

# **Revised Final Site Operations Plan for Soils Remediation**

**Landfill Operable Unit  
Tonawanda Landfill Vicinity Property  
Erie County, New York**

May 2019

Contract: W912QR-12-D-0010  
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Prepared for:



U.S. Army Corps of Engineers  
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**STATEMENT OF INDEPENDENT TECHNICAL REVIEW**

**Revised Final  
Site Operations Plan for Soil Remediation  
Tonawanda Landfill Vicinity Property, Erie County, New York  
U.S. Army Corps of Engineers  
Buffalo District**

Plexus Scientific Corporation has completed the preparation of the Revised Final Site Operations Plan. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives; technical assumptions; methods, procedures, and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing U.S. Army Corps of Engineers policy.

Significant concerns and explanation of the resolutions are documented within the project file. As noted above, all concerns resulting from independent technical review of the project have been considered.

  
Project Manager

05/15/2019  
Date

  
Independent Technical Review Team Leader

05/15/2019  
Date

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## **ACRONYMS AND ABBREVIATIONS**

%	percent
AEA	Atomic Energy Act
AEC	Atomic Energy Commission
APP	Accident Prevention Plan
ARAR	Applicable or Relevant and Appropriate Regulation
BCY	bank cubic yards
bgs	below ground surface
BRP	Backfill and Restoration Plan
CAA	Clean Air Act
CCR	Construction Completion Report
CERCLA	Comprehensive Environmental Restoration, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Constituent of Concern
COR	Contracting Officer's Representative
CQCP	Contractor Quality Control Plan
CRZ	Contaminant Reduction Zone
CWA	Clean Water Act
CY	cubic yard
DoD	Department of Defense
DOE	Department of Energy
DOT	U.S. Department of Transportation
EM	Engineer Manual
EP	Engineer Pamphlet
ER	Engineer Regulation
EZ	Exclusion Zone
ft	foot
ft <sup>2</sup>	square foot
FUSRAP	Formerly Utilized Sites Remedial Action Program
gpm	gallons per minute
HTRW	Hazardous, Toxic, and Radioactive Waste
IMC	Intermodal Container
ISOCs	<i>InSitu</i> Object Counting System
km	kilometer
KO	Contracting Officer
lbs/acre	pounds per acre
m	meter
m <sup>2</sup>	square meter
NPDES	National Pollution Elimination Discharge System
NRC	Nuclear Regulatory Commission
NYCRR	New York Code of Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
OU	operable unit

## **ACRONYMS AND ABBREVIATIONS**

PAMP	Perimeter Air Monitoring Plan
pCi/g	picocuries per gram
Plexus	Plexus Scientific Corporation
POTW	publicly owned treatment works
PP	Proposed Plan
PPE	Personal Protective Equipment
QA	Quality Assurance
QC	Quality Control
Ra-226	radium 226
RCP	Regulatory Compliance Plan
ROD	Record of Decision
RPP	Radiation Protection Plan
SARA	Superfund Amendments and Reauthorization Act
SSHP	Site Safety and Health Plan
SOP	Site Operations Plan
SOW	Scope of Work
SZ	Support Zone
Th-230	thorium 230
T&D	Transportation and Disposal
TLVP	Tonawanda Landfill Vicinity Property
TWP	Temporary Well Point
UFGS	Unified Facilities Guide Specifications
UFP-QAPP	Uniform Federal Policy – Quality Assurance Project Plan
USACE	United States Army Corps of Engineers
USC	United States Code
USCS	Unified Soils Classification System
USEPA	United States Environmental Protection Agency
U <sub>total</sub>	total uranium
U-234	uranium 234
U-235	uranium 235
U-238	uranium 238
WAC	Waste Acceptance Criteria
WAMP	Waste Management Plan
WMP	Water Management Plan
WWPPP	Wastewater Pollution Prevention Plan

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## 1.0 INTRODUCTION

Plexus Scientific Corporation (Plexus) was awarded a contract to provide soils remediation at the Landfill Operable Unit (OU; also referenced as “the site”) at the Tonawanda Landfill Vicinity Property (TLVP), in the Town of Tonawanda, in Erie County, New York. Contract Number W912QR-12-D-0010, Delivery Order Number W912P418F0049 was issued by the U.S. Army Corps of Engineers (USACE) – Buffalo District, under the Formerly Utilized Sites Remedial Action Program (FUSRAP), which was established to identify, investigate, and clean-up or control sites previously used by the Atomic Energy Commission (AEC) and its predecessor, the Manhattan Engineer District.

Soils at the vicinity property are contaminated with FUSRAP-related constituents of concern (COCs): radium-226 (Ra-226), thorium-230 (Th-230), and total uranium ( $U_{total}$ ), which consists of uranium-234 (U-234), uranium-235 (U-235), and uranium-238 (U-238) isotopes.

### 1.1 Document Purpose

The purpose of the Site Operations Plan (SOP) is to present the means, methods, and sequencing of the soils remediation project. The SOP provides the information required in the Scope of Work (SOW; USACE, 2018), including the Backfill and Restoration Plan (BRP), Regulatory Compliance Plan (RCP), Water Management Plan (WMP), and Waste Management Plan (WAMP). The following work plans will also be submitted for the soils remediation project:

- Accident Prevention Plan (APP)/Site Safety and Health Plan (SSHP; Plexus, 2019a), which includes the Radiation Protection Plan (RPP) as an appendix.
- Contractor Quality Control Plan (CQCP; Plexus, 2019b); and
- Perimeter Air Monitoring Plan (PAMP; Plexus, 2019c);
- Uniform Federal Policy – Quality Assurance Project Plan (UFP-QAPP; Plexus, 2019d).

### 1.2 Project Organization

An organizational chart for the soils remediation project is presented on Worksheet #3 and #5 in the UFP-QAPP (Plexus, 2019d). The organizational chart identifies key personnel and project stakeholders and their lines of authority and communication. The resumes of key personnel are presented in **Appendix A**. For the soils remediation project, Plexus has selected the following subcontractors:

- DNT Environmental Services, Inc. – will provide site work services, including mobilization (e.g., clearing and grubbing, stormwater and sediment controls, etc.), soil excavation, and backfilling and restoration;
- Pace Analytical Services, LLC – will provide off-site analytical services, including the analysis of backfill, confirmation, wastewater, intermodal container (IMC), and geotechnical samples;
- Austin Master Services, LLC – will provide qualified personnel for *in situ* object counting system (ISOCs) operation;
- Nussbaumer & Clarke, Inc. – will provide civil survey services;
- BE3/PanAmerican Corp – will provide a qualified radiation safety officer; and

- Earth Dimensions, Inc. – will provide temporary well point decommissioning services.

### **1.3 Project Schedule and Standard Work Hours**

A critical path method schedule for the soils remediation project is presented in **Appendix B**. The standard work hours at the site are from 7:00 a.m. – 4:00 p.m., Monday through Friday. Extended work hours may be performed if approved by the Town of Tonawanda and the Contracting Officer's Representative (COR).

### **1.4 Conference Calls/Progress Meetings**

Plexus will arrange and conduct conference calls/progress meetings during the soils remediation project to discuss schedule, accomplishments, milestones, and problems. These will be held with the following frequencies:

- Work Plan Preparation – monthly conference calls (or more frequently if necessary);
- Site Operations – weekly project meetings at the site and via conference call with the USACE; and
- After Demobilization – monthly conference calls until close out of contract (or more frequently if necessary).

Prior to each conference call/progress meeting, Plexus will prepare an agenda and distribute it to those planning to attend. The agenda will be submitted electronically to the Contracting Officer (KO)/COR no later than 12:00 p.m. of the day preceding the conference call/progress meeting. The agenda will include minutes of the previous conference call/progress meeting and a summary of work performed since the previous conference call/progress meeting. Minutes will be recorded during each conference call/progress meeting and submitted electronically to the KO/COR no later than five days after each conference call/progress meeting.

### **1.5 Public Poster Session**

Plexus will participate in one public poster session in Tonawanda, New York for the soils remediation project. Plexus will provide a meeting facility and sound system, including a lighted podium with microphone, two portable microphones, and speakers for the public poster session. The public poster session will be attended by at least three Plexus employees to assist with setup and teardown of the meeting area and to field community questions. Plexus will also design and produce up to five posters that explain the soils remediation project. Poster subjects will include site layout details, soil excavation and handling process, equipment to be used, waste management and transportation, and site monitoring and safety precautions. Draft posters for the poster session will be provided to the USACE 1.5 months prior to the poster session. The date and time of the poster session will be determined by the USACE. Any photos used in the posters must be high resolution images (.jpg). Other poster specifications include mounting on foam-core board, lamination, and at least 30 inches by 44 inches in size.

### **1.6 Public Affairs Guidance**

Plexus and its subcontractors will not make available to news media or publicly disclose any data generated or reviewed for the soils remediation project. If approached by news media, public officials, or adjacent residents for comment, Plexus and its subcontractors will refer them to the USACE Project Manager (Bryan Miner: 716-879-4302). Reports and data generated for the soils remediation project will become the property of the government and distribution to any other



entity by Plexus or its subcontractors is prohibited, unless authorized by the KO/COR. The USACE Buffalo District will prepare and publish any required legal notices.

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## **2.0 SITE INFORMATION**

### **2.1 Site Location**

The site is located in the Town of Tonawanda, Erie County, New York. It is approximately 16 kilometers (km; 10 miles) north of downtown Buffalo and 2.4 km (1.5 miles) north of the Linde FUSRAP Site (**Figure 2-1**). The vicinity property comprises approximately 22 hectares (55 acres); it is zoned commercial/industrial. The site is located at the northern end of East Park Drive. Residential developments border the site to the north and northwest. There is a railroad line to the east and a parcel (i.e., Niagara Mohawk right-of-way) containing high-voltage transmission lines to the south. The residential development to the north and northwest of the site lies within the City of Tonawanda.

### **2.2 Site Background**

In the early 1900s, the western portion of the town's landfill property was a quarry. The quarry was reportedly abandoned in the 1920s when operators encountered water at an 18-meter (m) (60-foot (ft)) depth. Waste disposal at the landfill by the Town of Tonawanda began during the 1930s and continued through 1989. Landfill wastes disposed of in the former quarry included ash generated by the town's incinerators, construction/demolition debris, and yard refuse (leaves, branches, etc.) collected from town residents. The landfill occasionally accepted municipal solid waste and wastewater sludge from the Town of Tonawanda's wastewater treatment plant when the incinerators were temporarily inoperable (USACE, 2017).

In 1992, the U.S. Department of Energy (DOE) designated the landfill and mudflats together as a FUSRAP vicinity property. The designation was based on a radiological survey conducted in 1991 to determine whether FUSRAP-related material from the nearby Linde FUSRAP Site was in the Town of Tonawanda's municipal solid waste landfill (USACE, 2017).

In October 1997, Congress transferred overall responsibility for implementing FUSRAP from DOE to USACE and directed that FUSRAP remediation be conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). With this transfer, USACE assumed responsibility for a response, if necessary, at the TLVP (USACE, 2017).

Since that time, USACE completed a number of studies at the TLVP. These included a human health risk assessment, a remedial investigation, and a proposed plan (PP) for the property. In 2008, USACE signed a no-action record of decision (ROD) for the Mudflats OU portion of the TLVP after it determined that risks were within acceptable limits established in the National Oil and Hazardous Substances Pollution Contingency Plan. The remainder of the USACE studies, which included a historical photo analysis, Phase 2 remedial investigation, updated baseline risk assessment, environmental monitoring, feasibility study, and PP focused on the Landfill OU (USACE, 2017).

In 2007, the Town of Tonawanda began the process of closing the municipal solid waste landfill in accordance with Title 6 of the New York Code of Rules and Regulations (NYCRR). The Town of Tonawanda undertook this action under New York State Department of Environmental Conservation (NYSDEC) oversight. The Town of Tonawanda installed a cap over the 10-hectare (25-acre) eastern portion of the solid waste municipal landfill in 2011. In 2013, the Town of Tonawanda began constructing the final cap over the western portion of the solid waste

municipal landfill but has since halted the work until USACE completes implementation of the selected remedy (USACE, 2017). In 2017, USACE signed a ROD that identified a selected remedy for the Landfill OU portion of the TLVP. The 2017 ROD was prepared after the USACE's studies determined that FUSRAP-related material posed unacceptable risk at the site and a response action was necessary. The selected remedy for the site is presented in Section 2.5.

### **2.3 Site Topography and Drainage**

The surface water hydrology at the site is controlled by man-made features. On the site, runoff flows radially from the top of the landfill. It collects in intermittent swales along the northwestern, northeastern, and eastern edges of the landfill. The northeastern swale discharges to the marshy area northeast of the site. The eastern swale discharges to a drainage ditch along the railroad tracks. The northwestern swale collects runoff from the northern portion of the site, west and northwest of its highest point. During storm events, surface water collected in this swale flows along to the northeastern property boundary and eventually discharges into Two Mile Creek. Two Mile Creek flows to the north and empties into the Niagara River approximately one mile north of the site. A secondary engineered swale, separate from but parallel to the natural drainage, captures surface runoff from the Phase 2 cap construction area; this swale discharges into a sedimentation basin connected to the municipal sanitary sewer system (USACE, 2018).

Runoff along the southern border of the site occurs as sheet flow into the wet area in the Niagara Mohawk right-of-way. Surface water is held in the right-of-way by a berm along the southern boundary until it discharges westerly into a culvert beneath the landfill access road. This culvert leads to an east-west trending drainage ditch that flows to the storm water collection system that conveys surface water to Two Mile Creek (USACE, 2018).

### **2.4 Nature and Extent of Contamination**

The various FUSRAP soil sampling efforts identified soils in the Landfill OU with elevated levels of the FUSRAP-related COCs: Ra-226, Th-230, and  $U_{total}$ . Soils with elevated FUSRAP-related COCs were generally confined to an area in the northwestern portion of the Landfill OU, near the center of and roughly paralleling the northwestern fence line separating the site from the adjacent residential properties. The highest levels were generally detected 0.6 m (2 ft) or more below ground surface (bgs), with elevated levels detected as deep as 7.6 m (25 ft) bgs. Maximum detected concentrations within the excavation locations included 3,485 picocuries per gram (pCi/g) for Ra-226, 4,300 pCi/g for Th-230, and 2,048 pCi/g for U-238 (USACE, 2018).

### **2.5 Selected Remedy**

The remedy selected in the ROD for the Landfill OU is Alternative 3, Targeted Shallow Removal and Off-Site Disposal of FUSRAP-Related Material (**Figure 2-2**). Implementing this remedy will involve excavating FUSRAP-related materials exceeding cleanup goals within the top 1.5 m (5 ft) of the surface, transporting material off-site, and disposing of them at a permitted disposal facility. The major components of the selected remedy for the Landfill OU include:

- Excavating impacted soil above cleanup goals within the first 1.5 m (5 ft) of the surface and dispose at a permitted off-site disposal facility.
- Collecting and analyzing groundwater that had infiltrated excavation areas for potential sanitary discharge and treatment as necessary for off-site disposal at a facility permitted to

accept the waste stream. Provisions would be made to protect removal areas from the collection of surface runoff until confirmatory sampling can be conducted, and the areas are determined to comply with remediation objectives.

- Establishing perimeter dust control measures, air monitoring and contamination control measures to monitor and control the discharge of surface water runoff and airborne dust from the excavation areas to local conveyances. This will be conducted for health and safety purposes during excavation.
- Scanning the sidewalls of the excavation to determine if the lateral extent of the excavation areas have confirmed that each removal area has met cleanup criteria. If scan limit has been met, confirmatory samples will be collected and analyzed per TLVP excavation side wall sampling procedure in Section 5.2.6 of the SOW.
- Backfilling with clean soil, contoured to promote surface water runoff, and seeding in accordance with the approved site restoration plan (USACE, 2018).

The FUSRAP-related COCs (R-226, Th-230, and  $U_{total}$ ) in soil at the Landfill OU may pose potential unacceptable risk should the Landfill OU not be maintained and if it is allowed to erode over time. Therefore, the remedial action objectives were developed to prevent human exposure to FUSRAP-related COCs in soil above applicable or relevant and appropriate requirement (ARAR) cleanup goals. The soil removal cleanup criteria for the Landfill OU would be to limit the residual radionuclide concentrations remaining in soils within a 100 square meter ( $m^2$ ; 1,076 square foot ( $ft^2$ )) area to concentrations that shall not exceed the cleanup goals (sum-of-the ratios exceeding 1) in **Table 2-1** (USACE, 2018).

**Table 2-1. Cleanup Goals for FUSRAP-Related COCs at the Landfill OU**

FUSRAP-Related COCs	Units	Background <sup>a</sup>	Recreational Adult Surface Soil Goal <sup>b</sup>	Recreational Adult Subsurface Soil Goal <sup>b</sup>
Ra-226	pCi/g	0.95	5	15
Th-230	pCi/g	0.92	14	42
$U_{total}$ <sup>c</sup>	pCi/g	1.75	152	457
U-238 as $U_{total}$ Surrogate	pCi/g	0.86	75	224

a. Average background values for the Landfill OU.

b. The depth and area requirements as specified in 10 Code of Federal Regulations (CFR) Part 40, Appendix A, Criterion 6-(6). Surface soil is defined as 0–15 centimeters (0–6 inches) bgs. Subsurface soil is considered to be at depths greater than 15 centimeters (6 inches) bgs. The cleanup goals must be achieved (on average) over a 100  $m^2$  (1,076  $ft^2$ ) area.

c.  $U_{total}$  is a sum of the isotopes U-234, U-235, and U-238.

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### **3.0 OBJECTIVE AND SCOPE**

The objective of the soils remediation project is to implement the remedy selected in accordance with the ROD for the Landfill OU (USACE, 2017). To achieve that objective, Plexus will conduct the following activities in accordance with the SOW:

#### General

- Develop work plans for USACE review and acceptance;
- Manage the project and provide construction quality assurance/quality control (QA/QC);
- Establish, maintain, and follow a safety and health program;
- Establish and follow analytical data quality procedures based on USACE, U.S. Environmental Protection Agency (USEPA), and NYSDEC guidance;
- Perform multi-media radiological and chemical sampling and analysis;
- Maintain electronic files, data, maps, tables, databases, geographic information system files, and project administrative files;
- Prepare reports and documentation during and after completion of the soils remediation project; and
- Provide public relations support.

#### Site Activities

- Document the condition of the site and all areas that will be used during or disturbed by the soils remediation project;
- Conduct property boundary and topographic surveys prior to site activities;
- Mobilize the required workforce and equipment;
- Install and maintain support facilities and air monitoring stations (including off-site air monitor);
- Implement radiological and construction site safety procedures;
- Monitor worker exposures and environmental contamination spread through routine contamination control surveys;
- Operate and maintain air monitoring program to enable early detection and an emergency notification system of potential contaminant emissions prior to site activities and during the remedial action;
- Clear and grub the site to enable performance of the remedial action;
- Manage storm water and wastewater collected from the excavation areas;
- Obtain discharge permit from the Town of Tonawanda publicly owned treatment works (POTW);
- Treat all collected wastewater to meet the discharge requirements of the POTW discharge permit, and if allowed, discharged to the on-site POTW discharge location;

- Install drainage management techniques during construction, demobilization, and restoration that preclude water and sediment transport into adjacent residential properties;
- Excavate and handle contaminated soil debris;
- Conduct radiation measurements using an *in situ* gamma spectroscopy system (e.g. Canberra ISOCS) for each waste container;
- Conduct sidewall confirmation soil sampling to document attainment of the remediation goals;
- Restore the excavations with clean backfill and seed the area with the Tonawanda Landfill approved seed mixture;
- Conduct pre- and post-construction gamma walk-over surveys for work areas that may be impacted;
- Conduct radioactivity contamination surveys on equipment prior to release from the site and decontaminate equipment found to have levels of contamination exceeding release standards;
- Deconstruction of temporary measures used for the soils remediation project, including hauls roads and culverts; and
- Demobilize the workforce and equipment from the site.



## **4.0 PREMOBILIZATION**

Prior to mobilization of equipment/materials, facilities, and personnel for the soils remediation project, the following activities will be conducted.

### **4.1 Civil Survey**

A civil survey will be conducted to establish the baseline conditions of the site. The civil survey will be conducted to document the initial topography of the area and identify the excavation limits. The initial topography data will be used to restore the site prior to demobilization. Civil surveys will also be conducted during site operations and post-demobilization.

### **4.2 Perimeter Air Monitoring**

Perimeter air monitoring will be conducted to establish baseline conditions for the soils remediation project. The details of the perimeter air monitoring are presented in the PAMP (Plexus, 2019c). Perimeter air monitoring will be conducted from premobilization through the end of demobilization.

### **4.3 Radiation Monitoring**

A gamma walkover survey will be conducted during premobilization to establish the baseline conditions of the site. The results of the gamma walkover survey will be graphed for analysis. The details of the gamma walkover survey are presented in the RPP (Plexus, 2019a). Radiation monitoring will be conducted from premobilization through the end of demobilization.

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## **5.0 MOBILIZATION**

After the project work plans have been approved and premobilization activities have been completed, Plexus will mobilize the equipment/materials, facilities, and personnel to the site in preparation for site operations.

### **5.1 Site Layout**

The planned construction site layout is presented on **Figure 5-1**. The site layout figure shows the location of the following features/elements for the soils remediation project:

- Equipment and material laydown areas – these areas will be reinforced, as needed, with a suitable material (e.g., gravel and geosynthetic fabric) to a depth that will accept the weight of the equipment/materials and facilities that will be placed on them for the duration of the project. Depth of reinforcement will be based on the site conditions encountered during the project.
- Site entrance and exit – located off of Two Mile Creek Road in the Town of Tonawanda right-of-way located to the southwest of the Landfill OU.
- Project signs – project identification and safety performance signs will be prepared in accordance with Section 16 of Engineer Pamphlet (EP) 310-1-6a (USACE, 2006) and posted at the site entrance; the following project name will be posted on it: “Tonawanda Landfill Vicinity Property Landfill Operable Unit Remedial Action, Formerly Utilized Sites Remedial Action Program.”
- Site trailers – two trailers will be staged at the site; these trailers will be furnished (e.g., conference table, desks, and chairs) with internet service.
- Electrical utility connection point – the trailers at the site will be connected to the local electrical utility provider or portable power source, perimeter air monitoring and other activities will be powered locally by generators.
- Worker parking area – this area will be reinforced, as needed, with a suitable material (e.g., gravel and geosynthetic fabric) to a depth that will accept the weight of the vehicles that will be placed on it for the duration of the project.
- Decontamination area – A decontamination area will be established at each excavation area. Each decontamination area will be lined with polyethylene sheeting and reinforced, as needed, with a suitable material (e.g., gravel and geosynthetic fabric) to a depth that will accept the weight of the vehicles that will be decontaminated during the duration of the project. Depth of reinforcement will be based on the site conditions encountered during the project. Sumps will be constructed at each decontamination area to collect decontamination water. Collected water will be removed by sump pump, placed in drums that have been labeled non-hazardous, and transported to the wastewater treatment unit for treatment. Wastewater treatment is detailed in Section 11.2.
- Temporary sanitary facilities – worker sanitation will be provided with portable toilets, a hand-wash station, and bottled drinking water; portable toilets will be serviced once a week.

- Initial limits of excavation – soil and debris within these areas will be removed to a depth of 1.5 m (5 ft) and disposed off-site in accordance with the selected remedy; USACE will provide global positioning system coordinates for the excavation footprints.
- Contamination zones – will consist of an exclusion zone (EZ), contamination reduction zone (CRZ), and support zone (SZ); the spread of contamination, whether soil or airborne, will be controlled and minimized through the establishment of these zones; the initial anticipated work zone boundaries may be modified as work progresses.
- IMC storage areas – these areas will be reinforced, as needed, with a suitable material (e.g., gravel and geosynthetic fabric) to a depth that will accept the weight of the equipment/materials that will be placed on them for the duration of the project. The 20 cubic yard (CY) IMCs will be provided by the USACE's transportation and disposal (T&D) contractor; a meeting between Plexus, USACE, and the USACE's T&D contractor will be held approximately 30 days before the date of the remedial action to finalize IMC coordination details. Each 20 ft x 8 ft IMC will be placed nose-to-tail with 5 feet of space between them. A straight-body truck is about 35 feet long with a turning radius of about 40 feet. Each row of IMCs will have at least 50 feet of open space to facilitate turning and picking up of the first IMC. Subsequent IMCs will have an additional 25 feet of clear space due to removal of the previous IMC.
- Temporary fencing – will consist of 6-foot chain link fence installed around trailers and materials and orange high-visibility, high-density polyethylene grid or approved equal installed around open excavations.
- Refuse containers – roll-off container supplied by a local municipal solid waste company; will be used only for solid waste, i.e., not hazardous, toxic, or radiologically-contaminated, and emptied regularly.
- Access and haul routes – these areas will be reinforced, as needed, with synthetic interlocking crane mats; to accommodate rubber tired equipment (e.g., dump trucks, fork lifts, tractor-trailers, cranes, etc.), the reinforcement placed on the access and haul road over the western side of the capped portion of the Landfill OU will consist of a minimum of 6-inches of New York State Department of Transportation No. 2 ROC stone.

## **5.2 Equipment Inspection**

Equipment delivered to the site will undergo an inbound radiological survey as a baseline to ensure that contamination has not been brought on-site. Equipment will also be inspected to identify any mechanical or operational deficiencies and all safety devices and guards are in place and operational.

## **5.3 Meteorological Monitoring**

A meteorological station will be deployed on-site to record general weather conditions, including wind direction, wind speed, relative humidity, and air temperature. The details of the meteorological monitoring are presented in the PAMP (Plexus, 2019c). Meteorological monitoring will be conducted from mobilization through the end of demobilization.

## **5.4 Utilities**

The locations of underground utilities at the site will be determined prior to the start of any intrusive work according to the procedures presented in the APP/SSHP (Plexus, 2019a). Underground utilities are not anticipated to interfere with or require special considerations during the soils remediation project. The presence of underground utilities (i.e., water main and buried pipelines) and overhead utilities, i.e., electrical distribution lines within the National Grid (formerly Niagara Mohawk) right-of-way, will be discussed in the morning safety briefings. Utility locations at the site are presented on **Figure 5-2**.

## **5.5 Clearing and Grubbing**

Based on the initial limits of excavation, a limited amount of clearing and grubbing will be required to gain access to the subsurface for excavation activities. The limits of excavation are presented on **Figure 5-1**.

Clearing will consist of the felling, trimming, and cutting of trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish. Trees, stumps, roots, brush, and other vegetation in areas to be cleared must be cut off flush with or below the original ground surface.

Grubbing will consist of the removal and disposal of stumps, roots larger than 3 inches in diameter, and matted roots. Material to be grubbed, together with logs and other organic or metallic debris, must be removed to a depth of not less than 18 inches below the original surface level of the ground. Grubbed material will be disposed according to the WAMP (see Section 12.1.1).

## **5.6 Erosion and Sediment Controls**

The selection and installation of erosion and sediment controls at the site for the soils remediation project is presented in the Stormwater Pollution Prevention Plan (Section 11.0).

## **5.7 Traffic Control Plan**

General traffic into and out of the site will be directed through the entrance gate and along the haul road to the site trailers and worker parking area as shown on **Figure 5-1**. Waste transportation vehicles will utilize the same haul road to drop-off and pick-up IMCs. Traffic along the haul roads will be coordinated with other site users (e.g., Ensol, etc.).

## **5.8 Temporary Well Point Decommissioning**

The USACE installed 12 temporary well points (TWPs; TWP-1 and TWP-3 through TWP-14) at the site to gather groundwater data during the Phase 2 remedial investigation. The TWPs were constructed of 2-inch polyvinyl chloride with No. 5 sand (or best equivalent) with a 5 to 10-foot section of 0.010-inch slotted screen. The total depth of each TWP varies but they average approximately 20 ft bgs (USACE, 2011). The location of these TWPs is presented on **Figure 5-2**. Before site operations begin, all 12 TWPs will be decommissioned in accordance with NYSDEC guidance. Specifically, NYSDEC Policy CP-43 using the “Casing Pulling” method (NYSDEC, 2009).

It should be noted that the Town of Tonawanda owned monitoring wells (e.g., L-2, L-3, and BM-4) will remain in place. The locations of the town-owned monitoring wells are presented on **Figure 5-2**. The town-owned monitoring wells will be protected during the remedial action as

shown on **Figure 5-3**. If any of the town-owned monitoring wells are damaged during the soils remediation project, they will be reinstalled.

## **5.9 Site Security**

Plexus will provide site security for all equipment/materials, facilities, and personnel during standard work hours (7:00 a.m. to 4:00 p.m.) for the soils remediation project. Site access will be through the entrance gate off of Two Mile Creek Road in the Town of Tonawanda right-of-way located to the southwest of the Landfill OU. Access will be limited to authorized personnel, including representatives from the USACE, Plexus, and subcontractors. Outside of standard work hours, access will be controlled by locking the entrance gate. If after-hours tampering or vandalism become evident during the execution of the soils remediation project, Plexus will notify the appropriate law enforcement agency and request that they conduct periodic security checks.

## **6.0 SITE OPERATIONS**

Site operations will commence once mobilization activities have been completed. Site operations are summarized below.

### **6.1 Soil Excavation**

The selected remedy for the Landfill OU includes the excavation of FUSRAP-related material from the limits of excavation. The limits of excavation include eight distinct areas where FUSRAP-related material exceeds the clean-up goals. These areas have been identified as Areas A through H on **Figure 5-1**. The limits of excavation for Areas A through H will be identified in the field by a licensed surveyor. Soil excavation is anticipated to begin in the northeastern corner of the site at Area H and continue through Area A. A tracked excavator will be used to excavate, size-reduce as necessary, and work the soil into working piles within the excavation. The working piles facilitate the draining of free liquids and expedite the loading of IMCs by the tracked excavator. IMCs may be staged around the excavation and filled on the ground as well as being filled while mounted on trucks. The management of IMCs and excavated FUSRAP-related material is presented in the WAMP (Section 12.0). The soil excavation will be performed to the initial limits of excavation and may be expanded, based on field screening and confirmatory sidewall sampling results.

Field screening and confirmatory sidewall sampling will be conducted to confirm that all FUSRAP-related material has been removed from each excavation area. The approach for field screening and collecting confirmatory sidewall samples to ensure that all FUSRAP-related material above the clean-up goals has been removed is presented in the UFP-QAPP (Plexus, 2019d). Additional step-out excavation will only be conducted with USACE approval. Under no circumstances will damage to the landfill cap occur; excavation and sampling will stop five feet before the cap to prevent damage. If confirmation sampling indicates that contaminants are above clean-up goals within five feet of the cap, Plexus will discuss the situation with the USACE.

After completion of confirmation sampling, USACE will be given access to the excavated area to observe site conditions. The excavated areas will be kept as dry as reasonably achievable (weather permitting) and in a condition that is safe for workers. Once USACE inspection is completed and no material is targeted for additional excavation (i.e., confirmation sampling results have been reviewed and no results exceed the clean-up goals), the excavated area will be filled in with approved backfill material to match the surrounding ground surface. Backfilling and restoration details for remediated excavation areas are presented in the BRP (Section 9.0).

Benching and/or sloping will be utilized when required to allow workers to enter an excavation that exceeds four ft bgs. Any material that is removed to allow workers to enter an excavation in excess of four ft bgs will be loaded into IMCs and taken off-site for disposal. Benching and sloping procedures are presented in the APP/SSHP (Plexus, 2019a).

### **6.2 Contamination Control**

The focus of the radioactive contamination control program is thorough identification of areas/materials with contamination, controlling access to these areas/materials, implementing work practices to prevent unnecessary contact with contamination, using properly trained/qualified staff, routine monitoring for contamination, using personal protective

equipment (PPE), controlling movement for equipment/materials that are contaminated or potentially contaminated, decontamination, and verifying contamination-free condition before release. Contamination control will be performed in accordance with the RPP (Plexus, 2019a) and the PAMP (Plexus, 2019c).

The primary concern for migration of contamination is through movement of people, equipment, or materials and airborne emissions during remedial activities. The effectiveness of the contamination control program will be assessed by use of portable radiation detection equipment and wipe samples to determine surface contamination levels. In addition, a best management practice of a “visibly clean” standard will be applied as an adjunct to the surface monitoring program. This involves having administrative procedures in place and observed to keep surfaces in the work zones free of visible contaminant accumulation. The intent of this practice is to apply the “visibly clean” approach to routine access areas, containers (external surfaces), and any equipment or materials not in use.

### **6.2.1 Contamination Control Zones**

The soils remediation project will have contamination control zones established. These include the SZ, CRZ, and EZ. The SZ will contain site trailers, parking, and an equipment/IMC storage yard. The transition from SZ to CRZ is through an access control point. The CRZ will contain a decontamination pad/area. The EZ will contain the excavation areas. The EZ will then extend out to excavation areas and move as progress is made. There will also be an extension of the CRZ around the perimeter of the EZ to facilitate contamination control during remedial activities. Exiting from the EZ will be through the access control point for doffing PPE, radiological monitoring, and personnel decontamination.

### **6.2.2 Housekeeping**

An important aspect of contamination control is housekeeping. Routine cleaning of surfaces within the CRZ and EZ will be necessary to reduce the potential for spreading contamination; the CRZ and EZ are the most likely places from which contamination can spread. Routine but less frequent cleaning of the SZ will also be part of the housekeeping program. The housekeeping program will focus on “visibly clean” protocol to control migration of contamination. Routine monitoring for contamination will be performed for all areas of the site (EZ, CRZ, and SZ), and if action levels are exceeded, then cleaning will be required. Radiation monitoring of excavation areas during site operations is detailed in the RPP (Plexus, 2019a), and air monitoring of excavation areas during site operations is detailed in the PAMP (Plexus, 2019c).

### **6.2.3 Intermodal Containers**

IMCs are being provided by the USACE T&D contractor and may contain negligible residual material from previous use. To control this, the IMCs will be received and staged in the IMC storage areas and will remain sealed until they have entered the EZ. The IMCs will only be opened in the EZ for loading and sampling. Once those activities have been completed, each IMC will be sealed, visually inspected, scanned for external contamination, and decontaminated (as necessary) before leaving the EZ and returning to a storage area.

### **6.2.4 Equipment Decontamination**

All equipment used for remediation activities shall remain in the EZ or CRZ until surveyed and determined to meet free-release levels for radioactive contamination defined in Table B-4 of the RPP (Plexus, 2019a). Equipment will be decontaminated as necessary during field execution to



prevent the migration of contamination between excavation locations. Equipment will be decontaminated using a variety of methods including:

- Dry decontamination with hand tools, brushes, and wipes;
- Removable scrapers and coarse brushes; or
- Wet decontamination with brushes and/or pressure washer.

Decontamination activities will occur at the excavation area prior to leaving the controlled area. When wet decontamination procedures are necessary, a temporary decontamination station will be constructed by placing 20-mil plastic on the ground to capture any liquids. The plastic will be bermed to prevent decontamination liquids from leaving the pad. Decontamination liquids will be collected and managed according to the WMP (Section 11.2).

### **6.2.5 Dust Control**

The emission of fugitive dust during the soils remediation project will be controlled by the application of water to work areas, including excavation areas, haul roads, and contamination zones. Dust control measures are outlined in the APP/SSHP (Plexus, 2019a). Dust emissions will be monitored throughout the project by the perimeter air monitoring program. Details of the perimeter air monitoring program are presented in the PAMP (Plexus, 2019c). Dust suppression water will be obtained from a Town of Tonawanda hydrant that is equipped with a tested backflow preventer and flow meter.

### **6.3 Civil Survey**

A civil survey will be performed on each remediated excavation area before backfilling and restoration. The civil survey will be conducted to document the final limits of excavation and calculate the volume of material that was excavated.

### **6.4 Radiation Monitoring**

Radiological monitoring, such as direct and transferable contamination surveys, will be performed to evaluate radiological conditions and to verify that radiological work activities are being adequately controlled. Radiation monitoring details are presented in the RPP (Plexus, 2019a).

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## **7.0 DEMOBILIZATION**

After site operations have been completed, the following demobilization activities will be conducted:

- Civil and gamma walkover surveys;
- Decontamination of equipment, tools, temporary facilities, and supplies for unrestricted use or controlled as contaminated material for disposal;
- Decontamination and removal/demolition of any wastewater handling/treatment equipment;
- Sampling and analysis of any waste generated during decontamination activities;
- Disposal of used PPE and decontamination waste;
- Performing verification surveys on decontaminated equipment, tools, temporary facilities, and supplies prior to release from the site (USACE may perform QA confirmatory surveys);
- Removal of all temporary facilities, access restrictions, and signage;
- Dismantling and disposal of erosion and sedimentation control measures;
- Demolition, removal, and disposal of temporary access roads, parking lots, and equipment laydown areas constructed for the project;
- Repair of any off-site areas damaged by remedial activities; and
- Demobilization of site personnel, equipment, tools, temporary facilities, and supplies.

Demobilization will be considered complete only after USACE has verified that all activities authorized under the contract have been completed to USACE satisfaction.

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## **8.0 QUALITY CONTROL**

Plexus's QC program is presented in the CQCP (Plexus, 2019b). The CQCP describes the proposed procedures for inspections, monitoring, follow-up, and corrective actions for all phases of work. The information provided in the CQCP will ensure compliance with the quality goals and applicable statutory and regulatory requirements.

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## 9.0 BACKFILL AND RESTORATION PLAN

The procedures for backfilling and restoring the site, including excavation areas and any areas disturbed at the site during the soils remediation project, are described in the following section. Erosion/surface water runoff controls will be maintained during backfill and restoration operations in accordance with the WMP (Section 11.1).

### 9.1 Excavation Areas

Once USACE has approved an excavation area for backfilling and restoration, backfill will be placed within it to match the surrounding grade. Backfill will be obtained from off-site source(s) approved by USACE. Suitable backfill materials will consist of the following Unified Soil Classification Soils (USCS) types: GW, GP, GM, GC, SW, SP, SM, SC, ML, MH, CL, or CH that do not contain contaminants, roots and other organic matter, trash, debris, snow, ice, frozen materials, or other undesirable material. The maximum particle size within the backfill must be less than six inches. A proposed backfill source is identified in **Table 9-1**.

**Table 9-1. Proposed Backfill Source**

Site/Facility	Location	Soil Type(s)
Tonawanda Terminals Corporation	4635 River Road, Tonawanda, New York 14150	Clay, Sand, Silt <sup>1</sup>
1) Soil type will be tested to determine its USCS classification.		

The facilities identified in **Table 9-1** historically supply product that demonstrates compliance with NYSDEC Soil Cleanup Objectives established in 6 NYCRR Part 375, Table 375-6.8(b). Additional locations, such as EnSol Inc.'s sources at the North Youngman Commerce Center and 795 E. Park Drive, may be utilized if the soils are demonstrated to meet acceptable levels. All backfill, regardless of the source, will be tested in accordance with the UFP-QAPP (Plexus, 2019d) to confirm that all COCs are within acceptable levels. Classification, including Proctor test and sieve analyses performed to understand compaction characteristics of the backfill with change in moisture content, and chemical parameter testing will be provided to USACE for acceptance.

Backfill will be placed into the excavations in nominal 8- to 12-inch loose lifts and mechanically compacted (e.g., sheeps-foot roller) to meet a compaction of 90 percent of standard Proctor for non-traffic (road) areas. For each lift of placed backfill, Plexus will use a Troxler nuclear density gauge to determine the percent compaction in accordance with *ASTM D1557-12e1: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort*. Density testing will be conducted at a minimum frequency of one test per lift when using the nuclear method. If compaction requirements are not met, then the area will be scarified and recompacted.

Topsoil will be placed over the backfilled excavation areas to support vegetative growth and minimize future erosion. The Town of Tonawanda's Seeding Guide Specifications includes the following topsoil requirements:

- Two to 15 percent by weight stable organic material, or as approved by the USACE;
- At least 20 percent passing No. 200 sieve material, and no more than 20 percent by weight clay, or as approved by USACE;

- Free of trash and have less than 5 percent by volume gravel, or as approved by USACE;
- pH between 6.0 and 8.0, or as approved by USACE; and
- Identified as treated with sterilants or herbicides, if applicable.

Topsoil will be tested for classification and chemical parameters in accordance with the UFP-QAPP (Plexus, 2019d). Approved topsoil will be placed according to the following requirements:

- Before topsoil placement, backfill will be scarified at right angles to the slope in areas steeper than 5 percent;
- Topsoil will not be placed in frozen or excessively moist conditions, which includes placement over ice, snow, or standing water;
- Topsoil will be placed in a single, approximately 4 to 6-inch loose lift;
- Mixing between backfill and topsoil will be minimized during topsoil placement;
- Erosion and sediment controls will be maintained to preserve the topsoil until vegetation is established; and
- Topsoil will be minimally compacted with tracked equipment to ensure cohesiveness. Grouzer marks for finished grade will be perpendicular to the finished slope prior to seeding.

The Town of Tonawanda's Seeding Guide Specifications includes information on seed mixtures, mulch, and fertilizer approved for use at the site. Grass seed mixtures will be in sealed containers showing weight, seed mix, year of production, date of packaging, and location of packaging. Mulching material will consist of oat or wheat straw, be free from weeds and foreign matter detrimental to plant life, and dry. Fertilizer will be FS O-F-24, Type I, Grade A. Approved seed mixtures, including type, application rate, and seeding season, are presented in **Table 9-2**.

**Table 9-2. Seeding Specifications**

Type	Rate	Seeding Season
<i>Conservation Mixture</i>		
Tall Fescue, VNS <sup>1</sup>	130 lbs/acre	Spring, Summer, or Fall
Creeping Red Fescue, VNS <sup>1</sup>		
Annual Ryegrass, VNS <sup>1</sup>		
Timothy, VNS <sup>1</sup>		
Kentucky Bluegrass, VNS <sup>1</sup>		
White Clover, VNS <sup>1</sup>		
Redtop	2 lbs/acre	Spring, Summer, or Fall
<i>Permanent Slope Vegetation Mixture Type 2</i>		
Empire Birdsfoot Trefoil or White Clover	8 lbs/acre	Early Spring
Tall Fescue	20 lbs/acre	



**Table 9-2. Seeding Specifications**

Type	Rate	Seeding Season
Redtop	2 lbs/acre	
Permanent Slope Vegetation Mixture Type 3		
Creeping Red Fescue	20 lbs/acre	Early Spring, Late August
Tall Fescue	20 lbs/acre	
Redtop	2 lbs/acre	
1) The "conservation mixture" blend can be obtained from Preferred Seed Co., 575 Kennedy Road, Buffalo, NY 14227.		
lbs/acre = pounds per acre		

After the topsoil has been placed in accordance with the above specifications, the following activities will be conducted in preparation for seeding:

- Topsoil will be graded to remove high spots and depressions;
- Topsoil will also be scarified to a depth of 2 inches with a disk or other suitable implement;
- Fertilizer will be applied at a typical rate of 600 pounds per acre, although soil testing will be conducted to determine the appropriate application rate.

Once the topsoil has been prepared and fertilized (as necessary), an approved seed mixture will be mechanically and/or hydraulically planted with the goal of evenly distributing the seed and maximizing soil to seed contact. Mulch will be used to retain moisture, reduce soil temperature fluctuations, and reduce runoff and erosion. Mulch will be spread uniformly over the seeded area with no less than 75% coverage and at least a 1.5-inch loose thickness. Hydraulic mulching may be utilized if accessibility or steep slopes prevent standard application methods. Hydraulic mulching will consist of the mixing of virgin wood fiber mulch, pre-blended tackifier, and/or other additives with water. Maintenance of the completed seeding shall begin immediately after mulch is applied. The seeded areas will be kept moist to a depth of 2 inches during the seed germination period. All areas greater than 10 square feet not having uniform coverage will be reseeded and mulched, until such a time a uniform stand of vegetation is obtained.

## 9.2 General

Plexus will restore the site to its photographed/documented condition prior to mobilization. The access and haul roads will primarily utilize synthetic crane matting when needed, so the removal of road base from these areas is not anticipated. The reinforcement placed over the existing access and haul road over the western portion of the capped area will be removed or left in place if permitted by the Town of Tonawanda. Any material imported for the construction of equipment and material laydown, worker parking, IMC staging, or decontamination areas will be removed from the site unless permitted to remain by the town. Once the material has been removed, these areas will be regraded and seeded to match the photographed/documented conditions prior to mobilization.

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## 10.0 REGULATORY COMPLIANCE PLAN

The following RCP identifies the ARARs for the soils remediation project, and it also identifies the laws, rules, regulations, and standards governing safety and operational requirements Plexus will follow during the execution of the soils remediation project.

### 10.1 Soils Remediation ARARs

Nuclear Regulatory Commission (NRC) regulations found in 10 CFR Part 40, Appendix A, establish technical, financial, ownership, and long-term site surveillance criteria relating to siting, operation, decontamination, decommissioning, and reclamation of licensed uranium and thorium mills and tailings. For a number of reasons, including the fact that USACE is not a licensee; the Landfill OU is not a licensed site; and residual material will stem from non-licensed activities, 10 CFR Part 40 is not applicable.

Since the regulation contains some substantive criteria pertaining to the hazardous substances or the circumstances of their suspected release at the Landfill OU, USACE has determined that parts of 10 CFR Part 40, Appendix A, are relevant and appropriate to the cleanup. Specifically, radionuclides found at the site (radium, thorium, and to a lesser extent uranium) are similar in nature to tailings or wastes produced by the extraction of source material from ores primarily for their source content (i.e., uranium processing activities). For the soils remediation project, the relevant and appropriate components of 10 CFR Part 40, Appendix A are presented in **Table 10-1**.

**Table 10-1. Selected ARARs for the Soils Remediation Project at the Landfill OU**

ARAR	Description
10 CFR Part 40, Appendix A <sup>1</sup> , Criterion 6-(6)	Closure of Waste Disposal Areas
1. 10 CFR Part 40, Appendix A – Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Waste Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for Their Source Material Content	

In summary, 10 CFR Part 40, Appendix A, Criterion 6-(6) includes both performance standards and a mechanism to establish cleanup standards for various radionuclides present at the site. The USACE evaluated the criterion, 10 CFR Part 40, Appendix A, Criterion 6-(6), to develop cleanup criteria. Based on the results of the USACE evaluation, the soil removal cleanup criteria for the Landfill OU would be to limit the residual radionuclide concentrations remaining in soils within a 100 m<sup>2</sup> (1,076 ft<sup>2</sup>) area to concentrations that shall not exceed 1 for the sum of ratios of these radionuclide concentrations to the associated concentration limits above background. Constituents of concern include Ra-226, Th-230, and U<sub>total</sub>. The ARARs related to the soil removal are averaged over 100 m<sup>2</sup> (1,076 ft<sup>2</sup>) resulting in the cleanup goals in **Table 2-1**.

### 10.2 Soils Remediation Requirements

Plexus and its subcontractors will adhere to all applicable laws, rules, regulations, and standards of federal, state, and local authorities in executing the soils remediation project at the site. The following sections summarize the regulatory authorities and agencies that serve as the framework for the project execution.

### **10.2.1 Permitting**

Pursuant to Section 121(e) of CERCLA, permits typically required under federal and state laws or statutes, such as the Clean Water Act (CWA) or Clean Air Act (CAA), are not required for the portion of remedial actions conducted on-site. Remedial actions conducted off-site that will require permitting consist of waste operations and wastewater discharge. Permits required for waste operations (e.g., solid waste transport) will be obtained by others (i.e., not Plexus) through the appropriate regulating entity. The permit required for wastewater discharge will be obtained by Plexus through the Town of Tonawanda (see Section 11.2.2).

### **10.2.2 Statutory Authorities**

This section introduces the major safety, environmental, and preservation statutes/laws that frame remedial actions at radiological and chemically contaminated sites, with a specific focus on the site. These laws provide agencies with the authority to develop and implement regulations, guidance, and standards affecting radiation protection and cleanup of radioactive waste.

- Atomic Energy Act (AEA). Through the formation of the AEC, this Act promulgated the basic criteria for the development, management, processing, and utilization of radioactive materials in a manner that protects public health and the environment. In 1974, under the Energy Reorganization Act, the AEC was reorganized to separate the functions of national defense and development and energy-related work (established under what is now the DOE) and nondefense-related radioactive material regulation under the then newly created NRC. The NRC regulates source, byproduct, and special nuclear material, as defined in the AEA.
- Comprehensive Environmental Restoration, Compensation, and Liability Act. This Act serves as the basis for the cleanup of abandoned or closed waste sites and provides the requirements for the response to uncontrolled releases of hazardous substances to the environment. Under CERCLA, the process of evaluating a site and its existing or potential hazards was established. This includes preparing a site-specific remedial investigation and feasibility study. Based on alternatives presented in the feasibility study, a proposed plan is developed, which identifies the preferred alternative, and a record of decision is developed which identifies the selected remedy to be implemented. This is followed by completing remedial design and remedial action to address the release or threat of release of contamination. The Act authorizes the USEPA to complete remedial action in response to releases or substantial threats of releases of hazardous substances into the environment.
- Superfund Amendments and Reauthorization Act (SARA). Passage of SARA did not change the basic structure of CERCLA; instead, it modified existing requirements on remedial alternative evaluations and long-term reviews of the implemented remediation effectiveness. This Act also promulgated new standards for the health and safety of workers at hazardous waste sites.
- Federal Water Pollution Control Act Amendments, commonly referred to as the CWA. The CWA established interim water quality goals aimed at restoring and maintaining the chemical, physical, and biological integrity of the nation's surface waters. The objective of the CWA is to prevent, reduce, and eliminate discharges of pollutants by developing a national monitoring program and procedures for interfacing with state programs of a similar nature. Major requirements of the CWA include establishing discharge effluent limits,

establishing the National Pollutant Discharge Elimination System (NPDES) permitting program, and setting toxicity-based water quality standards.

- Clean Air Act. The CAA protects and enhances the nation's air quality by establishing the national ambient air quality standards, new source performance standards, and monitoring and reporting provisions. Under this Act, radionuclides are defined as a hazardous air pollutant.
- Occupational Safety and Health Act. The Occupational Safety and Health Act was passed to ensure worker and workplace safety, and it resulted in the creation of the Occupational Safety and Health Administration (OSHA). The goal of the law was to ensure employers provide their workers a place of employment free from recognized hazards to safety and health, such as exposure to toxic chemicals, excessive noise levels, mechanical dangers, heat or cold stress, or unsanitary conditions. This Act also created the National Institute for Occupational Safety and Health as a research institution to establish standards for workplace health and safety. The OSHA is a division of the U.S. Department of Labor. It oversees the administration of the Act and enforces standards in all 50 states.
- Hazardous Materials Transportation Act, as amended by the Hazardous Materials Transportation Uniform Security Act. These Acts establish requirements for transportation of hazardous materials, including procedures and requirements for classification, packaging, labeling, marking, shipping, and placarding of hazardous materials.
- Floodplain Management, Executive Order 11988, requires federal agencies to evaluate the potential effects of actions they may take in a floodplain area, to the maximum extent possible, with respect to adverse impacts associated with the direct and indirect development of these areas. Regulation of floodplain management is provided at 40 CFR 6.302(b).
- Protection of Wetlands, Executive Order 11990, requires federal agencies to evaluate the potential effects of actions on wetlands and to avoid undertaking any actions, to the maximum extent possible, that would negatively impact wetlands. The regulation providing wetland protection is 40 CFR 6.302(a). The CWA's Section 404 prohibits the discharge of dredged or fill material into waters of the United States without a permit from USACE.

### **10.2.3 Federal Regulatory Authorities**

Plexus will follow promulgated requirements of the following federal agencies during the soils remediation project. Some of these agencies may have regulatory oversight for one or more of Plexus's activities at the site.

- NRC – Responsibilities of the NRC include regulatory and oversight duties associated with radiological materials and operations other than national defense or energy research and development. Specifically, the NRC provides standards for licensing, radiation safety, and protection for source, byproduct, and special nuclear materials licenses. The NRC also provides requirements for packaging, transporting, and disposal of radioactive waste.
- OSHA – The OSHA regulations apply to the safety and health of workers on hazardous, toxic, and radioactive sites. These OSHA standards are for the general and construction industry. They include requirements for training personnel who will be involved with hazardous waste site cleanup projects.

- USEPA – The USEPA promulgates the standards under the authority of CERCLA, which provide for the remedial investigations and actions to be completed to address hazardous waste releases. The USEPA also regulates the standards of the CWA and CAA, which are defined in Section 10.2.2. The USEPA’s objectives are to protect the public and environment by establishing limits on pollutant concentrations in air, water, and soil environments.
- DOT – The DOT oversees transportation of goods and commerce over federal highway, air, railroad, and maritime routes. Specific DOT regulations apply to the packaging, labeling, and all intrastate and interstate shipment of hazardous materials, including hazardous and radioactive waste.
- Department of Defense and USACE – The U.S. Army is the Department of Defense (DoD) executive agent for managing the disposal of the majority of DoD radioactive waste (with the exception of the Navy’s propulsion program) and overseeing the disposal and health and safety issues involving radioactive materials at DoD sites. Under the FUSRAP, USACE is responsible for the oversight of sites such as the Landfill OU.

#### **10.2.4 State Regulatory Authorities**

The State of New York agencies with regulations that may apply to removal actions at the site include the NYSDEC and New York State Department of Health (NYSDOH). Applicable regulations and standards related to the soils remediation project are found in Title 6 (NYSDEC) and Title 10 (NYSDOH) of the NYCRR.

#### **10.3 Soils Remediation Requirements Applicability**

The laws, rules, regulations, and standards Plexus will follow during project execution are presented in **Table 10-2**. It also includes references to the supporting work plans prepared for this project, as identified in Section 1.1. These supporting work plans present the means and methods Plexus will use to conduct the soils remediation project in compliance with the laws, rules, regulations, and standards presented in this RCP.

The relevant USACE engineer manuals (EMs); EPs; and engineer regulations (ERs) applicable to hazardous, toxic, and radioactive waste (HTRW) sites and potentially applicable to the soils remediation project are presented in **Table 10-3**. It also lists Unified Facilities Guide Specifications (UFGSs) and USACE technical requirements that apply to the soils remediation project.

**Table 10-2. Regulatory Requirements for the Soils Remediation Project at the Landfill OU**

Agency	Regulation, Standard, Requirement, Criteria	Citation or Reference	Description	Applicability
<b>FEDERAL</b>				
OSHA	Occupational Safety and Health Standards, General Industry	29 CFR 1910	<p>Specifies the health and safety requirements applicable to the conditions, practices, means, methods, and operations for general industry working conditions.</p> <p>Includes § 1910.120, "Hazardous Waste Operations and Emergency Response," which sets forth training and safety requirements specific to CERCLA cleanup sites; uncontrolled hazardous waste sites; operations at transportation, storage, and disposal facilities; and emergency response to releases or threats thereof for hazardous waste.</p>	<p>Provides the general guidelines Plexus will follow for safe conduct of site work and worker protection (i.e., fall protection, PPE, heavy equipment operation, material handling and storage, use of tools, and electrical/fire safety).</p> <p>The APP/SSHP (Plexus, 2019a), provides an analysis of the site hazards and details Plexus's established procedures for providing a safe and healthy working environment for personnel. There will be evidence that all remediation workers have attended a 40-hour course, which will include training on hazard communication. If any worker completed the 40-hour course more than 12 months before initial site mobilization, Plexus will provide evidence of an 8-hour refresher covering the period of initial site mobilization. An 8-hour refresher shall be completed every 12 months thereafter.</p> <p>Certificates documenting course attendance and medical fit-for-duty forms will be maintained on-site. The site superintendent will also have 8-hour supervisory training.</p> <p>If personally identifiable information is collected in addressing this requirement, it will be protected in accordance with the Health Insurance Portability and Accountability Act.</p>
OSHA	Safety and Health Requirements for Construction	29 CFR 1926	<p>Provides health and safety criteria similar to § 1910, but the § 1926 criteria are specific to the construction industry, pursuant to the "Contract Work Hours and Safety Standards Act" (40 USC § 333 et seq.).</p>	<p>Health and safety requirements under §1926 will be followed at all times, including sanitation, housekeeping, first aid, electrical/fire safety, emergency action plans, material handling, PPE, tool use, and applicable construction safety training. See APP/SSHP (Plexus, 2019a)].</p>



**Table 10-2. Regulatory Requirements for the Soils Remediation Project at the Landfill OU**

Agency	Regulation, Standard, Requirement, Criteria	Citation or Reference	Description	Applicability
OSHA	Recording and Reporting Occupational Injuries and Illnesses	29 CFR 1904	Provides the criteria and methodologies for determining, recording, and reporting work-related illnesses, injuries, and fatalities.	Plexus will maintain records pursuant to § 1904 related to the site.  Records will be kept on-site at all times during remediation, and will include medical surveillance, training certifications, and accident investigation/reporting forms. Corporate data will also be made available for inspection by conspicuous placement of OSHA 300 logs. Following completion of the project, Plexus will maintain these records for at least three years in its corporate office records.  If personally identifiable information is collected in addressing this requirement, it will be protected in accordance with the Health Insurance Portability and Accountability Act.
NRC	Notices, Instructions, and Reports to Workers: Inspection and Investigations	10 CFR 19	Specifies requirements for notices, instructions, and reports to be provided by licensed employers to workers employed in radiological working conditions. Specifically, pursuant to 19.12, employers shall instruct employees in the areas of health protection, radioactive material storage and transfer, reporting requirements, and responsibilities related to radiological employment.	Applies if licensable sources are found during the excavation. As discussed in the APP/SSHP (Plexus, 2019a) and RPP (Plexus, 2019a), all employees and subcontractors involved with on-site operations who might be exposed to radiological materials will have been trained in accordance with Plexus's Radiation Safety Program and project safety requirements.
NRC	Standards for Protection Against Radiation	10 CFR 20, Subparts C and D, and Appendix B	Specifies dose limits for adults, minors, the embryo/fetus of a declared pregnant worker, and the public. Values specified in Appendix B may be used to demonstrate compliance with dose limits (annual limits on intake, derived air concentrations, effluent concentrations).	Applies if licensable sources are found during the excavation. Plexus Radiation Protection Program (RPP) included in the APP/SSHP requires all employees and subcontractors involved with on-site operations who might be exposed to ionizing radiation to comply with occupational dose limits. Dose monitoring to verify compliance with dose limits is specified in the RPP.



**Table 10-2. Regulatory Requirements for the Soils Remediation Project at the Landfill OU**

Agency	Regulation, Standard, Requirement, Criteria	Citation or Reference	Description	Applicability
NRC	Standards for Protection Against Radiation	10 CFR 20	Specifies standards for protection against ionizing radiation.	Applies if licensable sources are found during the excavation, Site perimeter exposure limits for public members and on-site Occupational Exposure Limits will be maintained in accordance with NRC 10 CFR 20, Subparts C and D, and Subpart O, Appendix B - Annual Limits on Intake and Derived Air Concentrations of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage.
NRC	Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Waste Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for Their Source Material Content	10 CFR 40, Appendix A	Specifies technical, financial, ownership, and long-term site surveillance criteria relating to siting, operation, decontamination, decommissioning, and reclamation of licensed uranium and thorium mills and tailings.	10 CFR 40, Appendix A, specifically, Criterion 6-(6), was used to develop the cleanup goals for the Landfill OU. The UFP-QAPP (Plexus, 2019d) defines the process for ascertaining cleanup consistent with these standards. Applies if licensable sources are found during the excavation,
NRC	Packaging and Transportation of Radioactive Material	10 CFR 71	Specifies requirements for packaging, preparation for shipment, and transportation of licensed material.	Applies if licensable sources are found during the excavation, the material to be excavated and disposed of will be regulated as a Class 7 (radioactive) hazardous material if quantity in each shipment qualifies as such.

**Table 10-2. Regulatory Requirements for the Soils Remediation Project at the Landfill OU**

Agency	Regulation, Standard, Requirement, Criteria	Citation or Reference	Description	Applicability
USEPA	Discharge of Oil	40 CFR 110	Establishes the definition of and reporting requirements for discharges of oil to navigable waters of the U.S.. Oil discharges are defined as those which result in either a violation of applicable water quality standards or cause a film or sheen upon surface water or adjoining shorelines.	Plexus will follow good housekeeping and materials management practices to prevent oil spills. Practices will include monitoring refueling operations, storing flammable fuels (gasoline cans) in approved storage lockers with secondary containment, having large quantities of diesel fuel for equipment delivered to the site rather than storage on-site, having site personnel at refueling locations at all times during on-site refueling, and using spill/drip pans. If spills occur, workers will follow emergency procedures established in the APP/SSHP (Plexus, 2019a), and the National Response Center (800-424-8802) will be notified as required in §110.6.
USEPA	Designation of Hazardous Substances	40 CFR 116	Designates hazardous substances pursuant to the CWA and applies to discharges of the substances listed in Table 116.4 of this Part.	Minor quantities of the listed chemicals (§116, Table 116.4) will be used in conjunction with the soils remediation. Plexus will use them to preserve select samples for chemical analysis.
USEPA	USEPA Administered Permit Program: The National Pollutant Discharge Elimination System	40 CFR 122 and 40 CFR 123	Describes the NPDES program for approved and permitted discharges to waterways and delegates authority of the NPDES program to approved state programs for state-level management.	Wastewater will be discharged to the Town of Tonawanda POTW. The collection, treatment, and discharge of wastewater to the Town of Tonawanda POTW is addressed in the WMP (Section 11.2).
USEPA	National Oil and Hazardous Substances Pollution Contingency Plan	40 CFR 300	Establishes the NCP, whose purpose is to provide the organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants, and contaminants.	Under FUSRAP, the USACE is provided the authority to conduct remedial actions at sites where specific radionuclides from specific sources have been released. Remediation activities will be performed consistent with the NCP and in accordance with the project work plans.
<b>STATE</b>				

**Table 10-2. Regulatory Requirements for the Soils Remediation Project at the Landfill OU**

Agency	Regulation, Standard, Requirement, Criteria	Citation or Reference	Description	Applicability
NYSDOH	Ionizing Radiation	10 NYCRR Part 16	Specifies standards for protection against ionizing radiation.	Applies if licensable sources are found during the excavation, Provides general guidelines Plexus will follow for the protection of workers and the public against the effect of ionizing radiation. Actions defined by Plexus are discussed in the APP/SSHP (Plexus, 2019a) and RPP (Plexus, 2019a) in terms of employees and subcontractors involved with on-site operations who might be exposed to radiological materials.
NYSDOH	Ionizing Radiation - Notices, Instructions, and Reports to Workers	10 NYCRR Part 16.13	Specifies requirements for notices, instructions, and reports to be provided by licensed employers to workers employed in radiological working conditions.	Applies if licensable sources are found during the excavation, As discussed in the APP/SSHP (Plexus, 2019a) and RPP (Plexus, 2019a), all employees and subcontractors involved with on-site operations who might be exposed to radiological materials will have been trained in accordance with Plexus's Radiation Safety Program and will be provided with proper posting and reporting relative to exposures.
NYSDOH	Ionizing Radiation - Transportation	10 NYCRR Part 16.17	Specifies requirements for packaging, preparation for shipment, and transportation of radioactive material.	Applies if licensable sources are found during the excavation, The material to be excavated and disposed of will be regulated as a Class 7 (radioactive) hazardous material if quantity in each shipment qualifies as such.
NYSDEC	Remedial Program Soil Cleanup Objectives	6 NYCRR Part 375-6	Establishes soil cleanup objectives for unrestricted and restricted land use.	All backfill from off-site sources will be tested for chemical parameters and material classification in accordance with the UFP-QAPP (Plexus, 2019d). It must meet the applicable Soil Cleanup Objectives established in 6 NYCRR Part 375, Table 375-6.8(a) or 6.8(b) and not contain COCs above the cleanup goals identified in Table 2-1.

**Table 10-2. Regulatory Requirements for the Soils Remediation Project at the Landfill OU**

Agency	Regulation, Standard, Requirement, Criteria	Citation or Reference	Description	Applicability
NYSDEC	Prevention and Control of Environmental Pollution by Radioactive Materials	6 NYCRR Part 380	Establishes standards for protection against ionizing radiation resulting from the disposal and release of radioactive material to the environment.	Wastewater discharged to the Town of Tonawanda POTW will be required to meet the standards specified in Section 380-11.5, Table III Releases to Sewer. The collection, treatment, and discharge of wastewater to the Town of Tonawanda POTW is addressed in the WMP (Section 11.2).
NYSDEC	Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations	6 NYCRR Part 703	Establishes water quality standards and other criteria for many specific substances. These standards can either be narrative or numeric. Sets provisions for the control of discharges through best available, demonstrated control technology relative to specific regulated pollutants.	Activities at the site are being conducted to ensure the implementation of best management practices that reduce the pollutants in stormwater discharges during construction and pollutants associated with post-construction activities. The WMP (Section 11.1) provides details relative to these activities.

**Table 10-3. USACE Guidance Documents for HTRW Sites**

<b>USACE Document Number</b>	<b>Document Title</b>
<b>Engineer Manuals</b>	
EM 200-1-6	Chemical Quality Assurance for HTRW Projects
EM 385-1-1	Safety and Health Requirements Manual
EM 385-1-80	Radiation Protection
EM 1110-1-1005	Control and Topographic Surveying
EM1110-1-4000	Monitoring Well Design, Installation, and Documentation at Hazardous, Toxic, and Radioactive Waste Sites
<b>Engineer Pamphlets</b>	
EP 200-1-1	Process and Procedures for Shipping Hazardous Wastes and Other Hazardous Materials
EP 310-1-6a and 6b	Sign Standards Manual
EP 415-1-266	Resident Engineering Management Guide for Hazardous, Toxic, and Radioactive Waste (HTRW) Projects
EP 1110-1-33	Spill Reporting Procedures for USACE Hazardous, Toxic and Radioactive Waste Projects
<b>Engineer Regulations</b>	
ER 200-1-7	Chemical Data Quality Management for Environmental Restoration Activities
ER 385-1-80	Ionizing Radiation Protection
ER 385-1-92	Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities
ER 385-1-99	USACE Accident Investigation and Reporting
<b>Unified Facilities Guide Specifications</b>	
UFGS Section 01 10 10	Real Estate
UFGS Section 01 32 01	Project Schedule
UFGS Section 01 33 00	Submittal Procedures
UFGS Section 01 35 26	Governmental Safety Requirements
UFGS Section 01 35 29.13	Health, Safety, and Emergency Response Procedures for Contaminated Sites
UFGS Section 01 35 45	Chemical Data Quality Control
UFGS Section 01 45 00.00	Quality Control
UFGS Section 01 45 00.15 10	Resident Management System Contractor Mode (RMS CM)
UFGS Section 01 50 00	Temporary Construction Facilities and Controls
UFGS Section 01 57 20	Environmental Protection
UFGS Section 01 57 23	Temporary Storm Water Pollution Control

**Table 10-3. USACE Guidance Documents for HTRW Sites**

<b>USACE Document Number</b>	<b>Document Title</b>
UFGS Section 01 58 00	Project Identification
UFGS Section 02 61 13	Excavation and Handling of Contaminated Material
UFGS Section 31 11 00	Clearing and Grubbing
<b>USACE Technical Requirements (from Appendix B of the SOW)</b>	
N/A	USACE Air Monitoring Requirements
N/A	USACE Analytical Laboratory Requirements and Data Deliverables

## **11.0 WATER MANAGEMENT PLAN**

### **11.1 Stormwater Pollution Prevention Plan**

The stormwater pollution prevention plan is presented in **Appendix C**.

### **11.2 Wastewater Pollution Prevention Plan**

The Wastewater Pollution Prevention Plan (WWPPP) identifies procedures to manage wastewater generated during the soils remediation project. Any groundwater, surface water, or precipitation that accumulates in the eight excavation areas (Areas A through H) or is produced during decontamination activities will be managed as wastewater.

#### **11.2.1 Wastewater Management Operations**

Accumulated wastewater will be collected from a given area (e.g., excavation or decontamination) using a combination of hoses, transfer pumps, and/or mobile storage tanks and taken to the wastewater treatment unit for treatment prior to sampling and ultimate discharge to the Town of Tonawanda POTW. The location of the wastewater treatment unit is presented on **Figure 11-1**, and a process flow diagram of the wastewater treatment unit is presented on **Figure 11-2**. The major components of the wastewater treatment unit are:

- 21,000-gallon untreated wastewater storage tank(s) with integral electric submersible transfer pump;
- Three-stage sand filtration unit connected in series;
- Dual-bag filter system (two connected in parallel) with 10-micron filters;
- Flow-meter; and
- 21,000-gallon treated wastewater storage tank(s).

The wastewater treatment unit is capable of processing up to 200 gallons per minute (gpm). The wastewater treatment unit will always be maintained in an operating or standby condition. Wastewater will be collected during periods of standby as necessary and the system brought on line for treatment when needed.

#### **11.2.2 Wastewater Monitoring Requirements**

A wastewater discharge permit will be obtained from the Town of Tonawanda POTW for the discharge of collected wastewater to the sanitary sewer during the soils remediation project. The Town of Tonawanda POTW is located at 779 Two Mile Creek Road in Tonawanda, New York, 14150. Treated wastewater will be discharged to the Town of Tonawanda POTW at the outfall shown on **Figure 11-1**. Based on discussions with the Town of Tonawanda POTW, the preliminary monitoring requirements for treated wastewater are presented in **Table 11-1**. Final monitoring requirements will be provided by the Town of Tonawanda POTW when the discharge permit is obtained, although they are not anticipated to vary.

**Table 11-1. Town of Tonawanda POTW Preliminary Monitoring Requirements**

Parameters <sup>1</sup>	Sample Frequency	Sample Type	Discharge Limit <sup>2,3</sup>
Total/Soluble: radium-226, Isotopic thorium, Isotopic uranium	1 per 20,000 gallons	Grab	6 NYCRR Part 380, Table III, Releases to Sewers
Priority Pollutants (except for Asbestos and Dioxins)	Once every 6 months	Grab	Compliance
1) Wastewater sampling will be conducted in accordance with the UFP-QAPP (Plexus, 2019d). 2) All wastewater will be filtered with a 10-micron bag filter prior to discharge to the sanitary sewer. 3) Wastewater discharge flow not to exceed 100 gpm without prior authorization from the Town of Tonawanda POTW.			

Monitoring results will be provided to the USACE and the Town of Tonawanda POTW for approval prior to the release of any treated wastewater to the sanitary sewer. If monitoring results do not comply with the requirements of the discharge permit, then additional treatment and/or alternate disposal methods will be implemented. The additional method(s) of treatment and/or disposal will be determined by the analyte(s) that do not meet the discharge permit requirements.



## **12.0 WASTE MANAGEMENT PLAN**

This section describes procedures for the identification, safe handling, transportation, and disposal of wastes generated during the soils remediation project. Characterization of these wastes, when required, is addressed in the UFP-QAPP (Plexus, 2019d).

### **12.1 Waste Streams**

In addition to the liquid wastes discussed in the WWPPP (Section 11.2), other waste streams will be generated during the remedial action. These waste streams include the following:

- FUSRAP Wastes – All soil, debris, grubbing debris, equipment, PPE, or any other material (e.g., temporary well point casings) identified as impacted with radioactivity;
- Clearing Debris – Brush, branches, and other clearing related debris; and
- General Waste – Non-impacted PPE, packing material, and office waste.

Additional waste streams are not anticipated but, if identified, will be managed in a manner that is consistent with the handling of the waste streams identified above.

#### **12.1.1 FUSRAP Wastes**

The FUSRAP-related soil and debris will be excavated from the approximate excavation limits identified in **Figure 2-2**. The excavation areas will be excavated to a depth of 1.5 m (5 ft) bgs from top of grade to the lateral limits identified. The estimated quantity of material to be excavated and managed is approximately 2,000 bank cubic yards (BCY) or approximately 3,800 tons. The estimation from BCY to tons was calculated using an assumed density swell factor of 1.9 per BCY. Actual volumes may vary based on conditions at the time of the remedial action and will be determined by field screening and confirmation sampling.

Because of the shallow water table at the site and potential for material containing a high-water content, each excavation area will be dewatered prior to the start of material removal. Surface water control and groundwater extraction, treatment, and discharge to the Town of Tonawanda POTW are addressed in the WMP (Section 11.2). If necessary, saturated material will be treated (i.e., mixed with dry material or an amendment, such as cement kiln dust) to ensure that no free liquids are present when transferred to an IMC. If the addition of an amendment is required to ensure that FUSRAP-related soil and debris meet disposal criteria, then information for the amendment will be incorporated into the waste profile prior to profile approval. Treatment will be conducted to meet the waste acceptance criteria (WAC) of the disposal facility.

Due to the nature of the site, the FUSRAP-related soil and debris consists of various landfill wastes. An attempt will be made to homogenize the material before removing it from each excavation area. All excavated material will be reduced in size to smaller than four cubic feet to allow for handling by an excavator; this is the smallest size requirement of the waste disposal facility. At each excavation area, an excavator will place size-reduced material (as necessary) directly into an IMC; the material will not be staged or piled on site (other than in a temporary working pile within the excavation). IMC management is presented in Section 12.2.

Other FUSRAP wastes, including grubbing material (e.g., root balls), PPE, temporary well point casings, decontamination pad material, will be size reduced (as necessary) to meet size requirements of the disposal facility and placed in containers along with the FUSRAP-related

soil and debris for off-site disposal. These containers will be appropriately labeled in accordance with 10 CFR 20.1904 and 10 CFR 20.1905. All FUSRAP wastes will be placed into IMCs supplied by the USACE T&D contractor for off-site disposal at the U.S. Ecology facility located at 49350 North I-94 Service Drive, Belleville, Michigan 48111.

### **12.1.2 Clearing Debris**

Clearing debris, including any aboveground tree material (e.g., stumps, trunks, or branches) will be loaded into a truck or roll-off box and disposed of at the Erie County Recycling Center as wood debris. Any belowground tree material (e.g., root balls), will be size reduced (as necessary) to meet size requirements of the disposal facility and placed in containers along with the FUSRAP-related soil and debris for off-site disposal.

### **12.1.3 General Wastes**

General wastes include those waste that are generated during the remedial action that are not FUSRAP-related or clearing debris. Office wastes, such as packing paper, non-contaminated PPE, lunch containers, etc. will be containerized locally in waste pails and consolidated into a dumpster for off-site disposal as municipal waste. Regular trash service will be established at mobilization.

## **12.2 IMC Management**

The USACE T&D contractor will supply IMCs capable of containing 20 CY of waste. A coordination meeting will be held approximately 30 days before the date of the remedial action to finalize coordination details between Plexus and the USACE T&D contractor. Plexus's Waste Manager will have the responsibility for waste management and handling and act as the liaison between Plexus and the USACE's T&D contractor.

It is anticipated that the USACE T&D contractor can transport 6 IMCs each day to/from the site. The intent is for the T&D contractor to drop off an empty IMC and pick up a full IMC.

However, at the beginning of the project, the USACE T&D contractor may deliver IMCs to the site without picking up full IMCs and at the end of the project remove IMCs without delivering empty IMCs. Plexus's Waste Manager will communicate with the USACE T&D contractor to minimize the amount of time full IMCs will be stored on site.

Each IMC will be assigned a unique identification number. The identification number will be used to correlate all information collected (e.g., date filled, weight, ISOCS scan, screening and visual inspection, DOT conveyance, etc.) on the IMC throughout the project. IMCs will be managed between the staging areas and the excavation areas with a straight-body roll-off truck. The haul road from the staging areas to the excavation areas is shown on **Figure 5-1**. The haul road within the excavation area will be determined based on daily site conditions, but the preference is for the haul road to be as far from the property fence line as possible.

### **12.2.1 Receiving**

Arriving IMCs will be placed at one of the staging areas and given a unique ID number for tracking purposes. A visual inspection will be performed on each IMC that arrives to ensure that the IMCs are being received in a serviceable and clean condition without off-site waste. The staged IMCs will remain sealed until they are transported to the excavation area for filling. The USACE will be notified of any container that is non-serviceable or is discovered to contain off-site waste when opened for filling.

### **12.2.2 Handling**

When excavation operations are ready to begin, an empty IMC will be brought to the excavation area for filling. The primary IMC handling process is to direct-load the IMCs without off-loading them to the ground. If the direct loading of IMCs is not possible, then IMCs will be placed on the ground, within reach of excavation equipment, and filled for later pick-up by the straight-body roll-off truck. Filled IMCs will then be replaced with empty IMCs. Empty IMCs may also be pre-placed at the excavation area to facilitate continuous excavation operations.

During filling operations, the IMC will be, to the extent practicable, placed upwind of the excavation areas. The excavator operator will load the wastes into the IMC, being careful to minimize spilling wastes onto the ground or the exterior of the IMC. Polyethylene sheeting may be placed over the sides of the IMC and truck to prevent contamination. Filled IMCs will be sealed and visually inspected at the excavation area to identify any areas on the exterior of the IMC or straight-body roll-off truck that require decontamination. The IMC and truck will be scanned for external contamination. Once inspected and decontaminated (as needed), the filled IMCs will be weighed to determine their gross weight. Weighed IMCs will then be transported to the staging area for ISOCS scanning. ISOCS scanning will be conducted in accordance with the standard operating procedures presented in the UFP-QAPP (Plexus, 2019d). Multiple rows of 6 IMCs will be placed approximately 7 feet apart to allow for ISOCS scanning. IMCs that are determined to be above the WAC will be reconfigured. IMC reconfiguration will consist of the following steps:

- Transport the non-exempt IMC back to the excavation area;
- Remove its contents and place them in an open excavation;
- Mix the removed material with other FUSRAP-related soil and debris;
- Place the mixed material back in the IMC; and
- Transport to the staging area and conduct ISOCS scan.

Once the ISOCS scan has been completed, the IMC will be surveyed to ensure compliance with the site release criteria and for compliance with Department of Transportation (DOT) regulations. The survey will be conducted in accordance with the standard operating procedures presented in the UFP-QAPP (Plexus, 2019d). Placards and other markings will be affixed to the containers as necessary. ISOCS scan results and additional survey information will be provided to the USACE for review the day of the scan or the following day (depending on availability of the results) to facilitate approval of the manifest.

### **12.2.3 Waste Characterization Sampling**

Waste characterization samples will be collected for every 10 IMCs filled to determine WAC compliance. IMC sampling results will be provided to the USACE for preparation of waste documentation. Waste characterization samples will be collected in the excavation areas before the container is sealed and transported to a storage area. IMC sampling is detailed in the UFP-QAPP (Plexus, 2019d).

### **12.2.4 Manifesting**

Manifests will be prepared for the transportation and disposal of radioactive wastes in accordance with DOT and NRC requirements, if licensed radioactive materials are discovered

during the excavation. The principal components of the completed manifest package include the following information:

- Bill of lading, non-hazardous waste manifest, or Low-level radioactive waste manifest (NRC forms 540 and 541) if licensed radioactive material is shipped;
- Exclusive use instructions to the driver (if necessary);
- Emergency response information for hazardous material shipments;
- ISOCS scan documentation;
- Radiological Survey Form;
- Certificate of Analysis – Smears; and
- Contamination Survey Instrument Once Daily QC Check Sheet.

Waste manifests and exclusive use instructions will list the U.S. Army as the generator and will be signed by an appointed representative of USACE. Once the waste manifest is completed, the IMC will be ready for transport by the USACE T&D contractor to the off-site disposal facility. One copy of the manifest will be kept by Plexus, and additional copies of the manifest will be provided to the USACE T&D contractor (truck driver and office), USACE, and off-site disposal facility. A coordination meeting between the USACE T&D contractor, Plexus, and USACE will be held approximately 30 days before the start of the remedial action to finalize manifest coordination details (i.e., method of delivery to the USACE T&D contractor and contact information).

### **12.3 Spill Prevention, Control, and Countermeasures Plan**

Procedures and responsibilities for spill prevention, response activities, and cleanup associated with the soils remediation project are presented in Section 9.2.4 of the APP/SSHP (Plexus, 2019a). Plexus will have on-site spill response material, including containers, adsorbents, shovels, and personal protective equipment from mobilization through demobilization.

## 13.0 PROJECT REPORTING

### 13.1 Lessons Learned Report

A Lessons Learned Report will be prepared by Plexus after completion of the soils remediation project. It will use the problem and solution format presented in **Table 13-1**.

**Table 13-1. Lessons Learned Report Problem and Solution Format**

Discipline	
Title	
Problem	(include optional backup files as appropriate)
Solution	(include optional backup files as appropriate)

After submittal of the Draft Lessons Learned Report to the USACE, Plexus will host a conference call to present and discuss lessons learned and value engineering issues. After the conference call, Plexus will make changes to the Draft Lessons Learned Report based on comments received.

### 13.2 Construction Completion Report

A Construction Completion Report (CCR) will be prepared by Plexus after completion of the field portion of the soils remediation project. The CCR will include:

- Project description and scope;
- A figure that illustrates pre-remediation surfaces and site conditions;
- Excavation, material handling, and backfilling methods;
- A discussion of environmental sampling and analysis procedures used, including sample locations (shown on a figure) and analytical results;
- QC activities and results;
- Worker safety protection measures implemented;
- Scope deviations and corrective measures;
- Stormwater and wastewater management activities and monitoring;
- Source(s) of all off-site fill/topsoil;
- Off-site fill material classification;
- A site restoration figure that includes final contours; and
- Appendices that contain all backup documentation generated during the soils remediation project, including log books, permits, inspection records, photographs, laboratory data, monitoring and test reports, meeting minutes, daily reports, and site surveys.

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## **14.0 REFERENCES**

NYSDEC, 2009. CP-43: Groundwater Monitoring Well Decommissioning Policy. November 3. [http://www.dec.ny.gov/docs/remediation\\_hudson\\_pdf/cp43mwdecomm.pdf](http://www.dec.ny.gov/docs/remediation_hudson_pdf/cp43mwdecomm.pdf). Accessed October 29, 2018.

Plexus, 2019a. Accident Prevention Plan/Site Safety and Health Plan for Soils Remediation, Landfill Operable Unit, Tonawanda Landfill Vicinity Property, Tonawanda, New York. March.

Plexus, 2019b. Contractor Quality Control Plan for Soils Remediation, Landfill Operable Unit, Tonawanda Landfill Vicinity Property, Tonawanda, New York. March.

Plexus, 2019c. Perimeter Air Monitoring Plan for Soils Remediation, Landfill Operable Unit, Tonawanda Landfill Vicinity Property, Tonawanda, New York. March.

Plexus, 2019d. Uniform Federal Policy – Quality Assurance Project Plan for Soils Remediation, Landfill Operable Unit, Tonawanda Landfill Vicinity Property, Tonawanda, New York. March.

USACE, 2006. Sign Standards Manual, Volume 1. Engineer Pamphlet 310-1-6a.

USACE, 2011. Final Report for the Phase 2 Remedial Investigation at the Tonawanda Landfill FUSRAP Vicinity Property in Tonawanda, New York. Buffalo District, March. Prepared by American Remediation Services and Environmental Corporation, Port Allen, LA.

USACE, 2017. Record of Decision for the Landfill Operable Unit of the Tonawanda Landfill Vicinity Property, Tonawanda, New York. Buffalo District, September.

USACE, 2018. Scope of Work (Amended) for Landfill Operable Unit of the Tonawanda Landfill Vicinity Property Soils Remediation, Formerly Utilized Sites Remedial Action Program, Erie County, New York. Buffalo District, August.

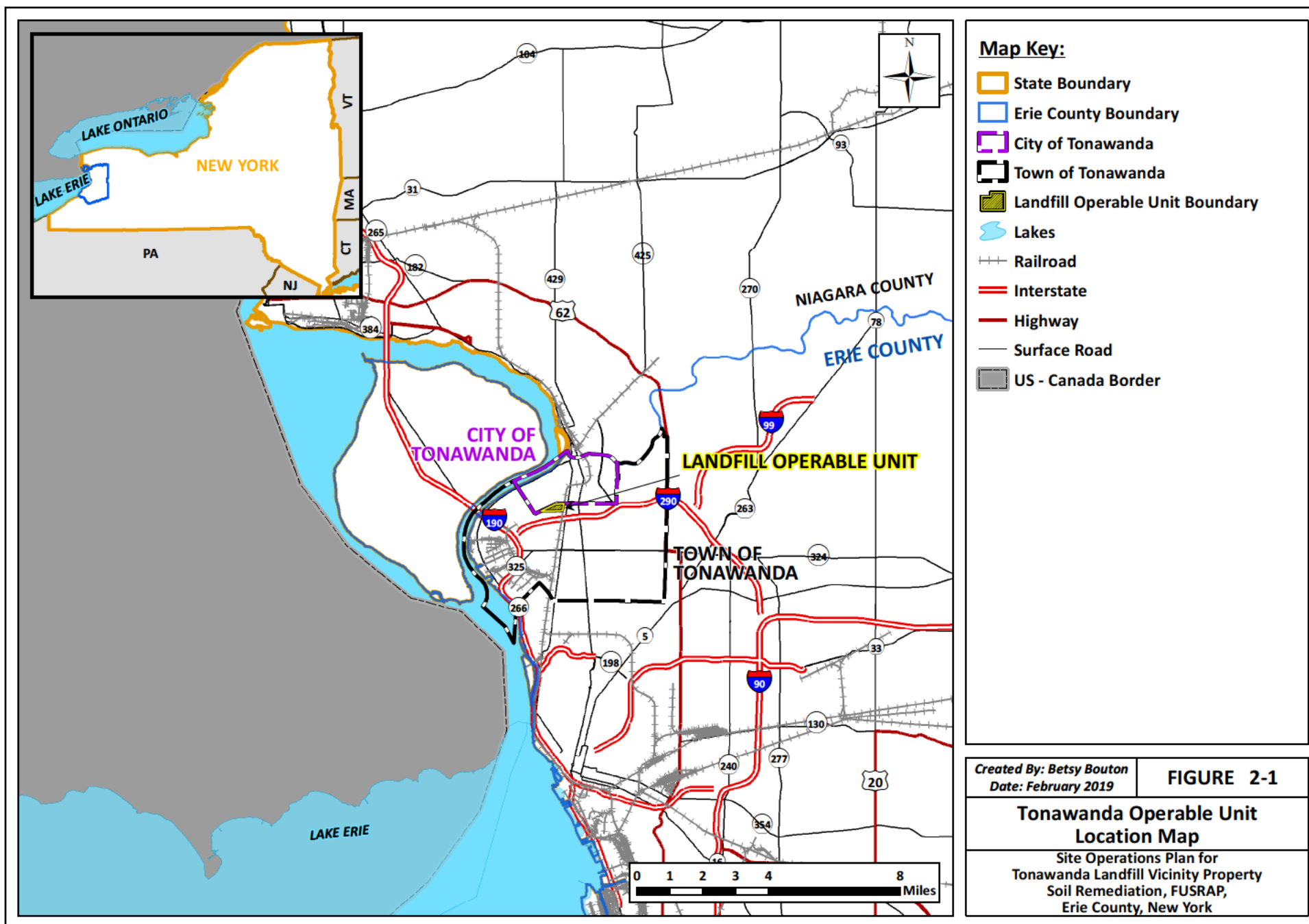
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## **FIGURES**

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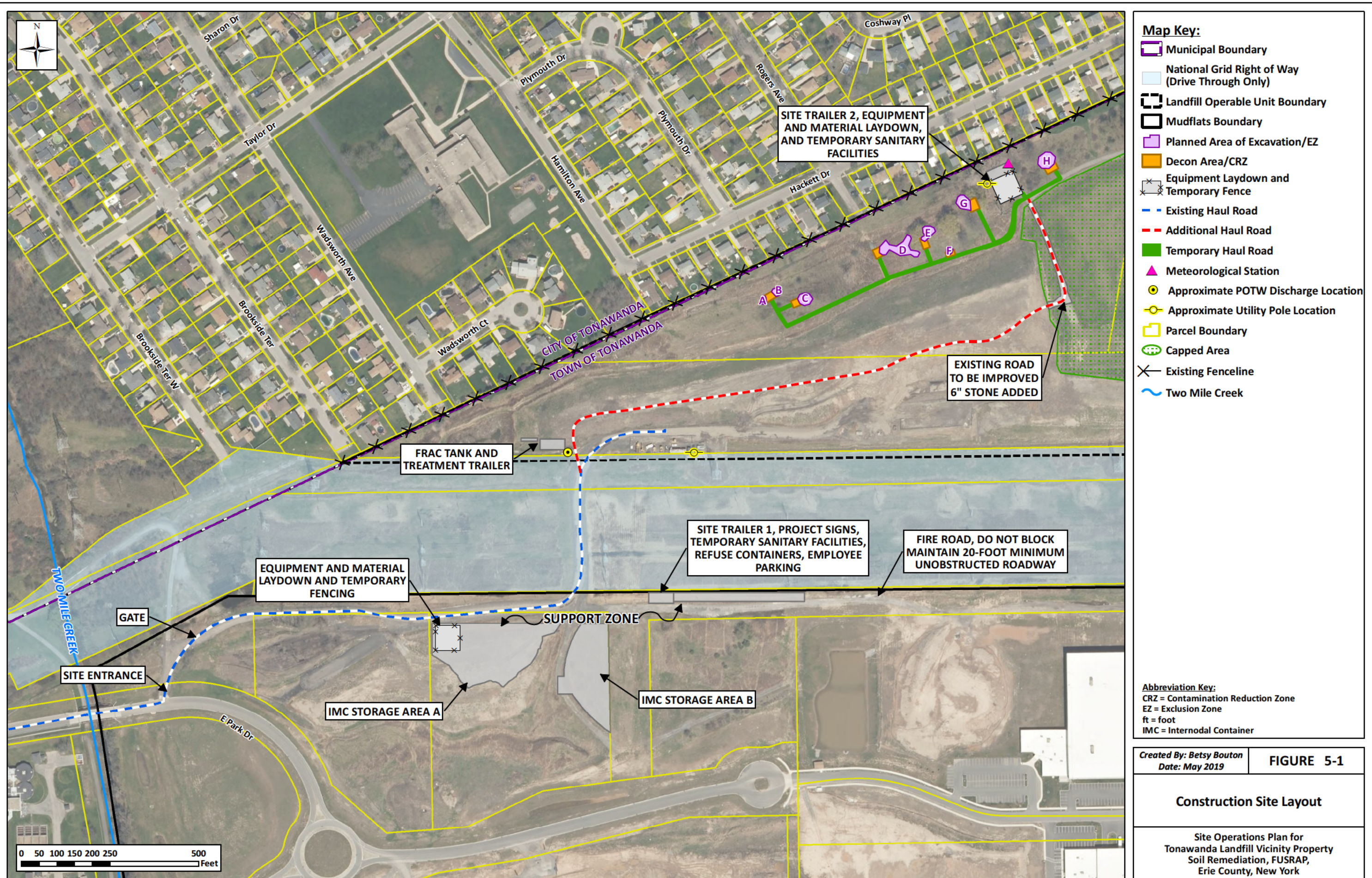


**Map Key:**

- Municipal Boundary
- Planned Area of Excavation
- Existing Fenceline

Created By: Betsy Bouton Date: January 2019	<b>FIGURE 2-2</b>
<b>Conceptual Illustration of the Selected Remedy</b>	
Site Operations Plan for Tonawanda Landfill Vicinity Property Soil Remediation, FUSRAP, Erie County, New York	









**Map Key:**

- Municipal Boundary
- LTCCODE
- Temporary Well Points
- Town Well Points (To Be Protected)
- Sanitary Sewer
- Water Line
- National Grid Right of Way (Drive Through Only)<sup>1</sup>
- Landfill Operable Unit Boundary
- Mudflats Boundary
- Planned Area of Excavation
- Topographic Contour (10 ft interval)
- Topographic Contour (2 ft interval)
- Parcel Boundary
- Capped Area
- Existing Fenceline

<sup>1</sup> the Right of Way includes the following other utilities:

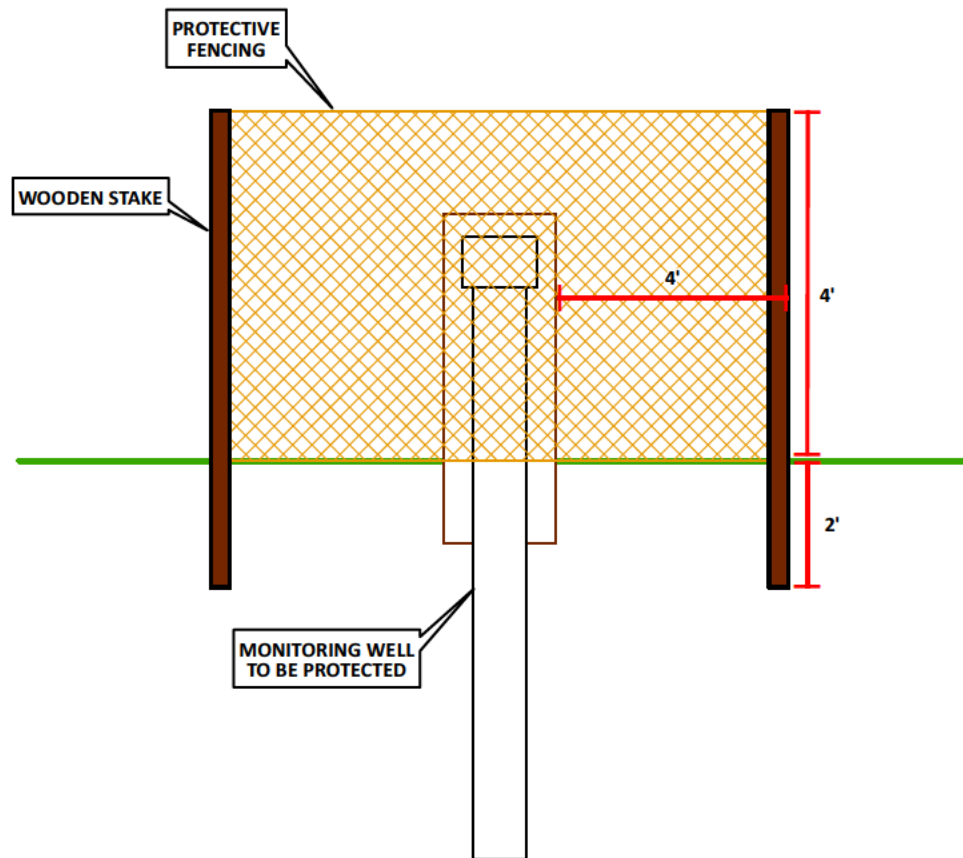
- Erie County Water Authority - 48" water line
- NMPC - abandoned 6" pipeline
- Lakehead Pipeline Co., Inc. - 0.1 pipeline
- Sun Oil Co. - 8" 0.1 pipeline
- Overhead power lines

Created By: Betsy Bouton  
Date: May 2019

**FIGURE 5-2**  
**Temporary Monitoring Well Points and Utility Map**

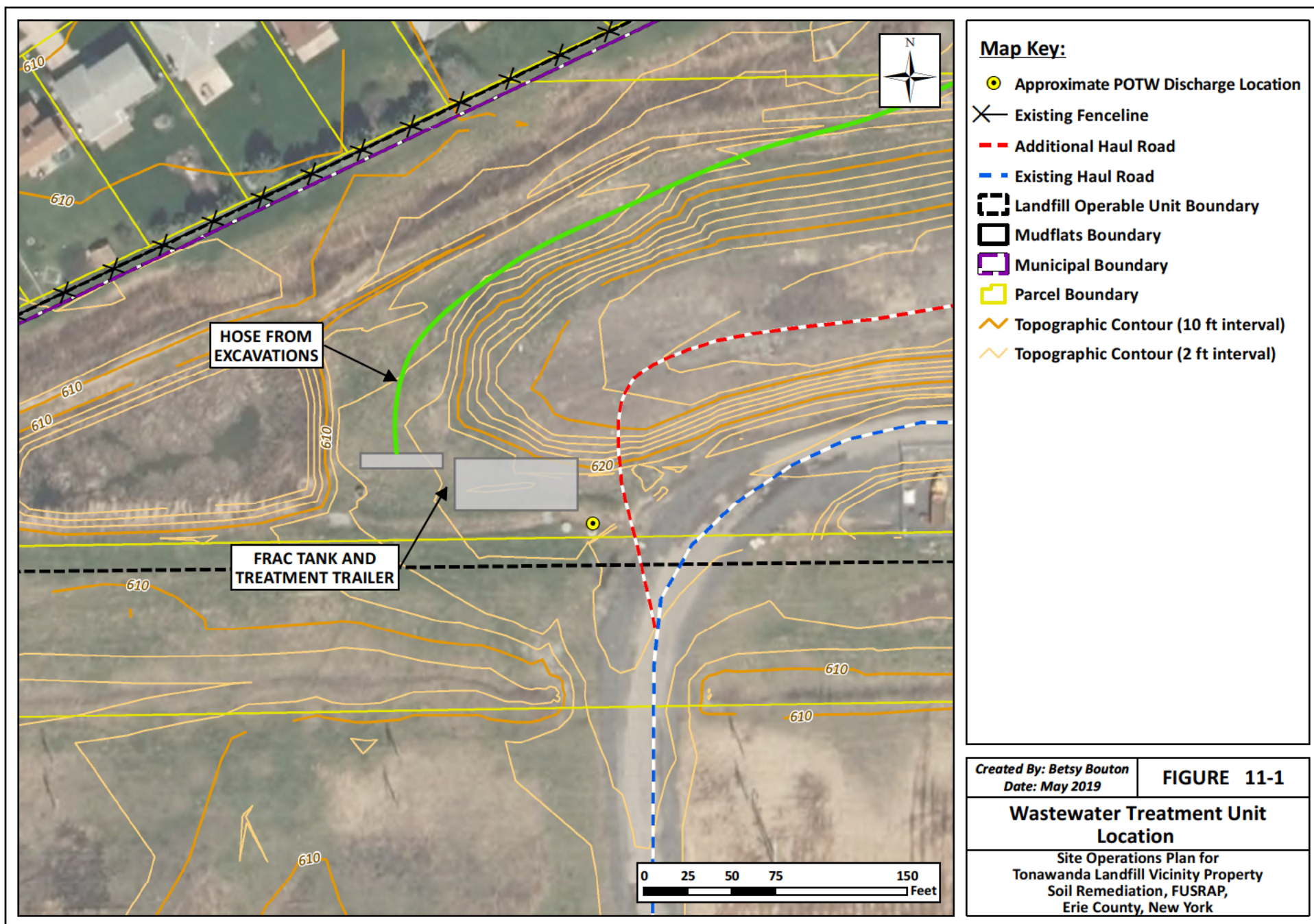
Site Operations Plan for  
Tonawanda Landfill Vicinity Property  
Soil Remediation, FUSRAP,  
Erie County, New York





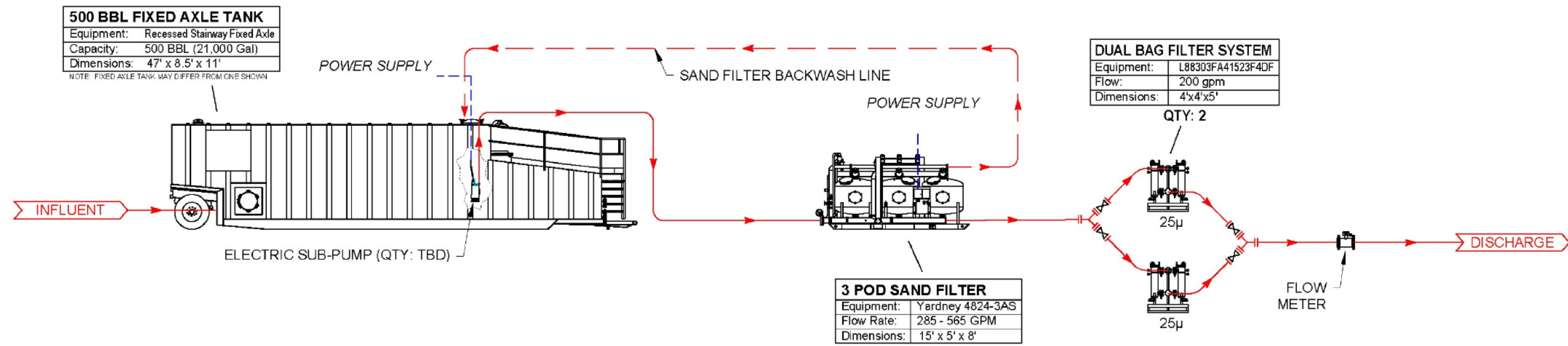
DRAWING NOT TO SCALE

Created By: Betsy Bouton Date: January 2019	<b>FIGURE 5-3</b>
<b>Town-Owned Monitoring Wells Protection Plan</b>	
Site Operations Plan for Tonawanda Landfill Vicinity Property Soil Remediation, FUSRAP, Erie County, New York	





100-200 GPM FILTRATION SYSTEM



**NOTE:**  
ALL HOSES TO BE 3" CAMLOCK HOSES.

Created By: Betsy Bouton Date: February 2019	<b>FIGURE 11-2</b>
<b>Wastewater Treatment Unit Process Flow Diagram</b>	
Site Operations Plan for Tonawanda Landfill Vicinity Property Soil Remediation, FUSRAP, Erie County, New York	

**APPENDIX A**  
Key Personnel Resumes

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**APPENDIX B**  
Project Schedule

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**Tonawanda Landfill Vicinity Property  
Project Schedule Update  
Wed 5/8/19**

ID	Task Name	% Complete	Duration	Start	Finish												
						2nd Quarter Apr	3rd Quarter Jul	4th Quarter Oct	2019 1st Quarter Jan	2nd Quarter Apr	3rd Quarter Jul	4th Quarter Oct	2020 1st Quarter Jan	2nd Quarter Apr			
1	<b>Tonawanda Landfill Vicinity Project</b>	0%	375 days	Fri 9/28/18	Sun 3/29/20												
2	Notice to Proceed (NTP)	100%	0 days	Wed 10/17/18	Wed 10/17/18												
3	RFP-002/AN001 - Award/NTP	100%	0 days	Fri 9/28/18	Fri 9/28/18												
4	Project End	0%	0 days	Sun 3/29/20	Sun 3/29/20												
5	<b>Pre-Planning</b>	100%	22 days	Fri 10/19/18	Mon 11/19/18												
6	Kick-Off Meeting (Conference Call)	100%	1 day	Fri 10/19/18	Fri 10/19/18												
7	Project Planning Conference Call	100%	1 day	Mon 11/19/18	Mon 11/19/18												
8	<b>Planning</b>	78%	165 days	Fri 10/12/18	Sat 6/8/19												
9	<b>Submittal Register</b>	100%	6 days	Fri 10/12/18	Fri 10/19/18												
10	Prepare Submittal Register	100%	8 days	Fri 10/12/18	Fri 10/19/18												
11	Submit Submittal Register	100%	1 day	Fri 10/19/18	Fri 10/19/18												
12	<b>Project Schedule</b>	77%	160 days	Fri 10/19/18	Sat 6/8/19												
13	Prepare Initial 90-day Project Schedule	100%	21 days	Fri 10/19/18	Thu 11/8/18												
14	Submit Initial 90-Day Project Schedule	100%	1 day	Thu 11/8/18	Thu 11/8/18												
15	Prepare Draft Project Schedule (42 days from NTP)	100%	21 days	Fri 11/9/18	Thu 11/29/18												
16	Submit Initial Draft Schedule	100%	0 days	Thu 11/29/18	Thu 11/29/18												
17	USACE Review Schedule	100%	103 days	Mon 12/3/18	Fri 3/15/19												
18	Submit Revised Schedule includnig RFP-0002/AN001	100%	1 day	Wed 4/24/19	Wed 4/24/19												
19	Respond to Comments, Issue Revised Draft Schedule	0%	15 days	Thu 4/25/19	Thu 5/9/19												
20	USACE Backcheck	0%	15 days	Fri 5/10/19	Fri 5/24/19												
21	Revise and Issue Final Schedule	0%	15 days	Sat 5/25/19	Sat 6/8/19												



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**Tonawanda Landfill Vicinity Property  
Project Schedule Update  
Wed 5/8/19**

ID	Task Name	% Complete	Duration	Start	Finish												
						2nd Quarter Apr	3rd Quarter Jul	4th Quarter Oct	2019 1st Quarter Jan	2nd Quarter Apr	3rd Quarter Jul	4th Quarter Oct	2020 1st Quarter Jan	2nd Quarter Apr			
22	Submit Final Schedule	0%	0 days	Sat 6/8/19	Sat 6/8/19						6/8						
23	Work Plans	93%	151 days	Thu 10/18/18	Thu 5/23/19												
24	Work Plan	93%	151 days	Thu 10/18/18	Thu 5/23/19												
25	Develop Draft Work Plans	100%	65 days	Thu 10/18/18	Fri 12/21/18												
26	Submit Draft WP	100%	0 days	Fri 12/21/18	Fri 12/21/18												
27	USACE Review Draft WP	100%	30 days	Thu 12/27/18	Fri 1/25/19												
28	Respond to Comments, Issue Revised Draft WP	100%	20 days	Sat 1/26/19	Thu 2/14/19												
29	USACE Backcehck WP	100%	34 days	Fri 2/15/19	Wed 3/20/19												
30	Revise and Issue Final WP	100%	6 days	Thu 3/21/19	Tue 3/26/19												
31	Stakeholder Review	100%	38 days	Mon 4/1/19	Wed 5/8/19												
32	Revise and Issue Revised Final WP	0%	15 days	Thu 5/9/19	Thu 5/23/19												
33	Submit Revised Final WP	0%	0 days	Thu 5/23/19	Thu 5/23/19												
34	Quality Assurance Project Plan (QAPP)	93%	151 days	Thu 10/18/18	Thu 5/23/19												
35	Develop Draft Quality Assurance Project Plan (QAPP)	100%	65 days	Thu 10/18/18	Fri 12/21/18												
36	Submit Draft QAPP	100%	0 days	Fri 12/21/18	Fri 12/21/18												
37	USACE Review Draft QAPP	100%	30 days	Thu 12/27/18	Fri 1/25/19												
38	Respond to Comments, Issue Revised Draft QAPP	100%	20 days	Sat 1/26/19	Thu 2/14/19												
39	USACE Backcheck QAPP	100%	34 days	Fri 2/15/19	Wed 3/20/19												
40	Revise and Issue Final QAPP	100%	6 days	Thu 3/21/19	Tue 3/26/19												
41	Stakeholder Review	100%	38 days	Mon 4/1/19	Wed 5/8/19												
42	Revise and Issue Revised Final QAPP	0%	15 days	Thu 5/9/19	Thu 5/23/19												



Task  
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Tonawanda Landfill Vicinity Property  
Project Schedule Update  
Wed 5/8/19

ID	Task Name	% Complete	Duration	Start	Finish	2019								2020	
						2nd Quarter Apr	3rd Quarter Jul	4th Quarter Oct	1st Quarter Jan	2nd Quarter Apr	3rd Quarter Jul	4th Quarter Oct	1st Quarter Jan	2nd Quarter Apr	
43	Submit Revised Final QAPP	0%	0 days	Thu 5/23/19	Thu 5/23/19	<p>The Gantt chart displays the progress of tasks 43 through 63. Tasks 43-53 and 54-63 are shown with blue bars indicating completion status. Milestones are marked with diamonds and dates. A vertical green line indicates the current date.</p>									
44	Site Operations Plan	93%	151 days	Thu 10/18/18	Thu 5/23/19										
45	Develop Draft Site Operations Plan (SOP)	100%	65 days	Thu 10/18/18	Fri 12/21/18										
46	Submit Draft SOP	100%	0 days	Fri 12/21/18	Fri 12/21/18										
47	USACE Review Draft SOP	100%	30 days	Thu 12/27/18	Fri 1/25/19										
48	Respond to Comments, Issue Revised Draft SOP	100%	20 days	Sat 1/26/19	Thu 2/14/19										
49	USACE Backcheck SOP	100%	34 days	Fri 2/15/19	Wed 3/20/19										
50	Revise and Issue Final SOP	100%	6 days	Thu 3/21/19	Tue 3/26/19										
51	Stakeholder Review	100%	38 days	Mon 4/1/19	Wed 5/8/19										
52	Revise and Issue Revised Final SOP	0%	15 days	Thu 5/9/19	Thu 5/23/19										
53	Submit Revised Final SOP	0%	0 days	Thu 5/23/19	Thu 5/23/19										
54	Contractor Quality Control Plan	93%	151 days	Thu 10/18/18	Thu 5/23/19										
55	Develop Draft Contractor Quality Control Plan	100%	65 days	Thu 10/18/18	Fri 12/21/18										
56	Submit Draft CQCP	100%	0 days	Fri 12/21/18	Fri 12/21/18										
57	USACE Review Draft CQCP	100%	30 days	Thu 12/27/18	Fri 1/25/19										
58	Respond to Comments, Issue Revised Draft CQCP	100%	20 days	Sat 1/26/19	Thu 2/14/19										
59	USACE Backcehck CQCP	100%	34 days	Fri 2/15/19	Wed 3/20/19										
60	Revise and Issue Final CQCP	100%	6 days	Thu 3/21/19	Tue 3/26/19										
61	Stakeholder Review	100%	38 days	Mon 4/1/19	Wed 5/8/19										
62	Revise and Issue Revised Final CQCP	0%	15 days	Thu 5/9/19	Thu 5/23/19										
63	Submit Revised Final CQCP	0%	0 days	Thu 5/23/19	Thu 5/23/19										



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**Tonawanda Landfill Vicinity Property  
Project Schedule Update  
Wed 5/8/19**

ID	Task Name	% Complete	Duration	Start	Finish								
						2nd Quarter Apr	3rd Quarter Jul	4th Quarter Oct	2019 1st Quarter Jan	2nd Quarter Apr	3rd Quarter Jul	4th Quarter Oct	2020 1st Quarter Jan
64	<b>Public Meeting</b>	88%	49 days	Thu 3/7/19	Tue 5/14/19								
65	Develop Posters	100%	5 days	Thu 3/7/19	Mon 3/11/19								
66	Submit Draft Posters to USACE	100%	0 days	Mon 3/11/19	Mon 3/11/19								
67	USACE Review	100%	8 days	Tue 3/12/19	Tue 3/19/19								
68	Revise Posters (as required)	100%	13 days	Wed 3/20/19	Mon 4/1/19								
69	USACE Backcheck Posters	100%	11 days	Tue 4/2/19	Fri 4/12/19								
70	Additional Revisions	100%	5 days	Mon 4/15/19	Fri 4/19/19								
71	USACE Approval	100%	0 days	Fri 4/19/19	Fri 4/19/19								
72	Produce Posters	0%	5 days	Thu 5/9/19	Mon 5/13/19								
73	Public Meeting	0%	1 day	Tue 5/14/19	Tue 5/14/19								
74	<b>Planning Meetings</b>	73%	43 days	Wed 3/27/19	Fri 5/24/19								
75	Procurement	97%	30 days	Wed 3/27/19	Thu 4/25/19								
76	Logistics Planning & Coordination Meeting (30 days in Advance of Mobilization)	100%	1 day	Fri 5/3/19	Fri 5/3/19								
77	Coordination Meeting	0%	5 days	Mon 5/20/19	Fri 5/24/19								
78	Preconstruction Conference	0%	5 days	Mon 5/20/19	Fri 5/24/19								
79	<b>Field Effort</b>	0%	89 days	Tue 5/28/19	Tue 10/1/19								
80	<b>Preparatory Work</b>	0%	5 days	Tue 5/28/19	Mon 6/3/19								
81	Mobilization of Site Supervision and Management	0%	1 day	Tue 5/28/19	Tue 5/28/19								
82	Civil Survey & Stakeout	0%	2 days	Wed 5/29/19	Thu 5/30/19								
83	Gamma Walkover	0%	3 days	Wed 5/29/19	Fri 5/31/19								



Task  
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Tonawanda Landfill Vicinity Property  
Project Schedule Update  
Wed 5/8/19

ID	Task Name	% Complete	Duration	Start	Finish												
						2nd Quarter Apr	3rd Quarter Jul	4th Quarter Oct	2019 1st Quarter Jan		2nd Quarter Apr	3rd Quarter Jul	4th Quarter Oct	2020 1st Quarter Jan		2nd Quarter Apr	
84	Setup Background Air Monitoring Station	0%	1 day	Wed 5/29/19	Wed 5/29/19												
85	Background Air Monitoring	0%	3 days	Thu 5/30/19	Mon 6/3/19												
86	Monitoring Well Abandonment	0%	3 days	Wed 5/29/19	Fri 5/31/19												
87	Field Work	0%	84 days	Mon 6/3/19	Mon 9/30/19												
88	Mobilization of Construction Equipment	0%	1 day	Mon 6/3/19	Mon 6/3/19												
89	Road Sweeping - Base	0%	61 days	Mon 6/3/19	Tue 8/27/19												
90	Road Sweeping - Above Base	0%	23 days	Wed 8/28/19	Mon 9/30/19												
91	Setup Temporary Facilities	0%	4 days	Mon 6/3/19	Thu 6/6/19												
92	Clearing & Grubbing	0%	3 days	Mon 6/3/19	Wed 6/5/19												
93	Roads, Parking, Curbs & Walls	0%	2 days	Mon 6/3/19	Tue 6/4/19												
94	Fencing	0%	2 days	Mon 6/3/19	Tue 6/4/19												
95	Sediment Barriers	0%	3 days	Mon 6/3/19	Wed 6/5/19												
96	Pumping/Draining/Collection	0%	73 days	Mon 6/10/19	Fri 9/20/19												
97	Liquids/Sediment/Sludges Collection	0%	73 days	Mon 6/10/19	Fri 9/20/19												
98	Container Handling	0%	45 days	Thu 6/6/19	Thu 8/8/19												
99	Contaminated Soil Collection - Base	0%	40 days	Mon 6/10/19	Mon 8/5/19												
100	Confirmation Scanning, Sample Collection, & Analysis - Base	0%	45 days	Mon 6/10/19	Mon 8/12/19												
101	Contaminated Soil Collection - Above Base	0%	23 days	Tue 8/6/19	Fri 9/6/19												
102	Confirmation Scanning, Sample Collection, & Analysis - Above Base	0%	28 days	Tue 8/6/19	Fri 9/13/19												



Task  
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Project Summary

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External Tasks

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Tonawanda Landfill Vicinity Property  
Project Schedule Update  
Wed 5/8/19

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Task		Inactive Task		Manual Summary Rollup		External Milestone	
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Milestone		Inactive Summary		Start-only		Progress	
Summary		Manual Task		Finish-only		Manual Progress	
Project Summary		Duration-only		External Tasks			

## **APPENDIX C**

### **Stormwater Pollution Protection Plan**

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## **Stormwater Pollution Prevention Plan**

### **For Construction Activities At:**

Landfill Operable Unit  
Tonawanda Landfill Vicinity Property  
Town of Tonawanda  
Erie County, New York

### **SWPPP Prepared For:**

U.S. Army Corps of Engineers  
Buffalo District  
1776 Niagara Street  
Buffalo, New York 14207

### **SWPPP Prepared By:**

Plexus Scientific Corporation  
5510 Cherokee Avenue, Suite 350  
Alexandria, VA 22312

### **SWPPP Preparation Date:**

May 2019

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### **Acronyms and Abbreviations**

APP/SSHP	Accident Prevention Plan / Site Safety and Health Plan
ARAR	Applicable or Relevant and Appropriate
CWA	Clean Water Act
FUSRAP	Formerly Utilized Sites Remedial Action Program
IMC	Intermodal Containers
MS4	Municipal Separate Storm Sewer System
POTW	publicly owned treatment works
SOP	Site Operations Plan
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
USACE	U.S. Army Corps of Engineers



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## SECTION 1: CONTACT INFORMATION/RESPONSIBLE PARTIES

### 1.1 Operator(s)/Subcontractor(s)

#### Operator(s):

Plexus Scientific Corporation  
[REDACTED] Project Manager  
5510 Cherokee Avenue, Suite 350  
Alexandria, Virginia, 22312  
[REDACTED]

#### Subcontractor(s):

DNT Environmental Solutions, Inc.  
[REDACTED] Project Manager  
650 Fairburn Road SW  
Atlanta, Georgia 30331  
[REDACTED]

#### Emergency 24-Hour Contact:

DNT Environmental Solutions, Inc.  
[REDACTED] Site Superintendent  
[REDACTED]

### 1.2 Stormwater Team

Table 1-1. Stormwater Team

Name and/or position, and contact	Responsibilities	I Have Read the CGP and Understand the Applicable Requirements
[REDACTED] Project Manager [REDACTED]	Record Keeping and Reporting Develop and Maintain SWPPP	
[REDACTED] Construction Quality Control Systems Manager [REDACTED]	Inspector/Corrective Actions	
[REDACTED] Site Superintendent [REDACTED]	Inspector/Corrective Actions	

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## SECTION 2: SITE EVALUATION, ASSESSMENT, AND PLANNING

### 2.1 Project/Site Information

#### Project Name and Address

Project/Site Name: Landfill Operable Unit, Tonawanda Landfill Vicinity Property

Project Street/Location: Tonawanda Landfill

City: Tonawanda

State: New York

ZIP Code: 14150

County or Similar Subdivision: Erie County

Business days and hours for the project: Monday – Friday 7:00 a.m. – 4:00 p.m.

#### Project Latitude/Longitude

Latitude: 42.998932° N  
(decimal degrees)

Longitude: - 78.891314° W  
(decimal degrees)

Latitude/longitude data source:

☐ Map   ☐ GPS   ☒ Other (please specify): Google Earth

### 2.2 Discharge Information

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)?   ☒ Yes   ☐ No

*No discharge permit is required for remedial actions completed under CERCLA.*

Are there any waters of the U.S. within 50 feet of your project's earth disturbances?   ☒ Yes   ☐ No

**Table 2-1. Discharge Information**

Point of Discharge ID	Name of receiving water:	Is the receiving water impaired (on the CWA 303(d) list)?	If yes, list the pollutants that are causing the impairment:	Has a TMDL been completed for this receiving waterbody?	Is this receiving water designated as a Tier 2, Tier 2.5, or Tier 3 water?
001	Two Mile Creek	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Dissolved Oxygen, Odors, Pathogens	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

## 2.3 Nature of the Construction Activities

### General Description of Project

The selected remedy for the Landfill Operable Unit includes the excavation of FUSRAP-related material from eight distinct areas where FUSRAP-related material exceeds the cleanup goals. FUSRAP-related material from each excavation area will be removed using a tracked excavator. FUSRAP-related material will be directly loaded into intermodal containers for processing and off-site disposal at a permitted facility.

**Table 2-2. Size of Construction Site**

Size of Property	Approximately 55 acres
Total Area Expected to be Disturbed by Construction Activities	3.8 acres 2.1 acres – Excavation Area 1.7 acres – Storage Areas
Maximum Area Expected to be Disturbed at Any One Time	3.8 acres 2.1 acres – Excavation Area 1.7 acres – Storage Areas

### Type of Construction Site (check all that apply):

- ☐ Single-Family Residential   
 ☐ Multi-Family Residential   
 ☐ Commercial   
 ☐ Industrial  
☐ Institutional   
☐ Highway or Road   
☐ Utility   
☒ Other Bulk Grading

Will there be demolition of any structure built or renovated before January 1, 1980?    ☐ Yes    ☒ No

If yes, do any of the structures being demolished have at least 10,000 square feet of floor space?    ☐ Yes    ☐ No    ☒ N/A

Was the pre-development land use used for agriculture (see Appendix A for definition of "agricultural land")?    ☐ Yes    ☒ No

**Table 2-3. Pollutant-Generating Activities**

Pollutant-Generating Activity (e.g., paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering operations)	Pollutants or Pollutant Constituents (e.g., sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels)
Clearing and Grubbing	Sediment, Dust, Fuel/Lubricant
Improvement of storage areas, as needed	Sediment, Dust, Fuel/Lubricant
Improvement of haul routes, as needed	Sediment, Dust, Fuel/Lubricant
Excavation of FUSRAP-related material	Dust, Fuel/Lubricant
Transportation of intermodal containers (IMCs) to storage areas	Dust, Fuel/Lubricant
Backfilling and Grading	Sediment, Dust, Fuel/Lubricant
Seeding	Dust, Fuel/Lubricant

## 2.4 Sequence and Estimated Dates of Construction Activities

The project schedule is presented in Appendix B of the Site Operations Plan (SOP; Plexus, 2019a).

## 2.5 Authorized Non-Stormwater Discharges

**Table 2-4. List of Authorized Non-Stormwater Discharges Present at the Site**

Type of Authorized Non-Stormwater Discharge	Discharge Authorized?
Discharges from emergency fire-fighting activities	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Fire hydrant flushings	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Landscape irrigation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Waters used to wash vehicles and equipment	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Water used to control dust	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Potable water including uncontaminated water line flushings	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
External building washdown (soaps/solvents are not used and external surfaces do not contain hazardous substances)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Pavement wash waters	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Uncontaminated air conditioning or compressor condensate	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Uncontaminated, non-turbid discharges of ground water or spring water	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Foundation or footing drains	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Construction dewatering water	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Water will be used to suppress dust on haul roads and at the excavation areas. Site trailers will be equipped with air conditioning units. All water (ground, surface, storm) that enter the excavations will be captured, treated, and discharged to the POTW.

## 2.6 Site Maps

**Appendix A** contains the site maps. **Figure 2-1** provides the site location, work area, and receiving waters. **Figure 2-2** presents the planned haul routes, excavation areas, and the planned sediment and erosion control measures at the excavation area. **Figure 2-3** depicts the planned sediment and erosion controls at the storage areas.

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## **SECTION 3: DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS**

### **3.1     *Endangered Species Protection***

- No Endangered Species Act-listed species and/or designated critical habitat are present in the action area.
- The Remedial Investigation (USACE, 2005), Phase II Remedial Investigation (USACE, 2011), Feasibility Study (USACE, 2015), Proposed Plan (USACE, 2015), and Record of Decision (USACE, 2017) were reviewed. All indicate that the site is highly disturbed and consists of low-quality habitat areas and that there is no ecological risk. Additionally, the Threatened and Endangered Species Act, typically identified as an applicable or relevant and appropriate requirement (ARAR) when a threatened or endangered species is likely to be impacted by a remedial action, was not identified as an ARAR in any of the documents.
- The U.S. Fish & Wildlife Service's Information for Planning and Consultation website was also consulted. The Northern Long-eared Bat (Threatened) was identified as a potentially impacted species. There is no critical habitat associated with this species. The species roosts underneath bark, in cavities or in crevices of both live and dead trees. The habitat at the Site and the surrounding area are highly developed with few trees.

### **3.2     *Historic Preservation***

- No ground-disturbing stormwater controls will be installed as part of this project.

### **3.3     *Safe Drinking Water Act Underground Injection Control Requirements***

- No controls will be installed that divert stormwater underground as part of this project.



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## SECTION 4: EROSION AND SEDIMENT CONTROLS

### 4.1 *Natural Buffers or Equivalent Sediment Controls*

Are there any waters of the U.S. within 50 feet of your project's earth disturbances? ☒ YES ☐ NO

### 4.2 *Perimeter Controls*

Given the shallow slope and small footprint of the excavation areas, silt fence will be used on the down gradient perimeter to control sediments. The existing drainage swale for the landfill located to the south, eliminates any stormwater run-on to the area of disturbance. Each excavation area will have an earthen dike constructed around the perimeter to mitigate the flow of surface water into the open excavation. **Figures 2-2 and 2-3 (Appendix A)** depict the locations of the perimeter controls. The design details and maintenance requirements are provided in **Appendix B**.

### 4.3 *Sediment Track-Out*

Each excavation area will have a decontamination area to address potential FUSRAP contamination on IMCs and vehicles. Vehicles will travel on the haul routes out of the excavation area to the foot of the capped portion of the landfill. A stabilized construction entrance will be installed at the foot of the capped portion of the landfill to minimize track-out of sediment. Stabilized construction entrances will also be constructed at each storage area. **Figures 2-2 and 2-3 (Appendix A)** depict the locations of the stabilized construction entrances and **Appendix B** presents the design and maintenance requirements.

### 4.4 *Stockpiled Sediment or Soil*

FUSRAP-related material will not be stockpiled. Imported borrow material (both fill and topsoil) will be delivered on an as-needed basis and not stockpiled. Should stockpiling of borrow material be necessary, soil berms will be placed around the stockpile to prevent stormwater run-on and silt fence will be placed around the perimeter of the stockpile to mitigate sediment transport. The design details and maintenance requirements for silt fence are provided in **Appendix B**.

### 4.5 *Minimize Dust*

Disturbance of vegetation within the limits of disturbance will be kept to a minimum by establishing the shortest haul route to each excavation possible. Dust control will also be accomplished using a water truck to wet site soils on an as needed basis. The design details and maintenance requirements for dust control are provided in standard and specifications in **Appendix B**. Action levels for when to begin dust control measures are located in the Perimeter Air Monitoring Plan (Plexus, 2019b) and the Accident Prevention Plan/Site Safety and Health Plan (APP/SSHP; Plexus, 2019c).

### 4.6 *Minimize Steep Slope Disturbances*

There will be no disturbances on steep slopes.

### 4.7 *Topsoil*

The entire footprint of each excavation area will be excavated, any topsoil present will be disposed of with the FUSRAP-related material. Vehicle traffic within the limits of disturbance will

be limited to established haul routes. Disturbance of topsoil within the excavation area will be kept to a minimum by establishing the shortest haul route to each excavation possible.

#### **4.8      *Soil Compaction***

All disturbed areas will be restored to the original condition. Topsoil will be added where necessary. Topsoil suitable for growth will be installed in a single, approximately 4 to 6 inch loose lift and minimally compacted with tracked equipment. Grouzer marks will be perpendicular to the finished slope.

#### **4.9      *Storm Drain Inlets***

No storm drain inlets will be located within the limits of disturbance.

#### **4.10    *Stormwater Conveyance Channels***

Storm water conveyances channels will not be installed. All stormwater flow in the excavation area is sheet flow towards existing drainage swales.

#### **4.11    *Sediment Basins***

Sediment basins will not be installed.

#### **4.12    *Chemical Treatment***

No chemical treatment will be performed.

#### **4.13    *Dewatering Practices***

Dewatering will be necessary at each excavation area. A dewatering pit will be installed at each excavation area. All water that has had contact with FUSRAP-related material will be containerized, sampled, and treated as needed prior to discharge to the publicly owned treatment works (POTW).

#### **4.14    *Other Stormwater Controls***

Earth berms will be installed around each excavation area to minimize stormwater run-on into the excavations. All stormwater that has contacted FUSRAP-related material will be containerized, sampled, and treated as needed prior to disposal in the POTW. Excavations will be backfilled as soon as possible after receiving USACE approval to backfill.

#### **4.15    *Site Stabilization***

Temporary seeding will be used on areas which will be exposed for more than 14 days without active work. Temporary seeding will be installed in accordance with the standard and specification for temporary construction area seeding presented in **Appendix B**. Final Seeding will be performed in accordance with the Town of Tonawanda's Seeding Guide Specifications.

## SECTION 5: POLLUTION PREVENTION STANDARDS

### 5.1 Potential Sources of Pollution

**Table 5-1. Construction Site Pollutants**

<b>Pollutant-Generating Activity</b>	<b>Pollutants or Pollutant Constituents</b> (that could be discharged if exposed to stormwater)	<b>Location on Site</b> (or reference SWPPP site map where this is shown)
Clearing and Grubbing	Sediment, Dust, Fuel/Lubricant	<b>Figure 2-2</b>
Improvement of storage areas, as needed	Sediment, Dust, Fuel/Lubricant	Storage areas, <b>Figure 2-3</b>
Improvement of haul routes, as needed	Sediment, Dust, Fuel/Lubricant	Excavation area, <b>Figure 2-2</b>
Excavation of FUSRAP-related material	Dust, Fuel/Lubricant	Excavation area, <b>Figure 2-2</b>
Transportation of IMCs to storage areas	Dust, Fuel/Lubricant	Haul routes, <b>Figures 2-2 and 2-3</b>
Backfilling and Grading	Sediment, Dust, Fuel/Lubricant	Excavation area, <b>Figure 2-2</b>
Seeding	Dust, Fuel/Lubricant	Excavation area, <b>Figure 2-2</b>

### 5.2 Spill Prevention and Response

Spill response procedures are detailed in Section 9.2.4 of the APP/SSHP (Plexus, 2019c).

### 5.3 Fueling and Maintenance of Equipment or Vehicles

Equipment will be fueled away from drainage areas at equipment staging areas. The staging areas will be isolated from the work area such that any spill will be contained prior to discharge from the site. The design and maintenance requirements are provided in the Standard and Specification for Site Pollution Prevention provided in **Appendix B**.

### 5.4 Washing of Equipment and Vehicles

Equipment and vehicles will only be washed in designated decontamination areas. Decontamination procedures are provided in Section 6.2 (Contamination Control) of the SOP (Plexus, 2019a).

### 5.5 Storage, Handling, and Disposal of Building Products, Materials, and Wastes

All hazardous substances will be managed in accordance with Section 9.13 of the APP/SSHP (Plexus, 2019c).

#### 5.5.1 Building Products

The only building products utilized will be borrow material (backfill and topsoil). Borrow material will be imported on an as-needed basis. If borrow material is to be stored (e.g., stockpiled), it will be done in accordance with Section 4.4 of this SWPPP.

#### 5.5.2 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

Fertilizers may be required for final seeding. Fertilizer will be brought to the site on an as-needed basis and utilized the same day. If fertilizers are to be stored on site, they will be stored in their original container, covered and off the ground.

#### **5.5.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals**

Petroleum products may be used to maintain equipment. All petroleum products will be stored in their original container and remain sealed at all times when not in use. Fuel will be delivered by fuel truck. Small (e.g., 5 gal or less) fuel containers may be stored on site in designated areas only and at least 100 feet from drainage areas. All fueling operations will be performed as described in Section 5.3 of this SWPPP. Disposal of surplus petroleum products will be done in accordance with packaging labels.

#### **5.5.4 Hazardous or Toxic Waste**

Hazardous or toxic wastes, other than the FUSRAP-related material, will not be generated during this project. Any hazardous substances (e.g., paint, lubricant, etc.) will be maintained in its original container and remain sealed when not in use. Containers will be stored only in designated areas. FUSRAP-related material will be stored in sealed containers in the designed storage areas until removed from the site for transportation to the disposal facility.

#### **5.5.5 Construction and Domestic Waste**

General site wastes (e.g., office trash, packaging, etc.) will be disposed of in accordance with Section 12.0 (Waste Management Plan) of the SOP (Plexus, 2019a).

#### **5.5.6 Sanitary Waste**

Sanitary wastes will not be disposed of on site. Sanitary facilities will be placed at each trailer location and serviced regularly.

#### **5.6 *Washing of Applicators and Containers used for Paint, Concrete or Other Materials***

Applicators and containers used for paint, concrete or other materials will only be washed in designated decontamination areas. Decontamination procedures are provided in Section 6.2 (Contamination Control) of the SOP (Plexus, 2019a).

#### **5.7 Fertilizers**

Fertilizers may be required for final seeding. Fertilizer will be brought to the site on an as-needed basis and utilized the same day. If fertilizers are to be stored on site, they will be stored in their original container, covered and off the ground.

## **SECTION 6: INSPECTION, MAINTENANCE, AND CORRECTIVE ACTION**

### **6.1     *Inspection Personnel and Procedures***

#### **Personnel Responsible for Inspections**

Chris O'Malley – Site Superintendent

Mark Bagel – Construction Quality Control Systems Manager

#### **Inspection Schedule**

Erosion controls will be inspected weekly (every 7 days) and within 24 hours of a 0.25" rain event.

#### **Inspection Report Forms**

A copy of an inspection report form is presented in **Appendix C**.

### **6.2     *Corrective Action***

#### **Personnel Responsible for Corrective Action**

Chris O'Malley – Site Superintendent

Mark Bagel – Construction Quality Control Systems Manager

#### **Corrective Action Forms**

A copy of a corrective action form is presented in **Appendix C**.

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## SECTION 7.0: REFERENCES

- Plexus, 2019a. Site Operations Plan for Soils Remediation, Landfill Operable Unit, Tonawanda Landfill Vicinity Property, Tonawanda, New York. December.
- Plexus, 2019b. Perimeter Air Monitoring Plan for Soils Remediation, Landfill Operable Unit, Tonawanda Landfill Vicinity Property, Tonawanda, New York. December.
- Plexus, 2019c. Accident Prevention Plan/Site Safety and Health Plan for Soils Remediation, Landfill Operable Unit, Tonawanda Landfill Vicinity Property, Tonawanda, New York. December.
- USACE, 2005. Final Remedial Investigation Report Tonawanda Landfill Vicinity Property Tonawanda, New York. Buffalo District, April.
- USACE, 2011. Final Report for the Phase 2 Remedial Investigation at the Tonawanda Landfill FUSRAP Vicinity Property in Tonawanda, New York. Buffalo District, March. Prepared by American Remediation Services and Environmental Corporation, Port Allen, LA.
- USACE 2015. Final Feasibility Study Report for the Landfill Operable Unit of the Tonawanda Landfill Vicinity Project Tonawanda New York. Buffalo District, September.
- USACE, 2017. Record of Decision for the Landfill Operable Unit of the Tonawanda Landfill Vicinity Property, Tonawanda, New York. Buffalo District, September.
- Information for Planning and Consultation (<https://ecos.fws.gov/ipac/>). Accessed 12/19/18. Managed by Environmental Conservation Online System.



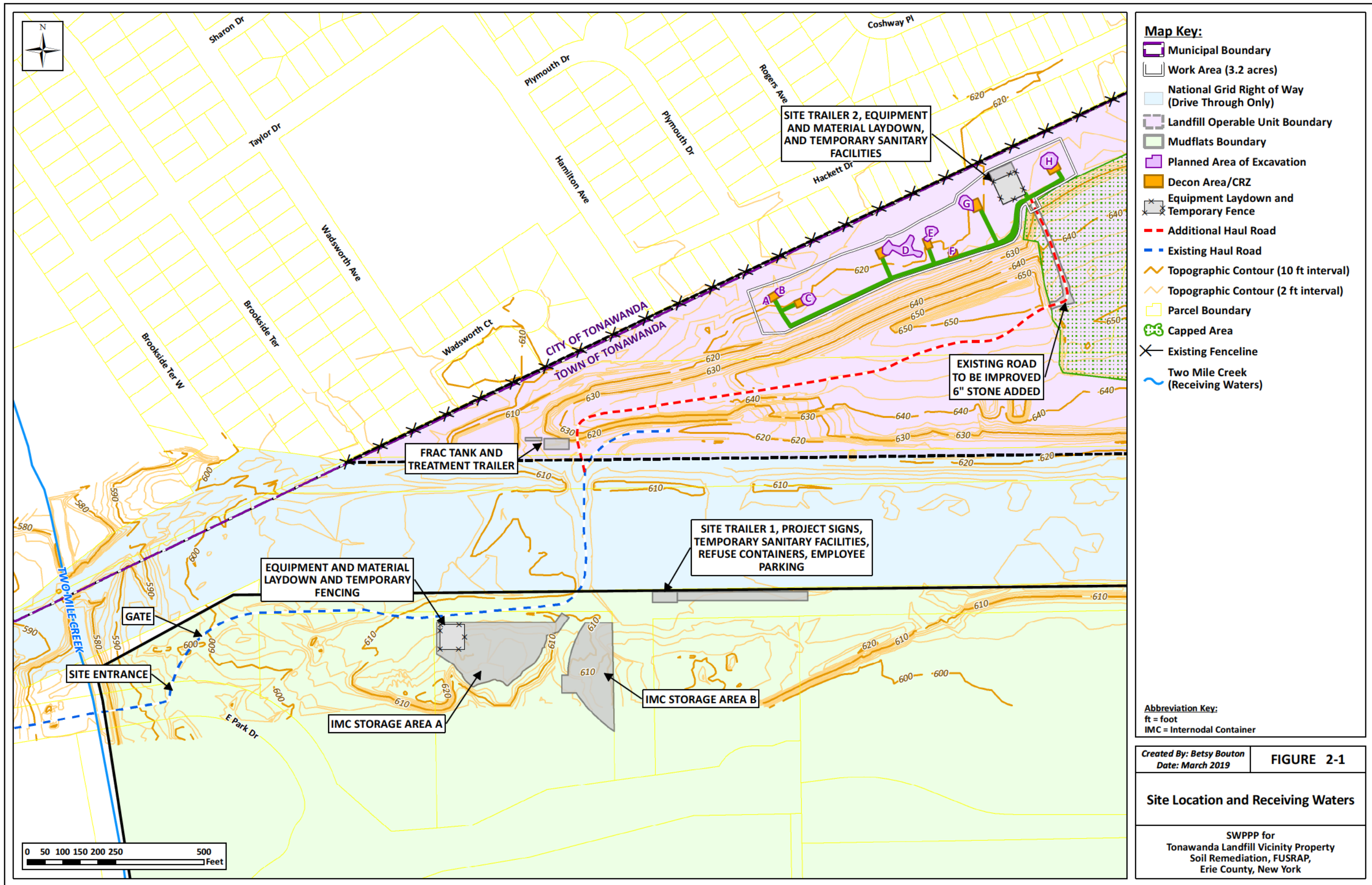
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## **Appendix A**

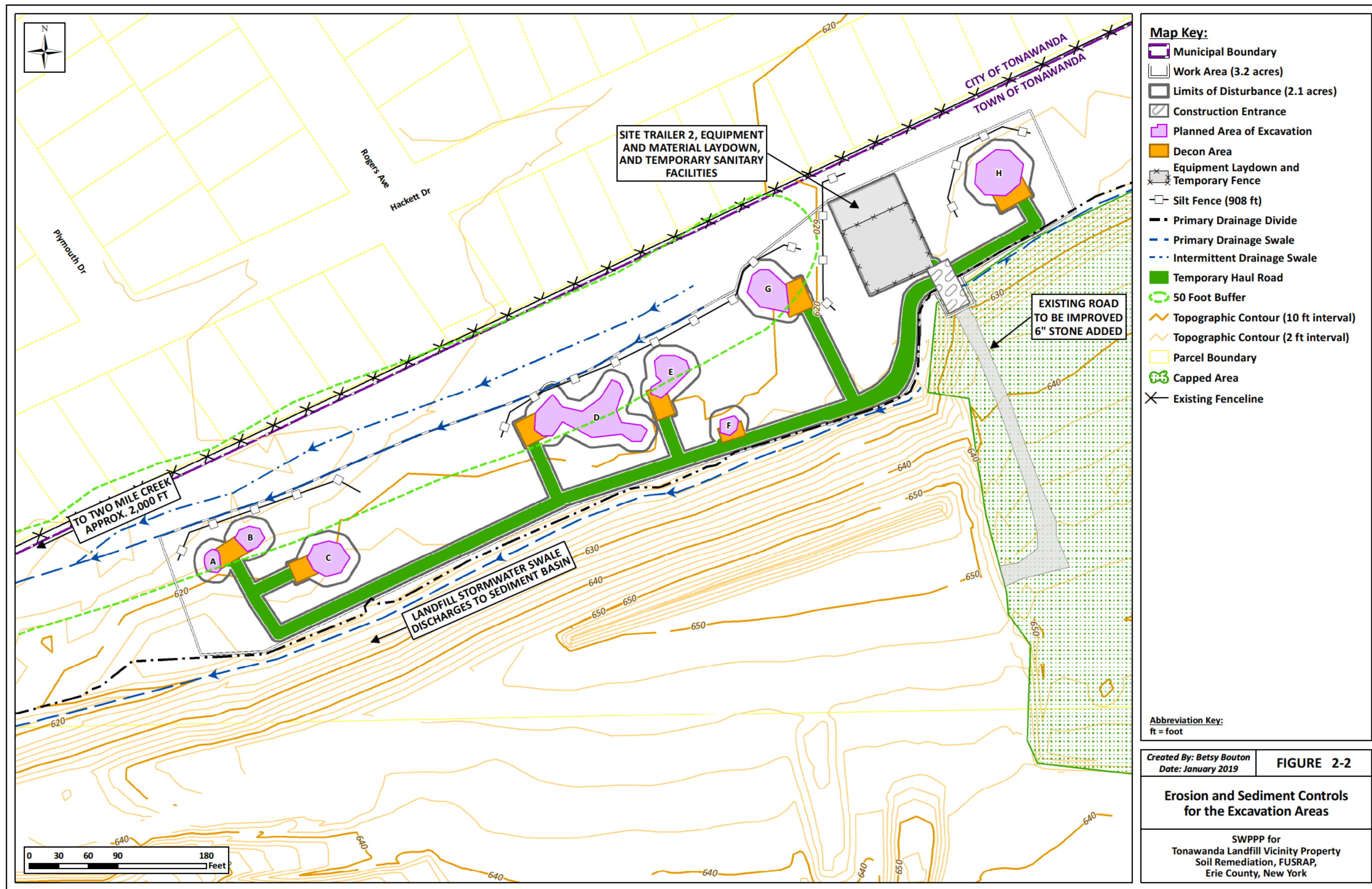
### **Site Maps**

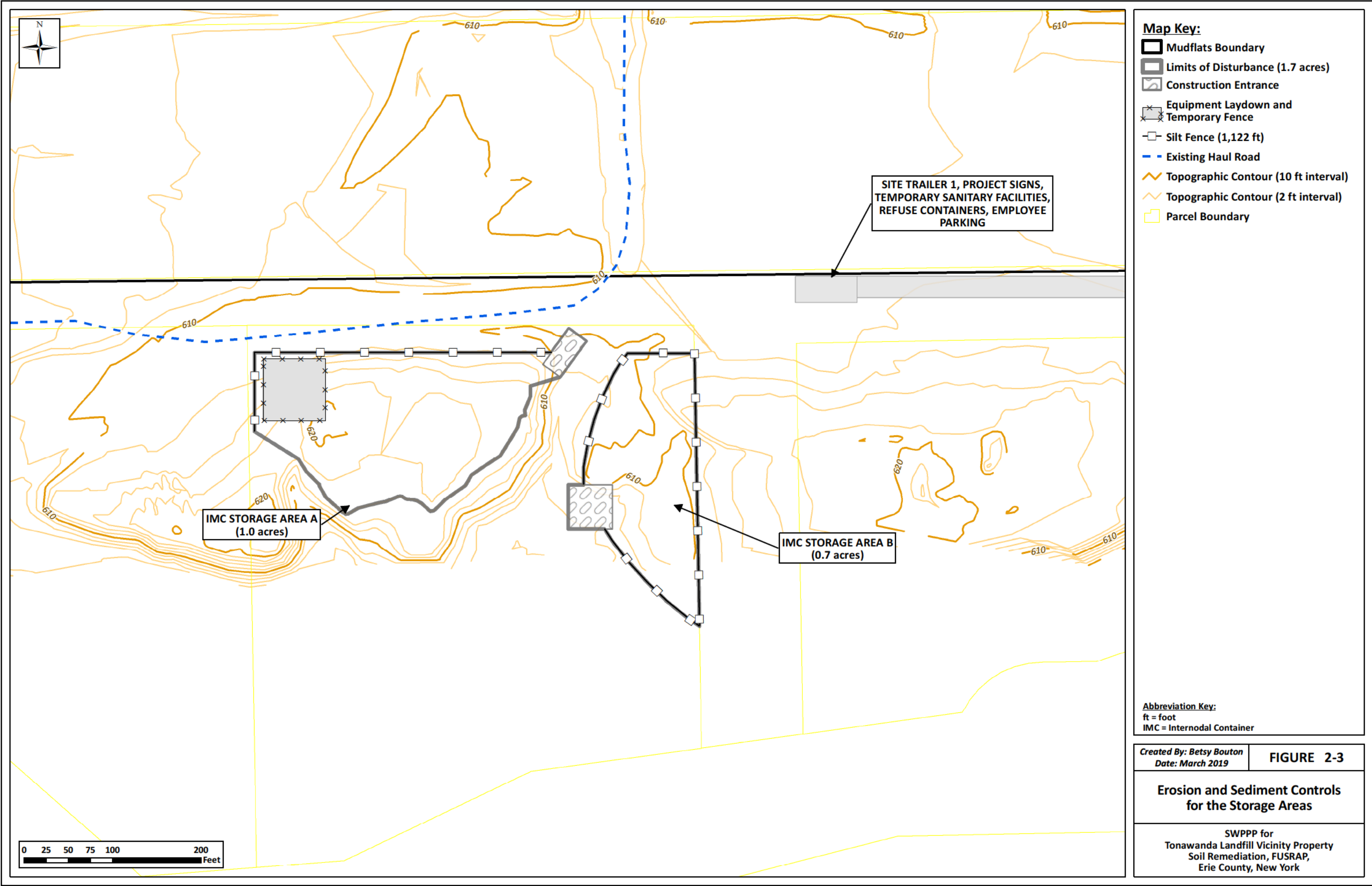
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**Appendix B**  
**Best Management Practices and Specifications**

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# STANDARD AND SPECIFICATIONS FOR DEWATERING SUMP PIT



Discharge of turbid water pumped from the standpipe should be to a sediment trap, sediment basin, filter bag or stabilized area, such as a filter strip. If water from the sump pit will be pumped directly to a storm drain system, filter cloth with an equivalent sieve size between 40-80 should be wrapped around the standpipe to ensure clean water discharge. It is recommended that  $\frac{1}{4}$  to  $\frac{1}{2}$  inch hardware cloth be wrapped around and secured to the standpipe prior to attaching the filter cloth. This will increase the rate of water seepage into the standpipe.

## **Definition & Scope**

A **temporary** pit which is constructed using pipe and stone for pumping excessive water from excavations to a suitable discharge area.

## **Conditions Where Practice Applies**

Sump pits are constructed when water collects during the excavation phase of construction. This practice is particularly useful in urban areas during excavation for building foundations. It may also be necessary during construction activities that encounter high ground water tables in floodplain locations.

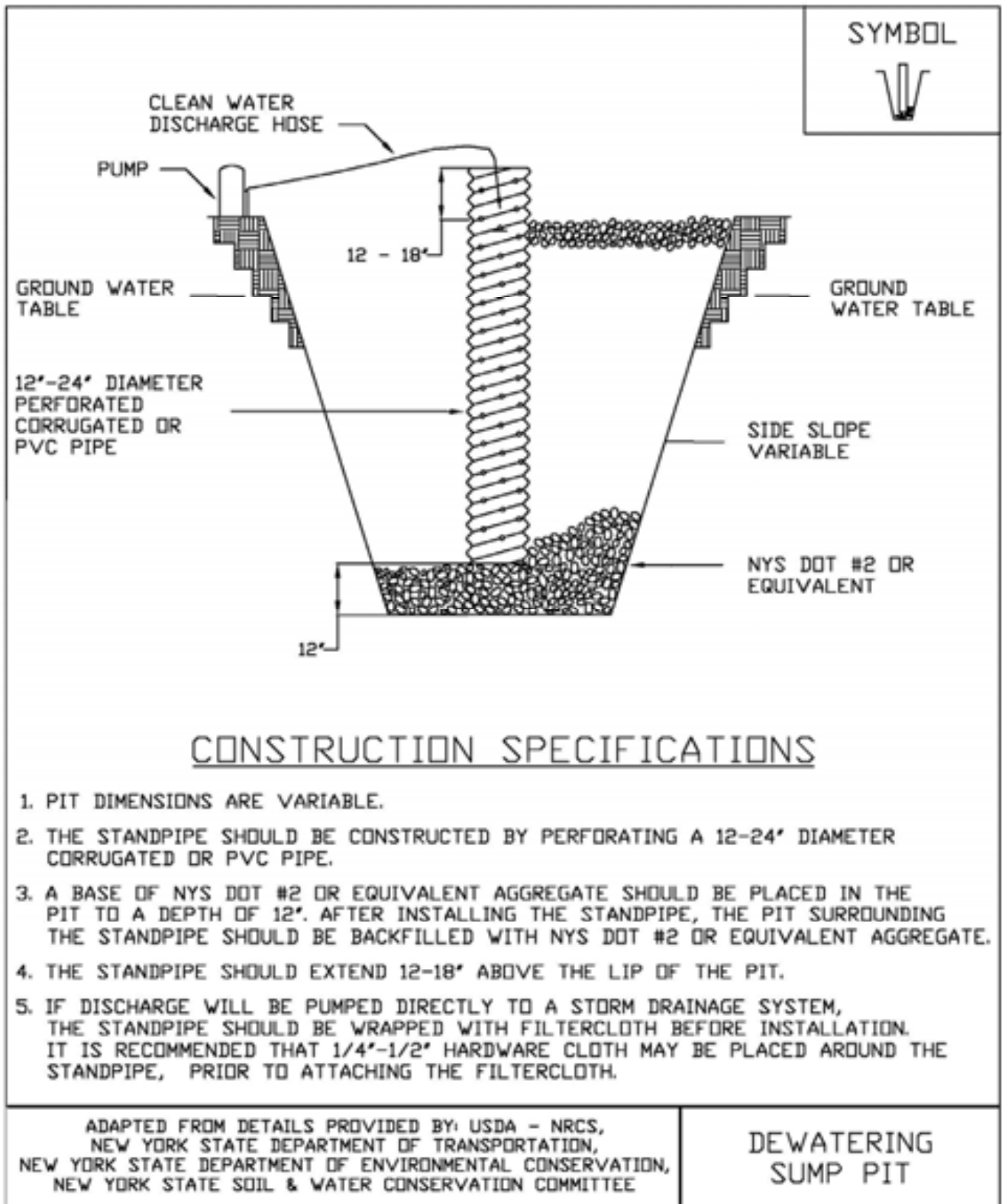
## **Design Criteria**

The number of sump pits and their locations shall be determined by the contractor/engineer. A design is not required, but construction should conform to the general criteria outlined on Figure 3.3 on page 3.8.

A perforated vertical standpipe is placed in the center of the pit and surrounded with a stone screening material to collect filtered water. Water is then pumped from the center of the pipe to a suitable discharge area.



**Figure 3.3**  
**Dewatering Sump Pit Detail**



# STANDARD AND SPECIFICATIONS FOR STABILIZED CONSTRUCTION ACCESS



## Definition & Scope

A stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area. The purpose of stabilized construction access is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets.

## Conditions Where Practice Applies

A stabilized construction access shall be used at all points of construction ingress and egress.

## Design Criteria

See Figure 2.1 on page 2.31 for details.

**Aggregate Size:** Use a matrix of 1-4 inch stone, or reclaimed or recycled concrete equivalent.

**Thickness:** Not less than six (6) inches.

**Width:** 12-foot minimum but not less than the full width of points where ingress or egress occurs. 24-foot minimum if there is only one access to the site.

**Length:** As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum would apply).

**Geotextile:** To be placed over the entire area to be covered with aggregate. Filter cloth will not be required on a single-family residence lot. Piping of surface water under entrance shall be provided as required. If piping is impossible, a mountable berm with 5:1 slopes will be permitted.

**Criteria for Geotextile:** The geotextile shall be woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric shall be

inert to commonly encountered chemicals, hydro-carbons, mildew, rot resistant, and conform to the fabric properties as shown:

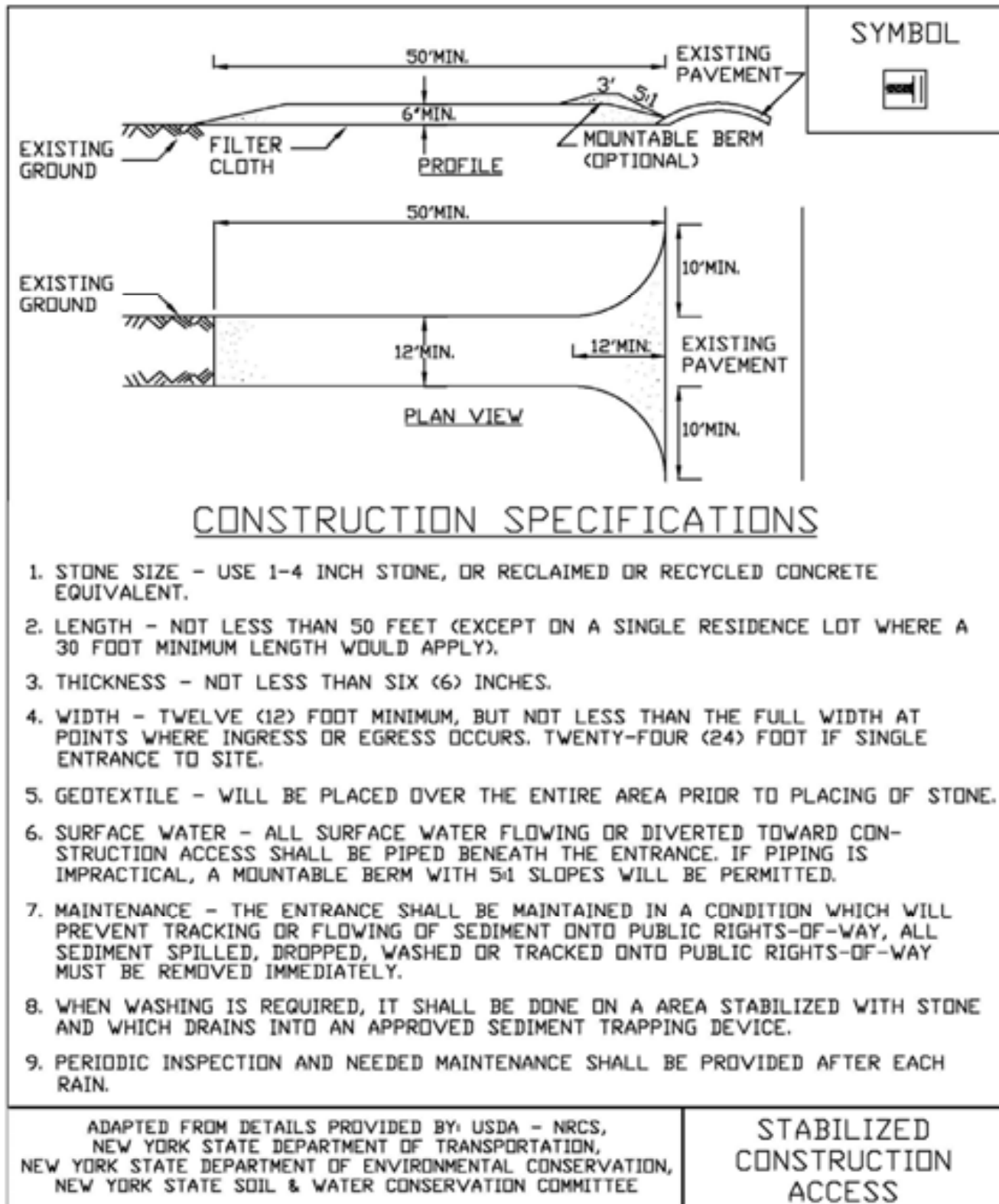
Fabric Properties <sup>3</sup>	Light Duty <sup>1</sup> Roads Grade Sub-grade	Heavy Duty <sup>2</sup> Haul Roads Rough Graded	Test Method
Grab Tensile Strength (lbs)	200	220	ASTM D1682
Elongation at Failure (%)	50	60	ASTM D1682
Mullen Burst Strength (lbs)	190	430	ASTM D3786
Puncture Strength (lbs)	40	125	ASTM D751 Modified
Equivalent	40-80	40-80	US Std Sieve
Opening Size			CW-02215
Aggregate Depth	6	10	-
<sup>1</sup> Light Duty Road: Area sites that have been graded to subgrade and where most travel would be single axle vehicles and an occasional multi-axle truck. Acceptable materials are Trevira Spunbond 1115, Mirafi 100X, Typar 3401, or equivalent.			
<sup>2</sup> Heavy Duty Road: Area sites with only rough grading, and where most travel would be multi-axle vehicles. Acceptable materials are Trevira Spunbond 1135, Mirafi 600X, or equivalent.			
<sup>3</sup> Fabrics not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.			

## Maintenance

The access shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way or streets. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public rights-of-way must be removed immediately.

When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device. All sediment shall be prevented from entering storm drains, ditches, or watercourses.

**Figure 2.1**  
**Stabilized Construction Access**



# STANDARD AND SPECIFICATIONS FOR DUST CONTROL



dust control (see Section 3).

**Mulch** (including gravel mulch) – Mulch offers a fast effective means of controlling dust. This can also include rolled erosion control blankets.

**Spray adhesives** – These are products generally composed of polymers in a liquid or solid form that are mixed with water to form an emulsion that is sprayed on the soil surface with typical hydroseeding equipment. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations for the specific soils on the site. In no case should the application of these adhesives be made on wet soils or if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators and others working with the material.

## **Definition & Scope**

The control of dust resulting from land-disturbing activities, to prevent surface and air movement of dust from disturbed soil surfaces that may cause off-site damage, health hazards, and traffic safety problems.

## **Conditions Where Practice Applies**

On construction roads, access points, and other disturbed areas subject to surface dust movement and dust blowing where off-site damage may occur if dust is not controlled.

## **Design Criteria**

**Construction operations should be scheduled to minimize the amount of area disturbed at one time.** Buffer areas of vegetation should be left where practical. Temporary or permanent stabilization measures shall be installed. No specific design criteria is given; see construction specifications below for common methods of dust control.

Water quality must be considered when materials are selected for dust control. Where there is a potential for the material to wash off to a stream, ingredient information must be provided to the NYSDEC.

No polymer application shall take place without written approval from the NYSDEC.

## **Construction Specifications**

**A. Non-driving Areas** – These areas use products and materials applied or placed on soil surfaces to prevent airborne migration of soil particles.

**Vegetative Cover** – For disturbed areas not subject to traffic, vegetation provides the most practical method of

**B. Driving Areas** – These areas utilize water, polymer emulsions, and barriers to prevent dust movement from the traffic surface into the air.

**Sprinkling** – The site may be sprayed with water until the surface is wet. This is especially effective on haul roads and access route to provide short term limited dust control.

**Polymer Additives** – These polymers are mixed with water and applied to the driving surface by a water truck with a gravity feed drip bar, spray bar or automated distributor truck. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations. Incorporation of the emulsion into the soil will be done to the appropriate depth based on expected traffic. Compaction after incorporation will be by vibratory roller to a minimum of 95%. The prepared surface shall be moist and no application of the polymer will be made if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators working with the material.

**Barriers** – Woven geo-textiles can be placed on the driving surface to effectively reduce dust throw and particle migration on haul roads. Stone can also be used for construction roads for effective dust control.

**Windbreak** – A silt fence or similar barrier can control air currents at intervals equal to ten times the barrier height. Preserve existing wind barrier vegetation as much as practical.

## **Maintenance**

Maintain dust control measures through dry weather periods until all disturbed areas are stabilized.



# STANDARD AND SPECIFICATIONS FOR SITE POLLUTION PREVENTION



## **Definition & Scope**

A collection of management practices intended to control non-sediment pollutants associated with construction activities to prevent the generation of pollutants due to improper handling, storage, and spills and prevent the movement of toxic substances from the site into surface waters.

## **Conditions Where Practice Applies**

On all construction sites where the earth disturbance exceeds 5,000 square feet, and involves the use of fertilizers, pesticides, petroleum based chemicals, fuels and lubricants, as well as sealers, paints, cleared woody vegetation, garbage, and sanitary wastes.

## **Design Criteria**

The variety of pollutants on a particular site and the severity of their impacts depend on factors such as the nature of the construction activity, the physical characteristics of the construction site, and the proximity of water bodies and conveyances to the pollutant source.

1. All state and federal regulations shall be followed for the storage, handling, application, usage, and disposal of pesticides, fertilizers, and petroleum products.
2. Vehicle and construction equipment staging and maintenance areas will be located away from all drainage ways with their parking areas graded so the runoff from these areas is collected, contained and treated prior to discharge from the site.
3. Provide sanitary facilities for on-site personnel.
4. Store, cover, and isolate construction materials including topsoil, and chemicals, to prevent runoff of

pollutants and contamination of groundwater and surface waters.

5. Develop and implement a spill prevention and control plan. The plan should include NYSDEC's spill reporting and initial notification requirements.
6. Provide adequate disposal for solid waste including woody debris, stumps, and other construction waste and include these methods and directions in the construction details on the site construction drawings. Fill, woody debris, stumps and construction waste shall not be placed in regulated wetlands, streams or other surface waters.
7. Distribute or post informational material regarding proper handling, spill response, spill kit location, and emergency actions to be taken, to all construction personnel.
8. Refueling equipment shall be located at least 100 feet from all wetlands, streams and other surface waters.



# STANDARD AND SPECIFICATIONS FOR TEMPORARY ACCESS WATERWAY CROSSING



## **Definition & Scope**

A temporary access waterway crossing is a structure placed across a waterway to provide access for construction purposes for a period of less than one year. Consideration should be given to stream flow capacity and velocity anticipated during the period of time that the temporary structures will be in place. Temporary access crossings shall not be utilized to maintain traffic for the general public. The purpose of the temporary access waterway crossing is to provide safe, environmentally sound access across a waterway for construction equipment by establishing minimum standards and specifications for the design, construction, maintenance, and removal of the structure. This standard and specification may represent a channel constriction, thus, the temporary nature of waterway access crossing must be stressed. They should be planned to be in service for the shortest practical period of time and removed as soon as their function is completed.

## **Conditions Where Practice Applies**

This standard and specification for temporary access waterway crossings is applicable in non-tidal waterways. It provides designs based on waterway geometry rather than the drainage area contributing to the point of crossing.

The principal consideration for development of the standard and specifications is concern for erosion and sediment control, tracking soil into waterways, blocking fish passage and destruction of aquatic habitat. Structural utility and safety must also be considered when designing temporary access waterway crossings to withstand expected loads.

The three types of standard temporary access

waterway crossings are bridges, culverts, and fords.

## **General Requirements**

1. **In-Stream Excavation:** In-Stream excavation shall be limited to only that necessary to allow installation of the standard methods as presented in Subsection “Temporary Access Waterway Crossing Methods.”
2. **Elimination of Fish Migration Barriers:** Of the two basic methods presented in Subsection “Temporary Access Waterway Crossing Methods,” bridges pose the least potential for creating barriers to aquatic migration. The construction of any specific crossing method as presented in Subsection “Temporary Access Waterway Crossing Methods,” shall not cause a significant water level difference between the upstream and downstream water surface elevations. Fish spawning or migration within waterways generally occurs between October 1 to May 31 for water classified for trout and from March 15 to July 15 for other streams. Fish spawning or migration dates can vary across New York and restrictions imposed by the NYS Department of Environmental Conservation may vary and must be checked.
3. **Crossing Alignment:** The temporary waterway crossing shall be at right angles to the stream. Where approach conditions dictate, the crossing may vary 15 degrees from a line drawn perpendicular to the centerline of the stream at the intended crossing location.
4. **Road Approaches:** The centerline of both roadway approaches shall coincide with the crossing alignment centerline for a minimum distance of 50 feet from each bank of the waterway being crossed. If physical or right-of-way restraints preclude the 50 feet minimum, a shorter distance may be provided. All fill materials associated with the roadway approach shall be limited to a maximum height of 2 feet above the existing flood plain elevation.
5. **Surface Water Diverting Structure:** A water diverting structure such as a swale shall be constructed (across the roadway on both roadway approaches) 50 feet (maximum) on either side of the waterway crossing. This will prevent roadway surface runoff from directly entering the waterway. The 50 feet is measured from the top of the waterway bank. Design criteria for this diverting structure shall be in accordance with the “Standard and Specification” for

the individual design standard of choice. If the roadway approach is constructed with a reverse grade away from the waterway, a separate diverting structure is not required.

6. **Road Width:** All crossings shall have one traffic lane. The minimum width shall be 12 feet with a maximum width of 20 feet.

7. **Time of Operation:** All temporary crossing shall be removed within 14 calendar days after the structure is no longer needed. Unless prior written approval is obtained, all structures shall be removed within one year from the date of the installation.

8. **Materials**

A. **Aggregate:** There shall be no earth or soil materials used for construction within the waterway channel. NYS DOT specifications for coarse aggregate designation No. 4 (2" to 4"), also referenced as AASHTO designation No. 1, shall be the minimum acceptable aggregate size for temporary crossings. Larger aggregates will be allowed.

B. **Filter Cloth:** Filter cloth is a fabric consisting of either woven or nonwoven plastic, polypropylene, or nylon used to distribute the load, retain fines, allow increased drainage of the aggregate and reduce mixing of the aggregate with the subgrade soil. The designer shall specify the appropriate filter fabric/cloth for a specific use.

### **Temporary Access Waterway Crossing Methods**

The following criteria for erosion and sediment control shall be considered when selecting a specific temporary access waterway crossing standard method:

1. **Site aesthetics:** Select a standard design method that will least disrupt the existing terrain of the stream reach. Consider the effort that will be required to restore the area after the temporary crossing is removed.

2. **Site location:** Locate the temporary crossing where there will be the least disturbance to the soils of the existing waterway banks. When possible, locate the crossing at a point receiving minimal surface runoff.

3. **Physical site constraints:** The physical constraints of a site may preclude the selection of one or more of the standard methods.

4. **Time of year:** The time of year may preclude the selection of one or more of the standard methods due to fish spawning or migration restrictions.

5. **Vehicular loads and traffic patterns:** Vehicular loads, traffic patterns, and frequency of crossing should be considered in choosing a specific method.

6. **Maintenance of crossing:** The standard methods will require various amounts of maintenance. The bridge method should require the least maintenance, whereas the ford method will probably require more intensive maintenance.

7. **Removal of the Structure:** Ease of removal and subsequent damage to the waterway should be primary factors in considering the choice of a standard method.

### **Temporary Access Bridge (Figure 2.2 on page 2.36)**

A temporary access bridge is a structure made of wood, metal, or other materials, which provides access across a stream or waterway.

#### **Considerations:**

1. This is the preferred method for temporary access waterway crossings. Normally, bridge construction causes the least disturbance to the waterway bed and banks when compared to the other access waterway crossings.

2. Most bridges can be quickly removed and reused.

3. Temporary access bridges pose the least chance for interference with fish migration when compared to the other temporary access waterway crossings.

4. Span width will be limited by the length of the bridging material and weight of equipment that will drive over the temporary bridge. Spans of over 10 feet are difficult to construct.

5. **Restrictions and Permits:** A permit from the New York State Department of Environmental Conservation, Division of Environmental Permits, Regional Permit Administrator, will be needed to install and remove temporary access culverts in streams with a classification of C(T) and higher. Installation and removal may not be permitted during the period of time from the start of trout spawning until the eggs have hatched. In some instances, restrictions may also be applied to bass spawning waters.

#### **Construction Specifications:**

1. **Restriction:** Construction, use, or removal of a temporary access bridge will not normally have any time of year restrictions if construction, use, or



removal does not disturb the stream or its banks.

2. Bridge Placement: A temporary bridge structure shall be constructed at or above bank elevation to prevent the entrapment of floating materials and debris.

3. Abutments: Abutments shall be placed parallel to and on stable banks.

4. Bridge Span: Bridges shall be constructed to span the entire channel. If a footing, pier, or bridge support is constructed within the waterway, a stream-disturbance permit may be required.

5. Stringers: Stringers shall either be logs, saw timber, pre-stressed concrete beams, metal beams, or other approved materials.

6. Deck Material: Decking shall be of sufficient strength to support the anticipated load. All decking members shall be placed perpendicular to the stringers, butted tightly, and securely fastened to the stringers. Decking materials must be butted tightly to prevent any soil material tracked onto the bridge from falling into the waterway below.

7. Run Planks (optional): Run planking shall be securely fastened to the length of the span. One run plank shall be provided for each track of the equipment wheels. Although run planks are optional, they may be necessary to properly distribute loads.

8. Curbs or Fenders: Curbs or fenders may be installed along the outer sides of the deck. Curbs or fenders are an option, which will provide additional safety.

9. Bridge Anchors: Bridges shall be securely anchored at only one end using steel cable or chain. Anchoring at only one end will prevent channel obstruction in the event that floodwaters float the bridge. Acceptable anchors are large trees, large boulders, or driven steel anchors. Anchoring shall be sufficient to prevent the bridge from floating downstream and possibly causing an obstruction to the flow.

10. Stabilization: All areas disturbed during installation shall be stabilized within 14 calendar days of that disturbance in accordance with the Standard and Specification for Temporary Construction Area Seeding on page 4.58.

### **Bridge Maintenance Requirements**

1. Inspection: Periodic inspection shall be performed by the user to ensure that the bridge, streambed, and streambanks are maintained and not damaged.

2. Maintenance: Maintenance shall be performed, as needed to ensure that the structure complies with the standard and specifications. This shall include removal and disposal of any trapped sediment or debris. Sediment shall be disposed of outside of the floodplain and stabilized.

### **Bridge Removal and Clean-Up Requirements**

1. Removal: When the temporary bridge is no longer needed, all structures including abutments and other bridging materials shall be removed within 14 calendar days. In all cases, the bridge materials shall be removed within one year of installation.

2. Final Clean-Up: Final clean-up shall consist of removal of the temporary bridge from the waterway, protection of banks from erosion, and removal of all construction materials. All removed materials shall be stored outside the waterway floodplain.

3. Method: Removal of the bridge and clean-up of the area shall be accomplished without construction equipment working in the waterway channel.

4. Final Stabilization: All areas disturbed during removal shall be stabilized within 14 calendar days of that disturbance in accordance with the Standard and Specifications for Permanent Construction Area Planting on page 4.42.

### **Temporary Access Culvert (Figure 2.3 on page 2.37)**

A temporary access culvert is a structure consisting of a section(s) of circular pipe, pipe arches, or oval pipes of reinforcing concrete, corrugated metal, or structural plate, which is used to convey flowing water through the crossing.

### **Considerations**

1. Temporary culverts are used where a) the channel is too wide for normal bridge construction, b) anticipated loading may prove unsafe for single span bridges, or c) access is not needed from bank to bank.

2. This temporary waterway crossing method is normally preferred over a ford type of crossing, since disturbance to the waterway is only during construction and removal of the culvert.

3. Temporary culverts can be salvaged and reused.

### **Construction Specifications**

1. Restrictions and Permits: A permit from the New York State Department of Environmental

Conservation, Division of Environmental Permits, Regional Permit Administrator, will be needed to install and remove temporary access culverts in streams with a classification of C(T) and higher. Installation and removal may not be permitted during the period of time from the start of trout spawning until the eggs have hatched. In some instances, restrictions may also be applied to bass spawning waters.

2. **Culvert Strength:** All culverts shall be strong enough to support their cross sectional area under maximum expected loads.

3. **Culvert Size:** The size of the culvert pipe shall be the largest pipe diameter that will fit into the existing channel without major excavation of the waterway channel or without major approach fills. If a channel width exceeds 3 feet, additional pipes may be used until the cross sectional area of the pipes is greater than 60 percent of the cross sectional area of the existing channel. The minimum size culvert that may be used is 12-inch diameter pipe.

4. **Culvert Length:** The culvert(s) shall extend a minimum of one foot beyond the upstream and downstream toe of the aggregate placed around the culvert. In no case shall the culvert exceed 40 feet in length.

5. **Filter Cloth:** Filter cloth shall be placed on the streambed and streambanks prior to placement of the pipe culvert(s) and aggregate. The filter cloth shall cover the streambed and extend a minimum six inches and a maximum one foot beyond the end of the culvert and bedding material. Filter cloth reduces settlement and improves crossing stability.

6. **Culvert Placement:** The invert elevation of the culvert shall be installed on the natural streambed grade to minimize interference with fish migration (free passage of fish).

7. **Culvert Protection:** The culvert(s) shall be covered with a minimum of one foot of aggregate. If multiple culverts are used, they shall be separated by at least 12 in. of compacted aggregate fill. At the minimum, the bedding and fill material used in the construction of the temporary access culvert crossings shall conform with the aggregate requirements cited in the General Requirements subsection.

8. **Stabilization:** All areas disturbed during culvert installation shall be stabilized within 14 calendar days of the disturbance in accordance with the Standard for Permanent Construction Area Plantings.

ensure that the culverts, streambed, and streambanks are not damaged, and that sediment is not entering the stream or blocking fish passage or migration.

2. **Maintenance:** Maintenance shall be performed, as needed in a timely manner to ensure that structures are in compliance with this standard and specification. This shall include removal and disposal of any trapped sediment or debris. Sediment shall be disposed of and stabilized outside the waterway flood plain.

### **Culvert Removal and Clean-Up Requirements**

1. **Removal:** When the crossing has served its purpose, all structures, including culverts, bedding, and filter cloth materials shall be removed within 14 calendar days. In all cases, the culvert materials shall

be removed within one year of installation. No structure shall be removed during the spawning season (generally October 1 through May 31 for trout waters and March 15 through July 15 for other waters).

2. **Final Clean-Up:** Final clean-up shall consist of removal of the temporary structure from the waterway, removal of all construction materials, restoration of original stream channel cross section, and protection of the streambanks from erosion. Removed material shall be stored outside of the waterway floodplain.

3. **Method:** Removal of the structure and clean-up of the area shall be accomplished without construction equipment working in the waterway channel.

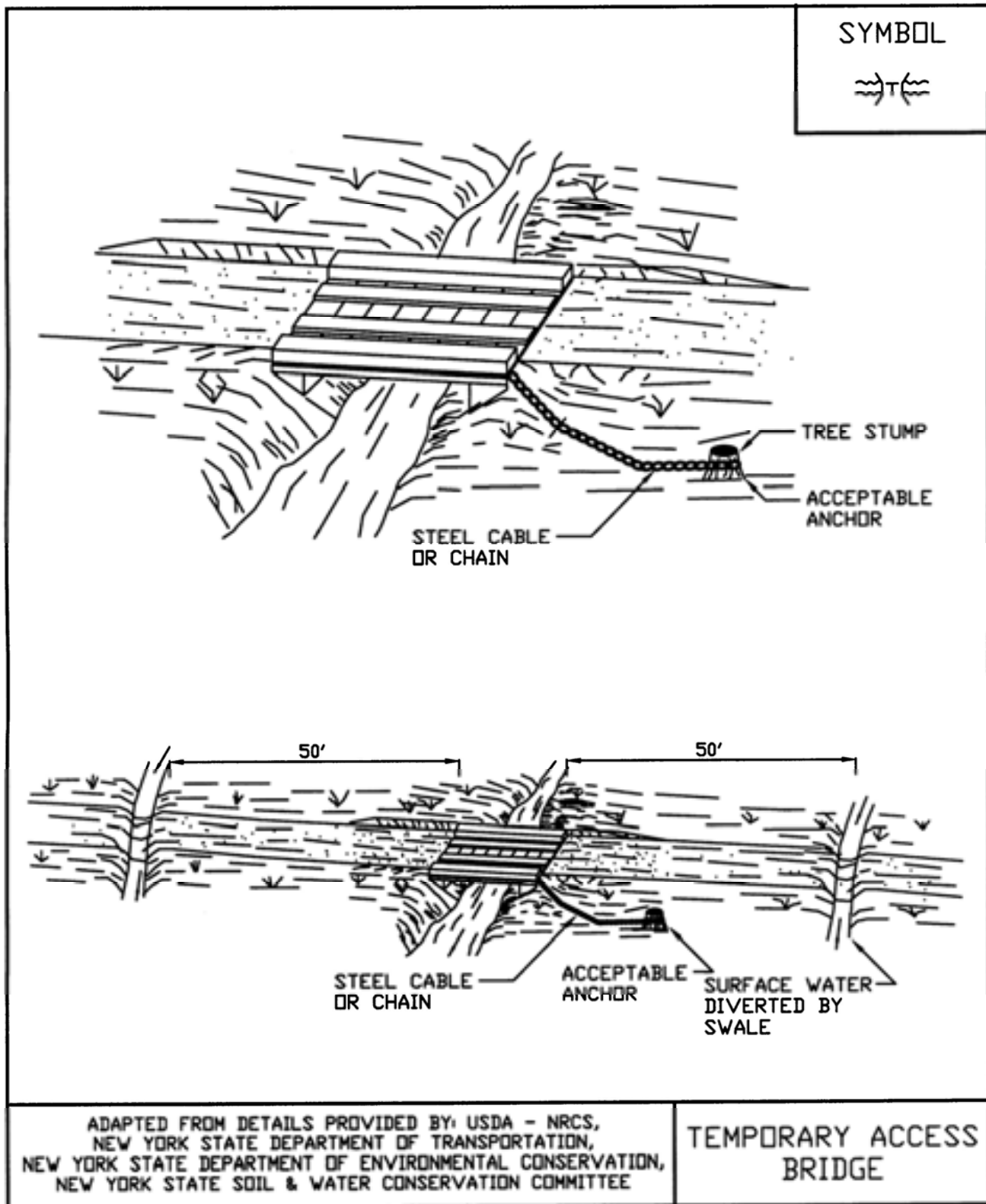
4. **Final Stabilization:** All areas disturbed during culvert removal shall be stabilized within 14 calendar days of the disturbance in accordance with the Standard for Permanent Construction Area Plantings.

**NOTE:** Any temporary access crossing shall conform to the technical requirements of this Standard and Specifications as well as any specific requirement imposed by the New York State Department of Environmental Conservation and the US Army Corps of Engineers. Permits may be required for streambank disturbance.

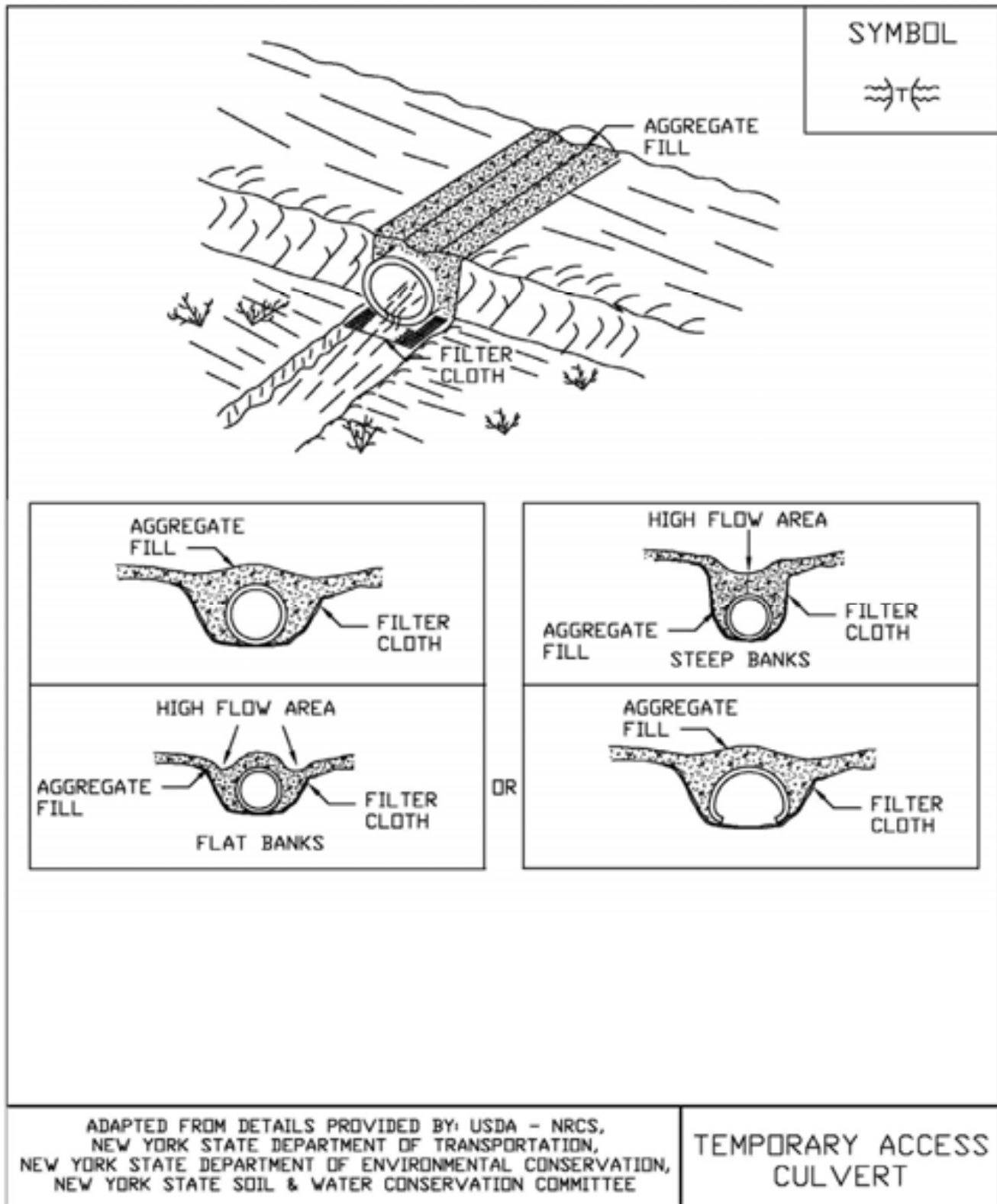
### **Culvert Maintenance Requirements**

1. **Inspection:** Periodic inspection shall be performed to

**Figure 2.2**  
**Temporary Access Bridge**



**Figure 2.3**  
**Temporary Access Culvert**



# STANDARD AND SPECIFICATIONS FOR PROTECTING VEGETATION DURING CONSTRUCTION



## **Definition & Scope**

The protection of trees, shrubs, ground cover and other vegetation from damage by construction equipment. In order to preserve existing vegetation determined to be important for soil erosion control, water quality protection, shade, screening, buffers, wildlife habitat, wetland protection, and other values.

## **Conditions Where Practices Applies**

On planned construction sites where valued vegetation exists and needs to be preserved.

## **Design Criteria**

### 1. Planning Considerations

#### A. Inventory:

1) Property boundaries, topography, vegetation and soils information should be gathered. Identify potentially high erosion areas, areas with tree windthrow potential, etc. A vegetative cover type map should be made on a copy of a topographic map which shows other natural and manmade features. Vegetation that is desirable to preserve because of its value for screening, shade, critical erosion control, endangered species, aesthetics, etc., should be identified and marked on the map.

2) Based upon this data, general statements should be prepared about the present condition, potential problem areas, and unique features of the property.

#### B. Planning:

1) After engineering plans (plot maps) are prepared, another field review should take place and

recommendations made for the vegetation to be saved. Minor adjustments in location of roads, dwellings, and utilities may be needed. Construction on steep slopes, erodible soils, wetlands, and streams should be avoided. Clearing limits should be delineated (See "Determine Limits of Clearing and Grading" on page 2.2).

2) Areas to be seeded and planted should be identified. Remaining vegetation should blend with their surroundings and/or provide special function such as a filter strip, buffer zone, or screen.

3) Trees and shrubs of special seasonal interest, such as flowering dogwood, red maple, striped maple, serviceberry, or shadbush, and valuable potential shade trees should be identified and marked for special protective treatment as appropriate.

4) Trees to be cut should be marked on the plans. If timber can be removed for salable products, a forester should be consulted for marketing advice.

5) Trees that may become a hazard to people, personal property, or utilities should be removed. These include trees that are weak-wooded, disease-prone, subject to windthrow, or those that have severely damaged root systems.

6) The vigor of remaining trees may be improved by a selective thinning. A forester should be consulted for implementing this practice.

### 2. Measures to Protect Vegetation

A. Limit soil placement over existing tree and shrub roots to a maximum of 3 inches. Soils with loamy texture and good structure should be used.

B. Use retaining walls and terraces to protect roots of trees and shrubs when grades are lowered. Lowered grades should start no closer than the dripline of the tree. For narrow-canopied trees and shrubs, the stem diameter in inches is converted to feet and doubled, such that a 10 inch tree should be protected to 20 feet.

C. Trenching across tree root systems should be the same minimum distance from the trunk, as in "B". Tunnels under root systems for underground utilities should start 18 inches or deeper below the normal ground surface. Tree roots which must be severed should be cut clean. Backfill material that will be in contact with the roots should be topsoil or a prepared planting soil mixture.

D. Construct sturdy fences, or barriers, of wood, steel, or other protective material around valuable

vegetation for protection from construction equipment. Place barriers far enough away from trees, but not less than the specifications in "B", so that tall equipment such as backhoes and dump trucks do not contact tree branches.

E. Construction limits should be identified and clearly marked to exclude equipment.

F. Avoid spills of oil/gas and other contaminants.

G. Obstructive and broken branches should be pruned properly. The branch collar on all branches whether living or dead should not be damaged. The 3 or 4 cut method should be used on all branches larger than two inches at the cut. First cut about one-third the way through the underside of the limb (about 6-12 inches from the tree trunk). Then (approximately an inch further out) make a second cut through the limb from the upper side. When the branch is removed, there is no splintering of the main tree trunk. Remove the stub. If the branch is larger than 5-6 inches in diameter, use the four cut system. Cuts 1 and 2 remain the same and cut 3 should be from the underside of the limb, on the outside of the branch collar. Cut 4 should be from the top and in alignment with the 3rd cut. Cut 3 should be 1/4 to 1/3 the way through the limb. This will prevent the bark from peeling down the trunk. Do not paint the cut surface.

H. Penalties for damage to valuable trees, shrubs, and herbaceous plants should be clearly spelled out in the contract.

## **PROTECTING TREES IN HEAVY USE AREAS**

The compaction of soil over the roots of trees and shrubs by the trampling of recreationists, vehicular traffic, etc., reduces oxygen, water, and nutrient uptake by feeder roots. This weakens and may eventually kill the plants. Table 2.6 rates the "Susceptibility of Tree Species to Compaction."

Where heavy compaction is anticipated, apply and maintain a 3 to 4 inch layer of undecayed wood chips or 2 inches of No. 2 washed, crushed gravel. In addition, use of a wooden or plastic mat may be used to lessen compaction, if applicable.

**Table 2.6**  
**Susceptibility of Tree Species to Compaction<sup>1</sup>**

Resistant:

Box elder.....	<i>Acer negundo</i>	Willows.....	<i>Salix spp.</i>
Green ash.....	<i>Fraxinus pennsylvanica</i>	Honey locust.....	<i>Gleditsia triacanthos</i>
Red elm.....	<i>Ulmus rubra</i>	Eastern cottonwood.....	<i>Populus deltoides</i>
Hawthornes.....	<i>Crataegus spp.</i>	Swamp white oak.....	<i>Quercus bicolor</i>
Bur oak.....	<i>Quercus macrocarpa</i>	Hophornbeam.....	<i>Ostrya virginiana</i>
Northern white cedar....	<i>Thuja occidentalis</i>		

Intermediate:

Red maple.....	<i>Acer rubrum</i>	Sweetgum.....	<i>Liquidambar styraciflua</i>
Silver maple.....	<i>Acer saccharinum</i>	Norway maple.....	<i>Acer platanoides</i>
Hackberry.....	<i>Celtis occidentalis</i>	Shagbark hickory.....	<i>Carya ovata</i>
Black gum.....	<i>Nyssa sylvatica</i>	London plane.....	<i>Platanus x hybrida</i>
Red oak.....	<i>Quercus rubra</i>	Pin oak.....	<i>Quercus palustris</i>
Basswood.....	<i>Tilia americana</i>		

Susceptible:

Sugar maple.....	<i>Acer saccharum</i>	Austrian Pine.....	<i>Pinus nigra</i>
White pine.....	<i>Pinus strobus</i>	White ash.....	<i>Fraxinus americana</i>
Blue spruce.....	<i>Picea pungens</i>	Paper birch.....	<i>Betula papyrifera</i>
White oak.....	<i>Quercus alba</i>	Mountain ash.....	<i>Sorbus aucuparia</i>
Red pine.....	<i>Pinus resinosa</i>	Japanese maple.....	<i>Acer palmatum</i>

<sup>1</sup> If a tree species does not appear on the list, insufficient information is available to rate it for this purpose.



# STANDARD AND SPECIFICATIONS FOR BUFFER FILTER STRIP



Land Slope (%)	Minimum Filter Strip Width (ft.)
≤10	50
20	60
30	85
40	105
50	125
60	145
70	165

## **Definition & Scope**

A **temporary/permanent** well vegetated grassed area below a disturbed area that can be used to remove sediment from runoff prior to it reaching surface waters or other designated areas of concern, such as parking lots and road pavement.

## **Condition Where Practice Applies**

This practice is effective when the flow is in the form of sheet flow and the vegetative cover is established prior to disturbance. Surface water must be protected from sediment-laden runoff until buffer filter strip vegetation is established, and then the proposed disturbance can be undertaken. This practice is effective when the flow is in the form of sheet flow (maximum of 150 feet).

## **Design Criteria**

1. The vegetation should be a well established perennial grass. Wooded and brushy areas are not acceptable for purposes of sediment removal.
2. The minimum buffer filter strip width for stream protection shall be in accordance with the following table:

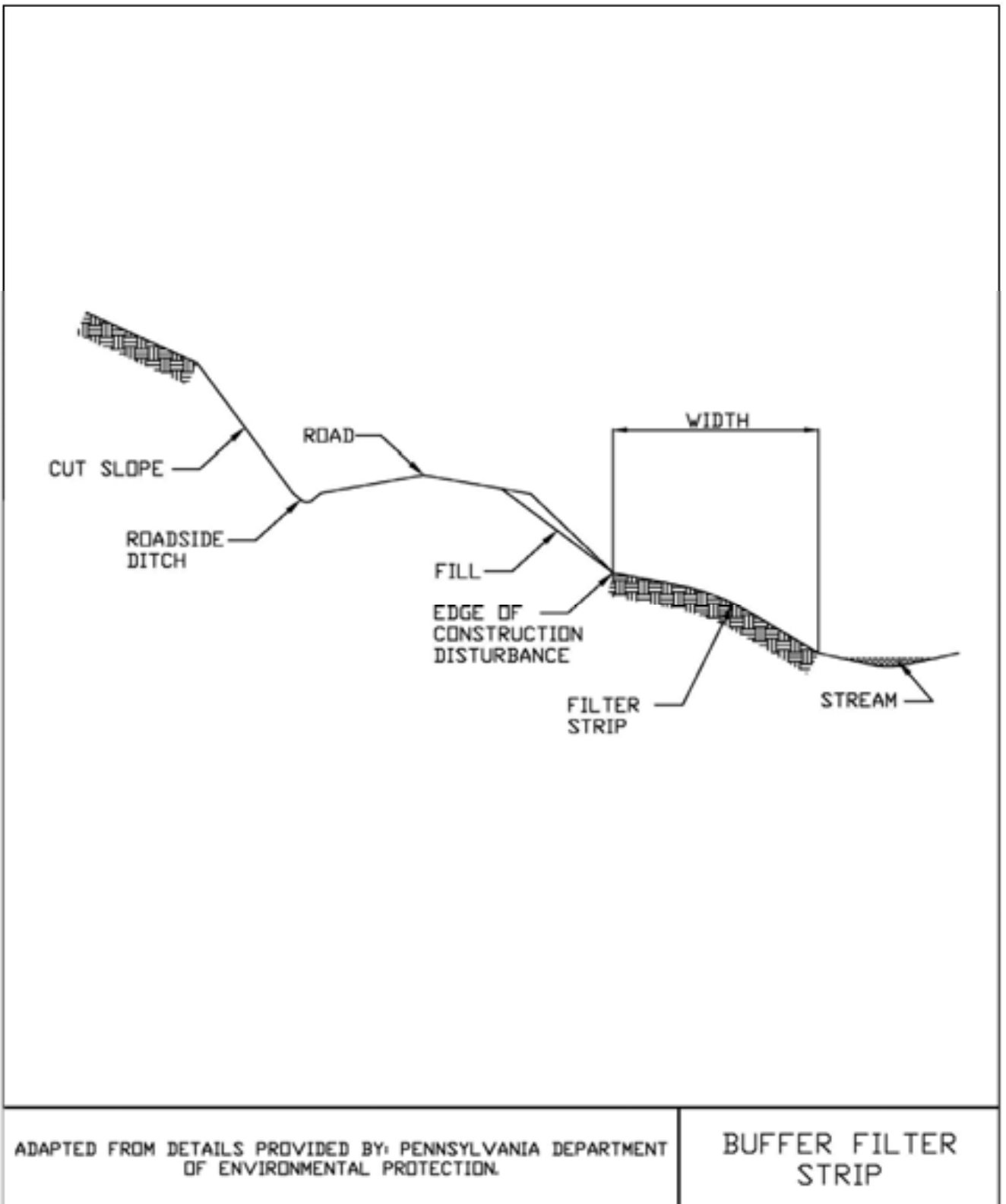
3. The minimum buffer filter strip width to protect paved areas during construction is 20 feet.

## **Maintenance**

If at any time the width of the buffer filter strip has been reduced by sediment deposition to half its original width or concentrated flow has developed, suitable additional practices should be installed. The erosion and sediment control plan shall include these details.



**Figure 5.1**  
**Buffer Filter Strip**



# STANDARD AND SPECIFICATIONS FOR FERTILIZER APPLICATION



## Definition & Scope

The **permanent** incorporation of fertilizer into the planting zone of the soil profile to provide nutrient amendments to the soil for vigorous support to plant and vegetation growth.

## Conditions Where Practice Applies

This standard applies to all areas where permanent seeding, sodding, and plant establishment is required. All application of fertilizer shall be in accordance with Nutrient Runoff Law - ECL Article 17, Title 21. Phosphorus runoff poses a threat to water quality. Therefore, under New York Law, fertilizer containing phosphorus may only be applied to lawn or non-agricultural turf when:

1. A soil test indicates that additional phosphorus is needed for growth of that lawn or non-agricultural turf, or
2. The fertilizer is used for newly established lawn or non-agricultural turf during the first growing season.

For projects located within watersheds where enhanced phosphorus removal standards are required as part of its post-construction stormwater management plan, use of any fertilizer containing more than 0.67 percent phosphate ( $P_2O_5$ ) content will be done only with a valid soil test demonstrating the need for that formulation.

## Design Criteria

Fertilizer is sold with an analysis printed on the tag or bag shown as three numbers separated by a dash, such as 5-10-5. The first number is the percent of the total weight of the bag that is nitrogen (N), the second is the percent of

phosphate (phosphorus, P), and the third is the percent of potash (potassium, K). Other elements are sometimes included and are listed with these three basic components.

For example a 40 lb bag of 5-10-5 fertilizer contains 5% of 40 lbs of Nitrogen which equals 2 lbs. There is 10% of 40 lbs of phosphate (phosphorus) which equals 4 lbs, and there is 5% of potash (potassium), another 2 lbs., for a total of 8 lbs of active fertilizer in the 40 lb bag. The rest is filler to aid in spreading the material over the area to be treated.

Specify the design fertilizer mix and application rates based on the results of the soil tests.

## Specifications

1. In no case shall fertilizer be applied between December 1 and April 1 annually.
2. Fertilizer shall not be spread within 20 feet of a surface water.
3. Any fertilizer falling or spilled into impervious surface areas such as parking lots, roadways, and sidewalks should be immediately contained and legally applied or placed in an appropriate container.
4. Incorporate the fertilizer, and lime if specified, into the top 2-4 inches of the topsoil or soil profile.
5. When applying fertilizer by hydro seeding care should be taken to apply mix only to seed bed areas at an appropriate flow rate to prevent erosion and spraying onto impervious areas.



# STANDARD AND SPECIFICATIONS FOR COMPOST FILTER SOCK



that 8" diameter socks may be used for residential lots to control areas less than 0.25 acres.

- The flat dimension of the sock shall be at least 1.5 times the nominal diameter.
- The **Maximum Slope Length** (in feet) above a compost filter sock shall not exceed the following limits:

Dia. (in.)	Slope %						
	2	5	10	20	25	33	50
8	225*	200	100	50	20	—	—
12	250	225	125	65	50	40	25
18	275	250	150	70	55	45	30
24	350	275	200	130	100	60	35
32	450	325	275	150	120	75	50

\* Length in feet

## Definition & Scope

A **temporary** sediment control practice composed of a degradable geotextile mesh tube filled with compost filter media to filter sediment and other pollutants associated with construction activity to prevent their migration offsite.

## Condition Where Practice Applies

Compost filter socks can be used in many construction site applications where erosion will occur in the form of sheet erosion and there is no concentration of water flowing to the sock. In areas with steep slopes and/or rocky terrain, soil conditions must be such that good continuous contact between the sock and the soil is maintained throughout its length. For use on impervious surfaces such as road pavement or parking areas, proper anchorage must be provided to prevent shifting of the sock or separation of the contact between the sock and the pavement. Compost filter socks are utilized both at the site perimeter as well as within the construction areas. These socks may be filled after placement by blowing compost into the tube pneumatically, or filled at a staging location and moved into its designed location.

## Design Criteria

- Compost filter socks will be placed on the contour with both terminal ends of the sock extended 8 feet upslope at a 45 degree angle to prevent bypass flow.
- Diameters designed for use shall be 12" – 32" except



- The compost infill shall be well decomposed (matured at least 3 months), weed-free, organic matter. It shall be aerobically composted, possess no objectionable odors, and contain less than 1%, by dry weight, of man-made foreign matter. The physical parameters of the compost shall meet the standards listed in Table 5.2 - Compost Standards Table. **Note: All biosolids compost produced in New York State (or approved for importation) must meet NYS DEC's 6 NYCRR Part 360 (Solid Waste Management Facilities) requirements. The Part 360 requirements are equal to or more stringent than 40 CFR Part 503 which ensure safe standards for pathogen reduction and heavy metals content. When using compost filter socks adjacent to surface water, the compost should have a low nutrient value.**
- The compost filter sock fabric material shall meet the

7. Compost filter socks shall be anchored in earth with 2" x 2" wooden stakes driven 12" into the soil on 10 foot centers on the centerline of the sock. On uneven terrain, effective ground contact can be enhanced by the placement of a fillet of filter media on the disturbed area side of the compost sock.
8. All specific construction details and material specifications shall appear on the erosion and sediment control constructions drawings when compost filter socks are included in the plan.
3. Socks shall be inspected weekly and after each runoff event. Damaged socks shall be repaired in the manner required by the manufacturer or replaced within 24 hours of inspection notification.
4. Biodegradable filter socks shall be replaced after 6 months; photodegradable filter socks after 1 year. Polypropylene socks shall be replaced according to the manufacturer's recommendations.
5. Upon stabilization of the area contributory to the sock, stakes shall be removed. The sock may be left in place and vegetated or removed in accordance with the stabilization plan. For removal the mesh can be cut and the compost spread as an additional mulch to act as a soil supplement.

### **Maintenance**

1. Traffic shall not be permitted to cross filter socks.
2. Accumulated sediment shall be removed when it reaches half the above ground height of the sock and disposed of in accordance with the plan.

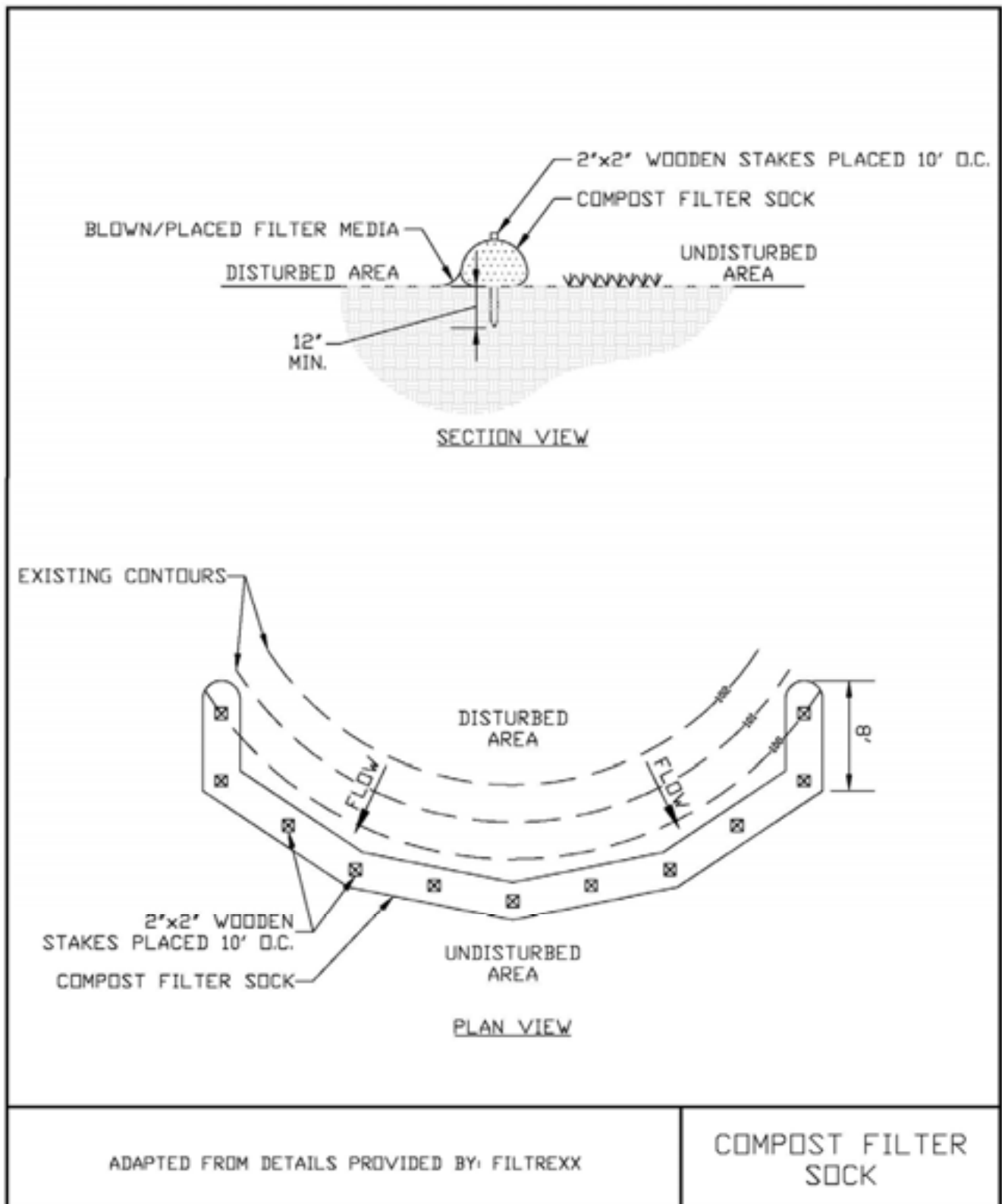
**Table 5.1 - Compost Sock Fabric Minimum Specifications Table**

Material Type	3 mil HDPE	5 mil HDPE	5 mil HDPE	Multi-Filament Polypropylene (MFPP)	Heavy Duty Multi-Filament Polypropylene (HDMFPP)
Material Characteristics	Photodegradable	Photodegradable	Biodegradable	Photodegradable	Photodegradable
Sock Diameters	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
Mesh Opening	3/8"	3/8"	3/8"	3/8"	1/8"
Tensile Strength		26 psi	26 psi	44 psi	202 psi
Ultraviolet Stability % Original Strength (ASTM G-155)	23% at 1000 hr.	23% at 1000 hr.		100% at 1000 hr.	100% at 1000 hr.
Minimum Functional Longevity	6 months	9 months	6 months	1 year	2 years

**Table 5.2 - Compost Standards Table**

Organic matter content	25% - 100% (dry weight)
Organic portion	Fibrous and elongated
pH	6.0 – 8.0
Moisture content	30% - 60%
Particle size	100% passing a 1" screen and 10 - 50% passing a 3/8" screen
Soluble salt concentration	5.0 dS/m (mmhos/cm) maximum

**Figure 5.2**  
**Compost Filter Sock**



# STANDARD AND SPECIFICATIONS FOR SILT FENCE



## Definition & Scope

A **temporary** barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil by temporarily ponding the sediment laden runoff allowing settling to occur. The maximum period of use is limited by the ultraviolet stability of the fabric (approximately one year).

## Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope length and fence length will not exceed the limits shown in the Design Criteria for the specific type of silt fence used ; and
2. Maximum ponding depth of 1.5 feet behind the fence; and
3. Erosion would occur in the form of sheet erosion; and
4. There is no concentration of water flowing to the barrier; and
5. Soil conditions allow for proper keying of fabric, or other anchorage, to prevent blowouts.

## Design Criteria

1. Design computations are not required for installations of 1 month or less. Longer installation periods should be designed for expected runoff.
2. All silt fences shall be placed as close to the disturbed area as possible, but at least 10 feet from the toe of a slope steeper than 3H:1V, to allow for maintenance and

roll down. The area beyond the fence must be undisturbed or stabilized.

3. The type of silt fence specified for each location on the plan shall not exceed the maximum slope length and maximum fence length requirements shown in the following table:

Slope	Steepness	Slope Length/Fence Length (ft.)		
		Standard	Reinforced	Super
<2%	< 50:1	300/1500	N/A	N/A
2-10%	50:1 to 10:1	125/1000	250/2000	300/2500
10-20%	10:1 to 5:1	100/750	150/1000	200/1000
20-33%	5:1 to 3:1	60/500	80/750	100/1000
33-50%	3:1 to 2:1	40/250	70/350	100/500
>50%	> 2:1	20/125	30/175	50/250

**Standard Silt Fence (SF)** is fabric rolls stapled to wooden stakes driven 16 inches in the ground.

**Reinforced Silt Fence (RSF)** is fabric placed against welded wire fabric with anchored steel posts driven 16 inches in the ground.

**Super Silt Fence (SSF)** is fabric placed against chain link fence as support backing with posts driven 3 feet in the ground.

4. Silt fence shall be removed as soon as the disturbed area has achieved final stabilization.

The silt fence shall be installed in accordance with the appropriate details. Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. Butt joints are not acceptable. A detail of the silt fence shall be shown on the plan. See Figure 5.30 on page 5.56 for Reinforced Silt Fence as an example of details to be provided.

## Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance.



Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	110	ASTM D 4632
Elongation at Failure (%)	20	ASTM D 4632
Mullen Burst Strength (PSI)	300	ASTM D 3786
Puncture Strength (lbs)	60	ASTM D 4833
Minimum Trapezoidal Tear Strength (lbs)	50	ASTM D 4533
Flow Through Rate (gal/min/sf)	25	ASTM D 4491
Equivalent Opening Size	40-80	US Std Sieve ASTM D 4751
Minimum UV Residual (%)	70	ASTM D 4355

#### Super Silt Fence

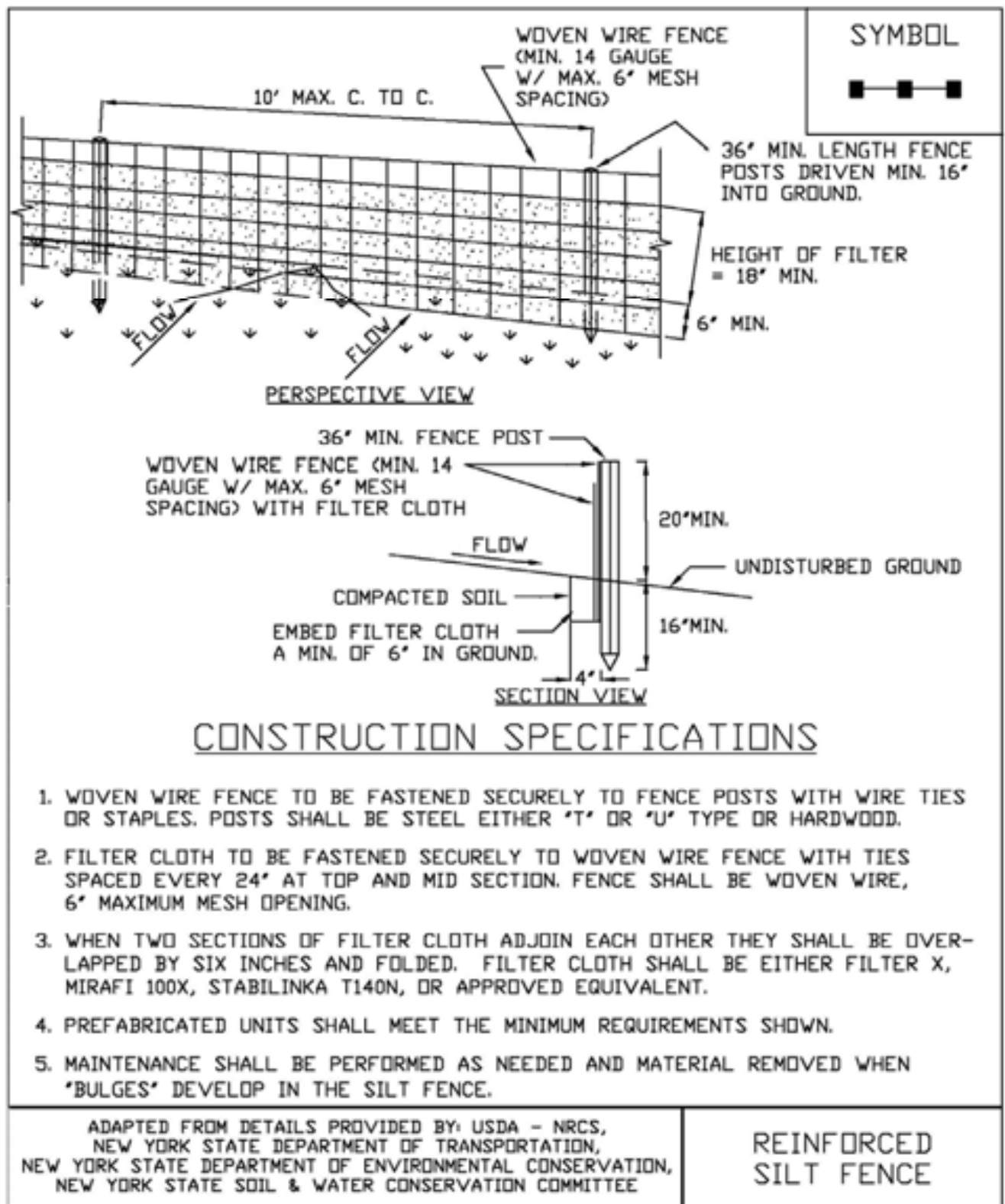


2. Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.5 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot. Posts for super silt fence shall be standard chain link fence posts.
3. Wire Fence for reinforced silt fence: Wire fencing shall be a minimum 14 gage with a maximum 6 in. mesh opening, or as approved.
4. Prefabricated silt fence is acceptable as long as all material specifications are met.

#### Reinforced Silt Fence



**Figure 5.30  
Reinforced Silt Fence**





# STANDARD AND SPECIFICATIONS FOR MULCHING



## **Definition and Scope**

Applying coarse plant residue or chips, or other suitable materials, to cover the soil surface to provide initial erosion control while a seeding or shrub planting is establishing. Mulch will conserve moisture and modify the surface soil temperature and reduce fluctuation of both. Mulch will prevent soil surface crusting and aid in weed control. Mulch can also be used alone for temporary stabilization in non-growing months. Use of stone as a mulch could be more permanent and should not be limited to non-growing months.

## **Conditions Where Practice Applies**

On soils subject to erosion and on new seedlings and shrub plantings. Mulch is useful on soils with low infiltration rates by retarding runoff.

## **Criteria**

Site preparation prior to mulching requires the installation of necessary erosion control or water management practices and drainage systems.

Slope, grade and smooth the site to fit needs of selected mulch products.

Remove all undesirable stones and other debris to meet the needs of the anticipated land use and maintenance required.

Apply mulch after soil amendments and planting is accomplished or simultaneously if hydroseeding is used.

Select appropriate mulch material and application rate or material needs. Hay mulch shall not be used in wetlands or in areas of permanent seeding. Clean straw mulch is preferred alternative in wetland application. Determine local availability.

Select appropriate mulch anchoring material.

NOTE: The best combination for grass/legume establishment is straw (cereal grain) mulch applied at 2 ton/acre (90 lbs./1000sq.ft.) and anchored with wood fiber mulch (hydromulch) at 500 – 750 lbs./acre (11 – 17 lbs./1000 sq. ft.). The wood fiber mulch must be applied through a hydroseeder immediately after mulching.



**Table 4.2**  
**Guide to Mulch Materials, Rates, and Uses**

<b>Mulch Material</b>	<b>Quality Standards</b>	<b>per 1000 Sq. Ft.</b>	<b>per Acre</b>	<b>Depth of Application</b>	<b>Remarks</b>
Wood chips or shavings	Air-dried. Free of objectionable coarse material	500-900 lbs.	10-20 tons	2-7"	Used primarily around shrub and tree plantings and recreation trails to inhibit weed competition. Resistant to wind blowing. Decomposes slowly.
Wood fiber cellulose (partly digested wood fibers)	Made from natural wood usually with green dye and dispersing agent	50 lbs.	2,000 lbs.	—	Apply with hydromulcher. No tie down required. Less erosion control provided than 2 tons of hay or straw.
Gravel, Crushed Stone or Slag	Washed; Size 2B or 3A—1 1/2"	9 cu. yds.	405 cu. yds.	3"	Excellent mulch for short slopes and around plants and ornamentals. Use 2B where subject to traffic. (Approximately 2,000 lbs./cu. yd.). Frequently used over filter fabric for better weed control.
Hay or Straw	Air-dried; free of undesirable seeds & coarse materials	90-100 lbs. 2-3 bales	2 tons (100-120 bales)	cover about 90% surface	Use small grain straw where mulch is maintained for more than three months. Subject to wind blowing unless anchored. Most commonly used mulching material. Provides the best micro-environment for germinating seeds.
Jute twisted yarn	Undyed, unbleached plain weave. Warp 78 ends/yd., Weft 41 ends/yd. 60-90 lbs./roll	48" x 50 yds. or 48" x 75 yds.	—	—	Use without additional mulch. Tie down as per manufacturers specifications. Good for center line of concentrated water flow.
Excelsior wood fiber mats	Interlocking web of excelsior fibers with photodegradable plastic netting	4' x 112.5' or 8' x 112.5'.	—	—	Use without additional mulch. Excellent for seeding establishment. Anchor as per manufacturers specifications. Approximately 72 lbs./roll for excelsior with plastic on both sides. Use two sided plastic for centerline of waterways.
Straw or coconut fiber, or combination	Photodegradable plastic net on one or two sides	Most are 6.5 ft. x 3.5 ft.	81 rolls	—	Designed to tolerate higher velocity water flow, centerlines of waterways, 60 sq. yds. per roll.

**Table 4.3**  
**Mulch Anchoring Guide**

Anchoring Method or Material	Kind of Mulch to be Anchored	How to Apply
1. Peg and Twine	Hay or straw	After mulching, divide areas into blocks approximately 1 sq. yd. in size. Drive 4-6 pegs per block to within 2" to 3" of soil surface. Secure mulch to surface by stretching twine between pegs in criss-cross pattern on each block. Secure twine around each peg with 2 or more tight turns. Drive pegs flush with soil. Driving stakes into ground tightens the twine.
2. Mulch netting	Hay or straw	Staple the light-weight paper, jute, wood fiber, or plastic nettings to soil surface according to manufacturer's recommendations. Should be biodegradable. Most products are not suitable for foot traffic.
3. Wood cellulose fiber	Hay or straw	Apply with hydroseeder immediately after mulching. Use 500 lbs. wood fiber per acre. Some products contain an adhesive material ("tackifier"), possibly advantageous.
4. Mulch anchoring tool	Hay or straw	Apply mulch and pull a mulch anchoring tool (blunt, straight discs) over mulch as near to the contour as possible. Mulch material should be "tucked" into soil surface about 3".
5. Tackifier	Hay or straw	Mix and apply polymeric and gum tackifiers according to manufacturer's instructions. Avoid application during rain. A 24-hour curing period and a soil temperature higher than 45 <sup>0</sup> Fahrenheit are required.

# STANDARD AND SPECIFICATIONS FOR TEMPORARY CONSTRUCTION AREA SEEDING



## **Definition & Scope**

Providing temporary erosion control protection to disturbed areas and/or localized critical areas for an interim period by covering all bare ground that exists as a result of construction activities or a natural event. Critical areas may include but are not limited to steep excavated cut or fill slopes and any disturbed, denuded natural slopes subject to erosion.

## **Conditions Where Practice Applies**

Temporary seedings may be necessary on construction sites to protect an area, or section, where final grading is complete, when preparing for winter work shutdown, or to provide cover when permanent seedings are likely to fail due to mid-summer heat and drought. The intent is to provide temporary protective cover during temporary shutdown of construction and/or while waiting for optimal planting time.

## **Criteria**

Water management practices must be installed as appropriate for site conditions. The area must be rough graded and slopes physically stable. Large debris and rocks are usually removed. Seedbed must be seeded within 24 hours of disturbance or scarification of the soil surface will be necessary prior to seeding.

Fertilizer or lime are not typically used for temporary seedings.

IF: Spring or summer or early fall, then seed the area with ryegrass (annual or perennial) at 30 lbs. per acre (Approximately 0.7 lb./1000 sq. ft. or use 1 lb./1000 sq. ft.).

IF: Late fall or early winter, then seed Certified 'Aroostook' winter rye (cereal rye) at 100 lbs. per acre (2.5 lbs./1000 sq. ft.).

Any seeding method may be used that will provide uniform application of seed to the area and result in relatively good soil to seed contact.

Mulch the area with hay or straw at 2 tons/acre (approx. 90 lbs./1000 sq. ft. or 2 bales). Quality of hay or straw mulch allowable will be determined based on long term use and visual concerns. Mulch anchoring will be required where wind or areas of concentrated water are of concern. Wood fiber hydromulch or other sprayable products approved for erosion control (nylon web or mesh) may be used if applied according to manufacturers' specification. Caution is advised when using nylon or other synthetic products. They may be difficult to remove prior to final seeding and can be a hazard to young wildlife species.

# STANDARD AND SPECIFICATIONS FOR TOPSOILING



## **Definition & Scope**

Spreading a specified quality and quantity of topsoil materials on graded or constructed subsoil areas to provide acceptable plant cover growing conditions, thereby reducing erosion; to reduce irrigation water needs; and to reduce the need for nitrogen fertilizer application.

## **Conditions Where Practice Applies**

Topsoil is applied to subsoils that are droughty (low available moisture for plants), stony, slowly permeable, salty or extremely acid. It is also used to backfill around shrub and tree transplants. This standard does not apply to wetland soils.

## **Design Criteria**

1. Preserve existing topsoil in place where possible, thereby reducing the need for added topsoil.
2. Conserve by stockpiling topsoil and friable fine textured subsoils that must be stripped from the excavated site and applied after final grading where vegetation will be established. Topsoil stockpiles must be stabilized. Stockpile surfaces can be stabilized by vegetation, geotextile or plastic covers. This can be aided by orientating the stockpile lengthwise into prevailing winds.
3. Refer to USDA Natural Resource Conservation Service soil surveys or soil interpretation record sheets for further soil texture information for selecting appropriate design topsoil depths.

## **Site Preparation**

1. As needed, install erosion and sediment control practices such as diversions, channels, sediment traps, and stabilizing measures, or maintain if already installed.
2. Complete rough grading and final grade, allowing for depth of topsoil to be added.
3. Scarify all compact, slowly permeable, medium and fine textured subsoil areas. Scarify at approximately right angles to the slope direction in soil areas that are steeper than 5 percent. Areas that have been overly compacted shall be decompact in accordance with the Soil Restoration Standard.
4. Remove refuse, woody plant parts, stones over 3 inches in diameter, and other litter.

## **Topsoil Materials**

1. Topsoil shall have at least 6 percent by weight of fine textured stable organic material, and no greater than 20 percent. Muck soil shall not be considered topsoil.
2. Topsoil shall have not less than 20 percent fine textured material (passing the NO. 200 sieve) and not more than 15 percent clay.
3. Topsoil treated with soil sterilants or herbicides shall be so identified to the purchaser.
4. Topsoil shall be relatively free of stones over 1 1/2 inches in diameter, trash, noxious weeds such as nut sedge and quackgrass, and will have less than 10 percent gravel.
5. Topsoil containing soluble salts greater than 500 parts per million shall not be used.
6. Topsoil may be manufactured as a mixture of a mineral component and organic material such as compost.

## **Application and Grading**

1. Topsoil shall be distributed to a uniform depth over the area. It shall not be placed when it is partly frozen, muddy, or on frozen slopes or over ice, snow, or standing water puddles.
2. Topsoil placed and graded on slopes steeper than 5 percent shall be promptly fertilized, seeded, mulched, and stabilized by "tracking" with suitable equipment.
3. Apply topsoil in the amounts shown in Table 4.7 below:

<b>Table 4.7 - Topsoil Application Depth</b>		
<b>Site Conditions</b>	<b>Intended Use</b>	<b>Minimum Topsoil Depth</b>
1. Deep sand or loamy sand	Mowed lawn	6 in.
	Tall legumes, unmowed	2 in.
	Tall grass, unmowed	1 in.
2. Deep sandy loam	Mowed lawn	5 in.
	Tall legumes, unmowed	2 in.
	Tall grass, unmowed	none
3. Six inches or more: silt loam, clay loam, loam, or silt	Mowed lawn	4 in.
	Tall legumes, unmowed	1 in.
	Tall grass, unmowed	1 in.

**Appendix C**  
*Inspection and Corrective Action Forms*

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General Information (see reverse for instructions)					
Name of Project		NPDES ID No.		Inspection Date	
Weather conditions during inspection		Inspection start time		Inspection end time	
Inspector Name, Title & Contact Information					
Present Phase of Construction					
Inspection Location (if multiple inspections are required, specify location where this inspection is being conducted)					
<b>Inspection Frequency</b> <i>(Note: you may be subject to different inspection frequencies in different areas of the site. Check all that apply)</i> <b>Standard Frequency:</b> <input type="checkbox"/> Every 7 days <input type="checkbox"/> Every 14 days and within 24 hours of a 0.25" rain or the occurrence of runoff from snowmelt sufficient to cause a discharge <b>Increased Frequency:</b> <input type="checkbox"/> Every 7 days and within 24 hours of a 0.25" rain (for areas of sites discharging to sediment or nutrient-impaired waters or to waters designated as Tier 2, Tier 2.5, or Tier 3) <b>Reduced Frequency:</b> <input type="checkbox"/> Twice during first month, no more than 14 calendar days apart; then once per month after first month; (for stabilized areas) <input type="checkbox"/> Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of a 0.25" rain (for stabilized areas on "linear construction sites") <input type="checkbox"/> Once per month and within 24 hours of a 0.25" rain (for arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought) <input type="checkbox"/> Once per month (for frozen conditions where earth-disturbing activities are being conducted)					
<b>Was this inspection triggered by a 0.25" storm event?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>If yes, how did you determined whether a 0.25" storm event has occurred?</b> <input type="checkbox"/> Rain gauge on site <input type="checkbox"/> Weather station representative of site. Specify weather station source:  <b>Total rainfall amount that triggered the inspection (in inches):</b>					
<b>Was this inspection triggered by the occurrence of runoff from snowmelt sufficient to cause a discharge?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No					
<b>Unsafe Conditions for Inspection</b> <b>Did you determine that any portion of your site was unsafe for inspection per CGP Part 4.5?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>If "yes", complete the following:</b> - Describe the conditions that prevented you from conducting the inspection in this location:   - Location(s) where conditions were found:					

Condition and Effectiveness of Erosion and Sediment (E&S) Controls (CGP Part 2.2)				
(see reverse for instructions)				
Type/Location of E&S Control [Add an additional sheet if necessary]	Maintenance Needed?*	Corrective Action Required?*	Date on Which Maintenance or Corrective Action First Identified?	Notes
1.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
4.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
5.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
6.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
7.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
8.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
9.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
10.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		

\* **Note:** The permit differentiates between conditions requiring routine maintenance, and those requiring corrective action. The permit requires maintenance in order to keep controls in effective operating condition. Corrective actions are triggered only for specific conditions, which include: 1) A stormwater control needs repair or replacement (beyond routine maintenance) if it is not operating as intended; 2) A stormwater control necessary to comply with the permit was never installed or was installed incorrectly; 3) You become aware that the stormwater controls you have installed and are maintaining are not effective enough for the discharge to meet applicable water quality standards or applicable requirements in Part 3.1; 4) One of the prohibited discharges in Part 1.3 is occurring or has occurred; or 5) EPA requires corrective actions as a result of a permit violation found during an inspection carried out under Part 4.8. If a condition on your site requires a corrective action, you must also fill out a corrective action form found at <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources>. See Part 5 of the permit for more information.

Condition and Effectiveness of Pollution Prevention (P2) Practices (CGP Part 2.3)				
(see reverse for instructions)				
Type/Location of P2 Practices [Add an additional sheet if necessary]	Maintenance Needed?*	Corrective Action Required?*	Date on Which Maintenance or Corrective Action First Identified?	Notes
1.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
4.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
5.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
6.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
7.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
8.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
9.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
10.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		

**\* Note:** The permit differentiates between conditions requiring routine maintenance, and those requiring corrective action. The permit requires maintenance in order to keep controls in effective operating condition. Corrective actions are triggered only for specific conditions, which include: 1) A stormwater control needs repair or replacement (beyond routine maintenance) if it is not operating as intended; 2) A stormwater control necessary to comply with the permit was never installed or was installed incorrectly; 3) You become aware that the stormwater controls you have installed and are maintaining are not effective enough for the discharge to meet applicable water quality standards or applicable requirements in Part 3.1; 4) One of the prohibited discharges in Part 1.3 is occurring or has occurred; or 5) EPA requires corrective actions as a result of a permit violation found during an inspection carried out under Part 4.8. If a condition on your site requires a corrective action, you must also fill out a corrective action form found at <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources>. See Part 5 of the permit for more information.

### Stabilization of Exposed Soil (CGP Part 2.2.14)

(see reverse for instructions)

Stabilization Area [Add an additional sheet if necessary]	Stabilization Method	Have You Initiated Stabilization?	Notes
1.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	
2.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	
3.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	
4.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	
5.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	

### Description of Discharges (CGP Part 4.6.6)

(see reverse for instructions)

Was a stormwater discharge or other discharge occurring from any part of your site at the time of the inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If "yes", provide the following information for each point of discharge:	
Discharge Location [Add an additional sheet if necessary]	Observations
1.	Describe the discharge:  At points of discharge and the channels and banks of waters of the U.S. in the immediate vicinity, are there any visible signs of erosion and/or sediment accumulation that can be attributed to your discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No  If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:
2.	Describe the discharge:  At points of discharge and the channels and banks of waters of the U.S. in the immediate vicinity, are there any visible signs of erosion and/or sediment accumulation that can be attributed to your discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No  If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:

**Contractor or Subcontractor Signature and Certification**

(see reverse for instructions)

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

**Signature of Contractor or Subcontractor:** \_\_\_\_\_ **Date:** \_\_\_\_\_**Printed Name and Affiliation:** \_\_\_\_\_**Operator Signature and Certification**

(see reverse for instructions)

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

**Signature of Operator or "Duly Authorized Representative":** \_\_\_\_\_ **Date:** \_\_\_\_\_**Printed Name and Affiliation:** \_\_\_\_\_

<b>Section A – Initial Report (CGP Part 5.4.1)</b> (Complete this section within 24 hours of identifying the condition that triggered corrective action)				
<b>Name of Project</b>		<b>NPDES ID No.</b>		<b>Today's Date</b>
<b>Date Problem First Discovered</b>		<b>Time Problem First Discovered</b>		
<b>Name and Contact Information of Individual Completing this Form</b>				
<b>What site conditions triggered the requirement to conduct corrective action (check the box that applies):</b> <input type="checkbox"/> A stormwater control needs repair or replacement (beyond routine maintenance required under Part 2.1.4) <input type="checkbox"/> A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly <input type="checkbox"/> A discharge is causing an exceedance of applicable water quality standards <input type="checkbox"/> A Part 1.3 prohibited discharge has occurred <input type="checkbox"/> EPA requires corrective action as a result of permit violations found during an EPA inspection carried out under Part 4.8  <b>Provide a description of the problem:</b>          <b>Deadline for completing corrective action (check the box that applies):</b> <input type="checkbox"/> Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events <input type="checkbox"/> Complete by close of the next business day when problem does not require a new or replacement control or significant repair <input type="checkbox"/> No later than 7 calendar days from the time of discovery for problems that require a new or replacement control or significant repair <input type="checkbox"/> Infeasible to complete the installation or repair within 7 calendar days. Explain why it is infeasible and document schedule for installing control:          Enter date of corrective action completion: _____				
<b>Section B – Corrective Action Completion (CGP Part 5.4.2)</b> (Complete this section no later than 24 hours after completing the corrective action)				
Section B.1 – Why the Problem Occurred				
<b>Cause(s) of Problem</b> (Add an additional sheet if necessary)	<b>How You Determined the Cause and the Date You Determined the Cause</b>			
1.          2.	1.          2.			
Section B.2 – Stormwater Control Modifications Implemented to Correct the Problem				
<b>List of Stormwater Control Modification(s) Needed to Correct Problem</b> (Add an additional sheet if necessary)	<b>Date of Completion</b>	<b>SWPPP Update Necessary?</b>  <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide date SWPPP modified:	<b>Notes</b>	
1.          2.		<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide date SWPPP modified:		

### Section C –Signature and Certification (CGP Part 5.4.3)

#### Section C.1 – Contractor or Subcontractor Signature and Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

**Signature of Contractor or Subcontractor:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Printed Name and Affiliation:** \_\_\_\_\_

#### Section C.2 – Operator Signature and Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

**Signature of Operator or "Duly Authorized Representative":** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Printed Name and Affiliation:** \_\_\_\_\_