02	WNT	AGP	AGP

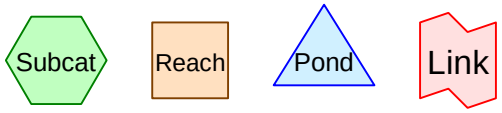
PSNH PUBLIC SERVICE OF NEW HAMPSHIRE — GENERAL ENGINEERING DIVISION

DRAWN	DJT
DESIGNED	PSL
CHECKED	PSL
APPROVED	PSL

PLAN OF ASH DISPOSAL LANDFILL
MERRIMACK STATION
PUBLIC SERVICE CO. OF NEW HAMPSHIRE
BOW, NEW HAMPSHIRE

SCALE	DATE	SHEET	DRAWING NO.
1"=50'	7/13/90	OF	MK-S-7.





Routing Diagram for Current Drainage
Prepared by Sanborn Head & Associates, Inc., Printed 8/18/2016

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.110	74	Final Cap (Assumed same as HSG C/grassed/good condition) (3S)
0.690	98	Modeled as Impervious Area (1S)
0.320	32	Woods/grass comb., Good, HSG A (4S)
3.120	**75**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.320	HSG A	4S
0.000	HSG B	
2.110	HSG C	3S
0.000	HSG D	
0.690	Other	1S
3.120		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	2.110	0.000	0.000	2.110	Final Cap (Assumed same as	3S
0.000	0.000	0.000	0.000	0.690	0.690	Modeled as Impervious Area	1S
0.320	0.000	0.000	0.000	0.000	0.320	Woods/grass comb., Good	4S
0.320	**0.000**	**2.110**	**0.000**	**0.690**	**3.120**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	219.00	216.80	110.0	0.0200	0.012	6.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Inactive Area (Lined) Runoff Area=0.690 ac 100.00% Impervious Runoff Depth>5.03"
Flow Length=100' Slope=0.2800 '/' Tc=0.4 min CN=98 Runoff=3.95 cfs 0.289 af

Subcatchment 2S: Active Area (Flow not modeled: Stormwater managed as Leachate)
Runoff=0.00 cfs 0.000 af

Subcatchment 3S: Final Capped Area Runoff Area=2.110 ac 0.00% Impervious Runoff Depth>2.58"
Flow Length=379' Tc=6.3 min CN=74 Runoff=6.00 cfs 0.453 af

Subcatchment 4S: East Area Runoff Area=0.320 ac 0.00% Impervious Runoff Depth>0.05"
Flow Length=415' Tc=9.5 min CN=32 Runoff=0.00 cfs 0.001 af

Pond 1P: Inactive Cells Peak Elev=220.28' Storage=0.052 af Inflow=3.95 cfs 0.289 af
6.0" Round Culvert n=0.012 L=110.0' S=0.0200 '/' Outflow=0.76 cfs 0.289 af

Total Runoff Area = 3.120 ac Runoff Volume = 0.744 af Average Runoff Depth = 2.86"
77.88% Pervious = 2.430 ac 22.12% Impervious = 0.690 ac

Summary for Subcatchment 1S: Inactive Area (Lined)

[49] Hint: Tc<2dt may require smaller dt

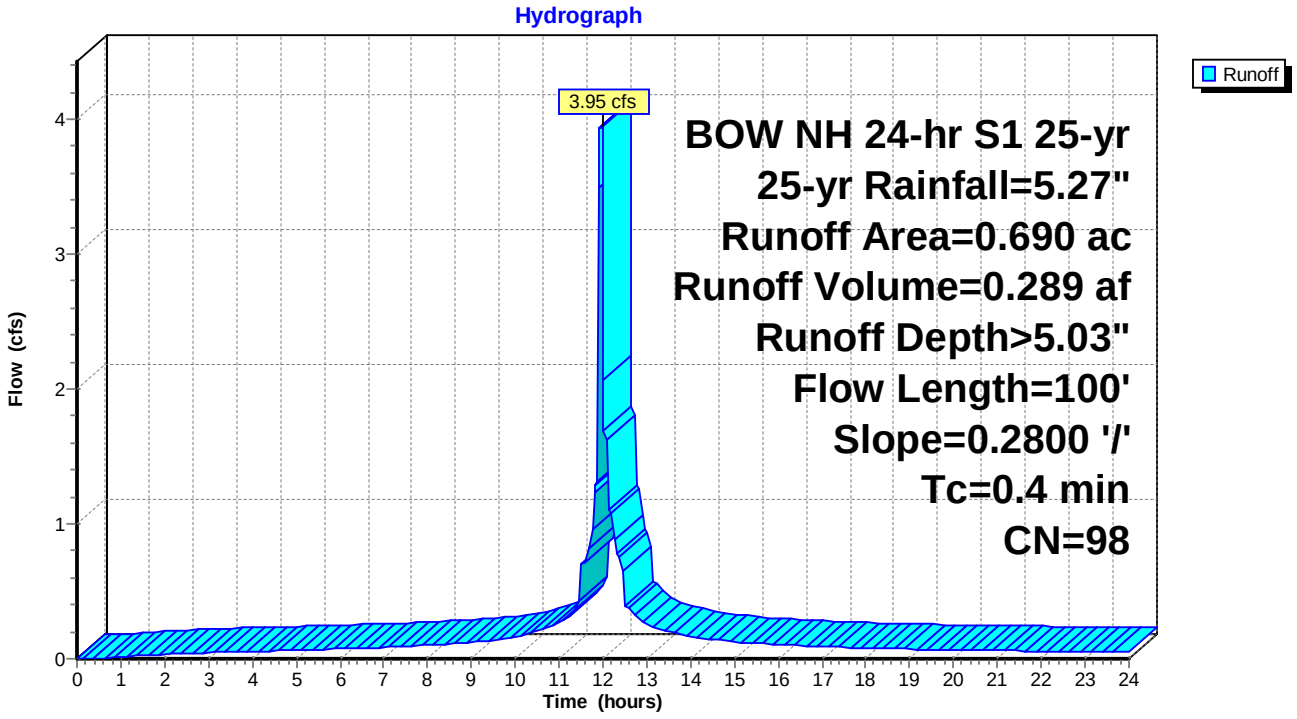
Runoff = 3.95 cfs @ 11.99 hrs, Volume= 0.289 af, Depth> 5.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
BOW NH 24-hr S1 25-yr 25-yr Rainfall=5.27"

	Area (ac)	CN	Description
*	0.690	98	Modeled as Impervious Area
	0.690		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	100	0.2800	3.72		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.84"

Subcatchment 1S: Inactive Area (Lined)



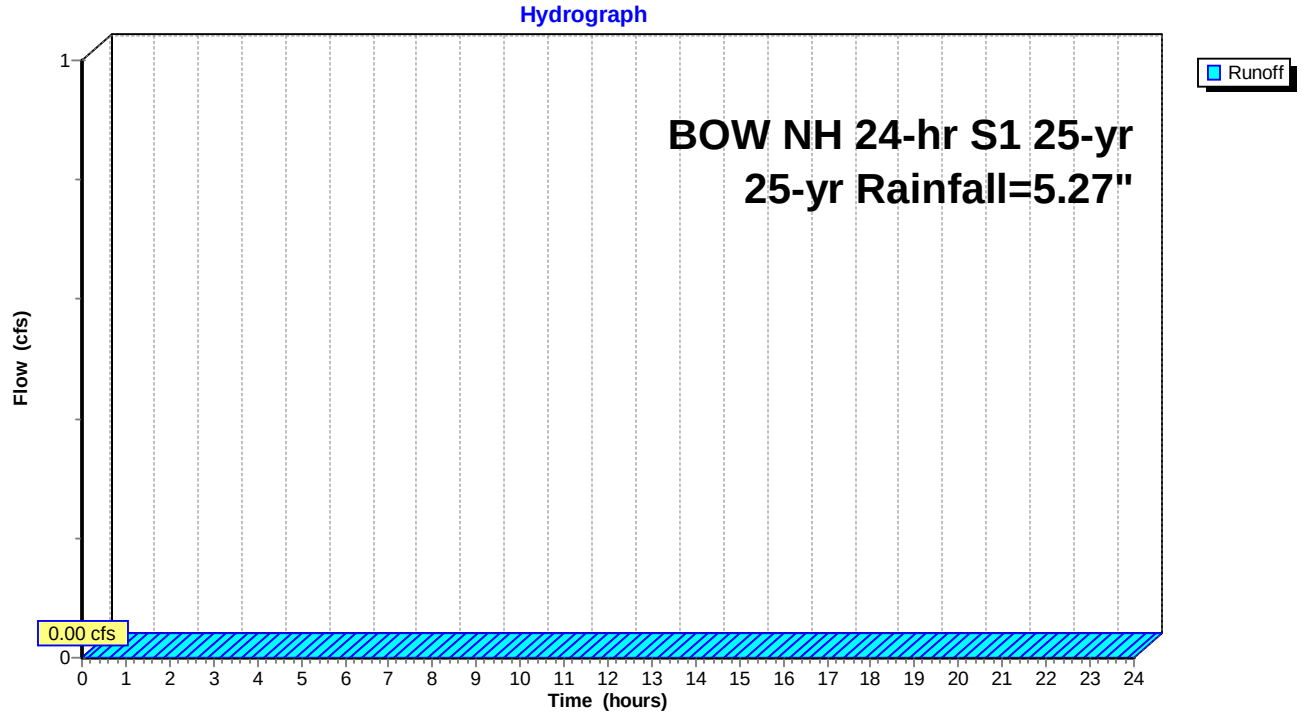
Summary for Subcatchment 2S: Active Area (Flow not modeled: Stormwater managed as Leachate)

[40] Hint: Not Described (Area=0)

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
BOW NH 24-hr S1 25-yr 25-yr Rainfall=5.27"

Subcatchment 2S: Active Area (Flow not modeled: Stormwater managed as Leachate)



Summary for Subcatchment 3S: Final Capped Area

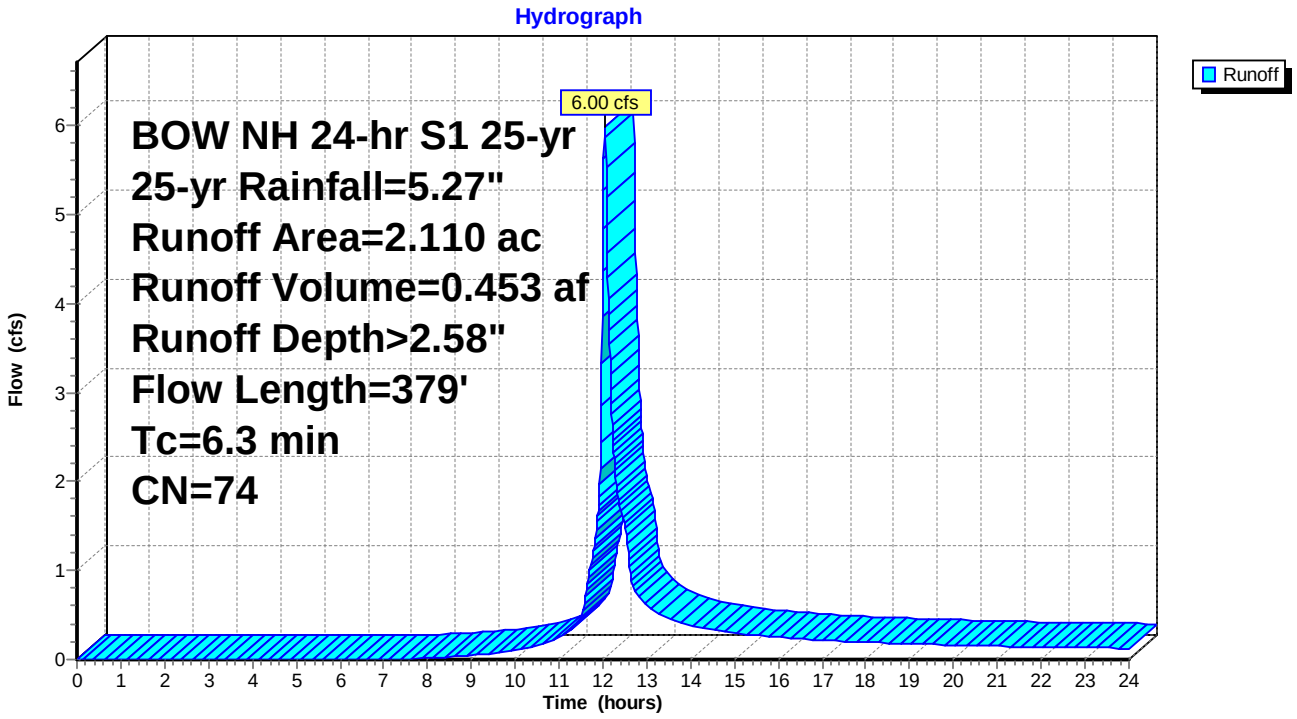
Runoff = 6.00 cfs @ 12.04 hrs, Volume= 0.453 af, Depth> 2.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
BOW NH 24-hr S1 25-yr 25-yr Rainfall=5.27"

	Area (ac)	CN	Description
*	2.110	74	Final Cap (Assumed same as HSG C/grassed/good condition)
	2.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.1950	0.40		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
2.1	279	0.1050	2.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.3	379	Total			

Subcatchment 3S: Final Capped Area



Summary for Subcatchment 4S: East Area

[73] Warning: Peak may fall outside time span

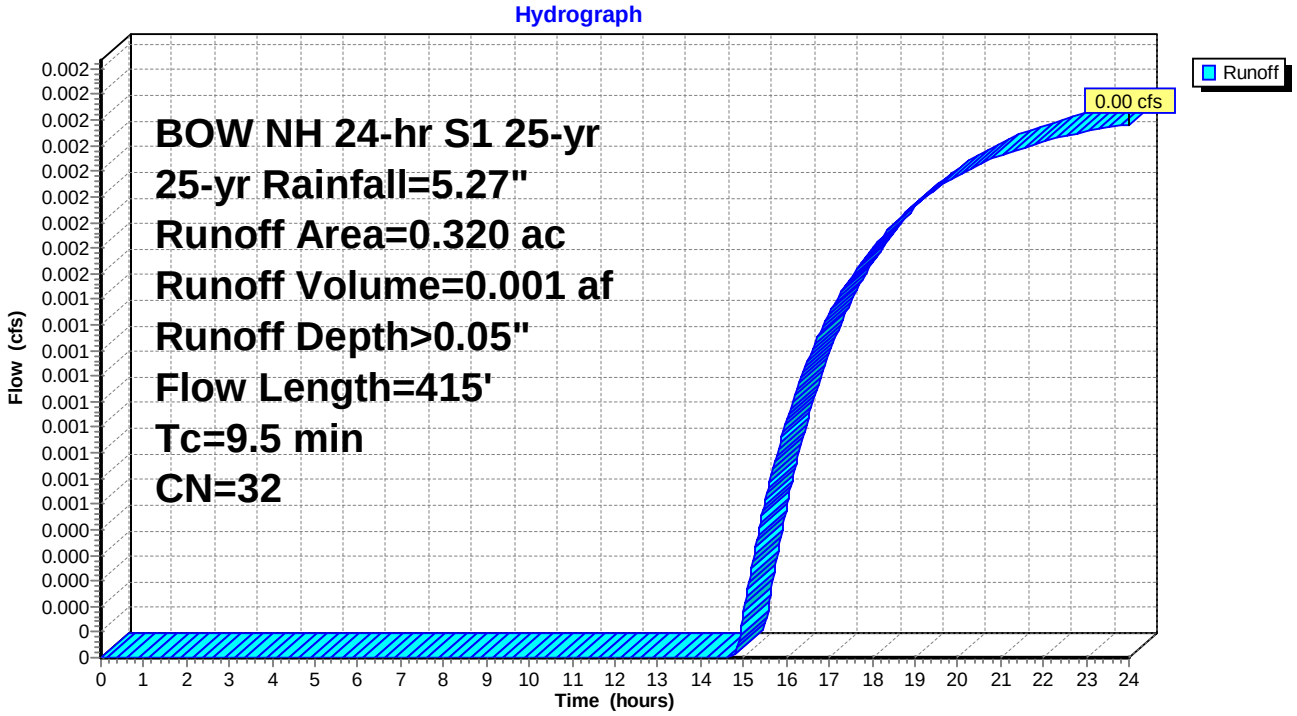
Runoff = 0.00 cfs @ 23.99 hrs, Volume= 0.001 af, Depth> 0.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
BOW NH 24-hr S1 25-yr 25-yr Rainfall=5.27"

Area (ac)	CN	Description
0.320	32	Woods/grass comb., Good, HSG A
0.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	100	0.0400	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
1.5	165	0.0650	1.78		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	150	0.2800	20.10	153.00	**Trap/Vee/Rect Channel Flow, Riprap-lined Channel** Bot.W=3.00' D=1.34' Z= 2.0 '/' Top.W=8.36' n= 0.035
9.5	415	Total			

Subcatchment 4S: East Area



Summary for Pond 1P: Inactive Cells

Inflow Area = 0.690 ac,100.00% Impervious, Inflow Depth > 5.03" for 25-yr event
Inflow = 3.95 cfs @ 11.99 hrs, Volume= 0.289 af
Outflow = 0.76 cfs @ 12.32 hrs, Volume= 0.289 af, Atten= 81%, Lag= 20.0 min
Primary = 0.76 cfs @ 12.32 hrs, Volume= 0.289 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 220.28' @ 12.32 hrs Surf.Area= 0.195 ac Storage= 0.052 af
Flood Elev= 223.00' Surf.Area= 0.303 ac Storage= 0.478 af

Plug-Flow detention time= 17.1 min calculated for 0.289 af (100% of inflow)
Center-of-Mass det. time= 16.1 min (759.1 - 743.0)

Volume	Invert	Avail.Storage	Storage Description
#1	220.00'	0.478 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
220.00	0.180	480.0	0.000	0.000	0.180
222.00	0.303	636.0	0.478	0.478	0.499

Device	Routing	Invert	Outlet Devices
#1	Primary	219.00'	**6.0" Round Culvert (Elevations Assumed)** L= 110.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 219.00' / 216.80' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.76 cfs @ 12.32 hrs HW=220.28' (Free Discharge)
1=Culvert (Elevations Assumed) (Inlet Controls 0.76 cfs @ 3.85 fps)

Pond 1P: Inactive Cells