CEDAR CREEK energy

# Vegetation Management Plan for

# Connexus Landfill

Prepared February 2025 by:

Natural Resource Services

Contents

# 1. Connexus Landfill Vegetation Management Plan (VMP) Overview

## 1.1. Site Developer

Cedar Creek Energy
3155 104th LN NE
Blaine, MN 5549
763.450.9763

## 1.2. Vegetation Restoration Consultant

Natural Resource Services, Inc
2885 Quail Road NE
Sauk Rapids, MN 56379
320.290.5363

and

16425 W. State Route 90
Princeville, IL 61559

## 1.3. Project Description

The proposed Connexus Landfill project is a 4.125 MW AC project planned for approximately 26.21 acres of solar footprint in Anoka County, Ramsey, Minnesota. Tracker-style panels with approximately 24" ground clearance at max tilt and above-ground drivelines are planned.

Some tree removal will be set forth to avoid hindering the productivity of solar panels. An existing tree line on the northern, eastern, and parts of the western end of the site will provide vegetative screening. One wetland has been delineated and identified within the fenced project area. The site will be planted with a fully-native pollinator mix to achieve the Habitat Friendly Solar status as defined by the Board of Water and Soil Resources.[1] An uncommon MN native plant species, creeping juniper, has also been identified on site. Any possible future herbicide applications will be done so in a manner to maintain a 5-foot buffer around this species.

## 1.4. VMP Use and Objectives

The VMP was written to provide a brief overview and description of the project and to act as a guide for vegetation installation and management. It has been custom-written based on information known at the time of writing. The VMP should be treated as a living document and adjusted as additional information about the site is gathered both pre and post construction. A qualified native vegetation contractor with a history of success working on native vegetation restorations should be contracted to implement the procedures outlined in this document and to provide feedback and suggestions for the VMP during the lifespan of the project.

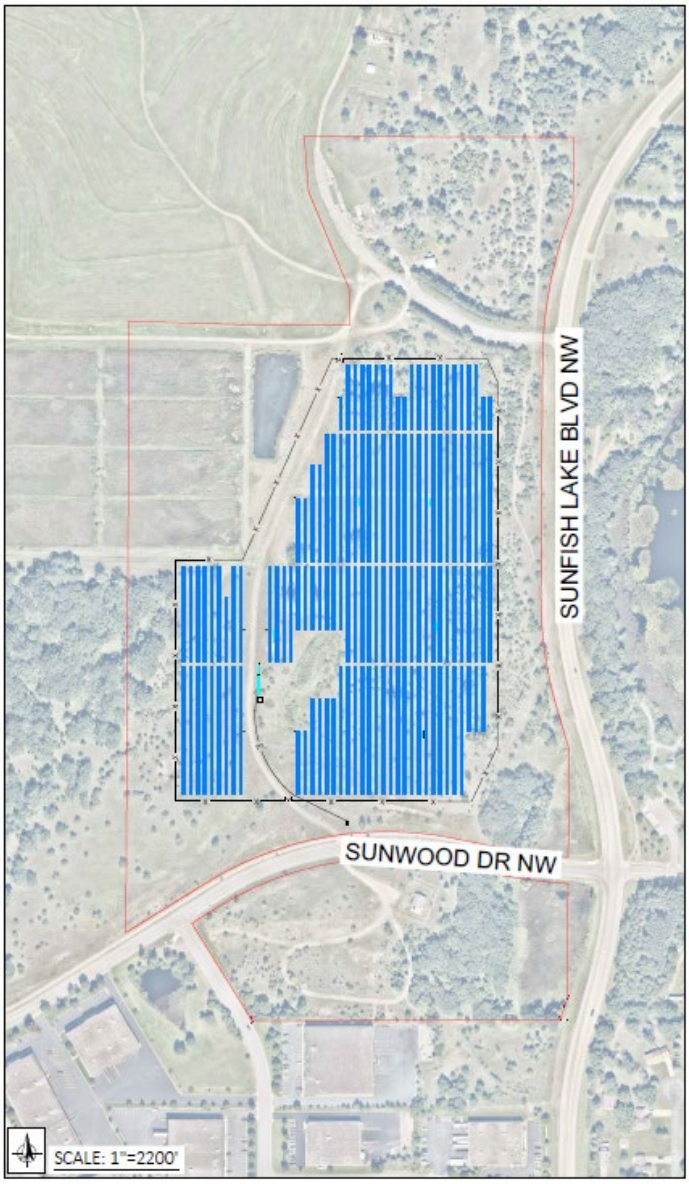
[1]https://www.revisor.mn.gov/statutes/cite/216B.1642

# 2. Site Information

## 2.1. Site Location

The Connexus Landfill project site is located on the west side of the intersection of Sunwood Dr. NW and Sunfish Lake Blvd NW. It is found approximately 1.25 miles to the northeast of the Mississippi River and less than ¼ of a mile to the West of Sunfish Lake in Ramsey township. The GPS coordinates of Connexus Landfill are 45.236828, -93.429691.

## 2.2. Map of Array Layout




## 2.3. Site Conditions

A review of historical aerial photos shows that a majority of the site has been minimally disturbed over the past 30 years. Over time, the presence of trees and shrubs has grown and the delineated wetlands can be observed. A review of the soils on the USDA/NRCS Web Soil Survey shows excessively drained soils; 55% of the site is ecologically classified as Hubbard loamy sand, 35% as a gravel-Udipsamments complex, and the remaining 10% as Nymore loamy coarse sand.

# 3. Overview of Vegetation Establishment and Management

## 3.1. Vegetative Goals

The primary vegetative goal is to establish permanent vegetation that does not interfere with solar production. This solar site is being planted with 100% native species. The species chosen produce an emphasis on native pollinator habitat to achieve and maintain the Habitat Friendly Solar status.

## 3.2. Contribution of Native Habitat on Solar Sites

Economical production of power is the foremost goal of solar sites. There is a parallel opportunity to provide critically important native pollinator-friendly habitat throughout the array while capitalizing on the long-term low maintenance needs of native vegetation.

Establishing prairies and other native plant communities within the confines of solar sites provides a tremendous opportunity to restore ecosystems that have been severely degraded or eliminated across all areas of the country.

Native plants have profound root systems, many reaching 12 or more feet deep into the soil. Rainwater follows those roots into the ground, helping to reduce water runoff and promote the drainage of standing water into an aquifer. Those deep roots also stabilize the soil, preventing erosion from rain and wind. The plants provide seeds for songbirds, cover for game birds and, of course, provide blossoms and host plants for our beloved butterflies and other nectar-loving insects.

Native grasses and forbs will be selected based on their ecological appropriateness to the specific conditions of this site, with consideration to their mature height to not interfere with panel productivity. These species will not require irrigation, fertilizer, or other soil amendments.

The contribution to habitat restoration cannot be overstated given the acreage impacted and lifespan of the project.

## 3.3. Vegetation Installation Overview

The native mix planned for this array is selected for ecological appropriateness to the soil types, moisture, and conditions as well as the mature plant height of 24” to 36” so as to not interfere with panel productivity. The habitat provides low-maintenance vegetation that won’t require fertilizer, amended soils or irrigation on this site.

It is important to note that the species selected for this site are based on their ability to successfully establish from seed and thrive within the unique conditions found on solar sites. From a practical standpoint, the species contained in these mixes are generally available in the marketplace and, as a whole, have reasonable price points. Ultimately, the list consists of well-performing, workhorse species coupled with smaller amounts of more unique species for a robust mixture.

## 3.4. Vegetation Management Overview

Maintenance plays a vital role in the eventual success of any native landscape installation, especially during the establishment period of years one through three. Active management is similar in all areas of the project site. All areas of the site are inspected annually followed by maintenance necessary to encourage healthy native species while discouraging non-native/invasive species. During the growing season of the first year of establishment, the site shall be inspected a minimum of three times.

# 4. Vegetation Installation Procedures

## 4.1. Site Inspections and Monitoring

Site inspections and monitoring throughout the installation process are vital to continually assess site conditions and determine what procedures are needed and the timing of those procedures. The pre-construction site inspection is particularly important to determine the need for any herbicide application or mowing prior to soil preparation and seeding.

## 4.2. Site Preparation Herbicide Application

A site preparation herbicide application, if deemed necessary, should be performed by a licensed, qualified contractor using appropriate herbicides to kill all actively growing weeds on the project site. Typically, only glyphosate herbicide is necessary, but if certain perennial weed species are present such as Canada thistle, a broadleaf additive may be necessary. The contractor should carefully select an herbicide with a short soil residual, such as Garlon 3A, to minimize the impact on germination of the permanent seeding. The vegetation should not be disturbed for a minimum of 14 days after an herbicide application to allow time for effective weed elimination.

## 4.3. Site Preparation Mowing

Site preparation mowing may be required to reset vegetative growth to prepare for an herbicide application. Additionally, site preparation mowing may be needed to cut and mulch vegetation to simplify the soil preparation and seeding process.

## 4.4. Soil and Seedbed Preparation

Soil and seedbed preparation is vital to the success of any planting. Disking and harrowing (or raking) the site is common and extremely effective. If extreme compaction is present on site, a ripper may be needed to mitigate the compaction. The seedbed should be relatively smooth and firm prior to seeding. Soil that is too clumpy or too fluffy may result in seeds being planted too deep in the soil to germinate and survive.

## 4.5. Seed and Seeding

A custom native pollinator seed mix has been designed for use on this project and is found in Section 8. Seeding will be completed through broadcasting by using a mechanical spreader appropriate for the specified seed mixes. Large and fluffy seeds (such as most grasses and cover crop) should be broadcast first and then lightly harrowed/raked into the soil. Following the harrowing, small seeds (such as most forbs, sedges, and rushes) should be broadcast on top of the soil.

### 4.6. Erosion control

Erosion control measures should be implemented as required after permanent seeding is completed.

## 5. Vegetation Management Procedures

### 5.1. Adaptive Management

An adaptive management strategy is vital to the success of any project, but especially so for native pollinator restorations. Adaptive management consists of continual monitoring and adjusting maintenance strategies based on the site conditions in order to achieve the best outcomes. No two sites are exactly the same and responding to changing site conditions, weed pressures, weather, and a multitude of other variables is essential to the success of the planting.

### 5.2. Complete Site Maintenance Mowing

Complete site maintenance mowing consists of mowing the entire project area during the growing season, including trimming as appropriate around equipment or in inaccessible areas. Complete site maintenance mowing is implemented primarily during the establishment phase of the restoration (years 1-3) for several reasons. First, if a closed canopy of vegetation develops, mowing is implemented to knock back the taller vegetation and allow sunlight to reach the native seedlings below. Second, if weed species are present and actively nearing their seed set, mowing is implemented to prevent those weeds from producing viable seed. Third, vegetation has become tall enough to shade the panels or impact other solar equipment on site and must be cut down.

### 5.3. Integrated Vegetation Maintenance

Integrated vegetation maintenance or IVM is a method using a combination of targeted mowing/trimming and herbicide application aimed at reducing or eliminating weed species and promoting the desired vegetation. IVM can also include grazing, haying, and other maintenance options as appropriate. IVM is implemented starting towards the end of the 2$^{nd}$ full growing season typically and is used throughout the life of the project. 3 IVM visits are typical on most sites until year 5 when a reduction to 1-2 visits per year can be made if site conditions allow.

### 5.4. Dormant Mowing

Dormant mowing is a type of complete site mow implemented when vegetation is not actively growing on site. This method is typically performed in early spring or fall. Oftentimes, dormant mows are completed in the fall to mulch up dead vegetation and encourage decomposition. This practice also has a dual purpose of cleaning up the site to make electrical maintenance easier and to reduce the chance of accidental fire.

# 6. Vegetation Installation and Management Timeline

## 6.1. Site Prep and Installation Phase

*Site Preparation:*

1. Prior to the start of construction, a cover crop may be seeded to aid in erosion control, soil moisture management, and weed suppression.
2. Inspection of the project area to assess site conditions and determine the need for any site prep mowing or spraying activities.
3. If necessary, an herbicide application will be completed using glyphosate (Round-up® or equivalent) as per manufacturer's directions in areas with actively growing vegetation. Allow a minimum of 14 days before disturbing the soil or completing seeding activities.
4. When perennial broadleaf vegetation is present a triclopyr herbicide will be added (Garlon 3A® or equivalent) as per manufacturer's directions. When a broadleaf herbicide is used allow a minimum of 30 days before disturbing the site or completing seeding.
5. Depending on the density and type of undesirable vegetation present (i.e., annual vs perennial) a complete site mowing might be advisable in lieu of an herbicide application. For instance, if the site is dominated by Foxtail (an annual), mowing would be preferrable to an herbicide application.

*Soil Prep and Seeding:*

1. Construction debris, garbage, and building materials will be removed and/or staged outside the intended seeding areas.
2. Disk soil within the project area in preparation for seeding. Harrow or rake the soil to achieve the proper seedbed.
3. Broadcast the large and fluffy seed (mostly grasses) along with a cover crop of winter wheat or oats.
4. Harrow or rake the soil to work the seed to a proper depth.
5. Broadcast the small seeds (forbs, sedges, rushes, small grass seeds) on top of the soil.

*Installation Phase Maintenance*

If the site is seeded in the summer or early fall, 1-2 complete site mowings may be needed during this first partial growing season.

## 6.2. Establishment Phase

Year 1 is defined as the 1st full growing season for the vegetation. A recommendation of 3 complete site mowings is most common for this phase. Depending on site conditions and vegetation growth, more or less may be needed.

Year 2 is the second full growing season. 3 total visits are typical with 2 complete site mowings and 1 Integrated Vegetation Maintenance visit the most likely combination.

Year 3 typically requires 3 IVM site visits depending on vegetation status.

### 6.3. Maintenance Phase

Year 4 – 34. During the maintenance phase, 2 IVM visits are typical.

## 7. Monitoring

Consistent project monitoring is essential to evaluate vegetative establishment, weed presence, and possible erosion concerns. This information helps determine which management procedures to utilize, the proper timing for those procedures, and whether any other remedial action is required such as reseeding or replanting. As the site's vegetation matures, adaptive management should be utilized as previously described.

# 8. Seed Mix

## Connexus Landfill Native Mix

Seeding Rate - 13.25 lb/acre - 85 seeds/ft$^2$

| Common Name | Scientific Name | Bloom Month | % of Mix by Weight | Lbs/Acre | Seeds/ft$^2$ | % of Mix by Seeds/ft$^2$ |
|---|---|---|---|---|---|---|
| Sideoats Grama | Bouteloua curtipendula | | 28.30% | 3.75 | 8.26 | 9.73% |
| Blue Grama | Bouteloua gracilis | | 4.91% | 0.65 | 9.55 | 11.24% |
| Prairie Brome | Bromus kalmii | | 1.89% | 0.25 | 0.73 | 0.86% |
| Plains Oval Sedge | Carex brevior | | 2.26% | 0.30 | 3.20 | 3.76% |
| Slender Wheatgrass | Elymus trachycaulus | | 4.53% | 0.60 | 1.52 | 1.79% |
| Silky Wild Rye | Elymus villosus | | 4.53% | 0.60 | 1.21 | 1.43% |
| June Grass | Koeleria macrantha | | 0.38% | 0.05 | 3.67 | 4.32% |
| Little Bluestem | Schizachyrium scoparium | | 30.19% | 4.00 | 22.04 | 25.93% |
| Prairie Dropseed | Sporobolus heterolepis | | 0.38% | 0.05 | 0.29 | 0.35% |
| **Graminoid Total** | | | **77.36%** | **10.25** | **50.48** | **59.41%** |
| Common Yarrow | Achillea millefolium | Jun-Aug | 0.57% | 0.08 | 4.91 | 5.78% |
| Anise Hyssop | Agastache foeniculum | Jun-Sep | 0.09% | 0.01 | 0.40 | 0.47% |
| Prairie Onion | Allium stellatum | Jul-Aug | 0.11% | 0.02 | 0.06 | 0.07% |
| Lead Plant | Amorpha canescens | Jun-Aug | 1.30% | 0.17 | 1.01 | 1.19% |
| Canada Anemone | Anemone canadensis | May-Jun | 0.06% | 0.01 | 0.02 | 0.03% |
| Wild Columbine | Aquilegia canadensis | Apr-Jun | 0.06% | 0.01 | 0.10 | 0.12% |
| Common Milkweed | Asclepias syriaca | Jun-Aug | 0.17% | 0.02 | 0.03 | 0.04% |
| Butterfly Milkweed | Asclepias tuberosa | Jun-Aug | 0.14% | 0.02 | 0.03 | 0.03% |
| Canada Milkvetch | Astragalus canadensis | Jun-Aug | 0.79% | 0.11 | 0.66 | 0.77% |
| Partridge Pea | Chamaecrista fasciculata | Jul-Sep | 2.26% | 0.30 | 0.30 | 0.35% |
| Prairie Coreopsis | Coreopsis palmata | Jun-Aug | 0.28% | 0.04 | 0.14 | 0.16% |
| White Prairie Clover | Dalea candida | Jun-Sep | 3.82% | 0.51 | 3.53 | 4.16% |
| Purple Prairie Clover | Dalea purpurea | Jul-Sep | 5.66% | 0.75 | 4.96 | 5.84% |
| Rough Blazing Star | Liatris aspera | Jul-Oct | 0.09% | 0.01 | 0.07 | 0.08% |
| Wild Lupine | Lupinus perennis | May-Jul | 0.17% | 0.02 | 0.01 | 0.01% |
| Spotted Bee Balm | Monarda punctata | Jul-Sep | 0.11% | 0.02 | 0.50 | 0.58% |
| Large-flowered Beardtongue | Penstemon grandiflorus | May-Jun | 0.28% | 0.04 | 0.19 | 0.23% |
| Virginia Mountain Mint | Pycnanthemum virginianum | Jun-Sep | 0.11% | 0.02 | 1.21 | 1.43% |
| Long-headed Coneflower | Ratibida columnifera | Jun-Aug | 1.19% | 0.16 | 2.43 | 2.86% |
| Black-eyed Susan | Rudbeckia hirta | Jun-Oct | 1.81% | 0.24 | 8.11 | 9.54% |
| Gray Goldenrod | Solidago nemoralis | Aug-Oct | 0.06% | 0.01 | 0.83 | 0.97% |
| Upland White Goldenrod | Solidago ptarmicoides | Jun-Sep | 0.23% | 0.03 | 0.71 | 0.83% |
| Calico Aster | Symphyotrichum lateriflorum | Aug-Oct | 0.11% | 0.02 | 1.38 | 1.62% |
| Sky Blue Aster | Symphyotrichum oolentangiense | Aug-Oct | 0.23% | 0.03 | 0.88 | 1.04% |
| Prairie Spiderwort | Tradescantia bracteata | May-Jul | 0.10% | 0.01 | 0.05 | 0.06% |
| Hoary Vervain | Verbena stricta | Jun-Sep | 0.57% | 0.08 | 0.77 | 0.91% |
| Golden Alexanders | Zizia aurea | Apr-Jun | 2.26% | 0.30 | 1.21 | 1.43% |
| **Forb Total** | | | **22.64%** | **3.00** | **34.50** | **40.59%** |
| **Mix Total** | | | **100.00%** | **13.25** | **84.98** | **100.00%** |

Central MN Sandy Native Mix 02.2025

# 9. Pollinator Scorecard

## Habitat Friendly Solar Site Assessment Form for Project Planning

BWSR

For Solar Companies, Local Governments and Other Partners to Meet Habitat Friendly Solar Standards

Updated 12-22-23

Note: The use of state developed solar seed mixes over 70% of the plantable area of a site will result in automatically meeting the standard.

1) PLANNED PERCENT OF PLANTABLE AREAS WITHIN PROJCT FOOTPRINT DOMINATED BY NATIVE SPECIES COVER (forbs, grasses, sedges, rushes, ferns). PROJECTS MUST HAVE A GOAL OF AT LEAST 70% COVER OF NATIVE VEGETATION TO MEET HABITAT FRIENDLY SOLAR STANDARDS

| | | | |
|---|---|---|---|
| ☐ | 70-84% | +15 points | |
| ☒ | 85% and above | +20 points | Total Points 20 |

2) PERCENT OF PROPOSED SITE VEGETATION COVER TO BE DOMINATED BY FORBS (not grasses, sedges and rushes)

| | | | |
|---|---|---|---|
| ☐ | 10-19% | +5 points | |
| ☐ | 20-29% | +10 points | |
| ☐ | 30-39% | +15 points | |
| ☒ | 40 and above | +15 points | Total Points 15 |

Note: Projects may have "array" mixes and diverse border mixes; forb dominance should be averaged across the entire site. The dominance should be calculated from total numbers of forb seeds vs. grass seeds based on seeds per square foot (from all seed mixes to be planted).

3) PLANNED COVER DIVERSITY (# of species in seed mixes; numbers from upland and moist soil mixes can be combined

| | | | |
|---|---|---|---|
| ☐ | 10-19 species | +5 points | |
| ☐ | 20-25 species | +10 points | |
| ☒ | 26-39 species | +15 points | |
| ☐ | 40 and above | +20 | Total Points 15 |

4) PLANNED SEASONS WITH AT LEAST THREE BLOOMING SPECIES (check all that apply)

| | | | |
|---|---|---|---|
| ☒ | Spring (April-May) | +4 points | |
| ☒ | Summer (June-August) | +3 points | |
| ☒ | Fall (September-October) | +3 points | Total Points 10 |

See BWSR pollinator toolbox about bloom season

5) SITE PLANNING

| | | | |
|---|---|---|---|
| ☒ | Detailed establishment and management plan (see notes) | +20 points | |
| ☒ | Seed Mixes are composed of at least 40 seeds per square foot | +5 points | |
| ☐ | All seed genetic origin is within 200 miles of site (see notes) | +5 points | |
| ☐ | At least .5% milkweed cover within each seed mix | +5 points | |
| ☒ | Plant species with more than 3 flower colors in mixes (see notes) | +5 points | Total Points 30 |

6) INSECTICIDE RISK

| | | | |
|---|---|---|---|
| ☐ | Planned on-site insecticide use (excluding buildings/electrical boxes, etc.) | -30 points | |
| ☐ | Communication with local chemical applicators/neighbors about need to prevent drift from adjacent areas. | +10 points | Total Points ☐ |

GRAND TOTAL 90

Gold Standard 85+ points
Meets Standard 70 points

Project Name: Connexus Landfill
Project County: Anoka
Project Size: 26.21 acres
Evaluation Date: 02/12/2025

See notes related to the questions on the back side of this form

Natural Resource Services

# 10. Soils Maps

## MAP LEGEND

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

**Soils**

**Soil Rating Polygons**
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

**Soil Rating Lines**
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

**Soil Rating Points**
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

**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 1:15,800.

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:
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: Anoka County, Minnesota
Survey Area Data: Version 22, Sep 7, 2024

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

Date(s) aerial images were photographed: Jun 29, 2023—Sep 13, 2023

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.

# Hydric Rating by Map Unit

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| D67A | Hubbard loamy sand, 0 to 2 percent slopes | 1 | 1.3 | 5.5% |
| D67B | Hubbard loamy sand, 1 to 6 percent slopes | 3 | 3.4 | 14.2% |
| D67C | Hubbard loamy sand, 2 to 12 percent slopes | 0 | 7.5 | 31.2% |
| GP | Pits, gravel-Udipsamments complex | 0 | 9.7 | 40.3% |
| NrD | Nymore loamy coarse sand, 12 to 25 percent slopes | 0 | 2.1 | 8.9% |
| **Totals for Area of Interest** | | | **24.0** | **100.0%** |